CONSTRUCTION OF LUTANANDWA ACCESS ROAD AND BRIDGE- PHASE 2

TENDER NUMBER: 35/2022

CIDB GRADING: 7 CE OR HIGHER

BOOK 1 OF 2

MAKHADO LOCAL MUNICIPALITY Contact Person: Ms P Mudau or Mr M Ramabulana Tel: (015) 516 3044/3024		**CONSULTANTS PRINCIPAL AGENT** Contact Person: Mr. T.E. Muvhango Tel: (015) 291 4173	
Name of Bidder:			
Bid Amount (VAT Incl.):			
BBBEE status:			
Bidder Address:			
Receipt Number:			
Email Address:			
Contact numbers:	**Tel:**	**Cell:**	**Fax:**
mig | Municipal Infrastructure Grant		EXPANDED PUBLIC WORKS PROGRAMME Creating opportunities towards human fulfilment	

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PART T1: TENDERING PROCEDURES

T1.1 TENDER NOTICE AND INVITATION TO TENDER

APPOINTMENT OF CONTRACTOR FOR CONSTRUCTION OF LUTANANDWA ACCESS ROAD AND BRIDGE -PHASE 2

All suitable service providers are hereby invited to bid for the below mentioned projects. Bidders are requested to bid as per specification attached to the bid documents that will be obtainable from **05 July 2022 at non–refundable amount of R600.00 per document** at the Procurement Office No. B043 Ground Floor, 83 Krogh Street, Civic Center, Makhado or can be downloaded from e-tender portal for free https://etenders.treasury.gov.za/content/advertised-tender or www.makhado.gov.za.

BID NO.	DESCRIPTION	SPECIAL REQUIREMENT	TECHNICAL ENQUIRIES	REFERENCE AND NOTICE NO	CLOSING DATE AND TIME
35 of 2022	Construction of Lutanandwa Access Road and Bridge-Phase 2	• CIDB Grading 7CE or Higher • Attach three years audited financial statement (only for those that are required by law)	Acting Director Technical Services: Mr G. Raleshuku or Ms. L. Thulare (015) 519 3000	File No. 8/3/2/1882 Notice No: 82/2022	01 August 2022 at 12:00pm

NB: NO COMPULSORY BRIEFING FOR THE ABOVEMENTIONED BID.

Completed bid documents signed by a duly authorized person, sealed in an envelope clearly marked “As mentioned above” must reach the undersigned by depositing it into the tender box at the foyer of the main entrance to the Civic Centre by not later than **12:00** on **01 August 2022** when all tenders received will be opened in public in the Council Chamber, Ground Floor, Civic Centre, No.83 Krogh Street, Makhado.

The Municipality is not bound to accept the lowest or any bid and reserves the right to accept any part of a bid. Bids must remain valid for a period of ninety (90) days after closing date of submission thereof. Submitted tenders will be evaluated on **80/20** score points and with functionality.

Bids which are late, incomplete, unsigned or submitted in pencil or by telegraph or facsimile or electronically by e-mail, or not having the following documents attached for evaluation or not complying with the tender specifications, will not be evaluated and will be disqualified:

- A valid Tax compliance status pin issued by SARS

- A copy of company registration certificate/CK.
- Certified copy/copies of company owner(s) ID book(s), not older than three (03) months.
- Attach proof of payment for municipal rates not owing for more than three (03) months or formal lease agreement for rental premises or letter from the traditional authority in case of non-rateable areas.(Attach for both entity and directors of the company)
- Copy of central supplier database report

NB:

- **Service provider must submit their certified BBBEE verification certificate from verification agency accredited by South African National Accreditation System (SANAS) or affidavit.**
- **All Service Provider doing business with Makhado Municipality are required to register on the CSD (Central Supplier Data Base)**
- **A copy of a certified copy will not be accepted.**

NOTE: ONLY A TENDERER

- Subcontracting a Minimum of 30% to an EME or QSE which is at least 51% owned by black people including the youth, women, people with disabilities, people living in rural areas or townships and military veterans.
- A tender that fails to meet pre=qualifying criteria stipulated in this advert and tenser document is unacceptable tender.

All procurement enquiries can be directed to Ms P Mudau or Mr M Ramabula at (015) 519 3044/3024

Civic Centre

83 Krogh Street **MR. KM NEMANAME**

LOUIS TRICHARDT **ACTING MUNICIPAL MANAGER**

T1.2 TENDER DATA

The conditions of tender are the Standard Conditions of Tender as contained in Annex F of the CIDB Standard for Uniformity in Construction Procurement (SFU) of May 2010, as published in Government Gazette No 33239, Board Notice 86 of 2010 of 28 May 2010. Those Standard Conditions of Tender remained the same as those published in the previous edition of the SFU as published in Government Gazette No 31823, Board Notice 12 of 2009 of 30 January 2009 - See www.cidb.org.za.

Each Tenderer shall obtain its own copy of the Standard Conditions of Tender.

The Standard Conditions of Tender make several references to the Tender Data for details that apply specifically to this tender. In the interpretation of any ambiguity or inconsistency between the Tender Data and the Standard Conditions of Tender, the Tender Data shall have precedence.

Each item of data given below is cross-referenced to the clause in the Standard Conditions of Tender to which it mainly applies.

Clause Number	Tender Data
2. EMPLOYER **Cl. F1.1**	The "Employer" is **"MAKHADO LOCAL MUNICIPALITY"** The Employer's domicilium citandi et executandi (permanent physical business address) is: Makhado Municipality, Civic Centre, 83 Krogh Street, Makhado. The Employer's address for communication relating to this project is: Private Bag x 2596, Louis Trichardt, 0920.
3. TENDER DOCUMENTS **Cl. F.1.2**	"The following documents form part of this tender: **VOLUME 1** **THE TENDER** **Part T1: Tendering procedures:** T1.1 Tender notice and invitation to tender T1.2 Tender Data **Part T2: Returnable documents** T2.1 Returnable Schedules required for Tender Evaluation T2.2 Other Documents required for Tender Evaluation T2.3 Returnable Schedules that will be incorporated into the Contract **THE CONTRACT** **Part C1: Agreements and contract data** C1.1 Form of Offer and Acceptance C1.2 Performance Guarantee C1.3 Contract Data

	C1.4 Performance Guarantee for Material and Equipment not yet Built into the Works C1.5 Retention Money Guarantee C1.6 Agreement in Terms of the Occupational Health and Safety Act 85 of 1993 C1.7 Abstracts of the mine health and safety Act No 29 of 1996 and Amendment act No.72 of 1997 C1.8 Agreement with Adjudicator **Part C2: Pricing data** C2.1 Pricing instructions C2.2 Bills of quantities C2.3 Calculation of Tender Sum **Part C3: Scope of work** C3.1 Description of Works C3.2 Engineering C3.3 Procurement C3.4 Construction C3.5 Management **Part C4: Site information** C4.1 Site Information C4.2 Locality Plan **Part C5: Annexures** C5.1 : Proforma Documents C5.2 : Baseline Risk Assessment C5.3 : Contract Drawings List **VOLUME 2** • Tender Drawings
4. <u>EMPLOYER'S AGENT</u> **Cl. F.1.4**	The Employer's agents are: **a) Principal Agent** **Mont Consulting Engineers** <u>Physical Address</u>: 29 Bendor Drive Pro-Park,Pro Arch Building Bendor,Polokwane 0699 Tel.: (015) 291 4173 <u>Postal Address</u>: P.O.BOX 1249 Fauna Park Polokwane 0787 Fax: (015) 291 4218 E-mail: admin@montce.co.za

5. TENDERER'S OBLIGATIONS	
5.1. Eligibility **Cl. F.2.1**	A tender offer may only be submitted if the Tenderer satisfies the criteria stated in the Tender Data and if the Tenderer, or any of his principals, is not under any restriction to do business with the Employer. Only those tenderers who are registered with the CIDB, or can provide proof of having applied for registration, in a contractor grading designation equal to or higher than a contractor grading designation determined in accordance with the sum tendered for a **7CE or higher** class of construction work, or by a contractor who is registered as a potentially emerging enterprise in terms of these Regulations at a contractor grading designation, one level higher than the contractor's registered grading designation, provided that the client (a) is satisfied that such a contractor has the potential to develop and qualify to be registered in that higher grade; and (b) ensures that financial, management or other support is provided to that contractor to enable the contractor to successfully execute that contract are eligible to submit tenders. Joint ventures are eligible to submit tenders provided that: 1. every member of the joint venture is registered with the CIDB or can provide proof of having registered; 2. the lead partner has a contractor grading designation in the **7 class** of construction work; and 3. the combined contractor grading designation calculated in accordance with the Construction Industry Development Regulations is equal to or higher than a contractor grading designation determined in accordance with the sum tendered for a **7 class** of construction work are eligible to submit tenders.
5.2. Site Visit and Clarification Meeting **Cl. F.2.7**	The arrangements for a compulsory pre-tender meeting are: **NO COMPULSORY BRIEFING MEETING**
5.3. Insurance **Cl. F.2.9**	No insurance cover will be provided by the Employer.
5.4. Alternative Tender Offers **Cl. F. 2.12**	Unless anything to the contrary has been determined in the Contract Data, a Tenderer may, together with his tender for the original designs contained in the contract documents, submit alternative designs and tender offers for consideration. All designs, calculations, drawings and Operation and Maintenance manuals shall be fully endorsed by a third-party registered

	engineer, accomplished in such specific field of practice and the cost thereof shall be borne solely by the Contractor. Such alternative designs and offers shall be subject to the following conditions and requirements: 5.4.1. Tenders An alternative offer or design will be considered only if the tender for the original items has been fully priced and completed. The alternative tender offer is to be submitted in **the same envelope as the main tender offer**, together with a schedule that compares the requirements of the tender documents with the alternative requirements the Tenderer proposes. No alternative tender will be considered unless a tender free from qualifications is also submitted. Unless the alternative offer stipulates to the contrary, it shall be assumed that the period for completion of the Works shall be the same as for the original design. Designs, calculations, drawings and a modified schedule of quantities (as determined hereafter) in respect of each alternative offer or design shall accompany the alternative tender offer and shall be endorsed fully by a third-party registered engineer, accomplished in such specific field of practice. 5.4.2. Preliminary calculations Preliminary calculations for an alternative design shall be submitted with the tender. Such calculations shall give adequate details so as to enable an assessment to be made of the general efficacy of the design and of its principal elements, also of the degree to which the design prescriptions and codes of the Employer are being complied with. The calculations shall be clear and in a logical sequence and shall clearly reflect all the design assumptions. 5.4.3. Preliminary drawings Preliminary drawings of the alternative designs shall also be submitted with the tender. These drawings shall comprise adequate layout plans, elevations and sections and shall clearly illustrate the general efficacy of the design and its principal elements. 5.4.4. Quantities Each alternative offer shall be accompanied by a modified priced schedule of quantities compiled in accordance with the specifications, in so far as it is applicable, which clearly shows the manner in which the price for the alternative offer has been determined and the items in the original schedule of quantities which fall away or are being changed. In addition to the schedule of quantities, a set of calculations shall be supplied to show how the quantities have been determined. All assumptions in regard to factors which will

	determine quantities shall be clearly and conspicuously marked by underlining or colouring and shall indicate whether or not the assumptions have been based on information furnished in the Contract Data (with the necessary references). 5.4.5. Further details Should the Employer's Agent find that the calculations and drawings submitted for alternative designs are not complete enough for proper adjudication of the alternative designs, the Employer reserves to itself the right to call on the Tenderer to submit such further calculations and drawings as may be required. If such further details are not submitted within ten days of having been requested, the alternative designs will not be given further consideration. 5.4.6. Preliminary adjudication of alternative designs The Employer's Agent will undertake a preliminary scrutiny of any alternative designs for compliance with the specified requirements of the Employer. Should he find any mistakes or unsatisfactory aspects, he may afford the Bidder the opportunity to rectify them within a period to be determined by the Employer's Agent. However, it is emphasized that the preliminary scrutiny of the design and tender by the Employer's Agent, by its very nature, cannot be comprehensive, and no guarantee can be given in this regard that all the mistakes made by the Bidder will in fact be detected. Any correction of such mistakes shall be made with the tender price of the bidder being retained, and, wherever necessary, the priced schedule of quantities for the alternative design shall be adjusted accordingly. 5.4.7. Acceptance of alternative design The Bidder shall note that the acceptance of a tender which includes alternative designs shall mean that the alternative designs have been approved in principle only. If the final calculations, drawings and details do not comply with the specified requirements, such alternative designs may be rejected, unless they are suitably amended by the Bidder so as to be acceptable to the Employer. 5.4.8. Final drawings and calculations and the priced schedule of quantities Where a tender with an alternative design has been accepted, the Contractor shall, not less than two months before he intends starting with the construction of such design, submit to the Employer's Agent a complete set of working drawings, detailed calculations and a complete schedule of quantities, for approval. The schedule of quantities shall be based on the preliminary

	schedule of quantities, but with the necessary adjustments in quantities and prices and with the tendered price for the alternative design being retained. Within three weeks of having received the above, the Employer's Agent will indicate which drawings, calculations, quantities, prices and other particulars are acceptable to him and which not, with reasons furnished. The Contractor shall then submit to the Employer's Agent in good time any modified drawings and other particulars for approval, for which he will require two weeks. Any delay arising from the fact that the amended particulars do not meet the requirements shall be the responsibility of the Contractor. No work which will be affected by an alternative design may be commenced, unless the drawings, schedule of quantities and prices for such alternative design have been approved. Should the Contractor fail to modify any drawings, calculations, quantities, prices or any other particulars to the satisfaction of the Employer's Agent, the alternative design will be rejected and the original design shall be constructed for the same amount as has been tendered for the alternative design. 5.4.9. <u>Responsibility for alternative design</u> The approval of a design by the Employer's Agent shall not in any way relieve the Bidder of his responsibility to produce a design which conforms in all respects to all the specified requirements and which will be suitable for the purpose envisaged. Should it appear later during construction or during the maintenance period that the design does not conform to the specified requirements, the Contractor only, shall be liable for any damage arising there from and he shall, at his own expense, do all the necessary work to ensure that the Works conforms to all the specified requirements. 5.4.10. <u>Indemnity</u> Once the alternative design has been approved, the Contractor shall indemnify and hold harmless the Employer, its agents and assigns, against all claims howsoever arising out of the said design whether in contract or delict.
5.1. <u>Submitting a Tender Offer Cl. F2</u>.13	5.5.1. <u>Whole of the Works</u> (Cl. F.2.13.1) Tenderers shall offer to provide for the whole of the Works identified. 5.5.2. <u>Original tender documents</u> (Cl. F2.13.3) The original tender document, issued to the Bidder, shall be submitted in its entirety. No copies are required.

5.5.3. Marking of Tender Submissions (Cl. F2.13.5)

The complete tender documents shall be enclosed and sealed in a single envelope, marked:

"BID NO. 35/2022: CONSTRUCTION OF LUTANADWA ACCESS ROAD AND BRIDGE-PHASE 2"

The Employer's address for delivery of tender offers to be shown on each tender submission package is the Tender Box located at:

The Foyer of Civic Centre,
83 Krogh Street,
Louis Trichardt.

5.5.4 Two envelope system (Cl. F.2.13.6)

A two-envelope procedure will not be followed.

5.5.5. Closing time (Cl. F.2.15)

The closing time for submission of tender offers is: **12H00**

Telegraphic, telephonic, telex, facsimile, e-mail, electronic and late tender offers will not be accepted.

5.5.6. Tender offer validity (Cl. F.2.16)

The tender offer validity period is **90 days** after tender closing date.

5.5.7. Clarification of tender offer after submission (Cl. F.2.17)

Delete the last part of the second sentence, commencing with the word "and". Furthermore, delete the last two sentences of Cl. F2.17.

Add the following sentence:
"The rates stated by the Bidder shall be binding".

5.5.8. Provide other Material (Cl. F.2.18.1)

Upon request by the Employer, the Bidder shall promptly supply any other material that has a bearing on the tender offer, the bidder's commercial position (including, where applicable, notarized joint venture agreements), preferencing arrangements, or samples of materials, considered necessary

	by the Employer for the purpose of a full and fair assessment. Should the Bidder not provide the information or material called for, by the time for submission stated in the Employer's request, the Employer will regard the tender offer as being non-responsive. 5.5.9. Certificates (Cl. F.2.23) The following certificates are to be provided with this tender: a) Provide a valid Central Supplier Database (CSD) number. b) Compensation Fund registration certificate c) Certificate of Contractor Registration issued by the Construction Industry Development Board or a copy of the application Form for registration in terms of the Construction Industry Development Board Act (Form F006). A minimum grading of **7 CE or Higher** is required. **Important Note:** Failure to provide the required particulars as per the above-listed certificates implies a non-responsive tender and warrants rejection of the tender on account of non-compliance with the requirements of the Tender Data
6. EMPLOYER'S UNDERTAKING	
6.1. Opening of Tender Submissions Cl. F3.4	The time and location for opening of the tender offers are: **12:00 on 01 August 2022** **Location: The Tender Box** **The Foyer of Civic Centre,** **83 Krogh Street,** **Makhado** **0920**
6.2. Arithmetical Errors **Cl. F.3.9**	Delete Clause 3.9.1 Insert the following new clause F.3.9.1 Check responsive bids for discrepancies between amounts in words and amounts in figures. Where there is a discrepancy between the amounts in figures and the amount in words, the amount in words shall govern. F3.9.2 Check the highest ranked bid or bidder with the highest number of bid evaluation points after the evaluation of bid offers in accordance with F.3.11 for:

	a) the gross misplacement of the decimal point in any unit rate; b) omissions made in completing the pricing schedule or bills of quantities; or c) arithmetic errors in: i) line item totals resulting from the product of a unit rate and a quantity in bills of quantities or schedules of prices; or ii) the summation of the prices F.3.9.3 Notify the bidder of all errors or omissions that are identified in the bid offer and either confirm the bid offer as bid or accept the corrected total of prices. F.3.9.4 Where the bidder elects to confirm the bid offer as bid, correct the errors as follows: a) If bills of quantities or pricing schedules apply and there is an error in the line item total resulting from the product of the unit rate and the quantity, the line item total shall govern, and the rate shall be corrected. Where there is an obviously gross misplacement of the decimal point in the unit rate, the line item total as quoted shall govern, and the unit rate shall be corrected. b) Where there is an error in the total of the prices either as a result of other corrections required by this checking process or in the tenderer's addition of prices, the total shall govern and the tenderer will be asked to revised selected item prices (and their rates if bills of quantities apply) to achieve the tendered total of the prices.
7. <u>EVALUATION OF BIDS</u> **Cl. F.3.11**	The procedure for evaluation of responsive Bid offers is Method 2, viz. the case of a financial offer and preferences. The Employer's Preferential Procurement Policy applicable to this Bid and based on the Preferential Procurement Policy Act, 2000 (Act No. 5 of 2000) is set out here following: 7.1 Business Registration Prospective Bidders shall be registered: a) with the South African Revenue Services for all categories of taxes applicable to it. b) with the Compensation Commissioner c) with the Construction Industry Development Board.A minimum grading of **7 CE or higher** is required. 7.2 Preference Point System

	Refer to form **as Preference Points Claim form in Terms of the Preferential Procurement Regulations 2017 (MBD 6.1)** in the Returnable Schedules. **Contractors must also supply copies of a joint venture, CC's or any other agreements that clearly indicates ownership and % shareholding.** **If a valid Tax compliance status PIN issued by SARS is not attached the bid will be disqualified.**
8. <u>ACCEPTANCE OF TENDER OFFER</u> **Cl. F3.13**	Tender offers will only be accepted if: a) The bidder has in his or her possession an original valid Tax Clearance Certificate issued by the South Africa Revenue Services or in case wherein the Bidder provide the municipality with a printed tax clearance from e-filing, it is compulsory that the bidder provide municipality with tax compliance status pin for verification; b) The bidder is registered with the Construction Industry Development Board in an appropriate contractor grading designation. A minimum grading of **7CE or Higher** is required for the main contractor; c) The bidder has demonstrated previous experience with the type of work required under this contract having successfully completed projects of similar scope and size. d) The bidder or any of its principals is not listed on the Register of Tender Defaulters in terms of the Prevention and Combating of Corrupt Activities Act of 2004 as a person prohibited from doing business with the public sector; and e) The bidder has not abused the Employer's Supply Chain Management System. f) The bidder has not failed to perform on any previous contract. g) Has completed the Compulsory Enterprise Questionnaire and there are no conflicts of interest which may impact on the bidder's ability to perform the contract in the best interests of the employer or potentially compromise the tender process.
9. <u>PROVIDE COPIES OF THE CONTRACT</u>	The number of paper copies of the signed contract to be provided by the employer is one.

DOCUMENT **Cl. F.3.18**	
10. Proof of Availability of Staff with LI Competencies	Only those tenderers who can demonstrate that they will have in their employ management and supervisory staff satisfying the requirement of the scope of work for labour-intensive competencies for supervisory and management staff during the validity of the contract are eligible to submit tenders
11. Requirement for submission of names of LI staff	The tenderer must submit to the Employer, names of all management and supervisory staff that will be employed to supervise the labour-intensive portion of the works together with satisfactory evidence that such staff members satisfy eligibility requirements.

EVALUATION CRITERIA

The bids will be evaluated in two stages. The first stage will check whether the bidders have submitted all documents as requested on the advert. Although functionality does not form part of the final tender points scoring for award purpose, tenderer will be assessed for responsiveness and functionality first and if the tender is not responsive or meet the minimum functionality score, the tenderer will be eliminated and not considered further for second stage of evaluation.

The second stage of the evaluation will be based on Price (80) and preference points for B-BBEE status level of contribution (20).

Detailed points scoring for functionality are as follows:

COMPETENCE ACHIEVEMENT/FUNCTIONALITY SCHEDULE

TABLE A1: REPUTATION AND REFERENCES

	TARGETED GOALS Name reference with contact details (Previous 3 yrs, Projects involving Road)	Max Points to be Scored	Points Claimed by Tenderer	Allocated Points
1	Project 1	10		
2	Project 2	10		
3	Project 3	10		
4	Project 4	10		
	Sub-Total: Reputation and References	**40**		

NOTE: The tender should attach <u>appointment letters and completion certificates</u> as a proof for having completed such project. Points for each project will be allocated as follows:

7CE: 10 points
6CE: 8 points
5CE: 6 points
4CE: 5 points
3CE: 4 points
2CE: 2 points

TABLE A2: FINANCIAL REFERENCES

	TARGETED GOALS	Tendered Goal	Points Claimed by Tenderer	Allocated Points
1	Tenderer submitted banking details proof attached	2		
2	Bank rating of “C” or better	5		
3	Registered financial Institution’s full details as guarantor in the amount of 10% as specified for surety purpose shall be submitted	3		
	Sub-Total: Financial References	**10**		

TABLE A3: EXPERIENCE AND QUALIFICATION OF KEY STAFF
Table A3.1 Experience

	TARGETED GOALS	Points Allocation	Points Claimed by Tenderer	Allocated Points
1	Contract Manager: 10 years in Road Projects	>10 yrs=5 6-9 yrs=3 3-5 yrs=2 1-2yrs=1		
2	Site Agent: 8 years in Road Projects	>8 yrs=5 5-7 yrs=3 3-4 yrs=2 1-2yrs=1		
3	Foreman 5 years in Road Projects	>5 yrs=3 4 yrs=1.5 3 yrs=1 1-2yrs=0.5		
4	Health and Safety Officer 5 years of experience as OHS in Civil Engineering Construction	>5 yrs=2 4 yrs=1 3 yrs=0.5 1-2yrs=0.25		
	Sub-Total: Experience	**15**		

NOTE: Project organogram should be attached. Curriculum vitae with detailed experience and contact details should be attached to the tender document for verification by the consultants.

Table A3.2 Qualifications

	TARGETED GOALS	Tendered Goal	Points Claimed by Tenderer	Allocated Points
1	Contract Manager: Civil Engineering or construction management	BSc = 5 B-Tech /PrCPM = 5 ND = 3 N6 = 2 Any Cert= 1		
2	Site Agent: Civil Engineering or construction management or project management (Must have at least NQF 5)	BSc/B-Tech = 5 ND = 4 NQF 5/7 = 3 N6 = 2 Any Cert= 1		
3	Foreman	ND = 3 NQF 7 =2 N6 = 2 N3= 1.5 NQF5= 1.5 NQF 4= 1 NQF 3= 0.5		
4	Health and Safety Officer 5 years of experience as OHS in Road projects	ND = 2 Cert = 0.5		
	Sub-Total: Qualifications	**15**		

CV's and Certified Qualifications should be attached.

TABLE A4: PLANT AND EQUIPMENT

TARGETED GOALS	Tendered Goal	Points Claimed by Tenderer	Allocated Points
1. Grader: No (1)	3		
2. TLB: No (1)	2		
3. Excavators: No (1)	5		
4. Water Cart: No (2) (10 000 litre)	2		
5. 10 m³ Tipper Trucks: No (5)	5		
6. Vibratory Roller 12 ton:No (1)	1		
7. Pad Foot Roller 8 ton: No (1)	1		
8. LDV: No (2)	1		
Sub-Total: Plant and Equipment	**20**		

Note: Tenderers should attach certified proof of ownership certificate for the plant mentioned above if they own such plant. In case of hired plant, tenderers will be required to attach a letter of undertaking by the hiring firm indicating that they will provide the tenderer with such plant should the tenderer becomes a successful bidder. The hiring company should also provide proof of ownership for such plants (For hiring, tenderers will only receive 50% of the full points for Plant and Equipment).

TABLE A5: SUMMARY

DESCRIPTION	Maximum Points to be Allocated	Points Claimed by Tenderer	Allocated Points
REPUTATION AND REFERENCE OF THE COMPANY: TABLE A1	40		
FINANCIAL REFERENCES: TABLE A2	10		
EXPERIENCE OF KEY STAFF: TABLE 3.1	15		
QUALIFICATION OF KEY STAFF: TABLE A3.2	15		
PLANT AND EQUIPMENT: TABLE A4	20		
TOTAL	**100**		

Minimum functionality requirements of seventy percent (70%) or 70 points required for further evaluation.

The 80/20-point scoring system will be used on second stage of evaluation.

PART T2: LIST OF RETURNABLE DOCUMENTS

The tenderer must complete the following returnable documents:

T2.1 LIST OF RETURNABLE SCHEDULES

MBD 1

T2.1 A INVITATION TO BID AND TERMS AND CONDITIONS FOR BIDDING

PART A: INVITATION TO BID

YOU ARE HEREBY INVITED TO BID FOR REQUIREMENTS OF THE MAKHADO LOCAL MUNICIPALITY					
BID NUMBER:	**35/2022**	CLOSING DATE:	**01 AUGUST 2022**	CLOSING TIME:	**12:00HRS**
DESCRIPTION	**CONSTRUCTION OF LUTANANDWA ACCESS ROAD AND BRIDGE – PHASE 2**				
BID RESPONSE DOCUMENTS MAY BE DEPOSITED IN THE BID BOX SITUATED AT *(STREET ADDRESS)*					
MAKHADO MUNICIPALITY OFFICES					
THE FOYER OF CIVIC CENTRE, 83 KROGH STREET					
LOUIS TRICHARDT					
0950					

BIDDING PROCEDURE ENQUIRIES MAY BE DIRECTED TO		**TECHNICAL ENQUIRIES MAY BE DIRECTED TO:**	
CONTACT PERSON	**Ms P Mudau or Mr. M. Ramabulana**	CONTACT PERSON	**Mr T. E Muvhango**
TELEPHONE NUMBER	**+27(0)15 3044/3024**	TELEPHONE NUMBER	**+27 (0)15 291 4173**
FACSIMILE NUMBER	**+27(0)15 519 1195**	FACSIMILE NUMBER	**+27 (0) 15 291 4218**
E-MAIL ADDRESS	**mudaup@makhado.gov.za**	E-MAIL ADDRESS	**admin@montce.co.za**

SUPPLIER INFORMATION				
NAME OF BIDDER				
POSTAL ADDRESS				
STREET ADDRESS				
TELEPHONE NUMBER	CODE		NUMBER	
CELLPHONE NUMBER				
FACSIMILE NUMBER	CODE		NUMBER	
E-MAIL ADDRESS				
VAT REGISTRATION NUMBER				

SUPPLIER COMPLIANCE STATUS	TAX COMPLIANCE SYSTEM PIN:		**OR**	CENTRAL SUPPLIER DATABASE No:	MAAA
B-BBEE STATUS LEVEL VERIFICATION CERTIFICATE	TICK APPLICABLE BOX] ☐ Yes ☐ No		B-BBEE STATUS LEVEL SWORN AFFIDAVIT		[TICK APPLICABLE BOX] ☐ Yes ☐ No
[A B-BBEE STATUS LEVEL VERIFICATION CERTIFICATE/ SWORN AFFIDAVIT (FOR EMES & QSEs) MUST BE SUBMITTED IN ORDER TO QUALIFY FOR PREFERENCE POINTS FOR B-BBEE]					
(a) ARE YOU THE ACCREDITED REPRESENTATIVE IN SOUTH AFRICA FOR THE GOODS /SERVICES /WORKS OFFERED?	☐Yes ☐No [IF YES ENCLOSE PROOF]		**(b)** ARE YOU A FOREIGN BASED SUPPLIER FOR **THE GOODS /SERVICES /WORKS OFFERED?**		☐Yes ☐No [IF YES, ANSWER PART B:3]

QUESTIONNAIRE TO BIDDING FOREIGN SUPPLIERS	
IS THE ENTITY A RESIDENT OF THE REPUBLIC OF SOUTH AFRICA (RSA)	☐ YES ☐ NO
DOES THE ENTITY HAVE A BRANCH IN THE RSA?	☐ YES ☐ NO
DOES THE ENTITY HAVE A PERMANENT ESTABLISHMENT IN THE RSA?	☐ YES ☐ NO
DOES THE ENTITY HAVE ANY SOURCE OF INCOME IN THE RSA	☐ YES ☐ NO
IS THE ENTITY LIABLE IN THE RSA FOR ANY FORM OF TAXATI	☐ YES ☐ NO

IF THE ANSWER IS "NO" TO ALL OF THE ABOVE, THEN IT IS NOT A REQUIREMENT TO REGISTER FOR A TAX COMPLIANCE STATUS SYSTEM PIN CODE FROM THE SOUTH AFRICAN REVENUE SERVICE (SARS) AND IF NOT REGISTER AS PER 2.3 BELOW.

PART B: TERMS AND CONDITIONS FOR BIDDING

1. BID SUBMISSION:

1.1. BIDS MUST BE DELIVERED BY THE STIPULATED TIME TO THE CORRECT ADDRESS. LATE BIDS WILL NOT BE ACCEPTED FOR CONSIDERATION.

1.2. ALL BIDS MUST BE SUBMITTED ON THE OFFICIAL FORMS PROVIDED (NOT TO BE RE-TYPED) OR ONLINE

1.3. THIS BID IS SUBJECT TO THE PREFERENTIAL PROCUREMENT POLICY FRAMEWORK ACT 2000 AND THE PREFERENTIAL PROCUREMENT REGULATIONS, 2017, THE GENERAL CONDITIONS OF CONTRACT (GCC) AND, IF APPLICABLE, ANY OTHER LEGISLATION OR SPECIAL CONDITIONS OF CONTRACT.

1.4. **THE SUCCESSFUL BIDDER WILL BE REQUIRED TO FILL IN AND SIGN A WRITTEN CONTRACT FORM (SBD7).**

2. TAX COMPLIANCE REQUIREMENTS

2.1 BIDDERS MUST ENSURE COMPLIANCE WITH THEIR TAX OBLIGATIONS.

2.2 BIDDERS ARE REQUIRED TO SUBMIT THEIR UNIQUE PERSONAL IDENTIFICATION NUMBER (PIN) ISSUED BY SARS TO ENABLE THE ORGAN OF STATE TO VIEW THE TAXPAYER'S PROFILE AND TAX STATUS.

2.3 APPLICATION FOR TAX COMPLIANCE STATUS (TCS) OR PIN MAY ALSO BE MADE VIA E-FILING. THROUGH THE SARS WEBSITE, WWW.SARS.GOV.ZA.

2.4 BIDDERS MAY ALSO SUBMIT A PRINTED TCS TOGETHER WITH THE BID.

2.5 IN BIDS WHERE CONSORTIA/JOINT VENTURES/SUB-CONTRACTORS ARE INVOLVED; EACH PARTY MUST SUBMIT A SEPARATE TCS/PIN/CSD NUMBER.

2.6 WHERE NO TCS IS AVAILABLE BUT THE BIDDER IS REGISTERED ON THE CENTRAL SUPPLIER DATABASE (CSD), A CSD NUMBER MUST BE PROVIDED.

2.7 NO BIDS WILL BE CONSIDERED FROM PERSONS IN THE SERVICE OF THE STATE, COMPANIES WITH DIRECTORS WHO ARE PERSONS IN THE SERVICE OF THE STATE, OR CLOSE CORPORATIONS WITH MEMBERS PERSONS IN THE SERVICE OF THE STATE.

NB: FAILURE TO PROVIDE ANY OF THE ABOVE PARTICULARS MAY RENDER THE BID INVALID.

SIGNATURE OF BIDDER: ……

CAPACITY UNDER WHICH THIS BID IS SIGNED: ……

(Proof of authority must be submitted, e.g. Company Resolution)

DATE: ……

MBD 2

T2.1 B DECLARATION OF GOOD STANDING REGARDING TAX

It is a condition of bid that the taxes of the successful bidder must be in order, or that satisfactory arrangements have been made with South African Revenue Service (SARS) to meet the bidder's tax obligations.

1. In order to meet this requirement bidders are required to apply for a Tax Clearance Certificate by using SARS form TCC 001 "Application for a Tax Clearance Certificate", and submit it to any SARS branch office nationally. The Tax Clearance Certificate Requirements are also applicable to foreign bidders / individuals who wish to submit bids.
2. SARS will then furnish the bidder with a Tax Clearance Certificate that will be valid for a period of 1 (one) year from the date of approval.
3. **The original Tax Clearance Certificate must be submitted together with the bid.** Failure to submit the **original and valid** Tax Clearance Certificate will result in the invalidation/disqualification of the bid. Certified copies of the Tax Clearance Certificate will not be acceptable.
4. In bids where Consortia / Joint Ventures / Sub-contractors are involved; each party must submit a separate Tax Clearance Certificate.
5. Copies of the TCC 001 "Application for a Tax Clearance Certificate" form are available from any SARS branch office nationally or on the website www.sars.gov.za.
6. Applications for the Tax Clearance Certificates may also be made via eFiling. In order to use this provision, taxpayers will need to register with SARS as eFilers through the website www.efiling.co.za

SARS

TAX CLEARANCE **TCC 001**

Application for a Tax Clearance Certificate

Purpose

Select the applicable option ..... Tenders ☐ Good standing ☐

If "Good standing", please state the purpose of this application

Particulars of applicant

Name/Legal name (Initials & Surname or registered name)	
Trading name (if applicable)	
ID/Passport no	Company/Close Corp. registered no
Income Tax ref no	PAYE ref no 7
VAT registration no 4	SDL ref no L
Customs code	UIF ref no U
Telephone no CODE – NUMBER	Fax no CODE – NUMBER
E-mail address	
Physical address	
Postal address	

Particulars of representative (Public Officer/Trustee/Partner)

Surname	
First names	
ID/Passport no	Income Tax ref no
Telephone no CODE – NUMBER	Fax no CODE – NUMBER
E-mail address	
Physical address	

Page 1 of 2

Particulars of tender (If applicable)

Tender number

Estimated Tender amount R ,

Expected duration of the tender year(s)

Particulars of the 3 largest contracts previously awarded

Date started	Date finalised	Principal	Contact person	Telephone number	Amount

Audit

Are you currently aware of any Audit investigation against you/the company?..... YES NO

If "YES" provide details

Appointment of representative/agent (Power of Attorney)

I the undersigned confirm that I require a Tax Clearance Certificate in respect of Tenders or Goodstanding.

I hereby authorise and instruct to apply to and receive from SARS the applicable Tax Clearance Certificate on my/our behalf.

Signature of representative/agent Date C C Y Y – M M – D D

Name of representative/ agent

Declaration

I declare that the information furnished in this application as well as any supporting documents is true and correct in every respect.

Signature of applicant/Public Officer Date C C Y Y – M M – D D

Name of applicant/ Public Officer

Notes:

1. It is a serious offence to make a false declaration.
2. Section 75 of the Income Tax Act, 1962, states: Any person who
   (a) fails or neglects to furnish, file or submit any return or document as and when required by or under this Act; or
   (b) without just cause shown by him, refuses or neglects to-
      (i) furnish, produce or make available any information, documents or things;
      (ii) reply to or answer truly and fully, any questions put to him ...
      As and when required in terms of this Act ... shall be guilty of an offence ...
3. **SARS will, under no circumstances, issue a Tax Clearance Certificate unless this form is completed in full.**
4. Your Tax Clearance Certificate will only be issued on presentation of your South African Identity Document or Passport (Foreigners only) as applicable.

Page 2 of 2

MBD 3.1

T2.1 C PRICING SCHEDULE – FIRM PRICES

(PURCHASES)

NOTE: **ONLY FIRM PRICES WILL BE ACCEPTED. NON-FIRM PRICES (INCLUDING PRICES SUBJECT TO RATES OF EXCHANGE VARIATIONS) WILL NOT BE CONSIDERED**

IN CASES WHERE DIFFERENT DELIVERY POINTS INFLUENCE THE PRICING, A SEPARATE PRICING SCHEDULE MUST BE SUBMITTED FOR EACH DELIVERY POINT

Name of Bidder ……	Bid Number ……
Closing Time ……	Closing Date ……..

OFFER TO BE VALID FOR …… DAYS FROM THE CLOSING DATE OF BID.

ITEM NO.	QUANTITY	DESCRIPTION	BID PRICE IN RSA CURRENCY (average) INCLUDED)
			**(ALL APPLICABLE TAXES

- Required by: ……
- At: ……
  ……
- Brand and Model ……
- Country of Origin ……
- Does the offer comply with the specification(s)? *YES/NO
- If not to specification, indicate deviation(s) ……
- Period required for delivery ……
  *Delivery: Firm/Not firm
- Delivery basis ……

Note: All delivery costs must be included in the bid price, for delivery at the prescribed destination.

** “all applicable taxes” includes value- added tax, pay as you earn, income tax, unemployment insurance fund contributions and skills development levies.

*Delete if not applicable

MBD 3.2

T2.1 D PRICING SCHEDULE – NON-FIRM PRICES

(PURCHASES)

NOTE: PRICE ADJUSTMENTS WILL BE ALLOWED AT THE PERIODS AND TIMES SPECIFIED IN THE BIDDING DOCUMENTS.

IN CASES WHERE DIFFERENT DELIVERY POINTS INFLUENCE THE PRICING, A SEPARATE PRICING SCHEDULE MUST BE SUBMITTED FOR EACH DELIVERY POINT

Name of Tenderer	.....	Tender No.	.....
Closing Time	.....	Closing Date	.....

OFFER TO BE VALID FOR …….. DAYS FROM THE CLOSING DATE OF TENDER.

ITEM NO.	QUANTITY	DESCRIPTION	BID PRICE IN RSA CURRENCY **(ALL APPLICABLE TAXES INCLUDED)
- Required by:			.....
- At:			.....
- Brand and model			.....
- County of origin			.....
- Does the offer comply with the specification(s)?			*YES/NO
- If not to specification, indicate deviation(s)			.....
- Period required for delivery			.....
- Delivery			*Firm/Not Firm

** ”all applicable taxes” includes value- added tax, pay as you earn, income tax, unemployment insurance fund contributions and skills development levies.

*Delete if not applicable

MBD 3.2

PRICE ADJUSTMENTS

A NON-FIRM PRICES SUBJECT TO ESCALATION

1. IN CASES OF PERIOD CONTRACTS, NON FIRM PRICES WILL BE ADJUSTED (LOADED) WITH THE ASSESSED CONTRACT PRICE ADJUSTMENTS IMPLICIT IN NON FIRM PRICES WHEN CALCULATING THE COMPARATIVE PRICES

2. IN THIS CATEGORY PRICE ESCALATIONS WILL ONLY BE CONSIDERED IN TERMS OF THE FOLLOWING FORMULA:

$$Pa = (1-V)Pt\left(D1\frac{R1t}{R1o} + D2\frac{R2t}{R2o} + D3\frac{R3t}{R3o} + D4\frac{R4t}{R4o} \right) + VPt$$

Where:

Pa	=	The new escalated price to be calculated.
(1-V) Pt	=	85% of the original bid price. **Note that Pt must always be the original bid price and not an escalated price.**
D1, D2..	=	Each factor of the bid price eg. labour, transport, clothing, footwear, etc. The total of the various factors D1,D2…etc. must add up to 100%.
R1t, R2t……	=	Index figure obtained from new index (depends on the number of factors used).
R1o, R2o	=	Index figure at time of bidding.
VPt	=	15% of the original bid price. This portion of the bid price remains firm i.e. it is not subject to any price escalations.

3. The following index/indices must be used to calculate your bid price:

Index “x” = 0.10.	Dated…….	Index Labour “a” = 0.15	Dated…….
Index Plant “b” = 0.2	Dated…….	Index Material “c” = 0.55	Dated…….
Index Fuel “e” = 0.1	Dated…….		

4. FURNISH A BREAKDOWN OF YOUR PRICE IN TERMS OF ABOVE-MENTIONED FORMULA. THE TOTAL OF THE VARIOUS FACTORS MUST ADD UP TO 100%.

FACTOR (D1, D2 etc. eg. Labour, transport etc.)	PERCENTAGE OF BID PRICE
Labour	
Plant	
Material	
Fuel	

MBD 3.2

B PRICES SUBJECT TO RATE OF EXCHANGE VARIATIONS

1. Please furnish full particulars of your financial institution, state the currencies used in the conversion of the prices of the items to South African currency, which portion of the price is subject to rate of exchange variations and the amounts remitted abroad.

PARTICULARS OF FINANCIAL INSTITUTION	ITEM NO.	PRICE	CURRENCY	RATE	PORTION OF PRICE SUBJECT TO ROE	AMOUNT IN FOREIGN CURRENCY REMITTED ABROAD
				ZAR =		
				ZAR =		
				ZAR =		
				ZAR =		
				ZAR =		
				ZAR =		

2. Adjustments for rate of exchange variations during the contract period will be calculated by using the average monthly exchange rates as issued by your commercial bank for the periods indicated hereunder: (Proof from bank required)

AVERAGE MONTHLY EXCHANGE RATES FOR THE PERIOD:	DATE DOCUMENTATION MUST BE SUBMITTED TO THIS OFFICE	DATE FROM WHICH NEW CALCULATED PRICES WILL BECOME EFFECTIVE	DATE UNTIL WHICH NEW CALCULATED PRICE WILL BE EFFECTIVE

MBD 4

T2.1 E DECLARATION OF INTEREST

1. No bid will be accepted from persons in the service of the state∗.
2. Any person, having a kinship with persons in the service of the state, including a blood relationship, may make an offer or offers in terms of this invitation to bid. In view of possible allegations of favouritism, should the resulting bid, or part thereof, be awarded to persons connected with or related to persons in service of the state, it is required that the bidder or their authorised representative declare their position in relation to the evaluating/adjudicating authority and/or take an oath declaring his/her interest.

3 In order to give effect to the above, the following questionnaire must be completed and submitted with the bid.

3.1 Full Name: ……

3.2 Identity Number: ……

3.3 Company Registration Number: ……

3.4 Tax Reference Number: ……

3.5 VAT Registration Number: ……

3.6 Are you presently in the service of the state∗ **YES / NO**

3.6.1 If so, furnish particulars.

……

……

3.7 Have you been in the service of the state for the past twelve months? **YES / NO**

3.7.1 If so, furnish particulars.

……

……

∗ MSCM Regulations: "in the service of the state" means to be –

(a) a member of –
  (i) any municipal council;
  (ii) any provincial legislature; or
  (iii) the national Assembly or the national Council of provinces;
(b) a member of the board of directors of any municipal entity;
(c) an official of any municipality or municipal entity;
(d) an employee of any national or provincial department, national or provincial public entity or constitutional institution within the meaning of the Public Finance Management Act, 1999 (Act No.1 of 1999);
(e) a member of the accounting authority of any national or provincial public entity; or
(f) an employee of Parliament or a
(g) provincial legislature.

3.8 Do you, have any relationship (family, friend, other) with persons in the service of the state and who may be involved with the evaluation and or adjudication of this bid?

YES / NO

3.8.1 If so, furnish particulars.

……

……

3.9 Are you, aware of any relationship (family, friend, other) between a bidder and any persons in the service of the state who may be involved with the evaluation and or adjudication of this bid?

YES / NO

3.9.1 If so, furnish particulars

……

……

3.10 Are any of the company's directors, managers, principal shareholders or stakeholders in service of the state?

YES / NO

3.10.1 If so, furnish particulars.

……

……

3.11 Are any spouse, child or parent of the company's directors, managers, principal shareholders or stakeholders in service of the state?

YES / NO

3.11.1 If so, furnish particulars.

……

……

CERTIFICATION

I, THE UNDERSIGNED (NAME) ……

CERTIFY THAT THE INFORMATION FURNISHED ON THIS DECLARATION FORM IS CORRECT.

I ACCEPT THAT THE STATE MAY ACT AGAINST ME SHOULD THIS DECLARATION PROVE TO BE FALSE.

…….. ……..……

Signature Date

…… ……

Position Name of Bidder

MBD 5

T2.1 F DECLARATION FOR PROCUREMENT ABOVE R10 MILLION (ALL APPLICABLE TAXES INCLUDED)

For all procurement expected to exceed R10 million (all applicable taxes included), bidders must complete the following questionnaire:

1. Are you by law required to prepare annual financial statements for auditing? ***YES / NO**

1.1 If yes, submit audited annual financial statements for the past three years or since the date of establishment if established during the past three years.

……

……

2. Do you have any outstanding undisputed commitments for municipal services towards any municipality for more than three months or any other service provider in respect of which payment is overdue for more than 30 days? ***YES / NO**

2.1 If no, this serves to certify that the bidder has no undisputed commitments for municipal services towards any municipality for more than three months or other service provider in respect of which payment is overdue for more than 30 days.

2.2 If yes, provide particulars.

……

……

……

3. Has any contract been awarded to you by an organ of state during the past five years, including particulars of any material non-compliance or dispute concerning the execution of such contract? ***YES / NO**

3.1 If yes, furnish particulars

……

……

……

4. Will any portion of goods or services be sourced from outside the Republic, and, if so, what portion and whether any portion of payment from the municipality / municipal entity is expected to be transferred out of the Republic? ***YES / NO**

4.1. If yes, furnish particulars

……..

……..

CERTIFICATION

I, THE UNDERSIGNED (NAME) .....

CERTIFY THAT THE INFORMATION FURNISHED ON THIS DECLARATION FORM IS CORRECT.

I ACCEPT THAT THE STATE MAY ACT AGAINST ME SHOULD THIS DECLARATION PROVE TO BE FALSE.

_____ _____

Signature **Date**

_____ _____

Position **Name of Bidder**

MBD 6.1

T2.1 G PREFERENCE POINTS CLAIM FORM IN TERMS OF THE PREFERENTIAL PROCUREMENT REGULATIONS 2017

This preference form must form part of all bids invited. It contains general information and serves as a claim form for preference points for Broad-Based Black Economic Empowerment (B-BBEE) Status Level of Contribution

NB: BEFORE COMPLETING THIS FORM, BIDDERS MUST STUDY THE GENERAL CONDITIONS, DEFINITIONS AND DIRECTIVES APPLICABLE IN RESPECT OF B-BBEE, AS PRESCRIBED IN THE PREFERENTIAL PROCUREMENT REGULATIONS, 2017.

1. GENERAL CONDITIONS

1.1 The following preference point systems are applicable to all bids:

- the 80/20 system for requirements with a Rand value of up to R50 000 000 (all applicable taxes included); and
- the 90/10 system for requirements with a Rand value above R50 000 000 (all applicable taxes included).

1.2 The value of this bid is estimated to not exceed R50 000 000 (all applicable taxes included) and therefore the 80/20 preference point system shall be applicable; or

1.3 Points for this bid shall be awarded for:

(a) Price; and

(b) B-BBEE Status Level of Contributor.

1.4 The maximum points for this bid are allocated as follows:

	POINTS
PRICE	**80**
B-BBEE STATUS LEVEL OF CONTRIBUTOR	**20**
Total points for Price and B-BBEE must not exceed	**100**

1.5 Failure on the part of a bidder to fill in and/or to sign this form and submit a B-BBEE Verification Certificate from a Verification Agency accredited by the South African Accreditation System (SANAS) or a Registered Auditor approved by the Independent Regulatory Board of Auditors (IRBA) or an Accounting Officer as contemplated in the Close Corporation Act (CCA) together with the bid, will be interpreted to mean that preference points for B-BBEE status level of contribution are not claimed.

1.6 The purchaser reserves the right to require of a bidder, either before a bid is adjudicated or at any time subsequently, to substantiate any claim in regard to preferences, in any manner required by the purchaser.

2. DEFINITIONS

(a) **"B-BBEE"** means broad-based black economic empowerment as defined in section 1 of the Broad-Based Black Economic Empowerment Act;

(b) "**B-BBEE status level of contributor"** means the B-BBEE status of an entity in terms of a code of good practice on black economic empowerment, issued in terms of section 9(1) of the Broad-Based Black Economic Empowerment Act;

(c) **"bid"** means a written offer in a prescribed or stipulated form in response to an invitation by an organ of state for the provision of goods or services, through price quotations, advertised competitive bidding processes or proposals;

(d) **"Broad-Based Black Economic Empowerment Act"** means the Broad-Based Black Economic Empowerment Act, 2003 (Act No. 53 of 2003);

(e) **"EME"** means an Exempted Micro Enterprise in terms of a code of good practice on black economic empowerment issued in terms of section 9 (1) of the Broad-Based Black Economic Empowerment Act;

(f) **"functionality"** means the ability of a tenderer to provide goods or services in accordance with specifications as set out in the tender documents.

(g) **"prices"** includes all applicable taxes less all unconditional discounts;

(h) **"proof of B-BBEE status level of contributor"** means:

1) B-BBEE Status level certificate issued by an authorized body or person;

2) A sworn affidavit as prescribed by the B-BBEE Codes of Good Practice;

3) Any other requirement prescribed in terms of the B-BBEE Act;

(i) **"QSE"** means a qualifying small business enterprise in terms of a code of good practice on black economic empowerment issued in terms of section 9 (1) of the Broad-Based Black Economic Empowerment Act;

(j) **"rand value"** means the total estimated value of a contract in Rand, calculated at the time of bid invitation, and includes all applicable taxes;

3. POINTS AWARDED FOR PRICE

3.1 THE 80/20 OR 90/10 PREFERENCE POINT SYSTEMS

A maximum of 80 or 90 points is allocated for price on the following basis:

80/20 **or** **90/10**

$$Ps = 80\left(1 - \frac{Pt - P\min}{P\min}\right) \quad \text{or} \quad Ps = 90\left(1 - \frac{Pt - P\min}{P\min}\right)$$

Where

Ps = Points scored for price of bid under consideration

Pt = Price of bid under consideration

Pmin = Price of lowest acceptable bid

4. POINTS AWARDED FOR B-BBEE STATUS LEVEL OF CONTRIBUTOR

4.1 In terms of Regulation 6 (2) and 7 (2) of the Preferential Procurement Regulations, preference points must be awarded to a bidder for attaining the B-BBEE status level of contribution in accordance with the table below:

B-BBEE Status Level of Contributor	Number of points (90/10 system)	Number of points (80/20 system)
1	10	20
2	9	18
3	6	14
4	5	12
5	4	8
6	3	6
7	2	4
8	1	2
Non-compliant contributor	0	0

5. BID DECLARATION

5.1 Bidders who claim points in respect of B-BBEE Status Level of Contribution must complete the following:

6. B-BBEE STATUS LEVEL OF CONTRIBUTOR CLAIMED IN TERMS OF PARAGRAPHS 1.4 AND 4.1

6.1 B-BBEE Status Level of Contributor: …….. = ..……(maximum of 10 or 20 points)

(Points claimed in respect of paragraph 7.1 must be in accordance with the table reflected in paragraph 4.1 and must be substantiated by relevant proof of B-BBEE status level of contributor.

7. SUB-CONTRACTING

7.1 Will any portion of the contract be sub-contracted?

(***Tick applicable box***)

YES		NO	

7.1.1 If yes, indicate:

i) What percentage of the contract will be subcontracted..... …….%
ii) The name of the sub-contractor ……..……..
iii) The B-BBEE status level of the sub-contractor.....……..
iv) Whether the sub-contractor is an EME or QSE

(Tick applicable box)

YES		NO	

v) Specify, by ticking the appropriate box, if subcontracting with an enterprise in terms of Preferential Procurement Regulations,2017:

Designated Group: An EME or QSE which is at last 51% owned by:	**EME** √	**QSE** √
Black people		
Black people who are youth		
Black people who are women		
Black people with disabilities		
Black people living in rural or underdeveloped areas or townships		
Cooperative owned by black people		
Black people who are military veterans		
OR		
Any EME		
Any QSE		

8. DECLARATION WITH REGARD TO COMPANY/FIRM

8.1 Name of company/firm: ……..

8.2 VAT registration number: ……. ……..……

8.3 Company registration number: ..…… ……..……

8.4 TYPE OF COMPANY/ FIRM

- ☐ Partnership/Joint Venture / Consortium
- ☐ One-person business/sole propriety
- ☐ Close corporation
- ☐ Company
- ☐ (Pty) Limited

[TICK APPLICABLE BOX]

8.5 DESCRIBE PRINCIPAL BUSINESS ACTIVITIES

……
……
……
……

8.6 COMPANY CLASSIFICATION

- ☐ Manufacturer
- ☐ Supplier
- ☐ Professional service provider
- ☐ Other service providers, e.g. transporter, etc.

[*TICK APPLICABLE BOX*]

8.7 MUNICIPAL INFORMATION

Municipality where business is situated: ….……

Registered Account Number: ……...…….…….

Stand Number: …...……..…….

8.8 Total number of years the company/firm has been in business:……

8.9 I/we, the undersigned, who is / are duly authorised to do so on behalf of the company/firm, certify that the points claimed, based on the B-BBE status level of contributor indicated in paragraphs 1.4 and 6.1 of the foregoing certificate, qualifies the company/ firm for the preference(s) shown and I / we acknowledge that:

i) The information furnished is true and correct;

ii) The preference points claimed are in accordance with the General Conditions as indicated in paragraph 1 of this form;

iii) In the event of a contract being awarded as a result of points claimed as shown in paragraphs 1.4 and 6.1, the contractor may be required to furnish documentary proof to the satisfaction of the purchaser that the claims are correct;

iv) If the B-BBEE status level of contributor has been claimed or obtained on a fraudulent basis or any of the conditions of contract have not been fulfilled, the purchaser may, in addition to any other remedy it may have –

(a) disqualify the person from the bidding process;

(b) recover costs, losses or damages it has incurred or suffered as a result of that person's conduct;

(c) cancel the contract and claim any damages which it has suffered as a result of having to make less favourable arrangements due to such cancellation;

(d) recommend that the bidder or contractor, its shareholders and directors, or only the shareholders and directors who acted on a fraudulent basis, be restricted by the National Treasury from obtaining business from any organ of state for a period not exceeding 10 years, after the *audi alteram partem* (hear the other side) rule has been applied; and

(e) forward the matter for criminal prosecution.

WITNESSES

1. ……..

2. ……

……

SIGNATURE(S) OF BIDDER(S)

DATE: ……..

ADDRESS ……..

……..

……..

MBD 6.2

T2.1 H DECLARATION CERTIFICATE FOR LOCAL PRODUCTION AND CONTENT

This Standard Bidding Document (MBD) must form part of all bids invited. It contains general information and serves as a declaration form for local content (local production and local content are used interchangeably).

Before completing this declaration, bidders must study the General Conditions, Definitions, Directives applicable in respect of Local Content as prescribed in the Preferential Procurement Regulations, 2011 and the South African Bureau of Standards (SABS) approved technical specification number SATS 1286:201x.

1. General Conditions

1.1. Preferential Procurement Regulations, 2011 (Regulation 9. (1) and 9. (3) make provision for the promotion of local production and content.

1.2. Regulation 9.(1) prescribes that in the case of designated sectors, where in the award of bids local production and content is of critical importance, such bids must be advertised with the specific bidding condition that only locally produced goods, services or works or locally manufactured goods, with a stipulated minimum threshold for local production and content will be considered.

1.3. Regulation 9.(3) prescribes that where there is no designated sector, a specific bidding condition may be included, that only locally produced services, works or goods or locally manufactured goods with a stipulated minimum threshold for local production and content, will be considered.

1.4. Where necessary, for bids referred to in paragraphs 1.2 and 1.3 above, a two stage bidding process may be followed, where the first stage involves a minimum threshold for local production and content and the second stage price and B-BBEE.

1.5. A person awarded a contract in relation to a designated sector, may not sub-contract in such a manner that the local production and content of the overall value of the contract is reduced to below the stipulated minimum threshold.

1.6. The local content (LC) as a percentage of the bid price must be calculated in accordance with the SABS approved technical specification number SATS 1286: 201x as follows:

$$LC = 1 - \left(\frac{x}{y} \right) \times 100$$

Where
x imported content
y bid price excluding value added tax (VAT)

Prices referred to in the determination of x must be converted to Rand (ZAR) by using the exchange rate published by South African Reserve Bank (SARB) at 12:00 on the date, one week (7 calendar days) prior to the closing date of the bid as indicated in paragraph 4.1 below.

1.7. A bid will be disqualified if:

- the bidder fails to achieve the stipulated minimum threshold for local production and content indicated in paragraph 3 below; and.
- this declaration certificate is not submitted as part of the bid documentation.

2. Definitions

2.1. **"bid"** includes advertised competitive bids, written price quotations or proposals;

2.2. **"bid price"** price offered by the bidder, excluding value added tax (VAT);

2.3. **"contract"** means the agreement that results from the acceptance of a bid by an organ of state;

2.4. **"designated sector"** means a sector, sub-sector or industry that has been designated by the Department of Trade and Industry in line with national development and industrial policies for local production, where only locally produced services, works or goods or locally manufactured goods meet the stipulated minimum threshold for local production and content;

2.5. **"duly sign"** means a Declaration Certificate for Local Content that has been signed by the Chief Financial Officer or other legally responsible person nominated in writing by the Chief Executive, or senior member / person with management responsibility(close corporation, partnership or individual).

2.6. **"imported content"** means that portion of the bid price represented by the cost of components, parts or materials which have been or are still to be imported (whether by the supplier or its subcontractors) and which costs are inclusive of the costs abroad, plus freight and other direct importation costs, such as landing costs, dock duties, import duty, sales duty or other similar tax or duty at the South African port of entry;

2.7. **"local content"** means that portion of the bid price which is not included in the imported content, provided that local manufacture does take place;

2.8. **"stipulated minimum threshold"** means that portion of local production and content as determined by the Department of Trade and Industry; and

2.9. **"sub-contract"** means the primary contractor's assigning, leasing, making out work to, or employing another person to support such primary contractor in the execution of part of a project in terms of the contract.

3. The stipulated minimum threshold(s) for local production and content for this bid is/are as follows:

Description of services, works or goods	Stipulated minimum threshold
_____	_____%
_____	_____%
_____	_____%

4. Does any portion of the services, works or goods offered have any imported content? YES / NO

4.1 If yes, the rate(s) of exchange to be used in this bid to calculate the local content as prescribed in paragraph 1.6 of the general conditions must be the rate(s) published by SARB for the specific currency at 12:00 on the date, one week (7 calendar days) prior to the closing date of the bid.

The relevant rates of exchange information is accessible on www.reservebank.co.za. Indicate the rate(s) of exchange against the appropriate currency in the table below:

Currency	**Rates of exchange**
US Dollar	
Pound Sterling	
Euro	
Yen	
Other	

NB: Bidders must submit proof of the SARB rate (s) of exchange used.

LOCAL CONTENT DECLARATION BY CHIEF FINANCIAL OFFICER OR OTHER LEGALLY RESPONSIBLE PERSON NOMINATED IN WRITING BY THE CHIEF EXECUTIVE OR SENIOR MEMBER/PERSON WITH MANAGEMENT RESPONSIBILITY (CLOSE CORPORATION, PARTNERSHIP OR INDIVIDUAL)

IN RESPECT OF BID No.

.....

ISSUED BY: (Procurement Authority / Name of Institution):

…….....
.

NB The obligation to complete, duly sign and submit this declaration cannot be transferred to an external authorized representative, auditor or any other third party acting on behalf of the bidder.

I, the undersigned ……..... (full names),
do hereby declare, in my capacity as ……..
of …..... (name of bidder entity), the following:

(a) The facts contained herein are within my own personal knowledge.

(b) I have satisfied myself that the goods/services/works to be delivered in terms of the above specified bid comply with the minimum local content requirements as specified in the bid, and as measured in terms of SATS 1286.

(c) The local content has been calculated using the formula given in clause 3 of SATS 1286, the rates of exchange indicated in paragraph 4.1 above and the following figures:

Bid price, excluding VAT (y)	R
Imported content (x)	R
Stipulated minimum threshold for Local content (paragraph 3 above)	
Local content % , as calculated in terms of SATS 1286	

If the bid is for more than one product, a schedule of the local content by product shall be attached.

(d) I accept that the Procurement Authority / Institution has the right to request that the local content be verified in terms of the requirements of SATS 1286.

(e) I understand that the awarding of the bid is dependent on the accuracy of the information furnished in this application. I also understand that the submission of incorrect data, or data that are not verifiable as described in SATS 1286, may result in the Procurement Authority / Institution imposing any or all of the remedies as provided for in Regulation 13 of the Preferential Procurement

Regulations, 2011 promulgated under the Policy Framework Act (PPPFA), 2000 (Act No. 5 of 2000).

SIGNATURE: _____ **DATE:** _____

WITNESS No. 1 _____ **DATE:** _____

WITNESS No. 2 _____ **DATE:** _____

MBD 7.1

T2.1 I CONTRACT FORM - PURCHASE OF GOODS/WORKS

THIS FORM MUST BE FILLED IN DUPLICATE BY BOTH THE SUCCESSFUL BIDDER (PART 1) AND THE PURCHASER (PART 2). BOTH FORMS MUST BE SIGNED IN THE ORIGINAL SO THAT THE SUCCESSFUL BIDDER AND THE PURCHASER WOULD BE IN POSSESSION OF ORIGINALLY SIGNED CONTRACTS FOR THEIR RESPECTIVE RECORDS.

PART 1 (TO BE FILLED IN BY THE BIDDER)

1. I hereby undertake to supply all or any of the goods and/or works described in the attached bidding documents to (name of institution)…….…… in accordance with the requirements and specifications stipulated in bid number……..…….. at the price/s quoted. My offer/s remain binding upon me and open for acceptance by the purchaser during the validity period indicated and calculated from the closing time of bid.

2. The following documents shall be deemed to form and be read and construed as part of this agreement:
   i) Bidding documents, viz
      - Invitation to bid;
      - Tax clearance certificate;
      - Pricing schedule(s);
      - Technical Specification(s);
      - Preference claims for Broad Based Black Economic Empowerment Status Level of Contribution in terms of the Preferential Procurement Regulations 2011;
      - Declaration of interest;
      - Declaration of bidder's past SCM practices;
      - Certificate of Independent Bid Determination;
      - Special Conditions of Contract;

   ii) General Conditions of Contract; and
   iii) Other (specify)

3. I confirm that I have satisfied myself as to the correctness and validity of my bid; that the price(s) and rate(s) quoted cover all the goods and/or works specified in the bidding documents; that the price(s) and rate(s) cover all my obligations and I accept that any mistakes regarding price(s) and rate(s) and calculations will be at my own risk.

4. I accept full responsibility for the proper execution and fulfilment of all obligations and conditions devolving on me under this agreement as the principal liable for the due fulfilment of this contract.

5. I declare that I have no participation in any collusive practices with any bidder or any other person regarding this or any other bid.

6. I confirm that I am duly authorised to sign this contract.

NAME (PRINT) .....

CAPACITY .....

SIGNATURE .....

NAME OF FIRM .....

DATE .....

WITNESSES

1. ……..

2. ……..

DATE: ……..

MBD 7.1

CONTRACT FORM - PURCHASE OF GOODS/WORKS

PART 2 (TO BE FILLED IN BY THE PURCHASER)

1. I…… in my capacity as……..…..
accept your bid under reference number ……dated……for the supply of goods/works indicated hereunder and/or further specified in the annexure(s).

2. An official order indicating delivery instructions is forthcoming.

3. I undertake to make payment for the goods/works delivered in accordance with the terms and conditions of the contract, within 30 (thirty) days after receipt of an invoice accompanied by the delivery note.

ITEM NO.	PRICE (ALL APPLICABLE TAXES INCLUDED)	BRAND	DELIVERY PERIOD	B-BBEE STATUS LEVEL OF CONTRIBUTION	MINIMUM THRESHOLD FOR LOCAL PRODUCTION AND CONTENT (if applicable)

4. I confirm that I am duly authorized to sign this contract.

SIGNED AT …… ON ……..

NAME (PRINT) ……..

SIGNATURE ……..

OFFICIAL STAMP

WITNESSES

1. ……

2

MBD 7.2

T2.1 J CONTRACT FORM – RENDERING OF SERVICES

THIS FORM MUST BE FILLED IN DUPLICATE BY BOTH THE SERVICE PROVIDER (PART 1) AND THE PURCHASER (PART 2). BOTH FORMS MUST BE SIGNED IN THE ORIGINAL SO THAT THE SERVICE PROVIDER AND THE PURCHASER WOULD BE IN POSSESSION OF ORIGINALLY SIGNED CONTRACTS FOR THEIR RESPECTIVE RECORDS.

PART 1 (TO BE FILLED IN BY THE SERVICE PROVIDER)

1. I hereby undertake to render services described in the attached bidding documents to (name of the institution)……. in accordance with the requirements and task directives / proposals specifications stipulated in Bid Number…….. at the price/s quoted. My offer/s remain binding upon me and open for acceptance by the Purchaser during the validity period indicated and calculated from the closing date of the bid.

2. The following documents shall be deemed to form and be read and construed as part of this agreement:

   i) Bidding documents, viz
   - Invitation to bid;
   - Tax clearance certificate;
   - Pricing schedule(s);
   - Filled in task directive/proposal;
   - Preference claims for Broad Based Black Economic Empowerment Status Level of Contribution in terms of the Preferential Procurement Regulations 2011;
   - Declaration of interest;
   - Declaration of Bidder's past SCM practices;
   - Certificate of Independent Bid Determination;
   - Special Conditions of Contract;

   ii) General Conditions of Contract; and
   iii) Other (specify)

3. I confirm that I have satisfied myself as to the correctness and validity of my bid; that the price(s) and rate(s) quoted cover all the services specified in the bidding documents; that the price(s) and rate(s) cover all my obligations and I accept that any mistakes regarding price(s) and rate(s) and calculations will be at my own risk.

4. I accept full responsibility for the proper execution and fulfilment of all obligations and conditions devolving on me under this agreement as the principal liable for the due fulfilment of this contract.

5. I declare that I have no participation in any collusive practices with any bidder or any other person regarding this or any other bid.

6. I confirm that I am duly authorised to sign this contract.

NAME (PRINT)	.....	WITNESSES
CAPACITY	.....	1. …….
SIGNATURE	.....	2. …….
NAME OF FIRM	.....	DATE: ...……..
DATE	.....	

CONTRACT FORM – RENDERING OF SERVICES

PART 2 (TO BE FILLED IN BY THE PURCHASER)

1. I…… in my capacity ……..…..
accept your bid under reference number ……dated……for the rendering of services indicated hereunder and/or further specified in the annexure(s).

2. An official order indicating delivery instructions is forthcoming.

3. I undertake to make payment for the services rendered in accordance with the terms and conditions of the contract, within 30 (thirty) days after receipt of an invoice.

DESCRIPTION OF SERVICE	PRICE (ALL APPLICABLE TAXES INCLUDED)	COMPLETION DATE	B-BBEE STATUS LEVEL OF CONTRIBUTION	MINIMUM THRESHOLD FOR LOCAL PRODUCTION AND CONTENT (if applicable)

4. I confirm that I am duly authorized to sign this contract.

SIGNED AT …… ON ……..

NAME (PRINT)……

SIGNATURE …….

OFFICIAL STAMP

WITNESSES

1. ……

2……

MBD 7.3

T2.1 K CONTRACT FORM – SALE OF GOODS/WORKS

THIS FORM MUST BE FILLED IN DUPLICATE BY BOTH THE SUCCESSFUL BIDDER (PART 1) AND THE SELLER (PART 2). BOTH FORMS MUST BE SIGNED IN THE ORIGINAL SO THAT THE SUCCESSFUL BIDDER AND THE SELLER WOULD BE IN POSSESSION OF ORIGINALLY SIGNED CONTRACTS FOR THEIR RESPECTIVE RECORDS.

PART 1 (TO BE FILLED IN BY THE BIDDER)

1. I hereby undertake to purchase all or any of the goods and/or works described in the attached bidding documents from (name of institution)…….…..…… in accordance with the requirements stipulated in (bid number)……..…….. at the price/s quoted. My offer/s remain binding upon me and open for acceptance by the seller during the validity period indicated and calculated from the closing time of bid.

2. The following documents shall be deemed to form and be read and construed as part of this agreement:

   i) Bidding documents, viz
      - Invitation to bid;
      - Tax clearance certificate;
      - Pricing schedule(s);
      - Declaration of interest;
      - Declaration of Bidder's past SCM practices;
      - Special Conditions of Contract;

   ii) General Conditions of Contract; and

   iii) Other (specify)

3. I confirm that I have satisfied myself as to the correctness and validity of my bid; that the price(s) quoted cover all the goods and/or works specified in the bidding documents; that the price(s) cover all my obligations and I accept that any mistakes regarding price(s) and calculations will be at my own risk.

4. I accept full responsibility for the proper execution and fulfilment of all obligations and conditions devolving on me under this agreement as the principal liable for the due fulfilment of this contract.

5. I undertake to make payment for the goods/works as specified in the bidding documents.

6. I declare that I have no participation in any collusive practices with any bidder or any other person regarding this or any other bid.

7. I confirm that I am duly authorised to sign this contract.

NAME (PRINT)	.....	WITNESSES
CAPACITY	.....	1. ……..
SIGNATURE	.....	2. ……..
NAME OF FIRM	.....	DATE: ……..
DATE	.....	

CONTRACT FORM – SALE OF GOODS/WORKS

PART 2 (TO BE FILLED IN BY THE PURCHASER)

1. I…… in my capacity as……..….. accept your bid under reference number ……dated……for the purchase of goods/works indicated hereunder and/or further specified in the annexure(s).

2. I undertake to make the goods/works available in accordance with the terms and conditions of the contract.

ITEM NO.	DESCRIPTION	PRICE (ALL APPLICABLE TAXES INCLUDED)		

3. I confirm that I am duly authorized to sign this contract.

SIGNED AT …… ON ……..

NAME (PRINT) …….

SIGNATURE ……..

OFFICIAL STAMP

WITNESSES

1. ……..……

2……..……

MBD 8

T2.1 L DECLARATION OF BIDDER'S PAST SUPPLY CHAIN MANAGEMENT PRACTICES

1 This Municipal Bidding Document must form part of all bids invited.

2 It serves as a declaration to be used by municipalities and municipal entities in ensuring that when goods and services are being procured, all reasonable steps are taken to combat the abuse of the supply chain management system.

3 The bid of any bidder may be rejected if that bidder, or any of its directors have:

a. abused the municipality's / municipal entity's supply chain management system or committed any improper conduct in relation to such system;
b. been convicted for fraud or corruption during the past five years;
c. willfully neglected, reneged on or failed to comply with any government, municipal or other public sector contract during the past five years; or
d. been listed in the Register for Tender Defaulters in terms of section 29 of the Prevention and Combating of Corrupt Activities Act (No 12 of 2004).

4 In order to give effect to the above, the following questionnaire must be completed and submitted with the bid.

Item	Question	Yes	No
4.1	Is the bidder or any of its directors listed on the National Treasury's Database of Restricted Suppliers as companies or persons prohibited from doing business with the public sector? (Companies or persons who are listed on this Database were informed in writing of this restriction by the Accounting Officer/Authority of the institution that imposed the restriction after the *audi alteram partem* rule was applied). **The Database of Restricted Suppliers now resides on the National Treasury's website(**www.treasury.gov.za**) and can be accessed by clicking on its link at the bottom of the home page.**	Yes ☐	No ☐
4.1.1	If so, furnish particulars:		
4.2	Is the bidder or any of its directors listed on the Register for Tender Defaulters in terms of section 29 of the Prevention and Combating of Corrupt Activities Act (No 12 of 2004)? **The Register for Tender Defaulters can be accessed on the National Treasury's website (www.treasury.gov.za) by clicking on its link at the bottom of the home page.**	Yes ☐	No ☐
4.2.1	If so, furnish particulars:		
4.3	Was the bidder or any of its directors convicted by a court of law (including a court of law outside the Republic of South Africa) for fraud or corruption during the past five years?	Yes ☐	No ☐

Item	Question	Yes	No
4.3.1	If so, furnish particulars:		
4.4	Does the bidder or any of its directors owe any municipal rates and taxes or municipal charges to the municipality / municipal entity, or to any other municipality / municipal entity, that is in arrears for more than three months?	Yes ☐	No ☐
4.4.1	If so, furnish particulars:		
4.5	Was any contract between the bidder and the municipality / municipal entity or any other organ of state terminated during the past five years on account of failure to perform on or comply with the contract?	Yes ☐	No ☐
4.7.1	If so, furnish particulars:		

CERTIFICATION

I, THE UNDERSIGNED (FULL NAME) ……..……..……
CERTIFY THAT THE INFORMATION FURNISHED ON THIS DECLARATION FORM TRUE AND CORRECT.

I ACCEPT THAT, IN ADDITION TO CANCELLATION OF A CONTRACT, ACTION MAY BE TAKEN AGAINST ME SHOULD THIS DECLARATION PROVE TO BE FALSE.

……... **……..**
Signature **Date**

…… **……..**
Position **Name of Bidder**

MBD 9

T2.1 M CERTIFICATE OF INDEPENDENT BID DETERMINATION

1 This Municipal Bidding Document (MBD) must form part of all bids[1] invited.

2 Section 4 (1) (b) (iii) of the Competition Act No. 89 of 1998, as amended, prohibits an agreement between, or concerted practice by, firms, or a decision by an association of firms, if it is between parties in a horizontal relationship and if it involves collusive bidding (or bid rigging).[2] Collusive bidding is a *pe se* prohibition meaning that it cannot be justified under any grounds.

3 Municipal Supply Regulation 38 (1) prescribes that a supply chain management policy must provide measures for the combating of abuse of the supply chain management system, and must enable the accounting officer, among others, to:

a. take all reasonable steps to prevent such abuse;

b. reject the bid of any bidder if that bidder or any of its directors has abused the supply chain management system of the municipality or municipal entity or has committed any improper conduct in relation to such system; and

c. cancel a contract awarded to a person if the person committed any corrupt or fraudulent act during the bidding process or the execution of the contract.

4 This MBD serves as a certificate of declaration that would be used by institutions to ensure that, when bids are considered, reasonable steps are taken to prevent any form of bid-rigging.

5 In order to give effect to the above, the attached Certificate of Bid Determination (MBD 9) must be completed and submitted with the bid:

[1] Includes price quotations, advertised competitive bids, limited bids and proposals.

[2] Bid rigging (or collusive bidding) occurs when businesses, that would otherwise be expected to compete, secretly conspire to raise prices or lower the quality of goods and / or services for purchasers who wish to acquire goods and / or services through a bidding process. Bid rigging is, therefore, an agreement between competitors not to compete.

[3] Joint venture or Consortium means an association of persons for the purpose of combining their expertise, property, capital, efforts, skill and knowledge in an activity for the execution of a contract.

CERTIFICATE OF INDEPENDENT BID DETERMINATION

I, the undersigned, in submitting the accompanying bid:

_____

(Bid Number and Description)

in response to the invitation for the bid made by:

_____

(Name of Municipality / Municipal Entity)

do hereby make the following statements that I certify to be true and complete in every respect:

I certify, on behalf of: _____that:

(Name of Bidder)

1. I have read and I understand the contents of this Certificate;
2. I understand that the accompanying bid will be disqualified if this Certificate is found not to be true and complete in every respect;
3. I am authorized by the bidder to sign this Certificate, and to submit the accompanying bid, on behalf of the bidder;
4. Each person whose signature appears on the accompanying bid has been authorized by the bidder to determine the terms of, and to sign, the bid, on behalf of the bidder;
5. For the purposes of this Certificate and the accompanying bid, I understand that the word "competitor" shall include any individual or organization, other than the bidder, whether or not affiliated with the bidder, who:
    (a) has been requested to submit a bid in response to this bid invitation;
    (b) could potentially submit a bid in response to this bid invitation, based on their qualifications, abilities or experience; and
    (c) provides the same goods and services as the bidder and/or is in the same line of business as the bidder
6. The bidder has arrived at the accompanying bid independently from, and without consultation, communication, agreement or arrangement with any competitor. However communication between partners in a joint venture or consortium[3] will not be construed as collusive bidding.

7. In particular, without limiting the generality of paragraphs 6 above, there has been no consultation, communication, agreement or arrangement with any competitor regarding:
   (a) prices;
   (b) geographical area where product or service will be rendered (market allocation)
   (c) methods, factors or formulas used to calculate prices;
   (d) the intention or decision to submit or not to submit, a bid;
   (e) the submission of a bid which does not meet the specifications and conditions of the bid; or
   (f) bidding with the intention not to win the bid.
8. In addition, there have been no consultations, communications, agreements or arrangements with any competitor regarding the quality, quantity, specifications and conditions or delivery particulars of the products or services to which this bid invitation relates.
9. The terms of the accompanying bid have not been, and will not be, disclosed by the bidder, directly or indirectly, to any competitor, prior to the date and time of the official bid opening or of the awarding of the contract.
10. I am aware that, in addition and without prejudice to any other remedy provided to combat any restrictive practices related to bids and contracts, bids that are suspicious will be reported to the Competition Commission for investigation and possible imposition of administrative penalties in terms of section 59 of the Competition Act No 89 of 1998 and or may be reported to the National Prosecuting Authority (NPA) for criminal investigation and or may be restricted from conducting business with the public sector for a period not exceeding ten (10) years in terms of the Prevention and Combating of Corrupt Activities Act No 12 of 2004 or any other applicable legislation.

…… ……

Signature Date

…… ……

Position Name of Bidder

T2.1 N CURRICULUM VITAE OF CONTRACT MANAGER AND QUALIFICATIONS

Name:	Date of Birth:
Profession:	Nationality:
Qualifications:	
Professional Registration Number:	
Name of Employer (Firm):	
Current Position:	Years with the firm:
Employment Record: (List in chronological order stating with earliest work experience)	
Experience Record Pertinent to Required Service	
Certification I, the undersigned, certify that to the best of my knowledge and belief, this data correctly describes me, my qualifications and my experience. …… Date: …… Signature	

T2.1 O CURRICULUM VITAE OF SITE AGENT AND QUALIFICATIONS

Name:	Date of Birth:
Profession:	Nationality:
Qualifications:	
Professional Registration Number:	
Name of Employer (Firm):	
Current Position:	Years with the firm:
Employment Record: (List in chronological order stating with earliest work experience)	
Experience Record Pertinent to Required Service	
Certification I, the undersigned, certify that to the best of my knowledge and belief, this data correctly describes me, my qualifications and my experience. …… Date: …… Signature	

T2.1 P CURRICULUM VITAE OF FOREMAN AND QUALIFICATIONS

Name:	Date of Birth:
Profession:	Nationality:
Qualifications:	
Professional Registration Number:	
Name of Employer (Firm):	
Current Position:	Years with the firm:
Employment Record: (List in chronological order stating with earliest work experience)	
Experience Record Pertinent to Required Service	
Certification I, the undersigned, certify that to the best of my knowledge and belief, this data correctly describes me, my qualifications and my experience. …… Date: …… Signature	

T2.1 Q CURRICULUM VITAE OF SAFETY OFFICER AND QUALIFICATIONS

Name:	Date of Birth:
Profession:	Nationality:
Qualifications:	
Professional Registration Number:	
Name of Employer (Firm):	
Current Position:	Years with the firm:
Employment Record: (List in chronological order stating with earliest work experience)	
Experience Record Pertinent to Required Service	
Certification I, the undersigned, certify that to the best of my knowledge and belief, this data correctly describes me, my qualifications and my experience. …… Date: …… Signature	

T2.2 OTHER DOCUMENTS REQUIRED FOR TENDER EVALUATION

T2.2 A CERTIFICATE OF AUTHORITY OF SIGNATORY

Indicate the status of the Bidder by ticking the appropriate box hereunder. The Bidder must complete the certificate set out below for the relevant category.

A	Company	☐
B	Partnership	☐
C	Joint Venture	☐
D	Sole Proprietor	☐
E	Close Corporation	☐

A. Certificate for company

I, ……., chairperson of the board of directors of ……

……, hereby confirm that by resolution of the board (copy attached) taken on ……. 20……, Mr/Ms ……., acting in the capacity of ……., was authorised to sign all documents in connection with this bid and any contract resulting from it on behalf of the company.

As witnesses:

1. ....
Chairman

....
Print Name Print Name

2. ....
Date

.....
Print Name

B. Certificate of partnership

We, the undersigned, being the key partners in the business trading as ……

....., hereby authorise Mr/Ms ……, acting in the capacity of ……., to sign all documents in connection with the bid for Contract ……., and any contract resulting from it on our behalf.

Name	Address	Signature	Date

NOTE: This certificate is to be completed and **signed by each and all of the key partners** upon whom rests the direction of the affairs of the Partnership as a whole.

C. Certificate for Joint Venture

We, the undersigned, are submitting this bid offer in Joint Venture and hereby authorize Mr/Ms ……., authorised signatory of the firm ....., acting in the capacity of lead partner, to sign all documents in connection with the bid offer for Contract …… and any contract resulting from it on our behalf.

This authorisation is evidenced by the attached power of attorney signed by legally authorised signatories of all the partners to the Joint Venture.

Name of Firm	Address	Authorising	
		Signature	Name
Lead Partner			

D. Certificate for sole proprietor

I, ……, hereby confirm that I am the sole owner of the business trading as ……..…...

……. …….……

Signature: Sole Owner Print Name

As witnesses:-

1. ……. …….
   Print Name Date

2. ……. ……..
   Print Name Date

E. Certificate for Close Corporation

We, the undersigned, being the key members in the business trading as …….

……..…… hereby authorise Mr/Ms ……., acting in

the capacity of ……, to sign all documents in connection with the bid

for Contract ……..…… and any contract resulting from it on our behalf.

Name	Address	Signature	Date

Note: This Certificate is to be completed and signed by each and all of the key members upon whom rests the direction of the affairs of the Close Corporation as a whole.

T2.2 B CERTIFICATE OF REGISTRATION WITH THE CONSTRUCTION INDUSTRY DEVELOPMENT BOARD

1. General

The Register of Contractors is established by the Construction Industry Development Board in terms of the CIDB Act 38 of 2000 and Construction Industry Development Regulations as published in Government Gazette number 26427 of 2004.

The Act makes it mandatory for public sector clients to apply this register when considering bids. Any enterprise that submits a bid or enters into contract for construction works with the public sector, must be registered.

Once-off joint ventures do not have to register, provided that each partner of the joint venture is separately registered.

2. Status

Bidders shall fill in the following sections of this form, depending on their status:

2.1 Section A

Bidders who have accomplished registration and can provide proof of their grading designation.

2.2 Section B

Bidders who are in the process of registration of an update to an existing registration or a renewal.

2.3 Section C

Bidders who have submitted the first application.

2.4 Section D

Bidders submitting this Bid offer in Joint Venture and can provide proof that each partner of the Joint Venture is separately registered.

Note: Only complete one of Sections A, B, C or D.

SECTION A

I, …….. acting in capacity of …… was authorised to sign all documents in connection with this bid an any contract resulting from it on behalf of the following entity: …….

hereby declare that the above mentioned entity has achieved registration with the Construction Industry Development Board on date …… and declare that the grading designation is reflected in the following **symbols** on the registration certificate.

Contract Value		

Type of Work		

……..	……...
Signature of Bidder	Signature of Witness
……..	……...
Print Name	Print Name

SECTION B

I, …… acting in capacity of …….. was authorised to sign all documents in connection with this bid and any contract resulting from it on behalf of the following entity: …….. hereby declare that the above mentioned entity has achieved registration with the Construction Industry Development Board on date …… furthermore declare that the existing grading designation is:

Contract Value		

Type of Work		

and the following update has been applied for:

Amendment of Category Status	
Change of Particulars	
Annual Confirmation of Particulars	
Renewal of Registration	

mark with a "✓"

…… ……..
Signature of Bidder Signature of Witness

…… ……..
Print Name Print Name

SECTION C

I, …….. acting in capacity of …… was authorised to sign all documents in connection with this bid and any contract resulting from in/on behalf of the following entity: …….. hereby declare that the above-mentioned entity has submitted its FIRST APPLICATION FOR REGISTRATION with the Construction Industry Development Board on date …….

I furthermore accept that failure to achieve registration with the Construction Industry Development Board in a category stipulated in the Bid Data within 10 days from the date of closing this bid, implies a non-responsive bid and warrants rejection of the Bid on account of non-compliance with the requirements of the Bid Data.

……	……..
Signature of Bidder	Signature of Witness
……	……..
Print Name	Print Name

SECTION D

I, …… acting in capacity of the LEAD PARTNER in the Joint Venture

……
. was authorised to sign all documents in connection with this bid and any contract resulting from it, hereby declare that each of the Joint Venture is separately registered with the Construction Industry Development Board and declare that the grading designation is reflected in the following **symbols** on the registration certificates:

Name of Lead Partner:		
Contract Value		
Type of Work		

Name of 2nd Partner:		
Contract Value		
Type of Work		

Name of 3rd Partner:		
Contract Value		
Type of Work		

…… ……..
Signature of Bidder Signature of Witness

…… ……..
Print Name Print Name

T2.2 C RECORD OF ADDENDA TO BID DOCUMENTS

We confirm that the following communications received from the Procuring Department before the submission of this Bid Offer, amending the Bid Documents, have been taken into account in this Bid Offer:

	Date	Title or Details
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		

Attach additional pages if more space is required.

Signed …….. Date ……..

Print Name …….. Position ……

Bidder ……..

T2.2 D FORM OF INTENT TO PROVIDE A DEMAND GUARANTEE

If my/our bid is accepted, I/we will, when required and within the time stipulated, provide a guarantee of

Insurance Company (name) ……...

(of address) …….

…….

or

Commercial Bank (Name) ……...

(Branch) ……...

(of address) …….

…….

to be approved by you, the Employer, for the amount stipulated.

I/we understand that failure to produce an acceptable Demand Guarantee within the stipulated period is a fundamental breach of Contract, entitling the Employer to:

(i) withhold all payments which may be due to the Contractor pending compliance with the stipulated requirements to produce an acceptable Demand Guarantee.

(ii) instruct the Contractor to cease all work pending provision of the Demand Guarantee, and

(iii) cancel the Contract.

Signed ……. Date …….

Print Name ……. Position …….

Bidder …….

T2.2 E HEALTH AND SAFETY PLAN: DECLARATION BY BIDDER

I/we declare that we have read and understand the health and safety specifications contained in the Contract Data and undertake to:

- provide and demonstrate to the Employer a suitably and sufficiently documented health and safety plan, which shall be applied from the date of commencement of and for the duration of the construction work,
- appoint a full-time competent employee in writing as the Construction Supervisor from the date of commencement of and for the duration of construction work,
- appoint a full time/part time competent employee in writing as the Construction Safety Officer from the date of commencement of and for the duration of construction work.

I/we undertake to rectify all non-conforming conditions for which we are responsible. I/we accept that, should I/we not rectify these timeously, they will be corrected by the Employer and the cost subtracted from any amounts due to me/us in terms of the Contract Data.

I/we confirm that I/we am/are registered and in good standing with the Compensation Fund and our

registration number is: ……..,

alternatively, my/our licensed compensation insurer is:

(Name) …….

(Address) …….

…….

To this effect, I/we attach proof of registration and good standing.

I/we certify that to the best of my/our knowledge and belief, the curricula vitae of our proposed key health and safety personnel cited hereinafter correctly describe their qualifications and experience.

Signed …….. Date …….

Print Name …….. Position …….

Bidder …….

T2.2 F SCHEDULE OF PROPOSED SUB-CONTRACTORS

We notify you that it is our intention to employ the following Sub-Contractors for work in this contract.

If we are awarded a contract we agree that this notification does not change the requirement for us to submit the names of proposed Sub-Contractors in accordance with requirements in the Contract for such appointments.

	Name and Address of Proposed Sub-Contractor	Nature and Extent of Work	Previous Experience with Sub-Contractor
1			
2			
3			
4			
5			

Signed …….. Date ……

Print Name …….. Position ……

Bidder …….

SUB-CONTRACTING UNDERTAKING

LETTER OF UNDERTAKING TO PERFORM AS A SUB-CONTRACTOR
(Copy as many as necessary)

Contract Number: ……

From: (Name and address of Sub-contractor)

……

……

……

To: (Name and address of Contractor)

……

……

……

The undersigned undertakes to *perform work/provide services/supply goods in connection with the above Contract as a *close corporation/sole proprietor/partnership/company and is prepared to perform in connection with the above-named Contract as Sub-contractor to the Contractor, the following *work/provide the following services/supply the following goods:
*(**delete that which is not applicable**)

……

……

for an estimated amount of R..... excluding VAT, subject to the terms of any agreement made between us for the purpose of the Contract which agreement shall include the General Conditions of Contract and relevant Special Conditions that govern this Contract.

Signature: ……

Name: ……

Designation: ……

Date: ……
who duly warrants that he/she is authorised to sign this letter.

SUB-CONTRACTING UNDERTAKING

LETTER OF UNDERTAKING TO PERFORM AS A SUB-CONTRACTOR
(Copy as many as necessary)

Contract Number: ……

From: (Name and address of Sub-contractor)

……

……

……

To: (Name and address of Contractor)

……

……

……

The undersigned undertakes to *perform work/provide services/supply goods in connection with the above Contract as a *close corporation/sole proprietor/partnership/company and is prepared to perform in connection with the above-named Contract as Sub-contractor to the Contractor, the following *work/provide the following services/supply the following goods:
*(**delete that which is not applicable**)

……

……

for an estimated amount of R..... excluding VAT, subject to the terms of any agreement made between us for the purpose of the Contract which agreement shall include the General Conditions of Contract and relevant Special Conditions that govern this Contract.

Signature: ……

Name: ……

Designation: ……

Date: ……
who duly warrants that he/she is authorised to sign this letter.

T2.2 G QUALITY ASSURANCE PROGRAMME

Bidder to submit details here below of his Quality Assurance Policy whereby he shall demonstrate that he has the following:

(a) An Operating Quality Management System based on SABS/ISO 9001 : 2000 international standards, if not, state alternative.

(b) Proof of Quality Assurance Co-ordination.

(c) Proven technical capabilities and resources to ensure Quality Management.

(d) A recent assessment/audit report on his Quality Management and Quality Control System(s).

Contractor's details with respect to items a), b), c) and d):

SIGNATURE OF BIDDER …… DATE …….

……
Print Name of Signatory

ON BEHALF OF: …… (the Bidder)

T2.2 H INSURANCE STATEMENT

BIDDER'S DECLARATION OF INSURANCES

I/We hereby declare that the insurances enumerated below have been affected by me/us.

I/We further declare that all premiums in respect of the insurances are fully paid up to date.

Cover Effected	Insurer and Policy Number	Expiry Date	Limits of Indemnity / Sums Insured	Deductibles
Contractor's All Risks				
Occupational Injuries and Diseases				
Unemployment Insurance				
Motor Vehicle Insurance				
Other:				

We submit herewith a letter of good standing from the Workman's Compensation Commissioner in respect of Occupational Injuries and Diseases Insurance.

Bidder: ……

....
Signature of Bidder Print Name of Signatory

.....
Capacity

T2.2 I SCHEDULE OF AVAILABLE INFRASTRUCTURE AND RESOURCES

1. Bidder's Plant and Equipment

The Bidder must list below all the items of major Plant and Equipment which he guarantees will be provided on Site in perfect working order to complete the Works. This list shall include, or additional lists shall be supplied to include all Plant provided by sub-contractors.

The lists of items of Equipment shall provide the Bidder's warranty of ownership of such Plant unless specifically endorsed herein to the contrary as "hired" or "hire purchase".

This Schedule must be accurately completed. Phrases such as 'adequate equipment will be provided', will not be accepted.

Year of Manufacture	Make & Description (Mass, condition, etc)	Ownership

2. Bidder's List of Third Party Design Engineers

In the event that the Bidder desires to design all or part of the Works or submit any alternative, he/she shall list the following, the Design Engineers, accomplished in the specific field of practice, which he/she proposes to employ for the purpose of third party certification of all works designed by the Bidder for the Works.

Notes: (i) All costs of third party designs shall be borne solely by the Bidder.
(ii) This Schedule must be accurately completed. Phrases such as "to be advised" will not be accepted.

Section of Works	Name and Address of Registered Engineer	ECSA Registration No.

3. Bidder's Personnel Profile

Key Staff Permanently employed, of foreman level and above	**Number of staff**
Sub-Total	
Other Permanent Staff	**Number of staff**
Sub-Total	
Temporary Staff	**Number of staff**
Sub-Total	

4. List the Firms who provide the following services:

Service	**Name**	**Contact Person**	**Telephone**
Accounting			
Auditing			
Insurance			
Legal			

5. Identify any amounts of money loaned to your enterprise, indicating the loan source, date and amount

Loan Source	**Address**	**Date of Loan**	**Loan Amount**

6. **List a maximum of five contract which your enterprise is engaged in and has not yet completed**

Contract Description	Location	Client	Contract Amount	Expected Completion (month & year)

7. **List the four largest assignments completed by your enterprise in the last three years**

Nature of Work Performed	Client	Consultant Contact Person	Telephone No.	Contract Amount

8. **Address of workshop facilities from where maintenance of works will be undertaken**

……..

……..

9. **Address of Branch Offices in the RSA**

……..

……..

10. **Address of Nearest Representative to Polokwane**

……..

……..

11. **Has work previously been performed for the Employer?** YES/NO* - Specify

……..

……..

12. **Bidder's Financial Ability to execute and complete the Works**

Provide the estimated cash flow on the project in terms of submissions of payment certificates or payment schedules of the Employer.

NOTES APPLICABLE:

(i) Value added tax to be included in all amounts

(ii) Assume for the purpose of this estimate, payment of certificates within 30 days after receipt by the Employer.

(iii) In calculation of the last column,

j = d m = l + g
k = j + e n = m + h
l = k + f etc

(iv) Failure to detail the required information, shall automatically signify that the Bidder lacks the infrastructure and resources necessary to execute and complete the Works.

Month No. in Contract Period	Estimated amount in Rands (VAT included)			
	a Received	**b Payments made**	**a-b Net cash flow**	**Cumulative cash flow**
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
Maximum negative cash flow. Take the largest negative number in the last column and write in here → → → → →				

Signed …….. Date ……

Print Name …….. Position ……

Bidder ……

T2.2 J FINANCIAL INFORMATION OF BIDDER

This information sheet has to be filled in by the financier of the Bidder, duly signed and stamped on behalf of the financial institution he represents.

Bidder / Bid Details

Bid Description : ……..

Contract Period : ……

Name of Bidder : ……..

Bank Account Number : ……

Bidding Amount : ……

Demand Guarantee will be provided by this Bank: YES ☐ NO ☐

If yes, state amount of Demand Guarantee: R ……

Financial Institution

Name of Commercial Bank : ……

Branch : ……

Name of Bank Manager : ……

Telephone Number : ……

I / We acting on behalf of the above Commercial Bank confirm that

…… (Bidder)

has operated an account with us for the last ..... years.

We have been requested to provide a bank rating based in relation to the financial capability of the Bidder, taking into account directives set out in the following two tables.

Financial Capability

Maximum value of contract that the Bidder is considered capable of	Value on which Bank Rating must be used
up to R300 000	R24 000
R1 000 000	R78 000
R3 000 000	R240 000
R5 000 000	R480 000
R10 000 000	R900 000
R30 000 000	R2 400 000
R100 000 000	R7 800 000

BANK RATING	
Bank Code	**Description of Bank Code**
A	Undoubted for the amount of enquiry
B	Good for the amount of enquiry
C	Good for the amount quoted if strictly in the way of business
D	Fair trade risk for amount of enquiry
E	Figures considered too high
F	Financial position unknown
G	Occasional dishonours
H	Frequent dishonours

The value on which our Bank Rating of the Bidder is based is R……..

(In words …… only)

The Bank Rating is code: ……

…… …….. ……..
Signature: Manager Financial Institution Print Name Date

RUBBER STAMP OF INSTITUTION

T2.2 K COMMERCIAL EQUITY DECLARATION

1. General

The Employer considers the information contained in this Declaration as a material aspect of the Contract. Should there, during the duration of either the bid enquiry or contract, be any significant change in the equity situation of the Bidder, the Employer shall immediately be notified and the Employer will, in terms of the Contract Data, exercise its rights.

2. Nameof Bidder……...……

3. Type of enterprise e.g. Sole proprietor, partnership, CC, Pty, JV, etc ……

4. Details of Firm:

Name of Company: ……...

Street Address: ……...

……...

Postal Address: ……...

……...

Tel. Number: (Code) ..... (Number) .....

Fax Number: (Code) ..... (Number) .....

Contact Person: ……...

Company Registration No. ……...

Income Tax Registration No. ……

VAT Registration No. ……

Number of years in Business: ……

Founding Date of Firm: ……

5. List all equity owners

Name	M/F	PDI (Y/N)	D (Y/N)	% Equity owned	ID Number

Attached registration documents and shareholders agreements.

PDI (Previously Disadvantaged Individuals). If disabled indicate under D.

6. Did the enterprise exist under a previous name? (Tick one box)

☐ Yes ☐ No

If yes:

What was its previous name? ……

Why did it change its name? ……

List the previous owners/partners/directors ……...

……..

……..

7. Identify by name, status and length of service, those individuals in the enterprise (including owners) responsible for day-to-day management and business decisions.

Financing decisions	Name	Status (Yes/No)*			Length of service (years)
		PDI	Women	Disabled	
Cheque signing					
Signing and co-signing of loans					
Acquisition of lines of credit					
Demand & Retention Guarantees					
Major Purchases or acquisitions					
Signing contracts					

Management decision	Name	Status (Yes/No)*			Length of service (years)
		PDI	Women	Disabled	
Estimating					
Marketing and sales operations					
Hiring & firing of management personnel					
Hiring & firing of non-management personnel					
Supervision of office personnel					
Supervision of field/production activities					

*State Yes or No Attach separate list, if necessary.

I (1), ... and (2) ..... (names), hereby certify that, to the best of our knowledge, the information, facts and representations are correct and that we are duly authorised to sign on behalf of the Bidder.

Date: .....

Signature: (1)..... (2) .....

T2.2 L JOINT VENTURE DISCLOSURE FORM

Employer: ……

Contract Number: ……

NOTE 1 This form need only be completed in the event of a Joint Venture submitting this bid.

NOTE 2 Fill in all the information requested in the spaces provided. Attach additional sheets if required.

NOTE 3 Provide a copy of the Joint Venture agreement. Demonstrate that the partners to the Joint Venture share in the ownership, control, management responsibilities, risks and profits of the Joint Venture. The Joint Venture agreement shall include specific details relating to:

a) the contributions of capital and equipment;
b) portions of the Contract to be performed by the partner's own resources; and
c) portions of the Contract to be performed under the supervision of each partner.

NOTE 4 Provide copies of all written agreements between partners concerning the Joint Venture, including those that relate to ownership options and to restrictions/limits regarding ownership and control.

1. Joint Venture Particulars

Name ……...

Postal Address ……...

Physical Address ……

……...

Telephone ……...

Fax ……...

Name of authorized representative ……

2. Identity of Partner No. 1

Name ……...

Postal Address ……...

Physical Address ……

……...

Telephone ……...

Fax ……...

Contact Person ……

3. Identity of Partner No. 2

Name ……...

Postal Address ……...

Physical Address ……

……...

Telephone ……...

Fax ……...

Contact Person ……

4. Identity of Partner No. 3

Name ……...

Postal Address ……...

Physical Address ……

……...

Telephone ……...

Fax ……...

Contact Person ……

5. Description of the role of the partners in the joint venture

Partner No. 1: ……...

……

Partner No. 2: ……...

……

Partner No. 3: ……...

……

6. Ownership of the joint venture

(i) Ownership percentage(s) Partner No. 1 …….. %

Partner No. 2 …….. %

Partner No. 3 …….. %

(ii) Partner percentage in respect of:

a) Profit and loss sharing: Partner No. 1 …….. %

Partner No. 2 …….. %
Partner No. 3 …….. %

b) Initial capital contribution Partner No. 1 R…….

Partner No. 2 R……..

Partner No. 3 R……..

(iii) Anticipated ongoing capital contributions:

Partner No. 1 R.....

Partner No. 2 R.....

Partner No. 3 R.....

(iv) Contributions of equipment (specify types, quality and quantities of equipment) to be provided by each partner:

Partner No. 1 …….

……

Partner No. 2 …….

……

Partner No. 3 …….

……

7. Recent contracts performed by partners in their own right or as partners in other joint ventures

a) Partner No. 1

(i) ……..

(ii) ……...

(iii) ……...

(iv) ……...

(v) ……...

b) Partner No. 2

(i) ……...

(ii) ……...

(iii) ……...

(iv) ……...

(v) ……...

c) Partner No. 3

(i) ……...

(ii) ……...

(iii) ……...

(iv) ……...

(v) ……...

8. Control and participation in the joint venture

(Identify by name and firm those individuals who are, or will be, responsible for, and have authority to engage in the relevant management functions and policy and decision making, indicating any limitations in their authority, for example, co-signature requirements and monetary limits).

a) Joint Venture cheque signing
……
……

b) Authority to enter into contracts on behalf of the Joint Venture

……
……

c) Signing, co-signing or collateralizing of loans
……
……

d) Acquisition of lines of credit
……
……

e) Acquisition of demand bonds
……
……

f) Negotiating and signing of labour agreements
……
……

9. Management of the performance of the Contract

(Fill in the name and firm of the responsible person)

a) Supervision of field operations ……

……

b) Major purchasing ……..

……

c) Estimating ……

……

d) Technical management ……

……

10. Management and control of the joint venture

a) Identify the managing partner
……
……

b) What authority does each partner have to commit or obligate the other to financial institutions, insurance companies, suppliers, subcontractors or other parties participating in the performance of the contemplated works:

Partner No. 1: ……
……

Partner No.2: ……
……

Partner No. 3: ……
……

c) Describe the management structure for the joint venture's work under this Contract:

Management Function/Designation	Name	Partner

11. Personnel

a) State the approximate number of operative personnel (by trade/function/discipline) needed to execute the Joint Venture contract.

Trade/function/discipline	Number

b) State the number of operative personnel to be employed on the Contract who are currently in the employ of partners:
……

c) State the number of operative personnel who are not currently in the employ of the respective partners and shall be engaged on the project by the Joint Venture:
……

d) State the name of the individual who shall be responsible for hiring Joint Venture employees:
……

e) State the name of the partner who shall be responsible for the preparation of Joint Venture payrolls:
……

12. Services

List the firms who provide the following services:

Service	Name	Contact Person	Tel. No.
Accounting			
Auditing			
Banking			
Insurance			
Legal			

13. Control and structure of the Joint Venture

Briefly describe the manner in which the Joint Venture is structured and controlled.
……
……
……

The undersigned warrants that he/she is duly authorised to sign this Joint Venture disclosure form and affirms that the foregoing statements are correct and include all the material information necessary to identify and explain the terms and operations of the Joint Venture and the intended participation of each partner in the undertaking.

The undersigned further covenants and agrees to provide the Employer with complete and accurate information regarding actual joint venture work and the payment therefore, and any proposed changes in any provisions of the Joint Venture Agreement, and to permit the audit and examination of the books, records and files of the Joint Venture, or those of each partner relevant to the Joint Venture, by duly authorized representatives of the Employer.

Duly authorized to sign on behalf of: …….
…… (**the Joint Venture**)

Signature: ..... Print Name: .....

Name: .....

Address: .....

.....

Telephone: .....

Date: .....

Duly authorized to sign on behalf of: ……

…….. (**Partner No. 1**)
Signature: ..... Print Name: .....

Name: .....

Address: .....

.....

Telephone: .....

Date: .....

Duly authorized to sign on behalf of: ……

…… (**Partner No. 2**)

Signature: ..... Print Name: .....

Name: .....

Address: .....

.....

Telephone: .....

Date: .....

Duly authorized to sign on behalf of: ……

…… (**Partner No. 3**)

Signature: ..... Print Name: .....

Name: .....

Address: .....

.....

Telephone: .....

Date: .....

T2.2 M ALTERATIONS BY BIDDER

Should the Bidder desire to make any departures from or modifications to the "Bid" or "Contract", or to qualify his bid in any way, he shall set out his proposals clearly hereunder or alternatively state them in a covering letter attached to his bid and referred to hereunder, failing which the bid will be deemed to be unqualified.

Page	Item of Clause	Details	Cost Involved (R)

Signed …….. Date ……

Print Name …….. Position ……..

Bidder …….

T2.2 N AUDITED ANNUAL FINANCIAL STATEMENT FOR THE PAST THREE YEARS

ATTACH AUDITED FINANCIAL STATEMENTS

T2.2 O MUNICIPAL UTILITY ACCOUNT

DECLARATION BY THE TENDERER

I the undersigned _____, has been duly authorized to sign all documents with the Bid Number _____on behalf of_____ hereby make a declaration as follows:(referred to herein as “the Bidder”)

1. I declare that the bidder and /or any of its director(s) / member(s) does not owe the municipality, or any other municipality and/or municipal entity any amount which is in arrears in respect of any municipal rates and taxes or municipal service charges.

2. I understand and accept that in the event that this declaration is proved to be false, the bid shall be rejected forthwith. All other rights of the municipality (including but not limited to the right to claim damages where applicable) shall remain reserved in full.

SIGNED ON BEHALF OF THE COMPANY _____

IN HIS CAPACITY AS _____

DATE _____

FULL NAMES OF SIGNATORY _____

UTILITY ACCOUNT NUMBER	NAME OF MUNICIPALITY	NAME OF OWNER

ATTACH AN ORIGINAL A CERTIFIED COPY OF A MUNICIPAL UTILITY ACCOUNT (NOT OLDER THAN THREE (3) MONTHS)

Important: Note the following

- List Account(s) registered either in the name(s) of the Director(s) or the Company on the declaration form attached hereto.
- Attach Municipal Utility account of Company's registered office (if applicable) and in case of leased premises, attach lease agreement and the services account of leased premises. (issued in the name of the bidding company)

T2.2 P B-BBEE STATUS VERIFICATION CERTIFICATE

ATTACH AN ORIGINAL OR CERTIFIED COPY OF B-BBEE STATUS VERIFICATION CERTIFICATE

NOTE THE FOLLOWING IN RESPECT OF B-BBEE CERTIFICATES:

1. **Certificates attached hereto should be those issued by approved verification agencies as directed by the National Treasury and the DTI (Department of Trade and Industry)**
2. **Verification agencies should be approved by SANAS and Accounting Officers and Auditors should be approved in terms of the IRBA (Independent Regulatory Body for Auditors), and as prescribed by the Close Corporations Act for designation as an Accounting Officer**
3. **Certified copies of the B-BBEE certificate should be within the financial year of the issued bid or quotation.**

Further information in respect of the above is obtainable from the National treasury and DTI websites and the Preferential Procurement Regulations, 2011

T2.3 RETURNABLE SCHEDULES THAT WILL BE INCORPORATED INTO THE CONTRACT

T2.3 A PROJECT PROGRAMME AND METHOD STATEMENT

Tenderer to supply project programme, using acceptable software, in sufficient detail to cover the various facets of the work.

This programme is to be supported by a method statement indicating the tenderer's proposed work plan for the construction of the works.

SIGNED ON BEHALF OF TENDERER:.....

Note to Tenderer

If a tenderer wishes to submit an alternative tender then this form, appropriately completed, shall be attached to the bill of quantities for the alternative proposal.

T2.3 B SCHEDULE OF ESTIMATED MONTHLY EXPENDITURE

The tenderer shall state his estimated value of the work to be completed every month, based on his preliminary programme and his tendered unit rates, in the table below. The amounts for contingencies and contract price adjustment shall not be included.

MONTH	**VALUE (INCLUDING VAT)**
1	**R**
2	**R**
3	**R**
4	**R**
5	**R**
6	**R**
7	**R**
8 (FINAL)	**R**
TOTAL: R…… (EXCLUDING CONTINGENCIES AND CONTRACT PRICE ADJUSTMENT)	

SIGNED ON BEHALF OF TENDERER: .....

T2.3 C RATES FOR SPECIAL MATERIALS

Only bitumen products will be dealt with as a special material in terms of subclause 6.8.3 of the General Conditions of Contract. All bitumen products, as indicated in the contract data must be stated in the list below.

The rates and prices for the special materials shall be furnished by the contractor, which rates and prices shall exclude VAT but shall include all other obligatory taxes and levies.

BASE MONTH = JULY 2022

SPECIAL MATERIALS	UNIT *	RATE OR PRICE FOR THE BASE MONTH

* Indicate whether the material will be delivered in bulk or in containers.

When called upon to do so, the contractor shall substantiate the above rates or prices with acceptable documentary evidence from the applicable refinery supplying the bitumen.

SIGNED ON BEHALF OF TENDERER:.....

THE CONTRACT

PART C1: AGREEMENT AND CONTRACT DATA

C1.1 FORM OF OFFER AND ACCEPTANCE

Offer

The employer, identified in the acceptance signature block, has solicited offers to enter into a contract in respect of the following works:

BID NO: 35/2022

CONSTRUCTION OF LUTANANDWA ACCESS ROAD AND BRIDGE-PHASE 2

The tenderer, identified in the offer signature block, has examined the documents listed in the tender data and addenda thereto as listed in the tender schedules, and by submitting this offer has accepted the conditions of tender.

By the representative of the tenderer, deemed to be duly authorized, signing this part of the Form of Offer and Acceptance, the tenderer offers to perform all of the obligations and liabilities of the contractor under the contract including compliance with all its terms and conditions according to their true intent and meaning for an amount to be determined in accordance with the conditions of contract identified in the contract data.

THE OFFERED TOTAL OF THE PRICE INCLUSIVE OF VALUE ADDED TAX IS (CONTRACT PRICE)

.....

.....

Rand (in words); R ..... (in figures)

This offer may be accepted by the employer by signing the acceptance part of this form of offer and acceptance and returning one copy of this document to the tenderer before the end of the period of validity stated in the tender data, whereupon the tenderer becomes the party named as the contractor in the conditions of contract identified in the contract data.

For the Tenderer:

Signature(s) ....

Name(s) ....

Capacity ....

Name and address of organization

.....

.....

Signature and Name of Witness:

Signature ……..

Name ……..

Date ……..

Acceptance

By signing this part of this form of offer and acceptance, the employer identified below accepts the tenderer's offer. In consideration thereof, the employer shall pay the contractor the amount due in accordance with the conditions of contract identified in the contract data. Acceptance of the tenderer's offer shall form an agreement between the employer and the tenderer upon the terms and conditions contained in this agreement and in the contract that is the subject of this agreement.

The terms of the contract are contained in:

PART C1 Agreements and contract data, (which includes this agreement)

PART C2 Pricing data

PART C3 Scope of work

PART C4 Site information

and drawings and documents or parts thereof, which may be incorporated by reference into Parts C1 to C4 above.

Deviations from and amendments to the documents listed in the tender data and any addenda thereto as listed in the tender schedules as well as any changes to the terms of the offer agreed by the tenderer and the employer during this process of offer and acceptance, are contained in the schedule of deviations attached to and forming part of this agreement. No amendments to or deviations from said documents are valid unless contained in this schedule, which must be signed by the authorised representative(s) of both parties.

The tenderer shall within two weeks after receiving a completed copy of this agreement, including the schedule of deviations (if any), contact the employer's agent (whose details are given in the contract data) to arrange the delivery of any bonds, guarantees, proof of insurance and any other documentation to be provided in terms of the conditions of contract identified in the contract data at, or just after, the date this agreement comes into effect. Failure to fulfil any of these obligations in accordance with those terms shall constitute a repudiation of this agreement.

Notwithstanding anything contained herein, this agreement comes into effect on the date when the tenderer receives one copy of the fully signed original document, including the schedule of deviations (if any). Unless the tenderer (now contractor) within five days of the date of such receipt notifies the employer in writing of any reason why he cannot accept the contents of this agreement, this agreement shall constitute a binding contract between the parties.

For the Employer

Signature .....

Name .....

Capacity .....

Name and address of organization

Makhado Municipality
Private Bag x 2596
Louis Trichardt
0920

Signature and Name of Witness

Signature .....

Name .....

Capacity .....

Schedule of Deviations

Notes:

1. The extent of deviations from the tender documents issued by the Employer prior to the tender closing date is limited to those permitted in terms of the Conditions of Tender,

2. A Tenderer's covering letter shall not be included in the final contract document. Should any matter in such, letter, which constitutes a deviation as aforesaid become the subject of agreements reached during the process of, offer and acceptance, the outcome of such agreement shall be recorded here,

3. Any other matter arising from the process of offer and acceptance either as a confirmation, clarification or change to the tender documents and which it is agreed by the Parties becomes an obligation of the contract shall also be recorded here,

4. Any change or addition to the tender documents arising from the above agreements and recorded here, shall also be incorporated into the final draft of the Contract,

4.1 Subject .....

Details …….....

4.2 Subject ..…….....

Details …….....

By the duly authorised representatives signing this schedule of deviations, the employer and the tenderer agree to and accept the foregoing schedule of deviations as the only deviations from and amendments to the documents listed in the tender data and addenda thereto as listed in the tender schedules, as well as any confirmation, clarification or changes to the terms of the offer agreed by the tenderer and the employer during this process of offer and acceptance.

It is expressly agreed that no other matter whether in writing, oral communication or implied during the period between the issue of the tender documents and the receipt by the tenderer of a completed signed copy of this Agreement shall have any meaning or effect in the contract between the parties arising from this agreement.

For the Tenderer:		**For the Employer**
.....	Signature	.....
.....	Name	.....
.....	Capacity	.....
Name and address of organisation:		Name and address of organisation
.....		**MAKHADO LOCAL MUNICIPALITY** Private Bag x 2596
……		**LOUIS TRICHARDT** **0920**
.....		
.....	Witness Signature	.....
.....	Witness Name	.....
.....	Date	.....

Confirmation of Receipt

The Tenderer, (now Contractor), identified in the Offer part of this Agreement hereby confirms receipt from the Employer, identified in the Acceptance part of this Agreement, of one fully completed original copy of this Agreement, including the Schedule of Deviations (if any) today:

the …… (day) of …….. (month) 20….. (year)

at …… (place)

For the Contractor:

Signature .....

Name .....

Capacity .....

Signature and name of witness:

Signature

Name .....

C1.2 PERFORMANCE GUARANTEE

(Not to be completed at tender stage)

In accordance with clause 6.2.1 of General Conditions of Contract, 3rd Edition (2015)

"Guarantor" means: ……

Physical address: ……

"Employer" means: ……

"Contractor" means: ……

"Engineer" means: ……

"Works" means: ……

"Site" means: ……

"Contract" means: The Agreement made in terms of the Form of Offer and Acceptance and such amendments or additions to the Contract as may be agreed in writing between the parties.

"Contract Sum" means: The accepted amount inclusive of tax of R ……

Amount in words: ……

"Guaranteed Sum" means: The maximum aggregate amount of R ……

Amount in words: ……

"Expiry Date" means: ……

CONTRACT DETAILS

Engineer issues: Interim Payment Certificates, Final Payment Certificate and the Certificate Completion of the Works as defined in the Contract.

PERFORMANCE GUARANTEE

1. The Guarantor's liability shall be limited to the amount of the Guaranteed Sum.
2. The Guarantor's period of liability shall be from and including the date of issue of this Performance Guarantee and up to and including the Expiry Date or the date of issue by the Engineer of the Certificate of Completion of the Works or the date of payment in full of the Guaranteed Sum, whichever occurs first. The Engineer and/or the Employer shall advise the Guarantor in writing of the date on which the Certificate of Completion of the Works has been issued.
3. The Guarantor hereby acknowledges that:

3.1 any reference in this Performance Guarantee to the Contract is made for the purpose of convenience and shall not be construed as any intention whatsoever to create an accessory obligation or any intention whatsoever to create a suretyship;

3.2 its obligation under this Performance Guarantee is restricted to the payment of money.

4. Subject to the Guarantor's maximum liability referred to in 1, the Guarantor hereby undertakes to pay the Employer the sum certified upon receipt of the documents identified in 4.1 to 4.3:

4.1 A copy of a first written demand issued by the Employer to the Contractor stating that payment of a sum certified by the Engineer in an Interim or Final Payment Certificate has not been made in terms of the Contract and failing such payment within seven (7) calendar days, the Employer intends to call upon the Guarantor to make payment in terms of 4.2;

4.2 A first written demand issued by the Employer to the Guarantor at the Guarantor's physical address with a copy to the Contractor stating that a period of seven (7) days has elapsed since the first written demand in terms of 4.1 and the sum certified has still not been paid;

4.3 A copy of the aforesaid payment certificate which entitles the Employer to receive payment in terms of the Contract of the sum certified in 4.

5. Subject to the Guarantor's maximum liability referred to in 1, the Guarantor undertakes to pay to the Employer the Guaranteed Sum or the full outstanding balance upon receipt of a first written demand from the Employer to the Guarantor at the Guarantor's physical address calling up this Performance Guarantee, such demand stating that:

5.1 the Contract has been terminated due to the Contractor's default and that this Performance Guarantee is called up in terms of 5; or

5.2 a provisional or final sequestration or liquidation court order has been granted against the Contractor and that the Performance Guarantee is called up in terms of 5; and

5.3 the aforesaid written demand is accompanied by a copy of the notice of termination and/or the provisional/final sequestration and/or the provisional liquidation court order.

6. It is recorded that the aggregate amount of payments required to be made by the Guarantor in terms of 4 and 5 shall not exceed the Guarantor's maximum liability in terms of 1.
7. Where the Guarantor has made payment in terms of 5, the Employer shall upon the date of issue of the Final Payment Certificate submit an expense account to the Guarantor showing how all monies received in terms of this Performance Guarantee have been expended and shall refund to the Guarantor any resulting surplus. All monies refunded to the Guarantor in terms of this Performance Guarantee shall bear interest at the prime

overdraft rate of the Employer's bank compounded monthly and calculated from the date payment was made by the Guarantor to the Employer until the date of refund.

8. Payment by the Guarantor in terms of 4 or 5 shall be made within seven (7) calendar days upon receipt of the first written demand to the Guarantor.
9. Payment by the Guarantor in terms of 5 will only be made against the return of the original Performance Guarantee by the Employer.
10. The Employer shall have the absolute right to arrange his affairs with the Contractor in any manner which the Employer may deem fit and the Guarantor shall not have the right to claim his release from this Performance Guarantee on account of any conduct alleged to be prejudicial to the Guarantor.
11. The Guarantor chooses the physical address as stated above for the service of all notices for all purposes in connection herewith.
12. This Performance Guarantee is neither negotiable nor transferable and shall expire in terms of 2, where after no claims will be considered by the Guarantor. The original of this Guarantee shall be returned to the Guarantor after it has expired.
13. This Performance Guarantee, with the required demand notices in terms of 4 or 5, shall be regarded as a liquid document for the purposes of obtaining a court order.
14. Where this Performance Guarantee is issued in the Republic of South Africa the Guarantor hereby consents in terms of Section 45 of the Magistrate's Courts Act No 32 of 1944, as amended, to the jurisdiction of the Magistrate's Court of any district having jurisdiction in terms of Section 28 of the said Act, notwithstanding that the amount of the claim may exceed the jurisdiction of the Magistrate's Court.

Signed at ……

Date ……

Guarantor's signatory (1) ……

Capacity……

Guarantor's signatory (2) ……..

Capacity ……..

Witness signatory (1) ……

Witness signatory (2) ……

C1.3 CONTRACT DATA

C1.3.1 Conditions of Contract

The Conditions of Contract are:

- the "General Conditions of Contract" as they appear in the commercially available publication "General Conditions of Contract for Construction Works, Third Edition, 2015", hereinafter referred to as "GCC 2015"; and
- Specific data as contained in this Contract Data.

Each party to the Contract shall purchase its own copy of the GCC 2015 (Third Edition) that applies to this Contract, available from its publisher:

South African Institution of Civil Engineering

Private Bag X200

Halfway House

1685

South Africa

Tel +27 (0)11 805 5947

The following Notes apply:

Note 1

The GCC 2015 makes several references to the Contract Data.

Each item of data below is cross-referenced to the clause in the Conditions of Contract to which it applies. Notwithstanding anything specified to the contrary, the Contract Data shall take precedence in the interpretation of any ambiguity or inconsistency between it and the GCC 2015.

The documents forming the Contract are to be taken as mutually explanatory of one another. For the purpose of interpretation, the priority of the documents shall be in accordance with the following order of precedence:

(a) The Form of Offer and Acceptance.

(b) Amendments to the General Conditions of Contract within the Contract Data.

(c) Additional conditions to the General Conditions of Contract within the Contract Data.

(d) corrigenda to the General Conditions of Contract.

(e) The General Conditions of Contract.

(f) The Specifications, Drawings, Schedules and other documents forming part of the Contract (in that order) contained in the Scope of Work and the Site Information.

If any ambiguity or discrepancy is found in the documents, the Engineer needs to be contacted to issue any necessary clarification or instruction.

Note 2

Certain pro-forma forms and pro-forma agreements contained in the GCC 2015 have been adapted for this particular contract. Those pro-forma forms and pro-forma agreements contained in the GCC 2015 do not apply where replaced by similar pro-forma forms and pro-forma agreements in this document.

C1.3.2 Contract Specific Data

The following contract-specific data, referring to the General Conditions of Contract, are applicable to this Contract:

Section 1: Data provided by the Employer

Clause	Data
1.1.1.13	The Defects Liability Period is **12 calendar months** calculated from the date of the Certificate of Completion.
1.1.1.14	The time for achieving Practical Completion is **8 months** calculated from the Commencement Date, excluding special non-working days.
1.1.1.15	The name of the Employer is **Makhado Local Municipality**
1.1.1.26	The Pricing Strategy of a Re-measurement Contract shall apply
1.2.1.2	The address of the Employer is: Physical address: 83 Krogh Street Civic Centre Louis Trichardt 0920 Postal address: Private Bag x 2596 Louis Trichardt 0920 e-mail address: livhuwanit@makhado.gov.za Contact numbers: Corporate: 015 516 3000 Direct: 015 516 3000 Fax: 015 516 6145

Clause	**Data**
1.1.1.16	'Engineer' means any Director, Associate or Professional Engineer appointed by a Director of Mont Consulting Engineers to fulfil the functions of the Engineer in terms of the Contract Data.
1.2.1.2	The employer's agent address for receipt of communication is: Physical address: 29 Bendor Drive Propark- Pro Arch Building Bendor- Ext 8 Polokwane, 0699 Postal address: P O Box 1249 Fauna Park; 0787 e-mail address: admin@montce.co.za Contact numbers: Corporate: 015 291 4173 Mobile: 083 643 3634 Fax: 015 291 4218
3.2.1	The Employer's Agent is required in terms of his appointment with the Employer to obtain the following specific approvals from the employer: e.g. 1. Approval of extension of time; 2. Approval of additional costs; 3. Approval of variation orders; 4. Approval of penalties; 5. Approval from Makhado Local Municipality for the utilization of any Contingencies.
4.9.1	The Contractor shall deliver to the Employer Agent, on a monthly basis, a detailed inventory of Construction Equipment kept on Site, full particulars given for each day of the month. Distinction shall be made between Owned Equipment and Hired Equipment as well as Equipment in working order and

Clause	Data
	Equipment out of order. Such inventory shall be submitted by the seventh day of the month following the month to be reported.
4.10.2	The Contractor shall deliver to the Employer Agent, on a monthly basis, a return in detail of supervisory staff and the number of categorized classes of labour employed each day for the said period by the Contractor for execution of the Contract. Such return shall be submitted by the seventh day of the month following the month to be reported.
5.3.1	The documentation required before commencement with Works execution are: a) Health and Safety Plan (refer to CL 4.3) b) Initial Programme (Refer to CL 5.6) c) Security (Refer to CL 6.2.1 and CL 6.2.3) d) Insurance (Refer to CL 8.6)
5.3.1	The Works are to be commenced within fourteen (14) Days of the Commencement Date taken as Date of Site Hand-over.
5.3.2	The time to submit the documentation required before commencement with Works execution is **14 Days.**
5.4.2	The access and possession of Site shall not be exclusive to the Contractor but shall be as set out elsewhere in the Contract.
5.8.1	The non-working Days are Sundays. The special non-working Days are: Statutory public holidays; and All annual year-end shutdown periods as recommended by the South African Federation of Civil Engineering Contractors (SAFCEC), and which commence after the Commencement Date and which commence before the Due Completion Date.
5.9.7	All designs, calculations, drawings and operation and maintenance manuals shall be fully endorsed by a third party registered engineer, accomplished in such specific field of practice and the cost thereof shall be borne solely by the Contractor. Once the alternative design has been approved, the Contractor shall indemnify and hold harmless the Engineer, the Employer, their agents and assigns, against all claims howsoever arising out of the said design, whether in contract or delict".
5.13.1	The penalty for delay is R 3000.00 **per calendar day.**

Clause	Data
5.16.3	The latent defect period is 10 years, commencing on the Day after the date of certification of Practical Completion.
6.2.1	The type of security required for the due performance of the Contract shall be restricted to one of the following: • Cash deposit of **10 (ten) percent of the Contract Sum,** or • Performance Guarantee of 10 (ten) percent of the Contract Sum, issued by a Commercial Bank registered in the Republic of South Africa, or • Performance Guarantee of 10 (Ten) percent of the Contract Sum, issued by an Insurance Company registered in terms of the Short-tem Insurance Act (Act 53 of 1998). **Whenever a Joint Venture constitutes the contracting party (Contractor) to this Contract, the Performance Guarantee shall be issued on behalf of the Joint Venture.**
6.2.2	Delete the entire contents of Clause 6.2.2 and replace with: "Failure to deliver an acceptable security as selected in the Contract Data within the stipulated period is a fundamental breach of Contract".
6.5.1.2.3	The percentage allowance to cover overhead charges is **10 (ten) percent**.
6.8.2	The value of certificates issued shall be adjusted in accordance with the Contract Price Adjustment Schedule with the following values: x = 0.10 Labour a = 0.20 Plant b = 0.40 Material c = 0.25 Fuel d = 0.15 The applicable area is **Limpopo Province.** The applicable industry for the Producer Price Index for materials is Civil Engineering Materials Index The applicable area for the Producer Price Index for fuel is **Witwatersrand** The base month is the month prior to closing date of bid.

Clause	Data
6.8.3	The following are special materials: Bitumen binder extracted from petroleum based products and used on site, including that used in asphalt, irrespective of whether it is produced and/or placed by the Contractor or an approved subcontractor. The rates and prices for the special materials shall be furnished by the contractor, which rates and prices ex refinery with the base date specified under 6.8.2 and shall exclude VAT but shall include all other obligatory taxes and levies on the basis specified in the contract price adjustment schedule (paragraph 4(i) and 4(ii)).
6.10.1.5	The percentage advance on materials not yet built into the Permanent Works is 80%. Proof of ownership is required.
6.10.3	The percentage retention on amounts due to the Contractor is **10 (ten) percent**. The limit of retention money is 10 (ten) percent of the Contract Sum. Add the following sub-clause 6.10.3.1: A Retention Money Guarantee is not permitted, after Practical Completion.
8.6.1.1.2	The value of Plant and materials supplied by the Employer to be included in the insurance sum is **nil**.
8.6.1.1.3	The amount to cover professional fees for repairing damage and loss to be included in the insurance sum is a maximum of **nil.**
8.6.1.3	The Limit of the liability insurance required should not be less than the contract amount.
8.6.1.5	The following additional and varied insurances are required: CAR & SASRIA.
9.2.1.3.2	Clause 9.2.1.3.2 is replaced by the following "Has failed to submit documentation or to commence the Works in terms of Clause 5.3, or has suspended the progress of the Works for fourteen (14) consecutive days after receiving from the Employer's Agent written notice to proceed," duplicate to C1.5.2
10.5.2	Dispute resolution shall be referred to ad-hoc adjudication.
10.6.1	Should either of the contracting parties disagree with any decision of the ad-hoc adjudicator, such matter shall be referred to litigation for court judgement.

Clause	Data
Special Clause in terms of RDP	Requirements in terms of government's reconstruction and development programme. Target values: In this project the minimum target values shall be as follows: • Labour Maximisation (Wages) :**5%** • SMME's :**20%** It is a requirement that the Contractor plan for achieving these targets and that a planned programme for achieving each of the targets is submitted at the start of the project together with the clause 12 programme of construction. **Penalties:** The penalties for not reaching the required labour and SMME target values will be calculated at **200%** of the difference between the set target values and the actual target values achieved by the contractor at completion of the works. Penalties will be applied monthly, when the actual figures are less than **75%** of the planned monthly figures. No bonuses for achieving the set target values are applicable.
Special Clause in terms of EPWP	
Payment for LI Component of Works	Payment for works identified in the Scope of Works as being labour-intensive shall only be made in accordance with the provisions of the Contract if the works are constructed strictly in accordance with the provisions of the Scope of Work. Any payment for such works shall not relieve the Contractor in any way from his obligations either in contract or in delict
Linkage of Payment to Submission of Project Data	The Contractor's payment invoices shall be accompanied by labour information for the corresponding period in a format specified by the employer. If the contractor chooses to delay submitting payment invoices, labour returns shall still be submitted as per frequency and timeframe stipulated by the Employer. The contractor's invoices shall not be paid until all pending labour information has been submitted.
Applicable Labour Laws	The current Ministerial Determination (also downloadable at www.epwp.gov.za), Expanded Public Works Programmes, issued in terms of the Basic Condition of Employment Act of 1997 by the Minister of Labour in Government Notice, shall apply to works described in the scope of work as being labour-intensive and which are undertaken by unskilled workers.

C1.3.4 Section 2: Data provided by the Contractor

Clause	Data
1.1.1.9	The contractor is .....
1.2.1.2	The contractor's address for receipt of communication is: Telephone: ..... Facsimile: ..... E-mail:…… Address:……
5.5.1	The Works shall be completed within …….. Months as proposed by the contractor.
6.5.1.2.3	The percentage allowances to cover all charges for the contractor's and subcontractor's profits, timekeeping, clerical work, insurance, establishment, superintendence and the use of hand tools is ……..% (Maximum 15%).
6.8.3	The rate for special materials, exclusive of Value Added Tax is to be completed in Schedule T2.3 C.

PRIORITY OF DOCUMENTS

The documents forming the Contract are to be taken as mutually explanatory of one another. For the purpose of interpretation, the priority of the documents shall be in accordance with the following sequence:

a) The Form of Offer and Acceptance.

b) Amplifications of the General Conditions of Contract within the Contract Data.

c) Additional special conditions or amendments to the General Conditions of Contract within the Contract Data.

d) The General Conditions of Contract.

e) The Specifications, Drawings, Schedules and other documents forming part of the Contract (in that order) contained in the Scope of Work and the Site Information.

If any ambiguity or discrepancy is found in the documents, the Engineer shall issue any necessary clarification or instruction.

C1.3.3 Variations to the General Conditions of Contract

The following amendments of the General Conditions of Contract 2015 apply to this contract. The headings in these Special Conditions of Contract shall not be deemed to be part thereof nor be taken into consideration in the interpretation or construction thereof or of the Contract.

4. CONTRACTOR'S GENERAL OBLIGATIONS

4.1 EXTENT OF OBLIGATIONS AND LIABILITY

Add the following sub clause:

4.1.1.1 The Contractor shall, save in so far as it is legally or physically impossible,

(b) Provide all superintendence, labour, materials, Constructional Plant, Temporary Works, including the design thereof, all requisite transport and all other things, whether of a temporary or permanent nature, required in and for such design, execution and completion of the Works and for the remedying of any defects, so far as the necessity for providing the same is specified in or reasonably to be inferred from the Contract.

(c) After award of the Contract, the Contractor shall be obligated to ensure that at least the Constructional Plant stated on the prescribed form in the Tender Documents, or Constructional Plant equivalent thereto, are on the site when required."

"4.1.3 Contractor deemed to have inspected the Site

The Contractor shall be deemed to have inspected and examined the Site and its surroundings and information available in connection therewith and to have satisfied himself before submitting his tender (as far as practicable) as to

(a) the form and nature of the Site and its surroundings, including subsurface conditions,

(b) the hydrological and climatic conditions.

(c) the extent and nature of work and materials necessary for the execution and completion of the Works,

(d) the means of access to the Site and the Accommodation he may require and, in general, shall be deemed to have obtained all information (as far as is practicable) as to risks, contingencies and all other circumstances which may influence or affect his tender.

No subsequent claims by the Contractor arising from his lack of knowledge of perceptible conditions on the site or its surroundings or of information available in connection therewith shall be entertained."

4.3 LEGAL PROVISIONS

Add the following sub-sub clauses:

4.3.1 The Contractor shall, in fulfilling the Contract, comply with all applicable laws, *with regard to Health, Safety, Wages and Condition of Work*, regulations, statutory provisions and agreements, and shall, at the request to the Employer's Agent, provide proof that he has complied therewith.

4.3.1.1 Mine Health and Safety Act, number 29 of 1996

The Employer shall obtain the Mining Authorisation for all sites where mining activities, as defined in the Mine Health and Safety Act, number 29 of 1996 as amended, are to be conducted.

4.3.1.2 Mineral Resources Petroleum Development Act, number 28 of 2002

The Contractor shall assume responsibility for the Environmental Management Programme (EMPR) in respect of the sites and shall ensure that the sites are rehabilitated at the conclusion of the contract."

4.4. SUBCONTRACTING

Add the following subclauses:

"4.4.7 Continuing obligation extending beyond date of completion of the work

In the event of a Selected Subcontractor having undertaken to the Contractor, in respect of work executed or goods or materials supplied by such Selected Subcontractor, any continuing obligation extending beyond the date of completion of the work or the end of the Defects Liability Period, and Latent Defect Liability Period as the case may be, the Contractor shall at any time after such date cede to the Employer, at the Employer's request and cost, the benefit of such obligation for the unexpired duration thereof, whereupon the Employer shall have no further claim against the Contractor in respect of the said continuing obligation.

4.4.8 Convert the subcontract

If the contract shall have been cancelled in terms of clause 9.2, the Employer shall have the right, by written notice given to any Selected Subcontractor not later than 28 days after the said cancellation, to convert the subcontract concerned to a direct contract between the Employer and the Subcontractor.

Provided that:

(a) the terms of the said direct contract shall mutatis mutandis be those of the subcontract concerned, and

(b) the Employer shall have the said right, notwithstanding any breach of the subcontract by the Contractor, subject to his forthwith paying to the Subcontractor all amounts then owing to the Subcontractor by the Contractor and perform any obligation which the Contractor has failed to perform."

4.9 CONSTRUCTION EQUIPMENT

Add the following: sub clauses:

"4.9.2 Preclude seizure of construction equipment

In order to preclude seizure by the owner of any constructional plant being held by the Contractor on a hire or hire-purchase agreement for the purposes of the contract, the Employer shall be entitled to pay any such owner the amount of any outstanding instalment or other sum owing under any hire or hire-purchase agreement and in the event

of his doing so, any amount thus paid by him shall be a debt payable to the Employer by the Contractor and may be deducted by the Employer from any moneys owing or that may become owing to the Contractor in terms of the contract, or be recovered at law from the Contractor by the Employer.

4.9.3 Constructional plant brought to the site by the subcontractor

When entering into any subcontract agreement for the execution of any part of the works, the Contractor shall incorporate in such subcontract agreement, by reference or otherwise, the provisions of this clause in respect of construction equipment brought to the site by the subcontractor."

5. TIME AND RELATED MATTERS

5.4 ACCESS TO THE SITE

Add the following subclause:

5.4.4 "If the site is insufficient for the needs and requirements of the work, the Contractor shall arrange with the owners or tenants for the additional land required and pay all rent and costs in connection therewith. The Contractor shall be responsible for all damage to such land and property, and he shall indemnify the Employer and hold him harmless in respect of all claims, demands proceedings, damages, costs, including attorneys and client costs, charges and expenses arising in respect thereof."

5.14 COMPLETION

Delete the following:

"5.14.5.3 The retention shall be reduced to half in terms of Clause 6.10.5"

5.16 APPROVAL

5.16.1 Final Approval Certificate

Delete the last sentence of this clause and replace with:

The payment of the retention money or the release of the retention money guarantee shall only be permitted after the Engineer has issued the Final Approval Certificate.

6. PAYMENT AND RELATED MATTERS

6.6 PROVISIONAL SUMS AND PRIME COST SUMS

6.6.1.2.1 In the first line after the word "sums" insert "excluding VAT"

6.6.1.2.2 In the fourth line after the word "amount" insert "excluding VAT"

6.10.5 Payment of retention money

Delete the first four lines where reference is made to the first half of retention. The paragraph should read:"

"Retention money shall become due when the Employer's Agent shall have certified payment thereof within 14 days after the expiration of the Defects Liability Period, extended if necessary in terms of Clauses 5.14.4 or 7.8.1. No retention, or part thereof, will hence be payable upon the issue of a Certificate of Completion as indicated in Clause 5.14.5.3.

6.11 VARIATIONS EXCEEDING 15 PER CENT

6.11.1 Second paragraph:

Change "15%" to "20%".

Add the following subclause:

"6.11.2 Variations exceeding 20% per cent

Where the decrease or increase in the quantity of work has not resulted from a written variation order (or an additional agreement) in terms of clause 5.11 but from the fact that the quantities are less or more than those given in the bill of quantities, the tendered rates or sums shall still apply, except in the case of a sub-item (or an item not subdivided into sub-items) in the bill of quantities, which covers work the value of which during the tender stage exceeds 7,5% of the value of the tender sum, and where the quantity of such sub-item or item, upon completion of the contract, deviates by more than 20% from the quantity given in the bill of quantities so that the scale of activities or the method of construction consequently changes to such an extent that the tendered rate or sum no longer applies. In such case the Engineer, should he deem it to be in the interest of the Employer or should the Contractor enter a claim, shall, considering the extent by which the deviation in respect of the quantity of the sub-item or item concerned exceeds 20%, determine a sum which will be equitable in the circumstances, and shall certify that such sum shall be deducted from or added to the sums owing to the Contractor."

8. RISKS AND RELATED MATTERS

8.2 Care of works

Add the following:

8.2.2.4 The Contractor shall take care that property beacons, trigonometrical survey beacons or setting-out beacons are not displaced or destroyed without the consent of the Employer's Agent. Property beacons and trigonometrical survey beacons that have been displaced or destroyed shall be replaced by a registered land surveyor, who shall certify such replacement.

The cost of replacing all beacons displaced or destroyed during the course of the Contract without the consent of the Employer's Agent shall be borne by the Contractor."

9. TERMINATION OF CONTRACT

9.3 Termination by Contractor

Delete the wording of sub clause 9.3.1.1.2 and replace this clause with the following:

9.3.1.2 "Failing to pay the contractor the amount due in terms of any payment certificate issued by the Employer's Agent, provided that such payment certificate is acceptable to

the Employer and further more subject to the provision of sub-clause 3.2.3, within the time of payment provided in the contract, or."

10. CLAIMS AND DISPUTES

Add the following

10.12 Joint ventures

"If the Contractor is in a joint venture of two or more parties or persons, the parties or persons shall be jointly and severally bound to the Employer for fulfilment of the Contractor's obligations and terms of this Contract. The formation and/or conditions of agreement of the joint venture shall not be altered without the consent of the Employers. Should such a change be acceptable to the Employer then two notarially certified copies of the revised Joint Venture Agreement shall be submitted to the Employer's Agent within fourteen (14) days of signature thereof by the parties to the Joint Venture."

C1.4 PERFORMANCE GUARANTEE FOR MATERIALS AND EQUIPMENT NOT YET BUILT INTO THE WORKS

(not to be completed at bid stage)

To: .....

.....

.....

(hereinafter referred to as the Employer)

re: Demand Guarantee in respect of the project : ……

Contract No. : ……

For construction of : ……

Contractor : ……

I/We, the undersigned,

……

and

……

of

……

(hereinafter referred to as the “Bank”)

address:

……

……

and acting on behalf of the Bank have been informed that ……

(hereinafter called "the Contractor") is your contractor under such Contract and wishes to receive payment in respect of manufacture or partial manufacture of equipment and/or materials brought in a ready state for despatch to the construction site, whether temporarily stored in the warehouse of the Contractor or on the Construction Site, for which the Contract requires him to obtain a guarantee.

We hereby irrevocably undertake to pay you, the Employer, any sum or sums not exceeding in total the amount of R..... (in words …… only) the "Guaranteed Amount"

upon receipt by us of your demand in writing and your written statement stating:

- that the Contractor has failed to deliver such equipment and/or materials when required or instructed to do so.

The Bank's liability under this guarantee is principal in nature and is not subject to the Contract. The Bank's liability shall not be reduced, or in any way be affected by any alteration of the terms of the Contract, or any other arrangements made between the Employer and Contractor.

The Bank will pay on demand and will not determine the validity of the demand or the correctness of the amount demanded, or become party to any claim or dispute of any nature which any party may allege.

The Bank will pay the amount demanded into the bank account to be notified by the Employer.

This guarantee is neither negotiable nor transferable, is restricted to the payment of a sum of money only and is limited to the Guaranteed Amount.

This guarantee will lapse sixty (60) days after all the said equipment and/or materials have been built into the Works unless the Bank is, before the expiration date, advised in writing by the Employer of his intention to demand payment for such equipment and/or materials.

This original guarantee must be returned to the Bank by the Employer or the Employer's duly authorised agent either:

- on expiry of the guarantee; or
- against payment of the Guaranteed Amount.

This guarantee shall be governed by the law of the Republic of South Africa.

The Bank chooses as its domicilium citandi et executandi for the purpose of the service of all notices and legal processes the following address:

THUS DONE AND SIGNED AT ..... ON ..... 20.....

In the presence of the following:

AS WITNESSES:

1. .....

.....

Print Name

2. .....

.....

Print Name

on behalf of the Bank and duly authorised thereto

1. .....

.....

Print Name

and

on behalf of the Bank and duly authorised thereto

2. .....

.....

Print Name

C1.5 RETENTION MONEY GUARANTEE

(not to be completed at bid stage)

TO: .....

.....

.....

.....

(whom the Contract defines as “the Employer”)

Re: Retention Money Guarantee in respect of : ……

Contract Number : ……

For supply of : ……

Contractor : ……

I/We, the undersigned,

…….

and

…….

of

…….

(hereinafter referred to as the “Bank”)

address:

…….

…….

and acting on behalf of the Bank have been informed that ..... (hereinafter called the “Contractor”) is your contractor under such Contract and wishes to receive early payment of the retention money, for which the Contract requires him to obtain a guarantee.

We hereby irrevocably undertake to pay you, the Employer, any sum or sums not exceeding in total the amount of R..... (in words ……) (the “guaranteed amount”,

upon receipt by us of your demand in writing and your written statement stating:

- that the Contractor failed to carry out his obligation(s) to rectify defect(s) for which he is responsible under the Contract.

The Bank's liability under this guarantee is principal in nature and is not subject to the Contract. The Bank's liability shall not be reduced, or in any way be affected by any alteration of the terms of the Contract, or any other arrangements made between the Employer and Contractor.

The Bank will pay on demand and will not determine the validity of the demand or the correctness of the amount demanded, or become party to any claim or dispute of any nature which any party may allege.

The Bank will pay the amount demanded into the Bank account to be notified by the Employer.

This guarantee is neither negotiable nor transferable, is restricted to the payment of a sum of money only and is limited to the Guaranteed Amount.

This guarantee shall expire on the date on which the last of the retention monies, which but for this guarantee would have been retained by the Employer, becomes payable to the Contractor.

This original guarantee must be returned to the Bank by the Employer or the Employer's duly authorised agent either:

- on expiry of the guarantee; or
- against payment of the Guaranteed Amount.

This guarantee shall be governed by the law of the Republic of South Africa.

The Bank chooses as its domicilium citandi et executandi for the purpose of the service of all notices and legal processes the following address:

THUS DONE AND SIGNED AT ..... ON ..... 20.....

In the presence of the following:

AS WITNESSES:

1. .....

.....

Print Name

2. .....

.....

Print Name

on behalf of the Bank and duly authorised thereto

1. .....

.....

Print Name

and

on behalf of the Bank and duly authorised thereto

2. .....

.....

Print Name

C1.6 AGREEMENT IN TERMS OF THE OCCUPATIONAL HEALTH AND SAFETY ACT 85 of 1993 AND APPOINTMENT AS MINE MANAGER IN TERMS OF SECTION 3(1)(a) OF MINE HEALTH AND SAFETY ACT 29 of 1996.

This AGREEMENT made at …….. on this ……. day of ……. in the year …… between MAKHADO LOCAL MUNICIPALITY (hereinafter called "the Employer" on the one part, herein represented by ……. in his capacity as ……. And delegate of the Employer and …… (hereinafter called "the Principal Contractor") of the other part, herein represented by ……. in his capacity as ……

WHEREAS the Employer is desirous that certain works be constructed, as stated for in Contract No 35/2022 ……For (description of contract)..... ……..… …… in the ……District of Limpopo Province and has accepted a tender by the Principal Contractor for the construction, completion and maintenance of such works and whereas the Employer and the Principal Contractor have agreed to certain arrangements and procedures to be followed in order to ensure compliance by the Principal Contractor with the provisions of the Occupational Health and Safety Act 1993(Act 85 of 1993 and the Construction Regulation, February 2014):

NOW THEREFORE THIS AGREEMENT WITNESSETH AS FOLLOWS:

1. The Principal Contractor shall execute the work in accordance with the contract documents pertaining to this contract.

2. This Agreement shall hold good from its commencement date, which shall be the date of a written notice from the employer or engineer requiring him to commence the execution of the Works, to either:

   a) the date of the final certificate issued in terms of clause 5.14 of the General Conditions of Contract for Construction Works 2015 (Third Edition) as issued by the South African Institution of Civil Engineering (hereinafter referred to as "the GCC 2015"), as contained in the contract documents pertaining to this contract, or

   b) the date of termination of the contract in terms of clause 9.1, 9.2 or 9.3 of the GCC 2015.

3. The Principal Contractor declares himself to be conversant with the following:-

   a) All requirements, regulations and standards of the Occupational Health and Safety Act (Act 85 of 1993), hereinafter referred to as "The Act", together with its amendments and with special reference to the following Sections of The Act.

      i. Section 8: General duties of employers to their employees.

      ii. Section 9: General duties of employers and self-employed persons to persons other than employees

      iii. Section 37: Acts or omissions by employees or mandatories and

iv. Sub-section 37(2) relating to the purpose and meaning of this Agreement.

v. Construction Regulations 2014, and other safety regulations, as applicable.

b) The procedures and safety rules of the employer as pertaining to the Principal Contractor and to his subcontractors.

4. The Principal Contractor is responsible for the compliance with the Act by his sub-contractors, whether or not selected and/or approved by the employer.

5. The Principal Contractor warrants that all his and his sub-contractors' employees (permanent and temporary) are covered in terms of the Compensation for Occupational Injuries and Diseases Act 1993 which cover shall remain in force whilst any such employees are present on site. The Principal Contractor shall submit a written report to this effect at each Progress Site Meeting.

6. The Principal Contractor undertakes to ensure that he and/or his sub-contractors and/or their respective employees will at all times comply with the following conditions:

a) The Principal Contractor shall assume the responsibility in terms of Section 16.1 of the Occupational Health and Safety Act. The Principal contractor shall not delegate any duty in terms of Section 16.2 of this Act without the prior written approval of the Employer. If the Principal contractor obtains such approval and delegates any duty in terms of Section 16.2 a copy of such written delegation shall immediately be forwarded to the Employer.

b) All incidents referred to in the Occupational Health and Safety Act shall be reported by the Principal Contractor to the Department of Labour as well as to the Employer. The Employer will further be provided with copies of all written documentation relating to any incident.

c) The Employer hereby obtains an interest in the issues of any formal enquiry conducted in terms of Section 32 of the Occupational Health and Safety Act into any incident involving the Principal Contractor and/or his employees and/or his sub-contractors.

Further to the abovementioned, where contracts involve quarries or borrow pits, the following shall be applicable:-

In terms of Section 3(1)(a) of the Mine Health and Safety Act of 1996, MAKHADO LOCAL MUNICIPALTY. shall appoint a manager for its mine/s.

You are hereby appointed as the mine manager for ……., with effect from ……. until further notice.

In terms of this appointment you are charged with the functions, duties and responsibilities imposed by the aforementioned Act and its regulations. Without derogating from the duties, functions and responsibilities imposed by this legislation, you are to:

i) Control, manage and direct employees at the Mine (borrow pit or quarry).

ii) Take all reasonable measures to ensure the health and safety of employees and proper discipline at the Mine.

iii) Take all reasonable measures to ensure that the provisions of the Mine Health and Safety Act and its regulations (as may be amended from time to time) are implemented and adhered to at the Mine.

iv) Ensure and maintain a healthy and safe mine environment for all persons.

v) Ensure an adequate supply of health and safety equipment and facilities.

vi) Staff the Mine, with due regard to health and safety.

vii) Provide health and safety training as far as reasonably practicable to all employees.

viii) Initiate, prepare and implement codes of practice, relating to health and safety.

ix) Maintain an effective risk identification and management system.

x) Ensure the effective maintenance of hazard identification and medical monitoring records.

xi) Prepare and or review the Health and Safety Policy for the Mine.

xii) Ensure that an annual medical report is compiled at the Mine, and forwarded to the owner or the appointed owner representative of the Mine.

xiii) Ensure compliance with relevant environmental legislation.

xiv) Assist with implementation and maintenance of the Makhado Local Municipality SHE Management Standards, the Contractor's Compliance Pack and operational procedures.

xv) Enhance a culture of high performance in safety and health.

You are to appoint the prescribed persons to assist you in your duties and functions, and you are hereby authorised and obliged to take all reasonable measures to comply with legislative requirements. You are to ensure that an acting mine manager is appointed when you are to be absent, or on leave for a period longer than five (5) days.

Instructions and procedures are from time to time issued by the Council of Makhado Local Municipality, and it will be your responsibility to ensure the implementation and adherence to these instructions and procedures at the Mine.

You are further responsible to ensure that relevant environmental legislative requirements are complied with, including the implementation of all internal procedures and systems to ensure compliance with such legislation.

It would be the responsibility of yourself to report any shortcomings, in relation to the implementation of applicable legislation which you are unable to rectify, immediately in writing to the appointed owner representative.

In witness thereof the parties have set their signatures hereon in the presence of the subscribing witnesses:

SIGNED FOR ON BEHALF OF THE EMPLOYER/SECTION 4.1 APPOINTEE

……

WITNESS: 1…….. 2……

NAME

(IN CAPITALS) 1…….. 2……

DATE: ……

SIGNED FOR AND ON BEHALF OF THE PRINCIPAL CONTRACTOR/MINE MANAGER

……

WITNESS: 1…… 2……

NAME

(IN CAPITALS) 1…… 2……

DATE: ……

Copy to: The Chief Inspector - Department of Minerals and Energy

EXAMPLE FOR USE BY CONTRACTOR WHEN APPOINTING SUB-ORDINATES IN TERMS OF THE MINE HEALTH AND SAFETY ACT (1996) AS AMENDED.
(To be printed on Contractors letter head)

APPOINTMENT IN TERMS OF SUB-ORDINATE MANAGER: REGULATION 2.6.1 IN FORCE IN TERMS OF SCHEDULE 4 OF THE MINE HEALTH AND SAFETY ACT (ACT NO. 29 OF 1996) AS AMENDED BY THE HEALTH SAFETY AMENDEMENT ACT (ACT NO. 72 OF 1997)

I, ……. in my capacity as ……., having been appointed in terms of **Section 3(1)** of the Act, by the who is our client, 'Makhado Local Municipality' and owner of the Mine(s) to be worked under the requirements of the above-mentioned Acts hereby, in terms of **Regulation 2.6.1** of the Act as amended, appoint ……. as Sub-Ordinate Manager of the Contractor, ……. of address, ……. and contact number, ……... on Bid No.: **35/2022 for the Construction of Lutanandwa Access Road and Bridge-Phase 2**

In accordance with the provisions of the Mine Health and Safety Act, 1996 (Act 29 of 1996), you are also appointed in terms of Section 7(2) of the Mine Health and Safety Act, 1996 to perform the following functions, assigned to the Mine Manager in terms of Section 7(1), 10(2) (b) and (c) and 11 (1) in so far as your area of responsibilities are concerned:-

1. You must identify the hazards, assess the risk and record the hazards to health and safety to which employees may be exposed while they are at work, and

2. To the extent that is reasonable, you must ensure that every employee is properly trained:

   a. In the measures necessary to eliminate, control and minimise those risks to health and safety.

   b. In the procedures to be followed to perform the employee's work.

3. To the extent that is reasonably practical, you must:-

   Ensure that every employee becomes familiar with the work-related hazards and risk and the measures that must be taken to eliminate, control and minimise those hazards and risks.

4. To the extent that is reasonably practical, you must:-

   Ensure that every employee under your control complies with the requirements of the Act.

   Institutes the measures necessary to secure, maintain and enhance health and safety.

   Considers and employees training and capabilities in respect of health and safety before assigning a task to that employee.

   Ensure that work is performed under the general supervision of a person trained to understand the hazards associated with the work, and who has the authority to ensure that the precautionary measures laid down by the Manager are implemented.

   You will be responsible for the control, management and direction of all the activities and employees connected with work and you are required to ensure that all such activities take place in accordance with the provisions of the Mine Health and Safety

Act and the Regulations are complied with.

You are further required to inform the Manager, …… as soon as practicable, of any breach of any provision of these Regulation, to enable him to inform the Principal Inspector of Mines, Department of Minerals and Energy, or take such steps as may be necessary.

Please acquaint yourself with the relevant Regulations, Standards and Procedures, which have a bearing on your appointment. You must ensure that you are fully conversant with the requirements of the Procedures for Reporting Accidents.

SIGNED: .....

DATE: .....

WITNESS: 1. ..... 2. .....

NAME(Print):1. ..... 2. .....

I, ……., having been appointed in terms of Regulation 2.6.1 of the act (as amended) to perform all functions entrusted to……In terms of the Act (as amended) hereby accept the above appointment.

SIGNED: .....

DATE: .....

WITNESS: 1. ..... 2. .....

NAME(Print):1. ..... 2. .....

EXAMPLE FOR USE BY CONTRACTOR WHEN APPOINTING SUB-ORDINATES IN TERMS OF THE MINE HEALTH AND SAFETY ACT (1996) AS AMENDED.

(To be printed on Contractors letter head)

APPOINTMENT AS COMPETENT PERSON IN CHARGE OF MACHINERY IN TERMS OF REGULATION 2.13.2 IN FORCE IN TERMS OF SCHEDULE 4 OF THE MINE HEALTH AND SAFETY ACT (ACT NO. 29 OF 1996) AS AMENDED BY THE HEALTH AND SAFETY AMENDEMENT ACT (ACT NO. 72 OF 1997)

I, …… in my capacity as ……, having been appointed in terms of **Section 3(1)** of the Act , who is our client, 'Makhado Local Municipality' and owner of the Mine(s) to be worked under the requirements of the above mentioned Acts hereby, in terms of **Regulations 2.13.2** of the Act as amended, appoint …….. as Competent Person in charge of machinery for the Contractor, ……. ……..…….. of address …….. and contact number, …… on all contracts in the Limpopo Province that are undertaken by the contractor.

You are to report any accident to the mine manager immediately and personally visit the scene of the accident without delay.

You must familiarise yourself with the Mine Health and Safety Act and the Minerals Act and the Regulations and ensure that you have a copy in your possession and you must take all reasonable measures to ensure that the provisions of this Act are complied with.

Your attention are further drawn to Regulation 2.13.4.1 as well as the requirements of Chapter 18,20 and 21.

Please confirm this appointment by signing at the bottom.

SIGNED: ..... DATE:.....

NAME: .....

SIGNED: ..... DATE:.....

NAME: .....

C1.7 ABSTRACTS OF THE MINE HEALTH AND SAFETY ACT No. 29 OF 1996 AND AMENDMENT ACT No. 72 OF 1997

FDEFINITIONS:

Section 102 of the Mine Health and Safety Act refers.

"mine" means, when –

(a) "used as a noun-

(i) any borehole, or excavation, in any tailing or in the earth, including the portion of the earth that is under the sea or other water, made for the purpose of searching for or winning a mineral, whether is being worked or not, or

(ii) any other place where a mineral deposit is being exploited, including the mining area and all buildings, structures, machinery, mine dumps, access roads or objects situated on or in that area that are used or intended to be used in connection with searching, winning, exploiting or processing of a mineral, or for health and safety purposes. But, if two or more excavations, boreholes or places are being worked in conjunction with one another

(iii) a works; and

b) used as a verb, the making of any excavation or borehole referred to in paragraph (a) (i), or the exploitation of any mineral deposit in any other manner, for the purpose of winning a mineral including prospecting in connection with the winning of a mineral.

a) whether that substance is in solid, liquid or gaseous form;

b) that occurs naturally in or on the earth, in or under water or in tailings, and

c) that has been formed by or subjected to a geological process.

"processing" means the recovering, extracting, concentrating, refining, calcimining, classifying, crushing, milling, screening, washing, reduction, smelting or gasification or any mineral, and "process" has a similar meaning

"works" means any place, excluding a mine, where any person carries out-

a) The transmitting and distributing to another consumer of any form of power from a mine, by the owner thereof, to the terminal point of bulk, to the power supply meter on any such other consumer's premises, or

b) Training at any central rescue station, or

c) The making, repairing, re-opening or closing of any subterranean tunnel, or

d) Any operations necessary in connection with any of the operational listed in this paragraph.

C1.8 AGREEMENT WITH ADJUDICATOR

This agreement is made on the.....day of ..... 20.....between: the Employer

(name of company / organisation).....

of (*address)*.....

.....and the Contractor

(name of company / organisation) .....

of *(address)*.....

.....

(hereinafter called **the Parties**)

and

(name).....

of *(address)*

.....

.....

(hereinafter called **the Adjudicator**)

Disputes or differences may arise/have arisen* between the Parties under a Contract dated.....

and known as Contract No.....

(Contract title).....

and these disputes or differences shall be/have been* referred to adjudication in accordance with the CIDB Adjudication Procedure, (hereinafter called "**the Procedure**") and the Adjudicator may be or has been requested to act.

(Delete as necessary)*

IT IS NOW AGREED as follows:

1. The rights and obligations of the Adjudicator and the Parties shall be as set out in the Procedure.
2. The Adjudicator hereby accepts the appointment and agrees to conduct the adjudication in accordance with the Procedure.
3. The Parties bind themselves jointly and severally to pay the Adjudicator's fees and expenses in accordance with the Procedure as set out in the Contract Data.
4. The Parties and the Adjudicator shall at all times maintain the confidentiality of the

adjudication and shall endeavour to ensure that anyone acting on their behalf or through them will do likewise, save with the consent of the other Parties which consent shall not be unreasonably refused.

5. The Adjudicator shall inform the Parties if he intends to destroy the documents which have been sent to him in relation to the adjudication and he shall retain documents for a further period at the request of either Party.

SIGNED by:

Signature):	(*Signature*):	(*Signature*): .....
Name:	**Name**:	**Name**: .....
who warrants that he/ she is duly authorised to sign for and on behalf of the **First Party** in the presence of	who warrants that he/ she is duly authorised to sign for and on behalf of the **Second Party** in the presence of	the **Adjudicator** in the presence of
Witness:	**Witness:**	**Witness:**
(*Signature*).....	(*Signature*).....	(*Signature*).....
Name:	**Name**:	**Name**: .....
Address:	Address:	Address: .....
.....	.....	.....
Date:	Date:	Date: .....

PART C2: PRICING DATA

C2.1 PRICING INSTRUCTIONS

1 For the purposes of this bill of quantities, the following words shall have the meanings hereby assigned to them:

Unit: The unit of measurement for each item of work as defined in the standard specifications or the project specifications.

Quantity: The number of units of work for each item.

Rate: The payment per unit of work for which the tenderer tenders to do the work.

Amount: The product of the quantity and the rate tendered for an item.

Lump Sum: An amount tendered for an item, the extent of which is described in the bill of quantities, the specifications or elsewhere, but of which the quantity of work is not measured in units.

2 This bill of quantities forms part of the contract documents and must be read in conjunction with all the other documents comprising the contract documents.

3 The quantities set out in the bill of quantities are only approximate quantities. The quantities of work finally accepted and certified for payment, and not the quantities given in the bill of quantities, will be used to determine payments to the contractor.

The validity of the contract shall in no way be affected by differences between the quantities in the bill of quantities and the quantities finally certified for payment. Work is valued at the rates or lump sums tendered, subject only to the provisions of sub-clause 1209 (a) of the standard specifications.

4 Rates and lump sums shall include full compensation for overheads, profits, incidentals, tax (other than VAT), etc, and for the completed items of work as specified, all in accordance with sub-clause 1209 (b) of the standard specifications. Full compensation for completing and maintaining, during the defects liability period, all the work shown on the drawings and specified in the standard specifications and project specifications and for all the risks, obligations and responsibilities specified in the general conditions of contract, special conditions of contract, standard specifications and project specifications shall be considered as provided for collectively in the items of payment given in the bill of quantities, except in so far as the quantities given in the bill of quantities are only approximate.

5 The tenderer shall fill in a rate or a lump sum for each item where provision is made for it even where no quantities are given. Items against which no rate or lump sum has been entered in the tender will not be paid for when the work is executed, as payment for such work will be regarded as being covered by other rates or lump sums in the bill of quantities.

The tenderer shall fill in a rate against all items where the words “rate only” appear in the amount column. Although no work is foreseen under such item and no quantities are

consequently given in the quantity column, the tendered rate shall apply should work under this item actually be required. Tenders should note the provisions of paragraph 12 of this preamble.

If the tender should group a number of items together and tender one lump sum for each group of items, this single tendered lump sum shall apply to that group of items and not to each individual item, or should he indicate that full compensation for any item has been included in the rate for another item, the rate for the item included in another item shall be deemed to be nil.

The tendered lump sums and rates shall be valid irrespective of any change in the quantities during the execution of the contract.

6 The works executed are measured for payment in accordance with the methods described in the contract documents under the various payment items, notwithstanding any custom to the contrary. Attention is directed to the provisions of clause 1220 of the standard specifications regarding the measurements of quantities for payment. Except where specified otherwise than in clause 1220, the nett measurement or mass of the finished work in place shall be taken for payment, and any volume or mass of work in excess of that prescribed, shall be excluded.

7 The amount of work or the quantities of material stated in the bill of quantities shall not be considered as restricting or extending the amount of work to be done or quantity of material to be supplied by the contractor.

8 The statement of quantities of material or the amount of work in the bill of quantities shall not be regarded as authorisation for the contractor to order material or to execute work. The contractor shall obtain the engineer's detailed instructions for all work before ordering any materials or executing work or making arrangements in this regard.

9 The short descriptions of the payment items in the bill of quantities are only given to identify the items and to provide specific details. Reference shall, inter alia, be made to the drawings, standard specifications, project specifications, general conditions of contract and special conditions of contract for more detailed information regarding the extent of work entailed under each item.

10 The provisions of clause 6.6 of the general conditions of contract shall apply to provisional sums and prime cost sums.

11 If a bill of quantities (or schedule of quantities or schedule of rates) applies and there is an error in the line item total resulting from product of unit rate and quantity, the line item total shall govern and the rates shall be corrected. Where there is an obviously gross misplacement of the decimal point in the unit rate, the line item total as quoted shall govern, and the unit rate shall corrected.

12 A tender may be rejected if the unit rates or lump sums for some of the items in the bill of quantities are, in the opinion of the employer, unreasonable or out of proportion, and if the tenderer fails, within a period of seven (7) days of having been notified in writing by the

employer to adjust the unit rates or lump sums for such items, to make such adjustments.

13 The units of measurement indicated in the bill of quantities are metric units

The following abbreviations are used in the bill of quantities:

mm	=	millimetre
m	=	metre
km	=	kilometre
km-pass	=	kilometre-pass
m^2	=	square metre
m^2-pass	=	square metre pass
ha	=	hectare
m^3	=	cubic metre
m^3km	=	cubic metre kilometre
l	=	litre
kl	=	kilolitre
kg	=	kilogram
t	=	ton (1000 kg)
No	=	number
mn	=	meganewton
mn-m	=	meganewton-metre
%	=	per cent
kW	=	kilowatt
Kn	=	kilonewton
PC sum	=	prime cost sum
Prov sum	=	provisional sum

14 All rates and sums of money quoted in the bill of quantities shall be in rands and whole cents. Fractions of a cent shall be discarded

15 The item numbers appearing in the bill of quantities refer to the corresponding item numbers in the standard specifications. Item numbers prefixed by the letter B refer to payment items described under part B of the project specifications, those with C to payment items described under part C, and so on for further parts of the project specifications.

Item numbers in schedule B of the bill of quantities are, in addition, preceded by the number of each separate part of schedule B of the bill of quantities, e.g. payment item 62.02 described in the standard specifications (clause 6210), when used in part 3 of schedule B of the bill of quantities, would be numbered 3/62.02, and if this payment item had been amended in part B of the project specifications, the payment item would be indicated as 3/B62.02.

16. Labour intensive items are highlighted in the bills of quantities for the payment items relating to labour intensive works.

16.1 Those parts of the contract to be constructed using labour intensive methods have

been marked in the bills of quantities with the letters LI in a separate column filled in against every item so designated. The works or parts of the works so designated are to be constructed using labour intensive methods only. The use of plant to provide such works, other than plant specifically provided for in the scope of work, is a variation to the contract. The letters marked with LI are **not necessarily an exhaustive list** of all items which must be done by hand, and this clause does not override any of the requirements in the generic labour intensive specification in the Scope of Works.

16.2 Where minimum labour intensity is specified by the design the contractor is expected to use their initiative to identify additional activities that can be done labour-intensively in order to comply with the set minimum labour intensity target

16.3 Payment for items which are designated to be constructed using labour intensively in the schedule of quantities will not be made unless they are constructed using labour intensive methods. Any unauthorised use of plant to carry out work which was to be done labour intensively will not be condone and any work so constructed will not be certified for payment. If a contractor, through innovation on other activities, achieved the Local labour content target, but he did not perform all LI-marked activities through labour, he will not be penalized. However, if a contractor did not achieve the Local labour content target and constructed a LI-marked activity through other means, he will not be paid for that activity. Any non-payment for such works shall not relieve the Contractor in any way from his obligations either in contract or in delict.

17. All cost for formal training to the targeted workforce (amongst others: allowances, wages, administration, transport, etc) shall be deemed to be included in the rates for Labour Intensive items.

C2.2 BILL OF QUANTITIES

SCHEDULE A : ROADWORKS

SCHEDULE B : STRUCTURES

SCHEDULE OF QUANTITIES

NB: TENDERERS MUST COMPLETE THE SCHEDULE OF QUANTITIES IN BLACK INK.

SCHEDULE A : ROAD CONSTRUCTION **SECTION 1200**

BID NO:35 OF 2022: CONSTRUCTION OF LUTANANDWA ACCESS ROAD AND BRIDGE-PHASE 2

ITEM NO	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
B12.01	**Relocation and reinstatement of ESKOM overhead power lines and / or underground cables**				
	(a) Direct payment to Eskom or its agent	P C Sum	1,00		200 000,00
	(b) Handling costs and profit in respect of B12.01(a)	%	200 000		
B12.02	**Relocation and reinstatement of TELKOM overhead phone lines and / underground cables**				
	(a) Direct payment to Telkom or its agent	P C Sum	1		40 000,00
	(b) Handling costs and profit in respect of B12.02(a)	%	40 000		
B12.03	**Relocation and reinstatement of watermains belonging to local or district authority , institution or community**				
	(a) Direct payment to the authority or its agent	P C Sum	1		50 000,00
	(b) Handling costs and profit in respect of B12.03(a)	%	50000,00		
B12.04	**including miscellaneous items such as gates, fences, etc.:**				
	(a) Direct payment to land owners	P C Sum	1		100 000,00
	(b) Handling costs and profit in respect of B12.04(a)	%	100 000		
B12.05	**Protection , removal, relocation and replacement of Utility Services**				
	(a) Household Fences/ Boundary walls	Prov Sum	Lump	Sum	100 000,00
	(b) Handling costs and profit in respect of B12.05 a	%	100 000		
B12.06	**Relocation of graves**				
	(a) Relocation of graves including reburial, EIA, heritage, etc	Prov Sum	Lump	Sum	100 000,00
	(b) Handling costs and profit in respect of B12.06 a	%	100 000		
B12,07	**PROVISIONAL SUMS**				
	(a) Project Launch Amount	Prov Sum	Lump	Sum	50 000,00
	(b) Employment of Community Liaison Officer (CLO) for the duration of the contract @R 6000.00 pm	Prov Sum	Lump	Sum	36 000,00
	(c)Provisional sum for attending steering committee meetings	Prov Sum	Lump	Sum	40 000,00
	(d) Payment for Social Facilitation Services	Prov Sum	Lump	Sum	520 000,00
	(e) Percentage for charges and profit on the provisional sums for contractor's cost and profit (a, b, c, and d)	%	646000		
B12,08	**Project Nameboard as per drawing MONT/MAK/RDS/2019/…**	number	1		
1200	**TOTAL CARRIED TO SUMMARY**				

ITEM NO	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
1300	**CONTRACTOR'S ESTABLISHMENT ON SITE AND GENERAL OBLIGATIONS**				
B13.01	**The Contractor's general obligations:**				
	(a) Fixed obligations	-	lump	sum	
	(b) Value-related obligations	-	lump	sum	
	(c) Time-related obligations	month	8,00		
	NB The combined total tendered for subitems (a), (b) and (c) shall not exceed 15% of the Tender Sum (excl VAT)				
1300	**TOTAL CARRIED TO SUMMARY**				

ITEM NO	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
1400	**HOUSING, OFFICES AND LABORATORIES FOR THE ENGINEER'S SITE PERSONNEL**				
14,01	**Office and laboratory accommodation:**				
	(a) Offices (interior floor space only)	m²	44,00		
	(e) Ablution units	m²	10,00		
	(f) Stores	m²	20,00		
14,02	**Office and laboratory furniture:**				
	(a) Chairs	number	28,00		
	(d) Desks, complete with drawers and locks	number	4,00		
	(e) Drawing tables	number	2,00		
	(f) Conference tables	number	1,00		
14,03	**Office and laboratory fittings, installations and equipment:**				
	(a) Items measured by number:	number			
	(i) 220/250 volt power points	number	12,00		
	(iii) Double 80 watt fluorescent-light fittings complete with ballast and tubes	number	10,00		
	(vi) Wash hand basins complete with tap and drains	number	6,00		
	(xi) Air-conditioning units with 2,2 kW minimum capacity, mounted and with own power connection	number	2,00		
	(xii) Heater, space-heating type, minimum capacity 1,5 kW	number	4,00		
	(xiv) General-purpose steel cupboards with shelves	number	3,00		
	(xv) Steel filing cabinets with drawers	number	3,00		
	(xvi) Refrigerators	number	1,00		
	(x) Fire extinguishers, 9,0 kg all purpose dry powder	number	4,00		
	(xix) Uninterupted power supply	number	1,00		
	(xviii) Voltage stabilisers	number	1,00		
1400	Carried forward				

ITEM NO	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
	Brought forward				
14.03 (b)(cont)	(b) Prime-cost items and items paid for in a lump sum:				
	(i) The provision of telephone service, including the cost of calls in connection with contract administration and telephone rental	-	Prov	Sum	65 000,00
	(ii) Handling costs and profit in respect of subsubitem B14.03(b)(i) above	%	65 000,00		
	(iii) The provision of a direct independent telephone line for the Engineer, including the cost of calls in connection with contract administration and telephone rental	-	Prov	Sum	15 000,00
	(iv) Handling costs and profit in respect of subsubitem 14.03(b)(iii) above	%	15 000,00		
	(v) The provision of a fax apparatus as specified	-	Prov	Sum	8 000,00
	(vi) Handling costs and profit in respect of subsubitem 14.03(b)(v) above connections, etc	%	8 000,00		
14,04	**Car-ports**	number	8,00		
14,07	**Rented, hotel and other accommodation:**				
	(a) Provisional Sum for providing rented housing, hotel or other accommodation as described in Subsubclause 1403(c)(ii)	-	Prov	Sum	52 000,00
	(b) Handling costs and profit in respect of subitem 14.07(a)	%	52 000,00		
14,08	**Services:**				
	(a) Services at offices and laboratories:				
	(i) Fixed costs	-	lump	Sum	
	(ii) Running costs	month	8,00		
	(c) Services for rented houses	month	8,00		
	(d) Services for labourers' accommodation on the Site:				
	(i) Fixed costs	-	lump	Sum	
	(ii) Running costs	month	8,00		
14.10	**Provision of photostat facilities**	month	8,00		
14,12	**Supply of Survey Equipment, Computer and Printers**				
	(a) Computers	-	Prov	Sum	15 000,00
	(b) Printers	-	Prov	Sum	10 000,00
	(c) Provision of survey equipment	-	Prov	Sum	25 000,00
1400	**TOTAL CARRIED TO SUMMARY**				

ITEM NO	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
1500	**ACCOMMODATION OF TRAFFIC**				
B15.01	**Accommodating traffic and maintaining temporary deviations**	km	3,42		
15,02	**Earthworks for temporary deviations:**				
	(a) Shaping of temporary deviations	km	3,42		
	(b) Cut and borrow to fill	m³	1 800,00		
	(c) Cut to spoil	m³	275,00		
B15.03	**Temporary traffic-control facilities:**				
	(a) Flagmen	Man-day	704,00		
	(b) Portable STOP and GO-RY signs	number	4,00		
	(e) Road signs, R- and TR-series, (900mm dia)	number	4,00		
	(f) Road signs, TW-series, (1200mm sides)				
	(i) Single	number	8,00		
	(ii) Mounted back to back	number	12,00		
	(h) Delineators (DTG50J)				
	(i) Single	number	264,00		
	(ii) Mounted back to back	number	100,00		
	(i) Movable barricade/road sign combination Chevron and Road Closed type	number	10,00		
	(n) Provision of high visibility safety jackets and hat	number	10,00		
15,04	**Relocation of traffic-control facilities**	-	lump	sum	
1500	Carried forward				

ITEM NO	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
	brought forward				
15,05	**Gravelling and repair of temporary deviations and existing gravel shoulders used as temporary deviations:**				
	(a) Temporary deviations	m³	1 050,00		
15,06	**Watering of temporary deviations**	kilolitre	2 500,00		
15,07	**Blading by road grader of:**				
	(a) Temporary deviations	km-passes	45,00		
15,12	**Temporary culverts:**				
	(a) Provision and laying of temporary prefabricated culverts complete:				
	(1) 600mm dia	m	60,00		
	(2) 900mm dia	m	80,00		
	(b) Re-use of prefabricated culverts complete:				
	(1) 600mm dia	m	Rate Only		Rate Only
	(2) 900mm dia	m	Rate Only		Rate Only
	(c) Eventual removal of prefabricated culverts:				
	(1) 600mm dia	m	60,00		
	(2) 900mm dia	m	70,00		
	(d) Overhaul on excavated material carted to spoil, backfill material (but excluding Portland cement), prefabricated culverts removed and reinstalled, and prefabricated culverts removed and stacked, for haul in excess of a free-haul distance of 1,0 km	m³-km	5 250,00		
1500	**TOTAL CARRIED TO SUMMARY**				

ITEM NO	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
1700	**CLEARING AND GRUBBING**				
17,01	**Clearing and grubbing**	ha	4,10		
17,02	**Removal and grubbing of large trees and tree stumps:**				
	(a) Girth exceeding 1 m up to and including 2 m	number	25,00		
17,04	**Clearing and grubbing at inlets and outlets of hydraulic structures**	m²	35,00		
17,09	Demolition,removal and disposal off site of miscellaneous structures consisting of:				
	(a) Unreinforced Concrete	m³	30,00		
	(b) Masonary and stone pitching	m³	55,00		
	(c) Reinforced concrete	m³	45,00		
	(d) Portal Culvert	m	32,00		
1700	**TOTAL CARRIED TO SUMMARY**				

ITEM NO	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
1800	**DAYWORKS**				
B18.01	**Labourers**				
	(i) Unskilled	hour	20,00		
	(ii) Semi-skilled	hour	20,00		
	(iii) Skilled	hour	20,00		
B18.02	**Foremen**	hour	20,00		
B18.03	**Trucks**				
	(i) 6m3	hour	20,00		
	(ii) 10m3	hour	20,00		
	(iii) 5 ton flat truck	hour	20,00		
B18.04	**TLB**	hour	20,00		
B18.05	**Loader (0,5m3 bucket)**	hour	20,00		
B18.06	**Grader (CAT 140G or similar)**	hour	10,00		
B18.07	**Vibratory roller**	hour	20,00		
B18.08	**Grid roller**	hour	20,00		
B18.09	**Pedestrian roller (Bomag BW90)**	hour	20,00		
B18.10	**Water truck (5000l)**	hour	20,00		
B18.11	**Chainsaw**	hour	20,00		
B18.12	**Mechanical broom**	hour	20,00		
B18.13	**Light delivery vehicle (1 ton capacity)**	hour	20,00		
1800	**TOTAL CARRIED TO SUMMARY**				

ITEM NO	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
2100	**DRAINS**				
21.01	**Excavation for open drains**				
	(a) Excavating soft material situated within the following depth ranges below the surface level:				
	(i) 0 m up to 1,5 m	m^3	3 160,00		
	(b) Extra over subitem 21.01(a) for excavation in hard material, irrespective of depth	m^3	Rate Only		Rate Only
	(c) Extra over subitem 21.01(a) for excavation by hand within the following depth ranges below surface level:				
	(i) 0 m up to 1,5 m	m^3	Rate Only		Rate Only
21.06	**Natural Marerial in subsoil drainage system (crushed stone):**				
	(b) crushed stone obtained from commercial sources (Coarse grade 19mm)	m^3	135,00		
21.08	**Pipes in subsoil drainage systems:**				
	(c) High density type polyethylene pressure pipes and fitting complete with couplings (100mm internal dia. Perforated)	m	150,00		
21.09	**Polythylene sheeting 0.15 mm thick, or similar approved material, for lining subsoil drainage system**	m^2	170,00		
21.10	**Synthetic fibre filter fabric**				
	(a) Kaytech Grade A2	m^2	156,00		
21.12	**Concrete outlet structures, manhole boxes, Junction boxes, and cleaning eyes for subsoil drainage systems**	No			
	(a) Outlet Structures	No	5,00		
	(b) Cleaning eyes	No	5,00		
21.18	**Excavation for cleaning of existing drainage systems**				
	a) Manhole inlet and outlet structure	m^3	20,00		
	b) Culverts barrels	m^3	30,00		
21.19	**Selected backfill material under concrete-lined side drains compacted to 93% mod. AASHTO density**	m^3	80,00		
2100	**TOTAL CARRIED TO SUMMARY**				

ITEM NO	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
2200	**PREFABRICATED CULVERTS**				
22.01	**Excavation:**				
	(a) Excavating soft material situated within the following depth ranges below the surface level:				
	(i) 0 m up to 1,5 m	m^3	623		
	(ii) Exceeding 1,5 m and up to 3,0 m	m^3	6 354		
	(ii) Exceeding 3,0 m and up to 4,5 m	m^3	350		
	(b) Extra over subitem 22.01(a) for excavation in hard material, irrespective of depth	m^3	31		
	(c) Extra over subitem 22.01(a) for excavation by hand within the following depth ranges below surface level:				
	(i) 0 m up to 1,5 m	m^3	150		
22.02	**Backfilling:**				
	(a) Using the excavated material	m^3	1 300		
	(b) Using imported selected material	m^3	4 040		
	(c) Extra over subitems 22.02(a) and (b) for soil cement backfilling containing 5% cement	m^3	374		
22.03	**Concrete pipe culverts:**				
	(b) On class B bedding:				
	(i) OG Class 50D - 600 mm Diameter	m	2 247		
	(i) OG Class 50D - 750 mm Diameter	m	170		
22,07	Cast in situ concrete and formwork				
	(b) In floor slabs, ground beams for portal or rectangular culverts, including formwork, joints and class U2 surface finish				
	(1) Class 30/19	m^3	15		
	(c) In inlet and outlet structures, skewed ends, catchpits, wingwalls, thrust and anchor blocks, excluding formwork but including class U2 surface finish				
	(1) Class 30/19	m^3	15		
2200	**Carried forward**				

ITEM NO	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
	Brought forward				
	(d) Formwork of concrete under subitem 22.07(c) above (type of finish indicated):				
	(1) Vertical formwork for F1 surface finish	m^2	35		
	B(f) In concrete surface slab on top of culvert sections, including formwork, joints and class U2 surface finish				
	(1) Class 30/19	m^2	70		
22,08	Concrete backfilling for culverts and making up levels				
	(a) Class 15/19	m^3	15		
22.10	**Steel reinforcement:**				
	(a) Mild steel bars	t	0,2		
	(b) High-tensile steel bars	t	1		
	(c) Welded steel fabric	kg	150		
22.12	**Removing existing concrete:**				
	(a) Plain concrete	m^3	50		
	(b) Reinforced concrete	m^3	35		
22.14	**Removing and stacking existing prefabricated culverts (450 - 900mm concrete pipes)**	m	Rate Only		
22.15	**Treating surfaces with epoxy resin for joining new to old concrete (ABE epoxy resin or similar)**	litre	Rate Only		
22,17	**Manholes, catchpits, precast inlet and outlet structures complete**				
	(a) Manholes as per Drawing No:MONT/MAK/RDS/01/2015/PTC15	No	36,00		
	(b) Catchpits as per Drawing No: MONT/MAK/RDS/01/2016/CTp07	No	38,00		
	(c) Precast inlet and outlet structure as per Drawing No: MONT/MAK/RDS/01/2016/CTp04	No	5,00		
2200	**Carried forward**				

ITEM NO	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
	Brought forward				
	(d) Extra over or less than subitem 22.17 (a) for variations in the depths of manholes from the standard depth designated for tendering purposes (standard depth and type of manhole indicated)	m	50,00		
22,18	**Brickwork**				
	(b) 290mm thick	m²	50,00		
	(c) 440mm thick	m²	25,00		
22,23	**Service ducts:**				
	(a) Ordinary pipes 110 mm diameter uPVC	m	75,00		
	(b) Ordinary pipes 150 mm diameter uPVC	m	80,00		
22,24	**Duct marker blocks, (type indicated)**	number	6,00		
22.25	**Overhaul on excavated material carted to spoil, backfill material (but excluding Portland cement in the case of soil cement), existing structures demolished and removed to spoil, and removing and relaying, and removing and stacking existing prefabricated culverts, for haul in excess of the free-haul distance**	m³-km	16 160		
2200	**TOTAL CARRIED TO SUMMARY**				

ITEM NO	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
2300	**CONCRETE KERBING, CONCRETE CHANNELLING, CHUTES AND DOWNPIPES, AND CONCRETE LINING**				
23.01	**Concrete kerbing**				
	(a) Precast kerbing to SABS 927:2006				
	(i) Figure 8 C	m	6 270		
2300	**TOTAL CARRIED FORWARD TO SUMMARY**				

ITEM NO	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
3100	**BORROW MATERIALS**				
B31.01	Excess overburden				
	(a) Depth up to and including 0.5m	m^3	1 500		
	(b) Depth exceeding 0.5m and up to 1.0m	m^3	1 200		
31,03	Finishing-off borrow areas in:				
	(a) Hard material	ha	2		
	(b) Intermediate material	ha	2		
	(c) Soft material	ha	1		
3100	**TOTAL CARRIED TO SUMMARY**				

ITEM NO	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
3300	**MASS EARTHWORKS**				
33.01	**Cut and borrow to fill, including free-haul up to 1,0 km:**				
	(a) Material in compacted layer thicknesses of 200 mm and less:				
	(i) Compacted to 90% of modified AASHTO density	m³	9200		
33.03	Extra over item 33.01 for excavating and breaking down material in:				
	(a) Intermediate excavation	m³	970		
	(b) Hard excavation	m³	300		
	(d) Boulder excavation Class A	m³	50		
33.04	Cut to spoil, including free haul up to 1,0 km materials				
	(a) Soft excavation	m³	5520		
	(b) Intermediate excavation	m³	1104		
	(c) Hard excavation	m³	552		
	(e) Boulder excavation Class A	m³	100		
33.07	**Removal of unsuitable material (including free-haul of 1 km)**				
	(a) In layer thickness of 200mm and less				
	(i) Stable material	m³	1650		
33.10	**Roadbed preparation and the compaction of material**				
	(b) Compaction to 93% of modified AASHTO density	m³	5472		
33.12	**In situ treatment of roadbed:**				
	(a) In situ treatment by ripping	m³	250		
	(b) In situ treatment by blasting	m³	60		
33.13	**Finishing-off cut and fill slopes, medians and interchange areas:**				
	(a) Cut slopes	m²	3500		
	(b) Fill slopes	m²	7500		
33/16.02	**Overhaul (extra over items 33.01 on material hauled in excess of the free-haul distance of 1km (ordinary overhaul)**	m³-km	23722		
33/32.06	**Stockpilling of material**	m³	2500		
3300	**TOTAL CARRIED TO SUMMARY**				

ITEM NO	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
3400	**PAVEMENT LAYERS OF GRAVEL MATERIAL**				
34.01	**Pavement layers constructed from gravel taken from cut or borrow including free-haul up to 1,0 km:**				
	(a) Gravel selected layer compacted to:				
	(ii) 93% of modified AASHTO density for a compacted layer thickness of 150 mm	m³	Rate Only		Rate Only
	(c) Gravel subbase compacted to:				
	(ii) 95% of modified AASHTO density for a compacted layer thickness of 150 mm	m³	5 180		
	(f) Gravel base (chemically stabilized gravel) compacted to:				
	(ii) 97% of modified AASHTO density for a compacted layer thickness of 150 mm	m³	4 895		
34/16.02	**Overhaul on material hauled in excess of 1,0 km (ordinary overhaul)**	m³-km	61 961		
34/32.04	**Removal of oversize pavement material**	m³	504		
34/32.06	**Stockpiling of material**	m³	2 500		
3400	**TOTAL CARRIED TO SUMMARY**				

ITEM NO	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
3500	**STABILIZATION**				
35.01	Chemical stabilization 150mm layer thickness extra over unstabilized compacted layers (base and subbase layer)				
	(a) Gravel Base, 150mm thick	m^3	4 895		
35.02	**Chemical stabilizing agent:**				
	(a) CEMII B-L	t	310		
	(b) Slaked Lime	t	-		
35.04	**Provision and application of water for curing**	kilolitre	3 500		
3500	**TOTAL CARRIED TO SUMMARY**				

ITEM NO	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
4100	**PRIME COAT**				
41.01	**Prime coat:**				
	(c) Polo Prime (0.8l/m²)	litre	23 023		
	(f) Enviro Prime or similar	litre	Rate Only		Rate Only
41.02	**Aggregate for blinding**	m²	350		
41.03	**Extra over item 41.01 for applying the prime coat in areas accessible only to hand held equipment**	litre	640		
4100	**TOTAL CARRIED TO SUMMARY**				

ITEM NO	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
4200	**ASPHALT BASE AND SURFACING**				
42.02	**Asphalt surfacing :**				
	(a) Continuously graded, medium grade, using 60/70 penetration grade bitumen:				
	(i) 30 mm thick, normal mixture with conventional binder	m²	28779		
42.04	**Tack Coat**				
	(a) Tack coat using 30% stable-grade emulsion applied at a rate of 0.5l/m²	litre	17267		
42.05	**Binder variations**				
	(a) 60/70 pen. grade bitumen	t	1		
42.06	Variations in active filler content:				
	(a) Cement	t	1		
	(b) Hydrated Lime	t	1		
42.07	Trial sections:				
	(a) 30 mm thick, continuously graded medium grade, normal mixture	m²	100		
42.08	100 mm cores in asphalt	No	15		
42.14	**Extra over item 42.04 for applying tack coat in restricted areas**	litre	12		
4200	**TOTAL CARRIED TO SUMMARY**				

ITEM NO	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
5100	**PITCHING, STONEWORK AND PROTECTION AGAINST EROSION**				
51.01	**Stone pitching:**				
	(b) Grouted stone pitching	m²	325		
5100	**TOTAL CARRIED TO SUMMARY**				

ITEM NO	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
5400	**GUARDRAILS**				
54.01	**Guardrails on timber posts:**				
	(a) Galvanized	m	72		
54.04	**End treatments:**				
	(c) Bridge adaptors: Terminal Section Type B in accordance with the drawings where singe guardrail sections are used, 11.43m long, complete with fixing detail to endblocks at bridge including all plates	number	4		
54.06	**Reflective plates**	number	30		
5400	**TOTAL CARRIED TO SUMMARY**				

ITEM NO	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
5500	**FENCING**				
55.01	**Clearing the fence line, 2 m wide strip**	km	1,2		
55.02	**Supply and erect new fencing material for new fences and for supplementing material in existing fences which are being repaired or removed:**				
	(a) Zinc-coated barbed wire, high-tensile-grade single - strand 3.15mm x 2.5mm oval-shaped wire,2.81 mm equivalent dia, fully galvanized	km	5,4		
	(g) Standards, 2,5 kg/m Y-sections:				
	(i) 1.85 m long	number	30		
	(h) Droppers (0,56kg/m ridgeback pattern steel)				
	(i) 1.200 m long	number	80		
	(i) Straining posts, stays and anchors:				
	(i) Vertical				
	Steeel straining post 101.6 mm outside dia, 2.95 mm wall thickness, fully galvanizedd with base plate and pressed mushroom top, 2100 mm long	number	6		
	(ii) Inclined				
	Steel stays and anchors, 60.33 mm outside dia tubular steel posts with cap and 2.95 mm thick walls, 1700 mm long excluding fully galvanized with base plate	number	6		
55.03	**New Gates:**				
	(a) 4.2 government pattern farm gate complete	number	2,0		
5500	**TOTAL CARRIED TO SUMMARY**				

ITEM NO	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
5600	**ROAD SIGNS**				
B56.01 LI	**Road sign boards with painted or coloured semi-matt background. Symbols, lettering and borders in diamond grade retro-reflective material, where the sign board is constructed from:**				
	(c) Prepainted galvanized steel plate (chromadek or approved equivalent):				
	(i) Area not exceeding 2 m²	m²	50		
	(ii) Area exceeding 2 m² but not 10 m²	m²	50		
	(e) Aluminium sheet regulatory warning and information signs				
	(i) Area not exceeding 2 m²	m²	35		
56,02	**Extra over item 56.01 for using:**				
	(a) Background of retro-reflective material:				
	(iii) Class III	m²	50		
	(b) Lettering,symbols,numbers,arrows,emblems and borders of retro-reflective material				
	(iii) Class II	m²	20		
56,03	**Road sign supports (overhead road sign structures excluded):**				
	(a) Steel tubing (D Profile)				
	(ii) 100mm dia, 4mm thick	t	2		
56,05 LI	**Excavation and backfilling for road sign supports (not applicable to kilometre posts)**	m³	4		
56,06 LI	**Extra over item 56.05 for cement-treated soil backfill**	m³	4		
56,07 LI	**Extra over item 56.05 for rock excavation**	m³	4		
B56.10	**Danger Plates**				
	(a) W401/402 back to back at culverts (1200mm height)	number	16		
B56.11	**Construction of speed hump as per Drawing No: MONT/MLM/RDS/01/2019/TPC16**	number	4		
5600	**TOTAL CARRIED TO SUMMARY**				

ITEM NO	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
5700	**ROAD MARKINGS**				
57.02	**Retro-reflective road-marking paint:**				
	(a) White lines (broken or unbroken):				
	(i) 100 mm wide	km	3,42		
	(iv) 300 mm wide	km	3,42		
	(b) Yellow lines (broken or unbroken):				
	(i) 150 mm wide	km	1,00		
	(d) White lettering and symbols	m²	45		
	(e) Yellow lettering and symbols	m²	1		
57,01	Variations in rate of application:				
	(a) White paint	litre	1		
	(b) Yellow paint	litre	1		
B57.06	**Setting out and premarking the lines (excluding traffic-island markings, lettering and symbols)**	km	3,42		
5700	**TOTAL CARRIED TO SUMMARY**				

ITEM NO	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
5900	**FINISHING THE ROAD AND ROAD RESERVE AND TREATING OLD ROADS**				
59.01	**Finishing the road and road reserve:**				
	(b) Single carriageway road	km	3,42		
59.02	**Treatment of old roads and temporary deviations**	km	3,42		
5900	**TOTAL CARRIED TO SUMMARY**				

ITEM NO	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
7300	**CONCRETE BLOCK PAVING**				
	Concrete block paving:				
73.01	(a) Supply and laying of 60mm thick concrete interlocking paving blocks of 25MPa crushing strength including 25mm thick sand bedding and filling the joints with jointing sand	m^2	960		
73.02	Cast insitu concrete edge and intermediate beams. Concrete class 25/19	m^3	48		
7300	**TOTAL CARRIED TO SUMMARY**				

ITEM NO	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
8100	**TESTING MATERIALS AND WORKMANSHIP**				
81.02	**Other special tests requested by the Engineer:**				
	(a) Cost of testing	-	-	PC Sum	150 000,00
	(b) Charge on Prime Cost Sum	%	150 000,00		
81.03	**Providing testing equipment:**				
	(a) Rolling straight-edge	number	2,00		
8100	**TOTAL CARRIED TO SUMMARY**				

ITEM NO	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
	GABIONS				
2/52.01	**Foundation trench excavation and backfilling:**				
	(b) In all other classes of material	m^3	93		
2/52.02	**Surface preparation for bedding the gabions**	m^2	213		
2/52.03	**Gabions:**				
	(a) Galvanised gabion boxes:				
	(iii) 2,0 m x 1,0 m x 1,0 m with mesh type 80 2,7mm dia class A galvanised wire	m^3	42		
	(b) Galvanized reno mattresses, 0,3 m deep with mesh type 60 and 2,2mm dia class A galvanised wires, and diaphragms at 1,0 centres	m^3	51		
2/52.04	**Filter fabic**				
	(a) Bidim grade A4 or approved equivalent	m^2	327		
5200	**TOTAL CARRIED TO SUMMARY -SCHEDULE B : PART 2**				

ITEM NO	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
	FOUNDATIONS FOR STRUCTURES				
2/61.01	**Additional foundation investigations**	-	prov	sum	15 000,00
2/B61.02	**Excavation:**				
	(a) Excavating soft material situated within the following successive depth ranges:				
	(i) 0 m up to 2 m	m³	610		
	(ii) Exceeding 2 m and up to 4 m	m³	562		
	(b) Extra-over subitem 61.02(a) for excavation in hard material irrespective of depth	m³	5		
	(c) Extra over subitem 61.02(a) for additional excavation required by the Engineer after the excavation has been completed	m³	10		
2/B61.03	**Access and drainage**				
	(a) Access	-	lump	sum	
2/B61.04	**Backfill to excavation utilising:**				
	(a) Material from excavation	m³	40		
	(b) Imported material	m³	20		
	(c) Soil cement	m³	20		
2/61.05	**Fill within a restricted area (extra over item 33.01)**	m³	270		
6100	Carried forward				

ITEM NO	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
	Brought forward				
2/B61.08	**Foundation fill consisting of:**				
	(a) Rock fill	m³	225		
	(b) Crushed-stone fill	m³	20		
	(d) Mass concrete, class 15/38	m³	5		
	(e) Concrete screed, 75 mm thick, class 15/20 concrete	m³	20		
6100	**TOTAL CARRIED TO SUMMARY -SCHEDULE B : PART 2**				

ITEM NO	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
	FALSEWORK, FORMWORK AND CONCRETE FINISH				
2/62.02	**Vertical formwork to provide:**				
	(a) Class F1 surface finish to:				
	(i) Cell structure	m²	67		
	(ii) In- and outlets	m²	84		
	(b) Class F2 surface finish to:				
	(i) Cell structure	m²	215		
	(ii) In- and outlets	m²	24		
2/62.03	**Horizontal formwork to provide:**				
	(b) Class F2 surface finish to:				
	(i) Cell structure	m²	146		
6200	**TOTAL CARRIED TO SUMMARY -SCHEDULE B : PART 2**				

ITEM NO	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
	STEEL REINFORCEMENT FOR STRUCTURES				
2/63.01	**Steel reinforcement for:**				
	(a) Structure				
	(i) Mild-steel bars	t	1		
	(ii) High-yield-stress-steel hot-rolled bars	t	18		
6300	**TOTAL CARRIED TO SUMMARY -SCHEDULE B : PART 2**				

ITEM NO	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
	CONCRETE FOR STRUCTURES				
2/B64.01	**Cast in situ concrete**				
	(a) Class 30/20 in:				
	(i) Cell structure incl head walls	m³	129		
	(ii) In- and outlets	m³	41		
2/64.06	**Demolishing of existing concrete:**				
	(b) Reinforced concrete in old/existing culvert	m³	12		
6400	**TOTAL CARRIED TO SUMMARY -SCHEDULE B : PART 2**				

ITEM NO	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
	NO FINES CONCRETE, JOINTS, BEARINGS, PARAPETS AND DRAINAGE FOR STRUCTURES				
2/66.06	**Filled joints:**				
	(a) Joints measured per square metre:				
	(i) 10 mm thick bitumen impregnated fibreboard	m²	13		
2/66.14	**Dowels:**				
	(a) Dowels, 700 mm long galvanised R20 bars, with filter through formwork complete as shown on the drawings	number	27		
2/66.19	**Drainage pipes and weep holes:**				
	(b) Weep holes:				
	(i) 50 mm dia PVC pipes	m	10		
2/66.21	**Synthetic-fibre filter fabric, Bidim Grade A4 or approved equivalent**	m²	55		
2/66.23	**Crushed stone in drainage strips**	m³	3		
6600	**TOTAL CARRIED TO SUMMARY -SCHEDULE B : PART 2**				

BID NO:35 OF 2022: CONSTRUCTION OF LUTANANDWA ACCESS ROAD AND BRIDGE-PHASE 2

ITEM NO	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
C1	**Occupational Health and Safety**				
C1.1	**Contractor's initial obligations in respect of the Occupational Health and Safety Act and Construction Regulation**	Lump Sum	-		
C1.2	**Contractor's time related obligations in respect of the Occupational Health and Safety Act and Construction Regulations**	Month	8		
C1.3	**Submission of the Health and Safety File**	Lump Sum			
	TOTAL SCHEDULE C CARRIED TO SUMMARY				**-**

ITEM NO	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
D1000	**ENVIRONMENTAL MANGEMENT PLAN**				
D100.01	**Penalty for unnecessary removal or damage to trees for the following diameter sizes:**				
	(a) 2 600mm girth or less	No		-5000	Rate Only
	(b) Greater than 2 600mm, but less than 6 180mm girth	No		-10000	Rate Only
	(c) Greater than 6 180mm girth	No		-30000	Rate Only
D100.02	**Penalty for serious violations:**				
	(a) Hazardous chemical/oil spill and/or dumping in non-approved sites	No		-10000	Rate Only
	(b) General damage to sensitive environments	No		-5000	Rate Only
	(c) Damage to cultural and historical sites	No		-5000	Rate Only
	(d) Pollution of water sources	No		-10000	Rate Only
	(e) Unauthorised blasting activities	No		-5000	Rate Only
	(f) Uncontrolled/unmanaged erosion per incident, depending on environment impacts, plus rehabilitation at contractor's cost	No		-5000	Rate Only
	(g) Damage to sensitive vegetation within "no-go" areas of vegetation damaged, plus rehabilitation thereof at contractors cost	No		-2000	Rate Only
D100.03	**Penalty for less serious violations:**				
	(a) Littering on site	No		-1000	Rate Only
	(b) Lighting of illegal fires on site	No		-1000	Rate Only
	(c) Persistent or un-repaired fuel and oil leaks	No		-1000	Rate Only
	(d) Excess dust or excess noise emanating from site	No		-1000	Rate Only
	(e) Dumping of milled material in side drains or on grassed	No		-1000	Rate Only
	(f) Possession or use of intoxicating substances on site	No		-500	Rate Only
	(g) Any vehicles being driven in excess of designated speed limits	No		-500	Rate Only
	(h) Removal and/or damage to flora or cultural or heritage objects on site, and/ or killing of wildlifile	No		-2000	Rate Only
	(i) Illegal hunting	No		-2000	Rate Only
	TOTAL SCHEDULE D CARRIED TO SUMMARY				**-**

CONSTRUCTION OF LUTANANDWA ACCESS ROAD AND BRIDGE - PHASE 1

ITEM NO	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
	PROVISION OF STRUCTURED TRAINING				
E1.1	**Accredited training :**				
	(a) Generic Skills	Prov sum	-		R 80 000,00
	(b) Enterprenerial Skills	Prov sum	-		R 80 000,00
	(c) Payment of Graduates Students in Training	Prov sum	-		R 56 000,00
	(d) Training Venue	Prov sum	-		R 7 500,00
	(e) Renumuneration of workers undergoing training	Prov sum	-		R 22 000,00
	(c) Handling cost and profit in respect of sub-item (D1.1 (a) and (b) above	%	R 245 500,00		
	TOTAL SCHEDULE E CARRIED TO SUMMARY				

SUMMARY OF SCHEDULE OF QUANTITIES

SECTION	DESCRIPTION	AMOUNT
SCHEDULE A : ROADWORKS		
1200	GENERAL REQUIREMENTS AND PROVISIONS	
1300	CONTRACTOR'S ESTABLISHMENT ON SITE AND GENERAL OBLIGATIONS	
1400	HOUSING, OFFICES AND LABORATORY FOR THE ENGINEER'S SITE PERSONNEL	
1500	ACCOMMODATION OF TRAFFIC	
1700	CLEARING AND GRUBBING	
1800	DAYWORK AND HIRE OF CONSTRUCTION PLANT	
2100	DRAINS	
2200	PREFABRICATE CULVERTS	
2300	CONCRETE KERBING, CONCRETE, CHANNELING, OPEN CHUTES AND CONCRETE LININGS FOR OPEN DRAINS	
3100	BORROW MATERIALS	
3300	MASS EARTHWORKS	
3400	PAVEMENT LAYERS OF GRAVEL MATERIAL	
3500	STABILIZATION	
4100	PRIME COAT	
4200	ASPHALT BASE AND SURFACING	
5100	PITCHING, STONEWORK AND PROTECTION AGAINST EROSION	
5400	GUARDRAILS	
5500	FENCING	
5600	ROAD SIGNS	
5700	ROAD MARKINGS	
5900	FINISHING THE ROAD AND ROAD RESERVE AND TREATMENT OF OLD ROADS	
7300	CONCRETE BLOCK PAVINGS	
8100	TESTING MATERIALS AND WORKMANSHIP	
TOTAL OF SCHEDULE A : ROADWORKS		

SCHEDULE B: STRUCTURES

PART 2 : STRUCTURE B2 AT CH 1408

SECTION	DESCRIPTION	AMOUNT
5200	GABIONS	
6100	FOUNDATIONS FOR STRUCTURES	
6200	FALSEWORK, FORMWORK AND CONCRETE FINISH	
6300	STEEL REINFORCEMENT FOR STRUCTURE	
6400	CONCRETE FOR STRUCTURE	
6600	NO FINES CONCRETE, JOINTS,BEARINGS,PARAPETS AND DRAINAGE FOR STRUCTURES	
TOTAL FOR STRUCTURE B2		

CALCULATE TOTAL FOR SCHEDULE B

PART 2	TOTAL FOR STRUCTURE B2	
TOTAL SCHEDULE B : (CARRIED TO CALCULATION OF TENDER SUM)		

C2.4 CALCULATION OF TENDER PRICE

ITEM	AMOUNT
TOTAL SCHEDULE A: ROADWORKS	
TOTAL SCHEDULE B: STRUCTURES	
TOTAL SCHEDULE C: OCCUPATIONAL HEALTH AND SAFETY	
TOTAL SCHEDULE D: ENVIROMENTAL MANAGEMENT PLAN	
TOTAL SCHEDULE E: PROVISION OF STRUCTURED TRAINING	
TENDER (CONTRACT) SUM	
CONTINGENCIES (Add 10% of Tender Sum) The sum provided here is under the sole control of the Engineer and may be deducted in whole or in part. (The Tenderer must add 10% of the total of schedule of quantities)	
SUB-TOTAL (1)	
CONTRACT PRICE ADJUSTMENT **Sum provided in terms of the provisions of the General of Conditions of Contract (The Tenderer must add 3.0% of of Sub-Total 1**	
SUB-TOTAL (2)	
Add VAT @ 15%	
TENDER (CONTRACT) PRICE CARRIED TO FORM OF OFFER AND ACCEPTANCE (Page C.3)	

THE CONTRACT

PART C3 SCOPE OF WORKS

PART C4 SITE INFORMATION

PART C3: SCOPE OF WORK

C3.1 DESCRIPTION OF WORKS

C3.1.1 Employer's Objectives

The objectives of the project are to upgrade an existing 3.420 km gravel access road and bridge to paved surface in Lutanadwa thereby improving access to community.

The employer's other objectives are to deliver public infrastructure using labour intensive methods in accordance with EPWP Guidelines.

C3.1.2 Overview and Location of Works

The project site is situated approximately 38 km East of town of Louis Trichardt in Vhembe District Municipality under Makhado Local Municipal area. The site is accessible via the National Road (R 524) leading northeast, away from the town of Louis Trichardt . The approximate central co-ordinates of the project are:

C3.1.3 Extent of Works

The works shall consist of the following main items to be upgraded under the contract:

a) Roadworks

- Setting out of the road;
- Site Clearance;
- Accommodation of traffic (establishment of detours);
- Locating and protection of the existing services;
- Relocation of services i.e fences, sewer line, water, powerlines etc,
- Mass Earthworks;
- Pavement layer works (Sub-Base and Base);
- Provide erosion protection by means of gabions,
- Installation of road signs and road markings;
- 30mm Continuously Graded Medium Hot Asphalt (AC) for 3.420 km;
- Upgrading of R 524 intersection and D 1253
- Finishing off the road and road reserve.

b) Major Drainage Structures

Structure B2 at chainage 1408:

The construction of a new reinforced concrete cell structure (major culvert) that comprises the following:

- An in-situ reinforced concrete cell structure, with four 3m spans, and opening height of 1,8m (4/3000 x 1800 in-situ reinforced concrete major culvert). Length of the major culvert is 12,2m
- A road formation width of 9,7m, which will accommodate 2 x 2,75m lanes + 2 x 1,3m sidewalks).
- A structural system consisting of a four-cell closed concrete frame.
- Foundation improvement by means of an imported 0,8m thick foundation fill (rock fill).
- The construction of reinforced concrete in-and outlet slabs, wing walls, and cut-off beams.
- Guardrails along sidewalk edges.
- Erosion protection by means of gabions in the riverbed and on fill slopes.

C3.1.4 Location of the Works

The following details provide the key elements of the project area.

- Municipal Area : Makhado Local Municipality
- Central Co-ordinates:
  - Latitude (S) : 23° 3'36.11"
  - Longitude (E) : 30°17'47.20"

The project site is situated approximately 38 km East of town of Louis Trichardt in Vhembe District Municipality under Makhado Local Municipal area. The site is accessible via the National Road (R 524) leading northeast, away from the town of Louis Trichardt .

C3.1.5 Temporary Works

No temporally works are envisaged on the contract.

C3.1.6 General Information

C3.1.6.1 Drawings

The reduced drawings contained in book 2 of 2 that form part of the tender document shall be used for tender purposes only. Further drawings are to be provided on an on-going basis by the engineer.

The contractor will be supplied with an unreduced 0,05 mm thick transparent polyester print of each of the drawings. These polyester prints are issued free of charge and the contractor shall make any additional prints he may require at his own cost.

Any information in the possession of the contractor, which the resident engineer requires to complete the as-built drawings, shall be supplied to the resident engineer before a certificate of completion will be issued.

Only figured dimensions shall be used and drawings shall not be scaled unless so instructed by the engineer. The engineer will supply all figured dimensions omitted from the drawings.

C3.1.6.2 Power, Water Supply and Other Services

The contractor shall make his own arrangements concerning the supply of electrical power and all other services. No direct payment will be made for the provision of electrical and other services. The cost of providing these services will be deemed to be included in the rates and amounts tendered for the various items of work for which these services are required.

C3.1.6.3 Contractor's Camp Site and Security

The contractor shall make his own arrangements regarding the establishment of a camp site and housing for his construction personnel and all regulations stipulated by the local authority shall be adhered to.

It is anticipated that the contractor's choice of a camp site will be influenced by the availability of telephone and electrical connections as well as the supply of potable water.

Provision is made in these specifications for the erection of a security fence around the site offices. The contractor shall be responsible for the security of his personnel and constructional plant on and around the site of the works and for the security of his camp, and the employer will consider no claims in this regard.

C3.1.6.4 Additional Requirements for Construction Activities

C3.1.6.4.1 The contractor may not commence constructional activities before adequate provision has been made to accommodate traffic in accordance with the requirements of this document and the South African Road Traffic Signs Manual.

C3.1.6.4.2 The contractor shall submit proposals in connection with directional signs to the engineer for approval.

C3.1.6.5 Programme Requirements for Construction Activities

The contractor shall programme his activities to be suitable in terms of his resources to complete the contract inside the stipulated time period.

C3.1.6.6 Construction in Confined Areas

It may be necessary for the contractor to work in confined areas. In certain areas the width of the fill material and pavement layers may reduce to zero and the working space may be confined. The method of construction in these confined areas depends on the contractor's construction plant. However, the contractor must note that measurement and payment will be in accordance with the specified cross-sections and dimensions, irrespective of the method used to achieve these cross-sections and dimensions, and that the rates and amounts tendered will be deemed to include full compensation for any special equipment or construction methods or for any difficulty encountered in working in confined areas and narrow widths, and at or around obstructions, and that no extra payment will be made nor will any claim for payment be considered on account of these difficulties.

C3.1.7 Labour Regulations

C3.1.7.0 EPWP Requirements

Labour-intensive works shall be constructed/maintained using local workers who are temporarily employed in terms of this Scope of Work

0\]'

Competencies of LI Management and Supervisory staff

Contractors shall engage supervisory and management staff in labour-intensive works that have completed the skills programme including Foremen/Supervisors at NQF "National Certificate: Supervision of Civil Engineering Construction Processes" and Site Agent/Manager at NQF level 4 "Manage labour-intensive Construction Processes" or equivalent QCTO qualifications.

Wage Dispute (Contractor default to pay beneficiaries)

Any dispute between the Contractor and labourers, regarding delayed payment or default in payment of fair wages, if not resolved immediately may compel the Employer to intervene.

The Employer may, upon the Contractor defaulting payment, pay the moneys due to the workers not honoured in time, out of any moneys due or which may become due to the Contractor under the Contract.

Provision of Hand tools

The Contractor shall provide his labour force with hand tools of adequate quality, sufficient in numbers and make the necessary provisions to maintain the tools in good and safe working conditions

Reporting Requirements

The Contractor should submit the following at the beginning of the Contract:

(a) Contracts of all the workers employed on the contracts including their certified identity documents;

(b) Proof of Registration for COIDA and UIF;

(c) OHS Files

The Contractor shall submit monthly returns/reports as specified below:

(a) Signed Muster rolls/pay sheets of temporary workers and permanent staff detailing the number, category, gender, rate of pay and daily attendance.

(b) Copies of certified identity documents of workers

(c) Number of persons who have attended training including nature and duration of training provided

(d) Assets created, rehabilitated or maintained in accordance with indicators in the EPWP M&E framework

(e) Plant utilization returns

(f) Progress report detailing production output compared to the programme of works

C3.1.7.1 **Payment for the labour-intensive component of the works**

Payment for works identified in clause 2.3 "the Extent of the Project" in the Project Specifications as being labour-intensive shall only be made in accordance with the provisions of the Contract if the works are constructed strictly in accordance with the provisions of the scope of work. Any non-payment for such works shall not relieve the Contractor in any way from his obligations either in contract or in delict.

C3.1.7.2 **Applicable labour laws**

Ministerial determination 4:

1. Special Public Works Programs Government Gazette no. 34310-3 of 4 May 2012.
2. Code of Good Practice for Employment and Conditions of works of Expanded Public Works Programs – Government Gazette no. 34032 of 18 February 2011.

C3.2 ENGINEERING

C3.2.1 Design

(a) The **Employer** is responsible for the design of the permanent Works as reflected in these Contract Documents unless otherwise stated.

(b) The **Contractor** is responsible for the design of the temporary Works and their compatibility with the permanent Works.

(c) The **Contractor** shall supply all details necessary to assist the engineer in the compilation of the as-built drawings.

C3.2.2 Employer's Design

(a) Detail description of Works

(b) General Works

C3.2.3 Contractor's Design

Where contractor is to supply the design of designated parts of the permanent Works or temporary Works he shall supply full working drawings supported by a professional engineer's design certificate.

C3.2.4 Design procedures

All designs and modifications thereto shall be communicated in writing and the contractor and engineer shall maintain master lists to record and track all transactions.

C3.3 PROCUREMENT POLICY

Bids will be assessed under the provisions of the following Acts and its Regulations: Municipal Finance Management Act, (Act 56 of 2003); BBBEE, Supply Chain Management Policy of the municipality in accordance with the specifications and in terms of 90:10 preferential points system and functionality. The minimum threshold for functionality is 70%, bidders who score less than 70% will not be considered for further evaluation.

C3.4 CONSTRUCTION

C3.4.1 STANDARD SPECIFICATIONS

(a) The following specifications shall apply for the construction of the Works.

(i) The COLTO Standard Specifications for Road and Bridge Works for State Road Authorities (1998).

The contractor may purchase copies of Volume (i) from the South African Institution of Civil Engineers.

SAICE Tel : (011) 805-5947
Waterfall Park / Postnet Suite 81 Fax : (011) 805-5971
Howick Gardens / Private Bag X65
Vorna Valley / Halfwayhouse Contact Person : Angeline Aylward
Becker Street / 1685
Midrand

(b) SABS or BS Specifications and Codes of Practice

Wherever any reference is made to the South African Bureau of Standards (SABS) and the British Standards Specification (BSS) in either these Bill of Quantities or the Specification of Materials and Methods to be Used (OOG-001E), this reference shall be deemed to read "SABS or equivalent standard" and BS or equivalent standard" respectively.

(c) Various other specifications specified in the COLTO Standard Specifications or the Project Specifications.

(d) Latest **Sabita Manual**, Manual 25 entitled "*Quality Management in the Handling and Transport of Bituminous Binders*".

C3.4.2 PROJECT SPECIFICATIONS RELATING TO STANDARD SPECIFICATIONS

C3.4.2.1 General Conditions of Contract Referred to in the Standard Specifications

The references to the General Conditions of Contract appearing in the COLTO Standard Specifications refer to the COLTO General Conditions of Contract which is superseded in this contract by the General Conditions of Contract for Construction Works 2010. The corresponding clause in the latter document pertaining to the reference in the COLTO Standard Specifications is listed in the table below.

Clause No. in the Standard Specifications	Clause No. in COLTO General Conditions	Equivalent Clause No. in General Conditions of Contract 2010
1202	15	5.6.1
1206	14	Deleted
1209	52	6.10.2
1210	54	51.1
1212(1)	49	6.10.1
1215	45	5.12.1
1217	35	8.2.1
1303	49	6.8

1303	53	6.11
1303	12	5.6
1303	45	5.12.1
1403	40(1)	6.4.1
1505	40	6.4
31.03	40	6.4
3204(b)	40	6.4
3303(b)	2	3
5803(c)	40	6.4
5805(d)	40	6.4
6103(c)	40	6.4
Item 83.03	22	5.15
ALL SECTIONS	48	6.6

C3.4.2.2 Amendments to the Standard Specifications

There are no amendments to the Standard Specifications as issued by the Committee of Land Transport Officials (COLTO).

C3.4.2.3 Project Specifications Relating to Standard Specifications

This part of the project specifications deals with matters relating to the standard specifications. Where reference is made in the standard specifications to the project specifications this part shall also contain the relevant information e.g. the requirements where a choice of materials or construction methods are provided for the standard specifications.

In certain clauses the standard specifications allow a choice to be specified in the project specifications between alternative materials or methods of construction and for additional requirements to be specified to suit a particular contract. Details of such alternatives or additional requirements applicable to this contract are contained in this part of the project specifications. It also contains some additional specifications and amendments of the standard specifications required for this particular contract.

The number of each clause and each payment item in this part of the project specifications consists of the prefix B followed by a number corresponding to the number of the relevant clause or payment item in the standard specifications. The number of a new clause or a new payment item, which does not form part of a clause or a payment item in the standard specifications and is included here, is also prefixed by B followed by a new number. The new numbers follow on the last clause or item number used in the relevant section of the standard specifications.

Clauses and pay items referring to labour intensive methods are prefixed by L in the project specifications.

Clauses and pay items referring to emerging contractors are prefixed by E in the

project specifications.

C3.4.2.4 Project Specifications Relating to EPWP

EPWP Special Project Specification

As much as is economically feasible all work shall be implemented by employing Labour Intensive Construction methods. Over and above the normal Building and Allied works to be implemented by employing skilled and unskilled labour the works specified in the "Guidelines for the Implementation of Labour-Intensive Infrastructure Projects under the Expanded Public Works Programme (EPWP)" shall be undertaken using Labour Intensive Construction methods

Requirement for Sourcing and engagement of Labour

Unskilled and semi-skilled labour required for the execution of all labour intensive works shall be engaged strictly in accordance with prevailing legislation and SANS 1914-5, Participation of Targeted Labour.

The minimum rate of pay set for the EPWP is R 220.00 per task or per day.

Tasks established by the contractor must be such that:

a) the average worker completes 5 tasks per week in 40 hours or less; and

b) the weakest worker completes 5 tasks per week in 55 hours or less.

(d The contractor must revise the time taken to complete a task whenever it is established that the time taken to complete a weekly task is not within the requirements of 1.1.3.

(e The Contractor shall, through all available community structures, inform the local community of the labour intensive works and the employment opportunities presented thereby. Preference must be given to people with previous practical experience in construction and / or who come from households:

a) where the head of the household has less than a primary school education;

b) that have less than one full time person earning an income;

c) where subsistence agriculture is the source of income.

d) those who are not in receipt of any social security pension income

Employment demographics

The Contractor shall endeavour to ensure that the expenditure on the employment of temporary workers is in the following proportions:

a) 60 % women;

b) 55% youth who are between the ages of 18 and 35; and

c) 2% on persons with disabilities.

MATTERS RELATING TO THE STANDARD SPECIFICATIONS

SECTION 1200 : GENERAL REQUIREMENTS AND PROVISIONS

B1202 SERVICES

Add the following to the fifth paragraph:

"Provision is made in the bill of quantities for payment for searching and exposing of known or unknown services as well as the relocation and/or protection of existing services. Any moving of existing services which may be required within the proclaimed road reserve will be undertaken by the relevant service authorities or by a selected subcontractor if so ordered by the engineer."

B1204 PROGRAMME OF WORK

(a) General requirements

Amend the word "network" in the fourth line of the first paragraph to read as "bar (Gantt) chart".

Add the following after the third paragraph:

"The bar-chart programme to be provided by the contractor shall show the various activities in such detail as may be required by the engineer. Progress in terms of the programme shall be updated monthly by the contractor in accordance with the progress made by the contractor.

In compiling the programme of work, the contractor shall indicate and make due allowance for the following, as specified elsewhere in the contract documents:

- The requirements regarding the accommodation of traffic and areas that may be occupied at any time for construction purposes (as indicated on the drawings and specified in Section 1500 of the specifications)
- Requirements regarding the training of labourers and Emerging Contractors (EC's).
- The requirements for work to be undertaken by labourers and work to be undertaken by EC's.

(b) Programme of work for rehabilitation work

Amend the word "network" in the fourth line of the second paragraph to read as "bar (Gantt) chart".

B1205 WORKMANSHIP AND QUALITY CONTROL

Add the following to the third paragraph:

"The engineer shall, however, undertake acceptance control tests for the judgement of workmanship and quality, without accepting any obligations vested with the contractor in terms of the contract with specific reference to quality of materials and workmanship. Such acceptance control test done by the engineer shall not relieve the contractor of his obligations to maintaining his own quality control system."

Add the following at the end of this clause:

"The engineer shall, for the purpose of acceptance control on products and workmanship, assess test results and measurements in accordance with the provisions of section 8300 of the standard specifications. Where small quantities of work are involved, a lot shall mean a full day's production for a specific item of work subject to acceptance control testing."

B1206 THE SETTING-OUT OF THE WORK AND PROTECTION OF BEACONS

Add the following:

"The contractor shall be responsible for the true and proper setting out of the Works and for the correctness of the position, levels, dimensions and alignment of all parts of the Works and for the provision of all necessary instruments, appliances and labour in connection therewith."

The Contractor shall take care that property beacons, trigonometrical survey beacons or setting-out beacons are not displaced or destroyed without the consent of the Engineer. Property

beacons and trigonometrical survey beacons that have been displaced or destroyed shall be replaced by a registered land surveyor, who shall certify such replacement.

The cost of replacing all beacons displaced or destroyed during the course of the Contract without the consent of the Engineer shall be borne by the Contractor."

B1209 PAYMENT

(b) Rates to be inclusive

Add the following:

"VAT shall be excluded from the rates and provided for as a lump sum in the Summary of Bill of Quantities".

(e) Materials on the site

Add the following:

"In addition, the engineer may at his sole discretion also allow payments under "Materials on Site" in respect of any construction materials if stored off-site providing that:

(a) The site selected for this purpose is approved by the engineer

(b) Such land is physically separated from any production plant or operation

(c) Only materials for use under this contract is stockpiled on such land

(d) The contractor has provided proof of an agreement with the owner of such land that the owner has no claim whatsoever on any materials stockpiled on such land

(e) Materials obtained by the contractor for or on behalf of emerging subcontractors (SMME's) shall remain the responsibility of the contractor after payment has been made in respect of materials on site."

B1214 CONTRACTOR'S ACTIVITIES IN RESPECT OF PROPERTY OUTSIDE THE ROAD RESERVE AND OF SERVICES MOVED, DAMAGED OR ALTERED

Add the following to the first paragraph of subclause (d)(ii)

"This is also required with respect to fences, gates, camp sites, bypasses and material spoiled on private property."

Add the following after subclause (e)

"These written statements, as required in Clause 1214(b)-(e) shall be handed to the Engineer before the final certificate will be issued."

B1215 EXTENSION OF TIME RESULTING FROM ABNORMAL RAINFALL

Add the following after the first paragraph of this clause:

"For the purposes of this contract, extension of time resulting from abnormal rainfall or other forms of inclement weather shall be determined according to the requirements of Method ii (critical-path method)."

Method (ii) (Critical path method)

Delete "(based on a five-day working week)" in the fifth and sixth lines of the second paragraph of the description of this method.

Delete the last sentence of the second paragraph of the description of this method and replace with the following:

"The value of "n" shall be taken as five (05) working days per calendar month.

If normal rainy or inclement weather, resulting in delays, occurs for less than five (05) working days in any calendar month, the difference between the five (05) working days and the actual number of working days on which normal rainy or inclement weather occurred, shall be ignored and not accumulated for the duration of the contract period for the purposes of determining an extension of time due to normal rainy weather, nor due to any other reason.

Items of work on the critical path of the programme of work which are subject to climatic limitations shall also be considered for extension of time if such items of work are delayed by e.g. cold weather, high winds or other inclement weather conditions.

In this regard, reference shall be made to weather limitations specified for the application of various bituminous products. However, for months during which seal-work cannot be undertaken in terms of the specifications, no extension of time shall be claimed for.

Rainfall records for **LOUIS TRICHARDT**

MONTH	AVERAGE RAINFALL (mm)	RAIN DAYS (per month)
JANUARY	95.8	12
FEBRUARY	82.9	11
MARCH	65.4	10
APRIL	25	6
MAY	9.7	3
JUNE	14.4	2
JULY	2.4	1
AUGUST	2.8	1
SEPTEMBER	4.1	3
OCTOBER	37.3	7
NOVEMBER	111	14
DECEMBER	92.6	13

B1217 PROTECTION OF THE WORKS AND REQUIREMENTS TO BE MET BEFORE CONSTRUCTION OF NEW WORK ON TOP OF COMPLETED WORK IS COMMENCED

Add the following subclause:

"(h) No concrete kerbing or concrete drains directly adjoining the bituminous surfacing shall be constructed prior to the completion of the bituminous surfacing."

B1222 USE OF EXPLOSIVES

Add the following subclause:

“(h) Where blasting operations are undertaken in close proximity of temporary deviations, the contractor shall implement all such safeguarding measures as may be required and instructed by the engineer.”

B1224 THE HANDING-OVER OF THE ROAD RESERVE

Add the following:

"The total length of the road reserve between the specified limits of construction will be handed over to the contractor on the commencement date. Reference shall, however, be made to the requirements of section 1500 of these specifications where limitations in respect of work-areas are specified. In the event of the non-adherence by the contractor in terms of the mentioned specifications, the engineer shall withdraw such sections of the road reserve as may be justified to ensure suitable progress of the works or safe passage of traffic."

B1229 SABS CEMENT SPECIFICATIONS

Replace the last paragraph of this clause with the following:

“Where reference is made in this specification or the standard specifications to the cement specifications, eg. SABS 471: Portland cement and rapid hardening Portland cement, it shall be replaced with the new specification:

SABS ENV 197-1: Cement-composition, specifications and conformity criteria.

Part 1: Common cements.

Furthermore, where reference is made in this specification or the standard specifications to the different cement types, the following new names/types shall apply:

Old product nomenclature	Typical new product nomenclature	
	Cement type	Cement strength class
OPC	CEM I	32,5
	CEM I	32,5R
RHC	CEM I	42,5
	CEM I	42,5R
LASRC	No provision made	No provision made
PC15SL	CEM II/A-S	32,5
	CEM II/A-S	32,5R
	CEM II/A-S	42,5
PC15FA	CEM II/A-V	32,5
	CEM II/A-V	32,5R

Old product nomenclature	Typical new product nomenclature	
	Cement type	**Cement strength class**
	CEM II/A-W CEM II/A-W	32,5 32,5R
RH15FA	CEM II/A-V CEM II/A-V CEM II/A-W CEM II/A-W	42,5 42,5R 42,5 42,5R
PBFC	CEM III/A CEM III/A	32,5 32,5R
PFAC	CEM II/B-V CEM II/B-W	32,5 32,5
RH30SL	CEM II/B-S CEM II/B-S	32,5R 42,5
RH40SL	CEM III/A CEM III/A	32,5R 42,5

CEM I 32,5, CEM II A-S 32,5, CEM II/A-V 32,5, or CEM III A may be used for the manufacture of reinforced concrete members."

Add the following new clauses:

"B1230: IN-SERVICE AND STRUCTURED TRAINING

The contractor shall in addition to the structured (accredited) training as provided for in Part C of this document implement an in-service training programme, from the commencement of the contract, in which the various skills required for the execution and completion of the works are imparted to the labourers engaged thereon, in a programmed and progressive manner. Labourers shall be trained progressively throughout the duration of the contract, in the various stages of a particular type of work.

(a) Details of in-service and structured training

(i) The contractor shall attach to form RDP 1(E) basic details of his proposed in-service training programme, which details shall inter alia include the following:

- the details of training to be provided
- the manner in which the training is to be delivered
- the number and details of trainers to be utilised.

(ii) The in-service training programme shall be submitted with the initial works programme. The progress in relation to this programme will be recorded monthly and attached to the site meeting minutes and payment certificate.

(iii) The contractor shall provide on site, sufficient skilled and competent trainers to train all labourers engaged on the contract, in the various skills required for the execution and completion of the works.

(iv) All labourers shall be remunerated in respect of all time spent undergoing training.

(v) Every worker engaged on the contract shall on the termination of his participation on

the contract, be entitled to receive from the contractor, a certificate of service in which the following information shall be recorded:

- the name of the contractor
- the name of the employee
- the name of the project/contract
- the nature of the work satisfactorily executed by the worker and the time spent thereon
- the nature and extent of training provided to the worker
- the dates of service.

The cost of the above obligations shall be deemed to be covered by the sums and rates tendered for items B13.01(a), (b) and (c) in the bill of quantities. The performance of the contractor in providing in-service training, shall be taken into consideration should the contractor fail to reach his CPG at the completion of the project.

(b) Lead time for training

The training of labour as specified shall, as far as possible, take place before commencement of each activity and the contractor shall take into account in his programme the lead-time he requires for such training. All training herein specified shall be deemed to be a construction activity and a non-negotiable condition of the contract".

B1231 COMMUNITY LIAISON OFFICER (CLO)

The contractor or his appointed agent will appoint a Community Liaison Officer (CLO) after consultation with the local communities, the engineer and the employer. The contractor shall direct all his liaison efforts with the local communities through the appointed officer. The contractor shall, however, accept the appointed as part of his management personnel.

(a) Duties of the Community Liaison Officer

The Community Liaison Officer's duties will be:

(i) To be available on site daily between the hours of 07:00 and 17:00 and at other times as the need arises. His normal working day will extend from 07:00 in the morning until 16:00 in the afternoon.

(ii) To determine, in consultation with the contractor, the needs of the temporary labour for relevant skills training. He will be responsible for the identification of suitable trainees and will attend one of each of the training sessions.

(iii) To communicate daily with the contractor and the engineer to determine the labour requirements with regard to numbers and skill, to facilitate in labour disputes and to assist in their resolution.

(iv) To assist in and facilitate in the recruitment of suitable temporary labour and the establishment of a "labour desk".

(v) To attend all meetings in which the community and/or labour are present or are required to be represented.

(vi) To assist in the identification, and screening of labourers from the community in accordance with the contractor's requirements.

(vii) To inform temporary labour of their conditions of temporary employment and to inform temporary labourers as early as possible when their period of employment will be terminated.

(viii) To attend disciplinary proceedings to ensure that hearings are fair and reasonable.

(ix) To keep a daily written record of his interviews and community liaison.

(x) To attend monthly site meetings to report on labour and RDP matters.

(xi) All such other duties as agreed upon between all parties concerned.

(xii) To submit monthly returns regarding community liaison as illustrated in Part C5.1 of this document (form RDP 12(E)).

(b) Payment for the community liaison officer

A special pay item is incorporated in section 1200 of the bill of quantities relating to payment of the liaison officer on a prime cost sum basis. This payment shall only be made for the period for which the duties of the liaison officer are required. The remuneration of the CLO shall be determined by the Employer in terms of the Sectorial determination 2: Civil Engineering Sector (Task grade 3).

(c) Period of employment of the community liaison officer

The period of employment of the community liaison officer shall be as decided upon jointly by the contractor, engineer and employer at a maximum period of a six months basis, but with the option of renewal.

B1232 SUBCONTRACTORS

Over and above the stipulations of clause 4.4 of the General Conditions of Contract 2010, regarding subletting of part of the works, it is a condition of the contract that an approved subcontractor shall not sublet part of his work, covered in his appointment by the main contractor, to another subcontractor without the consent and approval of the engineer. Subletting shall in all cases be critically considered by the engineer.

In addition to the provisions of clause 4.4 of the general conditions of contract regarding subcontracting of the works, it is a requirement of this contract that an approved subcontractor shall not further subcontract work subcontracted to him by the main contractor, to another subcontractor without the consent and approval of the engineer. Subcontracting shall in all cases be critically considered by the engineer. The engineer reserves the right to limit the extent or the volume of work subcontracted by the contractor, should he deem it necessary in terms of progress or quality of workmanship.

B1233 WORKMEN'S COMPENSATION ACT

All labour employed on the site shall be covered by the Compensation for Occupational Injuries and Deceases Act (COIDA). The contractor shall pay in full, including the payment of the necessary levies, such amounts, as are due in terms of the Act. The contractor at the commencement of the contract shall resolve the manner in which Workmen’s Compensation will be handled. Amounts paid by the contractor shall not be included in the wage rates but shall be covered by the Contractor to be deemed as included in his General Obligations rates in Section 1300 of the Bill of Quantities.

Add the following clause:

B1234 MINE HEALTH AND SAFETY ACT 1996, ACT 29 OF 1996

(a) Introduction

The main objective of this Act is to protect the health and safety of persons at mines. This specification is therefore aimed at promoting health and safety specifically at borrow pits. Borrow pits are classified as mines.

(b) General Provisions

The contractor shall be responsible for controlling his operations at every borrow pit where material is being excavated to ensure compliance with all the requirements of the Mine Health and Safety Act, 1996. The contractor shall also ensure that the works, shaping and finishing off of the borrow pit are done in accordance with the provisions as specified in section 3100 of the COLTO Standard Specifications and this Act. The contractor shall also comply to the requirements as set out in C3.4.3.2 Environmental Management Plan.

The minimum requirements for operations at borrow pits are:

- Borrow pits are worked in such a way that the health and safety of employees and the public will not be endangered.
- A monthly report shall be submitted to the engineer on health and safety aspects at the borrow pits.
- The contractor shall appoint a manager to manage the borrow pits in accordance with the Mine Health and Safety Act.
- The contractor shall take the necessary steps to ensure that the work area of the borrow pits are safe at all times. This shall include items such as the provision of fencing and security guards.

(c) Duties of the Manager

The minimum duties of the manager supervising the activities at borrow pits shall be:

- Maintain a healthy and safe borrow pit environment.
- Identify hazards and related risks to which persons and employees are exposed.
- Establish a health and safety policy that
  - Describes the organisation of work.
  - Contains aspects concerning the protection of the employees and other persons' health and safety.
  - Contains a risk analysis.
- Supply and erect the necessary safety and warning signs.

Add the following pay items and change the clause number.

B12.35 MEASUREMENT AND PAYMENT

Add the following items:

"ITEM		**UNIT**
B12.01	**Locating Existing Services**	Provisional Sum
ITEM		**UNIT**
B12.02	**Hand Excavation to determine the positions of existing services**	
	To determine the positions of existing services	cubic metre (m^3)
	Measurement and payment shall be as specified for item 22.01 in the standard specifications.	
ITEM		**UNIT**
B12.03	**Project Launch**	
	Project Launch	Prime Cost Sum

ITEM		**UNIT**
B12.07	**Provision for a Community Liaison Officer**	
	Provisional sum for the payment of the Community Liaison Officer	Provisional Sum
	Expenditure of the above item shall be made in accordance with the general conditions of contract.	

ITEM		**UNIT**
B12.07	**Provision for a Community Liaison Officer**	
	Provisional sum for the payment for attending steering Committee meetings	Provisional Sum

ITEM		**UNIT**
B12.07	Handling costs and profit in respect of sub-items a to e	percentage (%)

Measurement and payment shall be in accordance with the general conditions of contract."

The tendered percentage is a percentage of the amount actually spent under the sub-items, which shall include full compensation for the handling costs of the contractor, and the profit.

The prime cost sums shall be paid in accordance with the provisions of the General Conditions of Contract. The tendered percentage is a percentage of the amount actually spent under the prime cost items, which shall include full compensation for the profit in connection with providing the specified service.

SECTION 1300 : CONTRACTOR'S ESTABLISHMENT ON SITE AND GENERAL OBLIGATIONS

B1302 GENERAL REQUIREMENTS

(a) Camps, constructional plant and testing facilities

Add the following:

"The contractor shall, at each area where work is being undertaken, provide on a daily basis at least one (1) portable chemical latrine unit per thirty (30) workers for use by construction workers employed on the project. The latrine units shall be serviced daily and kept in a hygienic and orderly state to the satisfaction of the engineer. No separate payment shall be made for this requirement and shall be deemed to be included in the rates tendered for the contractor's time-related obligations."

B1303 PAYMENT

ITEM		UNIT
B13.01	**The contractor's general obligations**	(As specified)

Add the following after the fifth paragraph:

"The combined total tendered for sub-items (a), (b) and (c) shall not exceed 15% of the tender sum, excluding VAT.

Should the contractor be of the opinion that 15% is inadequate to cover his costs in terms of section 1300, he shall indicate separately with his tender where such costs have been allowed for in his tender. If no such indication is given, the contractor shall not at any stage during the contract for any reason whatsoever claim additional compensation under this item."

SECTION 1400 : HOUSING, OFFICES AND LABORATORIES FOR THE ENGINEER'S SITE PERSONNEL

B1402 OFFICES AND LABORATORIES

(a) General

Add the following:

"The facilities to be provided for the engineer in terms of these specifications shall be fenced off by a two metre high veranda type security fence with diamond mesh on the vertical portion and barbed wire on the overhang. A security gate shall be provided in the fence which shall be guarded at all times by an acceptable watchman provided by the contractor.

The engineer's establishment may be incorporated within the contractor's establishment provided that the preceding requirements are met to the satisfaction of the engineer.

Separate payment shall be made for the provision and erecting of the security fence and gate as indicated on the drawings, but the cost in respect of the provision of a watchman at all times by the contractor shall be deemed to be included in the contractor's tendered rate for item B13.01(c)."

(b) Offices

Add the following new sub-sub-clause:

"(xviii) The engineer's site supervisory staff shall be provided with cellular telephones by the contractor for site communication purposes. Provision is made in the bill of quantities for separate payment of the supply and operating costs of such cellular phones."

B1406 MEASUREMENT AND PAYMENT

Add the following sub-item:

ITEM		UNIT
B14.11	**Provision of cellular telephone to the Engineer:**	
	(a) Cost of cellular phone, calls and other charges	Provisional Sum (P Sum)
	(b) Handling cost and profits in respect of item B14.11(a)	Percentage (%)

The unit of measurement for item B14.11 shall include full compensation for the monthly cellular phone costs for the Engineer's site personnel.

Measurement and payment in respect of the provisional sum item shall be made in accordance with the provisions of the general conditions of contract.

ITEM		UNIT
B14.12	**Provision and erection of security fencing (Including gate)**	metre (m)

The unit of measurement shall be the metre of security fence supplied and erected as indicated on the drawings and/or ordered by the engineer. The tendered rate shall include full compensation for procuring and furnishing of all material, including one vehicle gate, labour and equipment required to erect the specified security fence and maintain it for the duration of the contract."

General: Method of payment

Add the following:

"The tendered rates under this section of the bill of quantities shall also include full compensation for the dismantling and removal from site of all offices, laboratories and other facilities provided for the engineer's supervisory staff at the completion of the contract."

SECTION 1500 : ACCOMMODATION OF TRAFFIC

B1502 GENERAL REQUIREMENTS

(e) Access to properties

Add the following:

"Where the alignment of the new road coincides with the alignment of the existing road, a number of accesses to private properties will have to be operational and maintained during the constructional period. No separate payment will be made for providing acceptable and safe access across the new road at all times during construction of the road."

(i) Traffic safety officer

Add the following after subclause (viii):

"(ix) be responsible for contacting all the relevant authorities in the event of an accident on the site of the Works

(vi) arrange for the removal of broken down vehicles that obstruct the normal traffic flow

The Contractor shall provide the traffic safety officer with all the necessary resources to carry out his duties as specified, inter alia, light delivery van (LDV), personnel, warning signs and revolving amber flashing lights. A warning sign with the words "CONTRACTOR TRAFFIC CONTROL" and/or "AANNEMER VERKEERSBEHEER" in clearly legible letters shall be mounted on the vehicle at least 1,5m above ground level to be clearly visible. The vehicle shall be equipped with two revolving amber-coloured flashing lights with a minimum intensity of 55W. The flashing lights shall be switched on and the warning sign be displayed at all times when the vehicle is used on the site.

No separate payment will be made for the traffic safety officer, his vehicle, personnel and equipment and the cost thereof shall be included in the Contractor's cost for his establishment and general obligations (Section 1300)."

Add the following new subclauses:

"(j) Handing over the site

The total extent of the site between the limits of construction as described in this document and indicated on the drawings will be handed over to the contractor at the commencement of the contract period. The engineer however reserves the right to adjust this arrangement should progress or safe passage of traffic warrant such a change.

(k) Use of explosives in close proximity of temporary deviations

The contractor shall arrange all necessary traffic control and other requirements to safeguard the traffic on temporary deviations during blasting operations.

(l) Land taken up for deviations

Negotiations with landowners to obtain the land taken up by temporary deviations will be undertaken by the employer. A prime cost sum is allowed in the bill of quantities for payment of compensation to affected landowners. All other negotiations regarding temporary access to properties, land-use, fencing requirements etc. shall be dealt with by the contractor in conjunction with the engineer and be confirmed in writing and be kept on record by the contractor.

"(m) Maximum lengths of construction areas

A temporary deviation, where the proposed road follows the existing route shall be constructed along the length of existing road. Traffic shall generally be accommodated as follows:

On a two-way two lane gravel deviation (Class 1) constructed partially outside or adjacent to the existing road reserve boundaries of road.

(i) On one-way single lane gravel deviation (Class 2) constructed inside the existing road reserve boundaries and on either side of road. In this instance special cognisance shall be taken to accommodate traffic to private properties.

A maximum length of one section of approximately 5,0km or two sections of 3,0km each of deviation (Class 1 or 2) shall be operational at a time and no relieve of this limitation shall be considered by the engineer except where the programme necessitates such at the construction of bridges."

B1503 TEMPORARY TRAFFIC CONTROL FACILITIES

Add the following after the first paragraph:

"All temporary road signs, devices, sequences, layouts and spacing shall comply with the requirements of the Road Traffic Act, 1996 (Act 93 of 1996), the National Road Traffic Regulations, 2000, the South African Road Traffic Signs Manual, the requirements of the relevant road authority and the drawings. All temporary traffic control facilities shall comply with the guidelines set in SA Road Traffic Signs Manual, Volume 2, Chapter 13: Roadworks Signing, (SARTSM, June 1999, obtainable from the Government Pinter, Pretoria)."

(b) Road signs and barricades

Add the following:

"All the temporary road signs are to be mounted on posts as specified in section 5600 of the specifications. Provision shall be made for the supply and erection of the signs and the maintenance of the signs during the construction period. Provisions shall also be made for the removal of the temporary road signs on completion of the construction work when such signs are no longer required.

Temporary road signs and channelization devices shall be manufactured in accordance with the latest edition of the South African Road Traffic Signs Manual (June 1999) and placed as shown on the drawings and in Road Signs Note 13. Delineators shall be manufactured from a non-metal material and shall be mounted on a base section also manufactured of non-metal material. Single as well as back-to-back mounted delineators are required.

The obligation to arrange safe passage of traffic shall always be vested with the contractor regardless what is indicated on the drawings of the engineer."

(c) Channelization devices and barricades

Add the following:

"Drums shall not be used as channelization devices.

TW 401 and TW 402 delineators shall comply with the following requirements:

a) It shall be manufactured from a flexible material and shall comply with SABS 1555. The blade portion of the delineator shall be positively affixed to a base unit which in turn shall be stable on its own or be stabilized by means of sandbags when used on the road.

ii) The blade shall be retro-reflectorised, with class 1 yellow sheeting on the side facing oncoming traffic..

iii) It shall nominally be 1000mm high x 250mm wide and the bottom edge of the delineator shall not be more than 200mm above the road surface.

iv) It shall be subject to the approval of the Engineer.

The maximum spacing between centres of delineators shall be as shown on the drawings or as directed by the Engineer."

(e) Warning devices

Add the following:

"It is a requirement of this contract that all construction vehicles and plant used on the works will be equipped with rotating amber flashing lights and warning boards as specified in the standard specifications. Construction vehicles travelling outside the limits of construction areas shall however, not operate the warning lights.

The warning lights shall have a base diameter of at least 170mm and the amber bulb cover a height of a least 150mm high. It shall be a requirement that the contractor also provides the engineer's site personnel with warning lights for their vehicles (a maximum of two lights are required) without any payment applicable.

B1514 TEMPORARY FENCING AND GATES

Replace the contents of this clause with the following:

"Where temporary fencing is ordered by the engineer, it shall be paid for under item 55.06 of the standard specifications. The temporary fencing shall be new fencing material, which shall subsequently be dismantled and removed and erected at an alternative position as directed by the engineer. When ordered by the engineer, temporary fences and gates shall be moved to new locations or either left in place or when no longer required be dismantled and removed from site if so directed. Allowance is made in the bill of quantities for moving existing fences and gates."

Add the following clause:

B1517 RETRO-REFLECTIVE MATERIAL

"Retro-reflective material for temporary signs shall comply with the requirements of SABS 1519-1 for weathered material. Tests shall be carried out with a field retro-reflectometer and the testing procedure and classification are described in Clause B 8118. The value of the coefficient of Retro-Reflection shall be at least 60% of the values indicated in Table B 8118/1."

B1518 MEASUREMENT AND PAYMENT

Renumber item 15.01 as B15.01 and add the following:

"The tendered rate shall also include for all measures necessary to safeguard traffic on temporary deviations during blasting operations as well as all temporary traffic-control facilities for temporary deviations."

Delete all references to half width construction under payment item 15.01. Half width construction will be measured under payment item 15.10.

Renumber item 15.03 as B15.03 and add the following

"This sections provides only for additional traffic-control facilities as and when required on instruction by the Engineer and does not provide for facilities already included under payment item B15.01"

Add the following sub-item:

"ITEM		**UNIT**
B15.02	**Temporary traffic control facilities**	
(n)	Provision of high visibility safety jackets and safety hats	number (No)

The unit of measurement shall be the number of safety jackets supplied to the supervisory staff.

The tendered rate shall include full compensation for providing and maintaining hats and the jackets equipped with high visibility retro-reflective and/or fluorescent panels in red, yellow and white for the duration of the contract".

SECTION 1700: CLEARING AND GRUBBING

B1702 DESCRIPTION OF WORK

a) Clearing

Add the following:

"Clearing shall include the removal of material to a thickness of up to 150mm in-situ material as ordered by the engineer. No payment shall be made for temporary stockpiling of topsoil material in the case where this material is applied as topsoil after completion of road side slopes.

Should the required depth exceed 150mm, the total volume of material removed shall either be classified as "temporary stockpiling of topsoil" or "unsuitable roadbed material" or "cut to spoil" whichever is applicable as allowed for in the standard specifications. In these cases no payment shall be made for clearing and grubbing.

Clearing as described shall in all cases be undertaken in such a manner that the topsoil is preserved and not contaminated with other debris or rubbish. Cross-sections for the determination of earthworks quantities shall be taken after clearing (topsoil or unsuitable roadbed material) and roadbed preparation if applicable.

Payment for gabion boxes and mattresses which have to be removed and the material sorted and stacked shall be made under section 5200"

B1703 EXECUTION OF WORK

(a) Areas to be cleared and grubbed

Add the following:

"Apart from normal clearing and grubbing, the fill embankments of the existing roads are also to be cleared and grubbed over the areas where the new horizontal alignment coincides with the alignment of the existing road, or where repairs are required to the fill embankments of the approaches of bridges. Provision is made for separate payment for clearing and grubbing of the existing fill embankments where conventional machinery might be suitable to undertake the work due to the steep side slopes of the embankments. An additional pay-item is allowed for in the bill of quantities for this type of clearing and grubbing which may have to be undertaken by hand or similar manner."

B1704 MEASUREMENT AND PAYMENT

Change item 17.01 to read as follows:

ITEM		UNIT
B17.01	**Clearing and grubbing of:**	
	Clearing and grubbing	hectare (ha)

Measurement and payment for item B17.01 shall be as specified for item 17.01 of the standard specifications.

SECTION 1800 : DAYWORK SCHEDULE

Note: This is a new section added to the Standard Specifications.

Add the following:

B1801 SCOPE

This section covers the listing of daywork items for use in determining payment for work which cannot be quantified in specific pay item "units" in the bill of quantities or work ordered by the engineer during the construction period which was not foreseen at tender stage for which no applicable rate exists in the schedule or for work of a special or different character warranting special payment as decided by the engineer.

B1802 ORDERING OF DAYWORK

No daywork shall be undertaken unless specific written authorisation is obtained from the engineer.

B1803 MEASUREMENT AND PAYMENT

The engineer may order the following daywork items:

ITEM	DESCRIPTION	UNIT
B18.01	(a) Normal hours of duty of:	
	(i) Unskilled	Hour (h)
	(ii) Semi-skilled	Hour (h)
	(iii) Skilled	Hour (h)
	(iv) Foreman	Hour (h)
B18.02	Hire of construction equipment	
	(a) Excavator 22 –30 ton	Hour (h)
	(b) TL Backactor	Hour (h)
	(c) Front end loader	Hour (h)
	(d) Platform truck	Hour (h)
	(e) Tip truck	Hour (h)
	(f) Grader (CAT 140G or similar)	Hour (h)
	(g) Walk behind roller *(Bomag BW90 or similar)*	Hour (h)
	(h) Mechanical Broom	Hour (h)
	(i) D6 Dozer	Hour (h)
	(j) Compressor	Hour (h)
	(k) Submersible dewatering pump	Hour (h)

The unit of measurement shall be the actual number of hours worked by labourers or foremen or an item of plant.

The tendered rates shall include full compensation for all cost items including overheads, head-office expenses and profits as described in sub-clause 6.5 of the general conditions of contract and shall be subject to contract price adjustment as provided for in the contract.

The mark-ups on daywork items in accordance with the Appendix to the Tender shall not be applicable on daywork items listed in the bill of quantities in terms of the above specifications. In the event of new daywork rates being requested for items not appearing in the bill of quantities, then the provisions of the general conditions of contract and the Appendix to the Tender shall apply.

Prior to the commencement of any work by the labourers described under item B18.01, the contractor must obtain written consent from the engineer regarding the classification and composition of all labourers in terms of “unskilled” and “skilled” labourers required for the work as ordered by the engineer.”

SECTION 2100 : DRAINS

B2103 BANKS AND DYKES

Add the following:

"Mitre banks at culvert inlets should be considered at such a skew angle that it guides the water into the inlet with a minimum loss of velocity (energy)."

B2104 SUBSOIL DRAINAGE

(a) Materials

(i) Pipes

Delete the last sentence of the fifth paragraph and substitute it with the following:

"Perforation for 100mm pipes shall be spaced in two rows, one on each side of the vertical centre line of the pipe, and at one third of the circumference. The perforation for the 150mm pipes shall be spaced in four rows, two as described for 100mm pipes, and the other two rows at two thirds of the circumference."

(ii) Synthetic-fibre filter fabric

Add the following:

"All filter fabric shall be a non-woven needle punched type material and must be approved by the engineer. Filter fabrics shall have a minimum co-efficient of permeability of 3 x 10-3 m per second."

B2107 MEASUREMENT AND PAYMENT

Add the following new items:

"ITEM	**UNIT**
B21.20 Galvanised wire mesh 250 x 250mm, at the outlets of subsoil drainage systems. Mesh 10mm x 2,5mm wire diameter	Number (No)

The unit of measurement shall be the number of 250mm x 200mm pieces of wire mesh, with a 10mm x 10mm mesh and 2,5mm wire diameter built into the subsurface drain outlet structure as shown on the drawings.

The tendered rate shall include for procuring, furnishing and installing the material, cutting, waste and keeping the mesh in the pipe opening clean during installation.

ITEM	**UNIT**
B21.21 Subsoil drainage markers	Number (No)

Measurement and payment shall be as specified for item 22.24 in the standard specifications."

SECTION 2200 : PREFABRICATED CULVERTS

B2201 SCOPE

Add the following:

"All rectangular culverts with spans from 0,9m up to and including 2,4m shall be constructed with precast units.

The attention of the contractor is drawn to the fact that information given on the plans, longitudinal sections or drainage schedules may have to be altered to suit actual site conditions and, therefore, the contractor shall only construct these culverts after the engineer has verified the information on the drawings from detail surveys taken on site by the contractor as directed by the engineer.

Precast units shall be ordered by the contractor from actual measurements of length acquired on the site and not from lengths stated in the drainage schedule or from the bill of quantities.

No precast units shall be ordered until the engineer has satisfied himself that the proposed units have been manufactured to the required tolerances and loading standards. The engineer must be given the opportunity to load test units if he considers this necessary".

B2203 MATERIALS

(f) Skewed Ends

Delete the second and third paragraphs and substitute with the following:

"Precast portal and rectangular culverts placed on a skew shall be supplied with cast in situ skewed ends as shown on the drawings. In situ skew ends are to be constructed simultaneously with the wingwalls and headwalls".

B2204 CONSTRUCTION METHODS

Add the following:

"In all cases where soft founding materials is classified as suitable for culvert bedding construction, the in situ material shall be ripped, moistened and compacted to 90% or 93% modified AASHTO density. The depth of preparation and compaction of founding material shall be as indicated on the drawings or as specified by the engineer. Allowance for measurement and payment for this work is made in the bill of quantities under this section."

(c) Excavation by hand

Where circumstances prevent the use of mechanical excavators and material can be removed only by hand tools, the engineer shall authorise the supplementary payment to the contractor for such work at the tendered rates for excavation by hand should he be satisfied that the contractor had been unable to prevent the necessity for excavation by hand by proper planning and precautionary measures. The supplementary rate for excavation by hand shall not apply to minor finishing or clearing jobs in excavations which are otherwise being done by mass excavation plant.

Payment for hand excavation shall be an "extra over" payment to normal excavation as allowed for in item 22.01."

B2205 EXCAVATION FOR CONSTRUCTION BY TRENCH METHOD

Add the following subclauses:

"(c) Excavation by hand

Where circumstances prevent the use of mechanical excavators and material can be removed only by hand tools, the engineer shall authorise the supplementary payment to the contractor for such work at the tendered rates for excavation by hand should he be satisfied that the contractor

had been unable to prevent the necessity for excavation by hand by proper planning and precautionary measures. The supplementary rate for excavation by hand shall not apply to minor finishing or clearing jobs in excavations which are otherwise being done by mass excavation plant.

Payment for hand excavation shall be an "extra over" payment to normal excavation as allowed for in item 22.01.

(d) Drainage of excavations

The contractor shall apply suitable, effective drainage and dewatering methods for preventing the ingress of water into the excavation and to keep them dry.

Drainage measures, with the exception of pumping, shall be maintained until the backfilling has been completed. Between various construction stages, pumping may be interrupted in consultation with the engineer.

Any draining or pumping of water shall be done in a manner as will preclude the concrete or materials or any part thereof from being carried away.

Allowance for measurement and payment for dewatering and keeping dry of culvert excavations is made in the schedule in this section".

B2210 LAYING AND BEDDING OF PREFABRICATED CULVERTS

B2210(b)(i) Cast in situ invert slabs

Replace with the following:

"In accordance with the drawings, transverse construction joints are required in cast in situ concrete invert slabs for portal culverts. In addition, longitudinal construction joints as shown on the drawings between the invert slabs of each of the barrels of multiple culverts are required. Allowance for measurement and payment for a Class F1 surface finish and soft board in these joints is made in the bill of quantities. No payment shall be made for formwork on the outside edges of invert slabs (closest to excavated face).

All culverts (precast as well as in situ) shall be constructed with an in situ reinforced concrete floor laid on a 75mm concrete screed".

Delete subclause B.2210(b)(ii) : "Prefabricated floor slabs."

B2211 BACKFILLING OF PREFABRICATED CULVERTS

Change the last sentence in the fourth paragraph to read "90% or 93% as shown on the drawings or as directed by the engineer."

B2212 INLET AND OUTLET STRUCTURES, CATCHPITS AND MANHOLES

(b) Concrete work

Add the following:

"The type of surface finish for in situ concrete in the culverts shall be as indicated on the drawings. Generally all exposed faces shall be of Class F2 formwork and faces covered by backfill shall be Class F1. The top of parapet walls and wingwalls shall be finished to a Class U2 surface finish."

(h) Prefabricated inlet and outlet structures

Add the following:

“The use of precast concrete inlets and outlets as described in clause 2212(h), shall not be allowed under any circumstances. Cast in situ concrete wingwall type inlets and outlets shall be constructed as indicated on the drawings and shall be in accordance with section 6000 of the Standard Specifications. Allowance for measurement and payment for wingwall type inlets and outlets is made in the schedule in this section.”

B2218 MEASUREMENTS AND PAYMENT

Add the following to pay item 22.05:

"In addition to the requirements for measuring concrete backfill to rectangular culverts as specified for item 22.08, the following shall apply:

Concrete backfill shall be measured to the actual dimensions of the precast units, i.e. actual volumes between ribs and haunches shall be taken into account. For the purpose of calculating concrete backfill quantities, the horizontal dimensions of the concrete backfill on the outside of the culvert(s) (closest to excavated face), shall be taken as 100mm maximum irrespective of what type or make of precast portal is used or the actual width of the excavation.

The width of the concrete backfill between portals in the case of multiple culverts, shall be taken as 80mm for precast units with a leg height of 1500mm and 100mm for precast units with a leg height exceeding 1500mm. The vertical dimensions, in both cases, shall be equal to the height of the portal".

SECTION 2300 : CONCRETE KERBING, CONCRETE CHANNELLING, CHUTES AND DOWNPIPES AND CONCRETE LININGS FOR OPEN DRAINS

B2301 SCOPE

Add the following:

"The position and length of the following types of concrete kerbs and channels are indicated on the geometric layout plans, typical drawings and on the drainage plans.

Type A	:	In situ concrete channel, 0,8m wide on fills
Type B	:	Precast concrete kerbing, semi-mountable (SABS 927-1969)
Type C	:	In situ concrete kerbing at intersections
Edge beam	:	In situ concrete kerbing at farm access and bus stops
Type E, F1 & F2	:	In situ concrete "V"-shaped channels in side drains and open drains."

B2302 MATERIAL

Add the following new sub-clauses:

(e) Metal pipes

"Metal pipes down side slopes shall comply with the requirements of clause 2203 of the standard specifications."

B2304 CONSTRUCTION

(d) Slip form kerbing

Add the following:

"Slip-form kerbing shall under no circumstances be allowed."

(e) Cast in situ kerbs and channels

Add the following:

"Forming and templates used to form joints between alternate sections shall be of steel plate of which the thickness shall not be less than 5mm."

Add the following new sub-clauses:

(i) Construction sequence

Replace paragraphs (i), (ii) and (iii) with the following:

"In all cases where kerbing and/or channelling adjoin the bituminous surface of the road, the kerbing and/or channelling may only be constructed after the bituminous surface has been completed.

Before commencing with the kerbing and/or channelling, the surfacing and the base, shall be accurately cut to line with a mechanical saw to a minimum depth of 75mm. After excavation the concrete shall then be cast against the cut surface without formwork. All material outside the cut line must be carefully removed to the required thickness of concrete without damaging the edge before commencing with the casting of the concrete. No payment shall be made for repair work as instructed by the engineer to damage caused by the cutting/excavating process of surfacing and base layers. Any concrete spilt onto the surfacing shall immediately be removed and cleaned. Where so required by the engineer, the contractor shall, without any additional compensation, paint emulsion over the stained surface.

Add the following sub-clause:

(k) Formwork and finish

“Formwork and finish of concrete kerbs shall comply with the requirements of section 6200. All visible edges on the sides or at joints of cast in situ concrete kerbs or channels shall be rounded with a rounding tool.”

SECTION 3100 : BORROW MATERIALS

B3102 NEGOTIATIONS WITH OWNERS AND AUTHORITIES

Add the following to sub-clause 3102(a):

"Arrangements regarding to access to borrow pits and the alignment of haul roads shall be made between the contractor and the owners of the land on which borrow pits are situated. The engineer's representative on site shall be present at all such negotiations, which shall be confirmed in writing by the contractor. All costs involved with such negotiations as well as the requirements contained in clause 3102 and clause 1225 of the specifications shall be borne entirely by the contractor."

B3103 OBTAINING BORROW MATERIALS

(a) General

Add the following:

"The expropriation and compensation for land from which borrow materials is obtained shall be negotiated and paid for by the employer."

(b) Use of borrow materials

Add the following to the second paragraph of this sub-clause:

"Compensation to owners and arrangements with owners for taking material from alternative borrow pits proposed by the contractor shall be the contractor's responsibility and entirely at his own expenses."

B3104 OPENING AND WORKING BORROW PITS AND HAUL ROADS

(c) Excess overburden

Add the following:

"All excess overburden removed at borrow pits shall be replaced over the entire area of the borrow pit after initial shaping has been undertaken in an even layer. Payment for this requirement shall be deemed to be included in pay item 31.01

(f) Protecting borrow pits

Add the following:

"It is a requirement of the contract that each borrow pit or pits shall be provided with fencing around the perimeters, including a access gate, of the borrow areas, including the supply of danger warning signage fixed to the fencing, visible at all sides approaching the borrow pit area. The fencing shall be erected prior to entering the land for borrowing purposes and shall on final finishing of the borrow areas as specified by the employer, be dismantled and removed or left in-place as instructed by the employer. Payment for fencing around borrow pits shall be made in accordance with the stipulations of section 5500 in these specifications."

In addition to fencing, Security Guards shall be supply on a 24 hour, 7 days a week basis, with full time communication to the Site Manager or site camp for the duration of the contract and activities at the borrow pits."

Add the following new sub-clause:

"(h) Haul roads

Haul roads to designated borrow pits along the road shall be constructed along alignments as instructed by the engineer and shall be maintained at the contractor's own cost to the satisfaction

of the engineer."

B3105 FINISHING-OFF BORROW AREAS AND HAUL ROADS

Add the following to this clause:

"Should the employer, engineer or any other authority approved by the engineer, require a higher standard of shaping and finishing off of borrow pits than specified in the standard specifications, measurement and payment for such extra work shall be made using daywork items as scheduled under this section."

B3108 MEASUREMENT AND PAYMENT

Change item 31.01 to read as follows:

"ITEM		**UNIT**
B31.01	**Excess overburden :**	
(a)	Depth up to and including 0,5m	cubic meter (m^3)
(b)	Depth exceeding 0,5m and up to 1,0m	cubic meter (m^3)

Measurement and payment shall be as specified for item 31.01 of the standard specifications with the abovementioned depth ranges applicable."

Add the following new item:

SECTION 3300 : MASS EARTHWORKS

B3305 TREATING THE ROADBED

(a) Removing unsuitable material

Add the following to the third paragraph:

"For the purpose of this contract, excavation and removal of in-situ clayey material over areas where the road is in a fill condition, shall be classified as removal of unsuitable material, irrespective of the stability or moisture condition of the in-situ material".

(c) Preparing and compacting the roadbed

Delete the last sentence of the first paragraph “If necessary, roadbed…….depth of compaction” and replace as follows:

“Where demarcated by the engineer, prior to the roadbed being scarified, the excess in situ material forming part of the present roadway, and within the limits of the roadbed, and in close proximity of the layer works, but falling within the limits of the layerworks, shall be bladed to controlled level in order to achieve the required level and necessary depth of compaction.”

B3307 FILLS

(c) Constructing a pioneer layer

Add the following to the first paragraph:

"For the purpose of this contract, pioneer layers shall be completed by means of eight-pass roller compaction using vibratory rollers as specified in sub-clause 3304(b) of the standard specifications.”

(d) Benching

Add the following:

“Benching of fill and pavement layer material is required to be undertaken into the existing fill embankments and pavement layers. No additional payment shall be made over and above the normal pay items applicable to earthworks and pavement layers where benching is required for widening of the existing road formation. Benching shall be undertaken as shown on the drawings.

It is a requirement that benching shall always be started at the bottom of the existing fill progressing to the top of the formation. The dimensions and details of benching are shown on the drawings.”

B3308 FINISHING THE SLOPES

(d) General

Add the following:

“Where existing cut and fill slopes are excessively eroded or where slippages occurred in slopes, the slopes are to be reinstated by means of backfilling with suitable gravel material. All loose material and vegetation shall first be removed from the eroded cut and fill slopes before backfilling may commence from the bottom of the cut or fill. The backfill material shall be benched into the existing slopes and compacted to 90% of modified AASHTO density, using suitable small compaction equipment e.g. Bomag walk-behind rollers or hand-held compaction tools. Benching shall be executed to the dimensions shown on the drawings. Upon completion of the backfilling operation the cut and fill slopes shall be neatly finished as specified.”

SECTION 3400 : PAVEMENT LAYERS OF GRAVEL MATERIAL

B3402 MATERIALS

(a) General

Add the following:

"Material requirements for gravel pavement layers are in accordance with TRH4 and shall be indicated on the drawings."

B3405 CONSTRUCTION TOLERANCES

(e) Cross-section

Delete the second paragraph and replace with the following:

"The normal crossfall of the road wearing course where the road is in a straight horizontal alignment, is specified as 3% as shown on the drawings.

At any cross-section the measured crossfall between any two points shall at least be 2,8% and not more than 3,5%. At any cross-section the actual level at any point shall not be higher than 10mm above the computed level from the cross-section as specified and the actual level, if lower than the computed level, shall not be lower by more than that derived from the specifications for longitudinal grade and crossfall deviations."

(f) Surface regularity

Add the following:

"Where transverse construction joints in base layers are made between newly and previously constructed sections, the contractor shall exercise level control at such joints by installing level poles at 5m intervals on either side of the joint of the layer covering at least a 30m length into the newly constructed section.

B3406 QUALITY OF MATERIALS AND WORKMANSHIP

Add the following:

"Test results and measurements shall be assessed by the engineer according to the provisions of Section 8300 of the standard specifications".

SECTION 3500 : STABILISATION

B3503 CHEMICAL STABILISATION

(a) Preparing the layer

Add the following:

Breaking-down and removal of oversize material and addition of material to make to required thickness shall be completed before stabilising agent shall be added."

(h) Curing the stabilised work

Add the following:

"It is the intention of this contract that curing of chemically stabilised layers shall be undertaken in accordance to protection method (ii) as specified. Any other method of curing shall only be allowed in special circumstances as decided upon by the engineer, but no additional payment whatsoever over and above that allowed for in item 35.05 will be made."

(i) Construction limitations

In table 3503/1, replace "8 hours" with "6 hours."

B3506 TOLERANCES

(b) Uniformity of mix (chemical stabilisation)

Add the following:

"All pavement layers, especially layers which are to be chemically stabilised, shall, apart from the application of other mixing equipment, include at least two motor grader blade mixing operations to the full depth of the layer.

The in-place mixing of chemical stabilising agents with gravel materials shall be executed in such a manner that the coefficient of variation in the uniformity of the mix shall not exceed 30% when the stabilised layer is subjected to the chemical titration test, TMH1 method A15d. For plant-mixed stabilised materials the coefficient of variation shall not exceed 20%.

The coefficient of variation, C_v, is calculated by the formula:

$$C_v = \frac{S_n}{X_n} \times 100 \text{ where,}$$

S_n = standard deviation of n determinations of stabilising agent content

X_n = mean percentage of n determinations of stabilising agent content with n = 4 minimum."

B3509 QUALITY OF MATERIALS AND WORKMANSHIP

Add the following:

"The preparation of chemically stabilised material for the determination of the modified AASHTO density of the material shall be executed in accordance with TMH1 test method A16T and compaction thereof in accordance with TMH1 test method A7."

SECTION 5200 : GABIONS

B5201 SCOPE

Add the following paragraph

"This section also covers the removal, dismantling and stacking of existing gabion work, and the reuse of these materials where authorised by the engineer."

B5203 CONSTRUCTION OF GABION CAGES

(a) General

Add the following new sub-clause:

"(iii) Reno mattresses or similar may be used as alternative to gabion boxes. These Reno mattresses are to be manufactured of 80mm x 100mm mesh (2,5mm diameter wires, diaphragm spacing 0,6m).

B5204 CONSTRUCTING GABIONS

(c) Assembly

Delete and substitute with:

(c) Assembly, erection and stretching

(i) Assembly

"Prior to assembly, the gabion material shall be opened out flat on the ground and stretched to remove any kinks and bends. The gabion boxes shall then be assembled individually by raising the sides, ends and diaphragms ensuring that all creases are in the correct position and that the tops of all four sides are even. The four corners of the gabion boxes shall be laced first followed by the edges of internal diaphragms to the sides. In all cases lacing shall commence at the top of the box by twisting the end of the lacing wire around the selvages. It shall then be passed round two edges being joined, through each mesh in turn and securely tied off at the bottom. The ends of all lacing wire shall be turned to the inside of the box on completion of each lacing operation.

(ii) Erection

Only assembled boxes, or groups of boxes, shall be positioned in the structure. The side, or end, from which work is to proceed, shall be secured to either completed work or by rods or stakes driven into the ground at the corners. These must be secured and reach at least to the top of the gabion box. Further gabions shall then be positioned in the structure as required, each being securely laced to the preceding one at all corners and diaphragm points.

(iii) Stretching

On completion of erection of a suitable length of gabion, the gabion boxes shall be stretched using a wire strainer or winch of at least one ton capacity firmly secured to the free end of the assembled gabion boxes.

Whilst under tension the gabion boxes shall be securely laced along edges (top, bottom and sides) and at diaphragm points, to all adjacent boxes and shall thereafter be filled."

(d) Rock filling

Add the following new sub-sub-clause:

(iii) General

"Filling shall be carried out only whilst gabion boxes are under tension. Filling material shall consist of rock of size not less than 120mm and not greater than 250mm so placed to produce a neat face and line with a minimum of voids.

Internal horizontal bracing wire shall be provided at 500mm vertical centres or such spacing to

ensure a ratio of four to every 1m³ of filling. These bracing wires shall be wrapped around two mesh wires and extended from front to back so positioned to ensure a neat face and line free of excessive bulges and depressions. Gabion boxes shall be filled in stages and horizontal bracing wires inserted as filling is brought up.

Similar bracing wires used vertically shall be provided in 0,5mm deep gabions at 330mm horizontal centres where water falls directly onto gabions or where a neat face is required.

Tension on the gabion boxes shall be released only when sufficiently full to prevent the mesh from slackening.

Gabion boxes shall be overfilled by 20 to 50mm above their tops to allow subsequent settlement of the filling."

Add the following new sub-clauses:

(e) Final wiring

“Closing and wiring down of lids shall proceed as soon as possible after filling operations and certainly in the likelihood of storms or floods during construction. The wiring down shall consist of wrapping around wire at such intervals as required or specified.

Lids shall be stretched tight over the filling with bars and wired down securely through each mesh along all edges, ends and diaphragms. The ends of all tying and bracing wires shall be turned into the gabion box on completion of all lacing operations.

Tightness of mesh, well packed filling and secure lacing is essential in all structures.”

(f) Removal, dismantling and stacking of gabions

“Existing gabions, either damaged or not, that require to be removed or moved to a new location shall be dismantled. Material not required for re-assembly or unsuitable for re-use shall be neatly stacked at approved locations in accordance with the engineer’s instructions. Payment will be made only for gabions removed in accordance with the written instruction of the engineer.

Where gabions require moving, or as declared suitable by the engineer are re-usable, the contractor shall re-use all the material, plus supply such new materials as may be required to re-assemble the gabion again to the standard specification for new gabions.”

SECTION 5600 : ROAD SIGNS

B5601 SCOPE

"This section also covers the supply and erection of permanent danger plates at culverts and bridges at the locations indicated on the drawings or as directed by the engineer."

B5603 MANUFACTURING OF ROAD SIGN BOARDS AND SUPPORTS

(a) Road signboards

Add the following:

"The contractor shall make every effort to ensure that signboards are correct in all respect and before dispatching the boards from the manufacturer's factory shall provide the Engineer with a 100mm x 150mm colour photograph of each sign face for approval of the correctness of the legend. Such approval will not imply final acceptance of the board. If the Contractor is in any doubt as to the correctness of the sign detail, the sign designer shall be contacted for verification."

(a) (ii) Steel profile road signboards

Add the following:

"Where the letter or legends cross the horizontal joints of the sign panels, the letter shall be cut on the joint and both ends folded around the radius.

Retro-reflective material to adjoining Chromadek panels on a sign shall be practical visual match of the specified colour."

B5604 ROAD SIGN FACES AND PAINTING

Add the following new subclause:

"(e) Application of retro-reflective material

All sign faces shall be faced with diamond grade retro-reflective material. Painted front sign faces shall not be used.

Where applied to Chromadek sections, retro-reflective material shall be applied as specified for aluminium section in Clause 5603(d) of the Standard Specification, and of Clause B5603(a)(ii) of this project Specification."

B5605 STORAGE AND HANDLING

Add the following:

"The following shall not be allowed on the sign face:

Drilling of holes, except for the fastening of overlays
Application of any form of adhesive
Cleaning with any chemicals that are not specifically approved by the manufacturer of the retro-reflective material
Covering the sign face with an impermeable material that does not allow free circulation of air."

B5606 ERECTING ROAD SIGNS

(c) Erection

Add the following:

"After erection the signboard shall be thoroughly cleaned with a cleaning agent approved by the retro-reflective material's manufacturer.

All vegetation obstructing the new or replaced sign board shall be removed and disposed of as instructed by the Engineer."

B5608 DISMANTLING, STORING AND RE-ERECTING EXISTING ROAD SIGNS

Add the following:

"Existing overhead and ground mounted road signs that are being replaced by new signs shall be dismantled and disposed of by the Contractor. Where possible the dismantling of the signs shall not be before the replacement sign is erected and displayed. Where dismantling of the sign is required before erection of the replacement sign, the dismantling shall not take place until immediately before work is to commence on the replacement, and the replacement shall be completed and the new sign displayed as soon as possible thereafter (within 72 hours).

Dismantling shall include sign panels and ground mounted sign supports.

Ground mounted sign supports shall be cut off just below ground level. Material excavated for removal of buried poles shall be replaced, and any depression made good using excess material from excavation for new signs.

Pay items are provided in the Bill of Quantities. Payment will differentiate between different types of sign panels."

B5609 MEASUREMENT AND PAYMENT

ITEM		UNIT
B56.01	Road sign boards with painted or coloured semi-matt background. Symbols, lettering, and borders in diamond grade retro-reflective material, where the sign board is constructed from:	
	Amend the last two lines of the second paragraph to read:	
	"completion, delivery, installation of the road sign board complete as specified, and the removal and disposal of all vegetation obstructing the motorists' view of the new or replaced sign board. Add the following pay items:	

"ITEM		UNIT
B56.10	**Danger plates at culverts/structures**	
(a)	Type A at stormwater culverts (size indicated)	number (No.)
(b)	Type B at bridges (size indicated)	number (No.)

The unit of measurement shall be the number of danger plates provided and erected in accordance with the drawings.

The tendered rate shall include full compensation for all labour and material, painting, posts, excavation, backfilling with soil etc., as may be necessary for completing the work in accordance with the details shown on the drawings."

SECTION 5700 : ROAD MARKINGS

B5706 SETTING OUT THE ROAD MARKINGS

Add the following:

"Where road markings are to be replaced after milling/overlay seal, it is essential that all existing barrier lines and other road marking lines be accurately referenced before commencement of milling or other operations which will obliterate the existing road markings. The position of barrier lines shall be re-assessed on site by the Engineer before the Contractor commences with the road marking."

B5707 APPLYING THE PAINT

Add the following:

"The Contractor's establishment on site and general obligation shall be deemed to fully include the establishment of the road-marking team, irrespective of the number of times the road-marking team is required to be onsite or is required to move within the site."

B5711 GENERAL

Insert the following into the last sentence of the last paragraph between "black paint" and "or chemical paint remover":

", bituminous emulsion, slurry"

Add the following to the last paragraph:

"Where black paint is used, it shall be matt."

Add the following new clause:

"B5715 REMOVAL OF EXISTING ROAD STUDS

The existing road studs shall be removed from the road surface prior to milling."

B5714 MEASUREMENT AND PAYMENT

ITEM	UNIT
B57.06 Setting out and pre-marking the lines (excluding traffic island markings, lettering and symbols)	

Add the following:

"Referencing of existing barrier lines and other road marking lines prior to milling and other operations, shall be included in the tendered rate for setting out and pre-marking."

Add the following item:

"Item	Unit
B57.07 Establishment of painting unit during the construction period	Lump sum

The unit of measurement shall be the lump sum to compensate the contractor for the establishment and removal of the painting unit after the retention period.

The tendered lump sum shall include full compensation for the establishment on site and for the removal of all equipment, personnel, etc. as may be required for the application of the road marking.

SECTION 5900 : FINISHING THE ROAD AND ROAD RESERVE AND TREATING OLD ROADS

B5902 FINISHING THE ROAD AND ROAD RESERVE

Add the following to the first paragraph:

"The contractor shall pay special attention to the collection and removal of all waste materials originating from the construction activities. All materials trimmed or excavated from the road shall be collected and removed from the road reserve to the satisfaction of the engineer.

This requirement shall be deemed to be incorporated in the tendered rates for item 59.01 of the bill of quantities or such other items as the contractor may decide upon.

The engineer may order additional finishing of the road reserve which will entail the collection and disposal of loose rocks etc. Payment for this work will be made under daywork items included in section 5900 of the bill of quantities as described in section 1800 of these project specifications."

SECTION 6100 : FOUNDATIONS FOR STRUCTURES

B6102 MATERIAL

(b) Rock (for rock fill)

Replace this section with the following:

“Stones/rock shall be hard, angular veld or quarry stones or rock fragments of such quality that they will not disintegrate on exposure to water or weathering. The stones/rock shall be free from soil, shale or organic material.

The size of the stone/rock fragments must be uniform, with a maximum largest stone/rock dimension of 250mm, and at least 85% of the rocks shall have an average least dimension of 100mm. Neither the breath or the thickness of a single stone shall be less than one-third its length.”

(c) Crushed stone

Replace this section with the following:

“Crushed stone used for construction of crushed stone foundation fill shall be 20mm stone used and approved for concrete works.”

B6105 EXCAVATION

(d) Classification of excavated material

Delete clause (i) and substitute it with the following:

“(i) Hard Material

“Boulders which the longest dimension exceeds 1,5m or which the volume exceeds 0,75m3 shall be classified as hard material;

or

material which cannot be excavated except by drilling and blasting or by using pneumatic tools or mechanical breakers shall be classified as hard material.”

B6108 BACKFILL AND FILL NEAR STRUCTURES

(a) General

Add the following:

(iv) "During backfilling within 1,0m of any concrete structure, or as directed by the Engineer, only hand operated mechanical compaction equipment shall be used to achieve the required density."

B6109 FOUNDATION FILL

Add the following after the 3rd paragraph:

"Granular foundation fill shall be constructed from approved granular material of at least gravel subbase quality."

Add the following after the 6th paragraph:

"Concrete screeds shall extend 200mm beyond the horizontal dimensions of all footings to facilitate the placing of formwork, unless otherwise directed by the engineer.

In the case of structures where excessive ground water is encountered, the screed shall extend over the full plan area of the base of the excavation. Payment shall be made for the quantity of concrete calculated as the product of the specified thickness of the screed and the actual area of screed specified by the engineer up to a maximum area of the product of the neat footing length plus 1m and the neat footing width plus 1m."

B6115 MEASUREMENT AND PAYMENT

Add the following note immediately after B6115 Measurement and Payment clause heading:

"Note:

The Contractor shall note that, notwithstanding the fact that various payment items indicate that haul, overhaul and all associated terms will be paid for separately, this shall not apply to Section 6100."

ITEM		UNIT
B61.02	**Excavation**	cubic metre (m^3)

Delete the following words in the second last paragraph:

"the hauling of excavated material for the free-haul distance of 1,0 km,"

Add the following sentence at the end of the same paragraph:

"The haulage and disposal of excavated material to an approved spoil site shall be deemed to be included in the tendered rates, irrespective of the hauling distance."

ITEM		UNIT
B61.03	**Access and Drainage**	
	(a) Access	lump sum

Add the following to the payment paragraph:

"The tendered lump sum shall also include for all draining by pumping or in any other way and for any other work necessary for keeping the excavations dry or for working in the dry."

ITEM		UNIT
B61.04	**Backfill to excavation utilising**	cubic metre (m^3)

Delete the following words in the last paragraph:

… "transporting the material within the free-haul distance of 1,0 km," ...

Add the following sentence at the end of the same paragraph:

"The transportation of backfill material shall be deemed to be included in the tendered rates, irrespective of the hauling distance."

ITEM		UNIT
B61.08	**Foundation fill consisting of:**	
	(a) Rock fill	cubic metre (m^3)
	(b) Crushed-stone fill	cubic metre (m^3)

Add the following to the payment paragraph:

“The tendered rates for rock fill and crushed stone fill shall also include full compensation for procuring the material from commercial sources and all transporting and stockpiling costs.”

SECTION 6200 : FALSEWORK, FORMWORK AND CONCRETE FINISH

B6205 CONSTRUCTION

(b) Formwork

(i) General

Add the following:

"Formwork to faces of structures with a gradient equal to or greater than ten vertical to one horizontal shall be classified as vertical formwork.

Formwork to faces of structures with a gradient of less than ten vertical to one horizontal, or equal to or greater than one vertical to ten horizontal, shall be classified as inclined formwork.

Formwork to faces of structures with a gradient of less than one vertical to ten horizontal shall be classified as horizontal formwork."

B6206 REMOVING THE FALSEWORK AND FORMWORK

Replace the second and third sentences in the first paragraph with:

"The minimum period for the falsework and formwork for the deck/roof slabs to remain in place shall be:

- At Structure B1 a period of 21 days.
- At structure B2 a period of 14 days.

and on condition that the deck (or roof slab) concrete attained 80% of its specified strength by that time."

B6210 MEASUREMENT AND PAYMENT

Delete the heading "Note" and the subsequent paragraph after item 62.04.

SECTION 6300: STEEL REINFORCEMENT FOR STRUCTURES

B6302 MATERIALS

(a) Steel bars

Replace the first and second paragraph with the following:

“Steel reinforcing bars shall comply with the requirements of SANS 920. For each consignment of steel reinforcement delivered on site, the contractor shall submit a certificate by a recognised testing authority to confirm that the steel complies with the specified requirements. The reinforcement may only be used on approval by the engineer.

Cold-worked reinforcing bars shall not be used.

The type of bar required shall be indicated on the drawings by the symbols R, Y or Z in accordance with SANS 282.”

B6306 PLACING AND FIXING

Delete the second and third paragraph and replace with the following:

"The concrete cover for all structural concrete shall be within the acceptance ranges as per section 6803(f). Prior to fixing the steel, samples of the proposed cover and spacer blocks shall be submitted to the Engineer along with a written method statement for in-situ manufacture, if applicable, for approval."

B6307 COVER AND SUPPORT

Add the following to the end of the fifth paragraph:

"No plastic or wood cover blocks will be permitted. Only semi-spherical concrete cover blocks shall be used. Where fixing wire is inserted into cover blocks, it shall be galvanised. Concrete cover and spacer blocks can be sourced from approved commercial source or can be manufactured on site. All cover blocks regardless if manufactured on site or obtained commercially shall not be visible on exposed concrete surfaces.”

If cover blocks are manufactured on site, it must also have approved semi-spherical shape, and must be made using the same cement and aggregate type as the main concrete with the same water/cement ratio so that differences in shrinkage, thermal movements and strain are minimised. Cover blocks shall be water cured by submersion for a minimum of 7 days and thereafter kept submerged in water until immediately before fixing onto reinforcing steel.”

SECTION 6400 : CONCRETE FOR STRUCTURES

B6402 MATERIALS

(a) Cement

Replace the colon at the end of the first paragraph with a comma, and add the following:

"taking into account the adoption of the new SANS 50197-1:2000 code for cements: (refer to C&CI website www.cnci.org.za)"

Add the following paragraphs:

"The type of cement to be used in any concrete element shall take into account the environmental conditions and durability requirements at the location of the site of the works, and shall be selected according to Table B6402/1 below, subject to the approval of the engineer.

With the exception of the standard SANS approved cement blends supplied by the primary cement producers, the blending of CEM1 and extenders shall not be permitted unless specifically approved by the engineer on the basis of an acceptable quality assurance procedure. In the case of the major culverts and bridges to be constructed in terms of this contract, the applicable condition of exposure in Table B6402/1 for **the selection of the type of cement shall be "2. SEVERE"**

Table B6402/1: SELECTION OF CEMENT TYPE

Condition of Exposure	**Placing Temperature of Concrete**	**Type of Cement*** **
1. MODERATE Concrete surfaces above ground level and protected against alternately wet and dry conditions caused by water, rain and sea-water spray	< 20ºC	CEM I CEM II A – S CEM II B – S
	20ºC - 30ºC	CEM I CEM II A – S CEM II B – S CEM II A – V CEM II B – V
2. SEVERE **Concrete surfaces exposed to hard rain and alternatively wet and dry conditions**	< 20ºC	CEM I CEM II A – S CEM II B – S
	20ºC - 30ºC	**CEM I** **CEM II A – S** **CEM II B – S** **CEM II A – V** **CEM II B – V**
3. VERY SEVERE	< 20ºC	CEM II B – S CEM II B – V

Concrete surfaces exposed to aggressive water, sea-water spray or a saline atmosphere	20ºC - 30ºC	CEM II B – S CEM II B – V
4. EXTREME Concrete surfaces exposed to the abrasive action of sea water or very aggressive water	< 20ºC	CEM II B – S
	20ºC - 30ºC	CEM II B – S

*** Notes to Table B6402/1:

1. Where the effective final composition of the cement as used in the manufacture of the concrete falls within the CEM I category, such concrete shall be used only in environments where the concrete is not prone to chloride attack, i.e., in inland drier environments.
2. Where a strength class of 42,5 or greater is required, and the placing temperature of concrete is between 20ºC and 30ºC, a set and hydration retarding admixture shall be used where required so as not to exacerbate bleeding.

b) Aggregates

Delete the remainder of the sentence after "exceed" in sub-clause (i)(1) and replace with the following:

"150% of that of the reference norite aggregate or any of the other three reference aggregates"

Delete the remainder of the sentence after "exceed" in sub--clause (i)(2) and replace with the following:

"200% and of the coarse aggregate 175% of that of the reference norite aggregate or any of the other three reference aggregates"

Delete the remainder of the sentence after "exceed" in the first paragraph of sub-clause (i)(3) and replace with the following:

"235% of that of the reference norite aggregate or any of the other three reference aggregates"

Delete the entire last paragraph of sub-sub-sub-clause (i)(3) commencing with "The drying shrinkage of concrete…"

Replace subclause B6402(b)(iv) with the following:

"The particular combination of aggregate and cement shall be tested for potential alkali aggregate reactivity in accordance with the test method as described in subclause 8105(f) and, where the results point to such reaction, either the aggregate or the cement, or both shall be replaced so that an acceptable combination may be obtained."

Add the following subclauses:

"(vi) The maximum chloride ion content of fine aggregate shall be 0,03% by mass of aggregate as measured by SANS 1083:2006. Where concrete is situated in a chloride environment, the value shall be reduced from 0,03% to 0,01%.

(vii) In addition to SANS 1083:2006 grading requirements for fine aggregates, the grading of the approved sand shall be such that between 25% and 35% by mass shall pass the 300 µm sieve. Sands that do not comply with this requirement will have to be blended with an approved fine sand in order to achieve the requirement.

(viii) The aggregate shall have a wet 10% FACT value of at least 75% of that of the determined dry value (SANS 1083)."

d) Water

Add the following:

"Water for concrete other than prestressed concrete, shall not contain chlorides, calculated as sodium chloride, in excess of three thousand parts per million (3000ppm) nor sulphates, calculated as sodium sulphate, in excess of two thousand parts per million (2000ppm).

Water for curing concrete shall not contain impurities in sufficient amount to cause discolouration of the concrete or produce etching of the surface.

No water containing salts shall be used.

No water shall be added on site to ready mix concrete prior to placing to improve workability. All concrete delivered to site shall be checked for workability using the slump cone test and slump measured outside of the limit set from the design mix shall be rejected."

e) Admixtures

Add the following sub-sub-clauses:

"(v) Admixtures, which have a retarding effect on the rate of hydration of the cement, may not be used when the concrete temperature is below 20°C.

(vi) A retarding admixture shall be used if the temperatures of concrete mixes using cements of strength class 42.5 or higher is between 20 to 30°C or where the ambient temperature is between 20 to 30°C."

Add the following:

"Note: Only admixtures of the type that do not increase the water content of the mix will be considered by the Engineer. In addition, no admixtures shall be added on site to ready mix concrete prior to placing to improve workability."

B6404 CONCRETE QUALITY

(b) Strength concrete

Add the following paragraph:

"The cement content for any class of structural concrete or mass concrete used in structures shall not be less than 300kg/m³ of concrete.

The contractor must provide the engineer with complete mix designs and materials test results for strength concrete at least four (4) weeks before the first concrete is cast on the project" on Colto Form D2 complete with all required test results for stone, sand and water. The minimum target design strengths for concrete mix designs must be at least 15% higher than the specified concrete cube strength (Characteristic cube compressive strength)

The following information/tests on the stone are also required and to be completed on form D2:

- Rock type from which sourced
- Flakiness index,

- ACV(%)
- 10% FACT (kN)
- Alkali reaction (y/n)
- Voids content
- Water absorption

The following information/tests on the sand are also required and to be completed on form D2:

- Rock type originally from
- Organic impurities/materials (y/n)
- Sugar detection
- pH
- Soluble deleterious impurities (Soluble salts (%), Soluble sulfates (%), Deleterious clay content, etc)
- Chloride content
- Sand equivalent value
- Shell content
- Alkali Reaction (y/n)

The following information/tests on the water that will be used to manufacture concrete are also required and to be completed on form D2 (also refer to Table8116/1 in Colto):

- pH
- Sulphates
- Chlorides
- Conductivity
- Total dissolved solids
- Alkali carbonates and bicarbonates
- Sugar
- Organic impurities

The cost of obtaining concrete mix designs in the prescribed format, and the cost of all above tests must be included in the Contractor's rates for concrete."

B6405 MEASURING THE MATERIALS

(c) Aggregates

Add the following:

"All concrete for structures shall be manufactured by mechanical mass batching on site. Volume batching will not be allowed."

B6406 MIXING

(a) General

Add the following:

"The Contractor must include in his rates to establish a concrete batching plant on site. The Contractor must establish on site a 750 litre minimum size, calibrated mechanical mass batch-mixer and also a standby mixer of at least 400 litre minimum size, calibrated mechanical mass batch-mixer"

(e) Standby mixer

Add the following:

"The Contractor must include in his rates to establish a concrete batching plant on site. The Contractor must establish on site also a standby mixer of at least 400 litre minimum size, calibrated mechanical mass batch-mixer"

(f) Ready-mixed Concrete

Replace the paragraph with the following:

"Commercial ready-mixed concrete will not be allowed on this project, to maximise local labour content on the project"

B6407 PLACING AND COMPACTING

(a) General

Add the following after the third paragraph:

"Concrete shall only be placed up to 20:00 at the latest. Under exceptional circumstances the Engineer may allow night work on condition that proper lighting arrangements can be made and a new and rested shift for night work is provided and ambient temperatures are such as to not adversely affect the setting of the concrete."

Add the following paragraphs to the end of subclause 6407(a):

"The concreting operations for all major culvert and bridge elements shall require careful planning, and sufficient concrete product and concreting resources such as labour, tools, equipment and plant shall be made available on each day of concreting to ensure that the concrete construction planned for that day is successfully achieved.

One month before the programmed date for the first element of box culvert or bridge concreting, the contractor shall be required to submit to the engineer for his approval a detailed method statement fully covering the proposed concreting operations required to construct the box culvert or bridge. The method statement shall, inter alia, include details of labour and supervision, tools and equipment (wheel barrows, spades, poker vibrators, hoists, baffled chutes, downpipes, flexible drop chutes, etc.), plant (batching plant, concrete dumpers, cranes, pumps, etc. including back-up plant and equipment), production rates, ready-mixed concrete supplier details and proposed schedule of concrete delivery times (if ready-mixed concrete is to be used), sequence of construction, curing method to be used, contingency plans and health and safety obligations. Box culvert and bridge concrete shall only be placed once the engineer is satisfied that every reasonable effort has been made by the contractor to ensure the success of the concrete placing operation. The approved method statement shall then apply to all other major culvert and bridge concreting operations of similar nature, and any amendments required to the approved method statement shall also be approved by the engineer prior to implementation."

B6408 CONSTRUCTION JOINTS

(a) General

Add the following:

"No construction joints other than those indicated on the drawings will be permitted without the written approval of the engineer".

B6409 CURING AND PROTECTING

Add the following:

Any vertical faces where formwork is removed before 7 days must be treated with an approved **wax-based** curing compound

The surface area of bridge footings, culvert floor slabs and culvert roof slabs shall be cured as follows:

(i) The area of freshly cast and finished concrete surface shall be immediately covered and cured as specified in clause 6409 (c) and (e), or

(ii) After the concrete has set sufficiently the entire area shall be treated with an approved **wax-based** curing compound as specified in clause 6409(f).

The surface area of bridge decks, which will be surfaced with asphalt, shall be cured as follows:

(i) The area of freshly cast and finished concrete surface shall be immediately covered and cured as specified in clause 6409 (c) and (e), or

(ii) After the concrete has set sufficiently the entire area shall be treated with an approved **resin-based** curing compound as specified in clause 6409(f)."

B6414 QUALITY OF MATERIALS AND WORKMANSHIP

(a) Criteria for compliance with the requirements

Add the following:

"Quality control shall be carried out by the engineer as specified in Section 8200 : Quality Control (Scheme 1)."

B6416 MEASUREMENT AND PAYMENT

ITEM		UNIT
B64.01	**Cast in situ concrete:**	cubic metre (m^3)

Add the following after the first paragraph:

"Where foundation slabs are set directly against the face of excavations, the volume of concrete measured for payment shall include the total volumes of concrete placed, allowing for up to a maximum over the neat footing dimensions of 200mm where in the opinion of the engineer accurate excavation to neat lines and levels indicated on the drawings is not possible. (No formwork to the footing shall be measured when the concrete is cast against the face of the excavations)."

SECTION 6600 : NO-FINES CONCRETE, JOINTS, BEARINGS, BOLT GROUPS FOR ELECTRIFICATION, PARAPETS AND DRAINAGE FOR STRUCTURE

B6606 DRAINAGE FOR STRUCTURES

(c) Synthetic-fibre filter fabric

Add the following:

"The synthetic-fibre filter fabric used in conjunction with crushed stone in drainage strips shall be Bidim Grade A4 or an approved equivalent material. An overlap of 300 mm shall be provided at joints."

C3.4.3 PROJECT SPECIFICATIONS: ADDITIONAL SPECIFICATIONS

CONTENTS

C3.4.3.1 OCCUPATIONAL HEALTH AND SAFETY ACT 1993 : HEALTH AND SAFETY SPECIFICATION

CONTENTS

C3.4.3.1.1 Introduction

In terms of the Construction Regulation 4(1) (a) of the Occupational Health and Safety Act, No. 85 of 1993, Makhado Local Municipality, as the Client, is required to compile a Health & Safety Specification for any intended project and provide such specification to any prospective tenderer.

The Client's further duties are as in C3.5.1.3.1.1. below and in the Construction Regulations, 2003.

This specification has as objective to ensure that Principal Contractors entering into a Contract with the Makhado Local Municipality achieve an acceptable level of OH&S performance. This document forms an integral part of the Contract and Principal and other Contractors should make it part of any Contracts that they may have with Contractors and/or Suppliers.

Compliance with this document does not absolve the Principal Contractor from complying with minimum legal requirements and the Principal Contractor remains responsible for the health & safety of his employees and those of his Mandataries.

C3.4.3.1.2 Scope

Development of a health & safety specification that addresses all aspects of occupational health and safety as affected by the abovementioned contract work.

The specification will provide the requirements that Principal Contractors and other Contractors will have to comply with in order to reduce the risks associated with the abovementioned contract work that may lead to incidents causing injury and/or ill health, to a level as low as reasonably practicable.

C3.4.3.1.3 General Occupational Health & Safety Provisions

(a) Hazard Identification & Risk Assessment (Construction Regulation 7)

(i) Risk Assessments

Annexure 3 contains a list of Risk Assessment headings that have been identified by Makhado Local Municipality as possibly applicable to the abovementioned contract work. It is, by no means, exhaustive and is offered as an assistance to Contractors intending to tender.

Based on the Risk Assessments, the Principal Contractor must develop a set of site-specific OH&S rules that will be applied to regulate the OH&S aspects of the construction.

The Risk Assessments, together with the site-specific OH&S rules must be submitted to the Makhado Local Municipality before mobilisation on site commences.

Despite the Risk Assessments listed in Annexure 3, the Principal Contractor is required to conduct a baseline Risk Assessment and the aforesaid listed Risk Assessments must be incorporated into the base-line Risk Assessment. The baseline Risk Assessment must further include the Standard Working procedures (SWP) and the applicable Method Statements based on the Risk Assessments

All out-of-scope work must be associated with a Risk Assessment.

(ii) Review of Risk Assessments

The Principal Contractor is to review the Hazard Identification, Risk Assessments and SWP's at each Production Planning and Progress Report meeting as the Contract work develops and progresses and each time changes are made to the designs, plans and construction methods and processes.

The Principal Contractor must provide the Client, other Contractors and all other concerned-parties with copies of any changes, alterations or amendments as contemplated in above.

(b) Legal Requirements

All Contractors entering into a Contract with the Makhado Local Municipality shall, as a minimum, comply with the

- Occupational Health & Safety Act and Regulations (Act 85 of 1993). A current, up-to-date copy of the OHS Act must be available on site at all times
- Compensation for Occupational Injuries & Diseases Act (Act 130 of 1993). The principal Contractor will be required to submit a letter of Registration and "good-standing" from the Compensation Insurer before being awarded the Contract. A current, up-to-date copy of the COID Act must be available on site at all times.
- Where work is being carried out on mines' premises the Contractor will have to comply with the Mine Health & Safety Act and Regulations (Act. 29 of 19960 and any other OH&S requirements that the mine may specify. A current, up-to-date copy of the OHS Act must be available on site at all times.

(c) Structure and Responsibilities

(i) Overall Supervision and Responsibility for OH&S

* It is a requirement that the Principal Contractor, when he appoints Contractors (Sub-contractors) in terms of Construction Regulations 5(3), (5), (9), (10) and (12)

he includes an OHS Act Section 37(2) agreement: "Agreement with Mandatary" in his agreement with such Contractors.

* Any OH&S Act (85/1993), Section 16(2) appointee/s as detailed in his/her/their respective appointment forms

(ii) Further (Specific) Supervision Responsibilities for OH&S

The Contractor shall appoint designated competent employees and/or other competent persons as required by the Act and Regulations. Below is a list of identified appointments and may be used to select the appropriate appointments for the current contract:

	Ref. Section/Regulation in OHSAct
Batch Plant Supervisor	(Construction Regulation 6(1)
Construction Vehicles/Mobile Plant/Machinery Supervisor	(Construction Regulation 21)
Demolition Supervisor	(Construction Regulation 12)
Drivers/Operators of Construction Vehicles/Plant	(Construction Regulation 21)
Electrical Installation and Appliances Inspector	(Construction Regulation 22)
Emergency/Security/Fire Coordinator	(Construction Regulation 27)
Excavation Supervisor	(Construction Regulation 11)
Explosive Powered Tool Supervisor	(Construction Regulation 19)
Fall Protection Supervisor	(Construction Regulation 8)
First Aider	(General Safety Regulation 3)
Fire Equipment Inspector	(Construction Regulation 27)
Formwork & Support work Supervisor	(Construction Regulation 10)
Hazardous Chemical Substances Supervisor	(HCS Regulations)
Incident Investigator	(General Admin Regulation 29)
Ladder Inspector	(General Safety Regulation 13A)
Lifting Equipment Inspector	(Construction Regulation 20)
Materials Hoist Inspector	(Construction Regulation 17)
OH&S Committee	(OHS Act Section 19)
OH&S Officer	(Construction Regulation 6(6)
OH&S Representatives	(OHS Act Section 17)
Person Responsible for Machinery	(General Machinery Regulation 2)
Scaffolding Supervisor	(Construction Regulation 14)
Stacking & Storage Supervisor	(Construction Regulation 26)
Structures Supervisor	(Construction Regulation 9)
Suspended Platform Supervisor	(Construction Regulation 15)
Tunneling Supervisor	(Construction Regulation 13)
Vessels under Pressure Supervisor	(Vessels under Pressure Regulations)
Working on/next to Water Supervisor	(Construction Regulation 24)
Welding Supervisor	(General Safety Regulation 9)

The appointments must be in writing and the responsibilities clearly stated together with the period for which the appointment is made. This information must be communicated and agreed with the appointees.

Copies of appointments must be submitted to the Makhado Local Municipality together with concise CV's of the appointees. All appointments must be officially approved by Makhado Local Municipality. Any changes in appointees or appointments must be communicated to Makhado Local Municipality forthwith.

The Principal Contractor must, furthermore, provide Makhado Local Municipality with an organogram of all Contractors that he/she has appointed or intends to appoint and keep this list updated on a weekly basis.

In addition Makhado Local Municipality may require that a Traffic Safety Officer be appointed for any project.

(iii) Designation of OH&S Representatives (Section 18 of the OHS Act)

OH&S Representatives have to be designated in writing and the designation must include the area of responsibility of the person and term of the designation.

(iv) Duties and Functions of the OH&S Representatives (Section 19 of the OHS Act)

The Principal Contractor must ensure that the designated OH&S Representatives conduct a minimum monthly inspection of their respective areas of responsibility using a checklist and report thereon to the Principal Contractor

OH&S representatives must be included in accident/incident investigations

OH&S representatives must attend all OH&S committee meetings.

(v) Appointment of OH&S Committee (Section 20 of the OHS Act)

The Principal Contractor must establish an OH&S Committee consisting of all the designated OH&S Representatives together with a number of management representatives that are not allowed to exceed the number of OH&S representatives on the committee and a representative of the Client who shall act as the chairman without a vote. The members of the OH&S committee must be appointed in writing.

The OH&S Committee must meet minimum monthly and consider, at least, the following Agenda:

1. Opening & Welcome
2. Present/Apologies/Absent
3. Minutes of previous Meeting
4. Matters Arising from the previous Minutes
5. OH&S Reps Reports
6. Incident Reports & Investigations
7. Incident/Injury Statistics
8. Other Matters
9. Endorsement of Registers and other statutory documents by a representative of the Principal Contractor
10. Close/Next Meeting

(d) Administrative Controls and the Occupational Health & Safety File

(i) The OH&S File (Construction Regulation 5 (7))

As required by Construction Regulation 5(7), the Principal Contractor and other Contractors will each keep an OH&S File on site containing the following documents as a minimum:

* Notification of Construction Work (Construction Regulation 3.)
* Copy of OH&S Act (updated) (General Administrative Regulation 4.)
* Proof of Registration and good standing with a COID Insurer (Construction Regulation 4 (g))
* OH&S Programme agreed with the Client including the underpinning Risk Assessment/s & Method Statements (Construction regulation 5 (1))
* Copies of OH&S Committee and other relevant Minutes
* Designs/drawings (Construction Regulation 5 (8))
* A list of Contractors (Sub-Contractors) including copies of the agreements between the parties and the type of work being done by each Contractor (Construction Regulation 9)
* Appointment/Designation forms as per (a)(i) & (ii) above.
* Registers as follows:
* Accident/Incident Register (Annexure 1 of the General Administrative Regulations)
* OH&S Representatives Inspection Register
* Asbestos Demolition & Stripping Register
* Batch Plant Inspections
* Construction Vehicles & Mobile Plant Inspections by Controller
* Daily Inspection of Vehicles. Plant and other Equipment by the Operator/ Driver/User
* Demolition Inspection Register
* Designer's Inspection of Structures Record
* Electrical Installations, -Equipment & -Appliances (including Portable Electrical Tools)
* Excavations Inspection
* Explosive Powered Tool Inspection, Maintenance, Issue & Returns Register (incl. cartridges & nails)
* Fall Protection Inspection Register
* First Aid Box Contents
* Fire Equipment Inspection & Maintenance
* Formwork & Support work Inspections
* Hazardous Chemical Substances Record
* Ladder Inspections
* Lifting Equipment Register
* Materials Hoist Inspection Register
* Machinery Safety Inspection Register (incl. machine guards, lock-outs etc.)

* Scaffolding Inspections
* Stacking & Storage Inspection
* Inspection of Structures
* Inspection of Suspended Platforms
* Inspection of Tunnelling Operations
* Inspection of Vessels under Pressure
* Welding Equipment Inspections
* Inspection of Work conducted on or Near Water
* All other applicable records

Makhado Local Municipality will conduct an audit on the OH&S file of the Principal Contractor from time-to-time.

(e) OH&S Goals & Objectives & Arrangements for Monitoring & Review of OH&S Performance

The Principal Contractor is required to maintain a CIFR of at least 8 (See Annexure 1. to this document: "Measuring Injury Experience) and report on this to Makhado Local Municipality on a monthly basis

(f) Notification of Construction Work (Construction Regulation 3.)

The Principal Contractor must, where the Contract meets the requirements laid down in Construction Regulation 3, within 5 working days, notify the Department of Labour of the intention to carry out construction work and use the form (Annexure A in the Construction Regulations) for the purpose. A copy must be held on the OH&S File and a copy must be forwarded to Makhado Local Municipality for record keeping purposes.

(g) Training, Awareness and Competence

The contents and syllabi of all training required by the Act and Regulations are to be included in the Principal Contractor's OH&S Plan.

(i) General Induction Training

All members of Contractor's Site management as well as all the persons appointed as responsible for OH&S in terms of the Construction and other Regulations will be required to attend a general induction session by the Client

All employees of the Principal and other Contractors to be in possession of proof of General Induction training.

(ii) Site Specific Induction Training

The Principal Contractor will be required to develop Contract work project specific induction training based on the Risk Assessments for the Contract work and train all employees and other Contractors and their employees in this.

All employees of the Principal and other Contractors to be in possession of proof of Site Specific OH&S Induction training at all times.

(iii) Other Training

All operators, drivers and users of construction vehicles, mobile plant and other equipment to be in possession of valid proof of training.

All employees in jobs requiring training in terms of the Act and Regulations to be in possession of valid proof of training as follows:

OH&S Training Requirements: (as required by the Construction Regulations and as indicated by the OH&S Specification & the Risk Assessment/s):

* General Induction (Section 8 of the Act)
* Site/Job Specific Induction (also visitors) (Sections 8 & 9 of the Act)
* Site/Project Manager
* Construction Supervisor
* OH&S Representatives (Section 18 (3) of the Act)
* Training of the Appointees indicated above
* Operators & Drivers of Construction Vehicles & Mobile Plant (Construction Regulation 21)
* Basic Fire Prevention & Protection (Environmental Regulations 9 and Construction regulation 27)
* Basic First Aid (General Safety Regulations 3)
* Storekeeping Methods & Safe Stacking (Construction Regulation 26)
* Emergency, Security and Fire Co-coordinator

(iv) Awareness & Promotion

The Principal Contractor is required to have a promotion and awareness scheme in place to create an OH&S culture in employees. The following are some of the methods that may be used:

- Toolbox Talks
- OH&S Posters
- Videos
- Competitions
- Suggestion schemes
- Participative activities such as OH&S Safety circles.

(v) Competence

The Principal Contractor shall ensure that his and other Contractors personnel appointed are competent and that all training required to do the work safely and without risk to health, has been completed before work commences

The Principal Contractor shall ensure that follow-up and refresher training is conducted as the contract work progresses and the work situation changes.

Records of all training must be kept on the OH&S File for auditing purposes.

(h) Consultation, Communication and Liaison

OH&S Liaison between the Client, the principal Contractor, the other Contractors, the Designer and other concerned parties will be through the OH&S committee as contemplated in above.

In addition to the above, communication may be directly to the Client or his appointed Agent, verbally or in writing, as and when the need arises.

Consultation with the workforce on OH&S matters will be through their Supervisors, OH&S Representatives, the OH&S committee and their elected Trade Union Representatives, if any.

The Principal Contractor will be responsible for the dissemination of all relevant OH&S information to the other Contractors e.g. design changes agreed with the Client and the Designer, instructions by the Client and/or his/her agent, exchange of information between Contractors, the reporting of hazardous/dangerous conditions/ situations etc.

The Principal Contractor will be required to do Site Safety Walks with Makhado Local Municipality at least on a basis to be determined between the two parties.

The Principal and other Contractors will be required to conduct Toolbox Talks with their employees on a weekly basis and records of these must be kept on the OH&S File. Employees must acknowledge the receipt of Toolbox Talks which record must, likewise be kept on the OH&S File.

The Principal Contractors most senior manager on site will be required to attend all Makhado Local Municipality OH&S meetings and

a list of dates, times and venues will be provided to the Principal Contractor by Makhado Local Municipality.

(i) Checking, Reporting and Corrective Actions

(i) Monthly Audit by Client (Construction Regulation 1(d))

Makhado Local Municipality will be conducting a Monthly Audit to comply with Construction Regulation 4(1)(d) to ensure that the principal Contractor has implemented and is maintaining the agreed and approved OH&S Plan.

(ii) Other Audits and Inspections by Makhado Local Municipality:

Makhado Local Municipality reserves the right to conduct other ad hoc audits and inspections as deemed necessary. This will include Site Safety Walks.

(iii) Conducting an Audit

A representative of the Principal Contractor must accompany Makhado Local Municipality on all Audits and Inspections and may conduct his/her own audit/inspection at the same time. Each party will, however, take responsibility for the results of his/her own audit/inspection results.

(iv) Contractor's Audits and Inspections

The Principal Contractor is to conduct his own monthly internal audits to verify compliance with his own OH&S Management system as well as of with this specification.

(v) Inspections by OH&S Representative's and other Appointees

OH&S Representatives must conduct weekly inspections of their areas of responsibility and report thereon to their foreman or supervisor whilst other appointees must conduct inspections and report thereon as specified in their appointments e.g. vehicle, plant and machinery drivers, operators and users must conduct daily inspections before start-up.

(vi) Recording and Review of Inspection Results

All the results of the abovementioned inspections to be in writing, reviewed at OH&S committee meetings, endorsed by the chairman of the meeting and placed on the OH&S File.

(vii) Reporting of Inspection Results

The Principal Contractor is required to provide the Client with a monthly report in the format as per the attached Annexure 2: "SHE Risk Management Report"

(j) Incident Reporting and Investigation

Reporting of Accidents and Incidents (Section 24 and General Administrative Regulation 8 of the OHS Act)

The Principal Contractor must report all incidents where an employee is injured on duty to the extent that he/she:

* dies
* becomes unconscious
* loses a limb or part of a limb
* is injured or becomes ill to such a degree that he/she is likely either to die or to suffer a permanent physical defect or likely to be unable for a period of at least 14 days either to work or continue with the activity for which he/she was usually employed

OR where:

* a major incident occurred
* the health or safety of any person was endangered
* where a dangerous substance was spilled
* the uncontrolled release of any substance under pressure took place
* machinery or any part of machinery fractured or failed resulting in flying, falling or uncontrolled moving objects
* machinery ran out of control

to Makhado Local Municipality within two days and to the Provincial Director of the Department of Labour within seven days (Section 24 of the Act & General Administrative Regulation 8.) EXCEPT that, where a person has died, has become unconscious for any reason or has lost a limb or part of a limb or may die or suffer a permanent physical defect, the incident must be reported to both Makhado Local Municipality and the Provincial Director of the Department of Labour forthwith by telephone, telefax or E-mail.

The Principal Contractor is required to provide Makhado Local Municipality with copies of all statutory reports required in terms of the Act within 7 days of the incident occurring.

The Principal Contractor is required to provide Makhado Local Municipality with copies of all internal and external accident/incident investigation reports including the reports contemplated below within 7 days of the incident occurring.

Accident and Incident Investigation (General Administrative Regulation 9)

The Principal Contractor is responsible for the investigation of all accidents/incidents where employees and non-employees were injured to the extent that he/she/they had to be referred for medical treatment by a doctor, hospital or clinic

The results of the investigation to be entered into the Accident/Incident Register listed in above.

The Principal Contractor is responsible for the investigation of all minor and non-injury incidents as described in Section 24 (1) (b) & (c) of the Act and keeping a record of the results of such investigations including the steps taken to prevent similar accidents in future.

The Principal Contractor is responsible for the investigation of all road traffic accidents and keeping a record of the results of such investigations including the steps taken to prevent similar accidents in future.

The Makhado Local Municipality reserves the right to hold its own investigation into an incident or call for an independent external investigation.

C3.4.3.1.4 Operational Control

(a) Emergency Preparedness, Contingency Planning and Response

The Principal Contractor must appoint a competent person to act as Emergency Controller/Coordinator.

The Principal Contractor must conduct an emergency identification exercise and establish what emergencies could possibly develop. He/she must then develop detailed contingency plans and emergency procedures, taking into account any emergency plan that Makhado Local Municipality may have in place.

The Principal Contractor and the other Contractors must hold regular practice drills of contingency plans and emergency procedures to test them and familiarise employees with them.

(b) First Aid (General Safety Regulation 3)

The Principal Contractor must provide First Aid equipment (including a stretcher) and have qualified First Aider/s as required by General Safety Regulation 3 of the OHS Act.

The Contingency Plan of the Principal Contractor must include the arrangements for speedily and timeously transporting injured/ill person/s to a medical facility or of getting emergency medical aid to person/s that may require it.

The Principal Contractor must have firm arrangements with his other Contractors in place regarding the responsibility of the other Contractors injured/ill employees

(c) Security

The Principal Contractor must establish site access rules and implement and maintain these throughout the construction period. Access control must include the rule that non-employees will not be allowed on site unaccompanied.

The Principal Contractor must develop a set of Security rules and procedures and maintain these throughout the construction period

(d) Fall Protection (Working in Elevated Positions (Construction regulation 8.)

A pre-emptive Risk Assessment will be required for any work to be carried out above two metres from the ground or any floor level and will be classified as “Work in Elevated Positions”.

As far as is practicable, any person working in an elevated position will work from a platform, ladder or other device that is at least as safe as if he/she is working at ground level and whilst working in this position be wearing a single belt with lanyard that will be worn to prevent the person falling from the platform, ladder or other device utilised. This safety belt will be, as far as is possible, secured to a point away from the edge over which the person might fall and the lanyard must be of such a length that the person will not be able to move over the edge.

Alternatively any platform, slab, deck or surface forming an edge over which a person may fall may be fitted with guard rails at two different heights as prescribed in SABS 085: Code of Practice for the Design, Erection, Use and Inspection of Access Scaffolding.

Where the requirement in is not practicable, the person will be provided with a full body harness that will be worn and attached above the wearer’s head at all times and the lanyard must be fitted with a shock absorbing device OR the person must be attached to an approved, by Makhado Local Municipality, fall arrest system.

Where the requirements are not practicable, a suitable catch net must be erected.

Workers working in elevated positions must be trained to do this safely and without risk to health

Where work on roofs is carried out, the Risk Assessment must take into account the possibility of persons falling through fragile material. Skylights and openings in the roof.

C3.4.3.1.5 Measurement and Payment

Payment for the contractor’s obligations in respect of the Occupational Health and Safety act and Construction Regulations shall be made through three payment items described below. The three payment items together shall include full compensation for all personnel (including a dedicated full time Construction Safety Officer), cost and incidentals in respect of compliance with the enforcement of the Health and Safety Specifications, which shall include for the compilation, presentation, implementation and maintenance of the Health and Safety Plan as contemplated. In tendering rates for the three items the contractor shall ensure that the sum of the amounts for the three items shall not be less than one percent (1%) of the Tender Amount.

Item	**Unit**
B1.1 Contractor’s initial obligations in respect of the Occupational Health and Safety Act and Construction Regulations	Lump Sum

The full amount will be paid in one instalment only once:-

(a) The contractor has notified the Provincial Director of the Department of Labour in writing of the project.

(b) The contractor has made the required initial appointments of employees and sub-contractors.

(c) The client has approved the contractor’s Health and Safety Plan.

(d) The contractor has set up his Health and Safety File.

Item	**Unit**
B1.2 Contractor's time related obligations in respect of the Occupational Health and Safety Act and Construction Regulations	Month

The tendered monthly amount shall represent full compensation for that part of the contractor's general obligations in terms of the Occupational Health and Safety Act and the Construction Regulations which are mainly a function of time. This includes inter alia payment of all costs for the appointment of all staff contemplated in the construction regulations and the transport of employees on site. Payment will be monthly only after payment for Item **B1.1** has been made.

Item	**Unit**
B1.3 Submission of the Health and Safety File	Lump Sum

The tendered lump sum shall represent full compensation for the contractor meeting all his obligations in respect of the Occupational Health and Safety Act and the Construction Regulations and for the preparation and submission of his Health and Safety File complete as envisaged on this specification to the Client's satisfaction.

This amount will be paid only once the contractor has met all his obligations in respect of the Occupational Health and Safety Act and the Construction Regulations and has submitted his Health and Safety File complete as envisaged on this specification to the Client's satisfaction.

C3.4.3.1.6 Project/Site Specific Requirements

See Annexure 3

Annexure 1: Measuring Injury Experience

Annexure 2: SHE Risk Management Report

Annexure 3. List of Risk Assessments

ANNEXURE 1: MEASURING INJURY EXPERIENCE

Injury experience has traditionally been measured by the use of a disabling injury frequency rate, the so-called “DIFR”. The DIFR is calculated by multiplying the number of disabling injuries by 1 million and dividing by the number of man-hours worked.

Lately the DIFR has been replaced internationally with a DIIR: disabling injury incidence rate. The only difference between the two rates are that the 10 million in the calculation is replaced with 200 000. (200 000 purported to be the number of hours and average person works in a lifetime.)

The use of the two rates above has proved to be somewhat problematical as they are open to manipulation and disabling injuries are often “hidden” by returning the injured employee to the workplace so as not to lose a shift and therefore having to register a disabling injury.

The Construction Industry recently decided to promote the use of a new frequency rate based on the number of compensation injury claims as these are more difficult to hide or manipulate because the reporting of compensable injuries is a legal requirement.

The industry is hoping that adoption of this new measurement of injury experience will enable the industry to monitor itself as far as work related injuries are concerned.

Below follows an explanation of this new rating system.

COMPENSATION INCIDENCE FREQUENCY RATE (CIFR)

FORMULA

No. of Compensation Claims X 200 000 /

*220 man hours X No. of Employees

DEFINITIONS

No. of Compensation

Claims: **The number of claims lodged with the COID insurer for the period under review**

200 000: The fixed factor to align the rate with other rates used internationally

Manhours Worked

Include:
* Hourly Paid Employees
* Sub-contactors (No. of Employees X *220 each)
* Staff (No. of Employees X *220 hours each)

220 manhours: The *average number of hours worked by one employee in one month in the Construction industry.

* Overtime, absence on leave or sick leave, unrecorded after hours time worked by senior and middle management factored into this average.

No. of Employees: The actual or average number of employees employed for the period under review.

2002/03CIFRSystem

ANNEXURE 2: EXECUTIVE SHE RISK MANAGEMENT REPORT

The SAFCEC OH&S committee recently developed the following report in an attempt to standardise on reporting and assist contractors in obtaining a clear picture of their SHE Risk Management performance. It is hoped that clients will also accept this standardised report. Your comments/suggestions for improvement is invited.

EXAMPLE ONLY: ALL INFORMATION IS FICTITIOUS

Xyz construction

*SHE RISK MANAGEMENT REPORT

PERIOD JANUARY TO MARCH 2002

*(SHE = Safety, Health & Environment)

1. Introduction

We hope that this new format of quarterly SHE Risk Management reporting will provide a clear picture of the company's performance as far as occupational health & safety is concerned.

The first quarter of 2002 generally reflected an improvement in injury experience and shows a decline in the number of injuries. Although Building was the only division where there was an increase in compensation claims, figures are still well down from the average 2001 figures. A sub-contractor experienced one fatality.

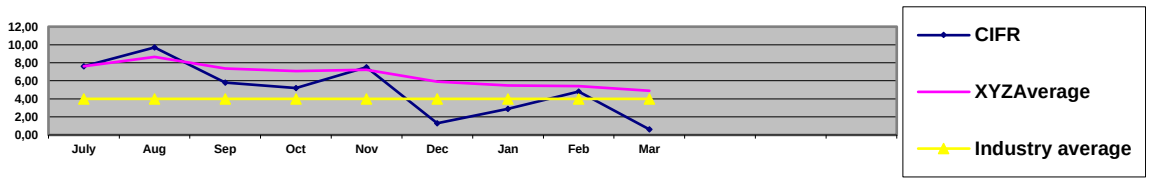
All divisions are eagerly awaiting the final implementation in May of the new electronic SHE Management system that will make the tools to implement the SHE programme available to all management and supervisory staff.

2. Incident Statistics

Compensation Incident Frequency Rate (CIFR)

CIFR = Total No. of Claims against the Workmen's Compensation Fund X 200 000

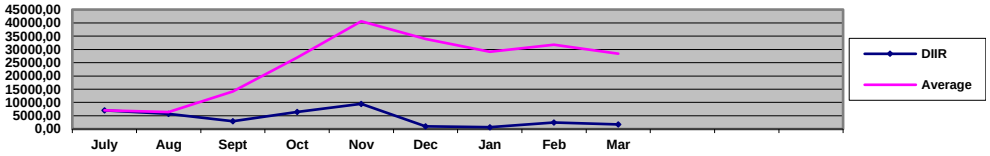
Manhours worked



2.2.

Disabling Injury Incidence Rate (DIIR)

DIIR = $\frac{\text{No. Disabling Injuries X 200 000}}{\text{Manhours worked}}$



2.3. Other Major Incidents

Three other major incidents were experienced in the period under review:

2.3.1. A major trench collapsed at Job. 00123: XYZ Head Office, Bochum: No personnel injured, extensive damage to foundations: 3 days delay.

2.3.2. A concrete dumper ran away when its brakes failed. It smashed into the glass façade of the building on Job 00332: McDonalds, Polokwane. The driver jumped off and was not injured. Cost of damage to façade: R45 000.

2.3.3. A storage hut on Job 00567: BP Petrol Station, Swartruggens was demolished by fire when the night watchman made a fire inside the storage hut which contained concrete vibrators and levelling machines. Cost of replacing the hut and machines: R30 000

3. RISK AREAS

The following items of concern need priority consideration by management:

3.1. New employees must undergo pre-employment medical examinations to:

- protect XYZ from claims at a later stage
- ensure that only healthy persons are employed
- prevent injuries and illness in the workplace
- enhance XYZ image

3.2. Vehicle drivers and plant operators must be instructed to inspect their vehicles daily before start-up using the prescribed checklists to ensure that these are safe to operate and in good condition.

4. AUDITS

Three SHE audits were conducted in February and March:

4.1.	Job 00432:	Gillooly's Mall	Compliance: 56%(*)
	Job 00786:	Cullinan Head Office	Compliance: 83%(****)
	Job 00589:	Cleveland Station	Compliance: 76%(***)

5. TRAINING

One hundred and forty two employees, representing 7% of employees, attended nine training courses. *Our objective is to train 5,5% of employees quarterly.

Month	**No. of Employees Trained**	**Course**	**Source**
January	26 15 3	Induction OH&S Reps Crane Drivers	Internal Consultant External
February	23 17	Induction OH&S Reps	Internal Consultant
March	43 9 3 3	Induction OH&S Reps Bomag Rollers First Aiders	Internal Consultant Supplier St. John's

6. LEGAL ISSUES

6.1. An inspector of the Department of Labour issued an improvement notice on Job 00987: Gillooly's Mall. The notice requires that all scaffolding comply with the SABS standards for the Erection and Maintenance of Access Scaffolding (SABS 085). This is currently being attended to and the inspector will return on 15 April 2002 to ascertain if the notice has been complied with.

8. OCCUPATIONAL AIND OTHER HEALTH MATTERS

8.1. HIV Aids

The proposed SAFCEC clinic will soon be operational and we will then be able to send our employees who have tested positive to the clinic for counselling and eventual treatment when necessary

The mobile clinic saw and tested fifty employee volunteers at 3 sites this month. Eighteen of them tested positive.

8.2. Tuberculosis

The mobile clinic will be calling at Gillooly's Mall and Cleveland Station on 15 and 16 October respectively to screen employees for TB.

8.3. Noise

All suspected noise pollution areas have been tested and the results are awaited. Employees working in areas testing over 85dBa will be issued with suitable hearing protectors.

9. ENVIRONMENTAL MEASURES

Inspectors from the Botswana Department of the Environment visited Djwaneng and inspected the site and yard. They gave it a "clean bill of health" and advised that we should increase the dust control measures by spraying roads three times per day instead of the present twice per day.

10. ACHIEVEMENTS/AWARDS

10.1. The client at Djwaneng (Job 00786) awarded the XYZ site first position in the housekeeping competition conducted bi-monthly by the client's SHE managers. The project manager and his team are to be congratulated for this sterling effort.

10.2. Job 0987: Refurbishment of Pretoria Main Railway Station has just completed 1million compensation claim free days. This was no easy achievement if we consider the conditions being worked under after the extensive fire that caused major damage.

SHE Risk Manager

2002.09.27

ANNEXURE 3: LIST OF RISK ASSESSMENTS

* Clearing & Grubbing of the Area/Site
* Site Establishment including:
  - Office/s
  - Secure/safe storage for materials, plant & equipment
  - Ablutions
  - Sheltered eating area
  - Maintenance workshop
  - Vehicle access to the site
* Dealing with existing structures
* Location of existing services
* Installation and maintenance of temporary construction electrical supply, lighting and equipment
* Adjacent land uses/surrounding property exposures
* Boundary and access control/Public Liability Exposures (NB: the Employer is also responsible for the OH&S of non-employees affected by his/her work activities.)
* Health risks arising from neighbouring as well as own activities and from the environment e.g. threats by dogs, bees, snakes, lightning etc.
* Exposure to noise
* Exposure to vibration
* Protection against dehydration and heat exhaustion
* Protection from wet & cold conditions
* Dealing with HIV/Aids and other diseases
* Use of Portable Electrical Equipment including
  - Angle grinder
  - Electrical drilling machine
  - Skill saw
* Excavations including
  - Ground/soil conditions
  - Trenching
  - Shoring
  - Drainage of trench
* Welding including
  - Arc Welding
  - Gas welding
  - Flame cutting
  - Use of LP gas torches and appliances
* Loading & offloading of trucks
* Aggregate/sand and other materials delivery
* Manual and mechanical handling
* Lifting and lowering operations
* Driving & operation of construction vehicles and mobile plant including
  - Trenching machine
  - Excavator
  - Bomag roller
  - Plate compactor
  - Front end loader
  - Mobile cranes and the ancillary lifting tackle
  - Parking of vehicles & mobile plant

- Towing of vehicles & mobile plant

* Use and storage of flammable liquids and other hazardous substances
* Layering and bedding
* Installation of pipes in trenches
* Pressure testing of pipelines
* Backfilling of trenches
* Protection against flooding
* Gabion work
* Use of explosives
* Protection from overhead power lines
* As discovered by the Principal Contractor's hazard identification exercise
* As discovered from any inspections and audits conducted by the Client or by the Principal Contractor or any other Contractor on site
* As discovered from any accident/incident investigation.

C3.4.3.2 ENVIRONMENTAL MANAGEMENT PLAN

CONTENTS

C3.4.3.2.1. SCOPE

This environmental management programme (EMP) sets out the methods by which proper environmental controls are to be implemented by the contractor. The duration over which the contractor's controls shall be in place cover the construction period of the project as well as the limited time after contract completion defined by the General Conditions of Contract, and the project specifications, as the defects notification period (maintenance period).

The provisions of this EMP are binding on the contractor during the life of the contract. They are to be read in conjunction with all the documents that comprise the suite of documents for this contract. In the event that any conflict occurs between the terms of the EMP and the project specifications or Record of Decision, the terms herein shall be subordinate.

The EMP is a dynamic document subject to similar influences and changes as are brought by variations to the provisions of the project specification. Any substantial changes shall be submitted to the Makhado Local Municipality in writing for approval.

The EMP identifies the following:

Construction activities that will impact on the environment.
Specifications with which the contractor shall comply in order to protect the environment from the identified impacts.
Actions that shall be taken in the event of non-compliance.

C3.4.3.2.2. DEFINITIONS

Alien Vegetation: alien vegetation is defined as undesirable plant growth which shall include, but not be limited to, all declared category 1 and 2 listed invader species as set out in the Conservation of Agricultural Resources Act (CARA) regulations. Other vegetation deemed to be alien shall be those plant species that show the potential to occupy in number, any area within the defined construction area and which are declared to be undesirable.

Construction Activity: a construction activity is any action taken by the contractor, his subcontractors, suppliers or personnel during the construction process as defined in the South African National Roads Agency Limited and National Roads Act, 1998 (Act No. 7, 1998)

Environment: environment means the surroundings within which humans exist and that could be made up of -

- the land, water and atmosphere of the earth;
- micro-organisms, plant and animal life;
- any part or combination of (i) and (ii) and the interrelationships among and between them; and
- the physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and well-being.

Environmental Aspect: an environmental aspect is any component of a contractor's construction activity that is likely to interact with the environment.

Environmental Impact: an impact or environmental impact is the change to the environment, whether desirable or undesirable, that will result from the effect of a construction activity. An impact may be the direct or indirect consequence of a construction activity.

Record of Decision: a record of decision is a written statement from the Limpopo Department of Economic Development, Environment and Tourism, that records its approval of a planned undertaking to improve, upgrade or rehabilitate a section of road and the mitigating measures required to prevent or reduce the effects of environmental impacts during the life of a contract.

Road Reserve: the road reserve is a corridor of land, defined by co-ordinates and proclamation, within which the road, including access intersections or interchanges, is situated. A road reserve may, or may not, be bounded by a fence.

Road Width: for the purposes of the EMP, the road width is defined as the area within the road reserve i.e. fence line to fence line, but also includes all areas beyond the road reserve that are affected by the continuous presence of the road, e.g. a reach of a water course.

C3.4.3.2.3. IDENTIFICATION OF ENVIRONMENTAL ASPECTS AND IMPACTS

The contractor shall identify likely aspects before commencing with any construction activity. Examples of environment aspects include:

- waste generation
- stormwater discharge
- emission of pollutants into the atmosphere
- chemical use operations
- energy use operations
- water use operations
- use of natural resources
- noise generation

Thereafter the contractor shall programme his work in such a way that each cause and effect of a construction activity is also identified and the activity planned so as to prevent any impact from happening. If prevention is not practicable, or in the event of mishap or misapplication, the contractor shall provide plans and measures for the engineer's approval, which will limit and contain the magnitude, duration and intensity of the impact. The contractor shall demonstrate that he/she is capable of carrying out any repair and reinstatement of the damaged environment. These requirements shall be concurrent with the time constraints to produce an approved construction programme according to subclause 8.3 as amended by Particular Condition of the general conditions of contract and clause B1204 of these project specifications.

Listed below are some environmental impacts that could adversely alter an aspect of the environment through usual construction activities:

Pollution of atmosphere, soil or water
Destruction or removal of fauna and flora and effect on biological diversity
Deformation of the landscape
Soil erosion
Destruction of historical/heritage sites
Effect on the built environment
Effect on agricultural land and wetlands

General good construction practice will play an important role in avoiding the occurrence of an Impact. The contractor's attention is drawn, in this regard, to C1008. Environmental Management of Construction Activities

C3.4.3.2.4. LEGAL REQUIREMENTS

a) General

Construction will be according to the best industry practices, as identified in the project documents. This EMP, which forms an integral part of the contract documents, informs the contractor as to his duties in the fulfilment of the project objectives, with particular reference to the prevention and mitigation of environmental impacts caused by construction activities associated with the project. The contractor should note that obligations imposed by the EMP are legally binding in terms of environmental statutory legislation and in terms of the additional conditions to the general conditions of contract that pertain to this project. In the event that any rights and obligations contained in this document contradict those specified in the standard or project specifications then the latter shall prevail.

b) Statutory and other applicable legislation

The contractor is deemed to have made himself conversant with all legislation pertaining to the environment, including provincial and local government ordinances, which may be applicable to the contract.

C3.4.3.2.5. ADMINISTRATION OF ENVIRONMENTAL OBLIGATIONS

a) Appointment of a Designated Environmental Officer (DEO)

For the purposes of implementing the conditions contained herein, the contractor shall submit to the engineer for approval the appointment of a nominated representative of the contractor as the DEO for the contract. The request shall be given, in writing, at least fourteen days before the start of any work clearly setting out reasons for the nomination, and with sufficient detail to enable the engineer to make a decision. The engineer will, within seven days of receiving the request, approve, reject or call for more information on the nomination. Once a nominated representative of the contractor has been approved he/she shall be the DEO and shall be the responsible person for ensuring that the provisions of the EMP are complied with during the life of the contract. The engineer will be responsible for issuing instructions to the contractor where environmental

considerations call for action to be taken. The DEO shall submit regular written reports to the engineer, but not less frequently than once a month.

The engineer shall have the authority to instruct the contractor to replace the DEO if, in the engineer's opinion, the appointed officer is not fulfilling his/her duties in terms of the requirements of the EMP or this specification. Such instruction will be in writing and shall clearly set out the reasons why a replacement is required.

There shall be an approved DEO on the site at all times.

b) Administration

Before the contractor begins each construction activity the DEO shall give to the engineer a written statement setting out the following:

The type of construction activity.
Locality where the activity will take place.
Identification of the environmental aspects and impacts that might result from the activity.
Methodology for impact prevention for each activity or aspect.
Methodology for impact containment for each activity or aspect.
Emergency/disaster incident and reaction procedures.
Treatment and continued maintenance of impacted environment.

The contractor may provide such information in advance of any or all construction activities provided that new submissions shall be given to the engineer whenever there is a change or variation to the original.

The engineer may provide comment on the methodology and procedures proposed by the DEO, but he shall not be responsible for the contractor's chosen measures of impact mitigation and emergency/disaster management systems. However, the contractor shall demonstrate at inception and at least once during the contract that the approved measures and procedures function properly.

c) Good Housekeeping

The Contractor shall undertake "good housekeeping" practices during construction as stated in clause 1217 of the COLTO Standard Specifications for Roads and Bridges and subclauses 4.3.1 and 4.3.2 of the General Conditions of Contract. This will help avoid disputes on responsibility and allow for the smooth running of the contract as a whole. Good housekeeping extends beyond the wise practice of construction methods that leaves production in a safe state from the ravages of weather to include the care for and preservation of the environment within which the site is situated.

C3.4.3.2.6. TRAINING

The designated environmental officer (DEO) must be conversant with all legislation pertaining to the environment applicable to this contract and must be appropriately trained in environmental management and must possess the skills necessary to impart environmental management skills to all personnel involved in the contract.

The contractor shall ensure that adequate environmental training takes place. All employees shall have been given an induction presentation on environmental awareness. Where possible, the presentation needs to be conducted in the language of the employees. The environmental training should, as a minimum, include the following:

- The importance of conformance with all environmental policies
- The environmental impacts, actual or potential, of their work activities;

- The environmental benefits of improved personal performance;
- Their roles and responsibilities in achieving conformance with the environmental policy and procedures and with the requirement of the Agency's environmental management systems, including emergency preparedness and response requirements;
- The potential consequences of departure from specified operating procedures;
- The mitigation measures required to be implemented when carrying out their work activities.

In the case of permanent staff the contractor shall provide evidence that such induction courses have been presented. In the case of new staff (including contract labour) the contractor shall inform the engineer when and how he/she intends concluding his environmental training obligations.

C3.4.3.2.7. ACTIVITIES/ASPECTS CAUSING IMPACTS

A list of possible causes of environmental impacts that occur during construction activities is given in Table 7/1: Aspects or Activities that Cause Environmental Impacts during Construction Activities, which is to be found at the end of this part. This list is not exhaustive, and shall be used for guideline purposes only.

C3.4.3.2.8. ENVIRONMENTAL MANAGEMENT OF CONSTRUCTION ACTIVITIES

a) Site Establishment

i) Site Plan

The contractor shall establish his construction camps, offices, workshops, staff accommodation and testing facilities on the site in a manner that does not adversely affect the environment. However, before construction can begin, the contractor shall submit to the engineer for his approval, plans of the exact location, extent and construction details of these facilities and the impact mitigation measures the contractor proposes to put in place.

The plans shall detail the locality as well as the layout of the waste treatment facilities for litter, kitchen refuse, sewage and workshop-derived effluents. The site offices should not be sited in close proximity to steep areas, as this will increase soil erosion. Preferred locations would be flat areas along the route. If the route traverses water courses, streams and rivers, it is recommended that the offices, and in particular the ablution facilities, aggregate stockpiles, spoil areas and hazardous material stockpiles are located as far away as possible from any water course as possible. Regardless of the chosen site, the contractor's intended mitigation measures shall be indicated on the plan. The site plan shall be submitted not later than the first site meeting. Detailed, electronic colour photographs shall be taken of the proposed site before any clearing may commence. These records are to be kept by the engineer for consultation during rehabilitation of the site. Read with COLTO Specification 1302(a), 1402 (e).

ii) Vegetation

The contractor has a responsibility to inform his staff of the need to be vigilant against any practice that will have a harmful effect on vegetation.

The natural vegetation encountered on the site is to be conserved and left as intact as possible. Vegetation planted at the site shall be indigenous and in accordance with instructions issued by the engineer. Only trees and shrubs directly affected by the works, and such others as may be indicated by the engineer in writing, may be felled or cleared. In wooded areas where natural vegetation has been cleared out of necessity, the same species of indigenous trees as were occurring, shall be re-established.

The project specification for the rehabilitation of the grass cover shall be strictly adhered to. Any proclaimed weed or alien species that propagates during the contract period shall be cleared by hand before seeding. (Read in conjunction with COLTO Specification 5801(b), 5802(b), (c), (d) and (e), 5804, 5805, 5806 and 5807). Fires shall only be allowed in facilities or equipment specially constructed for this purpose. A firebreak shall be cleared and maintained around the perimeter of the camp and office sites.

iii) Rehabilitation

The area where the site offices were erected will require rehabilitation at the end of the

contract. All construction material, including concrete slabs and braai areas shall be removed from the site on completion of the contract.

iv) Water for human consumption

Water for human consumption shall be available at the site offices and at other convenient locations on site.

All effluent water from the camp / office sites shall be disposed of in a properly designed and constructed system, situated so as not to adversely affect water sources (streams, rivers, pans dams etc). Only domestic type wastewater shall be allowed to enter this drain.

v) Heating and Cooking fuel

The contractor shall provide adequate facilities for his staff so that they are not encouraged to supplement their comforts on site by accessing what can be taken from the natural surroundings. The contractor shall ensure that energy sources are available at all times for construction and supervision personnel for heating and cooking purposes.

b) Sewage treatment

Particular reference in the site establishment plan shall be given to the treatment of sewage generated at the site offices, site laboratory and staff accommodation and at all localities on the site where there will be a concentration of labour. Sanitary arrangements should be to the satisfaction of project management, the local authorities and legal requirements.

Safe and effective sewage treatment will require one of the following sewage handling methods: septic tanks and soak-aways, dry-composting toilets such as “enviro loos”, or the use of chemical toilets which are supplied and maintained by a subcontractor. The type of sewage treatment will depend on the geology of the area selected, the duration of the contract and proximity (availability) of providers of chemical toilets. Should a soak-away system be used, it shall not be closer than 800 metres from any natural water course or water retention system. The waste material generated from these facilities shall be serviced on a regular basis. The positioning of the chemical toilets shall be done in consultation with the engineer. Read with COLTO Specifications 1402(g) and 1404(a).

Toilets and latrines shall be easily accessible and shall be positioned within walking distance from wherever employees are employed on the works. Use of the veld for this purpose shall not, under any circumstances, be allowed.

Outside toilets shall be provided with locks and doors and shall be secured to prevent them from blowing over. The toilets shall also be placed outside areas susceptible to flooding. The contractor shall arrange for regular emptying of toilets and shall be entirely responsible for enforcing their use and for maintaining such latrines in a clean, orderly and sanitary condition to the satisfaction of the engineer.

c) Waste Management

The contractor’s intended methods for waste management and waste minimisation shall be implemented at the outset of the contract. All personnel shall be instructed to dispose of all waste in the proper manner.

i) Solid Waste

Solid waste shall be stored in an appointed area in covered, tip proof metal drums for collection and disposal. A refuse control system shall be established for the collection and removal of refuse to the satisfaction of the engineer. Disposal of solid waste shall be at a Department of Water Affairs and Forestry (DWAF) licensed landfill site or at a site approved by DWAF in the event that an existing operating landfill site is not within reasonable distance from the site offices and staff accommodation. No waste shall be burned or buried at or near the site offices, nor anywhere else on the site, including the approved solid waste disposal site. Read with COLTO Specification 1404(a).

ii) Litter

No littering by construction workers shall be allowed. During the construction period, the facilities shall be maintained in a neat and tidy condition and the site shall be kept free of litter.

Measures shall be taken to reduce the potential for litter and negligent behaviour with regard to the disposal of all refuse. At all places of work the contractor shall provide litter collection facilities for later safe disposal at approved sites. (Read with COLTO Specification 1302(b)).

iii) Hazardous waste

Hazardous waste such as bitumen, tar, oils etc. shall be disposed of in a Department of Water Affairs and Forestry approved landfill site. Special care shall be taken to avoid spillage of tar or bitumen products such as binders or pre-coating fluid to avoid water-soluble phenols from entering the ground or contaminating water.

Under no circumstances shall the spoiling of tar or bituminous products on the site, over embankments, in borrow pits or any burying, be allowed. Unused or rejected tar or bituminous products shall be returned to the supplier's production plant. Any spillage of tar or bituminous products shall be attended to immediately and affected areas shall be promptly reinstated to the satisfaction of the engineer.

d) Control at the workshop

The contractor's management and maintenance of his plant and machinery will be strictly monitored according to the criteria given below, regardless whether it is serviced on the site (i.e. at the place of construction activity or at a formalised workshop).

i) Safety

All the necessary handling and safety equipment required for the safe use of petrochemicals and oils shall be provided by the contractor to, and used or worn by, the staff whose duty it is to manage and maintain the contractor's and his subcontractor's and supplier's plant, machinery and equipment.

ii) Hazardous Material Storage

Petrochemicals, oils and identified hazardous substances shall only be stored under controlled conditions. All hazardous materials e.g. tar or bitumen binders shall be stored in a secured, appointed area that is fenced and has restricted entry. Storage of tar or bituminous products shall only take place using suitable containers to the approval of the engineer.

The contractor shall provide proof to the engineer that relevant authorisation to store such substances has been obtained from the relevant authority. In addition, hazard signs indicating the nature of the stored materials shall be displayed on the storage facility or containment structure. Before containment or storage facilities can be erected the contractor shall furnish the engineer with details of the preventative measures he proposes to install in order to mitigate against pollution of the surrounding environment from leaks or spillage. The preferred method shall be a concrete floor that is bunded. Any deviation from the method will require proof from the relevant authority that the alternative method proposed is acceptable to that authority. The proposals shall also indicate the emergency procedures in the event of misuse or spillage that will negatively affect an individual or the environment.

iii) Fuel and Gas Storage

Fuel shall be stored in a secure area in a steel tank supplied and maintained by the fuel suppliers.. An adequate bund wall, 110% of volume, shall be provided for fuel and diesel areas to accommodate any leakage spillage or overflow of these substances. The area inside the bund

wall shall be lined with an impervious lining to prevent infiltration of the fuel into the soil. Any leakage, spillage or overflow of fuel shall be attended to without delay.

Gas welding cylinders and LPG cylinders shall be stored in a secure, well-ventilated area.

iv) Oil and Lubricant Waste

Used oil, lubricants and cleaning materials from the maintenance of vehicles and machinery shall be collected in a holding tank and sent back to the supplier. Water and oil should be separated in an oil trap. Oils collected in this manner, shall be retained in a safe holding tank and removed from site by a specialist oil recycling company for disposal at approved waste disposal sites for toxic/hazardous materials. Oil collected by a mobile servicing unit shall be stored in the service unit's sludge tank and discharged into the safe holding tank for collection by the specialist oil recycling company.

All used filter materials shall be stored in a secure bin for disposal off site. Any contaminated soil shall be removed and replaced. Soils contaminated by oils and lubricants shall be collected and disposed of at a facility designated by the local authority to accept contaminated materials.

e) Clearing the Site

In all areas where the contractor intends to, or is required to clear the natural vegetation and soil, either within the road reserve, or at designated or instructed areas outside the road reserve, a plan of action shall first be submitted to the engineer for his approval.

The plan shall contain a photographic record and chainage/land reference of the areas to be disturbed. This shall be submitted to the engineer for his records before any disturbance/stockpiling may occur. The record shall be comprehensive and clear, allowing for easy identification during subsequent inspections.

The contractor shall be responsible for the re-establishment of grass within the road reserve boundaries for all areas disturbed during road construction. This includes, for example, service roads, stockpile areas, stop/go facilities, windrows and wherever material generated for, or from, road construction has to be stored temporarily or otherwise within the road reserve, or at designated or instructed areas outside the road reserve. This responsibility shall extend until expiry of the defects notification period.

f) Soil Management

i) Topsoil

Topsoil shall be removed from all areas where physical disturbance of the surface will occur and shall be stored and adequately protected. The contract will provide for the stripping and stockpiling of topsoil from the site for later re-use. Topsoil is considered to be the natural soil covering, including all the vegetation and organic matter. Depth may vary at each site. The areas to be cleared of topsoil shall include the storage areas. All topsoil stockpiles and windrows shall be maintained throughout the contract period in a weed-free condition. Weeds appearing on the stockpiled or windrowed topsoil shall be removed by hand. Soils contaminated by hazardous substances shall be disposed of at an approved Department of Water Affairs and Forestry waste disposal site. (Read with COLTO Specifications 3104(a), 5802(a), (g), 5804(a), (b) and (c)). The topsoil stockpiles shall be stored, shaped and sited in such a way that they do not interfere with the flow of water to cause damming or erosion, or itself be eroded by the action of water. Stockpiles of topsoil shall not exceed a height of 2m, and if they are to be left for longer than 6 months, shall be analysed, and if necessary, upgraded before replacement. Stockpiles shall be protected against infestation by weeds.

The contractor shall ensure that no topsoil is lost due to erosion – either by wind or water. Areas to be topsoiled and grassed shall be done so systematically to allow for quick cover and reduction in the chance of heavy topsoil losses due to unusual weather patterns. The contractor's programme shall clearly show the proposed rate of progress of the application of topsoil and grassing. The contractor shall be held responsible for the replacement, at his own cost, for any unnecessary loss of topsoil due to his failure to work according to the progress plan approved by the engineer. The contractor's responsibility shall also extend to the clearing of drainage or water systems within and beyond the boundaries of the road reserve that may have been affected by such negligence.

ii) Subsoil

The subsoil is the layer of soil immediately beneath the topsoil. It shall be removed, to a depth instructed by the engineer, and stored separately from the topsoil if not used for road building. This soil shall be replaced in the excavation in the original order it was removed for rehabilitation purposes.

g) Drainage

The quality, quantity and flow direction of any surface water runoff shall be established prior to disturbing any area for construction purposes. Cognisance shall be taken of these aspects and incorporated into the planning of all construction activities. Before a site is developed or expanded, it shall be established how this development or expansion will affect the drainage pattern. Recognised water users / receivers shall not be adversely affected by the expansion or re-development. No water source shall be polluted in any way due to proposed changes.

Streams, rivers, pans, wetlands, dams, and their catchments shall be protected from erosion and from direct or indirect spillage of pollutants such as refuse, garbage, cement, concrete, sewage, chemicals, fuels, oils, aggregate, tailings, wash water, organic materials and bituminous or tar products.

The contractor shall submit to the engineer his proposals for prevention, containment and rehabilitation measures against environmental damage of the identified water and drainage systems that occur on the site. Consideration shall be given to the placement of sedimentation ponds or barriers where the soils are of a dispersive nature or where toxic fluids are used in the construction process. The sedimentation ponds must be large enough to contain runoff so that they function properly under heavy rain conditions.

h) Earthworks and Layerworks

This section includes all construction activities that involve the mining of all materials, and their subsequent placement, stockpile, spoil, treatment or batching, for use in the permanent works, or temporary works in the case of deviations. Before any stripping prior to the commencement of construction, the contractor shall have complied with the requirements of sections C1008 (e) and C1008 (g). In addition, the contractor shall take cognisance of the requirements set out below.

i) Quarries and borrow pits

The contractor's attention is drawn to the requirement of the Department of Minerals and Energy, that before entry into any quarry or borrow pit, an EMP for the establishment, operation and closure of the quarry or borrow pit shall have been approved by the Department. It is the responsibility of the contractor to ensure that he is in possession of the approved EMP or a copy thereof, prior to entry into the quarry or borrow pit. The conditions imposed by the relevant EMP are legally binding on the contractor and may be more extensive and explicit than the requirements of this specification. In the event of any conflict occurring between the requirements of the specific EMP and these specifications the former shall apply. The cost of complying with the requirements shall be deemed to be included in existing rates in the Bill of Quantities. (Read with COLTO Specification 3100 and 3200).

ii) Excavation, hauling and placement

The contractor shall provide the engineer with detailed plans of his intended construction processes prior to starting any cut or fill or layer. The plans shall detail the number of personnel and plant to be used and the measures by which the impacts of pollution (noise, dust, litter, fuel, oil, sewage), erosion, vegetation destruction and deformation of landscape will be prevented, contained and rehabilitated. Particular attention shall also be given to the impact that such activities will have on the adjacent built environment. The contractor shall demonstrate his "good housekeeping", particularly with respect to closure at the end of every day so that the site is left in a safe condition from rainfall overnight or over periods when there is no construction activity. (Read with COLTO Standard Specification clauses 1217 and 3309)

iii) Spoil sites

The contractor shall be responsible for the safe siting, operation, maintenance and closure of any spoil site he uses during the contract period, including the defects notification period. This shall include existing spoil sites that are being re-entered. Before spoil sites may be used proposals for their locality, intended method of operation, maintenance and rehabilitation shall be given to the engineer for his approval. The location of these spoil sites shall have signed approval from the affected landowner before submission to the engineer. No spoil site shall be located within 500m of any watercourse. A photographic record shall be kept of all spoil sites for monitoring purposes. This includes before the site is used and after re-vegetation.

The use of approved spoil sites for the disposal of hazardous or toxic wastes shall be prohibited unless special measures are taken to prevent leaching of the toxins into the surrounding environment. Such special measures shall require the approval of the relevant provincial or national authority. The same shall apply for the disposal of solid waste generated from the various camp establishments. The engineer will assist the contractor in obtaining the necessary approval if requested by the contractor.

Spoil sites will be shaped to fit the natural topography. These sites shall receive a minimum of 75mm topsoil and be grassed with the recommended seed mixture. Slopes shall not exceed a vertical: horizontal ratio of 1:3. Only under exceptional circumstances will approval be given to exceed this ratio. Appropriate grassing measures to minimise soil erosion shall be undertaken by the contractor. This will include both strip and full sodding. The contractor may motivate to the engineer for other acceptable stabilising methods. The engineer may only approve a completed spoil site at the end of the defects notification period upon receipt from the contractor of a landowner's clearance notice and an engineer's certificate certifying slope stability (Read with COLTO standard Specifications clause 1214). The contractor's costs incurred in obtaining the necessary certification for opening and closing of spoil sites shall be deemed to be included in the tendered rates for spoiling.

iv) Stockpiles

The contractor shall plan his activities so that materials excavated from borrow pits and cuttings, in so far as possible, can be transported direct to and placed at the point where it is to be used. However, should temporary stockpiling become necessary, the areas for the stockpiling of excavated and imported material shall be indicated and demarcated on the site plan submitted in writing to the engineer for his approval, together with the contractor's proposed measures for prevention, containment and rehabilitation against environmental damage.

The areas chosen shall have no naturally occurring indigenous trees and shrubs present that may be damaged during operations. Care shall be taken to preserve all vegetation in the immediate area of these temporary stockpiles. During the life of the stockpiles the contractor shall at all times ensure that they are:

- Positioned and sloped to create the least visual impact;
- Constructed and maintained so as to avoid erosion of the material and contamination of surrounding environment; and
- Kept free from all alien/undesirable vegetation.

After the stockpiled material has been removed, the site shall be re-instated to its original condition. No foreign material generated / deposited during construction shall remain on site. Areas affected by stockpiling shall be landscaped, top soiled, grassed and maintained at the contractor's cost until clearance from the engineer and the relevant Authority is received.

Material milled from the existing road surface that is temporarily stockpiled in areas approved by the engineer within the road reserve, shall be subject to the same condition as other stockpiled materials. Excess materials from windrows, in-situ milling or any detritus of material from road construction activities may not be swept off the road and left unless specifically instructed to do so in the contract drawing or under instruction from the engineer

In all cases, the engineer shall approve the areas for stockpiling and disposal of construction rubble before any operation commences and shall approve their clause only when they have been satisfactorily rehabilitated. (Read with COLTO Specification 3203 and 4306).

v) Blasting activities

Wherever blasting activity is required on the site (including quarries and/or borrow pits) the contractor shall rigorously adhere to the relevant statutes and regulations that control the use of explosives. In addition, the contractor shall, prior to any drilling of holes in preparation for blasting, supply the engineer with a locality plan of the blast site on which shall be shown the zones of influence of the ground and air shock-waves and expected limits of fly-rock. The plan shall show each dwelling, structure and service within the zones of influence and record all details of the dwellings/structures/services including existing positions, lengths and widths of cracks, as well as the condition of doors, windows, roofing, wells, boreholes etc. The contractor, alone, shall be responsible for any costs that can be attributed to blasting activities, including the collection of fly-rock from adjacent lands and fields. The submission of such a plan shall not in any way absolve the contractor from his responsibilities in this regard. The contractor shall also indicate to the engineer the manner in which he intends to advertise to the adjacent communities and/or road users the times and delays to be expected for each individual blast.

i) Batching sites

Asphalt plants are considered scheduled processes listed in the second schedule to the Atmospheric Pollution Prevention Act, 1965 (Act No. 45 of 1965). Should the use of an asphalt plant be considered on site, the contractor shall be responsible to obtain the necessary permit from the Department of Environmental Affairs and Tourism, regardless of where they are sited.

Crushing plants and concrete batching plants, whether sited inside or outside of defined quarry or borrow pit areas, shall be subject to the requirements of the Department of Minerals and Energy legislation as well as the applicable industrial legislation that governs gas and dust emissions into the atmosphere. Such sites will be the subject of regular inspections by the relative authorities during the life of the project. In addition, the selection, entry onto, operation, maintenance, closure and rehabilitation of such sites shall be the same as for those under section C1008(h)(iii), with the exception that the contractor shall provide additional measures to prevent, contain and rehabilitate against environmental damage from toxic/hazardous substances. In this regard the contractor shall provide plans that take into account such additional measures as concrete floors, bunded storage facilities, linings to drainage channels and settlement dams. Ultimate approval of these measures shall be from the relevant national authority, as shall approval of closure. The engineer will assist the contractor in his submissions to the relevant authority.

Effluent from concrete batch plants and crusher plants shall be treated in a suitable designated sedimentation dam to the legally required standards to prevent surface and groundwater pollution. The designs of such a facility should be submitted to the engineer for approval.

The contractor shall invite the relevant department to inspect the site within 2 months after any plant is commissioned and at regular intervals thereafter, not exceeding 12 months apart

j) Spillages

Streams, rivers and dams shall be protected from direct or indirect spillage of pollutants such as refuse, garbage, cement, concrete, sewage, chemicals, fuels, oils, aggregate, tailings, wash water, organic materials and tar or bituminous products. In the event of a spillage, the contractor shall be liable to arrange for professional service providers to clear the affected area.

Responsibility for spill treatment lies with the contractor. The individual responsible for, or who discovers a hazardous waste spill must report the incident to his/her DEO or to the engineer. The Designated Environmental Officer will assess the situation in consultation with the engineer and act as required. In all cases, the immediate response shall be to contain the spill. The exact treatment of polluted soil / water shall be determined by the contractor in consultation with the DEO and the engineer. Areas cleared of hazardous waste shall be re-vegetated according to the engineer's instructions

Should water downstream of the spill be polluted, and fauna and flora show signs of deterioration or death, specialist hydrological or ecological advice will be sought for appropriate treatment and remedial procedures to be followed. The requirement for such input shall be agreed with the engineer. The costs of containment and rehabilitation shall be for the contractor's account, including the costs of specialist input.

k) Areas of Specific Importance

Any area, as determined and identified within the project document as sensitive or of special interest within the site shall be treated according to the express instructions contained in these specifications or the approved EMP. The contractor may offer alternative solutions to the engineer in writing should he consider that construction will be affected in any way by the hindrance of the designated sensitive area or feature. However, the overriding principle is that such defined areas requiring protection shall not be changed. Every effort to identify such areas within the site will have been made prior to the project going out to tender. The discovery of other sites with archaeological or historical interest that have not been identified shall require ad hoc treatment.

i) Archaeological Sites

If an artefact on site is uncovered, work in the immediate vicinity shall be stopped immediately. The contractor shall take reasonable precautions to prevent any person from removing or damaging any such article and shall immediately upon discovery thereof inform the engineer of such discovery. The South African Heritage Research Agency (SAHRA) is to be contacted who will appoint an archaeological consultant. Work may only resume once clearance is given in writing by the archaeologist. (Read with COLTO General Condition of Contract Subclause 4.24 as amended by Particular Condition).

ii) Graves and middens

If a grave or midden is uncovered on site, or discovered before the commencement of work, then all work in the immediate vicinity of the graves/middens shall be stopped and the engineer informed of the discovery. SAHRA should be contacted and in the case of graves, arrangements made for an undertaker to carry out exhumation and reburial. The Employer will be responsible for attempts to contact family of the deceased and for the site where the exhumed remains can be re-interred. (Read with COLTO General Conditions of Contract Sub-clause 4.24 as amended by Particular Condition).

l) Noise Control

The contractor shall endeavour to keep noise generating activities to a minimum. Noises that could cause a major disturbance, for instance blasting and crushing activities, should only be carried out during daylight hours. Compliance with the appropriate legislation with respect to noise, shall be mandatory.

Should noise generating activities have to occur at night the people in the vicinity of the drilling shall be warned about the noise well in advance and the activities kept to a minimum.

m) Dust Control

Dust caused by strong winds shall be controlled by means of water spray vehicles. Dust omission from batching plants shall be subject to the relevant legislation and shall be the subject of inspection by the relevant office of the Department of Minerals and Energy.

n) Alien Vegetation

The contractor shall be held responsible for the removal of alien vegetation within the road reserve disturbed during road construction. This includes, for example, service roads, stockpile areas, stop/go facilities, windrows and wherever material generated for or from road construction has been stored temporarily or otherwise within the road reserve. This responsibility shall extend for the duration of the defects notification period.

C3.4.3.2.9. RECORD KEEPING

The engineer and the DEO will continuously monitor the contractor's adherence to the approved impact prevention procedures and the engineer shall issue to the contractor a notice of non-compliance whenever transgressions are observed. The DEO should document the nature and magnitude of the non-compliance in a designated register, the action taken to discontinue the non-compliance, the action taken to mitigate its effects and the results of the actions. The non-compliance shall be documented and reported to the engineer in the monthly report.

Copies of any record of decision or EMP's for specific borrow pits or quarries used on the project shall be kept on site and made available for inspection by visiting officials from the employer or relevant environmental departments.

C3.4.3.2.10. COMPLIANCE AND PENALTIES

The contractor shall act immediately when such notice of non-compliance is received and correct whatever is the cause for the issuing of the notice. Complaints received regarding activities on the construction site pertaining to the environment shall be recorded in a dedicated register and the response noted with the date and action taken. This record shall be submitted with the monthly reports and a verbal report given at the monthly site meetings.

Any avoidable non-compliance with the above-mentioned measures shall be considered sufficient ground for the imposition of a penalty

The following penalties shall apply for environmental violations:

a) Unnecessary removal or damage to trees

- 2600mm girth or less : R 5 000 per tree
- Greater than 2600mm, but less than 6180mm girth : R10 000 per tree
- Greater than 6180mm girth : R30 000 per tree

b) Serious violations:

- Hazardous chemical/oil spill and/or dumping in non-approved sites. : R10 000 per incident
- General damage to sensitive environments. : R 5 000 per incident
- Damage to cultural and historical sites. : R 5 000 per incident
- Uncontrolled/unmanaged erosion (plus rehabilitation at contractor's cost). : R1 000 to R5 000 per incident
- Unauthorised blasting activities. : R 5 000 per incident
- Pollution of water sources. : R 10 000 per incident

The engineer's decision with regard to what is considered a violation, its seriousness and the penalty imposed shall be final.

c) Less serious violations:

- Littering on site. : R1 000 per incident
- Lighting of illegal fires on site. : R1 000 per incident
- Persistent or un-repaired fuel and oil leaks. : R1 000 per incident
- Excess dust or excess noise emanating from site. : R1 000 per incident
- Dumping of milled material in side drains or on grassed areas: R1 000 per incident
- Possession or use of intoxicating substances on site. : R 500 per incident
- Any vehicles being driven in excess of designated speed limits. : R 500 per incident
- Removal and/or damage to flora or cultural or heritage objects on site, and/or killing of wildlife. : R2 000 per incident
- Illegal hunting. : R2 000 per incident
- Urination and defecation anywhere except in designated areas. : R 500 per incident

The engineer's decision with regard to what is considered a violation, its seriousness and the penalty imposed shall be final. The calculation shall include allied construction activities in the same way as the calculation of reduced payments under section 8200. The imposition of such a penalty shall not preclude the relevant provincial or national authority from applying an additional penalty in accordance with its statutory powers. Any non-compliance with the agreed procedures of the EMP is a transgression of the various statutes and laws that define the manner by which the environment is managed.

Failure to redress the cause shall be reported to the relevant authority for them to deal with the transgression, as it deems fit.

C3.4.3.2.11. MEASUREMENT AND PAYMENT

The cost of complying to this specification shall be deemed to be included in the rates tendered for this project.

Item			Unit
B100.01		**Penalty for unnecessary removal or damage to trees** for the following diameter sizes	
	(a)	2600mm girth or less	number (No)
	(b)	Greater than 2600mm, but less than 6180mm girth	number (No)
	(c)	Greater than 6180mm girth	number (No)

The unit of measurement shall be the number of trees by diameter size removed unnecessary or damaged. The penalty rates applied shall be those stated in clause C3.5.2.10.

Item			Unit
B100.02		**Penalty for serious violations**	
	(a)	Hazardous chemical/oil spill and/or dumping in non-approved sites	number (No)
	(b)	General damage to sensitive environments	
	(c)	Damage to cultural and historical sites	number (No)
	(d)	Pollution of water sources	number (No)
	(e)	Unauthorised blasting activities	number (No)
	(f)	Uncontrolled/unmanaged erosion per incident, depending on environment impacts, plus rehabilitation at contractor's cost)	number (No)

The unit of measurement for B100.02 (a) to (f) shall be the number of serious violation incidents. The penalty rates to be applied shall be those stated in clause C3.5.2.10.

Item		Unit
B100.03	**Penalty for less serious violations**	
•	Littering on site	number (No)
•	Lighting of illegal fires on site	number (No)
•	Persistent or un-repaired fuel and oil leaks	number (No)
•	Excess dust or excess noise emanating from site	number (No)
•	Dumping of milled material in side drains or on grassed areas	number (No)
•	Possession or use of intoxicating substances on site	number (No)
•	Any vehicles being driven in excess of designated speed limits	number (No)
•	Removal and/or damage to flora or cultural or heritage objects on site, and/or killing of wildlife	number (No)
•	Illegal hunting	number (No)
•	Urination and defecation anywhere except in designated areas	number (No)

The unit of measurement shall be the number of less serious violation incidents. The penalty rates applied shall be those stated in clause C3.5.2.10.

The engineer's decision with regard to what is considered a violation, its seriousness and the penalty imposed shall be final. The calculation shall include allied construction activities in the same way as the calculation of reduced payments under section 8200. The imposition of such a penalty shall not preclude the relevant provincial or national authority from applying an additional penalty in accordance with its statutory powers. Any non-compliance with the agreed procedures of the EMP is a transgression of the various statutes and laws that define the manner by which the environment is managed.

Failure to redress the cause shall be reported to the relevant authority for them to deal with the transgression, as it deems fit.

Table 1: Mechanisms that Cause Environmental Impacts during Construction Activities

SECTION	CONTENTS	ENVIRONMENTAL IMPACTS				
		POLLUTION TYPE	DEFORMATION OF LANDSCAPE	SOIL EROSION	ALIEN VEGETATION	SENSITIVE AREAS (to be completed by compiler)
1300	Camp Establishment	Waste treatment Hazardous waste Water supply Spillage Storage	Selection of site Preserve indigenous vegetation Preserve topsoil	Selection of site Preserve indigenous vegetation Preserve topsoil	Preserve indigenous vegetation Preserve topsoil Management of weeds	
1400	Housing, Offices and laboratories	Waste treatment Hazardous waste Water supply Spillage Storage Noise/lights	Selection of site Preserve indigenous vegetation Preserve topsoil Demarcate sensitive areas	Selection of site Preserve indigenous vegetation Preserve topsoil	Preserve indigenous vegetation Preserve topsoil Management of weeds	
1500	Accommodation of Traffic	Waste treatment Hazardous waste Water supply Spillage Storage Noise/lights Dust control	Selection of site Preserve indigenous vegetation Preserve topsoil Demarcate sensitive areas Maintenance of windrows	Selection of site Preserve indigenous vegetation Preserve topsoil	Preserve indigenous vegetation Preserve topsoil Management of weeds	
1600	Overhaul	Spillage Storage Noise/lights Dust control Exhaust fumes Washing waste	Turning circles Parking areas	Restrict access to sensitive areas	Protection of indigenous vegetation Preserve topsoil	

SECTION	CONTENTS	ENVIRONMENTAL IMPACTS				
		POLLUTION TYPE	DEFORMATION OF LANDSCAPE	SOIL EROSION	ALIEN VEGETATION	SENSITIVE AREAS (to be completed by compiler)
1700	Clearing and grubbing	Waste treatment Hazardous waste Water supply Noise /lights Dust control	Selection of site Preserve indigenous vegetation Preserve topsoil	Selection of site Preserve indigenous vegetation Preserve topsoil	Protection of indigenous vegetation Preserve topsoil	
2100 - 2400	Drainage	Waste treatment Hazardous waste Water supply Spillage Storage	Selection of site Preserve indigenous vegetation Preserve topsoil	Selection of site Preserve indigenous vegetation Preserve topsoil	Preserve indigenous vegetation Preserve topsoil Management of weeds	
3100	Borrow pits	Waste treatment Hazardous waste Water supply Spillage Storage	Selection of site Preserve indigenous vegetation Preserve topsoil	Selection of site Preserve indigenous vegetation Preserve topsoil	Preserve indigenous vegetation Preserve topsoil Management of weeds	
3200	Stockpiling	Waste treatment Hazardous waste Water supply Spillage Storage	Selection of site Preserve indigenous vegetation Preserve topsoil	Selection of site Preserve indigenous vegetation Preserve topsoil	Preserve indigenous vegetation Preserve topsoil Management of weeds	
3300	Mass Earthworks	Waste treatment Hazardous waste Water supply Spillage Storage	Selection of site Preserve indigenous vegetation Preserve topsoil	Selection of site Preserve indigenous vegetation Preserve topsoil	Preserve indigenous vegetation Preserve topsoil Management of weeds	
3400 - 3900	Pavement layers	Waste treatment Hazardous waste	Selection of site Preserve indigenous	Selection of site	Preserve indigenous vegetation	

SECTION	CONTENTS	ENVIRONMENTAL IMPACTS				
		POLLUTION TYPE	DEFORMATION OF LANDSCAPE	SOIL EROSION	ALIEN VEGETATION	SENSITIVE AREAS (to be completed by compiler)
		Water supply Spillage Storage Noise / lights Dust control	vegetation Preserve topsoil Demarcate sensitive areas Maintenance of windrows	Preserve indigenous vegetation Preserve topsoil	Preserve topsoil Management of weeds	
4100	Asphalt works / sealing operations	Waste treatment Hazardous waste Water supply Spillage Storage Noise / lights Dust control Smoke control Storage of materials	Selection of site Preserve indigenous vegetation Preserve topsoil Turning circles Parking areas	Selection of site Preserve indigenous vegetation Preserve topsoil	Preserve indigenous vegetation Preserve topsoil	
5000	Ancilliary roadworks	Waste treatment Hazardous waste Water supply Spillage Storage	Selection of site Preserve indigenous vegetation Preserve topsoil	Selection of site Preserve indigenous vegetation Preserve topsoil	Preserve indigenous vegetation Preserve topsoil Management of weeds	
6000	Structures	Waste treatment Hazardous waste Water supply Spillage Storage	Selection of site Preserve indigenous vegetation Preserve topsoil	Selection of site Preserve indigenous vegetation Preserve topsoil	Preserve indigenous vegetation Preserve topsoil Management of weeds	
7000	Concrete pavements etc	Waste treatment Hazardous waste Water supply	Selection of site Preserve indigenous vegetation	Selection of site Preserve indigenous vegetation	Preserve indigenous vegetation Preserve topsoil	

SECTION	CONTENTS	ENVIRONMENTAL IMPACTS				
		POLLUTION TYPE	DEFORMATION OF LANDSCAPE	SOIL EROSION	ALIEN VEGETATION	SENSITIVE AREAS (to be completed by compiler)
		Spillage Storage	Preserve topsoil	Preserve topsoil	Management of weeds	

C3.4.3.3 PROVISION OF STRUCTURED TRAINING

CONTENTS

C3.4.3.3.1 SCOPE

This specification covers the requirements for the provision of structured training to be arranged by the contractor over the period of this contract.

C3.4.3.3.2 GENERIC TRAINING

C3.4.3.3.2.1 The contractor shall, from the commencement of the contract, implement a structured progressive training programme.

C3.4.3.3.2.2 Training shall be at or by an approved accredited organisation and shall be delivered by suitably qualified and experienced trainers.

C3.4.3.3.2.3 The contractor shall be responsible for the provision of everything necessary for the delivery of the generic training programme, including the following:

(a) A suitable venue with sufficient furniture, lighting and power.
(b) All necessary stationery consumables and study material.
(c) Transport of the students (as necessary).

C3.4.3.3.2.4 Generic training courses shall commence within one month of possession of site and be completed before the end of the contract period. The Training Schedule should form part of the section 12 programme to be approved by the Engineer at the start of the project.

C3.4.3.3.2.5 The contractor's training programme shall be subject to the approval of Makhado Local Municipality and the contractor shall if so instructed by Makhado Local Municipality alter or amend the programme and course content if a need is identified once the contract commences.

C3.4.3.3.2.6 The contractor shall keep comprehensive records of the training given to each student and whenever required shall provide copies of such records to the engineer. At the successful completion of each course each student shall be issued with a certificate indicating the course contents as proof of attendance and completion.

In addition to the above, a monthly return shall be submitted by the contractor. An example of the form is illustrated in Part C5 of this document (form RDP 11 (E))

C3.4.3.3.3 ENTREPRENEURIAL SKILLS TRAINING

C3.4.3.3.3.1 Small contractors, subcontractors and the Project Steering Committee (PSC) will be entitled to receive a structured training programme, which will comprise both management skills as well as business development skills.

C3.4.3.3.3.2 The contractor shall closely monitor the performance of all small subcontractors in the execution of their contracts and shall identify all such subcontractors who, in his opinion, display the potential to benefit from structured training as may be provided for

in the contract and where required by the engineer, shall make recommendations in this regard. The final list of candidates will be decided between the contractor and the engineer.

C3.4.3.3.3.3 The training will be delivered by trainers who are accredited by the Civil Engineering Training Scheme (CEITS) or other institutions recognised by the Department of Labour. Accredited training refers to both the trainers as well as to the training material.

C3.4.3.3.3.4 The contractor shall facilitate in the delivery thereof, by instructing and motivating the subcontractor regarding attendance and participation therein.

C3.4.3.3.3.5 The contractor shall further make all reasonable efforts to co-ordinate the programming of the subcontractor's work with that of the delivery of the structured training.

C3.4.3.3.3.7 The contractor shall be responsible for the provision of everything necessary for the delivery of the entrepreneurial training programme, including the following:

(a) A suitably furnished venue (if required) with lighting and power.
(b) All necessary consumables, stationery and study material.
(c) Transport of the subcontractors (as necessary).

C3.4.3.3.3.7 All entrepreneurial training shall take place within normal working hours.

C3.4.3.3.3.8 The contractor's training programme shall be subject to the approval of Makhado Local Municipality and the contractor shall if so instructed by Makhado Local Municipality alter or amend the programme and course content if a need is identified once the contract commences.

C3.4.3.3.3.10 The contractor shall keep comprehensive records of the training given to each subcontractor and whenever required shall provide copies of such records to the engineer. At the successful completion of each course each subcontractor shall be issued with a certificate indicating the course contents as proof of attendance and completion.

In addition to the above, a monthly return shall be submitted by the contractor. An example of the form to be used is illustrated in Part C5 of this document, (form RDP 12 (E)).

C3.4.3.3.4 MEASUREMENT AND PAYMENT

ITEM		**UNIT**
C12.05	Provision for accredited training	
(a)	Generic skills	Provisional sum
(b)	Entrepreneurial skills	Provisional sum
(c)	Handling cost and profit in respect of sub-item C12.05(a) and (b) above	percentage (%)
(d)	Training venue (only if required)	lump sum

The prime cost sums are provided to cover the actual costs (including wages and the daily PSC reimbursement) for attendance of accredited training courses as agreed with the engineer and shall be expended in accordance with the provisions of sub-clause 48(2) of the general conditions of contract. The tendered percentage in sub-item C12.05 (c) is a percentage of the amount actually spent under sub-items C12.05(a) and (b) which shall include full compensation for the contractor's handling cost, profit, mentoring, record keeping, reporting and all other costs in connection therewith.

The lump sum tendered for C12.05(d) shall include full compensation for the provision of the training venue, for all necessary lighting, power, furniture, stationery, consumables and study material and for transportation of the students to and from the training venue.

Payment of the lump sum will be made after the provision of all the accredit training, issuing of all certificates and submission of all records as specified in the document.

C3.4.3.4 PROVISION OF THE TEMPORARY WORKFORCE

CONTENTS

C3.4.3.4.1 SCOPE

This Specification covers the provisions and requirements relating to the provision of the temporary workforce. Reference is also made to the Basic Conditions of Employment Act (Act 75 of 1997) with specific reference to the Sectoral Determination 2: Civil Engineering Sector

C3.4.3.4.2 INTERPRETATIONS

C3.4.3.4.2.1 Supporting documents

The Tender Rules, Conditions of Contract, Standard and Project Specifications, Drawings and statutory minimum requirements relating to the employment and remuneration of labour shall *inter alia* be read in conjunction with this Specification.

C3.4.3.4.2.1.2 Definitions and abbreviations

For the purposes of this specification, the definitions given in the Conditions of Contract, the Standard Specifications and the Project Specifications, together with the following additional definitions shall, unless the context dictates otherwise, apply:

(a) "Key Personnel" means all contracts managers, site agents, materials and survey technicians, trainers, supervisors, foremen, skilled plant operators, artisans and the like, and all other personnel in the permanent employ of the Contractor or Subcontractor who posses special skills and/or who play key roles in the Contractor's or Subcontractor's operation

(b) "Project Committee" means a committee consisting of the Employer, the Engineer, the Contractor, (or their nominated representatives) as well as representatives of the temporary workforce, which is convened from time to time at the discretion of the Engineer, for the purposes of acting as an avenue for effective communication and liaison between all the parties referred to, in all matters pertaining to the Contract

(c) "Subcontractor" means any person or group of persons in association, or firm, or body corporate (whether formally constituted or otherwise) not being the Contractor, to whom specific portions or aspects of the Works are sublet or subcontracted by the Contractor in accordance with the provisions of the Contract

(d) "Worker" for the purposes of this Specification means any person, not being one of the Contractor's key personnel, nor any key personnel of any Subcontractor, who is engaged by the Contractor, a Subcontractor or the Employer to participate in the execution of any part of the Contract Works and shall include unskilled labour, semi-skilled and skilled labour, clerical workers and the like

(e) "Workforce" means the aggregate body comprising all workers and shall, unless the context dictates otherwise, include the workforces of the Contractor and all Subcontractors

(f) “Project Steering Committee (PSC)” means a committee comprising mainly of representatives (to a maximum of 10) of the affected communities with additional members from Makhado Local Municipality, the Contractor, Consultants and the Municipality. The PSC convenes at least once a month as well as when the need so dictates, for the purpose of recruiting labour for the project, to address community issues and for acting as an avenue for effective communication and liaison between all the parties.

(g) "Liaison Officer" means a local representative of the temporary workforce, duly appointed through the PSC processes, to act on behalf of the workers and through whom all matters pertaining to the temporary workforce can be channelled.

C3.4.3.4.2.1.3 Status

Where any provisions or requirements of this Specification are in conflict with anything elsewhere set out in the Contract, the provisions and requirements of this Specification shall take precedence and prevail.

C3.4.3.4.3 PERMITTED SOURCES OF TEMPORARY WORKERS

The Contractor shall as far as possible make optimum use of the human resources outside his own workforce and the workforces of all subcontractors. The temporary workforce that is to be used in the execution of the Works in terms of Part C3 may consist of the workers of local communities, and shall not be bound to one particular community.

C3.4.3.4.4 EMPLOYMENT RECORDS TO BE PROVIDED

(a) The Contractor shall maintain accurate and comprehensive records of all workers engaged on the Contract and shall provide the Engineer at monthly intervals from the commencement of the Contract, with interim records substantiating the actual numbers of employment opportunities that shall have been generated to date and the amounts actually paid in respect thereof. Such interim records shall be in a Makhado Local Municipality approved format. An example of the forms to be used is illustrated in Part C5 of this document, (forms RDP 9 and 10 (E).

(b) The Contractor shall, on completion of the Contract, and as a pre-requisite event to the release of any retention money in terms of the Conditions of Contract, provide the Engineer with copies of the Terms of Employment as well as independently audited documentary evidence of the total number of temporary and permanent employment opportunities actually generated during the Contract.

C3.4.3.4.5 VARIATIONS IN WORKER PRODUCTION RATES

Notwithstanding anything to the contrary as may be stated in or inferred from any other provision of this Contract, the Contractor shall not be entitled to any additional payment or compensation

whatever, in respect of any differences as may result between the production rates actually achieved by workers in the course of the execution of the Contract Works and those production rates on which he has based his tender.

C3.4.3.4.6 TRAINING OF THE TEMPORARY WORKFORCE

(a) Selected members of the workforce are to be provided with structured training in accordance with the provisions of Part C3.4.3.3.

(b) The Contractor shall make all necessary allowances in his programme of work to accommodate and facilitate the delivery of such structured training and shall comply fully with the requirements of Part C3.4.3.3.

(c) The provision of structured training as described in Part C3.4.3.3. shall not relieve the Contractor of any of his obligations in terms of the Conditions of Contract and the Contractor shall remain fully liable for the provision, at his own cost, of all training of the workforce, additional to that as provided for in Part C3.4.3.3, as may be necessary to achieve the execution and completion of the works strictly in accordance with the provisions of the Contract.

C3.4.3.4.7 RECRUITMENT AND SELECTION PROCEDURES

C3.4.3.4.7.1 The Project Steering Committee, though the assistance of the Social Facilitator and the Contractor, shall be responsible for the recruitment and selection of the Community Liaison Officer and the workers to constitute the temporary workforce.

C3.4.3.4.7.2 The Contractor shall advise the Engineer in writing of the numbers of each category of temporary worker which he requires, together with the personal attributes which he considers desirable that each category of worker shall posses (taking due cognisance of the provisions of the Contract relating to training).

C3.4.3.4.7.3 The Social Facilitator shall take the necessary actions to advertise within the affected local communities comprising the personnel resources, the fact that temporary employment opportunities exist and the time and place where recruiting will occur

C3.4.3.4.7.4 The Social Facilitator shall record in writing, the details of all persons applying for employment, including *inter alia*:

(a) Name, Identity Number, Date of Birth, age and sex

(b) Marital status and number of dependants

(c) Qualifications and previous work experience (whether substantiated or not)

(d) On the job training programmes attended

(e) Period since last economically active

(f) Preference for type of work or task.

C3.4.3.4.7.5 The selection of workers from amongst the applicants should take into cognizance the Contractor's requirements for the workforce and the provisions of the contract in regard to the provision of training to the workforce and in accordance with the following principle:

(a) No potential temporary worker shall be precluded from being employed by the Contractor on the execution of the Works, by virtue of his lack of skill in any suitable operation forming part of the Works, unless -

(i) all available vacancies have been or can be filled by temporary workers who already posses suitable skills, or

(ii) the Time for Completion allowed in the Contract, or the remaining portion of the Contract Period (as the case may be) is insufficient to facilitate the creation of the necessary skills.

(b) Preference shall be given to the unemployed and single heads of households.

(c) The Contractor shall, in so far as is reasonably practicable, give priority to accommodating the applicants' expressed preferences regarding the types of work for which they are selected.

(d) The selection process shall not be prejudicial to youth (over the age of fifteen years) and women. The Contractor should strive to achieve the participation target for employment set for this project which is 60% female and 20% youth.

C3.4.3.4.7.6 After making the selection, the Social Facilitator shall forward the list in writing and without undue delay, to the Engineer for record keeping.

C3.4.3.4.7.7 The provisions of this clause shall apply *mutatis mutandis* in respect of the selection of additional or replacement members of the workforce as may be necessary from time to time during the Contract.

C3.4.3.4.7.8 The Contractor shall, after appointing his temporary workforce, arrange at his own cost for the appointment of the Liaison Officer as representative of the workforce to act on their behalf with regards to all matters pertaining to the workforce.

C3.4.3.4.8 TERMS AND CONDITIONS PERTAINING TO THE EMPLOYMENT OF THE TEMPORARY WORKFORCE

C3.4.3.4.8.1 All temporary workers engaged in accordance with the provisions of Part A of the Project Specifications, shall be employed on the terms and conditions of employment as are consistent with those as set out in this Contract. The Contractor shall implement and adhere strictly to such terms and conditions relating to the employment of the temporary workforce, and subject only to the provisions of this Contract, shall not employ any temporary worker on terms and conditions which are less favourable to the worker or inconsistent with the standards and norms generally applicable to temporary workers in the Civil Engineering Industry and applicable to the particular area. Refer to the Contract of Employment drafted/published by Department of Labour.

C3.4.3.4.8.2 RATE OF REMUNERATION. The Contractor shall pay to all workers engaged in terms of the contract, not less than the applicable gazetted minimum rate of remuneration in terms of the Sectorial Determination 2: Civil Engineering Sector.

The remuneration of the CLO shall be paid monthly at the rate equivalent to Task Grade 3 in accordance with the provisions of the Basic Conditions of Employment Act, No. 75 of 1997, Amendment i.t.o Sectorial Determination 2: Civil Engineering Sector, South Africa

Compensation for transport for the members of the Project Steering Committee shall be made at a rate of R75 / month. This will cover for transport cost to and from the PSC meeting, site meeting and any other meeting deemed necessary to fulfil their obligations.

C3.4.3.4.8.3 NON-PAYMENT OF LABOURERS. Under this contract it is expected of the Main Contractor to ensure that all labourers are paid in time on a monthly basis, whether they are employed by him/her directly or by any of his/her subcontractors. In the event of non-compliance, the employer reserves the right to use any remedies available at its disposal.

C3.4.3.4.9 LABOUR RELATIONS AND WORKER GRIEVANCE PROCEDURES

C3.4.3.4.9.1 The Contractor, as the Employer of the workforce, shall be fully responsible for the establishment and maintenance at his own cost, of satisfactory labour relations on site and the resolution of all grievances of temporary workers as may occur. Refer to Disciplinary Procedures for Small Business drafted/published by Department of Labour.

C3.4.3.4.9.2 The Contractor shall at all times adhere to the accepted norms and standards of labour relations prevailing generally in the Civil Engineering Construction Industry and shall conduct himself in a fair and reasonable manner, within the constraints as may be imposed upon him by the terms of the Contract.

C3.4.3.4.9.3 In the event of any temporary worker engaged by the Contractor in terms of the Contract, being aggrieved with regard to his Terms of Employment, working conditions and

training, he shall have the right, at his discretion, to be supported in any inquiry or disciplinary hearing or investigation instituted by the Contractor in terms of Subclause C3.4.3.4.9.2 above, by one member of the temporary workforce and one member of the Project Committee, which persons shall be nominated by the worker.

C3.4.3.4.9.4 In the event of any grievance not being satisfactorily resolved through the application of normal dispute resolution procedures in accordance with Sub clauses C3.4.3.4.9.2 and C3.4.3.4.9.3, then either the Contractor or the worker concerned may require that the matter be referred to the Project Committee for further consideration, with a view to facilitate the resolution thereof.

C3.4.3.4.10 THE SUBCONTRACTORS' WORKFORCES

C3.4.3.4.10.1 The provisions of this Part C shall apply *mutatis mutandis* to the workforces employed by all subcontractors engaged by the Contractor and the Contractor shall be fully responsible for ensuring, at his own cost, that the terms of every subcontract agreement entered into are such as to facilitate the application of these provisions in respect of the workforces of all subcontractors.

C3.4.3.4.10.2 The Contractor shall at his own cost and to the extent necessary, assist and monitor all subcontractors in the application of the provisions of this Specification, and shall, in terms of the Conditions of Contract, remain fully liable in respect of the acts, omissions and neglects of all subcontractors, in respect of the application of the provisions of this Specification.

C3.4.3.4.11 MEASUREMENT AND PAYMENT

The Contractor will not be separately reimbursed or compensated in respect of the provision of the workforce and creation of temporary employment opportunities and all the Contractor's costs associated with compliance with the provisions of this part of the Project Specifications shall, except to the extent provided for in Part C3.4.3.3. as relevant, be deemed to be included in the rates tendered for the various items of work listed in the Schedule of Quantities.

C3.5 MANAGEMENT

C3.5.1 MANAGEMENT MEETINGS

The following meetings will be required as minimum for the management of the contract.

(a) Monthly client site meeting (using standard agenda for management control).

(b) Technical meetings as required for each phase of the work.

(c) Monthly safety meetings in terms of the OHS requirements.

(d) Weekly progress meetings

C3.5.2 QUALITY CONTROL

Contractor to supply details of quality plan and procedures. These shall include:

- Accommodation of traffic.
- Inspection and test plans.
- Approval process.
- Hold-points.
- Milestones.

PART C4: SITE INFORMATION

C4.1 SITE INFORMATION

C4.1.1 General

The project site is situated approximately 38 km East of town of Louis Trichardt in Vhembe District Municipality under Makhado Local Municipal area. The site is accessible via the National Road (R 524) leading northeast, away from the town of Louis Trichardt.

C4.1.2 Climate and Weather

The site share a similar climatic regime to that of Louis Trichardt, which receives about 495 mm of rain per year, with most rainfall occurring during mid-summer. It receives the lowest rainfall (3 mm) in August and the highest (106 mm) in January. The average midday temperatures for Louis Trichardt range from 20.2°C in June to 27.1°C in January. The region is the coldest during July when the mercury drops to 5.5°C on average during the night.

C4.1.3 Topography

The study area is seen to host a slightly undulating surface morphology typical to that of regional gneissic and granitic terrains. These rocks form part of an ancient batholithic intrusion which have subsequently been disturbed by various geological processes (metamorphism, faulting, intrusions, etc.); resulting in a discontinuous underlying rock mass.

C4.1.4 Material site investigation

The laboratory results of the of the test pit conducted are as follows:

- The material is deemed to display High plasticity with a PI value average above 14.
- The material from test pits 6 to 10 yielded average California Bearing Ratio-(CBR) value of 15 at 93 % MOD AASHTO density classified as G7; Only test pit 12 with a CBR of 46 at 95 % MOD AASHTO density classified as G6 (COLTO, 19989).

C4.1.5 Pavement and layerworks design

- Roadbed (G7, 150mm thick, compacted to 93% Mod AASHTO)
- Subbase (150mm G6 Granular Compacted to 95% Mod AASHTO)
- Cement Stabilized Base (C3, 150mm thick, compacted to 97% Mod AASHTO)
- 30mm AC Surfacing

C4.1.6 Structures

The structures to be constructed is an in-situ reinforced concrete cell structure, with four 3m spans, and opening height of 1,8m (4/3000 x 1800 in-situ reinforced concrete major culvert). Length of the major culvert is 12,2m as per scope of work on Page C.88.

C4.1.6 Services

Water Pipelines and Sewerlines:

The as-built drawings for existing water pipelines are not available. Where pipes are crossing the streets, pipe sleeves will be constructed for future maintenance.

Electricity Lines:

The streets consist of overhead electrical cables. Electrical pole which is on the road will be relocated. The underground cables will be marked and care will be taken when excavating.

Fences:

Fences which are encroaching to the streets will be relocated. The social consultant will be involved to negotiate with the land owners for the expropriation of land.

Telkom lines

All Telkom lines are overheads. Telephone poles or stay found to be on the road will be relocated.

C4.2 LOCALITY PLAN

Locality Map is attached under separate book of drawings.”

PART C5: ANNEXURES

C5.1 PROFORMA DOCUMENTS

The following is a list of proforma documents and examples that are required to be completed by the successful tenderer.

C5.1.1 RETENTION MONEY GUARANTEE PROFORMA

EXAMPLE

MAKHADO LOCAL MUNICIPALITY
Private Bag x 2596
Louis Trichardt
0920

FOR INFORMATION ONLY:
This Guarantee is not to be completed and signed by the Guarantor.
A separate form will be issued to the successful Tenderer

Notes to Tenderer

1. **This pro forma is for information only. The successful tenderer's guarantor will need to reproduce it without amendment, omission or addition for completion and lodgement with the Employer.**

2. **The tenderer's guarantee will have to be on letterheads indicating the contact details of the guarantor, shareholders/board of directors, guarantee number and the company registration number.**

Tender No.: 35/2022

CONSTRUCTION OF LUTANANDWA ACCESS ROAD AND BRIDGE – PHASE 2

The guarantee is issued on behalf of .....

Registration No .....

(hereinafter referred to as "the Contractor") in connection with the above mentioned contract (hereinafter referred to as "the Contract").

Whereas you have agreed that the Contractor may provide a guarantee in lieu of the retention monies provided for under the Contract.

Now therefore we, the undersigned, being duly authorised to represent the .....

.....

(full name of guarantor) registration number .....

undertake to pay you such amounts as you may from time to time demand from us, immediately upon receipt of a written demand from you.

1. Each demand shall be in writing and delivered to us at ..... or such other address as we shall in writing notify to you.

2. Our liability to make the payments herein referred to shall be unconditional and not be affected or diminished by any disputes, claims or counterclaims between you and the Contractor.

3. Our aggregate liability under this guarantee is limited to .....

   (R……..) and is restricted to payment of monies only.

4. This guarantee shall expire on the date on which the last of the retention monies, which

but for this guarantee would have been retained by you, becomes payable to the Contractor.

5. This guarantee is neither negotiable nor transferable and must be returned to us against final payment of our aggregate liability or on the date of the expiry of the guarantee in terms of Clause 4 (above), whichever is the earlier.

Signed at .....for and on behalf of .....

on this the . ..... day of.....in the year .....

GUARANTOR: .....

AS WITNESS:

1.	2. .....
NAME(Print):	NAME(Print): .....
ADDRESS	ADDRESS .....
.....	.....
.....	.....

C5.1.2 EXAMPLE OF SMME DECLARATION AFFIDAVIT

1. Name of SMME firm : ……

   Postal address : ……

   Physical address of Head Office: ……

   ……

   Telephone no. : …… Fax no ……..

   Cell no : ……

   Contact person : ……

   VAT registration no. : ……

2. Type of firm (tick as appropriate)
   - Partnership……..
   - One person business/sole trader…….
   - Close corporation: registration no……
   - Date of registration…….
   - Company: registration no…….
   - Pty Ltd: registration no……

   [ATTACH LATEST CIPRO PRINTOUT TO PROVE ABOVE INFORMATION]

3. Principal Business Activities :……

4. Service/work to be performed on this contract: ……..

5. CIDB registration no (if applicable): …….

   [ATTACH LATEST CIDB INFORMATION AS PROOF]

5. SMME status (mark the appropriate category)

5.1. Total full time equivalent of paid employees: ……

5.2. Total Annual turnover: ……

5.3. Total gross asset value (fixed property excluded): …. ……..

[ATTACH CONFIRMATION LETTER OF AUDITER OR INCOME STATEMENT TO SUBSTANTIATE AND PROVE ABOVE INFORMATION]

8. Declaration

I, ……, being duly authorised to sign on behalf of the firm, affirm that the SMME status as stated above and the information as furnished is true and correct.

Signature .....

Name (print) .....

Date .....

Signed on behalf of (print name) .....

Address .....

.....

Telephone no. .....

Commissioner of Oath .....

Date .....

Note: In the case of a Company a certificate of authority for signatory must be provided.

EXAMPLE

C5.1.3 FORM RDP 9(E) : CONTRACT EMPLOYMENT REPORT

CONTRACT NO……..

REPORT ON EMPLOYMENT ON THE ABOVE CONTRACT FOR THE MONTH OF_____ 2016											
NAME OF COMPANY OR FIRM AND VENDOR NUMBER	AGE OF COMPANY OR FIRM	EMPLOYMENT GROUP	EMPLOYMENT								
			MALE	FEMALE	TOTAL	PERSON/HOURS			VALUE (RAND)	
						MALE	FEMALE	TOTAL	MALE	FEMALE
		Unskilled (US)								
		Semi-Skilled (SS)								
		Skilled (SK)								
		Lab.Tech (LT)								
		Surveyor (SUR)								
		Eng. Tech (ET)								
		Engineer (EN)								
		Admin (AD)								
		Others (o)								
								TOTALS		
								GRAND TOTALS		

EXAMPLE

C5.1.4 FORM RDP 10(E) : EMPLOYMENT OF SUPERVISORY STAFF REPORT

CONTRACT NO……

REPORT ON THE EMPLOYMENT OF SUPERVISORY STAFF ON THE ABOVE CONTRACT FOR THE MONTH OF_____2016				
POSITION HELD	**NAME**	**PDI**	**NON-PDI**	**TOTAL**
Site Agent				
Senior Materials Technician				
Senior Surveyor				
Earthworks Surveyor				
Compaction Supervisor				
Surfacing Supervisor				
Structures Supervisor				
Others: - List				
	TOTALS			

EXAMPLE

C5.1.5 FORM RDP 11(E) : GENERIC TRAINING REPORT

CONTRACT NO……

REPORT ON GENERIC TRAINING ON THE ABOVE CONTRACT FOR THE MONTH OF_____ 2016											
DATES OF TRAINING COURSES		EMPLOYER OF TRAINEE		NAME OF TRAINING INSTITUTE OR IF IN-HOUSE WRITE IH	ATTENDANCES				TOTAL COST OF TRAINING PER TYPE OF TRAINING	
					NUMBER ATTENDING		CERTIFICATES AWARDED			
START	FINISH	NAME	VENDOR NO.		MALE	FEMALE	MALE	FEMALE	MALE	FEMALE
						TOTAL				
						TOTAL ALL TRAINEES				

EXAMPLE

C5.1.6 FORM RDP 12(E) : ENTREPRENEURIAL TRAINING REPORT

CONTRACT NO……

REPORT ON ENTERPRENEURIAL TRAINING ON THE ABOVE CONTRACT FOR THE MONTH OF _____ 2016											
DATES OF TRAINING COURSES		EMPLOYER OF TRAINEE		NAME OF TRAINING INSTITUTE OR IF IN-HOUSE WRITE IH	ATTENDANCES				TOTAL COST OF TRAINING PER TYPE OF TRAINING	
					NUMBER ATTENDING		CERTIFICATES AWARDED			
START	FINISH	NAME	VENDOR NO.		MALE	FEMALE	MALE	FEMALE	MALE	FEMALE

EXAMPLE

C5.1.7 FORM RDP 13(E) : ENGINEERING TRAINING REPORT

CONTRACT NO……..

REPORT ON ENGINEERING TRAINING ON THE ABOVE CONTRACT FOR THE MONTH OF _____ 2016											
DATES OF TRAINING COURSES		EMPLOYER OF TRAINEE		NAME OF TRAINING INSTITUTE OR IF IN-HOUSE WRITE – IH	ATTENDANCES				TOTAL COST OF TRAINING PER TYPE OF TRAINING	
					NUMBER ATTENDING		CERTIFICATES AWARDED			
START	FINISH	NAME	VENDOR NO.		MALE	FEMALE	MALE	FEMALE	MALE	FEMALE
								TOTAL		
								TOTAL ALL TRAINEES		

EXAMPLE

C5.1.8 FORM RDP 14(E) : COMMUNITY LIAISON MEETING REPORT

CONTRACT NO……

REPORT ON COMMUNITY LIAISON MEETINGS ON THE ABOVE CONTRACT FOR THE MONTH OF_____ 2015						
DATE OF MEETING	COMPANY/FIRM OR ORGANISATION RESPONSIBLE FOR ARRANGING THE MEETING		NUMBER OF COMMUNITY MEMBERS PRESENT	DURATION OF MEETING (hours)	TOTAL COST OF THE MEETING	COMMENTS
	NAME	VENDOR NO.				

`

C5.2 CONTRACT DRAWINGS

The following is a list of contract drawings

Item	Description	Drawing No
1.	LOCALITY MAP	MONT/MAKH/RDS/01/2019/LMD01
2.	ROADS KEY PLAN FOR PHASE 2	MONT/MAKH/RDS/01/2019/KEY01
3.	ROAD 1 LAYOUT, LONGSECTION AND CROSS SECTIONS-1 OF 2	MONT/MAKH/RDS/01/2019/PLC01
4.	ROAD 1 LAYOUT, LONGSECTION AND CROSS SECTIONS-2 OF 2	MONT/MAKH/RDS/01/2019/PLC01
5.	ROAD 2 LAYOUT, LONGSECTION AND CROSS SECTIONS- 1 OF 3	MONT/MAKH/RDS/01/2019/PLC02
6.	ROAD 2 LAYOUT, LONGSECTION AND CROSS SECTIONS-2 OF 3	MONT/MAKH/RDS/01/2019/PLC02
7.	ROAD 2 LAYOUT, LONGSECTION AND CROSS SECTIONS-3 OF 3	MONT/MAKH/RDS/01/2019/PLC02
8.	ROAD 4 LAYOUT, LONGSECTION AND CROSS SECTIONS	MONT/MAKH/RDS/01/2019/PLC04
9.	ROAD 17 (School) LAYOUT, LONGSECTION AND CROSS SECTIONS	MONT/MAKH/RDS/01/2019/PLC17
10.	ROAD 51(R524 INTERSECTION) LAYOUT, LONGSECTION AND CROSS SECTIONS	MONT/MAKH/RDS/01/2019/PLC51
11.	ROAD INTERSECTION 1 (R524 TSHAKUMA) DETAILED LAYOUT	MONT/MAKH/RDS/01/2019/INT01
12.	ROAD INTERSECTION 1 (R524 TSHAKUMA) LAYOUT, LONGSECTION AND CROSS SECTIONS – 1 OF 2	MONT/MAKH/RDS/01/2019/INT01
13.	ROAD INTERSECTION 1 (R524 TSHAKUMA) LAYOUT, LONGSECTION AND CROSS SECTIONS – 2 OF 2	MONT/MAKH/RDS/01/2019/INT01
14.	ROAD INTERSECTION 2 (LEVUBU) DETAILED LAYOUT	MONT/MAKH/RDS/01/2019/INT02
15.	ROAD INTERSECTION 2 (LEVUBU) LAYOUT, LONGSECTION AND CROSS SECTIONS- 1 OF 2	MONT/MAKH/RDS/01/2019/INT02
16.	ROAD INTERSECTION 2 (LEVUBU) LAYOUT, LONGSECTION AND CROSS SECTIONS- 2 OF 2	MONT/MAKH/RDS/01/2019/INT02

17.	STORMWATER PLAN LAYOUT 1 OF 2	MONT/MAKH/RDS/01/2019/STP01
18.	STORMWATER PLAN LAYOUT 2 OF 2	MONT/MAKH/RDS/01/2019/STP01
19.	STORMWATER LONGSECTION 1 OF 2	MONT/MAKH/RDS/01/2019/STW01
20.	STORMWATER LONGSECTION 2 OF 2	MONT/MAKH/RDS/01/2019/STW01
21.	STRUCTURE B2 AT CH1408 GENERAL ARRANGEMENT	47/2018/B2/01
22.	STRUCTURE B2 AT CH1408 GENERAL ARRANGEMENT	47/2018/B2/02
23.	STRUCTURE B2 AT CH1408 REINFORCEMENT DETAILS	47/2018/B2/03
24.	STANDARD DRAWINGS GUARDRAIL ELEMENT AND MOUNTING DETAILS	MONT/MAKH/RDS/01/2019/TPC01
25.	STANDARD DRAWINGS GUARDRAIL ELEMENT AND MOUNTING DETAILS	MONT/MAKH/RDS/01/2019/TPC02
26.	STANDARD DRAWING TYPICAL ROAD SIGNS DETAILS	MONT/MAKH/RDS/01/2019/TPC03
27.	STANDARD DRAWING TYPICAL ROAD SIGN SUPPORT DETAILS	MONT/MAKH/RDS/01/2019/TPC04
28.	STANDARD DRAWING TYPICAL ROAD MARKING DETAILS	MONT/MAKH/RDS/01/2019/TPC05
29.	STANDARD DRAWING TYPICAL SUB-SURFACE DRAINAGE DETAILS	MONT/MAKH/RDS/01/2019/TPC06
30.	STANDARD DRAWING TYPICAL SURFACE SIGN DRAINAGE DETAILS	MONT/MAKH/RDS/01/2019/TPC07
31.	STANDARD DRAWING CHUTE DETAILS	MONT/MAKH/RDS/01/2019/TPC08
32.	STANDARD DRAWING TYPICAL TYPE ‘A’ KERB INLET DETAILS	MONT/MAKH/RDS/01/2019/TPC09
33.	STANDARD DRAWING TYPICAL TYPE ‘B’ KERB INLET DETAILS	MONT/MAKH/RDS/01/2019/TPC10
34.	STANDARD DRAWING TYPICAL INLET FOR SIDE DRAINS AND LOW POINTS DETAILS	MONT/MAKH/RDS/01/2019/TPC11
35.	STANDARD DRAWING TYPICAL INLET FOR SIDE DRAINS AND LOW POINTS DETAILS	MONT/MAKH/RDS/01/2019/TPC12
36.	STANDARD DRAWING INFORMATION BOARD	MONT/MAKH/RDS/01/2019/TPC13

38.	STANDARD DRAWING TYPICAL CROSS SECTION	MONT/MAKH/RDS/01/2019/TPC14
39.	STANDARD DRAWING TYPICAL BUS STOP DETAILS FOR SURFACED ROADS	MONT/MAKH/RDS/01/2019/TPC15
40.	STANDARD DRAWING TYPICAL SPEED HUMP	MONT/MAKH/RDS/01/2019/TPC16
41.	TYPICAL DETAIL; PIPE BEDDING AND CAST INSITU FLOOR SLABS FOR PRECAST BOX CULVERTS	MONT/MAKH/RDS/01/2019/TW02
42.	TYPICAL DETAIL; PIPE CULVERTS 90 DEGREE TO ROAD (450 TO 1200 DIA PIPES) CONCRETE DETAILS	MONT/MAKH/RDS/01/2019/TW03
43.	TYPICAL DETAIL; PIPE CULVERTS SKEW TO THE ROAD (450 TO 1200 DIA PIPES) CONCRETE DETAILS	MONT/MAKH/RDS/01/2019/TW04
44.	TYPICAL DETAIL; PIPE CULVERTS- 90 DEGREE & SKEW TO THE ROAD (450 TO 1200 DIA PIPES) REINFORCEMENT DETAILS	MONT/MAKH/RDS/01/2019/TW05
45.	TYPICAL DETAIL; PIPE CULVERTS- 90 DEGREE & SKEW TO THE ROAD (1050 TO 1200 DIA PIPES) REINFORCEMENT DETAILS	MONT/MAKH/RDS/01/2019/TW06
46.	TYPICAL DETAIL-CULVERT INLET AND OUTLET STRUCTURES TYPES 1 AND 1A	MONT/MAKH/RDS/01/2019/TW07
47.	TYPICAL DETAIL : MANHOLES AND KERBS INLETS	MONT/MAKH/RDS/01/2019/TW08
48.	TYPICAL DETAIL: CONCRETE SIDE AND MEDIAN DRAINS, CONCRETE SIDE DRAIN OUTLETS, CATCHWATER BANKS AND MITRE BANKS	MONT/MAKH/RDS/01/2019/TW09
49.	TYPICAL DETAIL: CONCRETE SIDE AND MEDIAN DRAINS, CONCRETE SIDE DRAIN OUTLETS, CATCHWATER BANKS AND MITRE BANKS	MONT/MAKH/RDS/01/2019/TW10
50.	TYPICAL DETAIL : CATHCWATER & DOWN CHUTE WITH TYPE 4 & 4A INLETS	MONT/MAKH/RDS/01/2019/TW11
51.	TYPICAL DETAIL: SURSURFACE DRAINAGE	MONT/MAKH/RDS/01/2019/TW12
52.	TYPICAL DETAIL: DOWN CHUTES ON HIGH FILL	MONT/MAKH/RDS/01/2019/TW13
53.	TYPICAL DETAIL: MANHOLES AND CATCHPITS FOR LARGE PIPE AND BOX CULVERTS	MONT/MAKH/RDS/01/2019/TW14

MAKHADO MUNICIPALITY

BOOK 2 OF 2 (DRAWINGS)
CONSTRUCTION OF LUTANANDWA
ACCESS ROAD AND BRIDGE - PHASE 2

BID NO.: 35 of 2022

THIS DOCUMENT IS PREPARED BY :

MONT CONSULTING ENGINEERS

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0787

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ISSUED FOR:

MAKHADO MUNICIPALITY

PRIVATE BAG X 2596
LOUIS TRICHARDT
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Proposed intersection

Shayandima

R524-1
43,2E

DESIGNED BY	SZB RANGANA	PROJECT	CONSTRUCTION OF LUTANANDWA ACCESS ROAD AND BRIDGE - PHASE 2 BID No.: 35 OF 2022
CHECKED BY	PXA NDLOVU	TITLE	LOCALITY MAP
DRAWN BY	TA MOSIA	DRAWING No.	MONT/MAKH/RDS/01/2019/LMD01
CHECKED BY	TE MUVHANGO	SCALE	NOT TO SCALE
		PAPER SIZE	A1
		REVISION	00
		SHEET	01 OF 01

ISSUED FOR TENDER
For Makhado Municipality 25/../..
For Mont Consulting Engineers 25/../..

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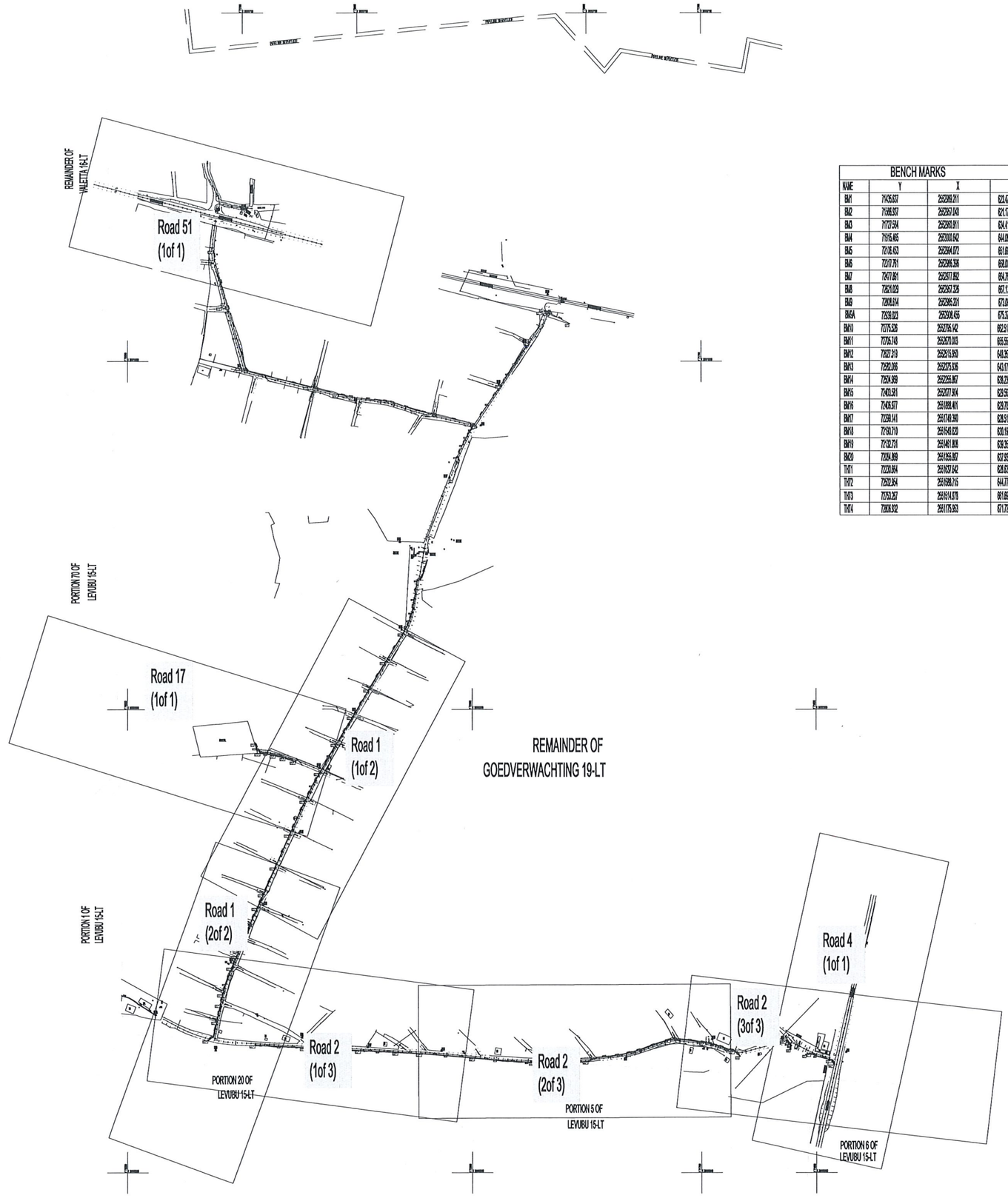
MEMBER OF CESA

No.	DATE	REVISION	CONSULT ENG.	D/R

Stormwater Schedule

Name	Y-Coord	X-Coord	Cover	Inlet	Depth	Length	Slope	Type	Size	Level In	Level Out
MH1	72363.61	2551911.23	627.57	623.82	3.75						
MH2	72345.31	2551912.97	626.84	623.09	3.75	18.39	3.96 %	Box Culvert	7 x 3000 x 3200	623.82	623.09
MH3	72066.55	2551393.23	637.68	635.93	1.65						
MH4	72081.16	2551395.79	637.92	635.66	2.07	15.60	0.50 %	50D Concrete	600 mm	635.93	635.66
MH119	72078.96	2551396.94	637.49	635.83	1.66	2.48	1.05 %	50D Concrete	600 mm	635.66	635.83
MH5	72037.17	2551418.68	633.73	632.08	1.65	47.11	7.96 %	50D Concrete	600 mm	635.83	632.08
MH55	71540.66	2552979.62	622.65	620.00	2.65						
MH06	71538.44	2552971.50	622.20	619.55	2.65	9.15	5.02 %	Box Culvert	6 x 2100 x 1500	620.00	619.55
MH37	72722.53	2552974.16	670.00	668.41	1.59						
MH79	72667.77	2552976.91	668.78	667.23	1.55	54.84	2.15 %	50D Concrete	600 mm	668.41	667.23
MH38	72613.00	2552979.65	667.71	666.22	1.49	54.84	1.85 %	50D Concrete	600 mm	667.23	666.22
MH80	72553.14	2552982.63	666.58	665.13	1.45	59.94	1.83 %	50D Concrete	600 mm	666.22	665.13
MH39	72493.28	2552985.61	665.15	663.50	1.65	59.94	2.72 %	50D Concrete	600 mm	665.13	663.50
MH81	72452.59	2552987.64	663.66	661.97	1.69	40.73	3.74 %	50D Concrete	600 mm	663.50	661.97
MH40	72411.91	2552989.68	661.82	660.36	1.47	40.74	3.95 %	50D Concrete	600 mm	661.97	660.36
MH41	72359.76	2552992.25	659.48	658.09	1.39	52.23	4.35 %	50D Concrete	600 mm	660.36	658.09
MH42	72304.43	2552996.77	657.27	655.54	1.73	55.48	4.59 %	50D Concrete	600 mm	658.09	655.54
MH43	72244.72	2553002.11	655.88	654.35	1.54	59.96	1.99 %	50D Concrete	600 mm	655.54	654.35
MH44	72195.56	2553006.47	655.11	653.62	1.49	48.35	1.50 %	50D Concrete	600 mm	654.35	653.62
MH45	72127.66	2553011.30	652.70	651.25	1.45	69.07	3.43 %	50D Concrete	600 mm	653.62	651.25
MH46	72114.23	2553011.58	651.95	650.57	1.38	13.43	5.09 %	50D Concrete	600 mm	651.25	650.57
MH47	72075.21	2553013.33	649.68	648.26	1.42	39.05	5.90 %	50D Concrete	600 mm	650.57	648.26
MH48	72055.45	2553013.57	648.55	647.04	1.51	19.77	6.19 %	50D Concrete	600 mm	648.26	647.04
MH49	72034.64	2553012.34	647.32	645.77	1.55	20.84	6.07 %	50D Concrete	600 mm	647.04	645.77
MH50	71966.95	2553008.84	645.68	643.94	1.74	37.85	4.85 %	50D Concrete	600 mm	645.77	643.94
MH51	71978.59	2553000.68	645.22	643.42	1.80	20.01	2.59 %	50D Concrete	600 mm	643.94	643.42
MH52	71946.47	2552997.82	644.94	643.17	1.77	32.27	0.76 %	50D Concrete	600 mm	643.42	643.17
MH53	71923.13	2552994.18	644.75	643.04	1.71	23.62	0.56 %	50D Concrete	600 mm	643.17	643.04
MH54	71896.65	2552987.89	644.58	642.91	1.67	27.22	0.50 %	50D Concrete	600 mm	643.04	642.91
MH55	71873.01	2552982.45	644.43	642.81	1.61	18.46	0.50 %	50D Concrete	600 mm	642.91	642.81
MH56	71834.32	2552966.65	643.14	641.55	1.59	47.40	2.67 %	50D Concrete	600 mm	642.81	641.55
MH57	71817.77	2552962.21	642.42	640.81	1.61	17.14	4.33 %	50D Concrete	600 mm	641.55	640.81
MH58	71793.61	2552951.40	641.61	639.98	1.63	19.17	4.30 %	50D Concrete	600 mm	640.81	639.98
MH59	71753.55	2552967.27	637.47	635.81	1.66	45.45	9.17 %	50D Concrete	600 mm	639.98	635.81
MH60	71741.44	2552969.02	635.79	634.13	1.65	12.23	13.75 %	50D Concrete	600 mm	635.81	634.13
MH61	71723.61	2552973.13	633.26	631.61	1.65	18.30	13.79 %	50D Concrete	600 mm	634.13	631.61
MH62	71691.74	2552983.91	628.53	626.88	1.65	33.65	14.07 %	50D Concrete	600 mm	631.61	626.88
MH63	71678.05	2552987.20	626.51	624.85	1.65	14.08	14.38 %	50D Concrete	600 mm	626.88	624.85
MH64	71667.05	2552998.17	624.50	622.84	1.65	15.53	12.84 %	50D Concrete	600 mm	624.85	622.84
MH66	71565.39	2552964.47	622.49	620.84	1.65						
MH118	71559.85	2552971.79	622.61	620.79	1.82	9.18	0.50 %	50D Concrete	600 mm	620.84	620.79
MH67	71555.56	2552976.90	620.68	619.32	1.66	6.42	22.95 %	50D Concrete	600 mm	620.79	619.32
MH68	71556.17	2552983.00	620.12	618.46	1.65	6.10	14.03 %	50D Concrete	600 mm	619.32	618.46
MH69	71461.78	2553016.39	624.76	623.10	1.66						
MH70	71466.83	2553006.65	623.83	622.17	1.66	11.00	8.43 %	50D Concrete	600 mm	623.10	622.17
MH71	71499.33	2552998.04	622.78	621.12	1.65	33.56	3.13 %	50D Concrete	600 mm	622.17	621.12
MH72	71512.18	2552993.10	622.74	621.06	1.69	13.77	0.50 %	50D Concrete	600 mm	621.12	621.06
MH73	71521.59	2552995.14	620.72	619.06	1.66	9.63	20.71 %	50D Concrete	600 mm	621.06	619.06
MH101	72812.69	2551281.47	669.20	667.54	1.65						
MH102	72810.74	2551280.73	668.62	666.96	1.65	19.35	3.00 %	50D Concrete	600 mm	667.54	666.96
MH103	72784.24	2551374.64	665.73	664.08	1.66	97.55	2.96 %	50D Concrete	600 mm	666.96	664.08
MH127	72779.21	2551392.58	665.15	663.50	1.66	18.66	3.10 %	50D Concrete	600 mm	664.08	663.50
MH104	72763.05	2551449.13	663.29	661.63	1.66	58.82	3.17 %	50D Concrete	600 mm	663.50	661.63
MH105	72744.29	2551514.04	661.14	659.48	1.66	67.57	3.18 %	50D Concrete	600 mm	661.63	659.48
MH129	72737.79	2551521.69	660.73	659.08	1.66	10.03	4.05 %	50D Concrete	600 mm	659.48	659.08
MH131	72671.55	2551538.22	658.45	656.79	1.66	68.28	3.34 %	50D Concrete	600 mm	659.08	656.79
MH108	72605.31	2551554.76	653.57	651.92	1.65	68.28	7.14 %	50D Concrete	600 mm	656.79	651.92
MH132	72584.28	2551560.06	652.27	650.61	1.65	21.69	6.02 %	50D Concrete	600 mm	651.92	650.61
MH109	72541.46	2551570.85	650.08	648.43	1.65	44.16	4.95 %	50D Concrete	600 mm	650.61	648.43
MH110	72521.47	2551574.99	647.79	646.14	1.65	20.41	11.22 %	50D Concrete	600 mm	648.43	646.14
MH111	72506.04	2551577.18	645.95	644.30	1.66	15.59	11.81 %	50D Concrete	600 mm	646.14	644.30
MH134	72447.27	2551584.19	639.03	637.37	1.65	59.19	11.70 %	50D Concrete	600 mm	644.30	637.37
MH135	72431.06	2551586.46	637.25	635.60	1.66	16.36	10.64 %	50D Concrete	600 mm	637.37	635.60
MH136	72417.09	2551590.69	635.96	634.30	1.66	14.60	8.83 %	50D Concrete	600 mm	635.60	634.30
MH114	72370.37	2551609.54	632.99	631.34	1.65	49.02	6.05 %	50D Concrete	600 mm	634.30	631.34
MH115	72340.07	2551613.17	631.29	629.63	1.66	31.25	5.44 %	50D Concrete	600 mm	631.34	629.63
MH91	72326.64	2551616.46	630.66	629.00	1.65	13.82	4.56 %	50D Concrete	600 mm	629.63	629.00
MH117	72253.27	2551632.87	629.07	627.41	1.66	75.19	2.12 %	50D Concrete	600 mm	629.00	627.41
MH9	72251.82	2551646.64	628.90	627.09	1.82	13.87	2.35 %	50D Concrete	600 mm	627.41	627.09
MH84	72260.83	2551662.22	628.76	626.94	1.82	18.10	0.80 %	50D Concrete	750 mm	627.09	626.94
MH85	72270.21	2551679.75	628.61	626.79	1.82	19.83	0.74 %	50D Concrete	750 mm	626.94	626.79
MH86	72282.63	2551705.76	628.49	626.65	1.84	28.84	0.50 %	50D Concrete	750 mm	626.79	626.65
MH87	72278.68	2551717.11	628.38	626.57	1.82	12.24	0.68 %	50D Concrete	750 mm	626.65	626.57
MH88	72291.18	2551754.58	628.10	626.28	1.82	39.70	0.72 %	50D Concrete	750 mm	626.57	626.28
MH128	72784.47	2551583.51	665.46	663.80	1.65						
MH127	72779.21	2551392.58	665.15	663.50	1.66	17.75	1.72 %	50D Concrete	600 mm	663.80	663.50
MH130	72751.69	2551517.80	661.16	659.51	1.66						
MH129	72737.79	2551521.69	660.73	659.08	1.66	14.48	2.97 %	50D Concrete	600 mm	659.51	659.08
MH133	72596.34	2551554.16	652.66	651.21	1.66						
MH132	72584.28	2551560.06	652.27	650.61	1.65	13.43	4.44 %	50D Concrete	600 mm	651.21	650.61
MH6	72124.72	2551459.29	637.98	636.33	1.65						
MH82	72154.02	2551503.63	633.84	632.18	1.66	53.19	7.80 %	50D Concrete	600 mm	636.33	632.18
MH83	72169.60	2551526.41	631.39	629.73	1.65	27.55	8.69 %	50D Concrete	600 mm	632.18	629.73
MH7	72156.50	2551551.51	629.74	628.09	1.66	30.27	5.44 %	50D Concrete	600 mm	629.73	628.09
MH77	72213.63	2551591.39	629.41	627.76	1.65	48.23	0.63 %	50D Concrete	600 mm	628.09	627.76
MH8	72243.92	2551634.23	628.88	627.23	1.66	52.47	1.02 %	50D Concrete	600 mm	627.76	627.23
MH9	72251.82	2551646.64	628.90	627.09	1.82	14.60	0.50 %	50D Concrete	600 mm	627.23	627.15
MH90	72336.47	2551612.22	631.07	629.41	1.66						
MH91	72326.64	2551616.46	630.66	629.00	1.65	10.70	3.83 %	50D Concrete	600 mm	629.41	629.00
MH10	72824.83	2552953.29	672.39	670.74	1.65						
MH11	72812.61	2552954.56	671.78	670.13	1.65	15.02	4.04 %	50D Concrete	600 mm	670.74	670.13
MH12	72805.69	2552922.97	669.26	667.69	1.57	32.34	7.55 %	50D Concrete	600 mm	670.13	667.69
MH13	72798.27	2552835.96	666.87	665.37	1.50	37.75	6.14 %	50D Concrete	600 mm	667.69	665.37
MH14	72793.15	2552663.59	665.54	664.05	1.48	22.95	5.74 %	50D Concrete	600 mm	665.37	664.05
MH15	72788.93	2552841.32	664.39	662.85	1.54	23.12	5.20 %	50D Concrete	600 mm	664.05	662.85
MH16	72773.13	2552606.01	662.69	661.12	1.56	37.89	4.56 %	50D Concrete	600 mm	662.85	661.12
MH17	72762.46	2552760.64	661.26	659.80	1.46	27.55	4.81 %	50D Concrete	600 mm	661.12	659.80
MH18	72748.22	2552746.94	659.80	658.37	1.43	38.59	3.91 %	50D Concrete	600 mm	659.80	658.37
MH19	72734.58	2552713.14	658.03	656.30	1.73	36.45	5.67 %	50D Concrete	600 mm	658.37	656.30
MH20	72717.93	2552677.03	656.37	654.34	2.02	39.76	4.93 %	50D Concrete	600 mm	656.30	654.34
MH21	72704.59	2552647.84	654.76	652.77	1.99	32.09	4.89 %	50D Concrete	600 mm	654.34	652.77
MH22	72678.81	2552589.66	652.06	650.29	1.77	63.63	3.90 %	50D Concrete	600 mm	652.77	650.29
MH24	72647.92	2552519.25	648.67	647.13	1.54	76.69	4.11 %	50D Concrete	600 mm	650.29	647.13
MH78	72630.81	2552482.74	647.03	645.47	1.56	40.32	4.13 %	50D Concrete	600 mm	647.13	645.47
MH25	72613.71	2552448.23	645.36	643.68	1.68	40.32	4.43 %	50D Concrete	600 mm	645.47	643.68
MH26	72598.27	2552413.43	644.21	642.60	1.61	36.25	2.97 %	50D Concrete	600 mm	643.68	642.60
MH27	72582.32	2552386.65	643.18	641.61	1.55	31.17	3.17 %	50D Concrete	600 mm	642.60	641.61
MH28	72545.81	2552323.76	641.05	639.37	1.68	72.72	3.09 %	50D Concrete	600 mm	641.61	639.37
MH29	72510.10	2552265.49	638.43	636.99	1.44	68.34	3.47 %	50D Concrete	600 mm	639.37	636.99
MH30	72474.43	2552206.31	636.44	634.78	1.66	69.06	6.10 %	50D Concrete	600 mm	636.99	632.78
MH31	72438.28	2552146.93	631.49	629.73	1.76	69.55	4.39 %	50D Concrete	600 mm	632.78	629.73
MH32	72399.97	2552085.75	630.54	628.72	1.82	72.19	1.43 %	50D Concrete	600 mm	629.73	628.72
MH94	72391.01	2552069.71	630.45	628.63	1.82	18.37	0.50 %	50D Concrete	750 mm	628.72	628.63
MH95	72385.87	2552057.64	630.39	628.56	1.82	13.12	0.50 %	50D Concrete	750 mm	628.63	628.56
MH96	72381.17	2552041.24	630.30	628.48	1.82	17.05	0.50 %	50D Concrete	750 mm	628.56	628.48
MH97	72375.78	2552011.66	630.15	628.33	1.82	29.87	0.50 %	50D Concrete	750 mm	628.48	628.33
MH98	72368.94	2551971.45	629.84	628.02	1.82	40.98	0.74 %	50D Concrete	750 mm	628.33	628.02
MH99	72359.34	2551965.28	629.54	627.72	1.82	11.61	2.62 %	50D Concrete	750 mm	628.02	627.72
MH100	72347.67	2551928.20	626.78	624.95	1.82	38.78	7.16 %	50D Concrete	750 mm	627.72	624.95
MH120	72635.17	2552561.98	642.34	640.69	1.66						
MH121	72656.86	2552354.24	641.80	640.15	1.66	23.04	2.35 %	50D Concrete	600 mm	640.69	640.15
MH122	72678.49	2552348.60	641.36	639.70	1.66	22.36	1.59 %	50D Concrete	600 mm	640.15	639.70
MH123	72695.94	2552345.55	641.15	639.50	1.66	17.71	1.17 %	50D Concrete	600 mm	639.70	639.50
MH124	72711.61	2552343.59	640.98	639.32	1.66	15.79	1.10 %	50D Concrete	600 mm	639.50	639.32
MH125	72719.73	2552333.06	640.87	639.92	1.66	13.30	3.05 %	50D Concrete	600 mm	639.32	638.92
MH126	72722.96	2552322.43	640.07	638.42	1.66	11.11	4.50 %	50D Concrete	600 mm	638.92	638.42



BENCH MARKS

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BM1	71435.837	2552996.211	620.479
BM2	71696.837	2552967.043	621.179
BM3	71777.554	2552930.911	634.416
BM4	71915.465	2553030.542	644.064
BM5	72126.423	2552994.077	651.696
BM6	72017.791	2552996.358	648.008
BM7	72471.851	2552971.892	664.764
BM8	72521.859	2552967.326	667.137
BM9	72616.514	2552996.291	673.065
BM9A	72538.823	2553008.435	674.373
BM10	72175.526	2552756.142	652.513
BM11	72176.749	2552670.033	655.555
BM12	72627.910	2552515.950	648.367
BM13	72592.266	2552375.556	643.178
BM14	72524.969	2552256.867	638.226
BM15	72403.581	2552077.564	629.556
BM16	72406.977	2551988.401	628.722
BM17	72298.141	2551740.366	628.512
BM18	72150.179	2551540.829	630.155
BM19	72132.731	2551481.806	630.359
BM20	72236.889	2551355.887	637.354
TP11	72220.864	2551837.842	628.026
TP12	72520.824	2551698.715	644.775
TP13	72753.257	2551614.578	661.650
TP14	72806.932	2551775.553	671.772

No	DATE	REVISION	CONSULT ENG	DR
-	-	-	-	-
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-	-	-	-	-
-	-	-	-	-
-	-	-	-	-

DESIGNED BY	SZB RANGANA
CHECKED BY	PXA NDLOVU
DRAWN BY	TA MOBIA
CHECKED BY	TE MUVHANGO

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MEMBER OF CESA

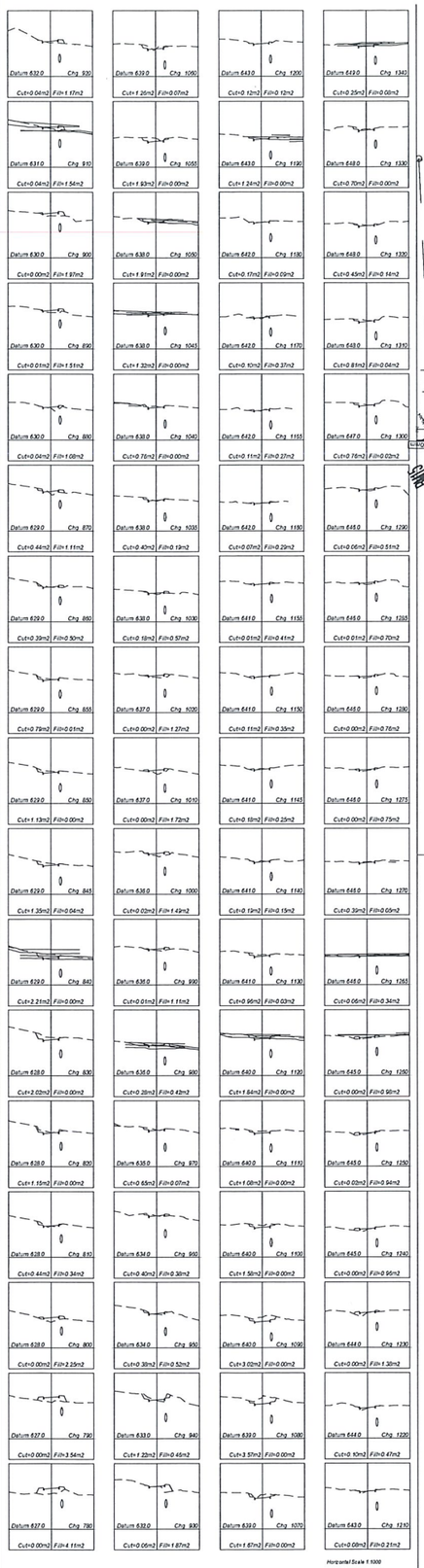
PROJECT
CONSTRUCTION OF LUTANANDWA ACCESS ROAD AND BRIDGE - PHASE 2
BID NO.: 35 OF 2022

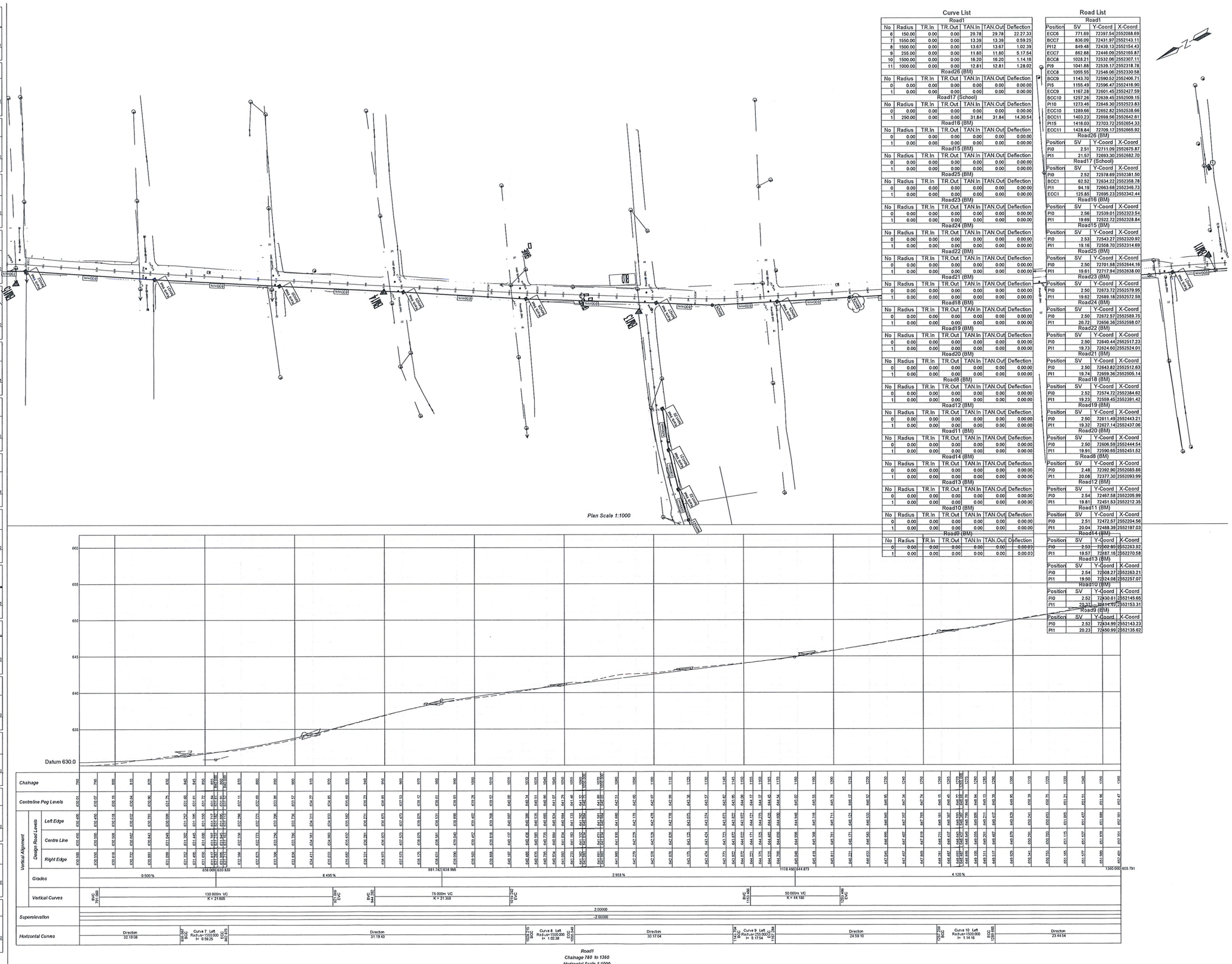
TITLE
KEY PLAN LAYOUT

ISSUED FOR TENDER
For Makhado Municipality 20__/__/__
For Mont Consulting Engineers 20__/__/__

DRAWING No. MONT/MAKH/RDS/01/2019/KEY01

SHEET 01 OF 01
SCALE AS SHOWN
PAPER SIZE A1
REVISION 00





Road1
Chainage 780 to 1360
Horizontal Scale 1:1000
Vertical Scale 1:250

Curve List

Road1

No	Radius	TR.In	TR.Out	TAN.In	TAN.Out	Deflection
6	150.00	0.00	0.00	29.78	29.78	22 27.33
7	1550.00	0.00	0.00	13.39	13.39	0.59.25
8	1500.00	0.00	0.00	13.67	13.67	1.02.39
9	255.00	0.00	0.00	11.80	11.80	5.17.54
10	1500.00	0.00	0.00	16.20	16.20	1.14.16
11	1000.00	0.00	0.00	12.81	12.81	1.28.02

Road26 (BM)

No	Radius	TR.In	TR.Out	TAN.In	TAN.Out	Deflection
0	0.00	0.00	0.00	0.00	0.00	0.00.00
1	0.00	0.00	0.00	0.00	0.00	0.00.00

Road17 (School)

No	Radius	TR.In	TR.Out	TAN.In	TAN.Out	Deflection
0	0.00	0.00	0.00	0.00	0.00	0.00.00
1	250.00	0.00	0.00	31.84	31.84	14.30.54

Road16 (BM)

No	Radius	TR.In	TR.Out	TAN.In	TAN.Out	Deflection
0	0.00	0.00	0.00	0.00	0.00	0.00.00
1	0.00	0.00	0.00	0.00	0.00	0.00.00

Road15 (BM)

No	Radius	TR.In	TR.Out	TAN.In	TAN.Out	Deflection
0	0.00	0.00	0.00	0.00	0.00	0.00.00
1	0.00	0.00	0.00	0.00	0.00	0.00.00

Road25 (BM)

No	Radius	TR.In	TR.Out	TAN.In	TAN.Out	Deflection
0	0.00	0.00	0.00	0.00	0.00	0.00.00
1	0.00	0.00	0.00	0.00	0.00	0.00.00

Road23 (BM)

No	Radius	TR.In	TR.Out	TAN.In	TAN.Out	Deflection
0	0.00	0.00	0.00	0.00	0.00	0.00.00
1	0.00	0.00	0.00	0.00	0.00	0.00.00

Road24 (BM)

No	Radius	TR.In	TR.Out	TAN.In	TAN.Out	Deflection
0	0.00	0.00	0.00	0.00	0.00	0.00.00
1	0.00	0.00	0.00	0.00	0.00	0.00.00

Road22 (BM)

No	Radius	TR.In	TR.Out	TAN.In	TAN.Out	Deflection
0	0.00	0.00	0.00	0.00	0.00	0.00.00
1	0.00	0.00	0.00	0.00	0.00	0.00.00

Road21 (BM)

No	Radius	TR.In	TR.Out	TAN.In	TAN.Out	Deflection
0	0.00	0.00	0.00	0.00	0.00	0.00.00
1	0.00	0.00	0.00	0.00	0.00	0.00.00

Road18 (BM)

No	Radius	TR.In	TR.Out	TAN.In	TAN.Out	Deflection
0	0.00	0.00	0.00	0.00	0.00	0.00.00
1	0.00	0.00	0.00	0.00	0.00	0.00.00

Road19 (BM)

No	Radius	TR.In	TR.Out	TAN.In	TAN.Out	Deflection
0	0.00	0.00	0.00	0.00	0.00	0.00.00
1	0.00	0.00	0.00	0.00	0.00	0.00.00

Road20 (BM)

No	Radius	TR.In	TR.Out	TAN.In	TAN.Out	Deflection
0	0.00	0.00	0.00	0.00	0.00	0.00.00
1	0.00	0.00	0.00	0.00	0.00	0.00.00

Road8 (BM)

No	Radius	TR.In	TR.Out	TAN.In	TAN.Out	Deflection
0	0.00	0.00	0.00	0.00	0.00	0.00.00
1	0.00	0.00	0.00	0.00	0.00	0.00.00

Road12 (BM)

No	Radius	TR.In	TR.Out	TAN.In	TAN.Out	Deflection
0	0.00	0.00	0.00	0.00	0.00	0.00.00
1	0.00	0.00	0.00	0.00	0.00	0.00.00

Road11 (BM)

No	Radius	TR.In	TR.Out	TAN.In	TAN.Out	Deflection
0	0.00	0.00	0.00	0.00	0.00	0.00.00
1	0.00	0.00	0.00	0.00	0.00	0.00.00

Road14 (BM)

No	Radius	TR.In	TR.Out	TAN.In	TAN.Out	Deflection
0	0.00	0.00	0.00	0.00	0.00	0.00.00
1	0.00	0.00	0.00	0.00	0.00	0.00.00

Road13 (BM)

No	Radius	TR.In	TR.Out	TAN.In	TAN.Out	Deflection
0	0.00	0.00	0.00	0.00	0.00	0.00.00
1	0.00	0.00	0.00	0.00	0.00	0.00.00

Road10 (BM)

No	Radius	TR.In	TR.Out	TAN.In	TAN.Out	Deflection
0	0.00	0.00	0.00	0.00	0.00	0.00.00
1	0.00	0.00	0.00	0.00	0.00	0.00.00

Road9 (BM)

No	Radius	TR.In	TR.Out	TAN.In	TAN.Out	Deflection
0	0.00	0.00	0.00	0.00	0.00	0.00.00
1	0.00	0.00	0.00	0.00	0.00	0.00.00

Road List

Road1

Position	SV	Y-Coord	X-Coord
ECC6	771.69	72397.54	2552088.69
BCC7	836.09	72431.97	2552143.11
PI12	849.48	72439.13	2552154.43
ECC7	862.88	72446.09	2552165.87
BCC8	1028.21	72532.06	2552307.11
PI9	1041.88	72539.17	2552318.78
ECC8	1055.55	72546.06	2552330.58
BCC9	1143.70	72590.52	2552406.71
PI5	1155.49	72596.47	2552416.90
ECC9	1167.28	72601.45	2552427.59
BCC10	1257.26	72639.45	2552509.15
PI10	1273.46	72646.30	2552523.83
ECC10	1289.66	72652.82	2552538.66
BCC11	1403.23	72698.56	2552642.61
PI15	1416.03	72703.72	2552654.33
ECC11	1428.84	72709.17	2552665.92

Road26 (BM)

Position	SV	Y-Coord	X-Coord
PI0	2.51	72711.09	2552675.87
PI1	21.57	72693.30	2552682.70

Road17 (School)

Position	SV	Y-Coord	X-Coord
PI0	2.52	72578.69	2552381.50
BCC1	62.52	72634.22	2552358.78
PI1	94.19	72663.68	2552346.73
ECC1	125.85	72695.23	2552342.44

Road16 (BM)

Position	SV	Y-Coord	X-Coord
PI0	2.56	72539.01	2552323.54
PI1	19.69	72522.72	2552328.84

Road15 (BM)

Position	SV	Y-Coord	X-Coord
PI0	2.53	72543.27	2552320.92
PI1	19.16	72558.70	2552314.69

Road25 (BM)

Position	SV	Y-Coord	X-Coord
PI0	2.50	72701.98	2552644.16
PI1	19.61	72717.94	2552638.00

Road23 (BM)

Position	SV	Y-Coord	X-Coord
PI0	2.50	72673.72	2552579.95
PI1	19.62	72689.18	2552572.59

Road24 (BM)

Position	SV	Y-Coord	X-Coord
PI0	2.50	72672.57	2552589.75
PI1	20.72	72656.36	2552598.07

Road22 (BM)

Position	SV	Y-Coord	X-Coord
PI0	2.50	72640.44	2552517.23
PI1	19.73	72624.60	2552524.01

Road21 (BM)

Position	SV	Y-Coord	X-Coord
PI0	2.50	72643.82	2552512.63
PI1	19.74	72659.36	2552505.14

Road18 (BM)

Position	SV	Y-Coord	X-Coord
PI0	2.52	72574.72	2552384.62
PI1	19.23	72559.45	2552391.42

Road19 (BM)

Position	SV	Y-Coord	X-Coord
PI0	2.50	72611.49	2552443.21
PI1	19.32	72627.14	2552437.06

Road20 (BM)

Position	SV	Y-Coord	X-Coord
PI0	2.50	72606.59	2552444.54
PI1	19.91	72590.65	2552451.52

Road8 (BM)

Position	SV	Y-Coord	X-Coord
PI0	2.48	72392.90	2552085.66
PI1	20.08	72377.30	2552093.99

Road12 (BM)

Position	SV	Y-Coord	X-Coord
PI0	2.54	72467.58	2552205.99
PI1	19.81	72451.53	2552212.35

Road11 (BM)

Position	SV	Y-Coord	X-Coord
PI0	2.51	72472.57	2552204.56
PI1	20.04	72488.39	2552197.03

Road14 (BM)

Position	SV	Y-Coord	X-Coord
PI0	2.53	72502.85	2552263.92
PI1	19.57	72487.16	2552270.58

Road13 (BM)

Position	SV	Y-Coord	X-Coord
PI0	2.54	72508.27	2552263.21
PI1	19.50	72524.08	2552257.07

Road10 (BM)

Position	SV	Y-Coord	X-Coord
PI0	2.52	72430.81	2552145.65
PI1	20.37	72414.47	2552153.31

Road9 (BM)

Position	SV	Y-Coord	X-Coord
PI0	2.52	72434.99	2552143.23
PI1	20.23	72450.99	2552135.62

No.	DATE	REVISION	CONSULT ENG	D/R
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-	-	-	-	-
-	-	-	-	-

DESIGNED BY	SZB RANGANA
CHECKED BY	PXA NDLOVU
DRAWN BY	TA MOSIA
CHECKED BY	TE MUVHANGO

MAKHADO MUNICIPALITY
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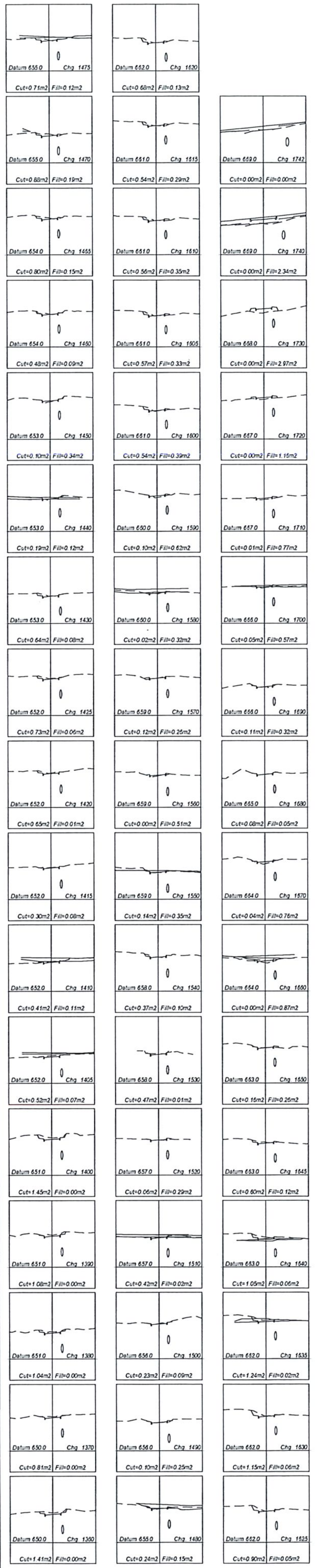
MEMBER OF CESA

PROJECT
CONSTRUCTION OF LUTANANDWA ACCESS ROAD AND BRIDGE - PHASE 2
BID NO.: 35 OF 2022

TITLE
ROAD 1 LAYOUT, LONGSECTION AND CROSS SECTIONS

ISSUED FOR TENDER
For Makhado Municipality 20_/_/_
For Mont Consulting Engineers 20_/_/_

SHEET 01 OF 02
SCALE AS SHOWN
PAPER SIZE A1
DRAWING No. MONT/MAKH/RDS/01/2019/PLC01
REVISION 00



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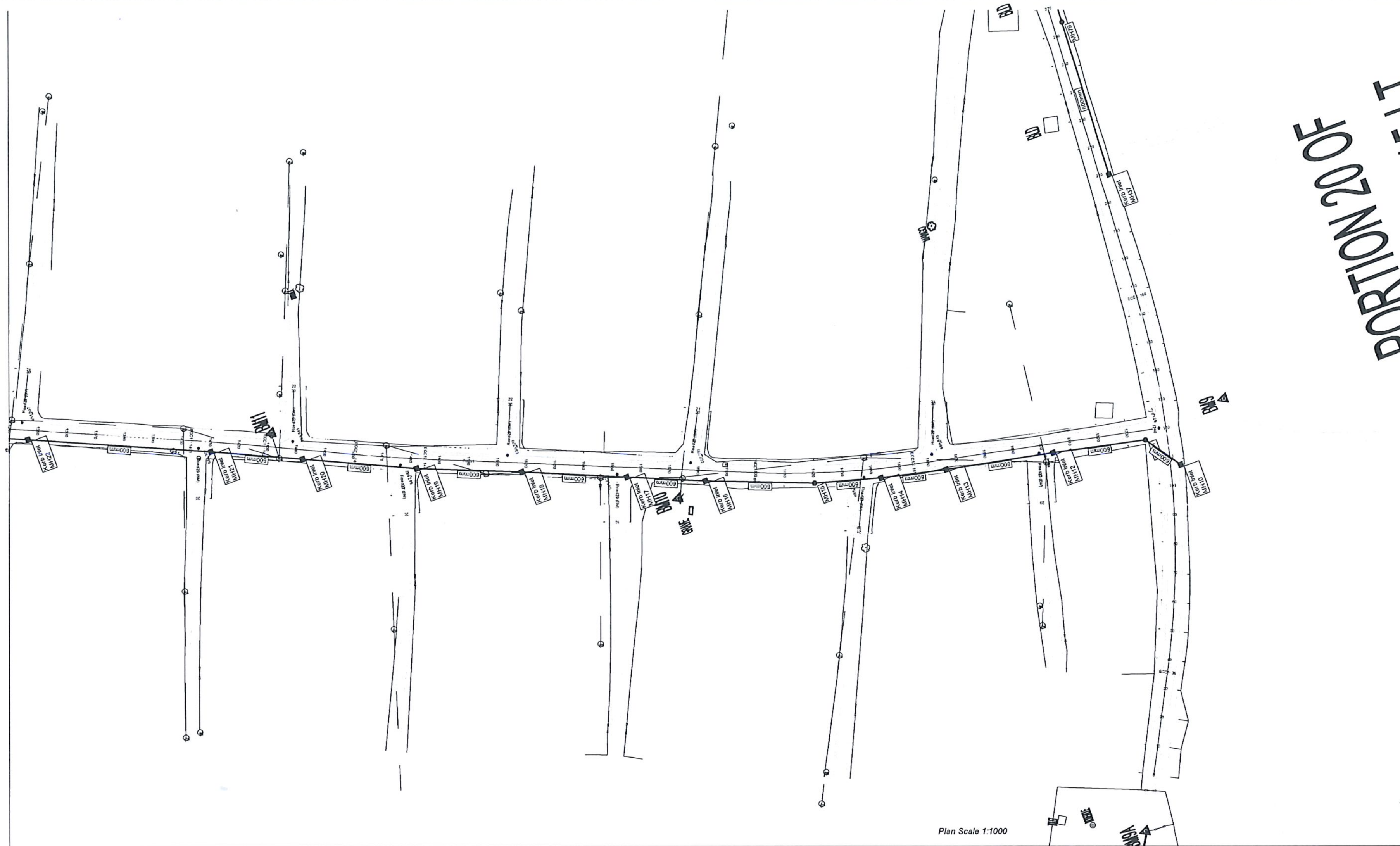


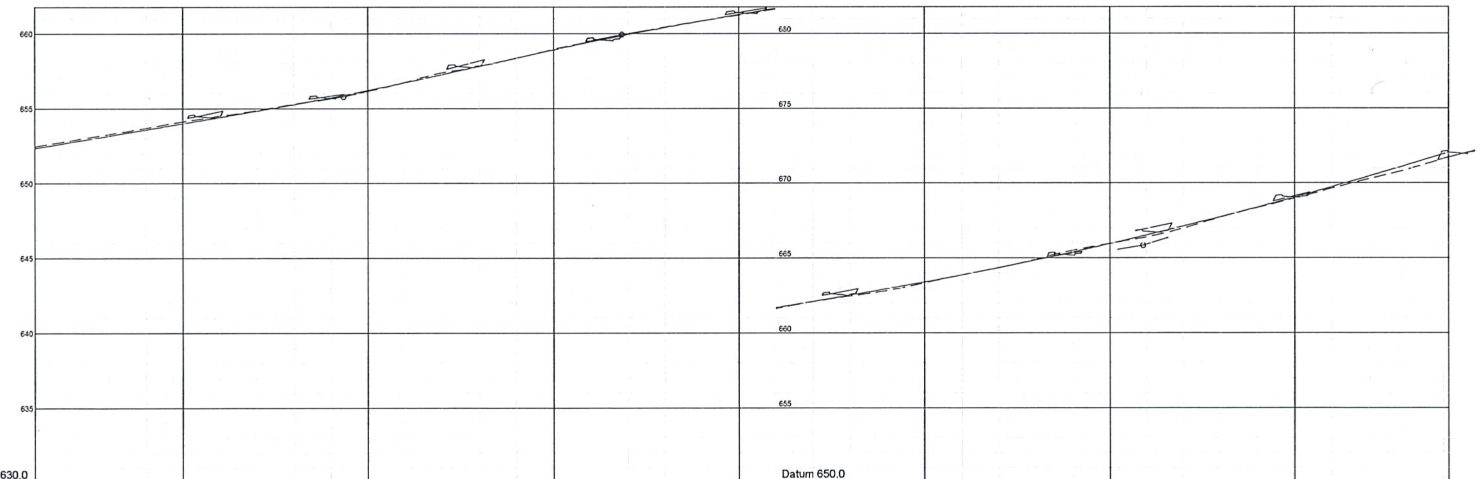
Plan Scale 1:1000

Curve List

No	Radius	TR.In	TR.Out	TAN.In	TAN.Out	Deflection
Road2						
0	0.00	0.00	0.00	0.00	0.00	0.00.00
1	300.00	0.00	0.00	66.40	66.40	24.57.43
Road1						
11	1000.00	0.00	0.00	12.81	12.81	1.28.02
12	500.00	0.00	0.00	12.13	12.13	2.46.46
13	300.00	0.00	0.00	27.71	27.71	10.33.13
14	0.00	0.00	0.00	0.00	0.00	0.00.00
Road26 (BM)						
0	0.00	0.00	0.00	0.00	0.00	0.00.00
1	0.00	0.00	0.00	0.00	0.00	0.00.00
Road33 (BM)						
0	0.00	0.00	0.00	0.00	0.00	0.00.00
1	0.00	0.00	0.00	0.00	0.00	0.00.00
Road32 (BM)						
0	0.00	0.00	0.00	0.00	0.00	0.00.00
1	0.00	0.00	0.00	0.00	0.00	0.00.00
Road31 (BM)						
0	0.00	0.00	0.00	0.00	0.00	0.00.00
1	0.00	0.00	0.00	0.00	0.00	0.00.00
Road30 (BM)						
0	0.00	0.00	0.00	0.00	0.00	0.00.00
1	0.00	0.00	0.00	0.00	0.00	0.00.00
Road28 (BM)						
0	0.00	0.00	0.00	0.00	0.00	0.00.00
1	0.00	0.00	0.00	0.00	0.00	0.00.00
Road29 (BM)						
0	0.00	0.00	0.00	0.00	0.00	0.00.00
1	0.00	0.00	0.00	0.00	0.00	0.00.00
Road27 (BM)						
0	0.00	0.00	0.00	0.00	0.00	0.00.00
1	0.00	0.00	0.00	0.00	0.00	0.00.00
Road25 (BM)						
0	0.00	0.00	0.00	0.00	0.00	0.00.00
1	0.00	0.00	0.00	0.00	0.00	0.00.00
Road24 (BM)						
0	0.00	0.00	0.00	0.00	0.00	0.00.00
1	0.00	0.00	0.00	0.00	0.00	0.00.00

Road List

Position	SV	Y-Coord	X-Coord
Road2			
PI0	0	72921.76	2552917.71
BCC1	35.59	72890.30	2552934.34
PI1	100.94	72831.59	2552965.36
ECC1	166.29	72765.27	2552968.71
Road1			
BCC11	1403.23	72698.56	2552642.61
PI15	1416.03	72703.72	2552654.33
ECC11	1428.84	72709.17	2552665.92
BCC12	1460.70	72722.75	2552694.75
PI14	1472.83	72727.91	2552705.72
ECC12	1484.96	72732.54	2552716.93
BCC13	1599.71	72776.34	2552823.00
PI6	1627.34	72786.91	2552848.61
ECC13	1654.97	72792.62	2552875.72
PI7	1741.52	72810.44	2552960.42
Road26 (BM)			
PI0	2.51	72711.09	2552675.87
PI1	21.57	72693.30	2552682.70
Road33 (BM)			
PI0	2.51	72804.14	2552918.31
PI1	19.70	72820.59	2552913.36
Road32 (BM)			
PI0	2.54	72791.60	2552883.01
PI1	20.64	72774.78	2552889.69
Road31 (BM)			
PI0	2.53	72790.92	2552858.04
PI1	21.45	72807.97	2552849.84
Road30 (BM)			
PI0	2.51	72765.50	2552803.29
PI1	21.06	72749.13	2552812.01
Road28 (BM)			
PI0	2.50	72741.12	2552744.25
PI1	21.79	72723.39	2552751.84
Road29 (BM)			
PI0	2.50	72760.40	2552777.84
PI1	18.96	72775.86	2552772.19
Road27 (BM)			
PI0	2.54	72731.58	2552708.25
PI1	19.57	72748.16	2552704.36
Road25 (BM)			
PI0	2.50	72701.98	2552644.16
PI1	19.61	72717.94	2552638.00
Road24 (BM)			
PI0	2.50	72672.57	2552589.75
PI1	20.72	72656.36	2552598.07



Chainage	Centreline Peg Levels	Left Edge	Centre Line	Right Edge
1360	652.47	652.301	652.351	652.401
1370	652.86	652.713	652.763	652.813
1380	653.27	653.125	653.175	653.225
1390	653.69	653.537	653.587	653.637
1400	654.13	653.949	653.999	654.049
1405	654.32	654.155	654.205	654.255
1410	654.50	654.361	654.411	654.461
1415 / 1410.000	654.68 / 654.49	654.567 / 654.361	654.617 / 654.411	654.667 / 654.461
1420	654.87	654.774	654.824	654.874
1425	655.09	654.985	655.035	655.085
1430	655.30	655.204	655.254	655.304
1440	655.68	655.663	655.713	655.763
1450	656.11	656.150	656.200	656.250
1460	656.74	656.666	656.716	656.766
1465	657.08	656.935	656.985	657.035
1470	657.41	657.210	657.260	657.310
1475	657.58	657.487	657.537	657.587
1480 / 1480.000	657.79 / 657.79	657.764 / 657.764	657.814 / 657.814	657.864 / 657.864
1490	658.34	658.318	658.368	658.418
1500	658.97	658.866	658.916	658.966
1510	659.50	659.389	659.439	659.489
1520	659.93	659.885	659.935	659.985
1530	660.46	660.354	660.404	660.454
1540	660.86	660.796	660.846	660.896
1550	661.21	661.217	661.267	661.317
1560	661.63	661.637	661.687	661.737
1570	662.11	662.056	662.106	662.156
1580	662.46	662.476	662.526	662.576
1590	662.80	662.899	662.949	662.999
1600	663.33	663.343	663.393	663.443
1605	663.60	663.573	663.623	663.673
1610	663.87	663.809	663.859	663.909
1615	664.11	664.050	664.100	664.151
1620	664.36	664.297	664.347	664.397
1625	664.61	664.550	664.600	664.650
1630	664.90	664.808	664.858	664.908
1635	665.24	665.071	665.121	665.171
1640 / 1640.000	665.50 / 665.50	665.340 / 665.340	665.390 / 665.390	665.440 / 665.440
1645	665.75	665.615	665.664	665.714
1650	665.97	665.895	665.945	665.995
1660	666.36	666.471	666.521	666.571
1670	666.95	667.070	667.120	667.170
1680	667.75	667.691	667.741	667.791
1690	668.35	668.334	668.384	668.434
1700	668.96	668.999	669.049	669.099
1710	669.64	669.687	669.737	669.787
1720	670.29	670.396	670.446	670.496
1730	670.83	671.128	671.178	671.228
1740 / 1741.52	671.61 / 671.75	671.880	671.928 / 672.042	672.049

Vertical Alignment — Design Road Levels

Grades: 4.120 % | 1443.488 655.791 | 5.541 % | 1518.348 659.939 | 4.196 % | 1659.056 665.843 | 7.517 %

Vertical Curves: BVC 1418.488 | 50.000m VC K = 35.185 | 1468.488 EVC | BVC 1493.348 | 50.000m VC K = 37.173 | 1543.348 EVC | BVC 1584.055 | 150.000m VC K = 45.161 | 1734.055 EVC

Superelevation: 2.00000 / -2.00000

Horizontal Curves: Direction 23.44.54 | 1403.229 BCC Curve 11 Right Radius=1000.000 I= 1.28.02 ECC 1428.838 | Direction 25.12.56 | 1460.705 BCC Curve 12 Left Radius=500.000 I= 2.46.46 ECC 1484.959 | Direction 22.26.11 | 1599.711 BCC Curve 13 Left Radius=300.000 I= 10.33.13 ECC 1654.970 | Direction 11.52.58

Road1
Chainage 1360 to 1741
Horizontal Scale 1:1000
Vertical Scale 1:250

No.	DATE	REVISION	CONSULT. ENG.	DIR.
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-

DESIGNED BY	SZB RANGANA
CHECKED BY	PXA NDLOVU
DRAWN BY	TA MOSIA
CHECKED BY	TE MUVHANGO

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MEMBER OF CESA

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BID NO.: 35 OF 2022

TITLE
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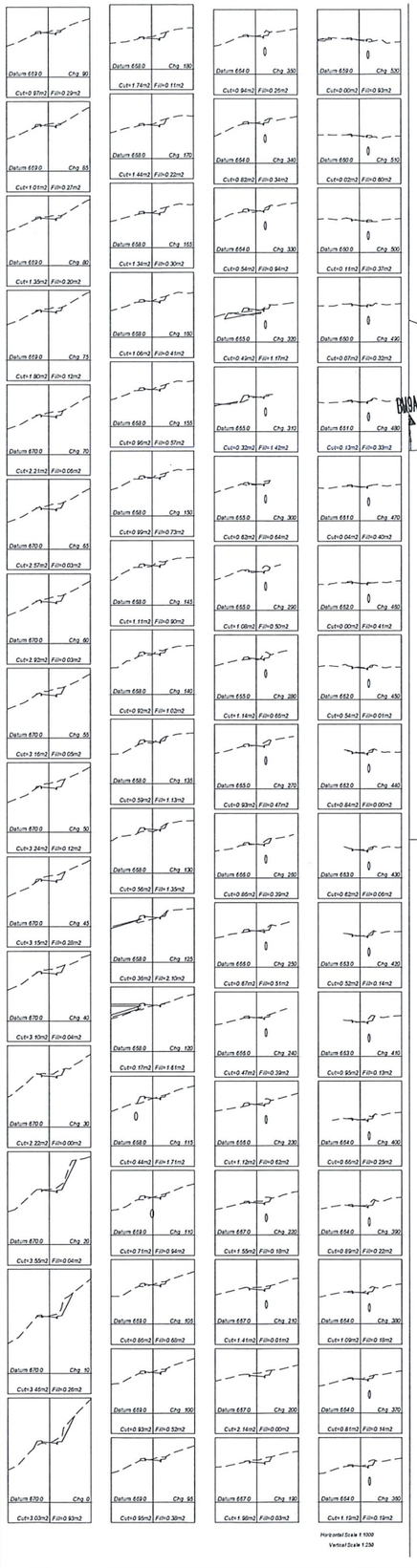
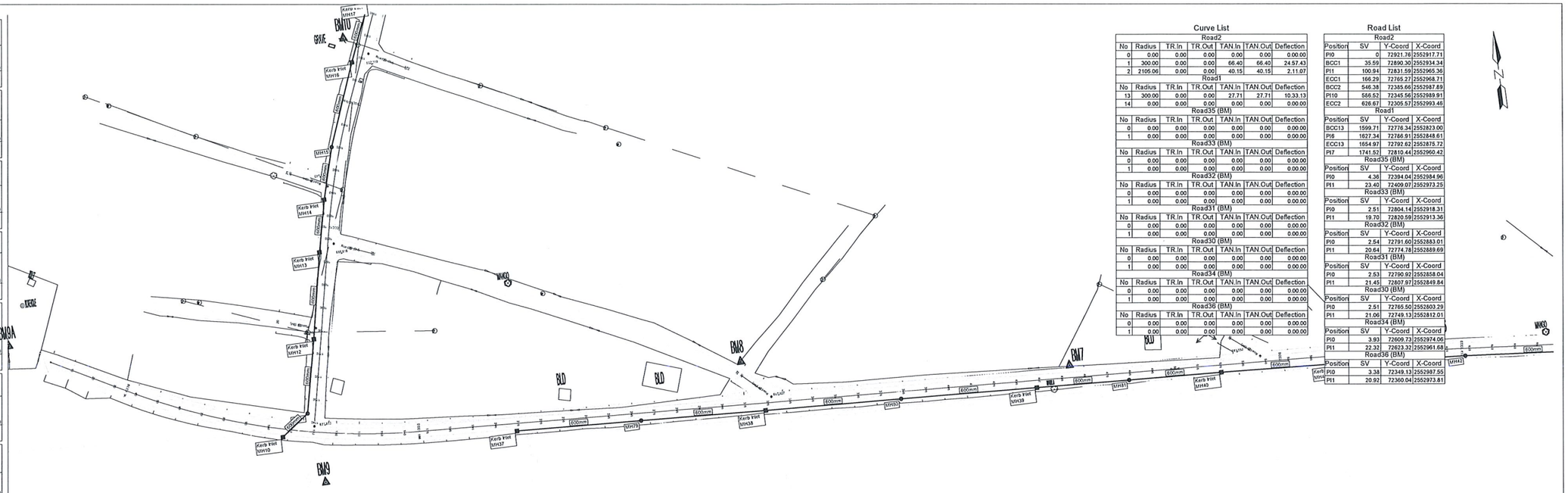
ISSUED FOR TENDER

For: Makhado Municipality 20_/_/_
For: Mont Consulting Engineers 20_/_/_

DRAWING No. MONT/MAKH/RDS/01/2019/PLC01

SHEET 02 OF 02
SCALE AS SHOWN
PAPER SIZE A1
REVISION 00





Plan Scale 1:1000

Curve List

Road2

No	Radius	TR.In	TR.Out	TAN.In	TAN.Out	Deflection
0	0.00	0.00	0.00	0.00	0.00	0.00.00
1	300.00	0.00	0.00	66.40	66.40	24.57.43
2	2105.06	0.00	0.00	40.15	40.15	2.11.07

Road1

No	Radius	TR.In	TR.Out	TAN.In	TAN.Out	Deflection
13	300.00	0.00	0.00	27.71	27.71	10.33.13
14	0.00	0.00	0.00	0.00	0.00	0.00.00

Road35 (BM)

No	Radius	TR.In	TR.Out	TAN.In	TAN.Out	Deflection
0	0.00	0.00	0.00	0.00	0.00	0.00.00
1	0.00	0.00	0.00	0.00	0.00	0.00.00

Road33 (BM)

No	Radius	TR.In	TR.Out	TAN.In	TAN.Out	Deflection
0	0.00	0.00	0.00	0.00	0.00	0.00.00
1	0.00	0.00	0.00	0.00	0.00	0.00.00

Road32 (BM)

No	Radius	TR.In	TR.Out	TAN.In	TAN.Out	Deflection
0	0.00	0.00	0.00	0.00	0.00	0.00.00
1	0.00	0.00	0.00	0.00	0.00	0.00.00

Road31 (BM)

No	Radius	TR.In	TR.Out	TAN.In	TAN.Out	Deflection
0	0.00	0.00	0.00	0.00	0.00	0.00.00
1	0.00	0.00	0.00	0.00	0.00	0.00.00

Road30 (BM)

No	Radius	TR.In	TR.Out	TAN.In	TAN.Out	Deflection
0	0.00	0.00	0.00	0.00	0.00	0.00.00
1	0.00	0.00	0.00	0.00	0.00	0.00.00

Road34 (BM)

No	Radius	TR.In	TR.Out	TAN.In	TAN.Out	Deflection
0	0.00	0.00	0.00	0.00	0.00	0.00.00
1	0.00	0.00	0.00	0.00	0.00	0.00.00

Road36 (BM)

No	Radius	TR.In	TR.Out	TAN.In	TAN.Out	Deflection
0	0.00	0.00	0.00	0.00	0.00	0.00.00
1	0.00	0.00	0.00	0.00	0.00	0.00.00

Road List

Road2

Position	SV	Y-Coord	X-Coord
PI0	0	72921.76	2552917.71
BCC1	35.59	72890.30	2552934.34
PI1	100.94	72831.59	2552965.36
ECC1	166.29	72765.27	2552968.71
BCC2	546.38	72385.66	2552987.89
PI10	586.52	72345.56	2552989.91
ECC2	626.67	72305.57	2552993.46

Road1

Position	SV	Y-Coord	X-Coord
BCC13	1599.71	72776.34	2552823.00
PI6	1627.34	72786.91	2552848.61
ECC13	1654.97	72792.62	2552875.72
PI7	1741.52	72810.44	2552960.42

Road35 (BM)

Position	SV	Y-Coord	X-Coord
PI0	4.36	72394.04	2552884.96
PI1	23.40	72409.07	2552973.25

Road33 (BM)

Position	SV	Y-Coord	X-Coord
PI0	2.51	72804.14	2552918.31
PI1	19.70	72820.59	2552913.36

Road32 (BM)

Position	SV	Y-Coord	X-Coord
PI0	2.54	72791.60	2552883.01
PI1	20.64	72774.78	2552889.69

Road31 (BM)

Position	SV	Y-Coord	X-Coord
PI0	2.53	72790.92	2552858.04
PI1	21.45	72807.97	2552849.84

Road30 (BM)

Position	SV	Y-Coord	X-Coord
PI0	2.51	72765.50	2552803.29
PI1	21.06	72749.13	2552812.01

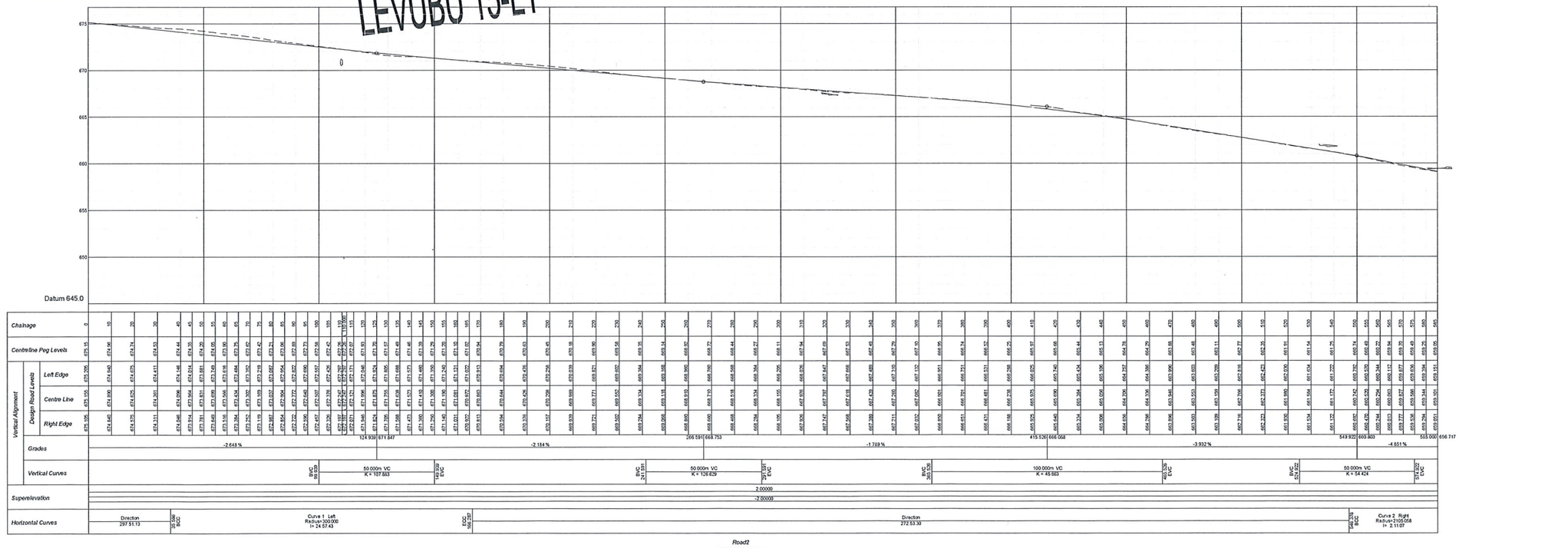
Road34 (BM)

Position	SV	Y-Coord	X-Coord
PI0	3.93	72609.73	2552974.06
PI1	22.32	72623.32	2552961.68

Road36 (BM)

Position	SV	Y-Coord	X-Coord
PI0	3.38	72349.13	2552987.55
PI1	20.92	72360.04	2552973.81

PORTION 20 OF LEVUBU 15-LT



Road2
Chainage 0 to 585
Horizontal Scale 1:1000
Vertical Scale 1:250

No	DATE	REVISION	CONSULT ENG	DR
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-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-

DESIGNED BY	SZB RANGANA
CHECKED BY	PXA NDLOVU
DRAWN BY	TA MOBIA
CHECKED BY	TE MUVHANGO

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FAUNA PARK
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TEL: 015 - 291 4173
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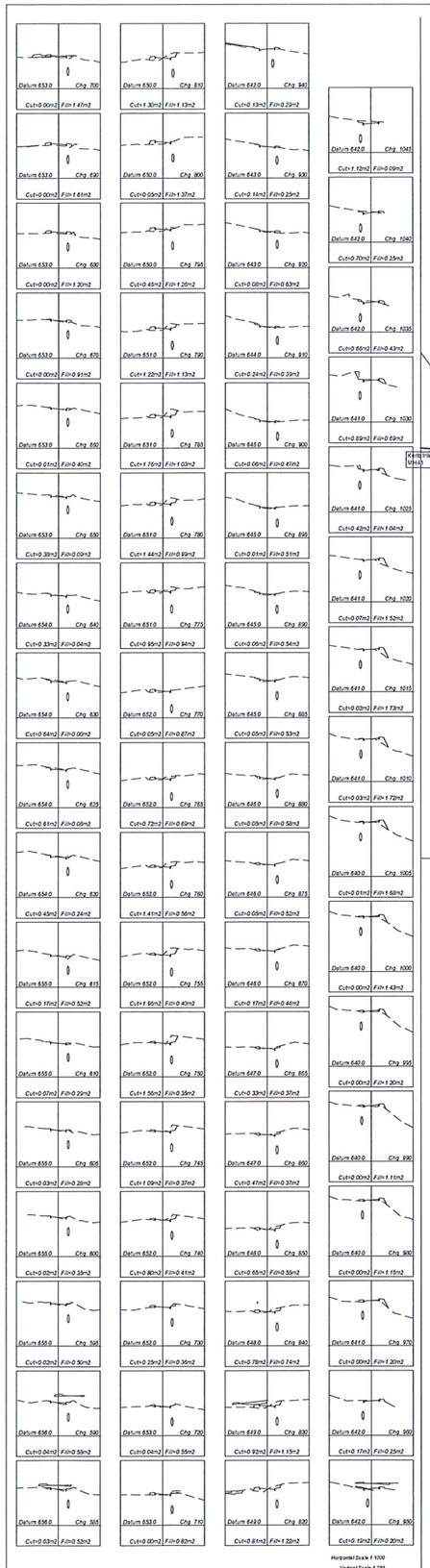
MEMBER OF CESA

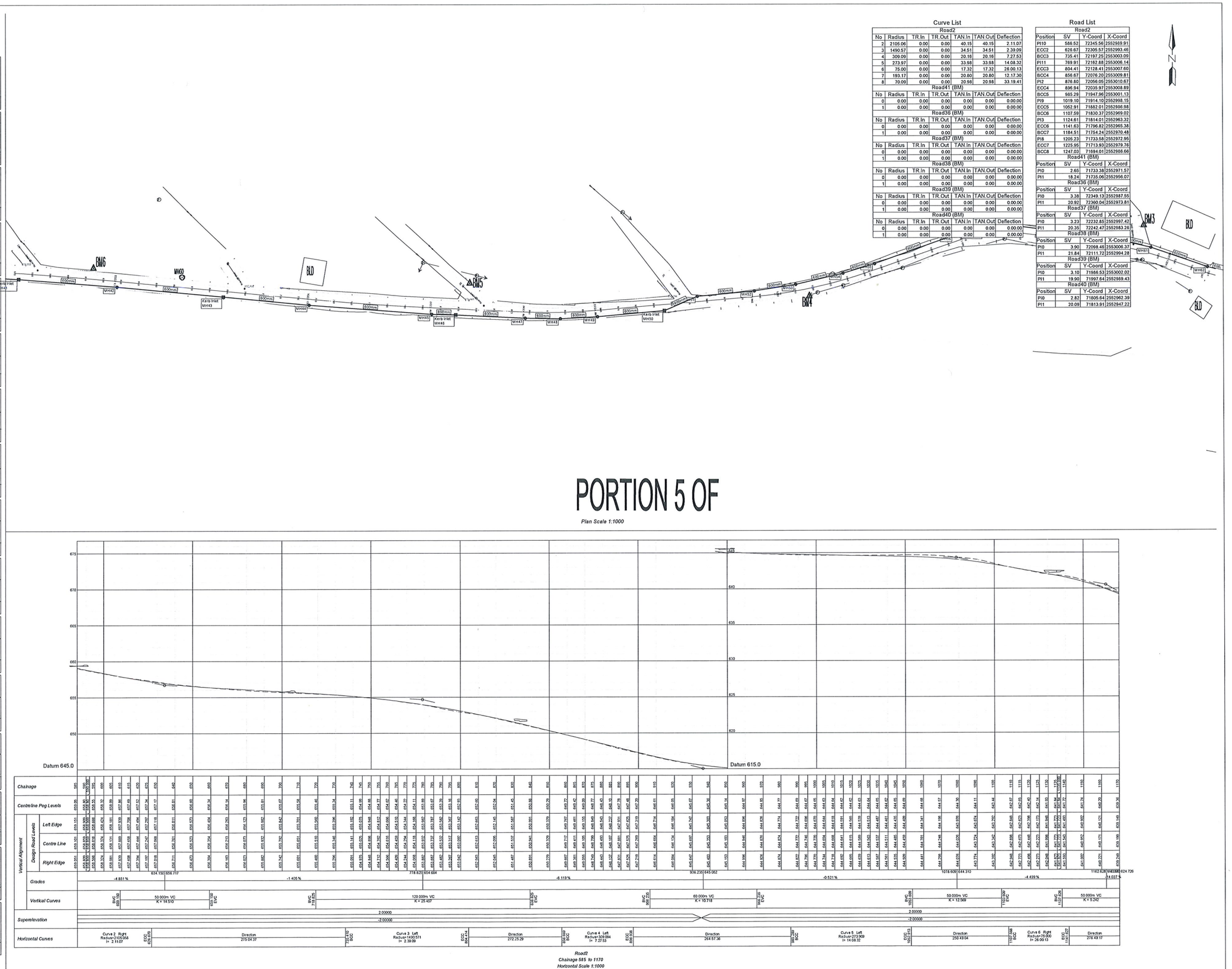
PROJECT
CONSTRUCTION OF LUTANANDWA ACCESS ROAD AND BRIDGE - PHASE 2
BID NO.: 35 OF 2022

TITLE
ROAD 2 LAYOUT, LONGSECTION AND CROSS SECTIONS

ISSUED FOR TENDER
For Makhado Municipality 20_/_/_
For Mont Consulting Engineers 20_/_/_

DRAWING No	MONT/MAKH/RDS/01/2019/PLC02
SHEET	H OF 08
SCALE	AS SHOWN
PAPER SIZE	A1
REVISION	00





PORTION 5 OF

Plan Scale 1:1000

Curve List

Road2

No	Radius	TR.In	TR.Out	TAN.In	TAN.Out	Deflection
2	2105.06	0.00	0.00	40.15	40.15	2.11.07
3	1490.57	0.00	0.00	34.51	34.51	2.39.09
4	309.09	0.00	0.00	20.16	20.16	7.27.53
5	273.97	0.00	0.00	33.98	33.98	14.08.32
6	75.00	0.00	0.00	17.32	17.32	26.00.13
7	193.17	0.00	0.00	20.80	20.80	12.17.30
8	70.09	0.00	0.00	20.98	20.98	33.19.41

Road41 (BM)

No	Radius	TR.In	TR.Out	TAN.In	TAN.Out	Deflection
0	0.00	0.00	0.00	0.00	0.00	0.00.00
1	0.00	0.00	0.00	0.00	0.00	0.00.00

Road36 (BM)

No	Radius	TR.In	TR.Out	TAN.In	TAN.Out	Deflection
0	0.00	0.00	0.00	0.00	0.00	0.00.00
1	0.00	0.00	0.00	0.00	0.00	0.00.00

Road37 (BM)

No	Radius	TR.In	TR.Out	TAN.In	TAN.Out	Deflection
0	0.00	0.00	0.00	0.00	0.00	0.00.00
1	0.00	0.00	0.00	0.00	0.00	0.00.00

Road38 (BM)

No	Radius	TR.In	TR.Out	TAN.In	TAN.Out	Deflection
0	0.00	0.00	0.00	0.00	0.00	0.00.00
1	0.00	0.00	0.00	0.00	0.00	0.00.00

Road39 (BM)

No	Radius	TR.In	TR.Out	TAN.In	TAN.Out	Deflection
0	0.00	0.00	0.00	0.00	0.00	0.00.00
1	0.00	0.00	0.00	0.00	0.00	0.00.00

Road40 (BM)

No	Radius	TR.In	TR.Out	TAN.In	TAN.Out	Deflection
0	0.00	0.00	0.00	0.00	0.00	0.00.00
1	0.00	0.00	0.00	0.00	0.00	0.00.00

Road List

Road2

Position	SV	Y-Coord	X-Coord
PI10	586.52	72345.56	2552989.91
ECC2	626.67	72305.57	2552993.46
BCC3	735.41	72197.25	2553003.09
PI11	769.91	72162.88	2553006.14
ECC3	804.41	72128.41	2553007.60
BCC4	856.67	72076.20	2553009.81
PI12	876.80	72056.05	2553010.67
ECC4	896.94	72035.97	2553008.89
BCC5	985.29	71947.96	2553001.13
PI9	1019.10	71914.10	2552998.15
ECC5	1052.91	71882.01	2552856.98
BCC6	1107.59	71830.37	2552969.02
PI3	1124.61	71814.01	2552963.32
ECC6	1141.63	71796.82	2552965.38
BCC7	1184.51	71754.24	2552970.48
PI8	1205.23	71733.58	2552972.95
ECC7	1225.95	71713.93	2552979.76
BCC8	1247.03	71694.01	2552988.66

Road41 (BM)

Position	SV	Y-Coord	X-Coord
PI0	2.65	71733.38	2552971.57
PI1	18.24	71735.06	2552956.07

Road36 (BM)

Position	SV	Y-Coord	X-Coord
PI0	3.38	72349.13	2552987.55
PI1	20.92	72360.04	2552973.81

Road37 (BM)

Position	SV	Y-Coord	X-Coord
PI0	3.23	72232.85	2552997.42
PI1	20.35	72242.47	2552983.26

Road38 (BM)

Position	SV	Y-Coord	X-Coord
PI0	3.90	72098.46	2553000.37
PI1	21.84	72111.72	2552994.28

Road39 (BM)

Position	SV	Y-Coord	X-Coord
PI0	3.10	71986.53	2553002.02
PI1	19.90	71997.64	2552989.43

Road40 (BM)

Position	SV	Y-Coord	X-Coord
PI0	2.82	71805.64	2552962.39
PI1	20.09	71813.91	2552947.22

Road2
Chainage 585 to 1170
Horizontal Scale 1:1000
Vertical Scale 1:250

No.	DATE	REVISION	CONSULT. ENG.	DIR.
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-

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SHEET 02 OF 02
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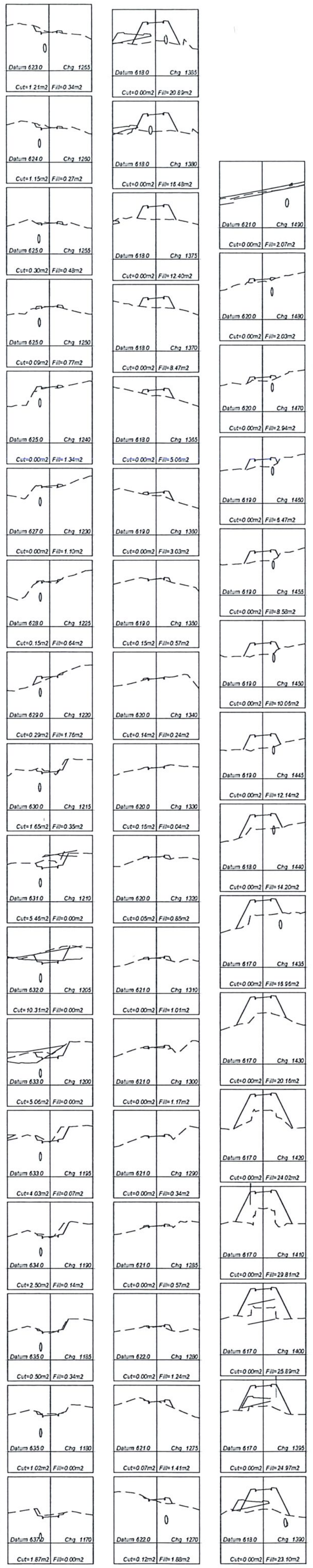
PAPER SIZE A1
DRAWING No. MONT/MAKH/RDS/01/2019/PLC02
REVISION 00



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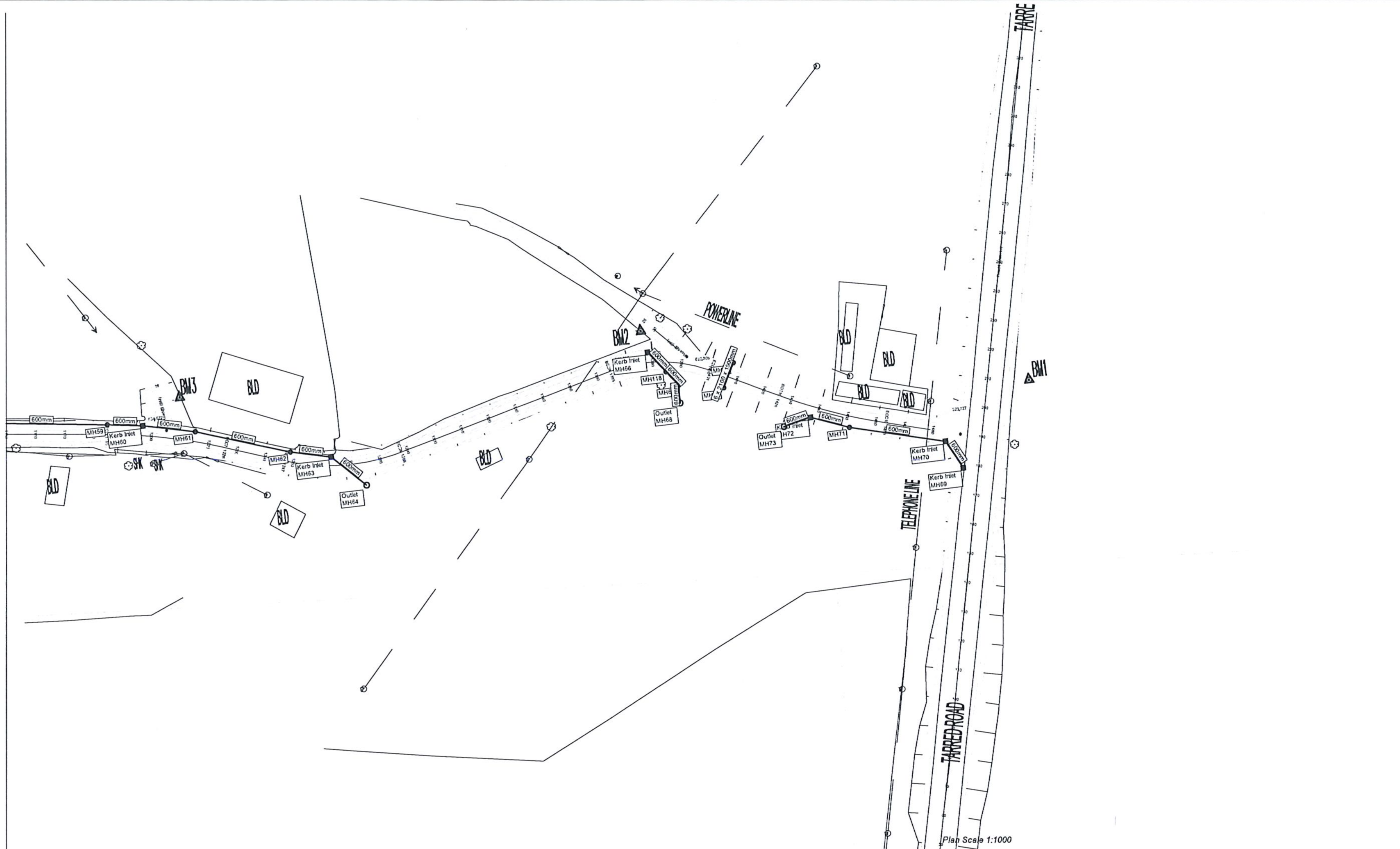
Vertical Scale 1:250



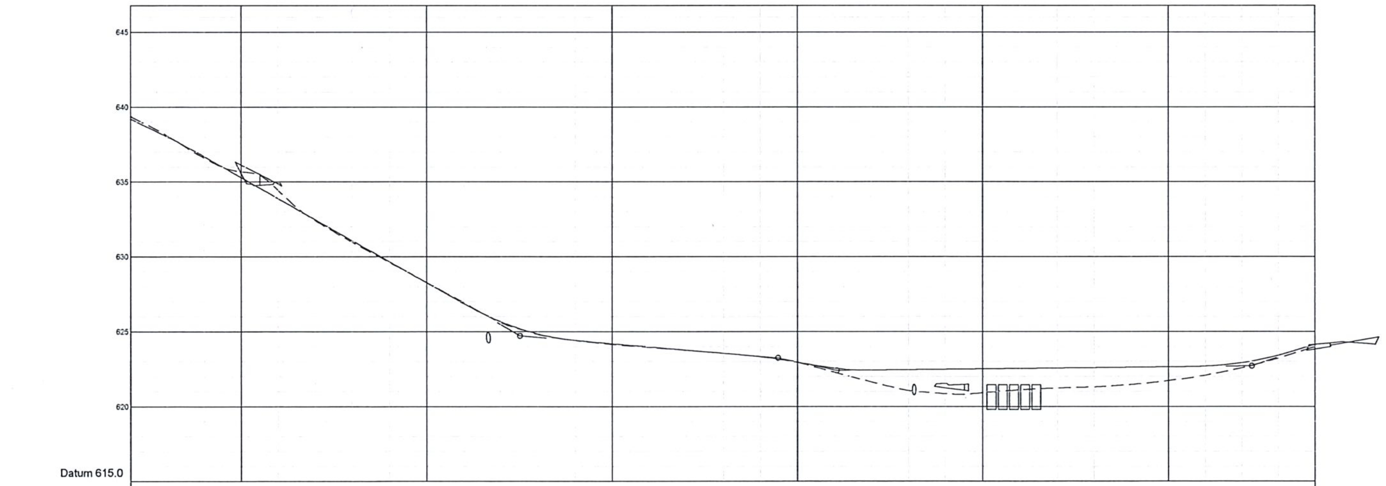
Plan Scale 1:1000

Curve List

No	Radius	TR.In	TR.Out	TAN.In	TAN.Out	Deflection
Road2						
7	193.17	0.00	0.00	20.80	20.80	12.17.30
8	70.09	0.00	0.00	20.98	20.98	33.19.41
9	50.00	0.00	0.00	18.62	18.62	40.51.26
10	189.12	0.00	0.00	18.99	18.99	11.27.56
11	0.00	0.00	0.00	0.00	0.00	0.00.00
Road41 (BM)						
0	0.00	0.00	0.00	0.00	0.00	0.00.00
1	0.00	0.00	0.00	0.00	0.00	0.00.00
Road4 (Main Int)						
Road42 (BM)						
0	0.00	0.00	0.00	0.00	0.00	0.00.00
1	0.00	0.00	0.00	0.00	0.00	0.00.00

Road List

Position	SV	Y-Coord	X-Coord
Road2			
BCC7	1184.51	71754.24	2552970.48
PI8	1205.23	71733.58	2552972.95
ECC7	1225.95	71713.93	2552979.76
BCC8	1247.03	71694.01	2552986.66
PI4	1267.41	71674.19	2552993.53
ECC8	1287.80	71653.85	2552988.38
BCC9	1364.91	71579.11	2552969.44
PI5	1382.73	71561.05	2552964.87
ECC9	1400.56	71544.41	2552973.22
BCC10	1425.61	71522.02	2552984.45
PI6	1444.54	71505.05	2552992.96
ECC10	1463.46	71486.72	2552997.94
PI7	1489.71	71461.39	2553004.81
Road41 (BM)			
PI0	2.65	71733.38	2552971.57
PI1	18.24	71735.06	2552956.07
Road4 (Main Int)			
Road42 (BM)			
PI0	5.29	71552.09	2552967.58
PI1	24.52	71565.34	2552953.64



Vertical Alignment – Design Road Levels

Chainage	Centreline Peg Levels	Left Edge	Centre Line	Right Edge
1170	639.36	639.149	639.199	639.249
1180	638.17	637.986	638.036	638.086
1185	637.27	637.333	637.383	637.433
1190	636.58	636.638	636.688	636.738
1195	635.91	635.936	635.986	636.036
1200	635.63	635.234	635.284	635.334
1205	635.63	634.532	634.582	634.632
1210 / 1210.000	634.43 / 634.43	633.830 / 633.830	633.880 / 633.880	633.930 / 633.930
1215	633.25	633.128	633.178	633.228
1220	632.39	632.427	632.477	632.527
1225	631.69	631.725	631.775	631.825
1230	630.97	631.023	631.073	631.123
1240	629.62	629.619	629.669	629.719
1250	628.28	628.216	628.266	628.315
1255	627.62	627.514	627.564	627.614
1260	626.94	626.812	626.862	626.912
1265	626.25	626.155	626.205	626.255
1270	625.52	625.598	625.648	625.698
1275	625.19	625.140	625.190	625.240
1280	624.78	624.781	624.831	624.881
1285	624.55	624.521	624.571	624.621
1290	624.41	624.360	624.410	624.460
1300	624.13	624.146	624.196	624.246
1310	623.95	623.932	623.982	624.031
1320	623.74	623.717	623.767	623.817
1330	623.56	623.503	623.553	623.603
1340	623.35	623.289	623.339	623.389
1350	623.00	622.914	622.964	623.014
1360	622.27	622.477	622.527	622.577
1365	621.96	622.387	622.437	622.487
1370	621.64	622.382	622.432	622.482
1375	621.33	622.395	622.445	622.495
1380	621.03	622.408	622.458	622.508
1385	620.95	622.422	622.472	622.522
1390	620.84	622.435	622.485	622.535
1395	620.77	622.448	622.498	622.548
1400	620.94	622.462	622.512	622.562
1410	621.12	622.488	622.538	622.588
1420	621.24	622.515	622.565	622.615
1430	621.29	622.541	622.591	622.641
1435	621.38	622.555	622.605	622.655
1440	621.46	622.568	622.618	622.668
1445	621.57	622.581	622.631	622.681
1450	621.72	622.595	622.645	622.695
1455	621.88	622.608	622.658	622.708
1460	622.07	622.621	622.671	622.721
1470	622.55	622.806	622.856	622.906
1480	623.19	623.320	623.368	623.418
1489.71	624.00		624.145	624.594

Grades: -14.037 % | 1275.216 624.726 | -2.140 % | 1344.783 623.237 | 1360.647 622.407 | -5.232 % | 0.266 % | 1472.681 622.705 | 8.456 %

Vertical Curves: 50.000m VC K = 5.242 | 1187.626 EVC | BVC 1260.216 | 30.000m VC K = 2.522 | 1290.216 EVC | BVC 1339.783 | 0.000m VC K = 3.235 | 1344.783 / 1350.147 EVC | 15.000m VC K = 2.728 | 1368.147 EVC | BVC 1460.181 | 25.000m VC K = 3.052 | 1485.181 EVC

Superelevation: 2.00000 / -2.00000

Horizontal Curves: Direction 276.49.17 | 1184.512 BCC | Curve 7 Right Radius=193.170 I= 12.17.30 | ECC 1225.953 | Direction 289.06.47 | 1247.028 BCC | Curve 8 Left Radius=70.088 I= 33.19.41 | ECC 1287.797 | Direction 255.47.06 | 1364.907 BCC | Curve 9 Right Radius=50.000 I= 40.51.26 | ECC 1400.562 | Direction 296.38.32 | 1425.612 BCC | Curve 10 Left Radius=189.124 I= 11.27.56 | ECC 1463.458 | Direction 285.10.37

Road2
Chainage 1170 to 1489
Horizontal Scale 1:1000
Vertical Scale 1:250

No.	DATE	REVISION	CONSULT. ENG.	DIR.
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-	-	-	-	-
-	-	-	-	-

DESIGNED BY	SZB RANGANA
CHECKED BY	PXA NDLOVU
DRAWN BY	TA MOSIA
CHECKED BY	TE MUVHANGO

MAKHADO MUNICIPALITY
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MEMBER OF CESA

PROJECT
CONSTRUCTION OF LUTANANDWA ACCESS ROAD AND BRIDGE - PHASE 2
BID NO.: 35 OF 2022

TITLE
ROAD 2 LAYOUT, LONGSECTION AND CROSS SECTIONS

ISSUED FOR TENDER
For: Makhado Municipality 20__/__/__
For: Mont Consulting Engineers 20__/__/__

DRAWING No. MONT/MAKH/RDS/01/2019/PLC02
SHEET 03 OF 03
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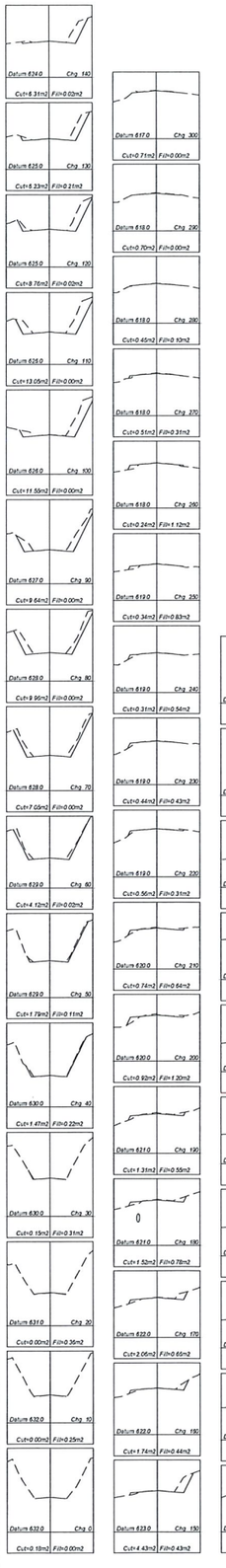
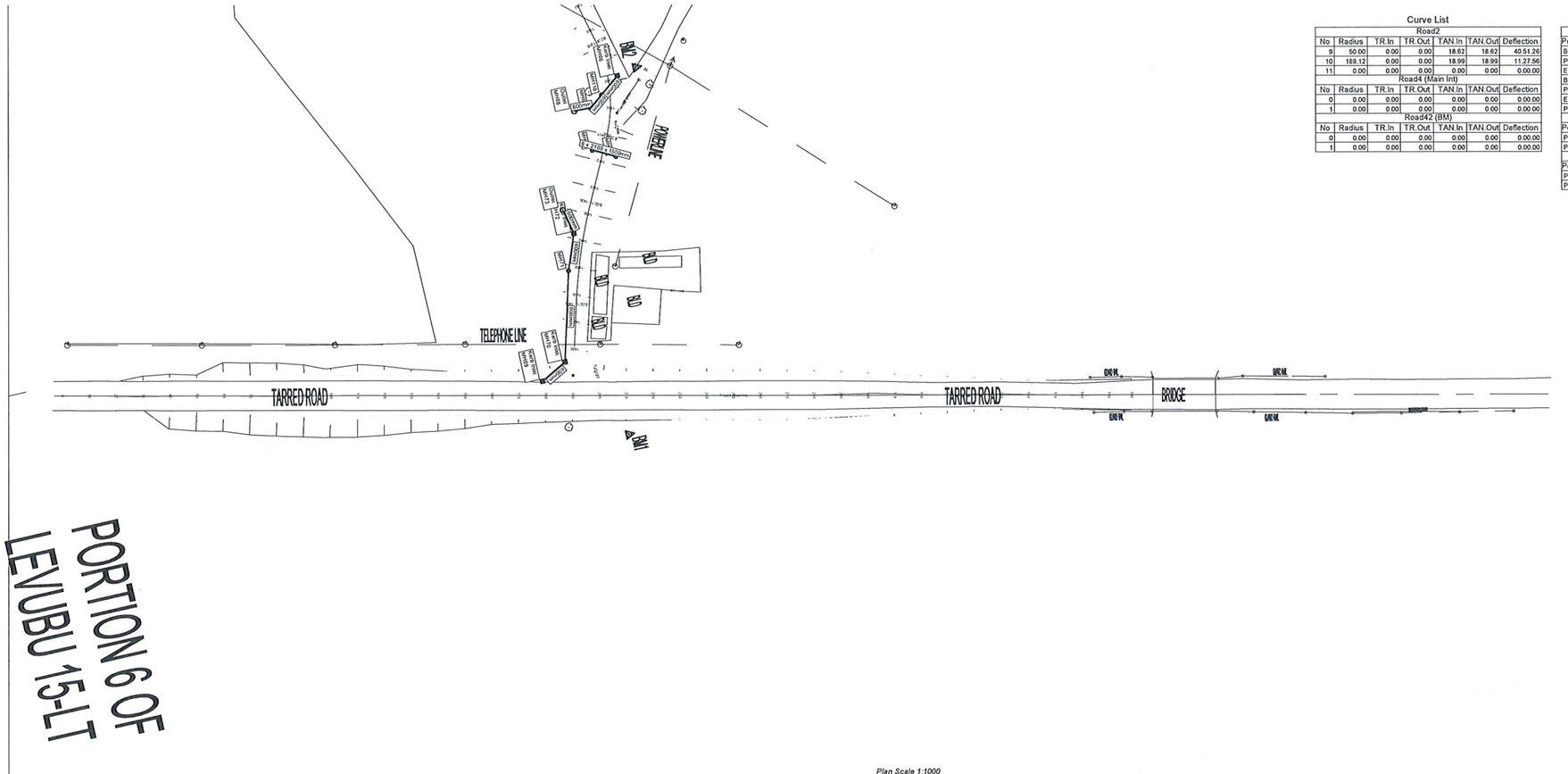




Curve List

Road2

No	Radius	TR.In	TR.Out	TAN.In	TAN.Out	Deflection
9	50.00	0.00	0.00	18.62	18.62	40.51.26
10	189.12	0.00	0.00	18.99	18.99	11.27.56
11	0.00	0.00	0.00	0.00	0.00	0.00.00

Road4 (Main Int)

No	Radius	TR.In	TR.Out	TAN.In	TAN.Out	Deflection
0	0.00	0.00	0.00	0.00	0.00	0.00.00
1	0.00	0.00	0.00	0.00	0.00	0.00.00

Road42 (BM)

No	Radius	TR.In	TR.Out	TAN.In	TAN.Out	Deflection
0	0.00	0.00	0.00	0.00	0.00	0.00.00
1	0.00	0.00	0.00	0.00	0.00	0.00.00

Road List

Road2

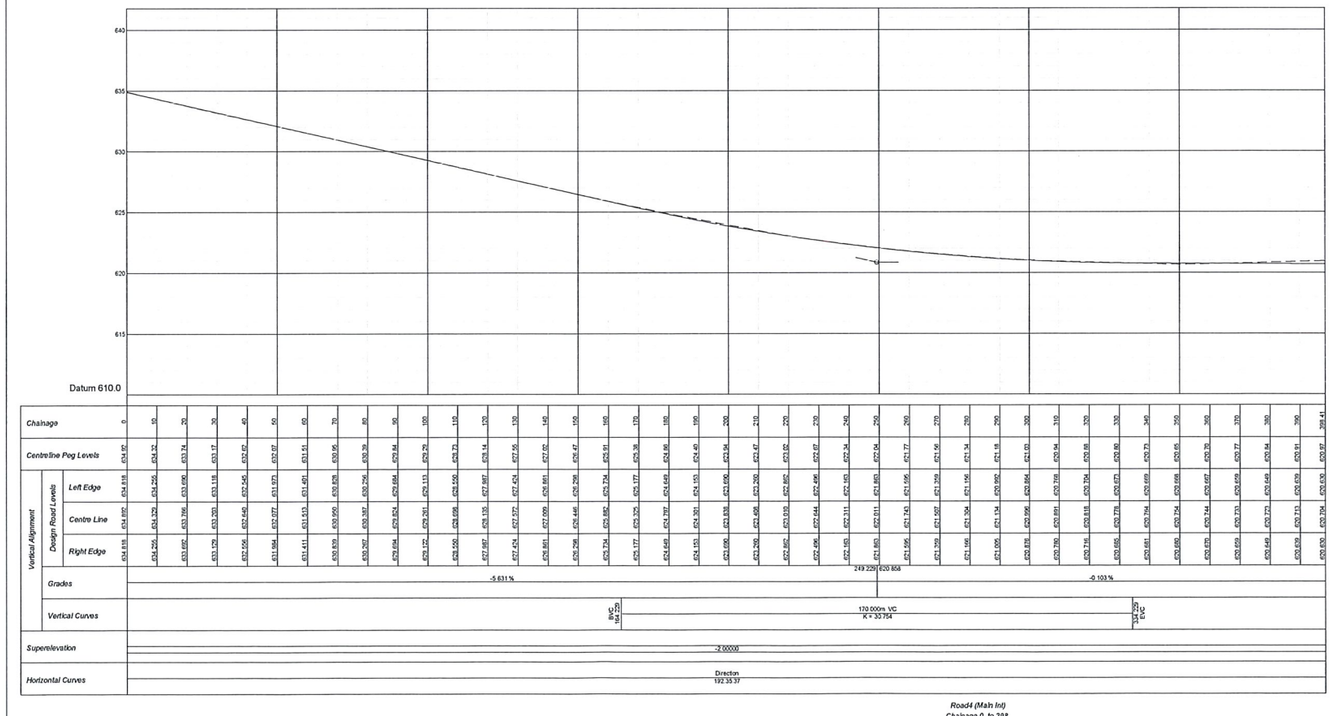
Position	SV	Y-Coord	X-Coord
BCC9	1364.91	71579.11	2552969.44
PI5	1382.73	71561.05	2552964.87
ECC9	1400.56	71544.41	2552973.22
BCC10	1425.61	71522.02	2552984.45
PI6	1444.54	71505.05	2552992.96
ECC10	1463.46	71486.72	2552997.94
PI7	1489.71	71461.39	2553004.81

Road4 (Main Int)

Position	SV	Y-Coord	X-Coord
PI0	0	71495.63	2553192.02
PI1	398.41	71408.76	2552803.20

Road42 (BM)

Position	SV	Y-Coord	X-Coord
PI0	5.29	71552.09	2552967.58
PI1	24.52	71565.34	2552953.64



10 m 0 m 10 m 20 m

No	DATE	REVISION	CONSULT. ENG	D/R
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-	-	-	-	-
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-	-	-	-	-
-	-	-	-	-

DESIGNED BY	SZB RANGANA
CHECKED BY	PXA NDLOVU
DRAWN BY	TA MOSIA
CHECKED BY	TE MUVHANGO

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MEMBER OF CESA

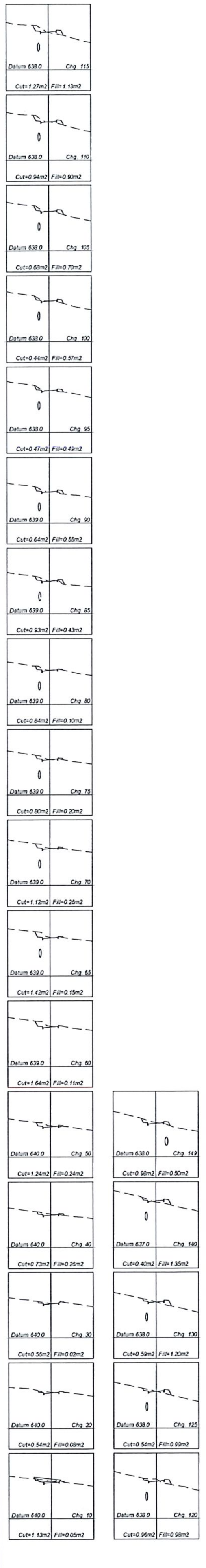
PROJECT
CONSTRUCTION OF LUTANANDWA ACCESS ROAD AND BRIDGE - PHASE 2
BID NO.: 35 OF 2022

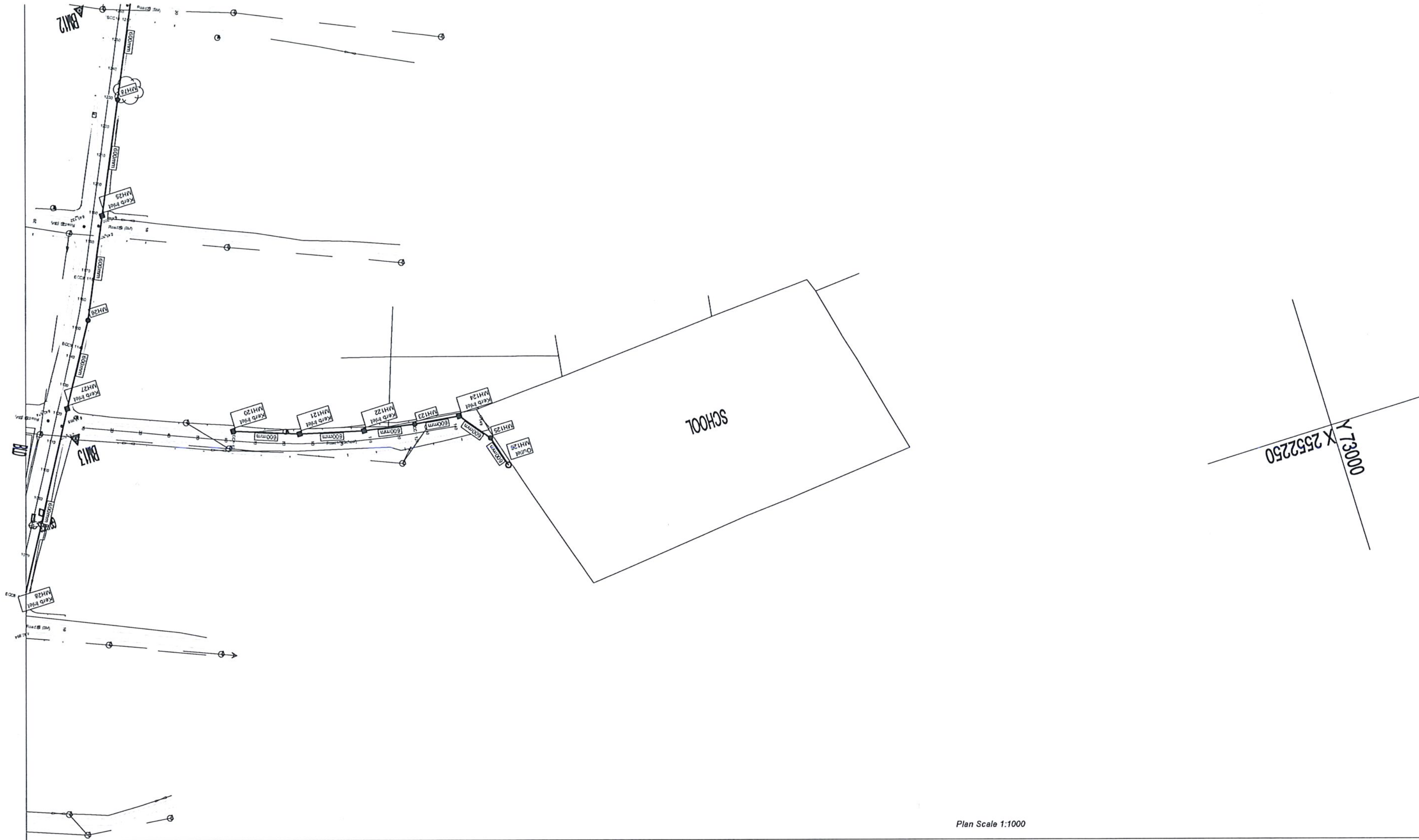
TITLE
ROAD 4 (D1253 INTERSECTION) LAYOUT, LONGSECTION AND CROSS SECTIONS

ISSUED FOR TENDER
For Makhado Municipality 20_/_/_
For Mont Consulting Engineers 20_/_/_

DRAWING No.
MONT/MAKH/RDS/01/2019/PLC04

SHEET 01 OF 01
SCALE AS SHOWN
PAPER SIZE A1
REVISION 00





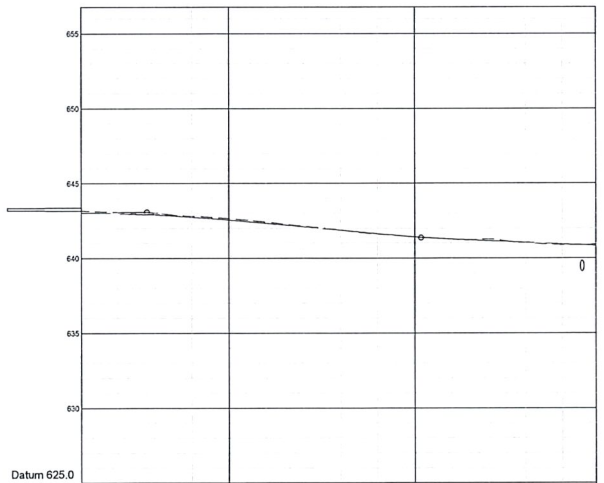
Plan Scale 1:1000

Curve List

No	Radius	TR.In	TR.Out	TAN.In	TAN.Out	Deflection
Road1						
9	255.00	0.00	0.00	11.80	11.80	5.17.54
10	1500.00	0.00	0.00	16.20	16.20	1.14.16
Road17 (School)						
0	0.00	0.00	0.00	0.00	0.00	0.00.00
1	250.00	0.00	0.00	31.84	31.84	14.30.54
2	0.00	0.00	0.00	0.00	0.00	0.00.00
Road15 (BM)						
1	0.00	0.00	0.00	0.00	0.00	0.00.00
Road21 (BM)						
0	0.00	0.00	0.00	0.00	0.00	0.00.00
1	0.00	0.00	0.00	0.00	0.00	0.00.00
Road18 (BM)						
0	0.00	0.00	0.00	0.00	0.00	0.00.00
Road19 (BM)						
0	0.00	0.00	0.00	0.00	0.00	0.00.00
1	0.00	0.00	0.00	0.00	0.00	0.00.00
Road20 (BM)						
0	0.00	0.00	0.00	0.00	0.00	0.00.00
1	0.00	0.00	0.00	0.00	0.00	0.00.00

Road List

Position	SV	Y-Coord	X-Coord
Road1			
BCC9	1143.70	72590.52	2552406.71
PI5	1155.49	72596.47	2552416.90
ECC9	1167.28	72601.45	2552427.59
BCC10	1257.26	72639.45	2552509.15
Road17 (School)			
PI0	2.52	72578.69	2552381.50
BCC1	62.52	72634.22	2552358.78
PI1	94.19	72663.68	2552346.73
ECC1	125.85	72695.23	2552342.44
PI2	148.99	72718.16	2552339.32
Road15 (BM)			
PI1	19.16	72558.70	2552314.69
Road21 (BM)			
PI0	2.50	72643.82	2552512.63
PI1	19.74	72659.36	2552505.14
Road18 (BM)			
PI0	2.52	72574.72	2552384.62
Road19 (BM)			
PI0	2.50	72611.49	2552443.21
PI1	19.32	72627.14	2552437.06
Road20 (BM)			
PI0	2.50	72606.59	2552444.54
PI1	19.91	72590.65	2552451.52



Chainage	Centreline Peg Levels	Design Road Levels – Left Edge	Design Road Levels – Centre Line	Design Road Levels – Right Edge
10	643.17	643.000	643.050	643.100
20	643.08	642.951	643.001	643.051
30	642.94	642.854	642.904	642.954
40	642.82	642.708	642.758	642.808
50	642.66	642.514	642.564	642.614
60	642.43	642.284	642.334	642.384
65	642.27	642.168	642.218	642.268
70	642.15	642.052	642.102	642.152
75	642.02	641.936	641.986	642.036
80	641.90	641.820	641.870	641.920
85	641.70	641.704	641.754	641.804
90	641.61	641.588	641.638	641.688
95	641.52	641.476	641.526	641.576
100	641.43	641.377	641.427	641.477
105	641.35	641.293	641.343	641.393
110	641.26	641.225	641.275	641.325
115	641.17	641.168	641.218	641.268
120	641.34	641.112	641.162	641.212
125	641.11	641.056	641.105	641.155
130	641.05	640.999	641.049	641.099
140	640.83	640.887	640.937	640.987
148.99	640.91	640.786	640.836	640.886

Vertical Alignment

Grades: 0.099 % | 27.829 643.080 | -2.319 % | 101.703 641.367 | -1.123 %

Vertical Curves: 50.000m VC K = 20.682 | 52.829 EVC | BVC 91.703 | 20.000m VC K = 16.724 | 111.703 EVC

Superelevation: 2.00000 / -2.00000

Horizontal Curves: Direction 112.15.09 | 62.520 BCC | Curve 1 Left Radius=250.000 I= 14.30.54 | ECC 125.853 | Direction 97.44.16

Horizontal Scale 1:1000
Vertical Scale 1:250

Road17 (School)
Chainage 10 to 148
Horizontal Scale 1:1000
Vertical Scale 1:250

No.	DATE	REVISION	CONSULT. ENG.	DIR.
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-	-	-	-	-
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-	-	-	-	-
-	-	-	-	-
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-	-	-	-	-
-	-	-	-	-

DESIGNED BY	SZB RANGANA
CHECKED BY	PXA NDLOVU
DRAWN BY	TA MOSIA
CHECKED BY	TE MUVHANGO

MAKHADO MUNICIPALITY
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PROJECT
CONSTRUCTION OF LUTANANDWA ACCESS ROAD AND BRIDGE - PHASE 2
BID NO.: 35 OF 2022

TITLE
ROAD 17 (School) LAYOUT, LONGSECTION AND CROSS SECTIONS

ISSUED FOR TENDER
(Full signature)
For: Makhado Municipality 20_/_/_
For: Mont Consulting Engineers 20_/_/_

DRAWING No.
MONT/MAKH/RDS/01/2019/PLC17

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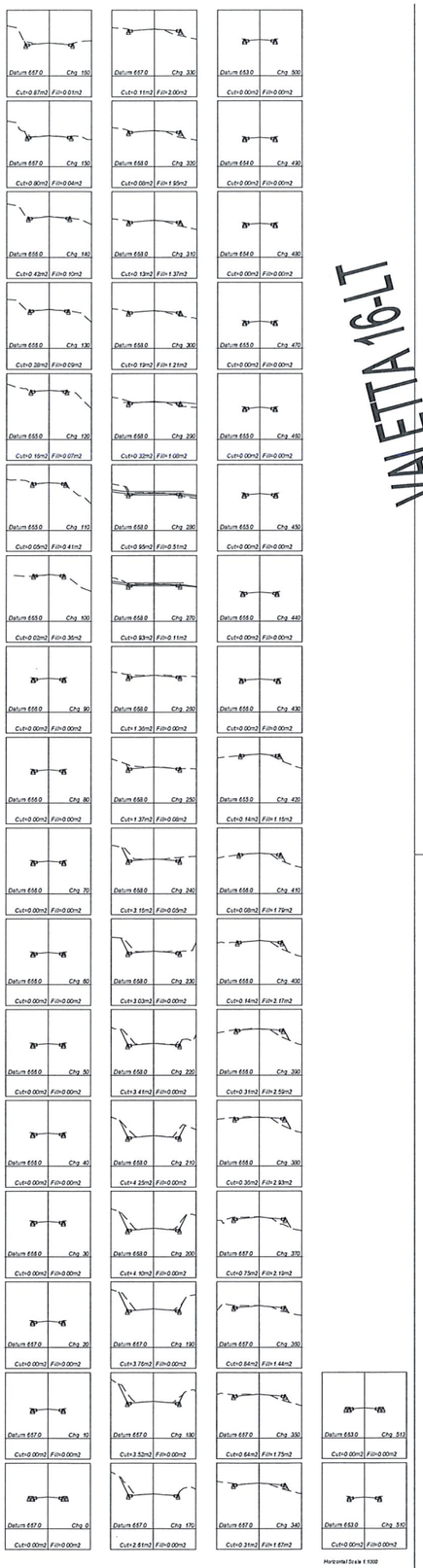

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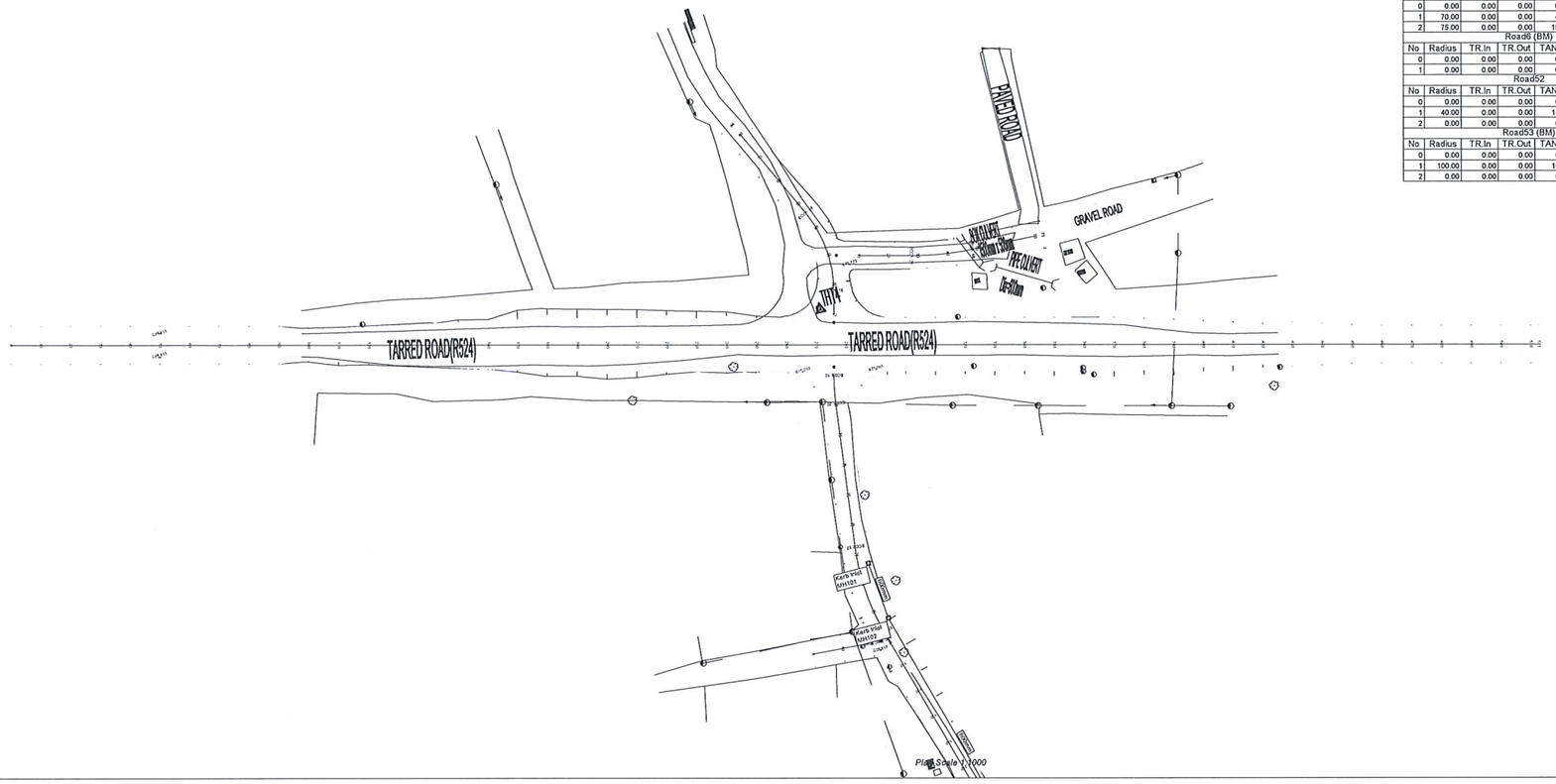


Curve List

Road51 (R524)

No	Radius	TR.In	TR.Out	TAN.In	TAN.Out	Deflection
0	0.00	0.00	0.00	0.00	0.00	0.00.00
1	0.00	0.00	0.00	0.00	0.00	0.00.00

Road5

No	Radius	TR.In	TR.Out	TAN.In	TAN.Out	Deflection
0	0.00	0.00	0.00	0.00	0.00	0.00.00
1	70.00	0.00	0.00	4.66	4.66	7.37.18
2	75.00	0.00	0.00	15.19	15.19	22.53.46

Road6 (BM)

No	Radius	TR.In	TR.Out	TAN.In	TAN.Out	Deflection
0	0.00	0.00	0.00	0.00	0.00	0.00.00
1	0.00	0.00	0.00	0.00	0.00	0.00.00

Road52

No	Radius	TR.In	TR.Out	TAN.In	TAN.Out	Deflection
0	0.00	0.00	0.00	0.00	0.00	0.00.00
1	40.00	0.00	0.00	14.60	14.60	40.05.46
2	0.00	0.00	0.00	0.00	0.00	0.00.00

Road53 (BM)

No	Radius	TR.In	TR.Out	TAN.In	TAN.Out	Deflection
0	0.00	0.00	0.00	0.00	0.00	0.00.00
1	100.00	0.00	0.00	10.33	10.33	11.47.58
2	0.00	0.00	0.00	0.00	0.00	0.00.00

Road List

Road51 (R524)

Position	SV	Y-Coord	X-Coord
PI0	0	73072.57	2551119.11
PI1	512.69	72576.34	2551248.02

Road5

Position	SV	Y-Coord	X-Coord
PI3	7.40	72807.43	2551195.63
BCC1	10.19	72808.13	2551198.33
PI0	14.85	72809.30	2551202.85
ECC1	19.50	72809.87	2551207.47
BCC2	67.47	72815.66	2551255.09
PI1	82.46	72817.50	2551270.17
ECC2	97.44	72813.32	2551284.77

Road6 (BM)

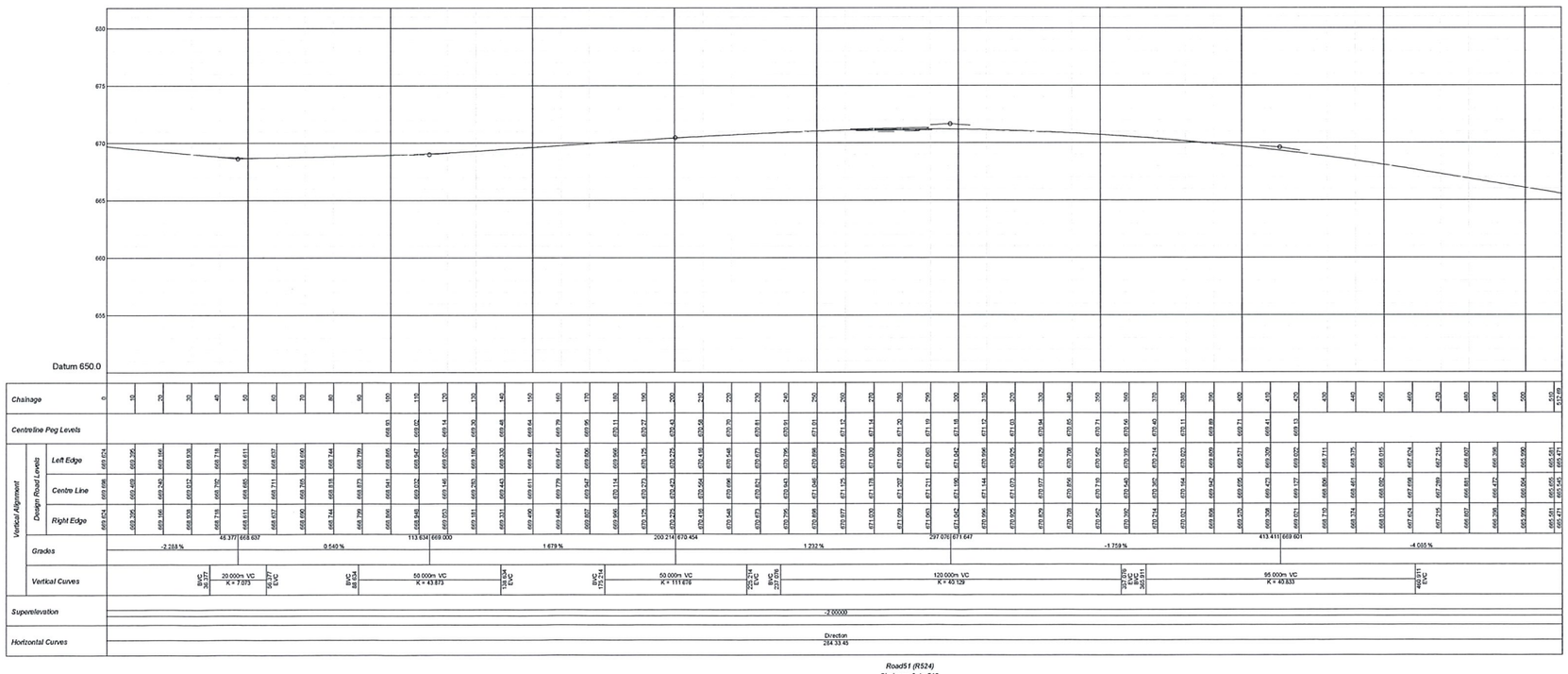
Position	SV	Y-Coord	X-Coord
PI0	0	72838.13	2551285.93
PI1	23.06	72815.13	2551287.54

Road52

Position	SV	Y-Coord	X-Coord
PI0	7.40	72803.71	2551181.31
BCC1	18.03	72801.04	2551171.02
PI1	32.02	72797.37	2551156.69
ECC1	46.02	72803.66	2551143.72
PI2	84.18	72820.11	2551109.29

Road53 (BM)

Position	SV	Y-Coord	X-Coord
PI0	2.56	72797.31	2551160.01
BCC1	27.75	72772.95	2551166.43
PI1	38.05	72762.96	2551169.07
ECC1	48.34	72752.64	2551169.60
PI2	72.62	72728.40	2551170.87



Road51 (R524)
Chainage 0 to 512
Horizontal Scale 1:1000
Vertical Scale 1:250

No.	DATE	REVISION	CONSULT ENG.	DIR.
-	-	-	-	-

DESIGNED BY	SZB RANGANA
CHECKED BY	PXA NDLOVU
DRAWN BY	TA MOSIA
CHECKED BY	TE MUVHANGO

MAKHADO MUNICIPALITY
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MEMBER OF CESA

PROJECT
CONSTRUCTION OF LUTANANDWA ACCESS ROAD AND BRIDGE - PHASE 2
BID NO.: 35 OF 2022

TITLE
ROAD 51 (R524 INTERSECTION) LAYOUT, LONGSECTION AND CROSS SECTIONS

ISSUED FOR TENDER
For Makhado Municipality 20__/__/__
For Mont Consulting Engineers 20__/__/__

SHEET 01 OF 01
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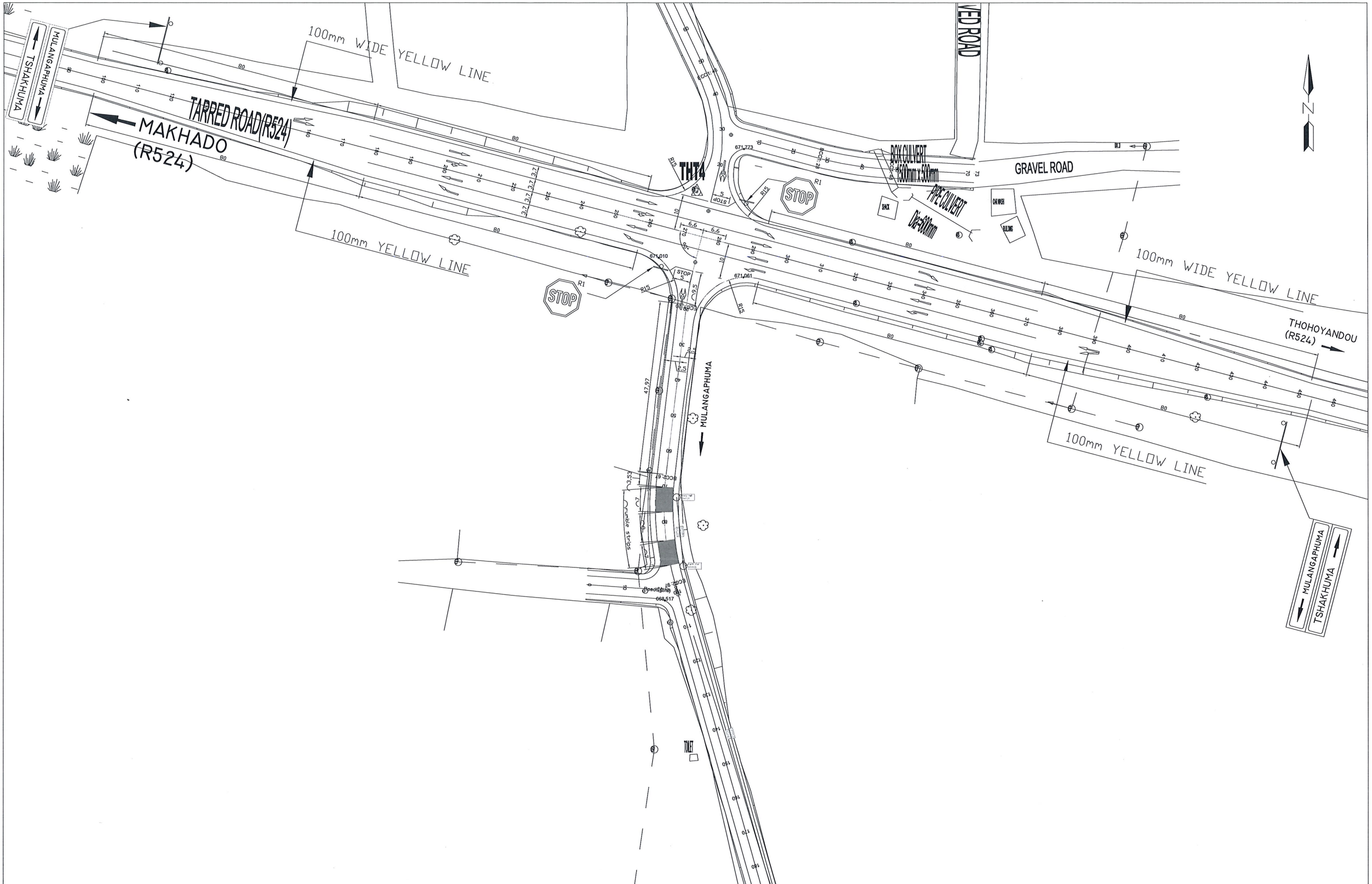
DRAWING No. MONT/MAKH/RDS/01/2019/PLC51
REVISION 00



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MEMBER OF CESA

PROJECT
CONSTRUCTION OF LUTANDWA ACCESS ROAD AND BRIDGE
TENDER NO.: 47 OF 2018

TITLE
ROAD INTERSECTION 1 (R524 TSHAKHUMA) DETAILED LAYOUT

ISSUED FOR PRESENTATION
(Full signature)

For: Makhado Municipality _____ 20__/__/__

For: Mont Consulting Engineers _____ 20__/__/__

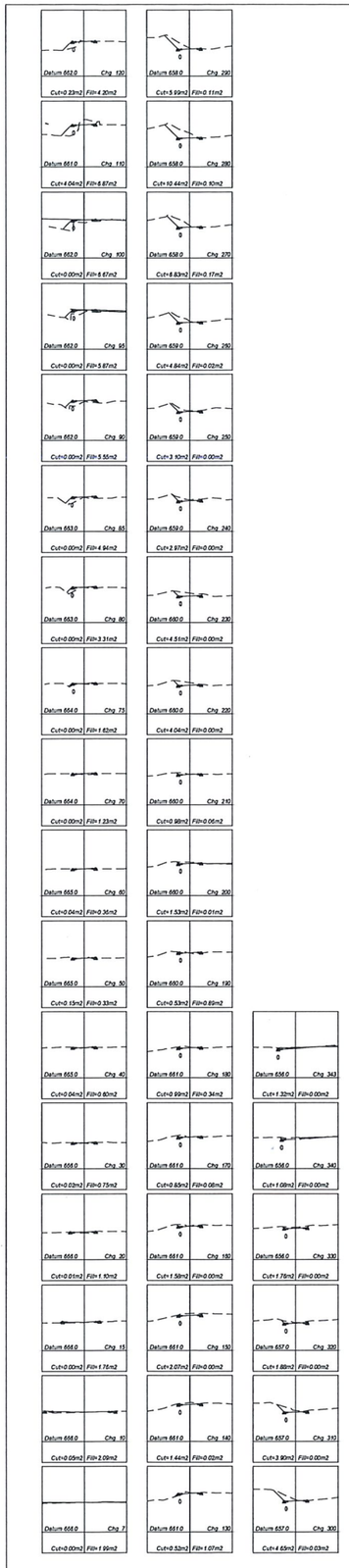
DRAWING No.: MONT/MAKH/RDS/01/2019/INT01

SHEET: 01 OF 03

SCALE: AS SHOWN

PAPER SIZE: A1

REVISION: 00



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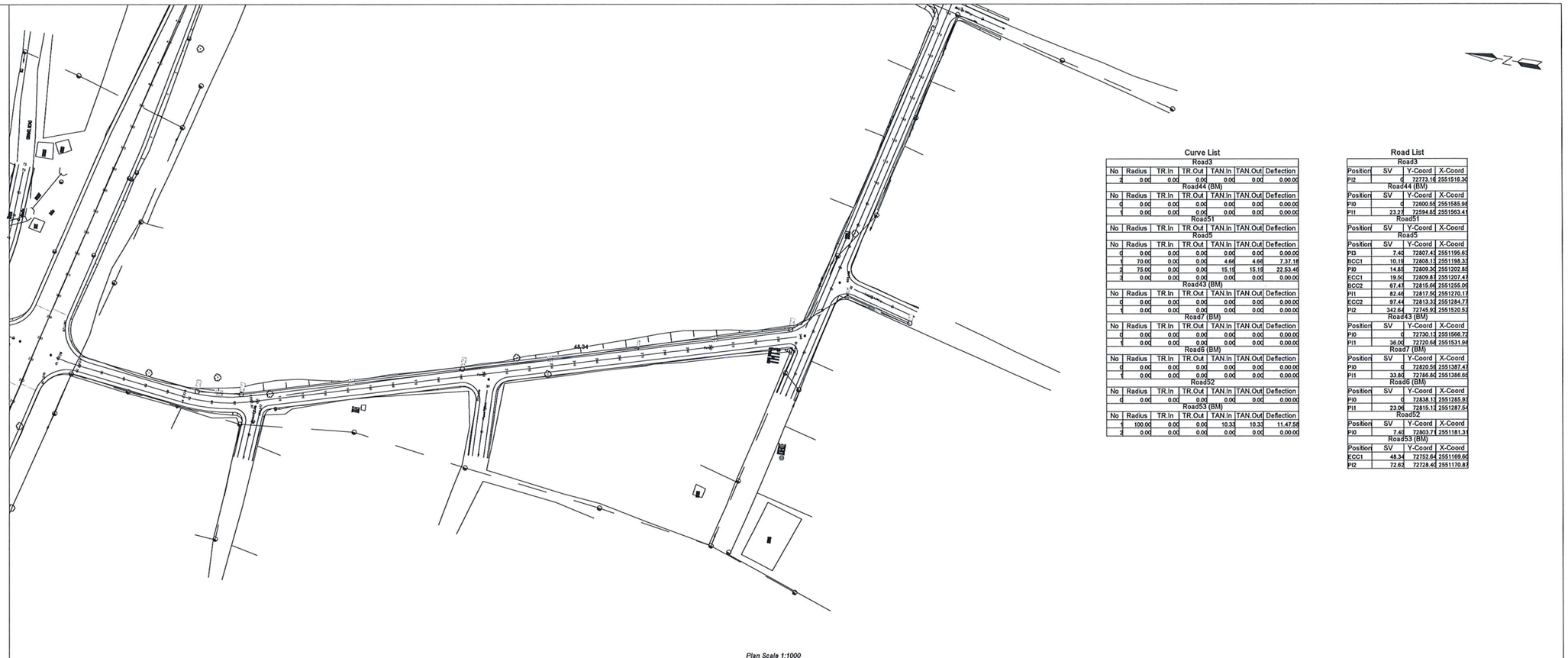


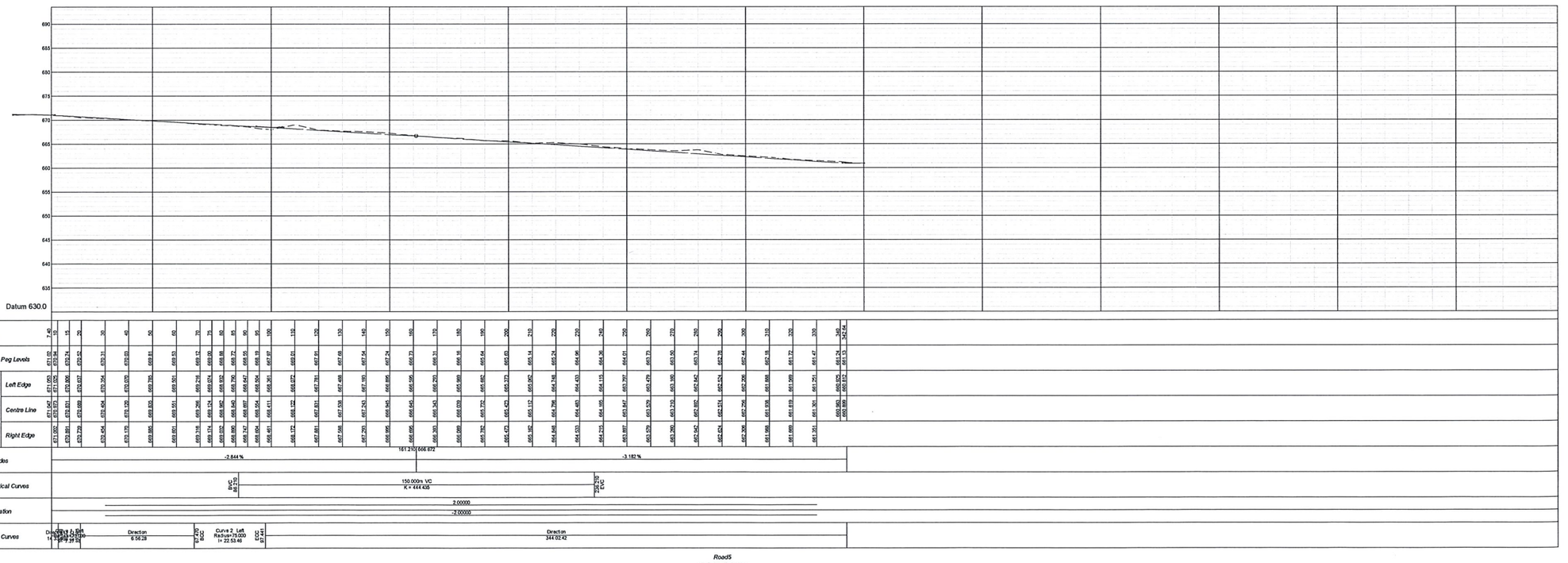
Plan Scale 1:1000

Curve List

Road3						
No	Radius	TR.In	TR.Out	TAN.In	TAN.Out	Deflection
2	0.00	0.00	0.00	0.00	0.00	0.00.00
Road44 (BM)						
No	Radius	TR.In	TR.Out	TAN.In	TAN.Out	Deflection
0	0.00	0.00	0.00	0.00	0.00	0.00.00
1	0.00	0.00	0.00	0.00	0.00	0.00.00
Road51						
No	Radius	TR.In	TR.Out	TAN.In	TAN.Out	Deflection
Road5						
No	Radius	TR.In	TR.Out	TAN.In	TAN.Out	Deflection
0	0.00	0.00	0.00	0.00	0.00	0.00.00
1	70.00	0.00	0.00	4.66	4.66	7.37.18
2	75.00	0.00	0.00	15.16	15.16	22.53.46
3	0.00	0.00	0.00	0.00	0.00	0.00.00
Road43 (BM)						
No	Radius	TR.In	TR.Out	TAN.In	TAN.Out	Deflection
0	0.00	0.00	0.00	0.00	0.00	0.00.00
1	0.00	0.00	0.00	0.00	0.00	0.00.00
Road7 (BM)						
No	Radius	TR.In	TR.Out	TAN.In	TAN.Out	Deflection
0	0.00	0.00	0.00	0.00	0.00	0.00.00
1	0.00	0.00	0.00	0.00	0.00	0.00.00
Road6 (BM)						
No	Radius	TR.In	TR.Out	TAN.In	TAN.Out	Deflection
0	0.00	0.00	0.00	0.00	0.00	0.00.00
1	0.00	0.00	0.00	0.00	0.00	0.00.00
Road52						
No	Radius	TR.In	TR.Out	TAN.In	TAN.Out	Deflection
0	0.00	0.00	0.00	0.00	0.00	0.00.00
Road53 (BM)						
No	Radius	TR.In	TR.Out	TAN.In	TAN.Out	Deflection
1	100.00	0.00	0.00	10.33	10.33	11.47.56
2	0.00	0.00	0.00	0.00	0.00	0.00.00

Road List

Road3			
Position	SV	Y-Coord	X-Coord
PI2	0	72773.16	2551516.30
Road44 (BM)			
Position	SV	Y-Coord	X-Coord
PI0	0	72900.56	2551585.98
PI1	23.27	72594.85	2551563.41
Road51			
Position	SV	Y-Coord	X-Coord
Road5			
Position	SV	Y-Coord	X-Coord
PI3	7.40	72807.43	2551195.63
BCC1	10.19	72808.13	2551198.33
PI0	14.85	72809.36	2551202.85
ECC1	19.50	72809.81	2551207.41
BCC2	67.47	72815.66	2551255.09
PI1	82.46	72817.50	2551270.17
ECC2	97.44	72813.32	2551284.73
PI2	342.64	72745.92	2551520.52
Road43 (BM)			
Position	SV	Y-Coord	X-Coord
PI0	0	72730.13	2551566.72
PI1	36.00	72720.66	2551531.98
Road7 (BM)			
Position	SV	Y-Coord	X-Coord
PI0	0	72820.56	2551387.41
PI1	33.80	72786.80	2551368.69
Road6 (BM)			
Position	SV	Y-Coord	X-Coord
PI0	0	72838.13	2551285.93
PI1	23.00	72815.13	2551287.54
Road52			
Position	SV	Y-Coord	X-Coord
PI0	7.40	72803.71	2551181.31
Road53 (BM)			
Position	SV	Y-Coord	X-Coord
ECC1	48.34	72752.64	2551169.60
PI2	72.62	72728.40	2551170.83



Road5
Chainage 7 to 342
Horizontal Scale 1:1000
Vertical Scale 1:500

-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
No	DATE	REVISION	CONSULT. ENG.	DR.	

PETER NDLOVU
PR TECH ENG NO: 200670122

SIGNATURE _____ DATE _____

DESIGNED BY	SZB RANGANA
CHECKED BY	PXA NDLOVU
DRAWN BY	TA MOSIA
CHECKED BY	TE MUVHANGO

MAKHADO MUNICIPALITY
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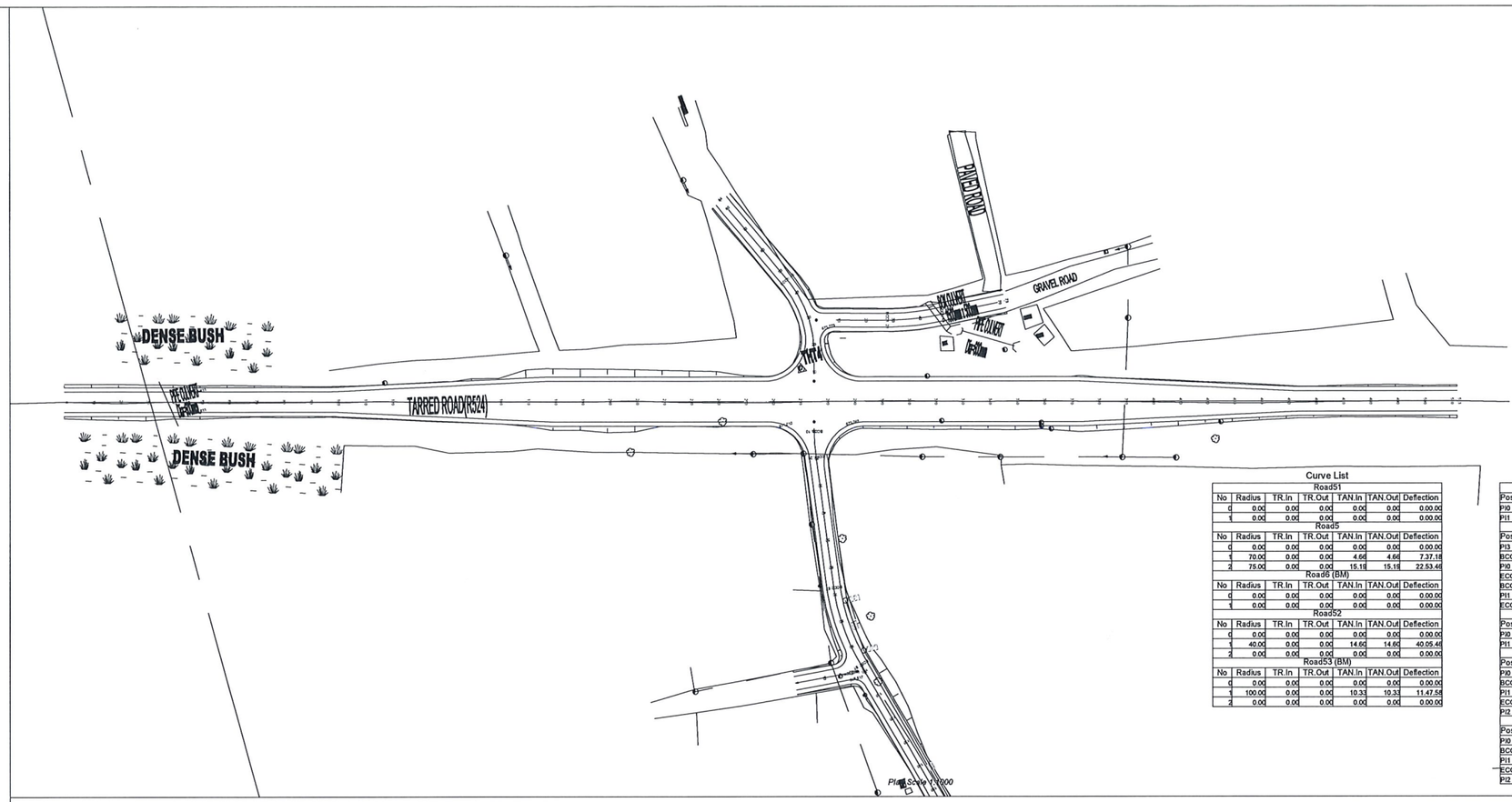
MEMBER OF CESA

PROJECT
CONSTRUCTION OF LUTANDWA ACCESS ROAD AND BRIDGE
TENDER NO.: 47 OF 2018

TITLE
INTERSECTING ROAD (R524 TSHAKHUMA) PLAN LAYOUT, LONGSECTION AND CROSS SECTIONS

ISSUED FOR PRESENTATION
For: Makhado Municipality __/__/__
For: Mont Consulting Engineers __/__/__

SHEET 02 OF 03
SCALE AS SHOWN
PAPER SIZE A1
DRAWING No. MONT/MAKH/RDS/01/2019/INT01
REVISION 00



Curve List

Road51

No	Radius	TR.In	TR.Out	TAN.In	TAN.Out	Deflection
0	0.00	0.00	0.00	0.00	0.00	0.00.00
1	0.00	0.00	0.00	0.00	0.00	0.00.00

Road5

No	Radius	TR.In	TR.Out	TAN.In	TAN.Out	Deflection
0	0.00	0.00	0.00	0.00	0.00	0.00.00
1	70.00	0.00	0.00	4.66	4.66	7.37.18
2	75.00	0.00	0.00	15.19	15.19	22.53.46

Road6 (BM)

No	Radius	TR.In	TR.Out	TAN.In	TAN.Out	Deflection
0	0.00	0.00	0.00	0.00	0.00	0.00.00
1	0.00	0.00	0.00	0.00	0.00	0.00.00

Road52

No	Radius	TR.In	TR.Out	TAN.In	TAN.Out	Deflection
0	0.00	0.00	0.00	0.00	0.00	0.00.00
1	40.00	0.00	0.00	14.60	14.60	40.05.46
2	0.00	0.00	0.00	0.00	0.00	0.00.00

Road53 (BM)

No	Radius	TR.In	TR.Out	TAN.In	TAN.Out	Deflection
0	0.00	0.00	0.00	0.00	0.00	0.00.00
1	100.00	0.00	0.00	10.33	10.33	11.47.56
2	0.00	0.00	0.00	0.00	0.00	0.00.00

Road List

Road51

Position	SV	Y-Coord	X-Coord
PI0	0	73072.57	2551119.11
PI1	512.68	72576.34	2551248.02

Road5

Position	SV	Y-Coord	X-Coord
PI3	7.40	72807.43	2551195.63
BCC1	10.18	72808.13	2551198.33
PI0	14.85	72809.30	2551202.85
ECC1	19.50	72809.85	2551207.43
BCC2	67.47	72815.66	2551255.06
PI1	82.46	72817.56	2551270.17
ECC2	97.44	72813.32	2551284.77

Road6 (BM)

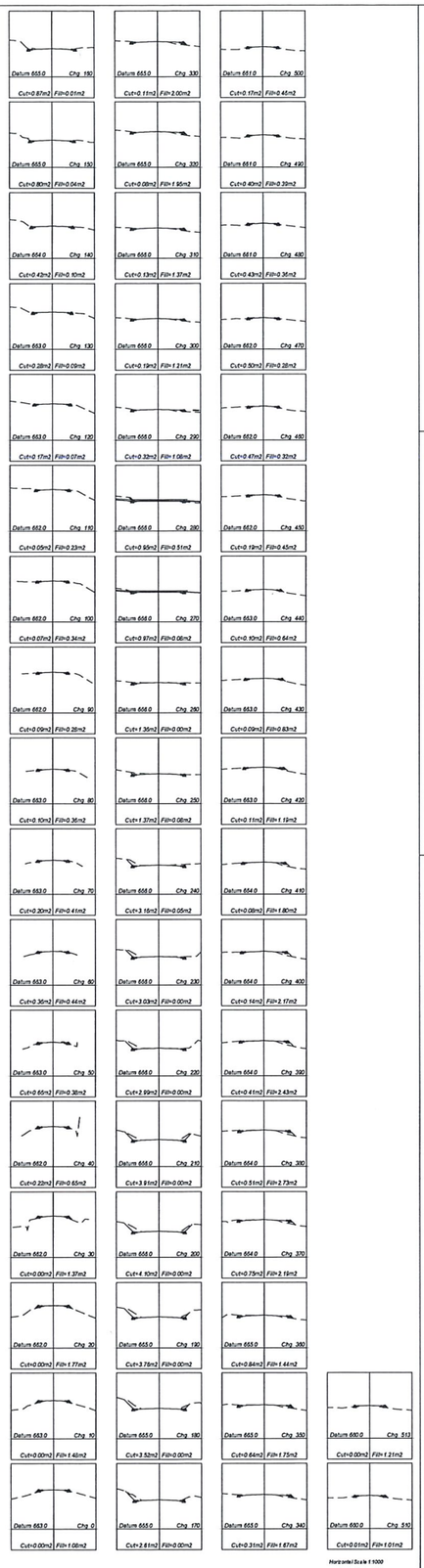
Position	SV	Y-Coord	X-Coord
PI0	0	72838.13	2551285.93
PI1	23.06	72815.13	2551287.54

Road52

Position	SV	Y-Coord	X-Coord
PI0	7.40	72803.71	2551181.31
BCC1	18.03	72801.04	2551171.02
PI1	32.02	72797.32	2551156.69
ECC1	46.02	72803.66	2551143.72
PI2	84.18	72820.11	2551109.28

Road53 (BM)

Position	SV	Y-Coord	X-Coord
PI0	2.56	72797.31	2551160.01
BCC1	27.75	72772.96	2551166.43
PI1	38.06	72762.96	2551169.07
ECC1	48.34	72752.64	2551169.66
PI2	72.62	72728.46	2551170.85



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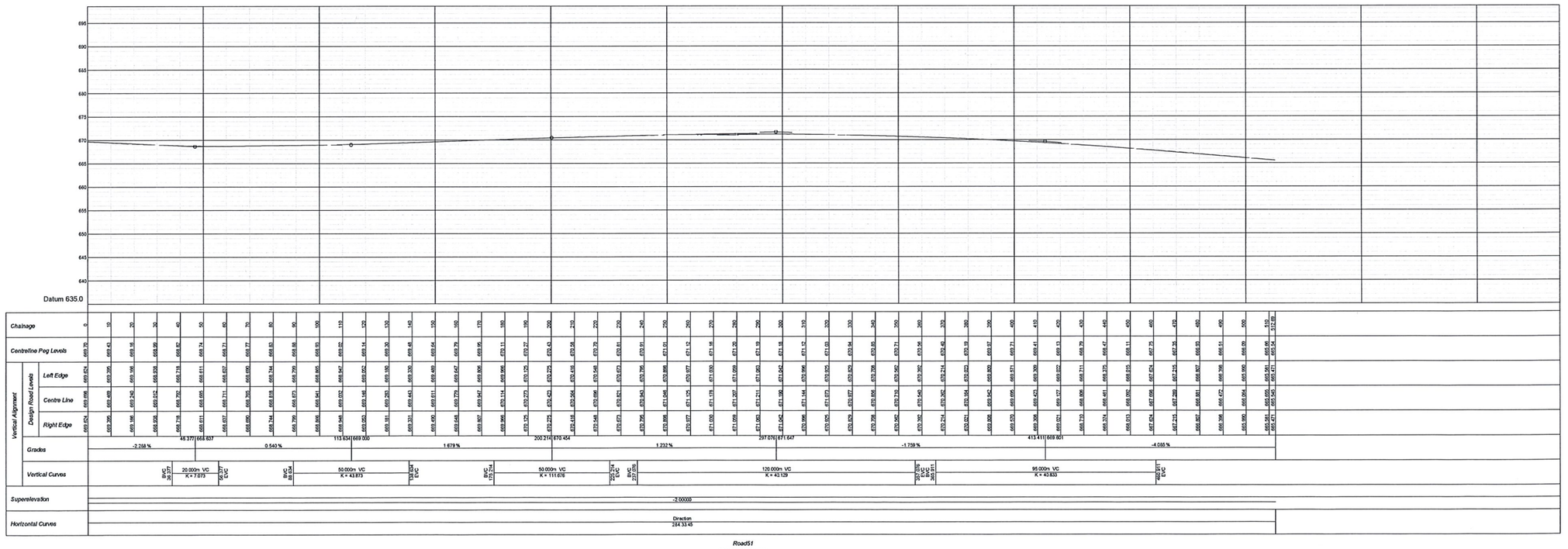

Road51
Chainage 0 to 512
Horizontal Scale 1:1000
Vertical Scale 1:500

PETER NDLOVU
PR TECH ENG NO: 200670122

SIGNATURE DATE

No	DATE	REVISION	CONSULT. ENG.	DIR.
-	-	-	-	-

DESIGNED BY	SZB RANGANA
CHECKED BY	PXA NDLOVU
DRAWN BY	TA MOSIA
CHECKED BY	TE MUVHANGO

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MEMBER OF CESA

PROJECT
CONSTRUCTION OF LUTANDWA ACCESS ROAD AND BRIDGE
TENDER NO.: 47 OF 2018

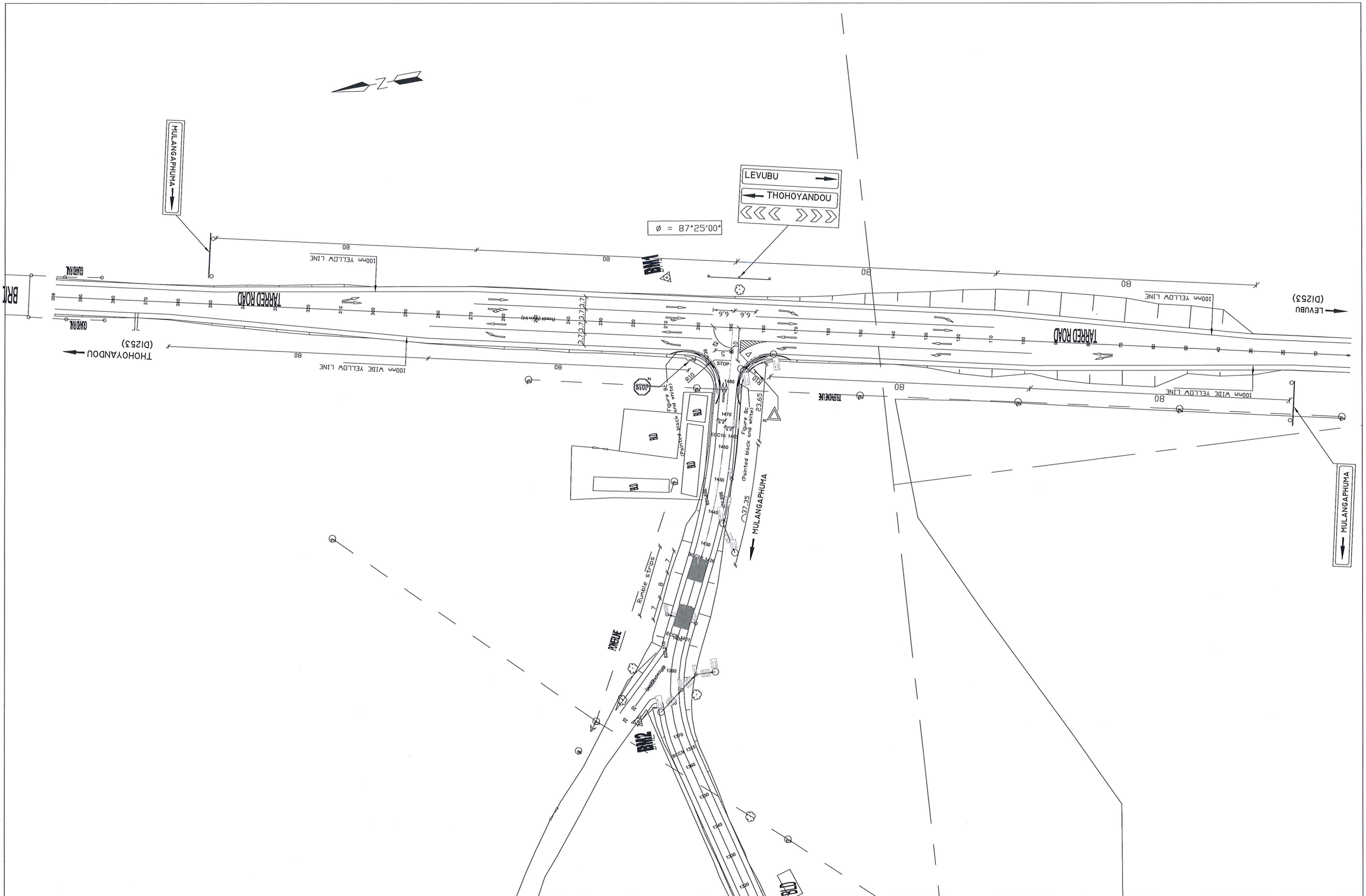
TITLE
MAIN ROAD (R524 TSHAKHUMA) PLAN LAYOUT, LONGSECTION AND CROSS SECTIONS

ISSUED FOR PRESENTATION

For Makhado Municipality 20__/__/__

For Mont Consulting Engineers 20__/__/__

SHEET 03 OF 03
SCALE AS SHOWN
PAPER SIZE A1
DRAWING No. MONT/MAKH/RDS/01/2019/INT01
REVISION 00



No.	DATE	REVISION	CONSULT ENG.	DIR.
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-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-

DESIGNED BY	SZB RANGANA
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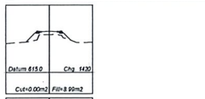
PROJECT
CONSTRUCTION OF LUTANDWA ACCESS ROAD AND BRIDGE
PHASE 2 - TENDER NO.: 35 OF 2022

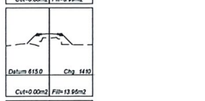
TITLE
ROAD INTERSECTION 2 (LEVUBU) DETAILED LAYOUT

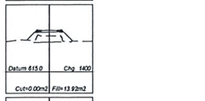
ISSUED FOR TENDER
For Makhado Municipality 20__/__/__
For Mont Consulting Engineers 20__/__/__

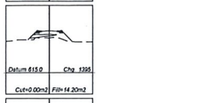
DRAWING No. MONT/MAKH/RDS/01/2019/INT02

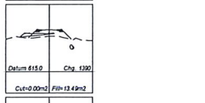
SHEET 01 OF 02
SCALE AS SHOWN
PAPER SIZE A1
REVISION 00

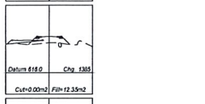


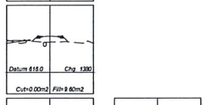


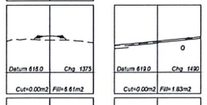


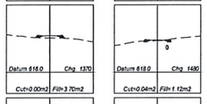


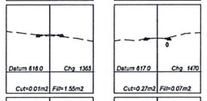


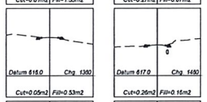


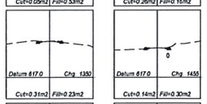


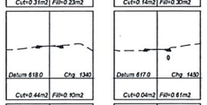


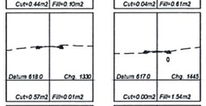


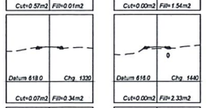


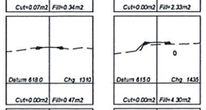


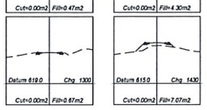












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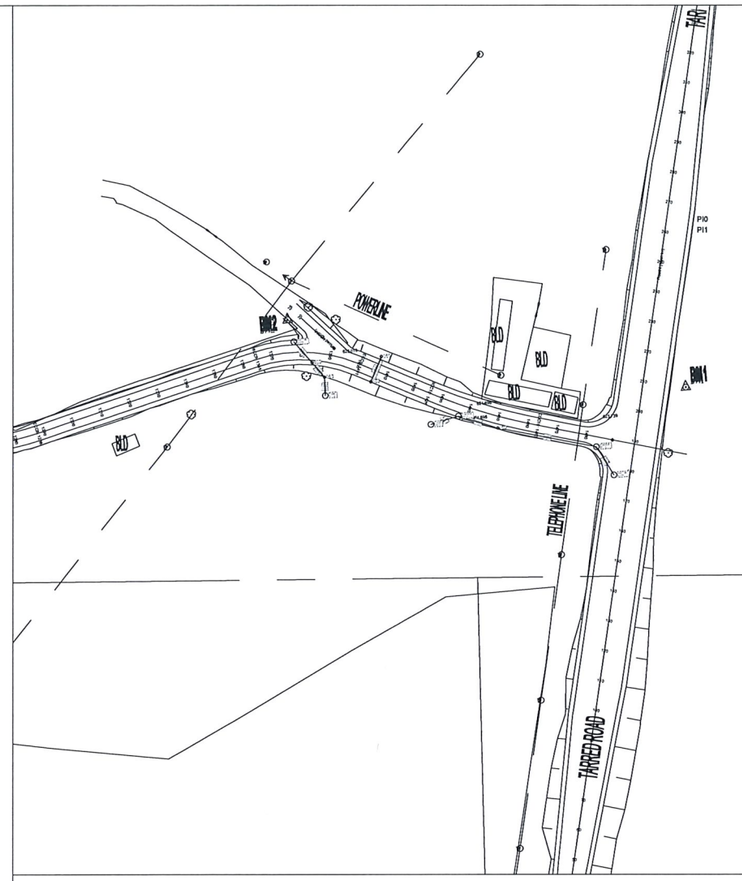
Vertical Scale 1:500



Plan Scale 1:1000

Curve List

Road2						
No	Radius	TR.In	TR.Out	TAN.In	TAN.Out	Deflection
8	70.00	0.00	0.00	20.98	20.98	33.19.41
9	50.00	0.00	0.00	18.62	18.62	40.51.26
10	189.12	0.00	0.00	18.99	18.99	11.27.56
11	0.00	0.00	0.00	0.00	0.00	0.00.00
Road4 (Main Int)						
No	Radius	TR.In	TR.Out	TAN.In	TAN.Out	Deflection
Road42 (BM)						
No	Radius	TR.In	TR.Out	TAN.In	TAN.Out	Deflection
0	0.00	0.00	0.00	0.00	0.00	0.00.00
1	0.00	0.00	0.00	0.00	0.00	0.00.00

Road List

Road2			
Position	SV	Y-Coord	X-Coord
ECC8	1287.80	71653.85	2552988.38
BCC9	1364.91	71579.11	2552969.44
PI5	1382.72	71561.05	2552964.83
ECC9	1400.56	71544.41	2552973.22
BCC10	1425.61	71522.02	2552984.45
PI6	1444.54	71505.08	2552992.96
ECC10	1463.46	71488.72	2553097.84
PI7	1489.71	71461.38	2553004.81
Road4 (Main Int)			
Position	SV	Y-Coord	X-Coord
Road42 (BM)			
Position	SV	Y-Coord	X-Coord
PI0	5.28	71552.06	2552967.58
PI1	24.52	71565.34	2552953.64

Road2
Chainage 1300 to 1489
Horizontal Scale 1:1000
Vertical Scale 1:500

No	DATE	REVISION	CONSULT. ENG.	DR.
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-

DESIGNED BY	SZB RANGANA
CHECKED BY	PXA NDLOVU
DRAWN BY	TA MOSIA
CHECKED BY	TE MUVHANGO

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MEMBER OF CESA

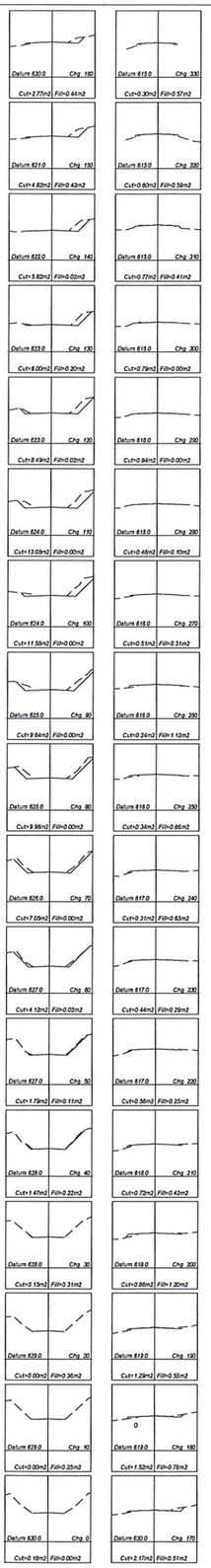
PROJECT
CONSTRUCTION OF LUTANDWA ACCESS ROAD AND BRIDGE
PHASE 2 - TENDER NO.: 35 OF 2022

TITLE
INTERSECTING ROAD (D1253 LEVUBU) PLAN LAYOUT, LONGSECTION AND CROSS SECTIONS

ISSUED FOR TENDER
For: Makhado Municipality 20__/__/__
For: Mont Consulting Engineers 20__/__/__

DRAWING No. MONT/MAKH/RDS/01/2019/INT02

SHEET 08 OF 08
SCALE AS SHOWN
PAPER SIZE A1
REVISION 00



Horizontal Scale 1:1000
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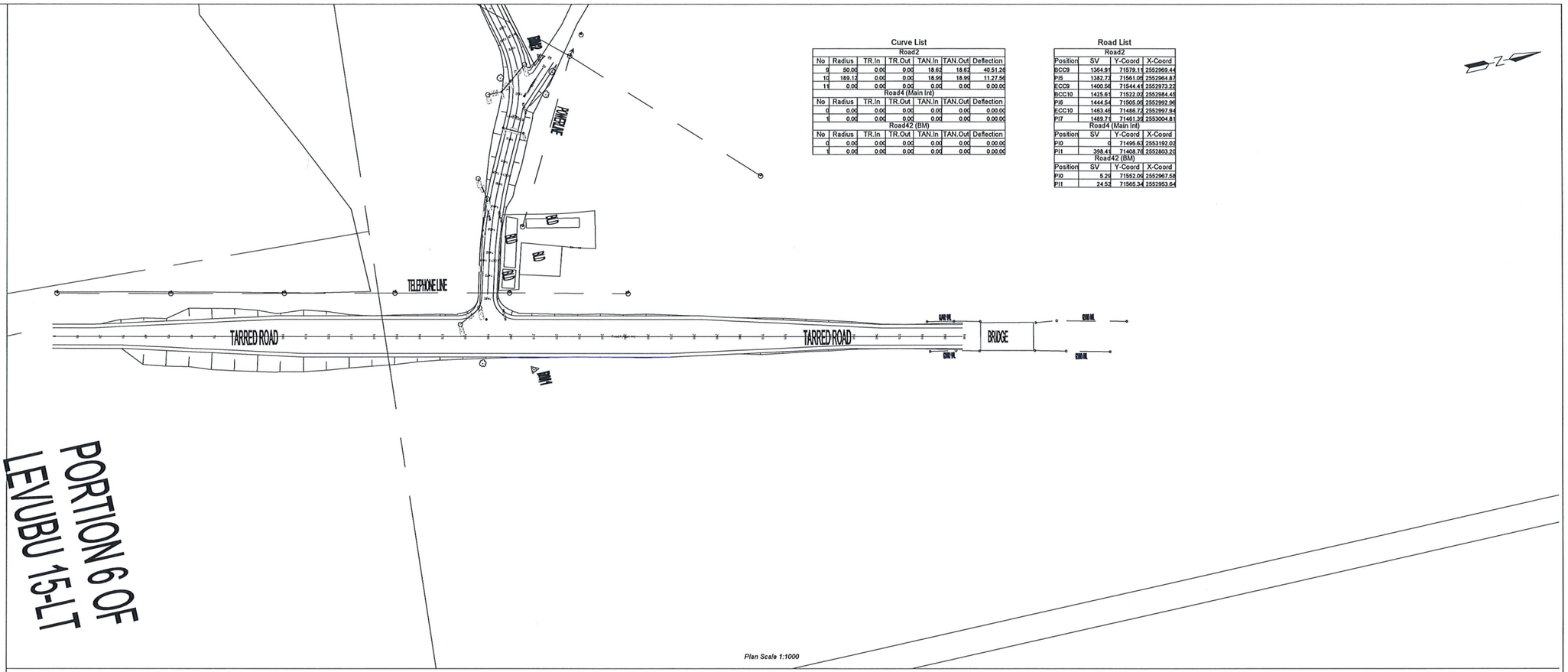


Plan Scale 1:1000

Curve List

Road2

No	Radius	TR.In	TR.Out	TAN.In	TAN.Out	Deflection
9	50.00	0.00	0.00	18.62	18.62	40.51.26
10	189.12	0.00	0.00	18.99	18.99	11.27.56
11	0.00	0.00	0.00	0.00	0.00	0.00.00

Road4 (Main Int)

No	Radius	TR.In	TR.Out	TAN.In	TAN.Out	Deflection
0	0.00	0.00	0.00	0.00	0.00	0.00.00
1	0.00	0.00	0.00	0.00	0.00	0.00.00

Road42 (BM)

No	Radius	TR.In	TR.Out	TAN.In	TAN.Out	Deflection
0	0.00	0.00	0.00	0.00	0.00	0.00.00
1	0.00	0.00	0.00	0.00	0.00	0.00.00

Road List

Road2

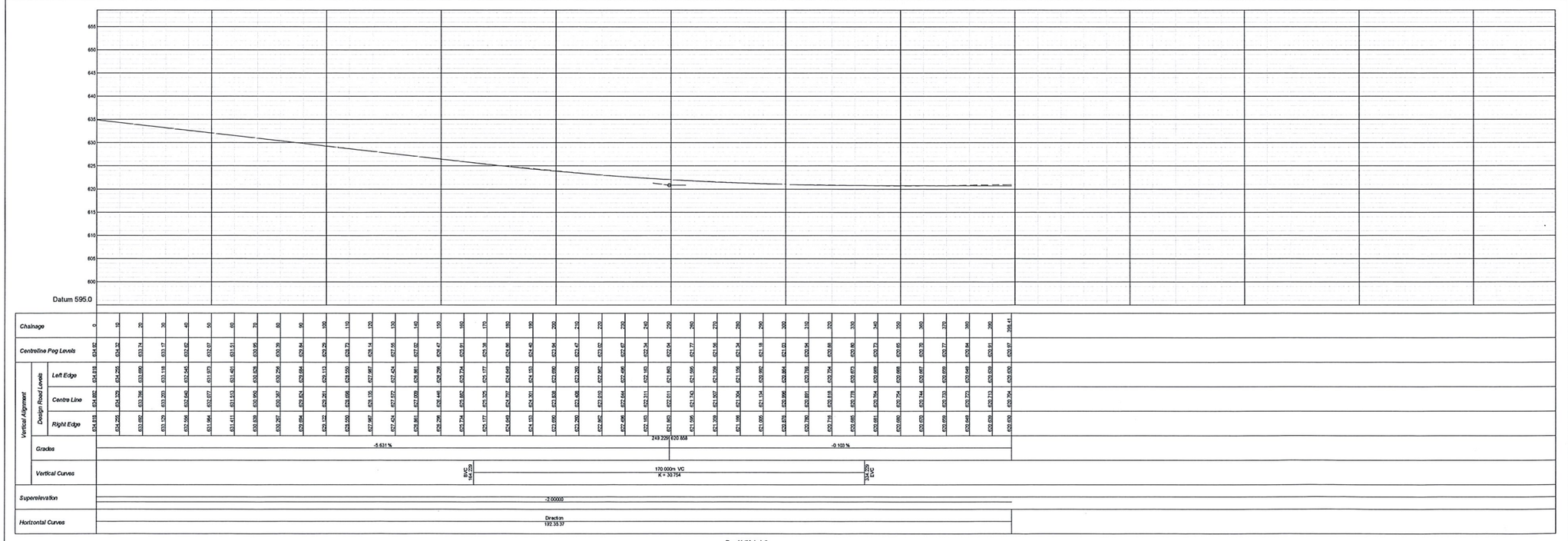
Position	SV	Y-Coord	X-Coord
BCC9	1364.91	71579.11	2552969.44
PI5	1382.73	71561.05	2552984.87
ECC9	1400.56	71544.41	2552973.22
BCC10	1425.61	71522.02	2552984.45
PI6	1444.54	71505.05	2552992.96
ECC10	1463.46	71486.72	2552997.94
PI7	1469.71	71481.39	2553004.81

Road4 (Main Int)

Position	SV	Y-Coord	X-Coord
PI0	0	71495.63	2553192.02
PI1	398.45	71408.76	2552803.20

Road42 (BM)

Position	SV	Y-Coord	X-Coord
PI0	5.29	71552.09	2552967.58
PI1	24.52	71565.34	2552953.64



Road4 (Main Int)
Chainage 0 to 398
Horizontal Scale 1:1000
Vertical Scale 1:500

No	DATE	REVISION	CONSULT. ENG.	D/R.
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DESIGNED BY	SZB RANGANA
CHECKED BY	PXA NDLOVU
DRAWN BY	TA MOSIA
CHECKED BY	TE MUVHANGO

MAKHADO MUNICIPALITY
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MONT CONSULTING ENGINEERS
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0787
TEL: 015 - 291 4173
FAX: 015 - 291 4218

MEMBER OF CESA

PROJECT
CONSTRUCTION OF LUTANDWA ACCESS ROAD AND BRIDGE
PHASE 2 - TENDER NO.: 35 OF 2022

TITLE
MAIN ROAD (D1253 LEVUBU) PLAN LAYOUT, LONGSECTION AND CROSS SECTIONS

ISSUED FOR TENDER

For Makhado Municipality 29/../..

For Mont Consulting Engineers 29/../..

SHEET 05 OF 05
SCALE AS SHOWN
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DRAWING No. MONT/MAKH/RDS/01/2019/INT02
REVISION 00

No	DATE	REVISION	CONSULT ENG	DRL
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PROJECT
CONSTRUCTION OF LUTANANDWA ACCESS ROAD AND BRIDGE - PHASE 2
BID NO.: 35 OF 2022

TITLE
STORMWATER PLAN LAYOUT

ISSUED FOR TENDER
For Makhado Municipality 20__/__/__
For Mont Consulting Engineers 20__/__/__

DRAWING No. MONT/MAKH/RDS/01/2019/STP01

SHEET 02 OF 02
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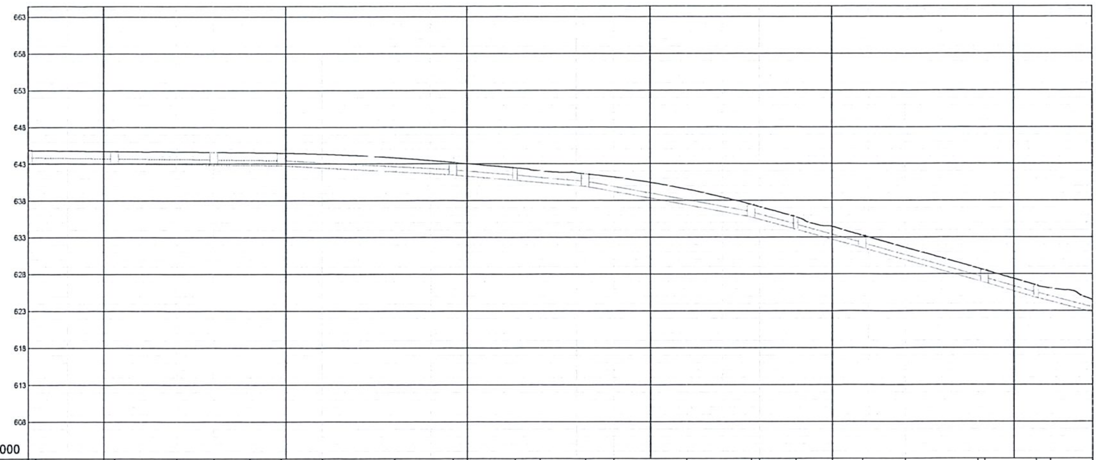
PROJECT
CONSTRUCTION OF LUTANANDWA ACCESS ROAD AND BRIDGE - PHASE 2
BID NO.: 35 OF 2022

TITLE
STORMWATER PLAN LAYOUT

ISSUED FOR TENDER
(Full signature)
For: Makhado Municipality 20_/_/_
For: Mont Consulting Engineers 20_/_/_

DRAWING No.
MONT/MAKH/RDS/01/2019/STP01

SHEET 01 OF 02
SCALE AS SHOWN
PAPER SIZE A1
REVISION 00

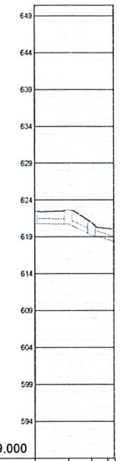


Datum 603.000

Chainage	779.332 / 780.000, 800.000 / 802.951, 820.000, 830.171, 840.000, 848.629, 860.000, 880.000, 896.027 / 900.000, 913.164, 920.000, 932.334, 940.000, 960.000, 977.781 / 980.000, 990.013, 1000.000, 1008.311, 1020.000, 1040.000 / 1041.958, 1056.037, 1060.000, 1071.565
Ground Level	644.830 / 644.826, 644.712, 644.697, 644.644, 644.584, 644.532, 644.470, 644.329, 643.829, 643.203, 643.024, 642.461, 642.046, 641.636, 641.193, 639.550, 637.469 / 637.166, 635.787, 634.480, 633.264, 631.629, 628.808 / 628.530, 626.506, 626.061, 624.497
Manhole Name	MH52, MH53, MH54, MH55, MH56, MH57, MH58, MH59, MH60, MH61, MH62, MH63, MH64
Inlet / Outlet	643.175 / 643.171, 643.069 / 643.042, 642.957, 642.906 / 642.906, 642.857, 642.814 / 642.814, 642.510, 641.976, 641.548 / 641.548, 641.376, 640.806 / 640.806, 640.512, 639.981 / 639.981, 639.278, 637.444, 635.814 / 635.814 / 635.509, 634.132 / 634.132, 632.755, 631.609 / 631.609, 629.904, [illegible] / 628.875, 624.851 / 624.851, 624.338, 622.842 / 622.842
Hydraulic Elevation	

Length	Link Type / Link Size	Slope	Flow Capacity	Velocity
23.619 m	50D Concrete 600 mm	0.563%	0.000 m³/s / 0.520 m³/s	0.000 m/s
27.220 m	50D Concrete 600 mm	0.500%	0.000 m³/s / 0.490 m³/s	0.000 m/s
18.458 m	50D Concrete 600 mm	0.500%	0.000 m³/s / 0.490 m³/s	0.000 m/s
47.415 m	50D Concrete 600 mm	2.670%	0.000 m³/s / 1.132 m³/s	0.000 m/s
17.153 m	50D Concrete 600 mm	4.330%	0.000 m³/s / 1.441 m³/s	0.000 m/s
19.158 m	50D Concrete 600 mm	4.304%	0.000 m³/s / 1.437 m³/s	0.000 m/s
45.638 m	50D Concrete 600 mm	9.169%	0.000 m³/s / 2.097 m³/s	0.000 m/s
12.347 m	50D Concrete 600 mm	13.751%	0.000 m³/s / 2.568 m³/s	0.000 m/s
18.471 m	50D Concrete 600 mm	13.788%	0.000 m³/s / 2.571 m³/s	0.000 m/s
33.978 m	50D Concrete 600 mm	14.070%	0.000 m³/s / 2.598 m³/s	0.000 m/s
14.224 m	50D Concrete 600 mm	14.376%	0.000 m³/s / 2.626 m³/s	0.000 m/s
15.657 m	50D Concrete 600 mm	12.938%	0.000 m³/s / 2.491 m³/s	0.000 m/s

Manhole MH52 to MH64

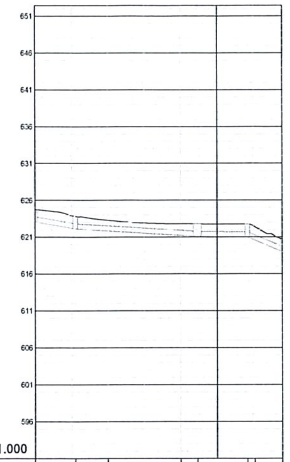


Datum 589.000

Chainage	0.000, 9.182, 15.597, 20.000 / 21.700
Ground Level	622.491, 622.610, 620.973, 620.141 / 620.117
Manhole Name	MH66, MH118, MH67, MH68
Inlet / Outlet	620.836, 620.790 / 620.790, 619.318 / 619.318, [illegible] / 618.462
Hydraulic Elevation	

Length	Link Type / Link Size	Slope	Flow Capacity	Velocity
9.182 m	50D Concrete 600 mm	0.500%	0.000 m³/s / 0.490 m³/s	0.000 m/s
6.582 m	50D Concrete 600 mm	22.948%	0.000 m³/s / [illegible]317 m³/s	0.000 m/s
[illegible].163 m	50D Concrete 600 mm	14.026%	0.000 m³/s / [illegible]594 m³/s	0.000 m/s

Manhole MH66 to MH68

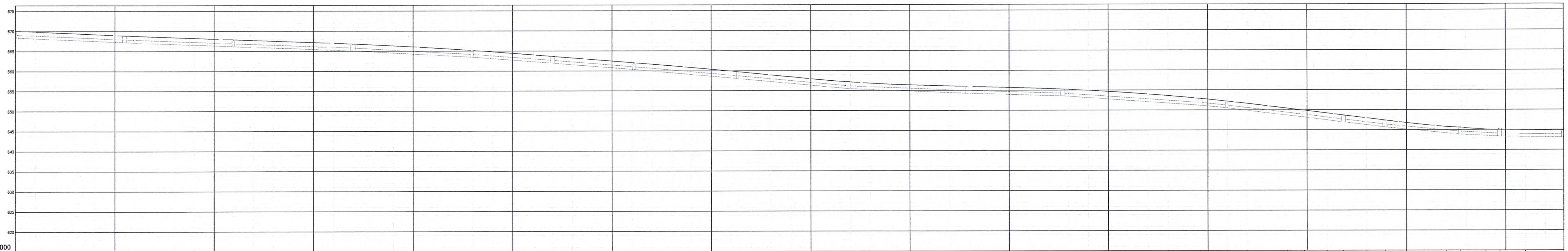


Datum 591.000

Chainage	0.000, 10.999, 20.000, 40.000, 44.562, 58.332 / 60.000, 67.960
Ground Level	624.755, 623.828, 623.298, 622.796, 622.779, 622.744 / 622.520, 620.716
Manhole Name	MH69, MH70, MH71, MH72, MH73
Inlet / Outlet	623.100, 622.173 / 622.173, 621.892, 621.297 / 621.124 / 621.124, 621.055 / 621.055 / 620.710, 619.061 / 619.061
Hydraulic Elevation	

Length	Link Type / Link Size	Slope	Flow Capacity	Velocity
11.038 m	50D Concrete 600 mm	8.428%	0.000 m³/s / 2.010 m³/s	0.000 m/s
33.579 m	50D Concrete 600 mm	3.125%	0.000 m³/s / 1.224 m³/s	0.000 m/s
13.770 m	50D Concrete 600 mm	0.500%	0.000 m³/s / 0.490 m³/s	0.000 m/s
9.832 m	50D Concrete 600 mm	20.712%	0.000 m³/s / 3.152 m³/s	0.000 m/s

Manhole MH69 to MH73



Datum 615.000

Chainage	0.000, 20.000, 40.000, 54.835, 60.000, 80.000, 100.000, 109.670, 120.000, 140.000, 160.000, 169.606, 180.000, 200.000, 220.000, 229.541, 240.000, 260.000, 270.276, 280.000, 300.000, 311.012, 320.000, 340.000, 360.000, 363.246, 380.000, 400.000, 418.722 / 420.000, 440.000, 460.000, 478.679 / 480.000, 500.000, 520.000, 527.033, 540.000, 560.000, 580.000, 596.103, 600.000, 609.536, 620.000, 640.000, 648.590, 660.000, 668.358, 680.000, 689.202, 700.000, 720.000, 727.054, 740.000, 747.064, 760.000, 779.332
Ground Level	670.065, 669.628, 669.194, 668.888, 668.785, 668.407, 668.049, 667.876, 667.691, 667.333, 666.972, 666.782, 666.555, 666.052, 665.464, 665.153, 664.790, 664.032, 663.628, 663.232, 662.446, 662.013, 661.656, 660.813, 659.899, 659.743, 658.929, 657.958, 657.195 / 657.140, 656.580, 656.294, 656.001 / 655.982, 655.719, 655.410, 655.275, 654.972, 654.373, 653.622, 652.905, 652.716, 652.221, 651.643, 650.440, 649.917, 649.223, 648.694, 647.990, 647.428, 646.775, 645.789, 645.594, 645.137, 645.075, 644.937, 644.830
Manhole Name	MH37, MH79, MH38, MH80, MH39, MH81, MH40, MH41, MH42, MH43, MH44, MH45, MH46, MH47, MH48, MH49, MH50, MH51, MH52
Inlet / Outlet	668.410, 667.981, 667.551, 667.233, 667.138, 666.769, 666.399, 666.221, 666.032, 665.667, 665.302, 665.127 / 665.127, 664.844, 664.301, 663.757, 663.498 / 663.498, 663.106, 662.358, 661.973 / 661.973, 661.587, 660.795, 660.358 / 660.358, 659.967, 659.098, 658.[illegible] / 658.[illegible] / 658.088, 657.318, 656.400, 655.540 / 655.540 / 655.515, 655.116, 654.718, 654.346 / 654.346 / 654.326, 654.026, 653.720, 653.620 / 653.620, 653.175, 652.489, 651.803, 651.250 / 651.250, 651.052, 650.566 / 650.566, 649.949, 648.769, 648.262 / 648.262, 647.556, 647.039 / 647.039, 646.332, 645.773 / 645.773, 645.250, 644.281, 643.939 / 643.939, 643.603, 643.420 / 643.420, 643.322, 643.175 / 643.175
Hydraulic Elevation	

Length	Link Type / Link Size	Slope	Flow Capacity	Velocity
54.843 m	50D Concrete 600 mm	2.146%	0.000 m³/s / 1.015 m³/s	0.000 m/s
54.844 m	50D Concrete 600 mm	1.846%	0.000 m³/s / 0.941 m³/s	0.000 m/s
59.945 m	50D Concrete 600 mm	1.825%	0.000 m³/s / 0.936 m³/s	0.000 m/s
59.958 m	50D Concrete 600 mm	2.718%	0.000 m³/s / 1.142 m³/s	0.000 m/s
40.764 m	50D Concrete 600 mm	3.744%	0.000 m³/s / 1.340 m³/s	0.000 m/s
40.768 m	50D Concrete 600 mm	3.965%	0.000 m³/s / 1.379 m³/s	0.000 m/s
52.283 m	50D Concrete 600 mm	4.346%	0.000 m³/s / 1.444 m³/s	0.000 m/s
55.534 m	50D Concrete 600 mm	4.593%	0.000 m³/s / 1.484 m³/s	0.000 m/s
59.969 m	50D Concrete 600 mm	1.991%	0.000 m³/s / 0.977 m³/s	0.000 m/s
48.359 m	50D Concrete 600 mm	1.501%	0.000 m³/s / 0.849 m³/s	0.000 m/s
69.111 m	50D Concrete 600 mm	3.431%	0.000 m³/s / 1.283 m³/s	0.000 m/s
13.450 m	50D Concrete 600 mm	5.092%	0.000 m³/s / 1.563 m³/s	0.000 m/s
39.122 m	50D Concrete 600 mm	5.900%	0.000 m³/s / 1.682 m³/s	0.000 m/s
19.806 m	50D Concrete 600 mm	6.187%	0.000 m³/s / 1.722 m³/s	0.000 m/s
20.882 m	50D Concrete 600 mm	6.074%	0.000 m³/s / 1.707 m³/s	0.000 m/s
37.896 m	50D Concrete 600 mm	4.845%	0.000 m³/s / 1.524 m³/s	0.000 m/s
20.017 m	50D Concrete 600 mm	2.594%	0.000 m³/s / 1.115 m³/s	0.000 m/s
32.269 m	50D Concrete 600 mm	0.759%	0.000 m³/s / 0.603 m³/s	0.000 m/s

Manhole MH37 to MH52

SCALES

Horizontal Scale: 1000
Vertical Scale :500

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MEMBER OF CESA

PROJECT
CONSTRUCTION OF LUTANANDWA ACCESS ROAD AND BRIDGE - PHASE 2
BID NO.: 35 OF 2022

TITLE
STORMWATER LONG SECTIONS

ISSUED FOR TENDER
(Full signature)
For: Makhado Municipality 20_/_/_
For: Mont Consulting Engineers 20_/_/_

DRAWING No.
MONT/MAKH/RDS/01/2019/STW01

SHEET 01 OF 02
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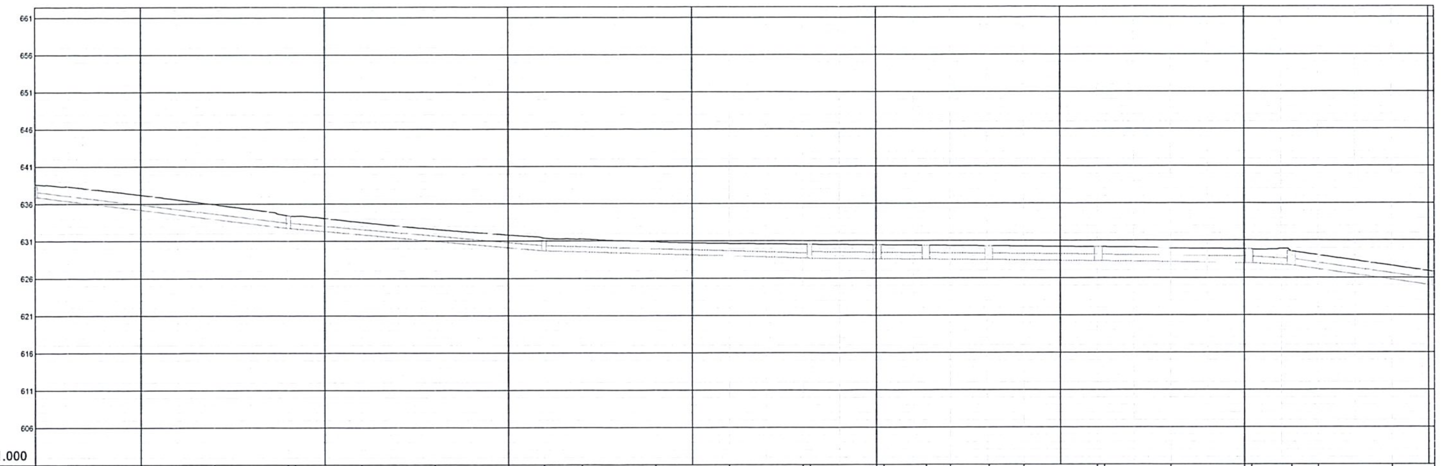
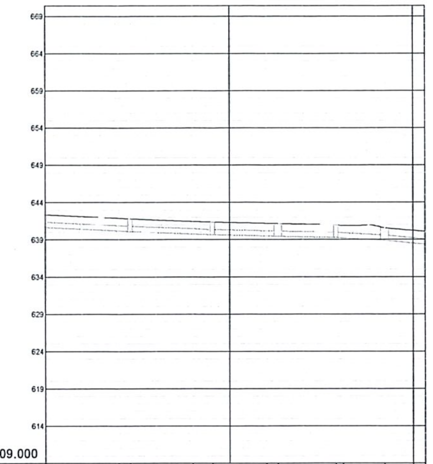


Chainage	Ground Level	Manhole Name	Inlet / Outlet
771.148	638.646	MH29	636.991
780.000	638.350		636.451
800.000	637.212		635.232
820.000	635.944		634.013
840.000 / 840.212	634.450 / 634.436	MH30	632.781 / [illegible] / 632.781
860.000	633.525		631.913
880.000	632.583		631.036
900.000	631.822		630.158
909.760	631.385	MH31	629.730 / 629.730
920.000	631.279		629.587
940.000	630.884		629.307
960.000	630.652		629.027
980.000 / 981.991	630.545 / 630.536	MH32	[illegible] / 628.720
1000.000 / 1000.323	630.449 / 630.448	MH94	628.628 / 628.628 / 628.628
1013.445	630.385	MH95	628.563 / 628.563
1020.000	630.347		628.530
1030.500	630.296	MH96	628.477 / 628.477
1040.000	630.246		628.430
1060.000 / 1060.372	630.149 / 630.148	MH97	628.328 / 628.328
1080.000	629.959		628.182
1100.000 / 1101.351	629.846 / 629.839	MH98	[illegible] / 628.023
1112.762	629.540	MH99	627.724 / 627.724
1120.000	629.022		627.206
1140.000	627.590		625.773
1151.541	626.763	MH100	624.947 / 624.947

Hydraulic Elevation

Length	Link Type / Link Size	Slope	Flow Capacity	Velocity
69.192 m	50D Concrete 600 mm	6.096%	0.000 m³/s / 1.710 m³/s	0.000 m/s
69.615 m	50D Concrete 600 mm	4.387%	0.000 m³/s / 1.450 m³/s	0.000 m/s
72.198 m	50D Concrete 600 mm	1.399%	0.000 m³/s / 0.819 m³/s	0.000 m/s
18.372 m	50D Concrete 750 mm	0.500%	0.000 m³/s / 0.882 m³/s	0.000 m/s
13.122 m	50D Concrete 750 mm	0.500%	0.000 m³/s / 0.882 m³/s	0.000 m/s
17.055 m	50D Concrete 750 mm	0.500%	0.000 m³/s / 0.882 m³/s	0.000 m/s
29.872 m	50D Concrete 750 mm	0.500%	0.000 m³/s / 0.882 m³/s	0.000 m/s
40.960 m	50D Concrete 750 mm	0.744%	0.000 m³/s / 1.076 m³/s	0.000 m/s
11.415 m	50D Concrete 750 mm	2.620%	0.000 m³/s / 2.020 m³/s	0.000 m/s
38.878 m	50D Concrete 750 mm	7.161%	0.000 m³/s / 3.340 m³/s	0.000 m/s

Manhole MH29 to MH100



Chainage	Ground Level	Manhole Name	Inlet / Outlet
0.000	642.343	MH120	640.688
20.000	641.876		
23.035	641.802	MH121	[illegible] / 640.147
40.000	641.444		639.810
45.392	641.358	MH122	639.703 / 639.703
60.000	641.187		639.531
63.101	641.150	MH123	639.495
78.893 / 80.000	640.976 / 640.781	MH124	639.321 / 639.321 / 639.287
92.190	640.571	MH125	638.916 / 638.916
100.000	640.217		[illegible]
103.298	640.071	MH126	638.416

Hydraulic Elevation

Length	Link Type / Link Size	Slope	Flow Capacity	Velocity
23.041 m	50D Concrete 600 mm	2.349%	0.000 m³/s / 1.061 m³/s	0.000 m/s
22.361 m	50D Concrete 600 mm	1.986%	0.000 m³/s / 0.976 m³/s	0.000 m/s
17.710 m	50D Concrete 600 mm	1.175%	0.000 m³/s / 0.750 m³/s	0.000 m/s
15.793 m	50D Concrete 600 mm	1.102%	0.000 m³/s / 0.727 m³/s	0.000 m/s
13.303 m	50D Concrete 600 mm	3.046%	0.000 m³/s / 1.209 m³/s	0.000 m/s
11.119 m	50D Concrete 600 mm	4.501%	0.000 m³/s / 1.469 m³/s	0.000 m/s

Manhole MH120 to MH126

Chainage	Ground Level	Manhole Name	Inlet / Outlet
0.000	672.304	MH10	670.739
15.017	671.786	MH11	670.133 / 670.133
20.000	671.414		669.757
40.000	669.999		668.247
47.361	669.346	MH12	667.691 / 667.691
60.000	668.629		666.915
80.000	667.337		665.686
85.109	667.027	MH13	665.372 / 665.372
100.000	666.161		664.517
108.055	665.709	MH14	664.054 / 664.054
120.000	665.020		663.432
131.174	664.506	MH15	662.851 / 662.851
140.000	664.085		662.449
160.000	663.170		661.537
169.060	662.779	MH16	661.124 / 661.124
180.000	662.321		660.598
196.613	661.454	MH17	659.799 / 659.799
200.000	661.388		659.666
220.000	660.644		658.884
233.200	660.022	MH18	658.367 / 658.367
240.000	659.688		657.982
260.000	658.623		656.849
269.651	657.957	MH19	656.302 / 656.302
280.000	657.492		655.702
300.000	656.461		654.807
309.414	655.998	MH20	654.343 / 654.343
320.000	655.508		653.825
340.000 / 341.500	654.627 / 654.428	MH21	652.847 / 652.773
360.000	653.829		652.062
380.000	653.004		651.273
400.000	652.179		650.493
405.136	651.948	MH22	650.293 / 650.293
420.000	651.304		649.682
440.000	650.512		648.859
460.000	649.689		648.037
480.000 / 482.027	648.863 / 648.786	MH24	[illegible] / 647.131
500.000	648.043		646.389
520.000 / 522.344	647.218 / 647.122	MH78	645.564 / 645.467
540.000	646.395		644.684
560.000 / 562.661	645.587 / 645.334	MH25	[illegible] / 643.670
580.000	644.864		643.163
598.915 / 600.000	644.256 / [illegible]	MH26	642.601 / 642.601 / 642.567
620.000	643.650		641.933
630.084	643.269	MH27	641.614 / 641.614
640.000	642.990		641.307
660.000	642.455		640.689
680.000	641.858		640.070
700.000 / 702.804	641.247 / 641.020	MH28	[illegible] / 639.365
720.000	640.652		638.768
740.000	640.041		638.073
760.000	639.296		637.378
771.148	638.646	MH29	636.991 / 636.991

Hydraulic Elevation

Length	Link Type / Link Size	Slope	Flow Capacity	Velocity
15.029 m	50D Concrete 600 mm	4.035%	0.000 m³/s / 1.391 m³/s	0.000 m/s
32.436 m	50D Concrete 600 mm	7.550%	0.000 m³/s / 1.903 m³/s	0.000 m/s
37.819 m	50D Concrete 600 mm	6.143%	0.000 m³/s / 1.716 m³/s	0.000 m/s
22.984 m	50D Concrete 600 mm	5.744%	0.000 m³/s / 1.660 m³/s	0.000 m/s
23.150 m	50D Concrete 600 mm	5.204%	0.000 m³/s / 1.580 m³/s	0.000 m/s
37.925 m	50D Concrete 600 mm	4.556%	0.000 m³/s / 1.478 m³/s	0.000 m/s
27.585 m	50D Concrete 600 mm	4.809%	0.000 m³/s / 1.519 m³/s	0.000 m/s
36.615 m	50D Concrete 600 mm	3.914%	0.000 m³/s / 1.370 m³/s	0.000 m/s
36.509 m	50D Concrete 600 mm	5.665%	0.000 m³/s / 1.648 m³/s	0.000 m/s
39.811 m	50D Concrete 600 mm	4.927%	0.000 m³/s / 1.537 m³/s	0.000 m/s
32.130 m	50D Concrete 600 mm	4.892%	0.000 m³/s / 1.532 m³/s	0.000 m/s
63.678 m	50D Concrete 600 mm	3.896%	0.000 m³/s / 1.367 m³/s	0.000 m/s
76.956 m	50D Concrete 600 mm	4.112%	0.000 m³/s / 1.404 m³/s	0.000 m/s
40.351 m	50D Concrete 600 mm	4.127%	0.000 m³/s / 1.407 m³/s	0.000 m/s
40.357 m	50D Concrete 600 mm	4.435%	0.000 m³/s / 1.458 m³/s	0.000 m/s
36.270 m	50D Concrete 600 mm	2.973%	0.000 m³/s / 1.194 m³/s	0.000 m/s
31.185 m	50D Concrete 600 mm	3.167%	0.000 m³/s / 1.232 m³/s	0.000 m/s
72.755 m	50D Concrete 600 mm	3.093%	0.000 m³/s / 1.218 m³/s	0.000 m/s
68.385 m	50D Concrete 600 mm	3.474%	0.000 m³/s / 1.291 m³/s	0.000 m/s

Manhole MH10 to MH29

SCALES

Horizontal Scale: 1000
Vertical Scale :500

No.	DATE	REVISION	CONSULT. ENG.	DIR.
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-

DESIGNED BY	SZB RANGANA
CHECKED BY	PXA NDLOVU
DRAWN BY	TA MOSIA
CHECKED BY	TE MUVHANGO

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MEMBER OF CESA

PROJECT
CONSTRUCTION OF LUTANANDWA ACCESS ROAD AND BRIDGE - PHASE 2
BID NO.: 35 OF 2022

TITLE
STORMWATER LONG SECTIONS

ISSUED FOR TENDER
(Full signature)

For: Makhado Municipality 20__/__/__

For: Mont Consulting Engineers 20__/__/__

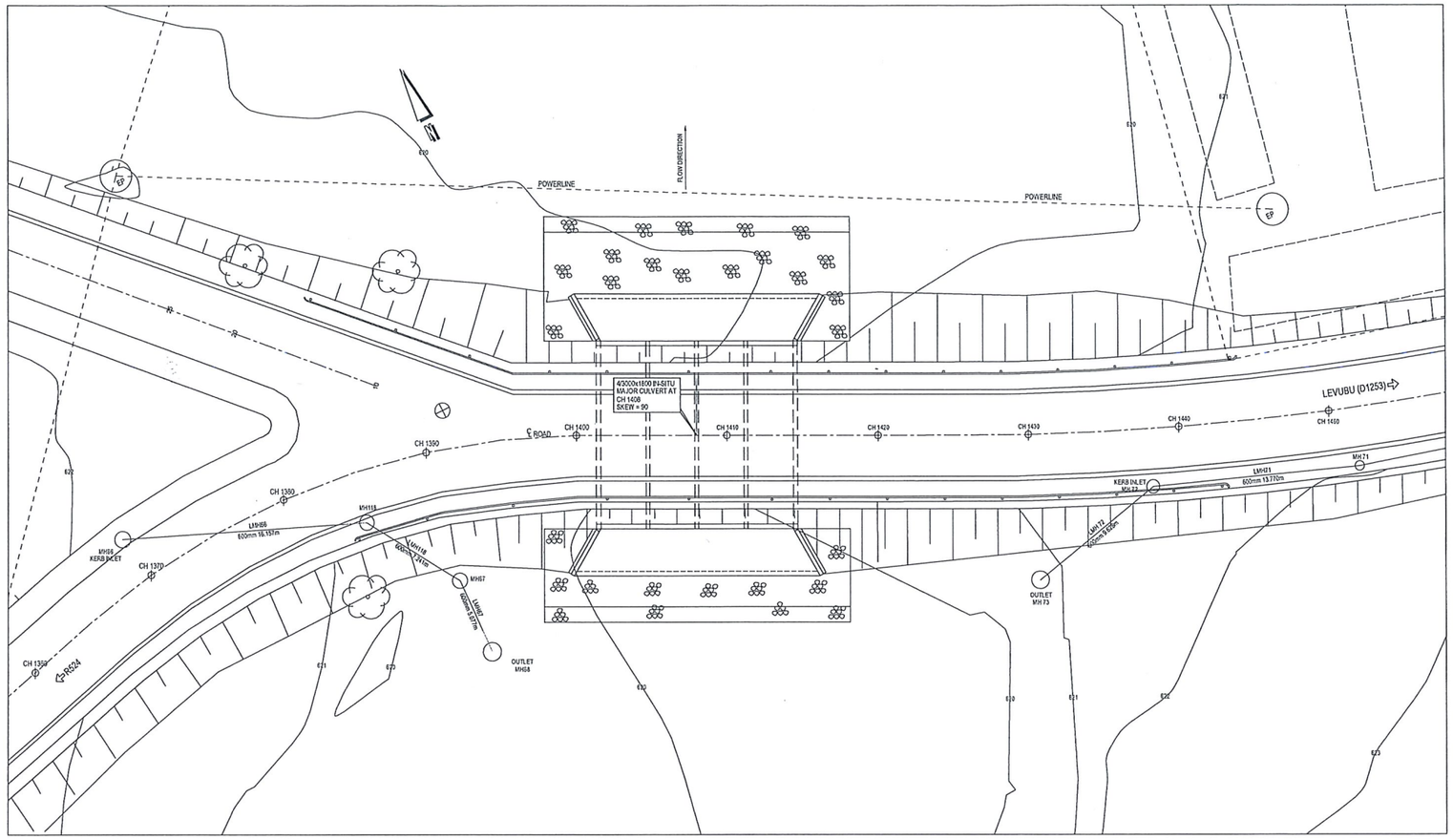
DRAWING No. MONT/MAKH/RDS/01/2019/STW01

SHEET 02 OF 02

SCALE AS SHOWN

PAPER SIZE A1

REVISION 00



SITE PLAN
1:500

	LIST OF DRAWINGS	
NO	DESCRIPTION	DRAWING NO
1	SITE PLAN	B2/01
2	GENERAL ARRANGEME .	B2/02
3	REINFORCEMENT DETAILS	B2/03

NOTES

LEGEND

REVISION

REV. No.	DATE	REVISION DESCRIPTION	REVISION BY	APPROVED BY

NAME AND ADDRESS OF CONSULTANT:

MONT CONSULTING ENGINEERS

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COMPILED		ADAPTED	
DESIGNED	JJ JVR	CHECKED	JR
DRAWN	JP	APPROVED	
PLAN No.	DATE	PROJECT ENG.	DATE

CLIENT

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APPROVED
ENG. CIVIL _____ DATE

MAIN TITLE

LUTANANDWA ACCESS ROAD AND BRIDGE

SUB TITLE

STRUCTURE B2 AT CH 1408
GENERAL ARRANGEMENT

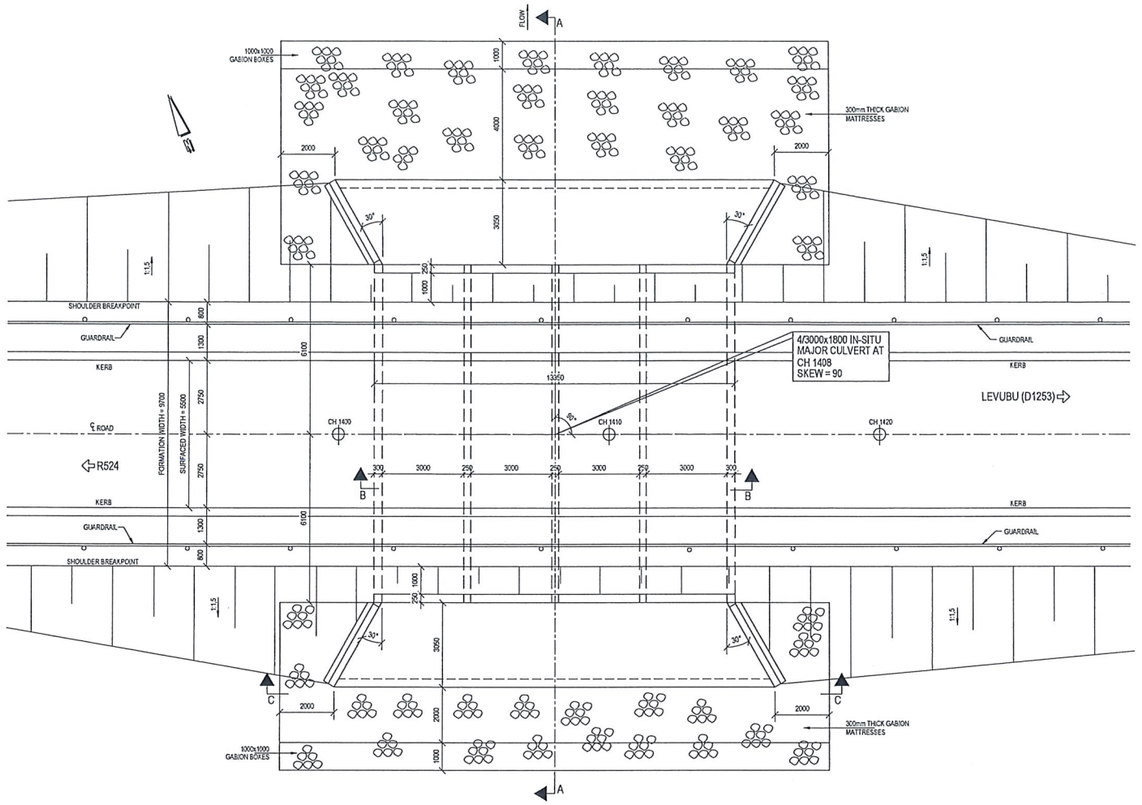
SCALE AS SHOWN

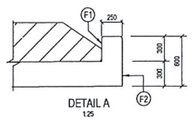
PROJECT No.

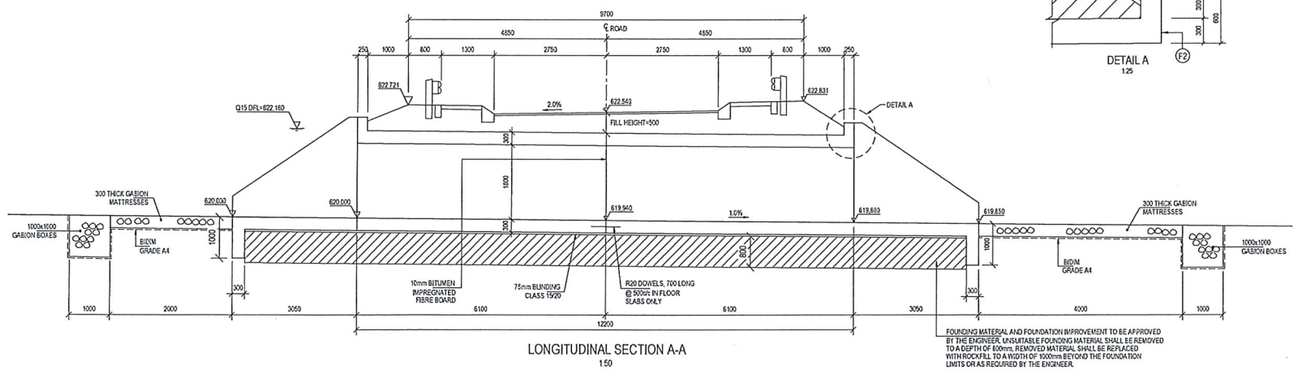
DRAWING No.
47/2018/B2/01

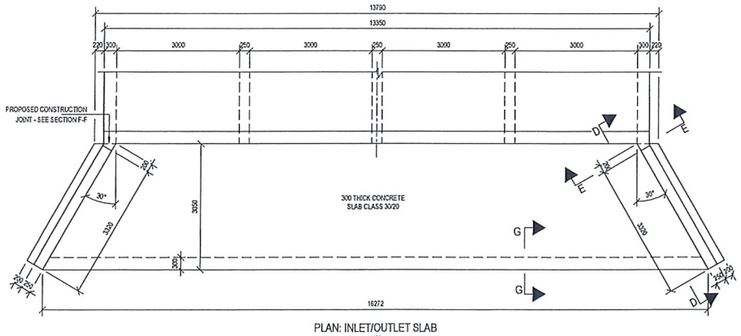
SHEET 1

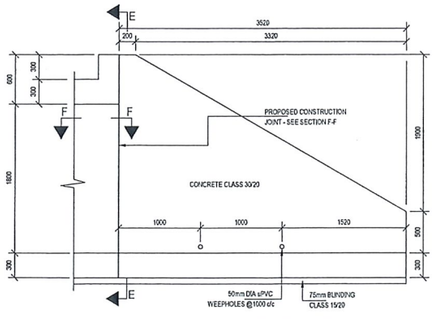
REVISION
0

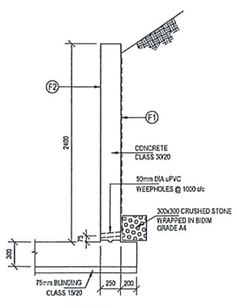


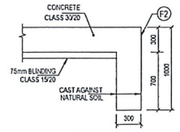


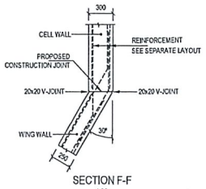


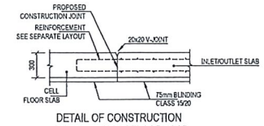


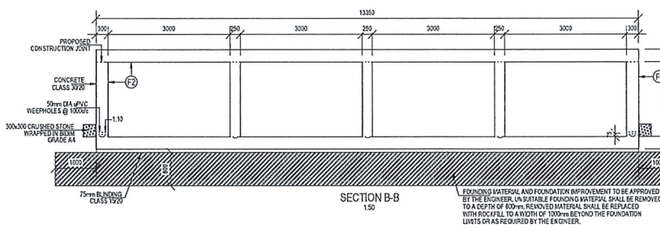


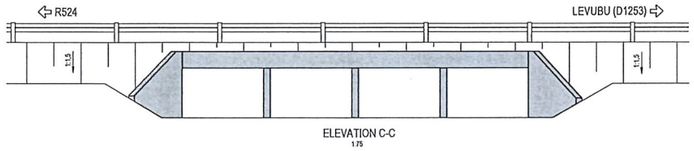












NOTES

1. GENERAL
1.1 STRUCTURAL SYSTEM: MULTI-CEMKO CELL STRUCTURE – 4 CELL CLOSED FRAME
1.2 DESIGN METHOD: LIMIT STATES DESIGN IN ACCORDANCE WITH TMH7 CODE OF PRACTICE FOR THE DESIGN OF HIGHWAY BRIDGES AND CULVERTS IN SOUTH AFRICA
1.3 SOFTWARE USED: PROKON SUITE OF STRUCTURAL ANALYSIS SOFTWARE

2. DESIGN LOADINGS
2.1 SELF WEIGHT: 25 kN/m³
2.2 FILL HEIGHT: MAX. = 1 m
DENSITY OF FILL MATERIAL = 2000 kg/m³ (20 kN/m³)
2.3 LIVE LOADS (TMH7 PARTS 1 AND 2, AS AMENDED (1988)
(a) NA
(b) NA36
(c) NC-30x6x60

3. MATERIAL SPECIFICATION
3.1 CONCRETE IN:

	CLASS	CHARACTERISTIC STRENGTH	YOUNG'S MODULUS	TEMP COEFFICIENT
(a) CELL STRUCTURE	30/20	30 MPa	26 GPa	12 E⁻⁶ m/m/°C
(b) IN-& OUTLETS	30/20	30 MPa	26 GPa	12 E⁻⁶ m/m/°C
(c) WING WALLS	30/20	30 MPa	26 GPa	12 E⁻⁶ m/m/°C
(d) BLINDING	15/20	15 MPa	23 GPa	12 E⁻⁶ m/m/°C

3.2 REINFORCEMENT (SANS 920-2011)

TYPE	YIELD STRENGTH	YOUNG'S MODULUS
(a) MILD STEEL BARS (R)	250 MPa	200 GPa
(b) HIGH TENSILE BARS (Y)	450 MPa	200 GPa

3.3 FOUNDING MATERIAL: CALCULATED MAXIMUM BEARING PRESSURE = 150 kPa

4. CONSTRUCTION DETAILS
4.1 EXISTING SERVICES TO RELOCATED OR PROTECTED PRIOR TO THE COMMENCEMENT OF EXCAVATIONS
4.2 EXISTING CULVERT TO BE REMOVED, INCLUDING INLET AND OUTLET.
4.3 FOUNDING LEVEL AND MATERIAL TO BE APPROVED BY THE ENGINEER. UNSUITABLE FOUNDING MATERIAL SHALL BE REMOVED TO A MAXIMUM DEPTH OF 0.6m (OR BEDROCK LEVEL IF BEDROCK IS SHALLOWER) AND REPLACED WITH APPROVED ROCKFILL.
4.4 BACKFILL IS REQUIRED TO BE SYMMETRICAL
4.5 ALL VISIBLE CORNERS MUST BE CHAMFERED 25mm x 25mm UNLESS SHOWN OTHERWISE
4.6 CONCRETE COVER: 40mm MIN
4.7 CONCRETE FINISH
(a) VISIBLE SURFACES – F2 (SMOOTH)
(b) NON-VISIBLE SURFACES – F1 (ROUGH)

5. HYDROLOGY AND HYDRAULICS
5.1 CATCHMENT AREA : 8,0 km²
5.2 HYDROLOGICAL ASSESSMENT METHOD : RATIONAL METHOD
5.3 HYDRAULIC CAPACITY IS DETERMINED BY INLET CONTROL
5.4 ROAD CLASS : CLASS R3
5.5 DESIGN FLOOD RECURRENCE INTERVAL (T) : 10 YEARS
5.6 DESIGN PEAK FLOW (Q_T) : 62 m³/s
5.7 HEADWATER/DEPTH RATIO FOR Q_T : 1,2
5.8 DESIGN FLOOD LEVEL (AT INLET) : 622,160 m
5.9 INVERT SLOPE : 1,0%
5.10 DESIGN FLOW VELOCITY : 3,8 m/s (AT OUTLET)

NOTES

LEGEND

REVISION

REV. No.	DATE	DESCRIPTION	REVISION BY	APPROVED BY

NAME AND ADDRESS OF CONSULTANT:

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COMPILED		ADAPTED	
DESIGNED	JJ JVR	CHECKED	JR
DRAWN	JP	APPROVED	
PLAN No.	DATE	PROJECT ENG.	DATE

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APPROVED		
ENG. CIVIL		DATE

MAIN TITLE

LUTANANDWA ACCESS ROAD AND BRIDGE

SUB TITLE

STRUCTURE B2 AT CH 1408
GENERAL ARRANGEMENT

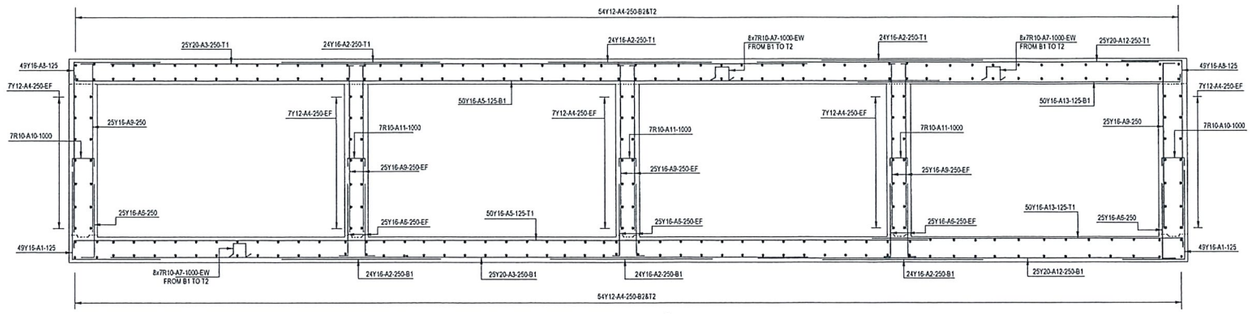
SCALE 1: 100

PROJECT No.

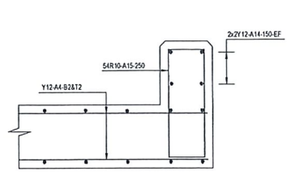
DRAWING No. 47/2018/B2/02

SHEET 1

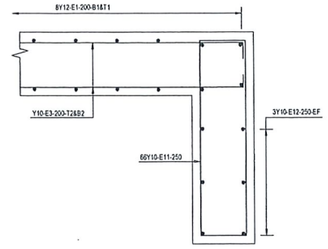
REVISION 0



TYPICAL SECTION PARALLEL TO ROAD℄ : CELL UNIT (2 OFF)
1:25



SECTION : HEAD WALL
1:10



SECTION A-A : CUT-OFF WALL
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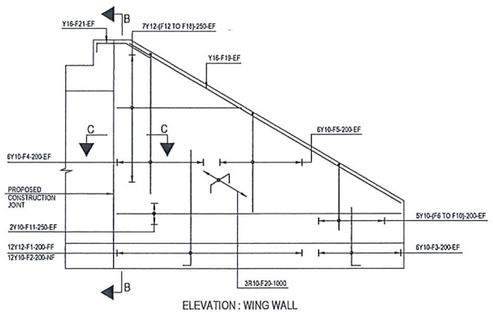
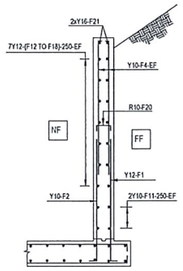


ELEVATION : WING WALL
1:25



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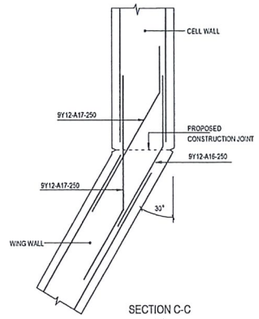

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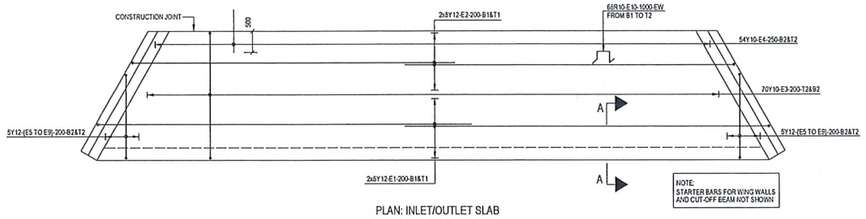


PLAN: INLET/OUTLET SLAB
1:50

MEMBER	No OF	BARS PER MEMB	DIA.	LENGTH	TOTAL NUM-BER	MARK	S C	BENDING A	B	C	D	E/r
CELL UNITS	2	98	Y16	2750	196	A1	37	1400	(1400)			
		144	Y16	2900	288	A2	20	(2900)				
		50	Y20	8800	100	A3	20	(8800)				
		286	Y12	6000	572	A4	20	(6000)				
		100	Y16	10450	200	A5	34	10300				
		200	Y16	1250	400	A6	34	1100				
		112	R10	1150	224	A7	83	300	165	300	(300)	
		98	Y16	3050	196	A8	37	1700	(1400)			
		200	Y16	2050	400	A9	34	1900				
		14	R10	450	28	A10	35	220				
		21	R10	400	42	A11	35	170				
		50	Y20	5300	100	A12	20	(5300)				
		100	Y16	3950	200	A13	34	3800				
HEAD-WALL	2	8	Y12	6950	16	A14	20	(6950)				
		54	R10	1550	108	A15	60	520	170			
WING WALL TIE-BARS	4	9	Y12	1400	36	A16	62	700	350	(700)		
		18	Y12	1700	72	A17	62	700	350	(1000)		

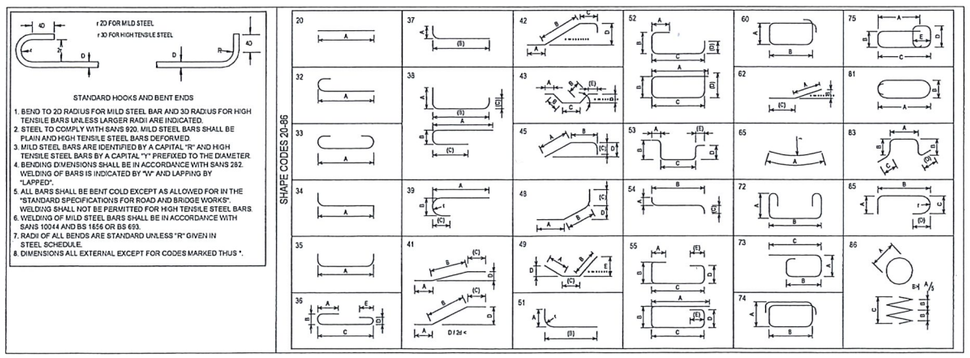
	8	10	12	16	20	25	32	40	TOT
R		280							280
Y			3299	9741	3477				16518
TOT		280	3299	9741	3477				16798

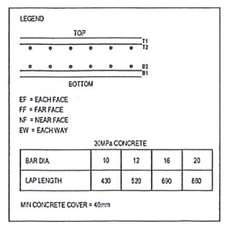
01

MEMBER	No OF	BARS PER MEMB	DIA.	LENGTH	TOTAL NUM-BER	MARK	S C	BENDING A	B	C	D	E/r
INLET & OUTLET SLAB	2	32	Y12	9000	64	E1	34	8900				
		32	Y12	8100	64	E2	34	8000				
		140	Y12	3150	280	E3	35	2950				
		108	Y10	1000	216	E4	20	(1000)				
		4	Y12	2800	8	E5	35	2600				
		4	Y12	2450	8	E6	35	2255				
		4	Y12	2100	8	E7	35	1910				
		4	Y12	1800	8	E8	35	1565				
		4	Y12	1450	8	E9	35	1220				
		68	R10	1200	136	E10	83	300	185	300	(300)	
		66	Y10	2350	132	E11	60	900	200			
		12	Y10	8900	24	E12	20	(8900)				
WING WALLS	4	12	Y12	1500	48	F1	34	1400				
		12	Y10	1500	48	F2	34	1400				
		12	Y10	850	48	F3	34	750				
		12	Y10	1600	48	F4	34	1500				
		12	Y10	1100	48	F5	34	1000				
		2	Y10	1050	8	F6	34	950				
		2	Y10	950	8	F7	34	835				
		2	Y10	850	8	F8	34	720				
		2	Y10	700	8	F9	34	605				
		2	Y10	600	8	F10	34	495				
		4	Y10	3400	16	F11	20	(3400)				
		2	Y12	3050	8	F12	20	(3050)				
		2	Y12	2600	8	F13	20	(2610)				
		2	Y12	2150	8	F14	20	(2170)				
		2	Y12	1750	8	F15	20	(1740)				
		2	Y12	1300	8	F16	20	(1300)				
		2	Y12	850	8	F17	20	(665)				
		2	Y12	400	8	F18	20	(430)				
		2	Y16	3750	8	F19	20	(3750)				
		3	R10	400	12	F20	35	170				
		2	Y16	1150	8	F21	45	700	350	(150)	380	

	8	10	12	16	20	25	32	40	TOT
R		104							104
Y		1203	1197	62					2462
TOT		1307	1197	62					2566

02





BAR DIA	10	12	16	20
LAP LENGTH	430	520	690	860

NOTES

LEGEND

REVISION

REV. No.	DATE	DESCRIPTION	REVISED BY	APPROVED BY

NAME AND ADDRESS OF CONSULTANT:

MONT CONSULTING ENGINEERS

mont

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MEMBER OF SACESA

SURVEYED		TRACED	
COMPILED		ADAPTED	
DESIGNED	JJ JVR	CHECKED	JR
DRAWN	JP	APPROVED	
PLAN No.	DATE	PROJECT ENG.	DATE

CLIENT

MAKHADO MUNICIPALITY

Private Bag X 2596
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TEL: 015 - 519 3000
FAX: 015 - 519 1195

APPROVED ENG. CIVIL		DATE

MAIN TITLE

LUTANANDWA ACCESS ROAD AND BRIDGE

SUB TITLE

STRUCTURE B2 AT CH 1408
REINFORCEMENT DETAILS

SCALE 1 : 100

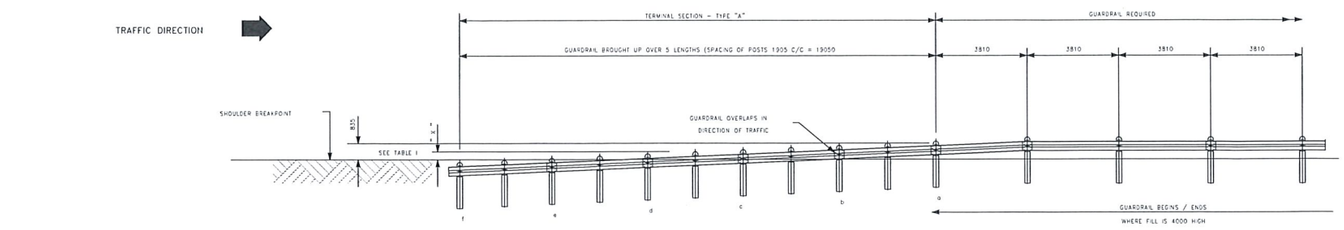
PROJECT No.

DRAWING No. 47/2018/B2/03

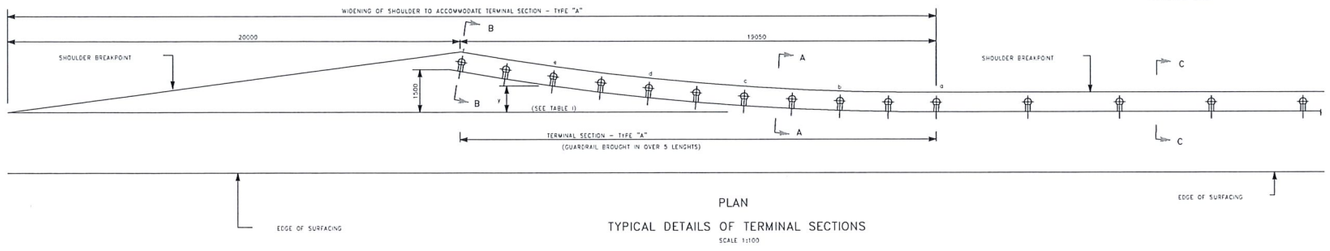
SHEET 1

REVISION 0

GUARDRAIL PLACING DETAILS



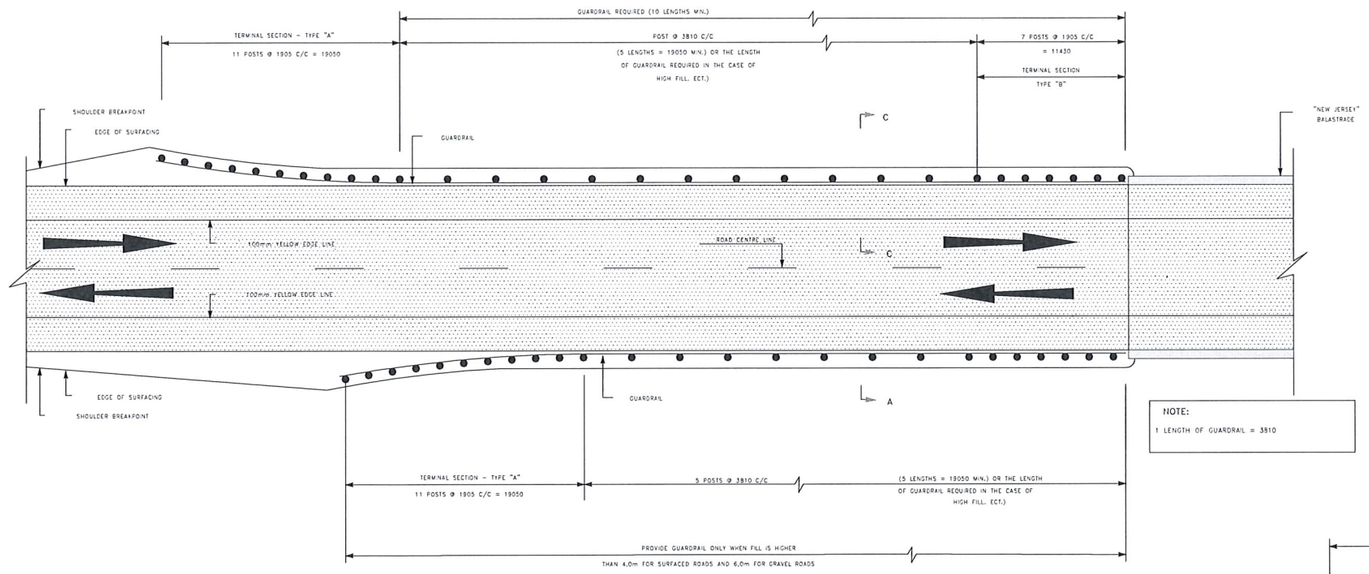
FRONT ELEVATION



PLAN

TYPICAL DETAILS OF TERMINAL SECTIONS

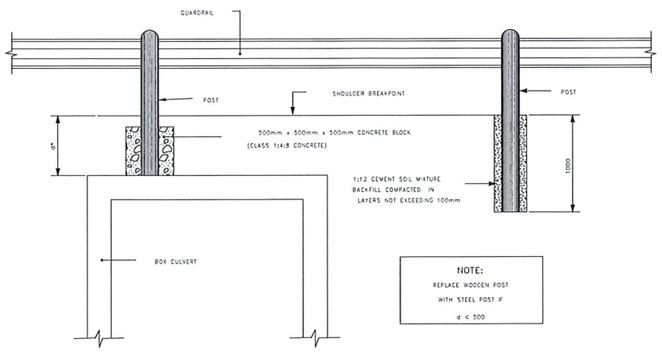
SCALE 1:100



PLACING DETAILS AT BRIDGE WITH BALUSTRADES

N.T.S.

NOTE:
1 LENGTH OF GUARDRAIL = 3810



NOTE:
REPLACE WOODEN POST WITH STEEL POST IF
ϕ < 500

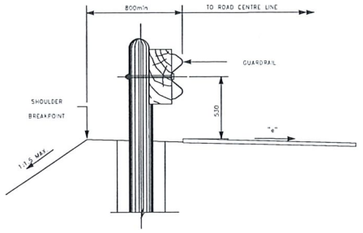
DETAIL 1

NOTES ON ERECTION DETAILS

1. THE HOLES FOR TIMBER POSTS SHALL BE OF SUFFICIENT SIZE TO PERMIT PROPER SETTING OF THE POSTS AND TO ALLOW SUFFICIENT ROOM FOR BACKFILLING.
2. AT LEAST 1,0m OF POST SHALL BE EMBEDDED IN THE GROUND
3. HOLES FOR TIMBER POSTS SHALL BE SPACED TO SUITE THE STANDARD LENGTH OF GUARDRAIL SUPPLIED.
4. HOLES SHALL BE BACKFILLED WITH 12:1 SOIL : CEMENT MIXTURE AT OPTIMUM MOISTURE CONTENT IN COMPACTED LAYERS NOT EXCEEDING 100mm.

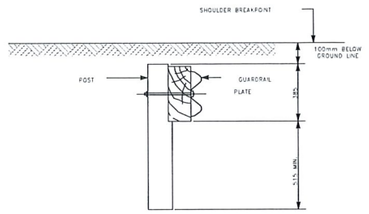
GUARDRAIL WARRANT

1. WHERE THE FILL IS HIGHER THAN 4,0m FOR SURFACED ROADS, AND 6,0m FOR GRAVEL ROADS.
2. WHERE WATER NEXT TO THE ROAD FORMATION IS DEEPER THAN 1,5m.
3. AT ALL BRIDGES WITH BALUSTRADES.
4. ON THE OUTSIDE OF CURVES WITH RADI LESS THAN 200mm AND ONLY WHEN THE ROAD IS IN FILL.
5. WHERE OBSTRUCTIONS ARE LESS THAN 1,0m FROM THE SHOULDER BREAKPOINT.
6. WHERE AN OBSTRUCTION APPEARS TO BE MORE DANGEROUS THAN A GUARDRAIL WOULD BE.
7. THESE RULES ARE TO BE APPLIED WITH DISCRETION AND THE POSITION OF ALL GUARDRAILS MUST BE CONFIRMED ON SITE BY THE ENGINEER PRIOR TO THE ERECTION THEREOF.



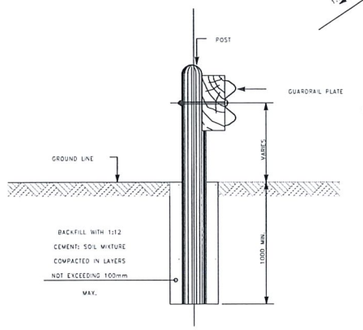
SECTION C - C

WITHOUT CONCRETE SIDE DRAIN



SECTION B-B

SCALE 1:20



SECTION A-A

SCALE 1:20

NOTE:
1 LENGTH OF GUARDRAIL = 3810

TABLE I

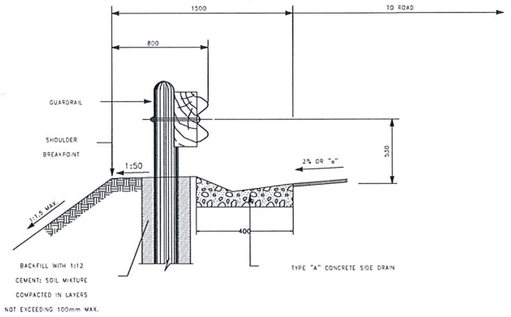
PLACING OF POLES AT PARABOLIC TERMINAL SECTIONS

	HORIZONTAL OFF - SETS FOR PARABOLIC TERMINAL SECTIONS Y (mm)	VERTICAL OFF-SETS FOR PARABOLIC TERMINAL SECTION (MEASURED FROM TOP OF POST) X (mm)
a	60	0
b	70	33
c	80	133
d	90	233
e	100	531
f	110	835

TABLE II

MIN. LENGTH OF GUARDRAIL REQUIRED (EXCLUDING TERMINAL SECTIONS)

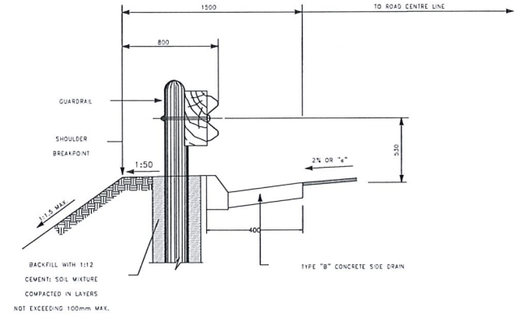
DESIGN SPEED km/h	MIN. LENGTH
60	12 LENGTHS (5,7)
70	14 LENGTHS (53,34)
80	16 LENGTHS (60,86)
90	20 LENGTHS (76,20)
100	23 LENGTHS (87,63)
110	27 LENGTHS (102,87)
120	29 LENGTHS (110,49)
130	32 LENGTHS (121,92)
140	35 LENGTHS (133,35)



SECTION C - C

WITH CONCRETE SIDE DRAIN "A"

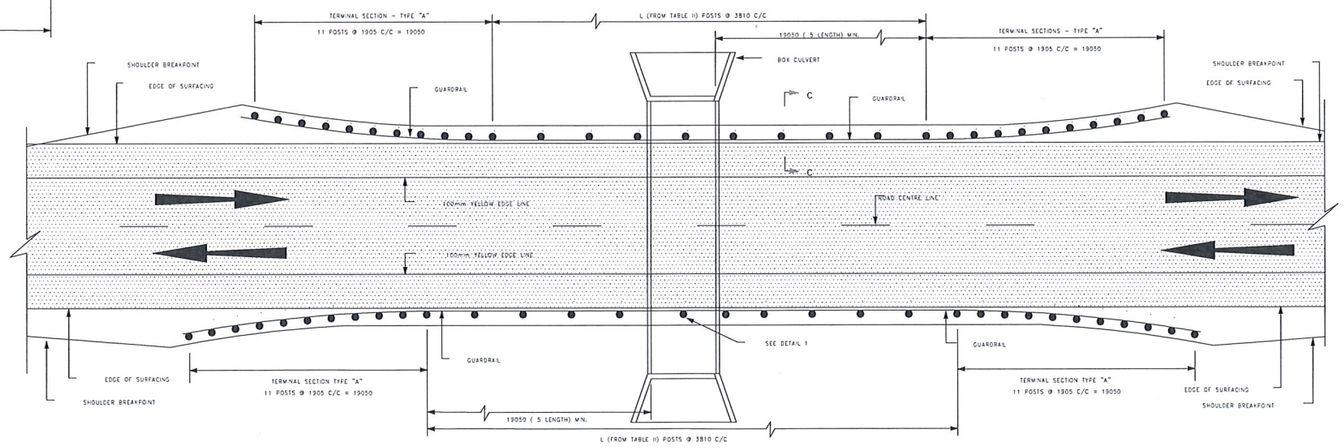
SCALE 1:20



SECTION C - C

WITH CONCRETE SIDE DRAIN "B"

SCALE 1:20



PLACING DETAILS AT BOX CULVERTS

N.T.S.

No	DATE	REVISION	CONSULT ENG	D/R
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-

DESIGNED BY	SZB RANGANA
CHECKED BY	PXA NDLOVU
DRAWN BY	TA MOSIA
CHECKED BY	TE MUVHANGO

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FAX: 015 - 291 4218
MEMBER OF CESA

PROJECT
CONSTRUCTION OF LUTANANDWA ACCESS ROAD AND BRIDGE - PHASE 1
BID NO.: 35 OF 2022

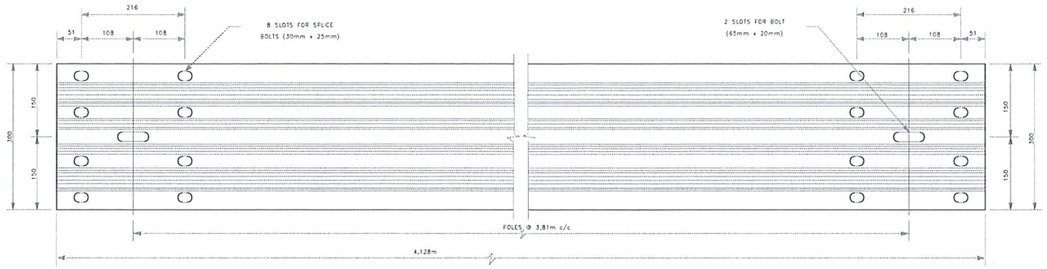
TITLE
STANDARD DRAWING
GUARDRAIL PLACING DETAILS

ISSUED FOR TENDER
For Makhado Municipality 20_/_/_
For Mont Consulting Engineers 20_/_/_

DRAWING No. MONT/MAKH/RDS/01/2019/TPC01

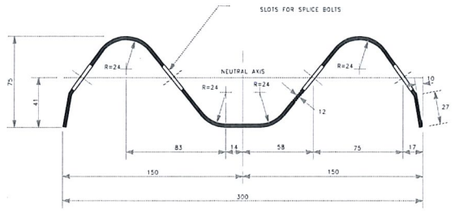
SHEET 01 OF 01
SCALE AS SHOWN
PAPER SIZE A1
REVISION 00

GUARDRAIL ELEMENTS AND MOUNTING DETAILS



TYPICAL GUARDRAIL SECTION

SCALE 1:5



SCALE 1:2

SECTION THROUGH GUARDRAIL

NOTE:

1. GUARDRAILS WILL ONLY BE PLACED WHERE REQUIRED BY THE ENGINEER.

2. ALL GUARDRAILS MUST BE GALVANIZED AS SPECIFIED (NOT PAINTED).

SPECIFICATIONS

1.BOLT:
HIGH TENSILE STEEL 16mm

2.WASHERS:
3mm THICK

3.SPACER BLOCK:
PINE OR GUM, PRESSURE IMPREGNATED WITH CREOSOTE WHICH COMPLIES WITH SABS 538 OR 539

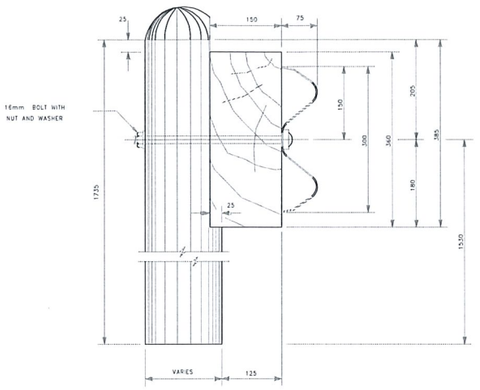
4.POSTS:
150mm MIN - 230mm MAX, PINE OR GUM, PRESSURE IMPREGNATED WITH CREOSOTE WHICH COMPLIES WITH SABS 538 OR SABS 539.

5.GALVANIZING:
GUARDRAILS:SABS 763:TYPE A1 ARTICLES, BOLTS AND WASHERS: SABS 763 TYPE C1 ARTICLES

6.TIMBER POSTS:
POSTS SHALL COMPLY WITH THE REQUIREMENTS OF SABS AND SHALL CARRY THE SABS MARK.

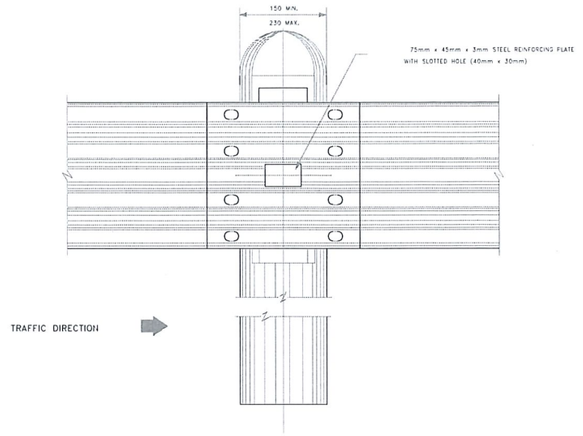
7.CREOSOTE TREATMENT:
TIMBER POSTS AND SPACER BLOCKS SHALL BE TREATED IN ACCORDANCE WITH SABS 05 WITH CREOSOTE WHICH COMPLIES WITH SABS 538 OR 539?.

8.REFLECTIVE PLATES:
THE OUTER SURFACES SHALL BE COATED WITH ENGINEERING GRADE RETRO-REFLECTIVE MATERIAL WHICH COMPLIES WITH THE PROVISIONS OF CKS 191 IN THE COLOURS SHOWN ON THIS DRAWING.



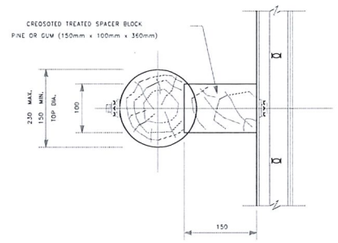
ELEVATION OF GUARDRAIL

SCALE 1:5



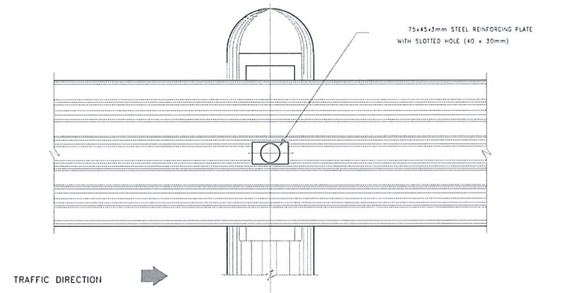
DETAIL A: FRONT ELEVATION
NORMAL SPACING OF POSTS

SCALE 1:5



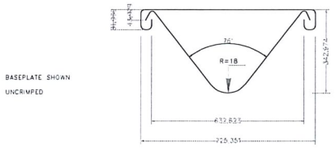
PLAN

SCALE 1 : 5



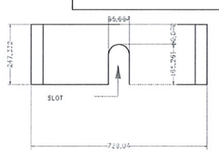
DETAIL B: FRONT ELEVATION
HALF SPACING OF POSTS

SCALE 1:5

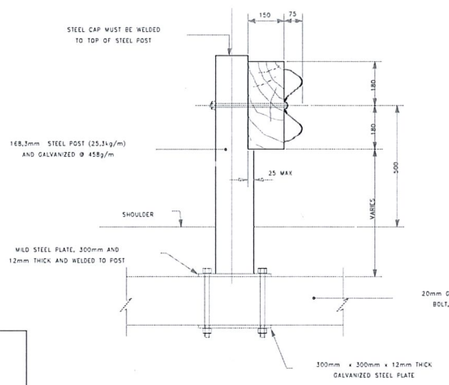


BASEPLATE SHOWN UNCRIMPED

SECTION PLAN

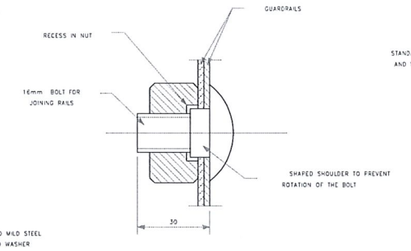


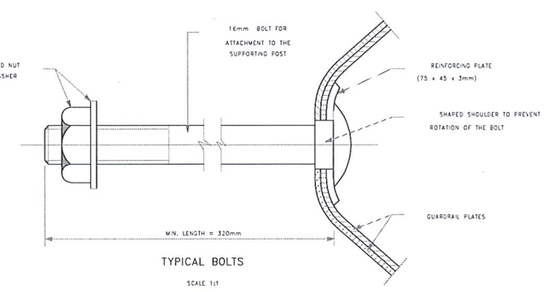
DETAIL OF BASEPLATE



DETAIL OF STEEL GUARDRAIL POST

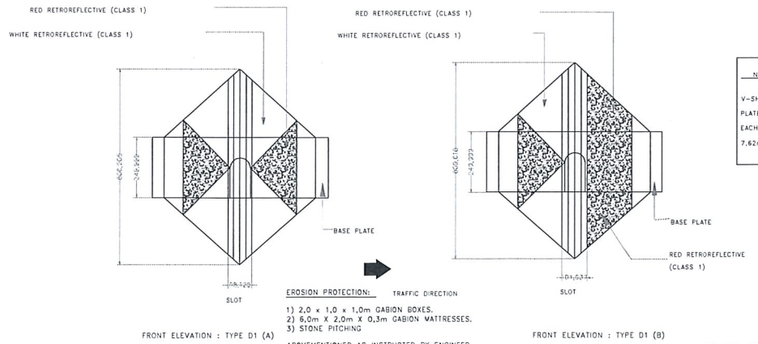
SCALE 1:10





TYPICAL BOLTS

SCALE 1:1



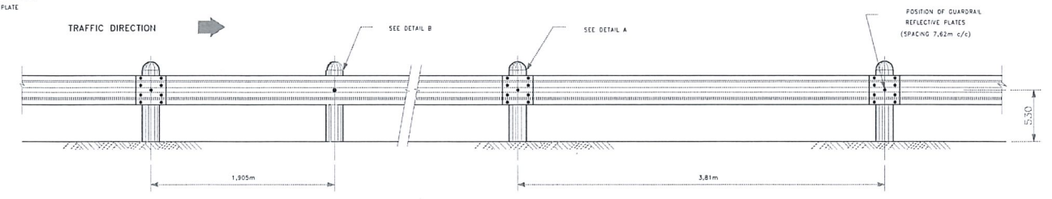
FRONT ELEVATION : TYPE D1 (A)

FRONT ELEVATION : TYPE D1 (B)

DETAIL OF GUARDRAIL REFLECTIVE PLATES

NOTE:

V-SHAPED REFLECTIVE PLATES ATTACHED TO EACH ALTERNATIVE POST- 7,62m c/c.



HALF-SPACING OF GUARDRAIL POSTS

NORMAL SPACING OF GUARDRAIL POSTS

SPACING OF POSTS AND POSITION OF REFLECTIVE PLATES

SCALE 1:25

No	DATE	REVISION	CONSULT ENG	DR
-	-	-	-	-

DESIGNED BY	SZB RANGANA
CHECKED BY	PXA NDLOVU
DRAWN BY	TA MOSIA
CHECKED BY	TE MUVHANGO

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ISSUED FOR TENDER
For Makhado Municipality 20__/__/__
For Mont Consulting Engineers 20__/__/__

DRAWING No: MONT/MAKH/RDS/01/2019/TPC02

SHEET 01 OF 01
SCALE AS SHOWN
PAPER SIZE A1
REVISION 00

NOTES

1. THESE NOTES APPLY FOR ALL SUB-SERIES IN THE ROADWORKS SIGNS AND DETOURS "SP-R" STANDARD PLAN SERIES. ADDITIONAL SPECIFIC INTRODUCTORY NOTES MAY BE GIVEN AT THE BEGINNING OF THE SUB-SERIES. THE CURRENT LIST OF SUB-SERIES IS GIVEN BELOW. OTHER STANDARD PLAN SERIES WHICH DEAL WITH SPECIFIC TYPES OF ROAD TRAFFIC SIGNS ARE –

   (a) "SP-J" ROAD MARKINGS AND ROADSTUDS
   (b) "SP-S" ROAD SIGNS.

2. THE STRUCTURAL AND MOUNTING ASPECTS OF ROAD TRAFFIC SIGNS ARE COVERED BY STANDARD PLAN SREIES "SP-B".

3. THE SIGNS DETAILED IN SUB-SERIES "SP-R-1" ARE SIGNS WHICH HAVE GENERAL APPLICATIONS AT ROADWORKS SITES.

4. ALMOST ALL REGULATORY AND WARNING SIGNS MAY BE USED IN A TEMPORARY FORM AT ROADWORKS SITES. DETAILS OF THE CLASSIFICATION OF THESE SIGNS ARE GIVEN OPPOSITE. THERE IS NO TEMPORARY COLOUR CODE FOR CONTROL REGULATORY SIGNS AND THEY SHALL ONLY BE USED IN THEIR PERMANENT FORM. A LIMITED SELECTION OF PERMANENT SIGNS ARE FREQUENTLY REQUIRED AT THE END OF ROADWORKS SITES. THE COMMAND, PROHIBITION AND COMPREHENSIVE REGULATORY SIGNS ILLUSTRATED, ARE REPRESENTATATIVE ONLY – THE MAJORITY OF OTHER SIGNS IN THESE CATEGORIES MAY ALSO BE USED IN A TEMPORARY FORM. A TEMPORARY VERSION OF SIGN R401 SHOULD NOT BE USED. SIMILARLY WARNING SIGNS MARKED * ARE REPRESENTATIVE. BOTH NUMBERS ARE INDICATED FOR WARNING SIGNS WHICH HAVE A "HANDED" VERSION.

5. TEMPORARY ROUTE MARKER AND DIRECTION GUIDANCE SIGNS MAY ALSO BE SPECIFIED. LIMITED EXAMPLES ARE SHOWN OPPOSITE.

6. SUB-SERIES "SP-R-2" COVERS DETAILS OF ALL TEMPORARY DIAGRAMMATIC GUIDANCE SIGNS. GENERAL NOTES ON THE USE OF DIAGRAMMATIC SIGNS ARE GIVEN ON THE FIRST DRAWING IN THE SUB-SERIES AND ALL AVAILABLE SIGNS ARE INDICATED ON A NUMBER OF KEY SHEETS. THESE KEY SHEETS ARE DESIGNED TO BE USED FOR SIGN ORDERING PURPOSES AND PROVIDE INFORMATION TO ENABLE SIGN QUANTITIES TO BE DETERMINED. DETAILS OF PERMANENT DIAGRAMMATIC SIGNS ARE COVERED IN SUB-SERIES "SP-S-7". THE DRAWINGS ARE GROUPED WITHIN THE SUB-SERIES "SP-R-2" AS FOLLOWS –

   (a) TRAFFIC FLOW OBSTRUCTIONS
   (b) LANE USE REGULATION
   (c) LANES MERGE
   (d) HEAVY VEHICLE GUIDANCE
   (e) OVERHEAD EXAMPLES.

EACH DRAWING GIVES DIMENSIONAL DETAILS FOR A NUMBER OF SIMILAR SIGN DESIGNS FOR THE THREE STANDARD SIGN SIZES. CARE MUST BE TAKEN TO SEE THAT THE CORRECTLY HANDED SIGNS ARE ORDERED.

SUB-SERIES IN THE ROADWORKS SIGNS AND DETOURS SERIES "SP-R"

GENERAL SIGN DETAILS	"SP-R-1"
TEMPORARY	"SP-R-2"
DIAGRAMMATIC SIGNS	
TYPICAL LAYOUTS	"SP-R-3"

KEY

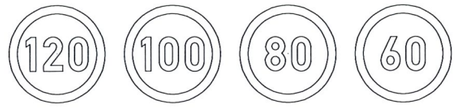
RED
WHITE
YELLOW
BLUE
BLACK
GREEN
BROWN

PERMANENT SIGNS

CONTROL REGULATORY SIGNS

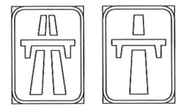
R1 R2 R3 R1.5A R1.5B

PROHIBITION REGULATORY SIGNS



R201-120 R201-100 R201-80 R201-60

COMPREHENSIVE REGULATORY SIGNS



R401 R402

TEMPORARY SIGNS

COMMAND REGULATORY SIGNS

TR102 TR103 TR104 TR105

PROHIBITION REGULATORY SIGNS

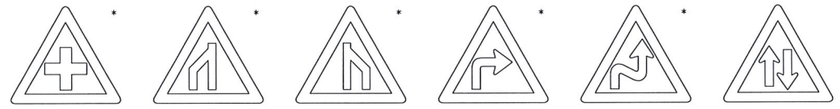
TR106 TR201-80 TR201-60 TR202-10 TR204

TR208 TR209 TR210 TR214 TR215 TR216 TR217 TR220 TR230

COMPREHENSIVE/DERESTRICTION REGULATORY SIGNS

TR402 TR601 TR602

ADVANCE WARNING SIGNS



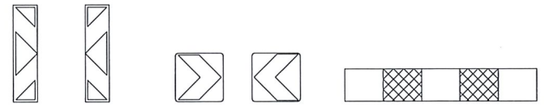
TW101 TW116 TW117 TW204 TW210/TW211 TW212

TW214/TW215 TW301 TW302 TW320 TW321 TW322 TW323 TW325 TW326

TW327 TW329 TW331 TW333 TW334/TW335 TW336 TW337 TW338 TW339

TW340/TW341 TW342 TW343 TW344/TW345 TW346/TW347

HAZARD MARKER SIGNS



TW401 TW402 TW405 TW406 TW411

GUIDANCE SIGNS

TGE1 TGE15.2 TGE12.2 TGA2/3 TGD1

No	DATE	REVISION	CONSULT ENG	DR.
-	-	-	-	-

DESIGNED BY	SZB RANGANA
CHECKED BY	PXA NDLOVU
DRAWN BY	TA MOSIA
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MEMBER OF CESA

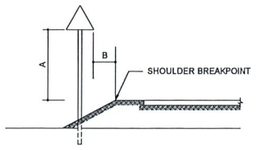
PROJECT: CONSTRUCTION OF LUTANANDWA ACCESS ROAD AND BRIDGE - PHASE 1
BID NO.: 35 OF 2022

TITLE: STANDARD DRAWING
TYPICAL ROAD SIGNS DETAILS

ISSUED FOR TENDER
For Makhado Municipality 20__/__/__
For: Mont Consulting Engineers 20__/__/__

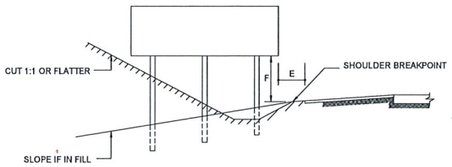
DRAWING No.: MONT/MAKH/RDS/01/2019/TPC03

SHEET 01 OF 01
SCALE: AS SHOWN
PAPER SIZE: A1
REVISION: 00



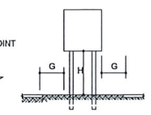
SHOULDER (ON KERB LINE)

PERMANENT SIGN PLACEMENT			
	MAXIMUM	PREFERRED	MINIMUM
A	2500	2100	600
B	2000	1500	1200
C	3000	2500	2100
D	-	750	500



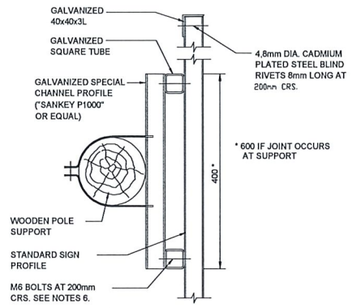
ELEVATION

PERMANENT SIGN PLACEMENT			
	MAXIMUM	PREFERRED	MINIMUM
E	-	2500	1500
F	2400	2000	1600



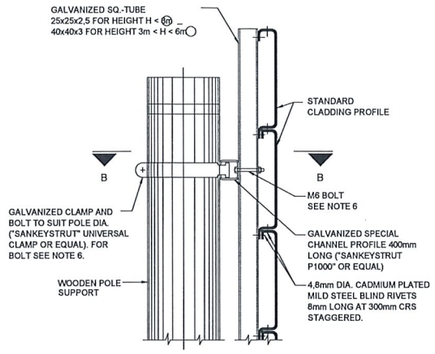
ELEVATION

PERMANENT SIGN PLACEMENT			
	MAXIMUM	PREFERRED	MINIMUM
G	2000	1500	1200
H	1600	1200	800



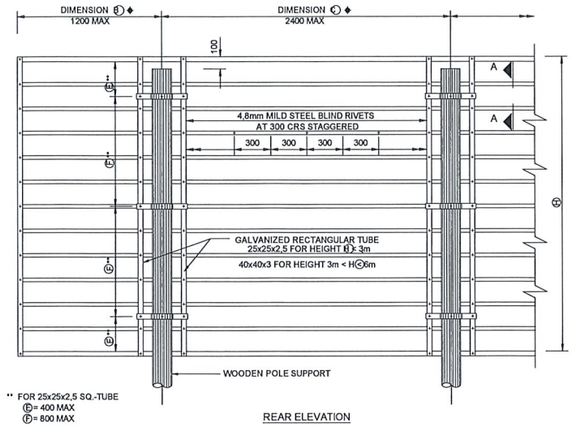
SECTION B-B

SCALE 1:5



ELEVATION A-A

SCALE 1:5

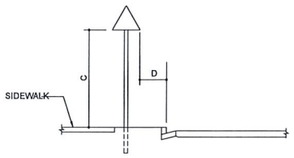


** FOR 25x25x2,5 SQ.-TUBE
E = 400 MAX
E = 800 MAX

REAR ELEVATION

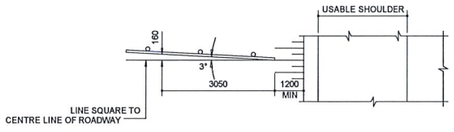
SCALE 1:20

ROAD SIGN FACE



KERB

GENERAL CASES



PLAN

GROUND-MOUNTED SHOULDER SIGN

CLEARANCE

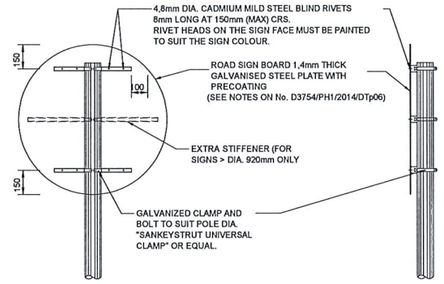
NOTE:

INFORMATION SHOWN ON THIS DRAWING IS REPRODUCED FROM "THE SOUTH AFRICAN ROAD TRAFFIC SIGNS MANUAL"

NOTES

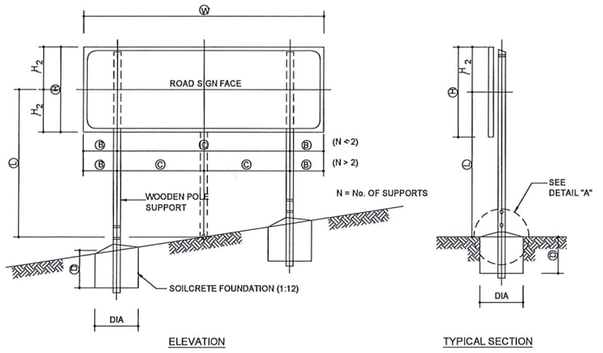
THE ROAD SIGN FACES SHALL BE MANUFACTURED AND ERECTED IN ACCORDANCE WITH THE RELEVANT CLAUSES OF SECTION 5600 OF STANDARD SPECIFICATIONS AS WELL AS THE FOLLOWING REQUIREMENTS:-

1. SIGN FACES SHALL BE FOR TYPE "A" OR "B" EXPOSURE AS INDICATED ON THE ROAD SIGN DETAIL DRAWINGS OR AS DIRECTED BY THE PROJECT MANAGER:-
   TYPE "A": ALL CASES OTHER THAN TYPE "B".
   TYPE "B": SIGN FACES FOR USE IN MARINE OR CHEMICALLY POLLUTED CORROSIVE ENVIRONMENTS
2. THE COATING SYSTEMS FOR SIGN FACES TYPE "A" AND "B" ARE SPECIFIED
3. THE STANDARD SIGN PROFILE SHALL BE MADE IN ACCORDANCE WITH THE DETAILS.
4. A SIGN FACE THAT EXCEEDS 6m IN LENGTH MAY BE MANUFACTURED IN TWO SECTIONS. THE JOINT SHALL BE MADE IN ACCORDANCE WITH DETAILS
5. STRUCTURAL STEEL SECTIONS SHALL BE OF MILD STEEL CONFORMING TO THE REQUIREMENTS OF SECTION 6700 OF THE STANDARD SPECIFICATIONS RECTANGULAR HOLLOW SECTIONS AND SPECIAL CHANNEL PROFILES MAY BE COLD FORMED OF COMMERCIAL QUALITY MILD STEEL
6. BOLTS, WASHERS AND NUTS SHALL BE AS FOLLOWS:-
   TYPE "A" SIGN FACES: GALVANIZED STEEL BOLTS COMPLYING WITH THE REQUIREMENTS OF CLAUSE 5602(b) OF THE STANDARD SPECIFICATIONS
   TYPE "B" SIGN FACES: STAILESS STEEL BOLTS GRADE 304 MANUFACTURED TO SABS 136
   NUTS FOR BOTH TYPE "A" AND "B" SIGN FACES SHALL BE SELFLOCKING "NYLOC" OR EQUAL APPROVED
7. BLIND RIVETS SHALL BE 4,8mm DIA CADMIUM PLATED MILD STEEL.
8. ALL STEEL SECTIONS SHALL BE HOT DIP GALVANIZED IN ACCORDANCE WITH CLAUSE 7105(1) OF THE STANDARD SPECIFICATIONS AFTER MANUFACTURE.
9. REFERENCE MUST BE MADE TO THE RELEVANT ROAD SIGN DETAIL DRAWINGS FOR DETAILS OF THE SYMBOLS AND LEGEND FOR EACH INDIVIDUAL SIGN



REAR ELEVATION

TYPICAL SIDE ELEVATION



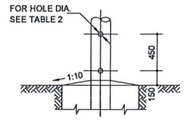
ELEVATION

TYPICAL SECTION

FREE STANDING SUPPORT

TABLE 1

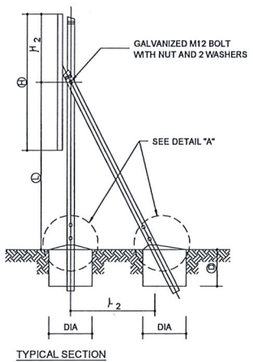
WIDTH OF SIGN	No. OF SUPPORTS	DIMENSIONS	
W	N	B	C
1,2m OR LESS	1	W/2	-
1,2m - 4,0m	2	W/5	3W/5
4,0m - 7,2m	3	W/2N	W/N
7,2m - 9,6m	4		
9,6m - 12,0m	5		



DETAIL "A"

TABLE 2

* AT GROUND LEVEL	POLE DIA * (mm)	HOLE DIA (mm)
	< 140	NONE
	141 - 170	40
	171 - 200	50
	201 - 225	65



TYPICAL SECTION

BRACED SUPPORT

GENERAL NOTES REFER ALSO TO SECTION 5600 OF THE STANDARD SPECIFICATIONS

POSITION
ROAD SIGNS SHALL BE ERECTED IN THE POSITIONS SHOWN ON THE DRAWINGS OR INDICATED BY THE PROJECT MANAGER, STANDARD CLEARANCES

EXCAVATION
EXCAVATION FOR FOUNDATIONS MUST BE MADE TO THE NEAT DIMENSIONS SPECIFIED. WHERE THE FOUNDATION DEPTH IS 1,5m OR GREATER, EXCAVATIONS MUST BE SUITABLE SHORED FOR THE PROTECTION OF WORKMEN.

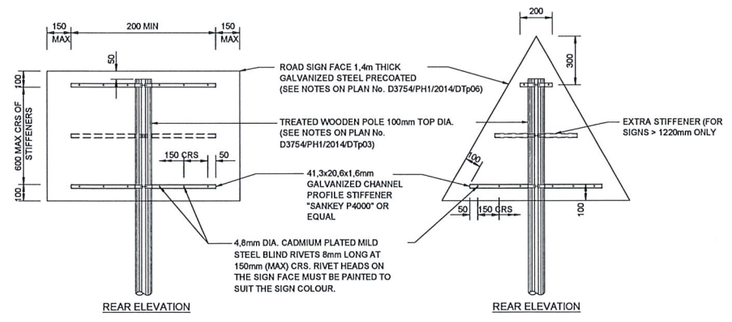
TIMBER POLE SUPPORTS
TIMBER SUPPORTS SHALL BE ROUND POLES COMPLYING WITH REQUIREMENTS OF SABS 457.
LENGTH:
WHEREVER POSSIBLE LENGTHS CORRESPONDING TO AVAILABLE NOMINAL LENGTHS SHALL BE USED
CUTTING:
WHERE CUTTING TO LENGTH AFTER PRESERVATIVE TREATMENT IS UNAVOIDABLE, ONLY ONE CUT PER POLE SHALL BE ALLOWED, THE CUT SHALL BE NEAR THE TOP END OF THE POLE AND THE EXPOSED SURFACE SHALL BE TREATED WITH TWO COATS OF THE APPLICABLE PRESERVATIVE AND THE POLE BANDED IN ACCORDANVE WITH SABS 457.
PRESERVATIVE TREATMENT:
THE POLES SHALL BE TREATED WITH A MIXTURE OF COPPER-CHROMIUM-ARSENIC COMPOUNDS COMPLYING WITH THE REQUIREMENTS OF TYPE II OF SABS 673 (HICKSONS "TANALITH C" OR EQUAL).
ERECTION:
POLES SHALL BE SELECTED FOR STRAIGHTNESS AND ERECTED AT AN ORIENTATION WICH WILL PERMIT THE SIGN FACE TO BE FASTENED IN A VERTICAL PLANE WITHOUT UNDUE DISTORTION.
BREAKAWAY HOLES:
ALL HOLES HAVING A DIAMETER > 140mm SHALL BE DRILLED WITH TWO HOLES PERPENDICULAR TO THE DIRECTION OF TRAFFIC AS SHOWN IN DETAIL "A". THE EXPOSED TIMBER SURFACES SHALL BE TREATED WITH TWO COATS OF THE APPLICABLE PRESERVATIVE

SOILCRETE FONDATIONS
SOILCRETE SHALL CONSIST OF 12 PARTS APPROVED GRANULAR SOIL OR GRAVEL MIXED WITH 1 PART PORTLAND CEMENT AND ONLY SUFFICIENT WATER TO GIVE IT A CONSISTENCY THAT WILL PERMIT THE SOILCRETE TO BE VIBRATED OR TAMPED TO EXCLUDE VOIDS. TIMBER SUPPORTS POLES SHALL BE SET VERTICAL AND FIRMLY PROPPED IN POSITION PRIOR TO PLACING OF THE SOILCRETE. PROPS SHALL REMAIN IN POSITION FOR A MINIMUM OF 12 HOURS AFTER PLACING THE SOILCRETE. THE SURFACE OF THE SOILCRETE SHALL BE NEATLY FINISHED WITH SUFFICIENT FALL TO ENSURE PROPER DRAINAGE. CONCRETE SHALL NOT BE SUBSTITUTED FOR SOILCRETE.

BOLTS, NUTS AND WASHERS
EXCEPT WHERE OTHERWISE SPECIFIED STEEL BOLTS AND NUTS SHALL CONFORM TO SABS 135 OR SABS 1143 AND ALL COMPONENTS SHALL HAVE A HOT-DIP (GALVANIZED) ZINC COATING THAT COMPLIES WITH THE REQUIREMENTS OF SABS 763 FOR COATINGS ON TYPE C1 ARTICLES

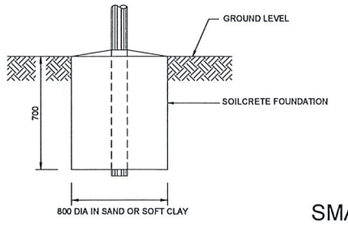
ROAD SIGN FACES
ROAD SIGN FACES SHALL BE MANUFACTURED STRICTLY IN ACCORDANCE WITH THE DETAILS SHOWN ON PLAN TYPICAL DETAIL : GROUND-MOUNTED ROAD TRAFFIC SIGNS. TRANSPORTATION AND ERECTION OF SIGN FACES SHALL BE CARRIED OUT IN SUCH A WAY THAT DAMAGE TO THE SIGN IS PREVENTED. THE LOWER EDGE OF SIGN FACES SHALL BE HORIZONTAL SIGN FACES SHALL BE CARRIED OUT IN SUCH A WAY THAT DAMAGE TO THE SIGN IS PREVENTED. THE LOWER EDGE OF SIGN FACES SHALL BE HORIZONTAL AFTER COMPLETION OF ERECTION. THE MONTH AND YEAR OF ERECTION OF THE ROAD SIGN SHALL BE INDICATED BY MEANS OF WHITE PAINT ON THE BACK OF THE SIGN IN THE BOTTOM

SUPPORTS AND FOUNDATIONS GENERAL DETAILS



REAR ELEVATION

REAR ELEVATION



TYPICAL FOUNDATION

NOTES:

1. DETAILS ON THIS DRAWING ARE APPLICABLE TO ROAD SIGNS SMALLER THAN 1,5m² REQUIRING A SINGLE SUPPORT.
2. ALL RELEVANT NOTES ON PLANS No. SHALL APPLY TO THE SIGN FACES, FASTENINGS, CORROSION PROTECTION, SUPPORTS AND FOUNDATIONS SHOWN ON THIS DRAWING ON THIS DRAWING.

SMALLER ROAD SIGNS

No	DATE	REVISION	CONSULT ENG	DR
-	-	-	-	-

DESIGNED BY	SZB RANGANA
CHECKED BY	PXA NDLOVU
DRAWN BY	TA MOBIA
CHECKED BY	TE MUVHANGO

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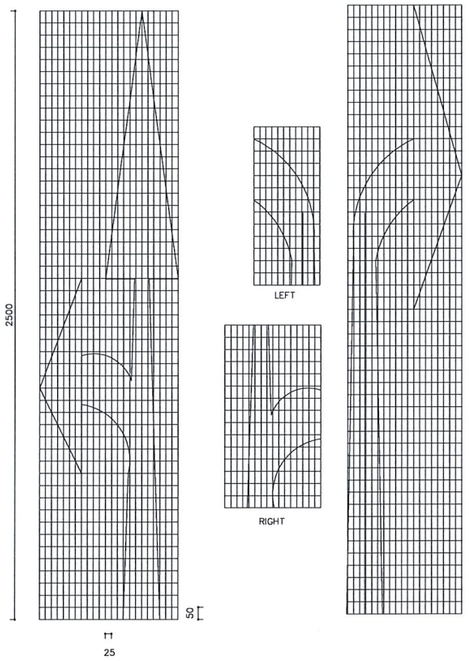
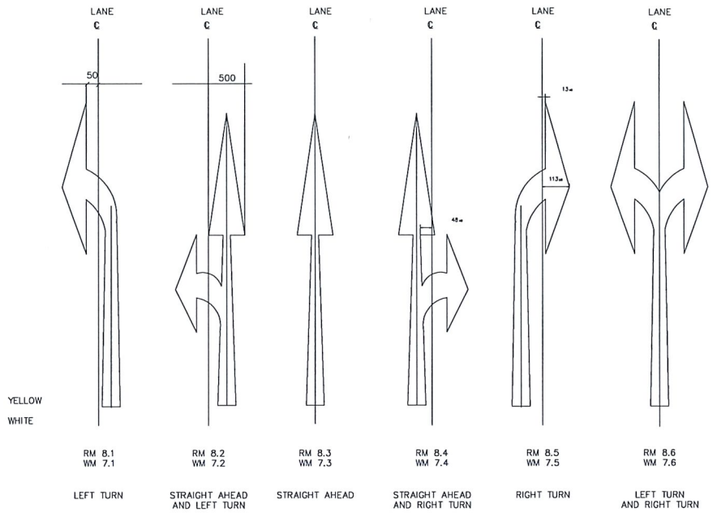
REVISION	00



MANDATORY DIRECTION ARROWS
1:20



APPLICATIONS

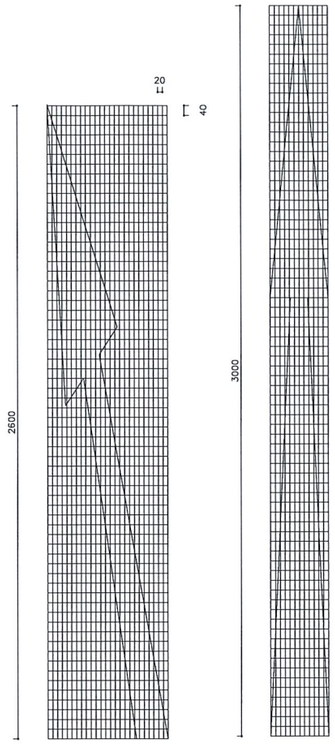
ARROW AREA/ (m)			
RM 8.1/RW 8.5 WM 7.1/WM 7.5	RM 8.2/RW 8.4 WM 7.2/WM 7.4	RM 8.3 WM 7.3	RM 8.6 WM 7.6
1.45	1.78	1.32	2.12

NOTES: MANDATORY DIRECTION ARROWS

1. THIS ARROWS MAY BE USED IN LANES TO INDICATE THAT DRIVERS SHALL PROCEED ONLY IN THE DIRECTION OR DIRECTIONS SHOWN. THEY SHOULD ONLY BE USED IF THE JUNCTION CONCERNED REQUIRE TURNING MOVEMENT CONTROL BY LANE.

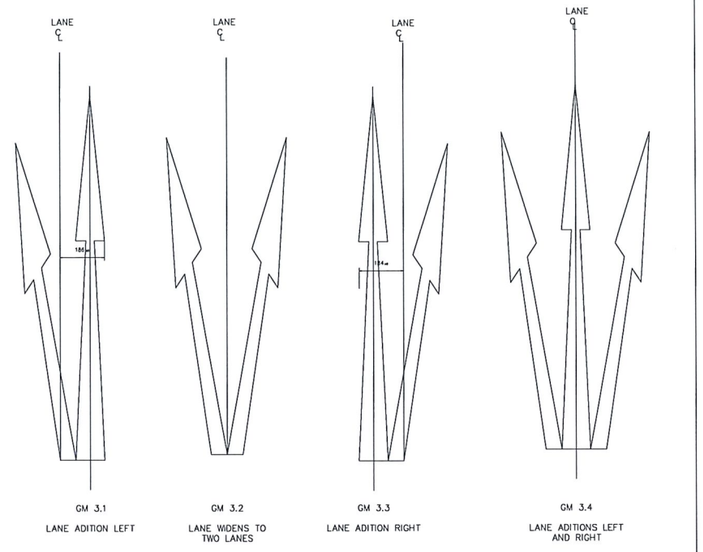
2. THE FINAL ARROW NEAREST TO THE POINT OF TURN OR STRAIGHT ON MOVEMENT SHALL BE YELLOW. ANY ARROWS MARKED IN ADVANCE OF THIS POINT TO WARN DRIVERS OF MANDATORY MOVEMENT AHEAD SHALL BE WHITE.

3. A MANDATORY OR WARNING DIRECTION ARROW SHALL NOT BE USED IN ADVANCE OF A WIDENING OF THE ROADWAY TO A GREATER NUMBER OF LANES. THIS SHALL BE INDICATED IF NECCESSARY, BY USING FURCATION ARROWS.



FURCATION ARROWS
1:25

ARROW AREA/ (m)		
GM 3.1/GM 3.3	GM 3.2	GM 3.4
3.89	3.82	5.80



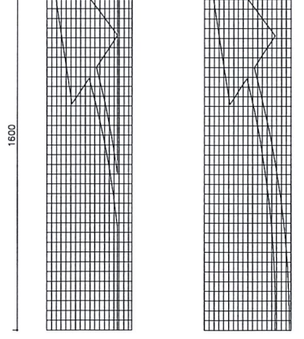
APPLICATIONS
1:50

NOTES: FURCATION ARROWS

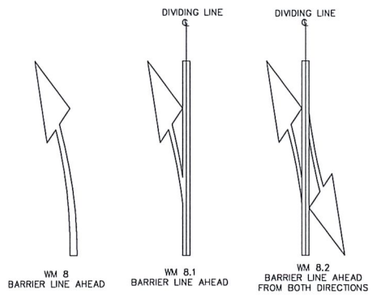
1. THESE ARROWS MAY BE USED TO INDICATE THAT THE NUMBER OF LANES IS INCREASING AHEAD. ONLY ONE SET OF ARROWS SHOULD BE USED UNLESS A LEFT AND RIGHT TURN LANE ARE ADDED TO MULTI-LANE ROADWAY AT THE SAME POINT WHERE TWO SETS MAY BE USED.

2. DIRECTION ARROWS MAY NOT BE USED TO INDICATE THE ADDITIONS OF LANES AHEAD.

3. AS A GENERAL RULE FURCATION ARROWS SHOULD BE LOCATED TWO TO THREE MARKING MODULES BEFORE THE START OF THE LANE GENERATING TAPER OR CURVE.



BARRIER LINE AHEAD ARROWS
1:25



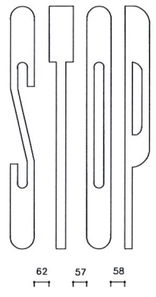
APPLICATIONS
1:50

NOTES: BARRIER LINE AHEAD ARROWS

1. THESE ARROWS SHOULD BE USED IN MULTIPLES OF THREE (AT LEAST) IN ADVANCE IN THE START OF A SECTION OF NO OVERTAKING LINE, NO CROSSING LINE OR PAINTED ISLAND WHEN SUCH BARRIER LINES REPLACES A DIVIDING LINE.

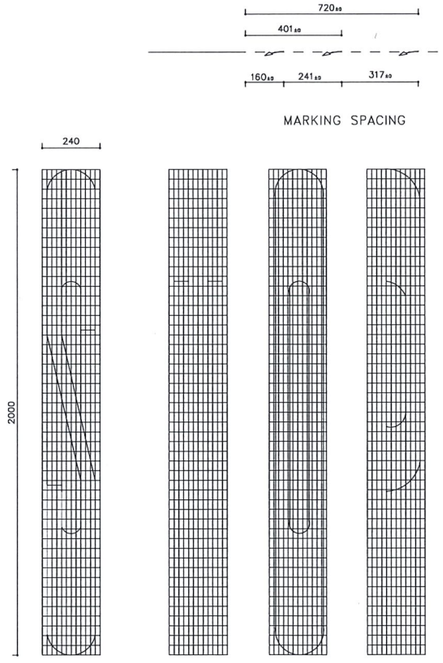
2. THE ARROWS MAY BE MARKED ON TOP OF THE EXISTING DIVIDING LINE MARKINGS (IF THE EXISTING LINE IS A CENTRE LINE TO A 12m OR 7.2m MODULE THE POINT OF ARROW SHOULD BE LINED UP WITH THE FORWARD END OF THE LINE).

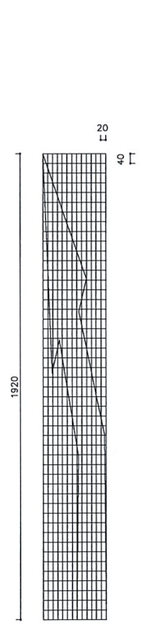
3. WHEN OVERTAKING SECTIONS ARE INTERSPERSED WITH NO OVERTAKING SECTIONS AND ARE SHORT IN LENGTH MARKING WM 8.2 MAY BE USED AT THE CENTRE OF THE OVERTAKING SECTION.

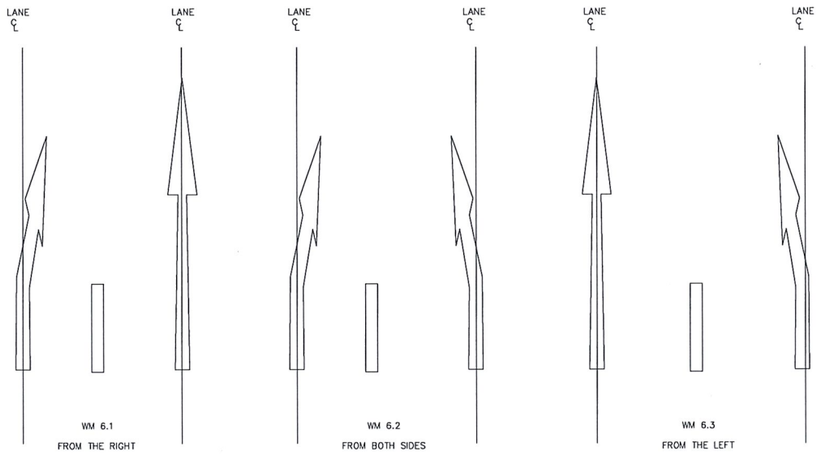


GM 7 STOP
1:50

GM4.1
1:50







APPLICATIONS
1:50

NOTES: LANE REDUCTION ARROWS

1. IT IS RECOMMENDED THAT THE THREE SETS OF ARROWS BE USED IN HIGH SPEED ROADS, SPACED AT FOUR MODULE INTERVALS BEFORE THE END OF THE LANE LINE. SINGLE ARROWS MAY BE USED IN LOWER SPEED ROADS.

2. THE BEND ARROWS MAY BE USED IN ADDITION TO THE THREE-ARROW SETS ALONG THE LENGHT OF THE LANE REDUCTION TAPER.

ARROW AREA/ (m)	
WM 1.1/WM 6.3	WM 6.2
6.56	6.20

No.	DATE	REVISION	CONSULT ENG.	DIR.
-	-	-	-	-

DESIGNED BY	SZB RANGANA
CHECKED BY	PXA NDLOVU
DRAWN BY	TA MOBIA
CHECKED BY	TE MUVHANGO

MAKHADO MUNICIPALITY
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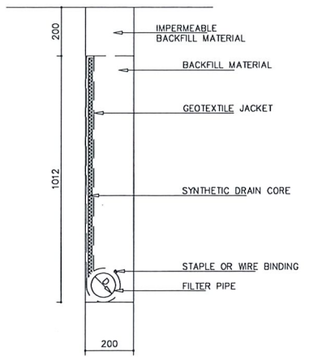


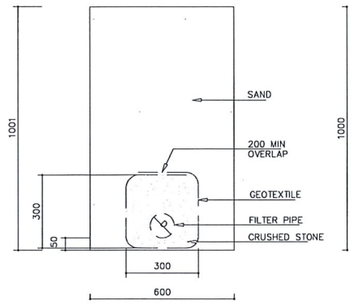
TYPE E
GEOCOMPOSITE DRAIN

NOTES:

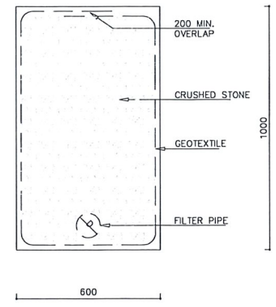
1. DEPTH OF GEOCOMPOSITE DRAIN TO BE 500, 700, 1000 OR 1400 AS SPECIFIED.
2. GEOTEXTILE JACKET TO BE GRADE 1 MATERIAL UNLESS OTHERWISE SPECIFIED.
3. FILTER PIPE TO BE APPROVED PERFORATED, SLOTTED OR GEOPIPE.
4. SYNTHETIC DRAIN CORE TO BE HDPE FLOWNET OR GEONET.
5. BACKFILL MATERIAL TO BE EXCAVATED MATERIAL OR SELECTED FREE-DRAINING MATERIAL AS INSTRUCTED BY THE ENGINEER.
6. IF EXCAVATED BACKFILL MATERIAL USED, GEOCOMPOSITE DRAIN TO BE SET AGAINST UPSTREAM FACE. IF SELECTED BACKFILL MATERIAL USED, GEOCOMPOSITE DRAIN TO BE SET AGAINST DOWNSTREAM FACE.
7. FILTER PIPE TO BE COVERED BY AT LEAST 2 x D OF SELECTED FREE-DRAINING MATERIAL BEFORE COMMENCING COMPACTION.
8. STAPLES OR 16 GAUGE BINDING WIRE TIES TO GEOTEXTILE FLAPS TO BE AT 200 CENTRES MINIMUM.

H	D
500	65 min
700	100
1000	100 min
1400	150

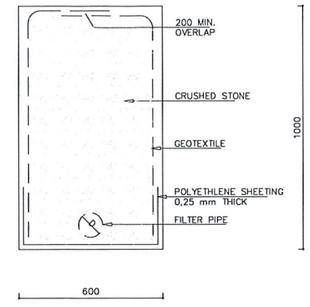
GEOCOMPOSITE DRAIN SIZES



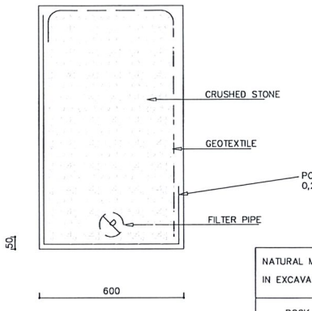
TYPE A
GRANULAR OR SAND



TYPE B
GEOTEXTILE FILTER



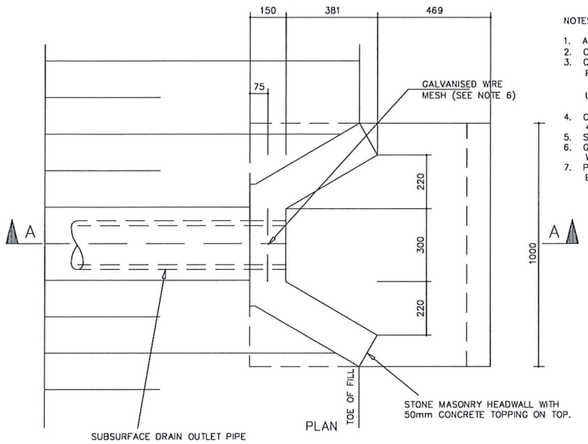
TYPE C
IMPERMEABLE MEMBRANE



TYPE D
IMPERMEABLE MEMBRANE
(FOR TOP OF CUT ONLY)

NATURAL MATERIAL IN EXCAVATION	SUBSOIL DRAIN TYPE	NATURAL PERMEABLE MATERIAL	
		CRUSHED STONE	SAND
ROCK	B or C	COARSE-GRADE OR 19mm	–
SAND	B or C	COARSE-GRADE OR 13,2mm	–
SOIL	A	MEDIUM – GRADE OR 9,5 mm	MEDIUM – GRADE (>2,0mm)
CLAY	A	MEDIUM – GRADE OR 9,5 mm	FINE – GRADE (>0,425mm)

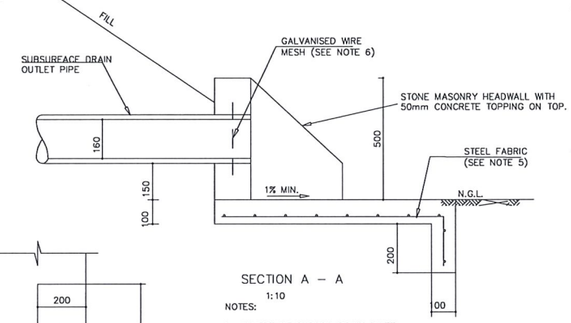
SUBSOIL DRAINS
N.T.S.



OUTLET STRUCTURE
1:10

NOTES:

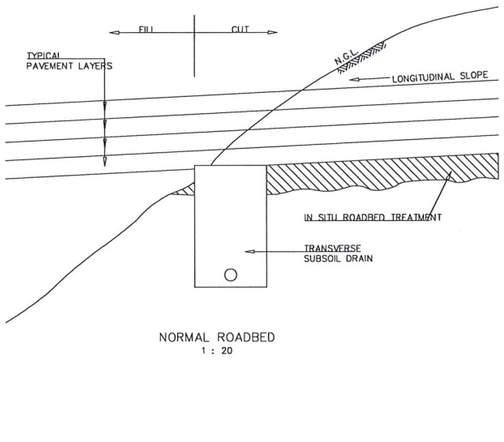
1. ALL DIMENSIONS GIVEN ARE IN MILLIMETRES.
2. CONCRETE TO BE CLASS 20/19.
3. CONCRETE FINISHES TO BE :
   FORMED SURFACES – CLASS F1 (CONCEALED)
   – CLASS F2 (EXPOSED)
   UNFORMED SURFACES – CLASS U1 (CONCEALED)
   – CLASS U2 (EXPOSED)
4. CONCRETE COVER TO REINFORCEMENT TO BE 40 mm MINIMUM.
5. STEEL FABRIC TO BE REF 311.
6. GALVANISED WIRE MESH TO BE 200 x 200 WITH MESH SIZE 10 x 10 x 2,5 mm DIAMETER.
7. POSITION OF END STRUCTURE TO BE DETERMINED BY THE ENGINEER.



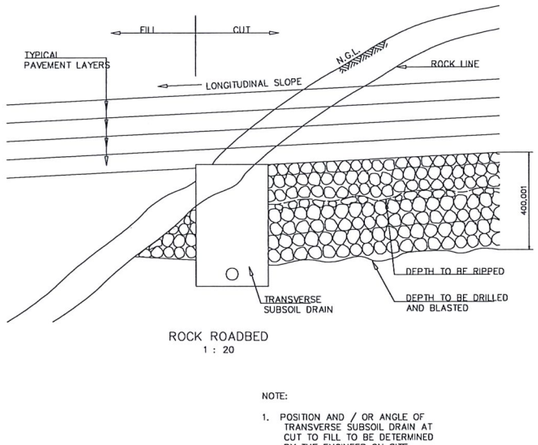
SECTION A – A
1:10

NOTES:

1. INVERT OF SUBSOIL DRAIN INLET (RODDING/INSPECTION POINT) FROM CATCHPIT TO BE ABOVE SOFFIT OF LOWEST STORMWATER CULVERT.
2. INVERT OF SUBSOIL DRAIN OUTLET INTO CATCHPIT TO BE ABOVE CENTRE OF LOWEST STORMWATER CULVERT.
3. END CAP TO BE COMPATIBLE WITH FILTER PIPE.



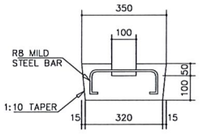
NORMAL ROADBED
1 : 20



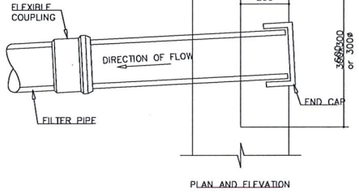
ROCK ROADBED
1 : 20

NOTE:

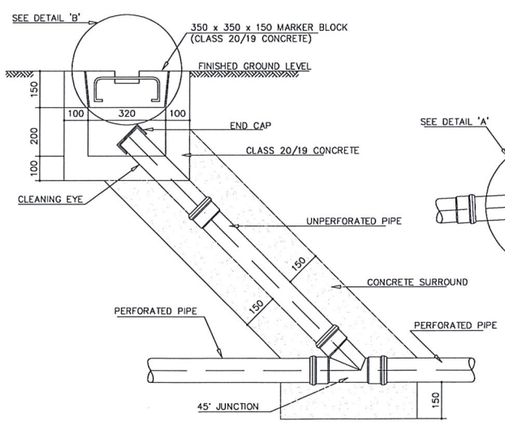
1. POSITION AND / OR ANGLE OF TRANSVERSE SUBSOIL DRAIN AT CUT TO FILL TO BE DETERMINED BY THE ENGINEER ON SITE.
2. TRANSVERSE SUBSOIL DRAIN PIPE TO BE JOINED TO LONGITUDINAL SUBSOIL DRAIN PIPE USING A MATCHING JUNCTION FITTING.
3. SUBSOIL DRAIN TO TERMINATE AT DEDICATED OUTLET STRUCTURE OR STORMWATER DRAINAGE SYSTEM AS INDICATED.



DETAIL 'B'

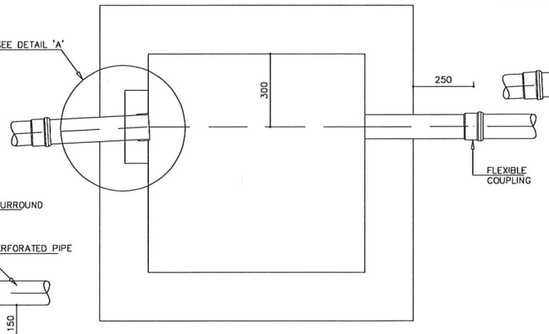


PLAN AND ELEVATION

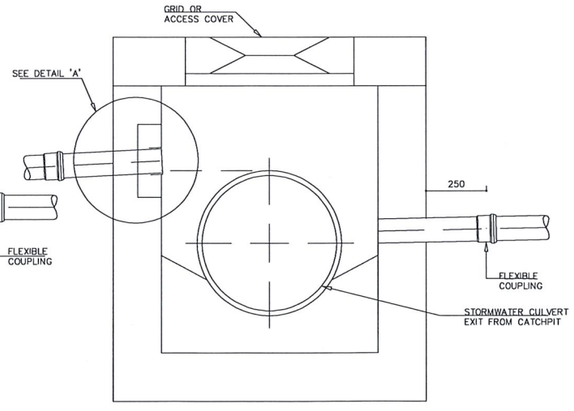


CLEANING EYE

DETAIL 'A'



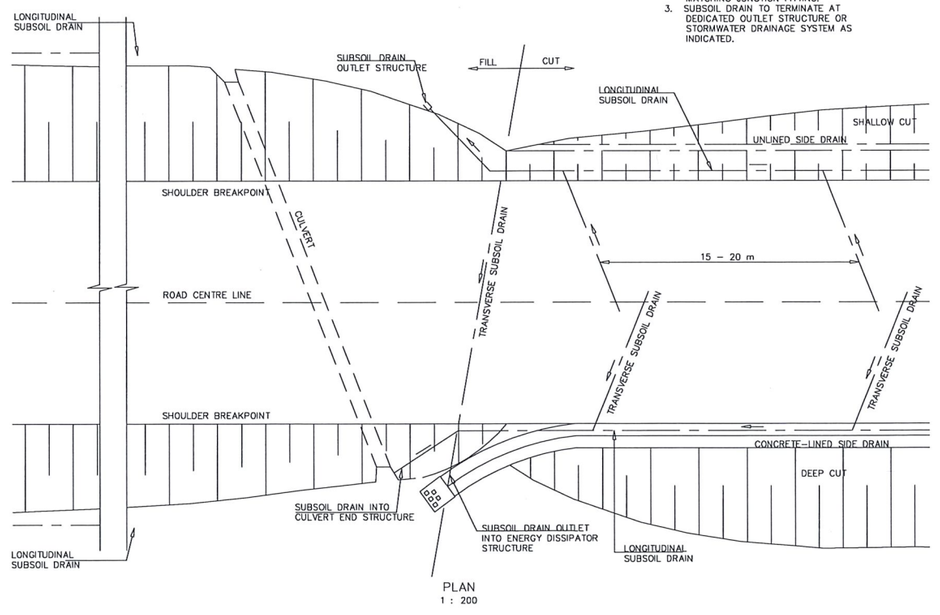
DIAGRAMMATIC PLAN



DIAGRAMMATIC SECTION

SUBSOIL DRAIN INLET AND OUTLET AT TYPICAL STORMWATER CATCHPIT
N.T.S.

SUBSOIL DRAIN INLETS AND OUTLETS



PLAN
1 : 200

SUBSOIL DRAINS AT CUT TO FILL
N.T.S.

No.	DATE	REVISION	CONSULT. ENG.	DR.
-	-	-	-	-

DESIGNED BY	SZB RANGANA
CHECKED BY	PXA NDLOVU
DRAWN BY	TA MOBIA
CHECKED BY	TE MUVHANGO

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MEMBER OF CESA

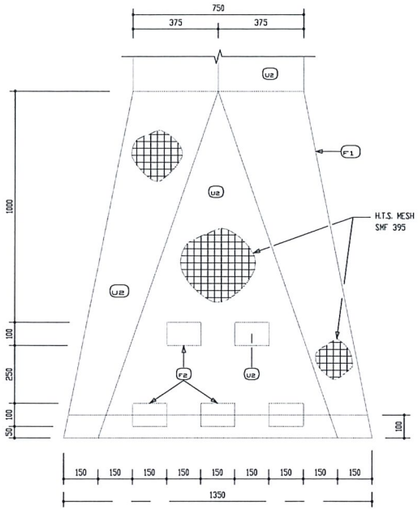
PROJECT
CONSTRUCTION OF LUTANANDWA ACCESS ROAD AND BRIDGE - PHASE 1
BID NO.: 35 OF 2022

TITLE
STANDARD DRAWING
TYPICAL SUB-SURFACE DRAINAGE DETAILS

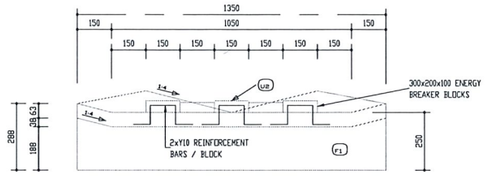
ISSUED FOR TENDER
For Makhado Municipality 20_/_/_
For Mont Consulting Engineers 20_/_/_

DRAWING No. MONT/MAKH/RDS/01/2019/TPC06

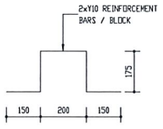
SHEET 01 OF 01
SCALE AS SHOWN
PAPER SIZE A1
REVISION 00



PLAN OF ENERGY BREAKER
SCALE 1:10

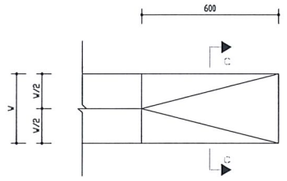


FRONT ELEVATION OF ENERGY BREAKER
SCALE 1:10



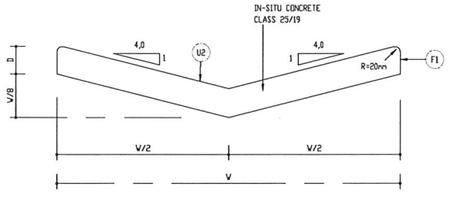
FIXING BAR
SCALE 1:10

DETAIL OF ENERGY BREAKER SYSTEM AT DISCHARGE POINT OF TYPE "E" CONCRETE SIDE DRAIN

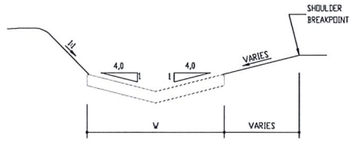


BEGINNING OF TYPE "E" CONCRETE DRAIN
SCALE : SCHEMATIC

SECTION C–C
SCALE 1:50



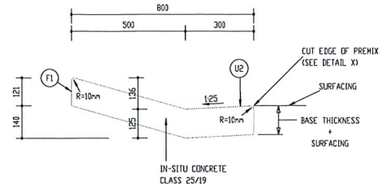
TYPE "E" – CROSS SECTION OF CONCRETE CHANNEL IN OPEN DRAINS
SCALE : SCHEMATIC



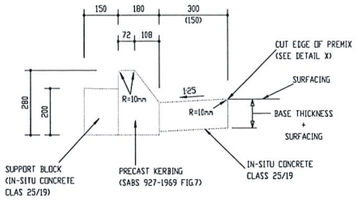
POSITION OF TYPE "E" CONCRETE DRAIN IN SHALLOW CUT
SCALE : SCHEMATIC

DIMENSIONS OF TYPE "E" CONCRETE CHANNELS

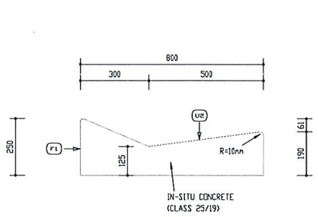
CASE(n)	V	V/2	V/8	D	V/8+D	VOLUME m3/m
1	1000	500	125	125	250	0,1250
2	1500	750	188	125	313	0.1875
3	2000	1000	250	150	400	0.3000
4	2500	1250	313	150	463	0.3750



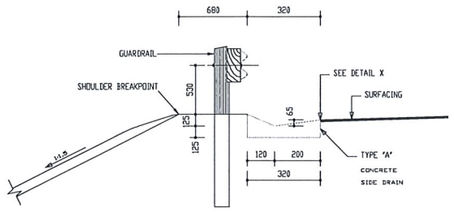
TYPE "C" – CROSS SECTION OF MOUNTABLE KERB AT RURAL INTERSECTIONS.
SCALE 1:10



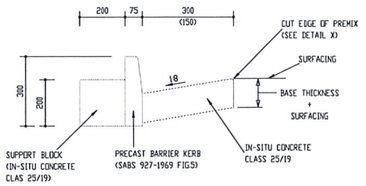
TYPE "B" – CROSS SECTION OF SEMI MOUNTABLE KERB AT INTERSECTIONS.
SCALE 1:10



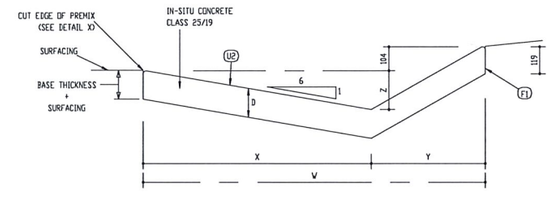
TYPE "A1" CROSS SECTION OF CONCRETE SIDE DRAIN
SCALE 1:10



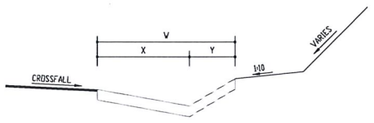
TYPE "A" – CONCRETE SIDE DRAIN IN FILLS
SCALE 1:25



TYPE "B1" – SECTION THROUGH BARRIER KERB (FIG 5)
SCALE 1:10



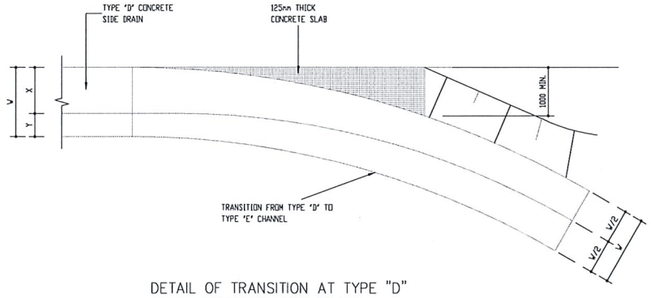
TYPE "D" – CROSS SECTION CONCRETE SIDE DRAIN IN CUTTINGS
SCALE : SCHEMATIC



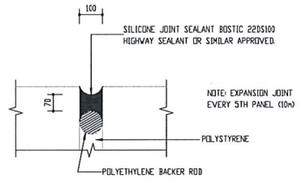
POSITION OF TYPE "D" CONCRETE SIDE DRAIN
SCALE : SCHEMATIC

DIMENSIONS OF TYPE "D" CONCRETE CHANNELS

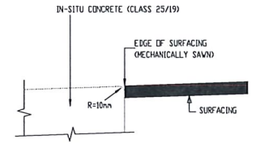
CASE(n)	V	X	Y	Z	D	VOLUME m3/m
1	1000	670	330	110	125	0,1250
2	1500	1000	500	170	125	0.1875
3	2000	1330	670	220	150	0.3000
4	2500	1670	830	280	150	0.3750



DETAIL OF TRANSITION AT TYPE "D" CONCRETE SIDE DRAIN
SCALE : SCHEMATIC



EXPANSION JOINT
SCALE : SCHEMATIC



DETAIL X
SCALE 1:5

NOTES

1. ALL CONCRETE CHANNELS AND OTHER DRAINAGE STRUCTURES ON THIS PLAN TO BE CAST USING CLASS 25/19 CONCRETE.
2. ALL IN-SITU CONCRETE SIDE DRAINS & CHANNELLING TO BE CASTED IN ALTERNATIVE LENGHTS 2.0 m WITH EXPANSION JOINTS EVERY 5TH PANEL (10m)
3. ALL EXPOSED CORNERS MUST BE ROUNDED OFF TO A RADIUS OF 10 mm
4. THE CLASS OF SURFACE FINISH IS INDICATED AS 'F1' OR 'U2'
5. V MIN = 150mm (PREFERRED = 300mm)

No	DATE	REVISION	CONSULT. ENG.	DIR.
-	-	-	-	-

DESIGNED BY	SZB RANGANA
CHECKED BY	PXA NDLOVU
DRAWN BY	TA MOSIA
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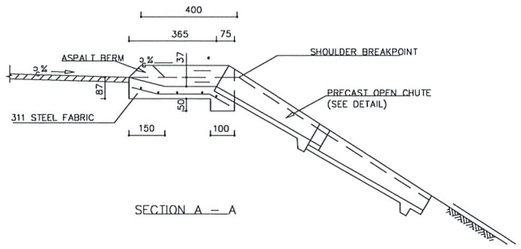
PROJECT
CONSTRUCTION OF LUTANANDWA ACCESS ROAD AND BRIDGE - PHASE 1
BID NO.: 35 OF 2022

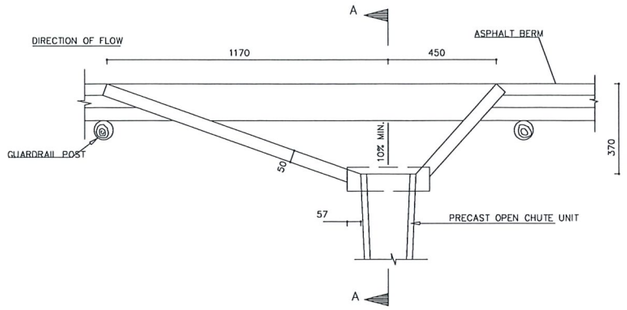
TITLE
STANDARD DRAWING
TYPICAL SURFACE SIDE DRAINAGE DETAILS

ISSUED FOR TENDER
For Makhado Municipality 20__/__/__
For Mont Consulting Engineers 20__/__/__

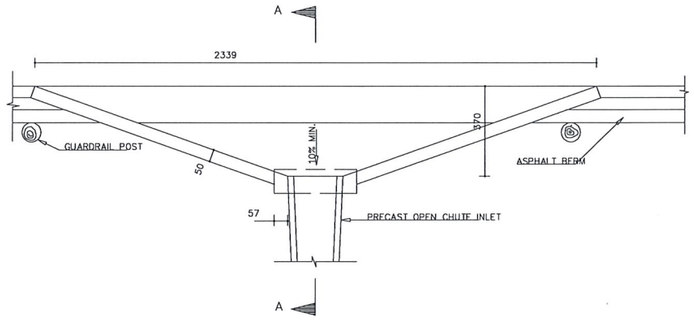
SHEET 01 OF 01
SCALE AS SHOWN
PAPER SIZE A1
DRAWING No. MONT/MAKH/RDS/01/2019/TPC07
REVISION 00



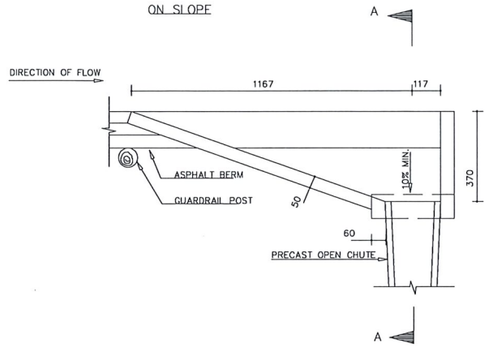
SECTION A – A



ON SLOPE



AT LOW POINT

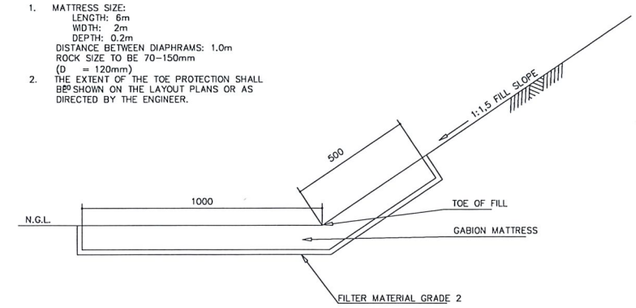


AT BERM END

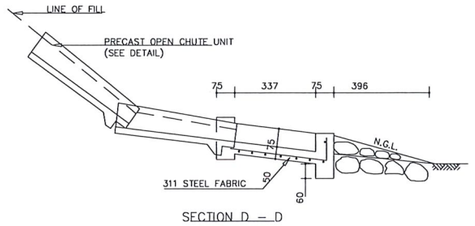
OPEN CHUTE INLETS
1 : 20

NOTES:

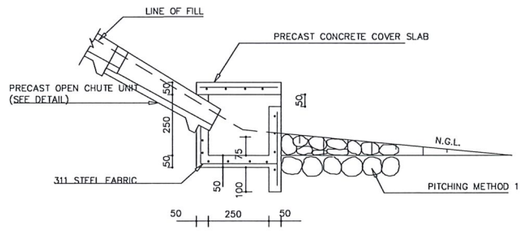
1. MATTRESS SIZE:
   LENGTH: 6m
   WIDTH: 2m
   DEPTH: 0.2m
   DISTANCE BETWEEN DIAPHRAMS: 1.0m
   ROCK SIZE TO BE 70–150mm
   (D = 120mm)
2. THE EXTENT OF THE TOE PROTECTION SHALL BE SHOWN ON THE LAYOUT PLANS OR AS DIRECTED BY THE ENGINEER.



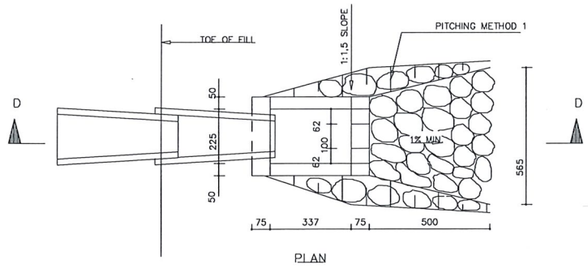
TOE PROTECTION
NTS



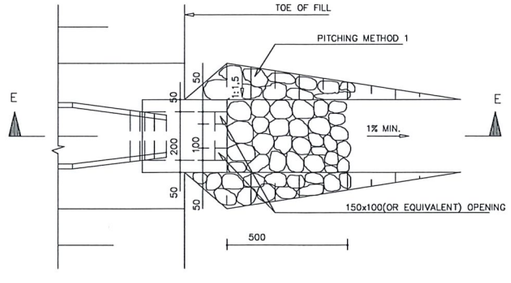
SECTION D – D



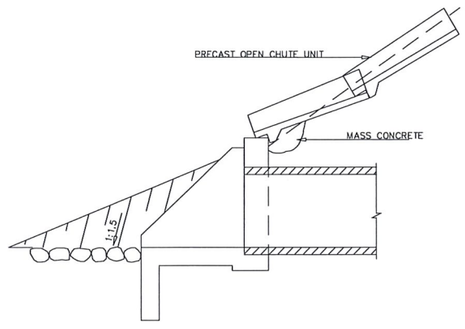
SECTION F – F



PLAN
TYPE A
1 : 20

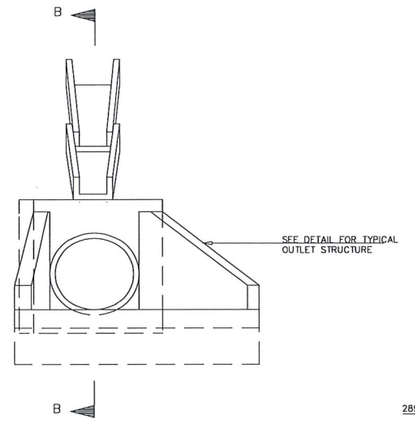


PLAN
TYPE B
1 : 20



SECTION B – B

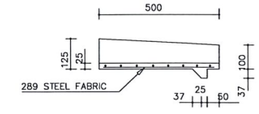
TYPE C
1 : 20



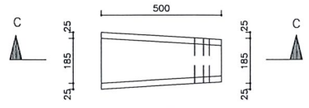
ELEVATION

NOTES:

1. ALL DIMENSIONS GIVEN ARE IN MILLIMETRES.
2. CONCRETE CLASS TO BE:
   25/19 FOR CHUTE INLETS AND OUTLETS
   25/19 FOR PRECAST OPEN CHUTE UNITS
3. CONCRETE FINISHES TO BE:
   FORMED SURFACES – CLASS F1 (CONCEALED)
   – CLASS F2 (EXPOSED)
   UNFORMED SURFACES – CLASS U1 (CONCEALED)
   – CLASS U2 (EXPOSED)
4. CONCRETE COVER TO REINFORCEMENT TO BE:
   40 MINIMUM FOR OPEN CHUTE OUTLETS
   25 FOR PRECAST OPEN CHUTE UNITS.
5. THE ENGINEER MAY VARY THE TYPE AND/OR EXTENT OF PROTECTION TO SUIT SITE CONDITIONS.
6. TYPE A CHUTE OUTLET TO BE USED WHEN THE FILL HEIGHT IS LESS THAN 5M AND/OR THE NATURAL GROUND MATERIAL IS NOT ERODABLE OR AS DECIDED BY THE ENGINEER.
7. TYPE B CHUTE OUTLET TO BE USED WHEN THE FILL HEIGHT EXCEEDS 5m AND/OR THE NATURAL GROUND MATERIAL IS ERODABLE OR AS DECIDED BY THE ENGINEER.
8. POSITIONS OF CHUTES ARE GIVEN ON THE LAYOUT DRAWINGS.



SECTION C – C



PLAN

PRECAST OPEN CHUTE
1 : 20

OPEN CHUTE OUTLETS

No.	DATE	REVISION	CONSULT ENG.	DR.
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-

DESIGNED BY	SZB RANGANA
CHECKED BY	PXA NDLOVU
DRAWN BY	TA MODIA
CHECKED BY	TE MUVHANGO

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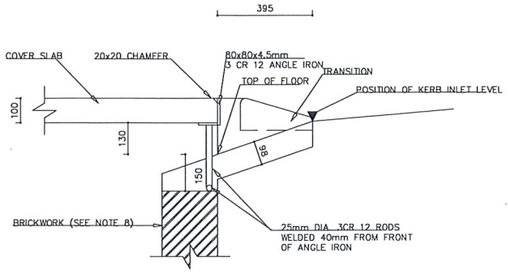
MEMBER OF CESA

PROJECT
CONSTRUCTION OF LUTANANDWA ACCESS ROAD AND BRIDGE - PHASE 1
BID NO.: 35 OF 2022

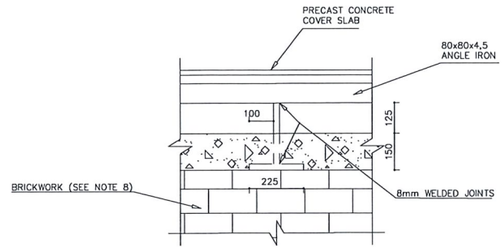
TITLE
STANDARD DRAWING
TYPICAL CHUTE DETAILS

ISSUED FOR TENDER
For Makhado Municipality 20_/_/_
For Mont Consulting Engineers 20_/_/_

DRAWING No.	MONT/MAKH/RDS/01/2019/TPC08
SHEET 01 OF 01	
SCALE	AS SHOWN
PAPER SIZE	A1
REVISION	00



DETAIL X
1:10



DETAIL Z
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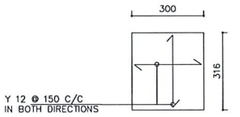
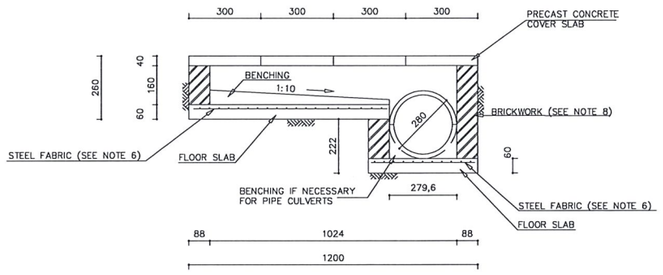
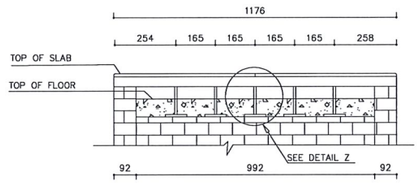


REINFORCEMENT

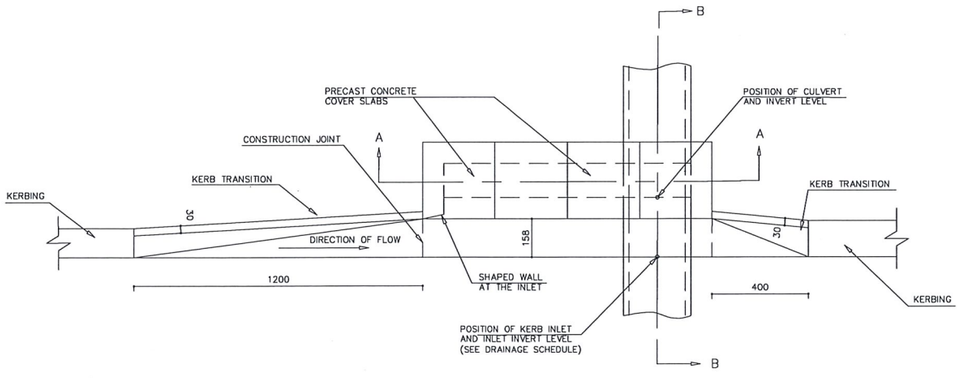
PRECAST CONCRETE
COVER SLAB
1:25



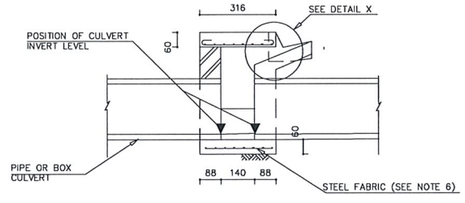
SECTION A–A
1:25



ELEVATION
1:25



PLAN
1:25



SECTION B–B
1:25

NOTES:
1. ALL DIMENSIONS GIVEN ARE IN MILLIMETRES.
2. ALL EXPOSED SHARP CORNERS OF CONCRETE TO HAVE 20 x 20 CHAMFERS.
3. CONCRETE TO BE:
   CLASS 30/19 FOR COVER SLAB
   CLASS 20/19 FOR BENCHING
   CLASS 25/19 FOR BALANCE OF STRUCTURE
4. CONCRETE FINISHES TO BE:
   FORMED SURFACES – CLASS F1 (CONCEALED)
   – CLASS F2 (EXPOSED)
   UNFORMED SURFACES – CLASS U1 (CONCEALED)
   – CLASS U2 (EXPOSED)
5. CONCRETE COVER TO REINFORCEMENT TO BE 40 MIN.
6. STEEL FABRIC TO BE :
   REF. 311 FOR KERB INLET FLOOR SLAB
   REF. 617 FOR CATCHPIT FLOOR SLAB
7. SUPPORTING STEELWORK TO BE 3CR12.
8. BRICKS TO BE BURNT CLAY MASONARY UNITS CONFORMING TO SABS 227.
9. KERB INLET STRUCTURE TO BE CONSTRUCTED ALONG SAME GRADIENT AS ROAD.
10. POSITION OF KERB INLET AND INLET INVERT LEVEL GIVEN IN THE DRAINAGE SCHEDULE.
11. BRICKWORK:
    WHERE TOTAL DEPTH (INVERT LEVEL TO FINISHED GROUND LEVEL) EXCEEDS 2,0m BRICKWORK TO BE 345mm THICK BELOW 2,0m DEPTH.
12. INLET TRANSITION TO BE:
    3000 FOR KERB INLETS ON SLOPE
    2000 FOR KERB INLETS AT LOW POINT
    END TRANSITION TO BE:
    1000 FOR KERB INLETS ON SLOPE
    2000 FOR KERB INLETS AT LOW POINT

KERB INLET – TYPE A

N/o	DATE	REVISION	CONSULT. ENG.	D/R.
-	-	-	-	-

DESIGNED BY	SZB RANGANA
CHECKED BY	PXA NDLOVU
DRAWN BY	TA MOSIA
CHECKED BY	TE MUVHANGO

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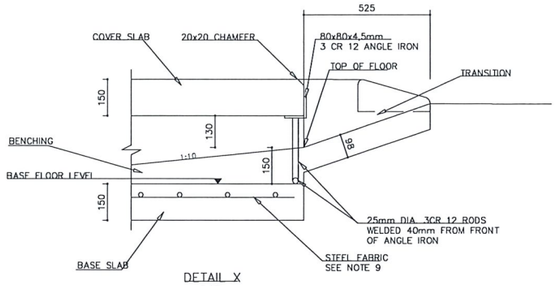
PROJECT
CONSTRUCTION OF LUTANANDWA ACCESS ROAD AND BRIDGE - PHASE 1
BID NO.: 35 OF 2022

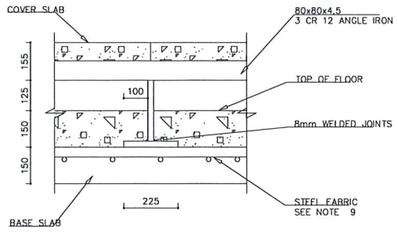
TITLE
STANDARD DRAWING
TYPICAL TYPE 'A' KERB INLET DETAILS

ISSUED FOR TENDER
For: Makhado Municipality 20_/_/_
For: Mont Consulting Engineers 20_/_/_

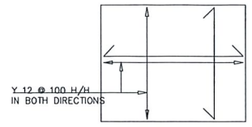
SHEET 01 OF 01
SCALE AS SHOWN
PAPER SIZE A1
DRAWING No. MONT/MAKH/RDS/01/2019/TPC09
REVISION 00



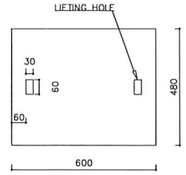
DETAIL X
1:10



DETAIL Z
1:10

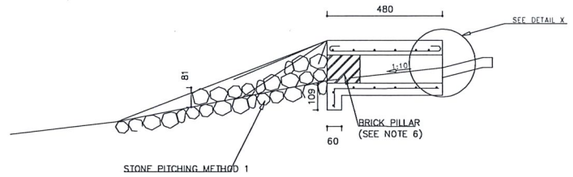


SLAB REINFORCEMENT DETAIL
1:25

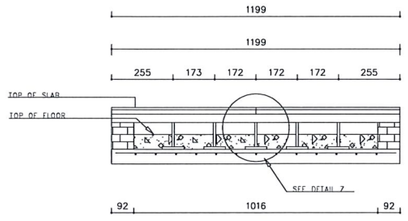


COVER SLAB
1:25

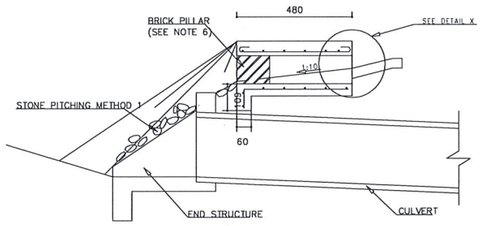
NOTES:
1. ALL DIMENSIONS GIVEN ARE IN MILLIMETRES.
2. ALL EXPOSED SHARP CORNERS OF CONCRETE TO HAVE 20x20 CHAMFERS.
3. CONCRETE CLASS:
   30/19 FOR COVER SLAB
   25/19 FOR BALANCE OF STRUCTURE
   20/19 FOR BENCHING
4. CONCRETE COVER TO REINFORCEMENT TO BE 40 MINIMUM.NOTE RELATIVE POSITION OF REINFORCEMENT IN SLAB.
5. CONCRETE FINISHES TO BE:
   FORMED SURFACES – CLASS F1 (CONCEALED)
   – CLASS F2 (EXPOSED)
   UNFORMED SURFACES – CLASS U2 (EXPOSED)
6. BRICKS TO BE BURNT CLAY MASONARY UNITS CONFORMING TO SABS 227.
7. KERB INLET STRUCTURE TO BE CONSTRUCTED ALONG SAME GRADIENT AS ROAD.
8. POSITION OF KERB INLET AND INLET INVERT LEVEL GIVEN IN THE DRAINAGE SCHEDULE.
9. STEEL FABRIC TO BE REF.617.
10. INLET TRANSITION TO BE:
    3000 FOR KERB INLETS ON SLOPE
    2000 FOR KERB INLETS AT LOW POINT
    END TRANSITION TO BE:
    1000 FOR KERB INLETS ON SLOPE
    2000 FOR KERB INLETS AT LOW POINT



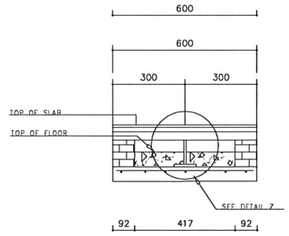
SECTION C–C
1:25



ELEVATION
1:25

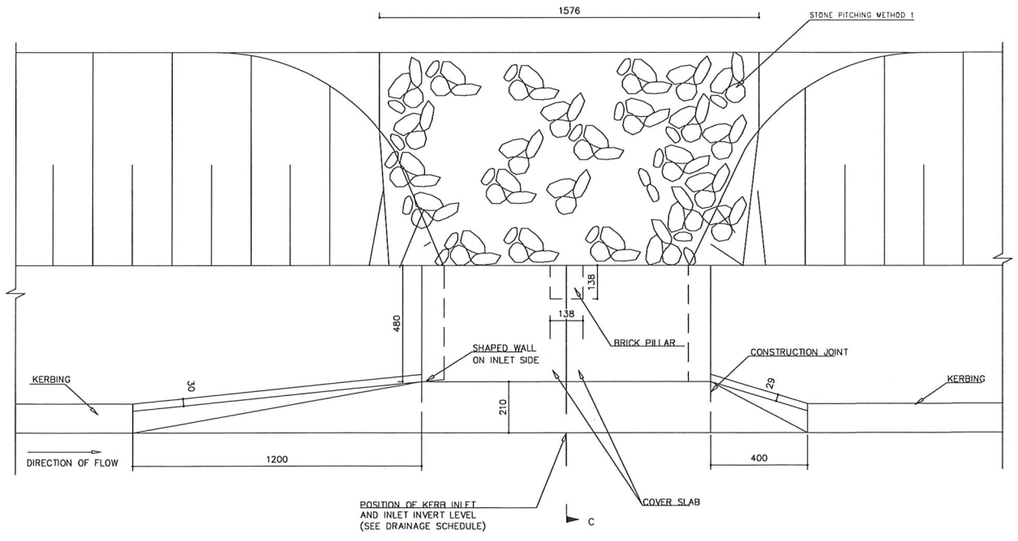


SECTION C–C
(FOR OUTLET OVER THE CULVERT END STRUCTURE)
1:10



ELEVATION
1:25

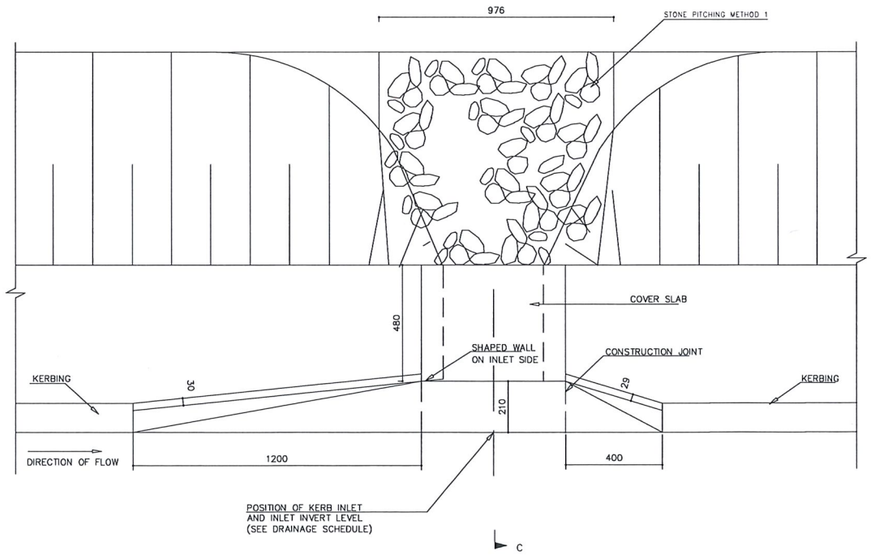
C



C

PLAN
(FOR STRUCTURE SIZE 3000)
1:25

C



C

PLAN
(FOR STRUCTURE SIZE 1500)
1:25

KERB INLET–TYPE B

No.	DATE	REVISION	CONSULT ENG.	DR.
-	-	-	-	-

DESIGNED BY	SZB RANGANA
CHECKED BY	PXA NDLOVU
DRAWN BY	TA MOSIA
CHECKED BY	TE MUVHANGO

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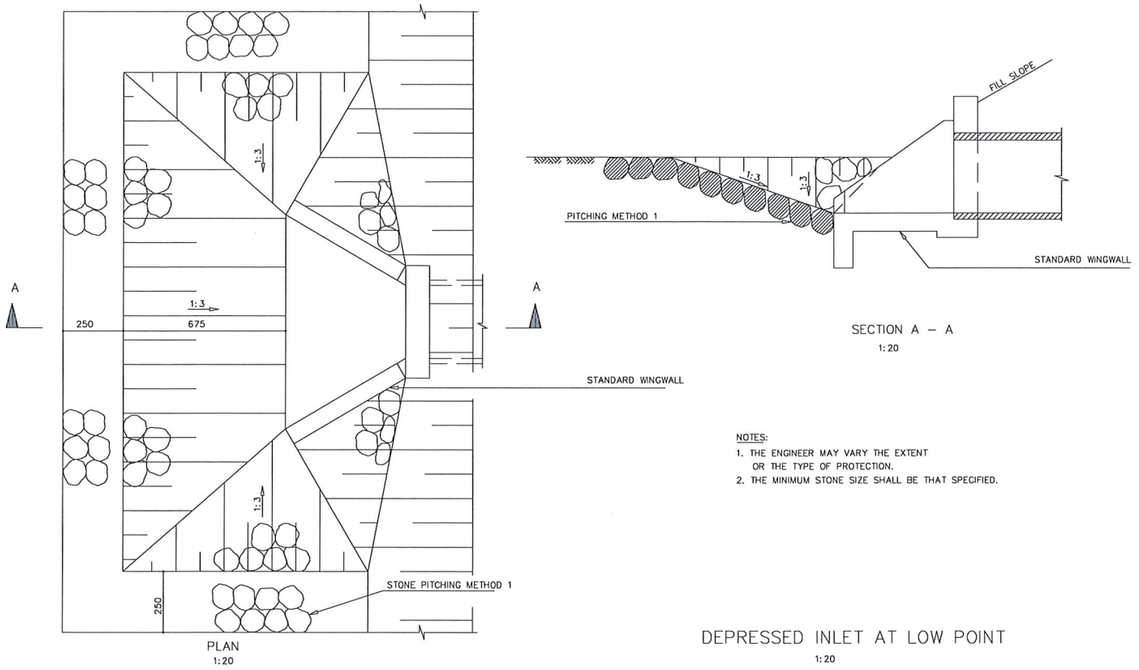
PROJECT
CONSTRUCTION OF LUTANANDWA ACCESS ROAD AND BRIDGE - PHASE 1
BID NO.: 35 OF 2022

TITLE
STANDARD DRAWING
TYPICAL TYPE 'B' KERB INLET DETAILS

ISSUED FOR TENDER
For Makhado Municipality 20__/__/__
For Mont Consulting Engineers 20__/__/__

SHEET 11 OF 21
SCALE: AS SHOWN
PAPER SIZE: A1
DRAWING No.: MONT/MAKH/RDS/01/2019/TPC10
REVISION: 00

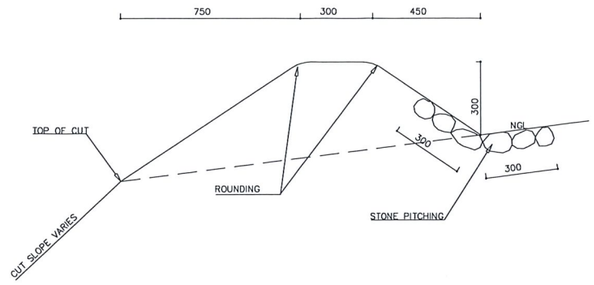


PLAN
1:20

SECTION A – A
1:20

DEPRESSED INLET AT LOW POINT
1:20

NOTES:
1. THE ENGINEER MAY VARY THE EXTENT OR THE TYPE OF PROTECTION.
2. THE MINIMUM STONE SIZE SHALL BE THAT SPECIFIED.



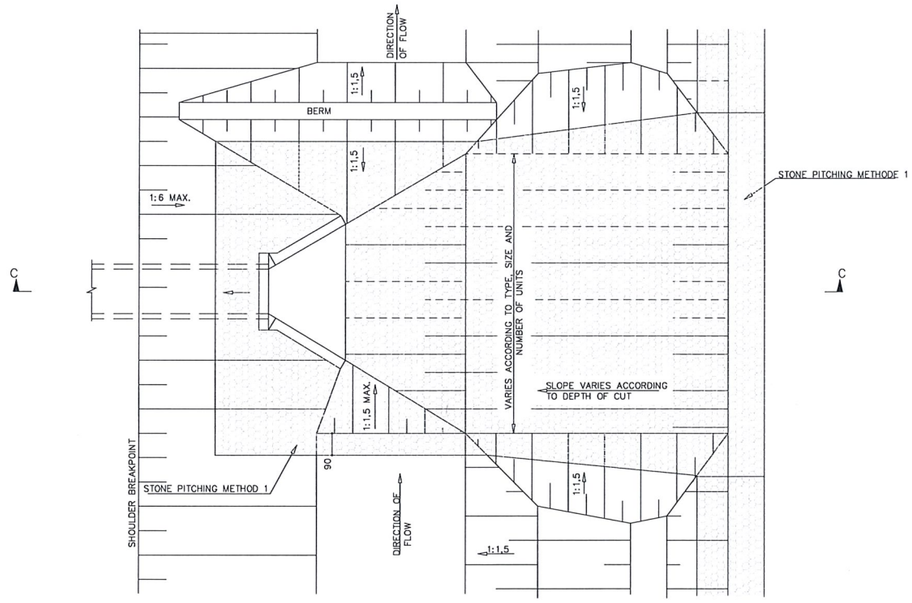
TYPE 'A' CATCHWATER BANK

NOTES:
1. CATCHWATER BANKS TO BE CONSTRUCTED FROM SELECTED MATERIAL, PREFERABLY SLIGHTLY PLASTIC AND WHICH CAN SUPPORT VEGETATION. THE BANKS TO BE COMPACTED AS SPECIFIED.
2. THE EXTENT OF EACH TYPE OF CATCHWATER BANK TO BE AS SHOWN ON THE LAYOUT PLANS, UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
3. MITRE BANKS TO BE CONSTRUCTED TO THE SAME PROFILE AS CATCHWATER BANKS.
4. THE NEED FOR AND TYPE OF STONE PITCHING TO BE DECIDED BY THE ENGINEER.
5. CATCHWATER BANK TO BE CONSTRUCTED AHEAD OF CUTTING, UNLESS OTHERWISE INSTRUCTED BY THE ENGINEER.

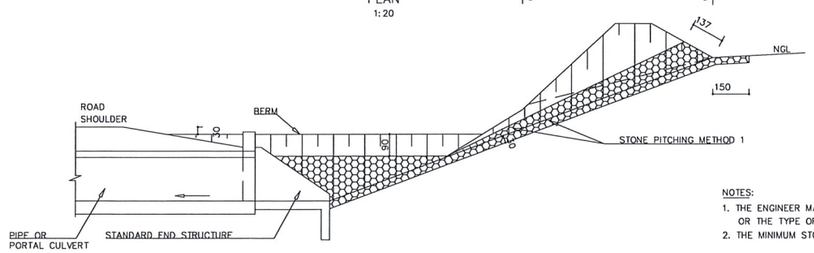
CATCHWATER BANKS
1:20

NOTES:
1. SLOPE OF CHANNEL WHETHER INLET OR OUTLET, TO BE NOT LESS THAN 0,5%.
2. TRIMMED CHANNEL TO BE COMPACTED IN SITU, IF INSTRUCTED BY THE ENGINEER.
3. WHEREVER POSSIBLE OUTLET CHANNEL TO BE EXCAVATED PERPENDICULAR TO THE NATURAL CONTOURS.
4. OUTLET CHANNEL TO EXTEND TO NATURAL GROUND LEVEL.
5. Bc REFERS TO OUTSIDE DIAMETER OF PIPE.

CHANNEL OUTLET
NTS



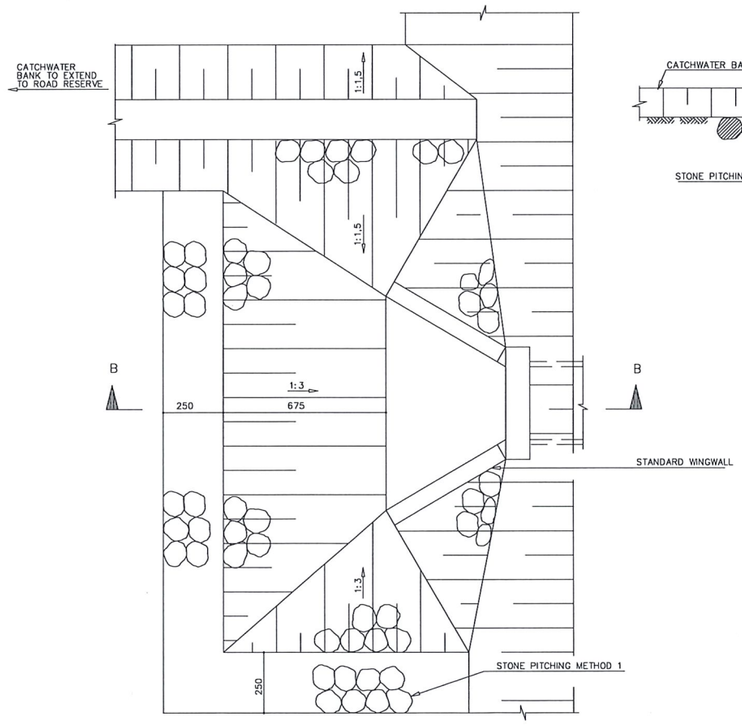
PLAN
1:20



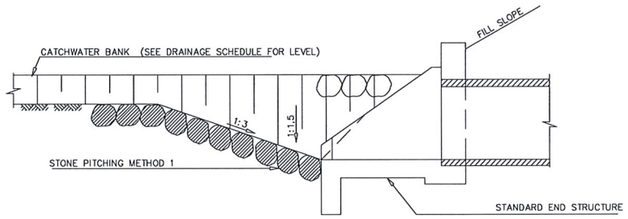
SECTION C – C

DEPRESSED INLET IN SIDE DRAIN WITH CATCHWATER BANK
NTS

NOTES:
1. THE ENGINEER MAY VARY THE EXTENT OR THE TYPE OF PROTECTION.
2. THE MINIMUM STONE SIZE SHALL BE THAT SPECIFIED.



PLAN
1:20



SECTION B – B
1:20

NOTES:
1. THE ENGINEER MAY VARY THE EXTENT OR THE TYPE OF PROTECTION.
2. THE MINIMUM STONE SIZE SHALL BE THAT SPECIFIED.

DEPRESSED INLET ON SLOPE
1:20

No	DATE	REVISION	CONSULT ENG.	DR.
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-

DESIGNED BY	SZB RANGANA
CHECKED BY	PXA NDLOVU
DRAWN BY	TA MOBIA
CHECKED BY	TE MUVHANGO

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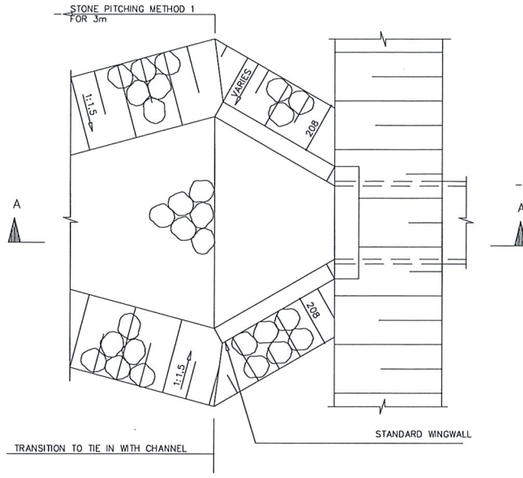
PROJECT
CONSTRUCTION OF LUTANANDWA ACCESS ROAD AND BRIDGE - PHASE 1
BID NO.: 35 OF 2022

TITLE
STANDARD DRAWING
TYPICAL INLET FOR SIDE DRAINS AND LOW POINTS DETAILS

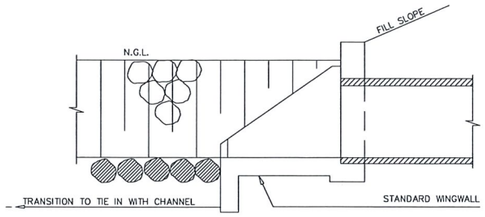
ISSUED FOR TENDER
For Makhado Municipality 20_/_/_
For Mont Consulting Engineers 20_/_/_

DRAWING No. MONT/MAKH/RDS/01/2019/TPC11

SHEET 01 OF 01
SCALE AS SHOWN
PAPER SIZE A1
REVISION 00



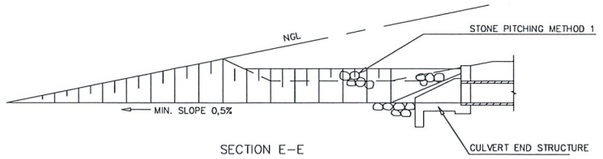
PLAN
1:20



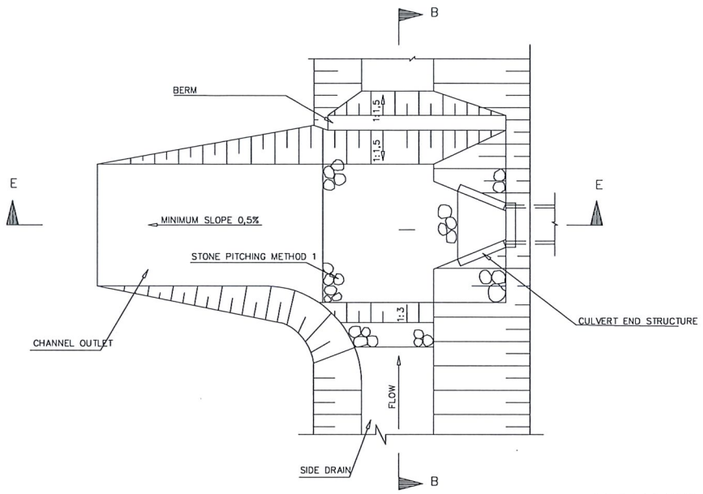
SECTION A – A
1:20

NOTES:
1. THE ENGINEER MAY VARY THE EXTENT OR THE TYPE OF PROTECTION.
2. THE MINIMUM STONE SIZE SHALL BE THAT SPECIFIED.

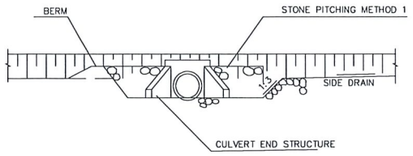
CHANNEL INLETS AND OUTLETS
1:20



SECTION E–E



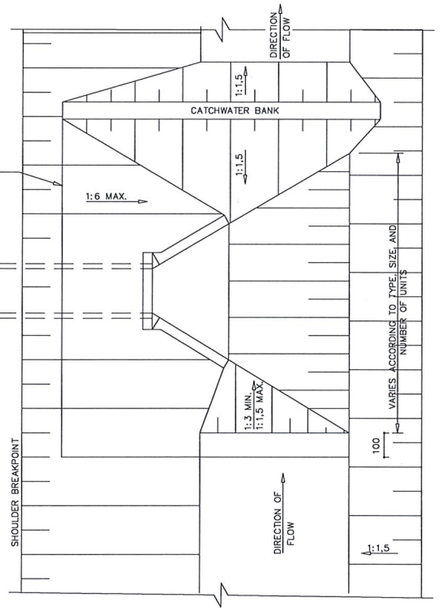
PLAN

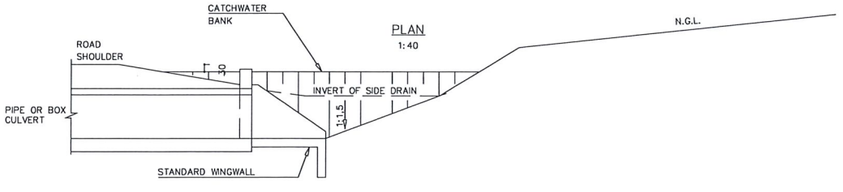


SECTION B–B

NOTES:
1. THE ENGINEER MAY VARY THE EXTENT OR THE TYPE OF PROTECTION.
2. THE MINIMUM STONE SIZE SHALL BE THAT SPECIFIED.

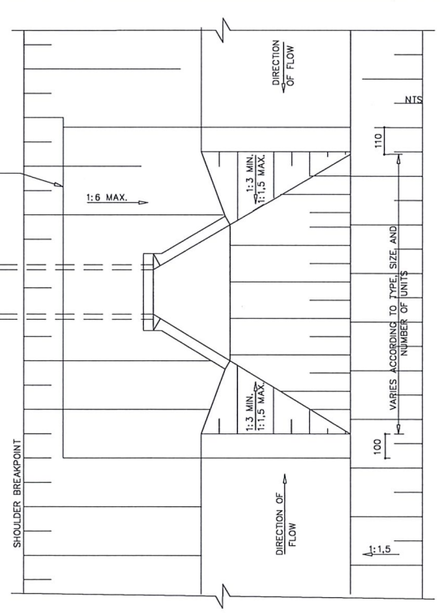
SIDE DRAIN–CULVERT OUTLET COMBINATION
1:20

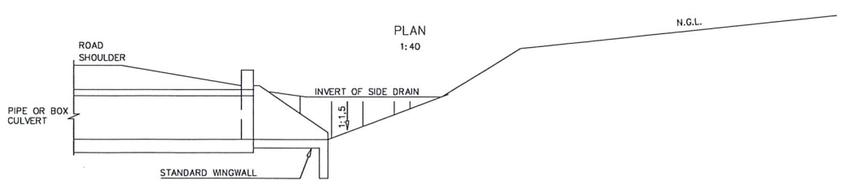




SECTION C – C

DEPRESSED INLET IN SIDE DRAIN ON SLOPE
1 : 20





SECTION D – D

DEPRESSED INLET IN SIDE DRAIN AT LOW POINT
1 : 20

No.	DATE	REVISION	CONSULT. ENG.	D/R
-	-	-	-	-

DESIGNED BY	SZB RANGANA
CHECKED BY	PXA NDLOVU
DRAWN BY	TA MOSIA
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PROJECT
CONSTRUCTION OF LUTANANDWA ACCESS ROAD AND BRIDGE - PHASE 1
BID NO.: 35 OF 2022

TITLE
STANDARD DRAWING
TYPICAL INLET FOR SIDE DRAINS AND LOW POINTS DETAILS

ISSUED FOR TENDER
For Makhado Municipality 20__/__/__
For Mont Consulting Engineers 20__/__/__

SHEET 01 OF 01
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REVISION 00

MAKHADO MUNICIPALITY

CONSTRUCTION OF LUTANANDWA ACCESS ROAD AND BRIDGE – PHASE 2

BID NO.: 35 OF 2022

CONSULTING ENGINEERS : TEL 015 – 291 4173

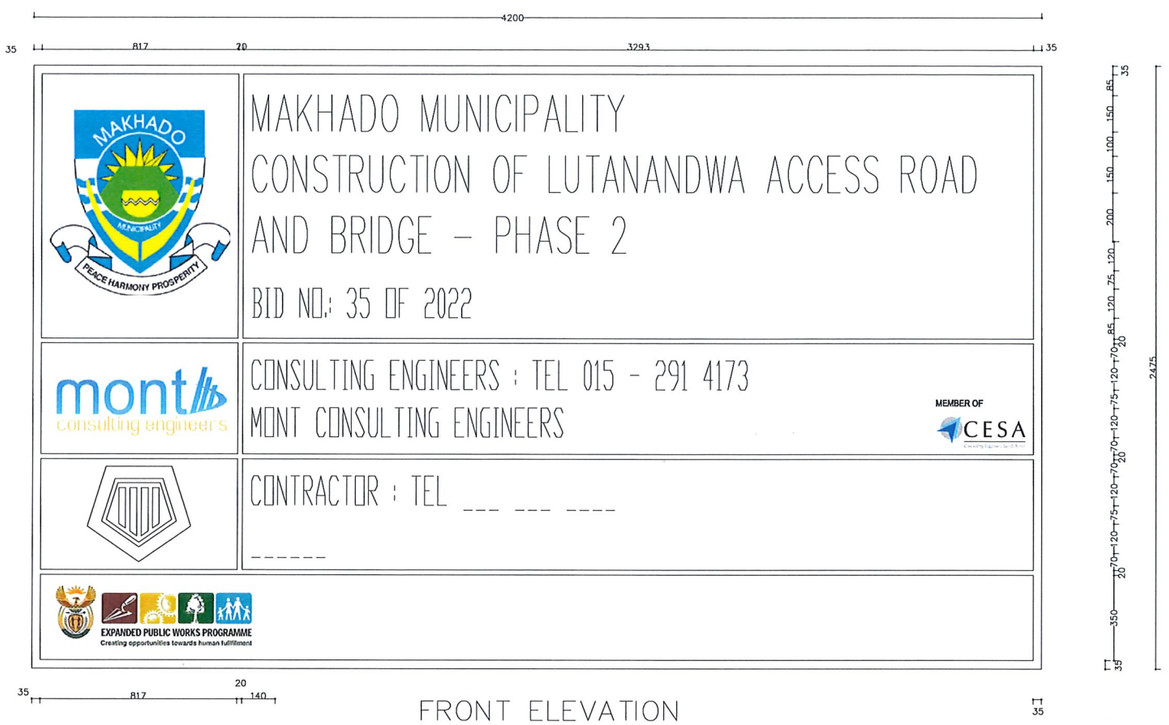
MONT CONSULTING ENGINEERS

MEMBER OF CESA

CONTRACTOR : TEL ___ ___ ____

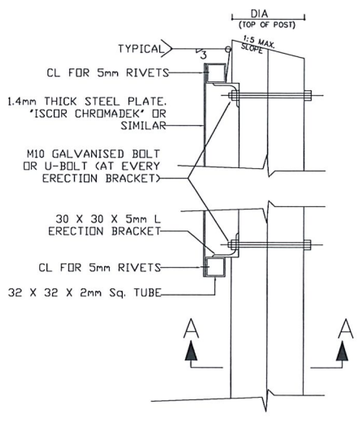
_____

EXPANDED PUBLIC WORKS PROGRAMME
Creating opportunities towards human fulfilment

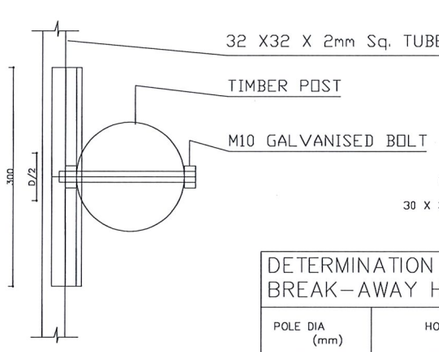


FRONT ELEVATION
1:10

REAR SIDE BRACING
1:10

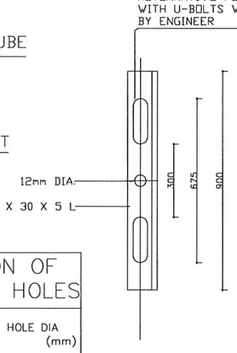


SIDE ELEVATION
NTS

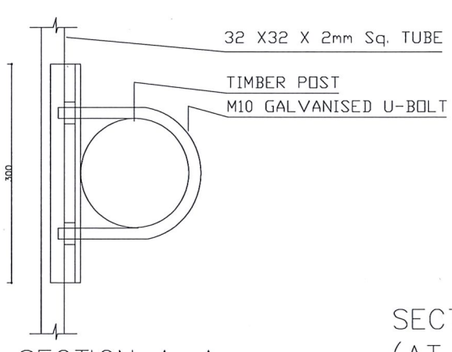


SECTION A–A
NTS

SLOTS TO BE PROVIDED AS ALTERNATIVE FOR ATTACHMENT WITH U-BOLTS WHEN REQUIRED BY ENGINEER

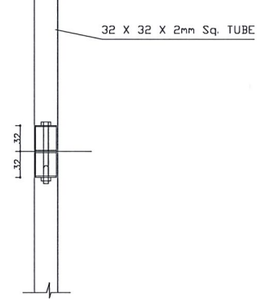


ELEVATION OF ERECTION BRACKET
NTS

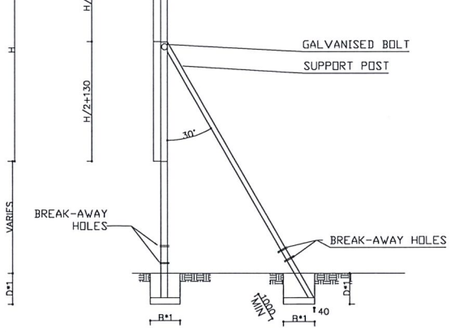


SECTION A–A
(WITH U–BOLT)
NTS

*1 REFER TO TABLE No 1 FOR DIMENSIONS



SECTION B–B
(AT JOINT OF SIGN)
NTS



SIDE ELEVATION OF ROAD SIGN
NTS

TABLE 1: DETERMINATION OF POSTS AND FOOTINGS				
ERECTION DETAILS				
TYPE OF POST	UPRIGHT STAY D	B(DIA)		
TIMBER POST AND STAY	100mm	80mm	800mm	850mm
TIMBER POST	180mm	–	1000mm	1450mm
HOLLOW SECTION STEEL POST	100mm x 4mm	–	1000mm	1450mm

DETERMINATION OF BREAK–AWAY HOLES	
POLE DIA (mm)	HOLE DIA (mm)
< 140	NONE
141 – 170	40
171 – 200	50
201 – 225	65

NOTES:

EMBLEM:
1. ALL EMBLEMS TO BE DISPLAYED IN FULL COLOUR ON A SEMI MATT BACKGROUND.

LETTERS AND NUMBERS:
2. DESCRIPTION: MATT–BLACK, SERIES DIN B LETTERS AND NUMBERS ON A SEMI MATT SMOKE–GREY BACKGROUND.

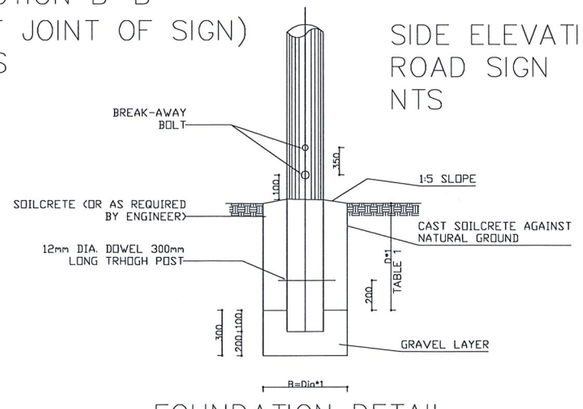
BORDERS:
3. BORDER: GREEN NON REFLECTORIZED.

QUANTITY:
4. TWO SIGN BOARDS, SHALL BE ERECTED AT POSITIONS AS DETERMINED BY THE ENGINEER.

DESCRIPTION:
5. DESCRIPTION OF WORK (NUMBER OF KILOMETRES AND TYPE OF WORK, eg. "13,5 km RECONSTRUCTION OF ROAD 2654," DESCRIPTION START CENTERED ON THE LEFT–HAND SIDE AND THE FIRST 105mm–DIMENSION BELOW "NORTHERN"

6. SAFCEC EBLEM ONLY IF CONTRACTOR IS A MEMBER OTHERWISE BLANK.

7. NEW SAACE LOGO TO BE OBTAINED FROM SAACE, JOHANNESBURG.



FOUNDATION DETAIL
NTS

No.	DATE	REVISION	CONSULT. ENG.	D/R.
-	-	-	-	-

DESIGNED BY	SZB RANGANA
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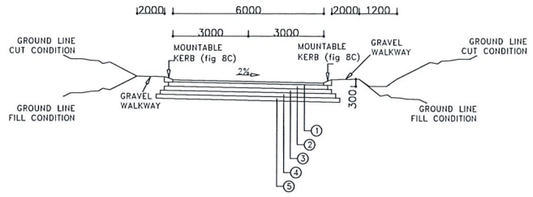
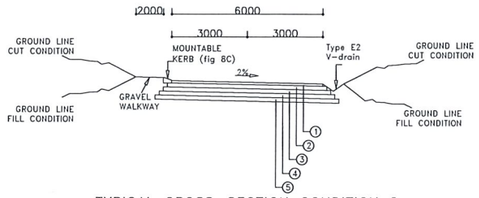
MEMBER OF CESA

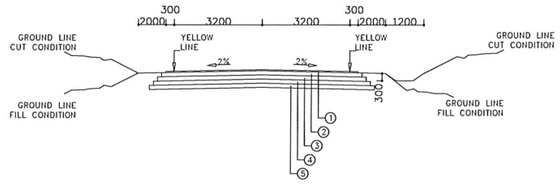
PROJECT	CONSTRUCTION OF LUTANANDWA ACCESS ROAD AND BRIDGE - PHASE 1 BID NO.: 35 OF 2022
TITLE	STANDARD DRAWING INFORMATION BOARD
ISSUED FOR TENDER	For Makhado Municipality 20__/__/__
	For Mont Consulting Engineers 20__/__/__
DRAWING No.	MONT/MAKH/RDS/01/2019/TPC13
SHEET	01 OF 01
SCALE	AS SHOWN
PAPER SIZE	A1
REVISION	00



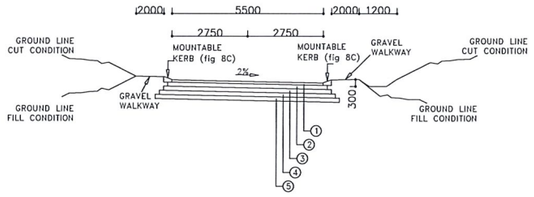
TYPICAL CROSS–SECTION CONDITION 1



TYPICAL CROSS–SECTION CONDITION 2



TYPICAL CROSS–SECTION CONDITION 3

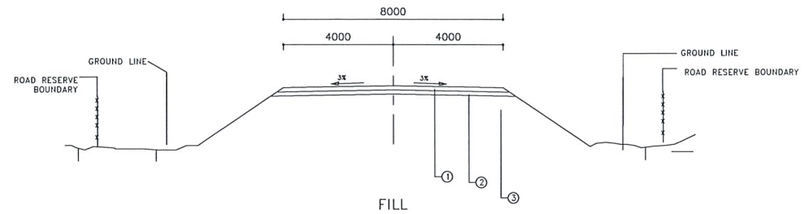


TYPICAL CROSS–SECTION CONDITION 4

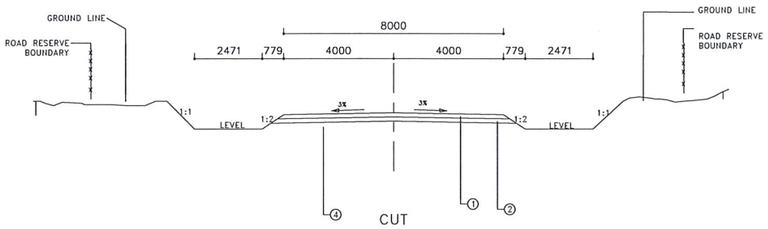
NOTES: SUBSURFACE DRAINAGE

1. ROAD PAVEMENT LAYERS AND SIDE DRAIN PROFILES SHOWN, ARE TYPICAL ONLY.
2. TYPE, POSITION AND DIMENSIONS OF SUBSOIL DRAIN TO BE DETERMINED BY THE ENGINEER.
3. GEOTEXTILE TO BE GRADE 1 UNLESS OTHERWISE SPECIFIED.
4. PLACING OF SUBSOIL DRAIN OVER DRY AREAS TO BE AVOIDED. THIS IS TO BE DONE WITH AN UNPERFORATED PIPE AND NOT WITH A SUBSOIL DRAIN.
5. DESIRABLE MINIMUM SLOPE OF LONGITUDINAL SUBSOIL DRAIN PIPE TO BE 0,8%, WITH AN ABSOLUTE MINIMUM OF 0,5%. THE MINIMUM SLOPE OF TRANSVERSE SUBSOIL DRAIN PIPE TO BE 1,5%.
6. PERFORATIONS OR SLOTS OF SUBSOIL DRAIN PIPE TO FACE DOWNWARDS.

TYPICAL CROSS–SECTION AND PAVEMENT DETAILS – TEMPORARY DEVIATION



FILL



CUT

CLASS 1: GRAVEL ACCESS ROAD
(8m FORMATION WIDTH)

LAYER NO.	DESCRIPTION	TRH 14 MATERIAL TYPE	SECTION OF SPECIFICATION	COMPACTION (% OF MOD AASHTO)	P.I. MAX	G.M. (MIN)	CBR @ % MOD AASHTO	UCS(kPa) @ % MOD AASHTO
1	125mm GRAVEL WEARING COURSE	G6	3400 / 1500	95%	MAX. 15	0.75	–	1500 @ 98%
2	125mm UPPER SELECTED LAYER	G7	3400	93%	3GM+10	0,75	–	1000 @ 95%
3	FILL	G10	1500	90%	–	–	–	–
4	ROADBED PREPARATION / TOP OF FILL	–	3300	90% OR ROLLER PASS	–	–	–	–

NOTES:

1. THE UPPER SELECTED LAYER IS ONLY TO BE PLACED WHERE POOR IN–SITU CONDITIONS ARE ENCOUNTERED AND AS INSTRUCTED BY ENGINEER.
2. THE CONSTRUCTION OF THE GRAVEL DEVIATION ROAD TO ACCURATE LEVELS PER CALCULATED LONGITUDINAL SECTION CAN BE OMITTED AND CONSTRUCTED IN ACCORDANCE WITH THE METHOD DESCRIBED IN CLAUSE 1506 OF THE STANDARD SPESIFICATIONS
3. ALL POINTS OF INTERSECTION WITH THE EXCEPTION OF THE CROWN OF THE ROAD, MUST BE ROUNDED TO A MIN. WIDTH OF 1,0m MEASURED HORIZONTALLY.

LAYER NO.	DESCRIPTION	TRH 14 MATERIAL TYPE	SECTION OF SPECIFICATION	COMPACTION (% OF MOD AASHTO)	P.I. MAX	G.M. (MIN)	CBR @ % MOD AASHTO	UCS(kPa) @ % MOD AASHTO
1	80mm PAVING BLOCKS							
2	150mm CHEMICALLY STABILIZED BASE COURSE	C4	3400 / 3500	97%	MAX. 6	1.75	–	1000 @ 100%
3	150mm CHEMICALLY STABILIZED SUBBASE	C4	3400 / 3500	97%	MAX. 6	1.75	–	750 @ 100%
4	ROADBED PREPARATION / TOP OF FILL	G9	3300	93%	MAX. 12	–	7 @ 93%	–
5	FILL	G10	3300	90%	–	–	3 @ 93%	–

No	DATE	REVISION	CONSULT. ENG.	D/R
-	-	-	-	-

DESIGNED BY	SZB RANGANA
CHECKED BY	PXA NDLOVU
DRAWN BY	TA MOSIA
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PROJECT: CONSTRUCTION OF LUTANANDWA ACCESS ROAD AND BRIDGE - PHASE 1
BID NO.: 35 OF 2022

TITLE: STANDARD DRAWING
TYPICAL CROSS SECTION

ISSUED FOR TENDER (Full signature)
For: Makhado Municipality 20__/__/__
For: Mont Consulting Engineers 20__/__/__

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SCALE: AS SHOWN
PAPER SIZE: A1
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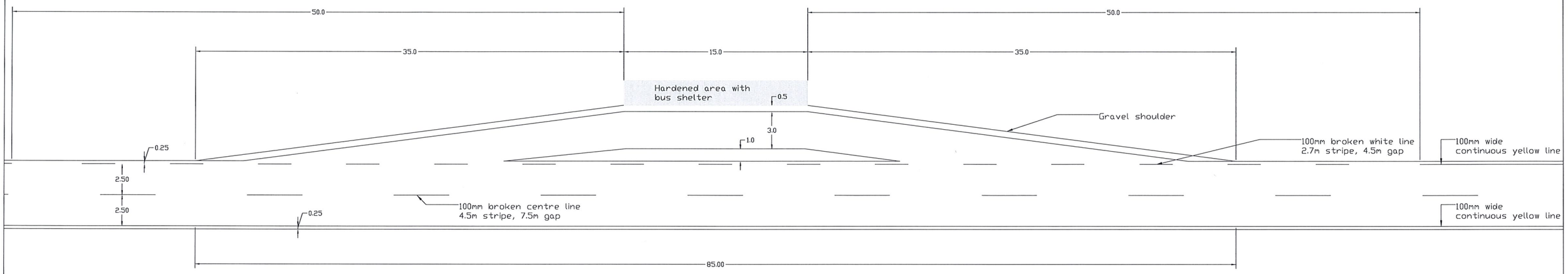
REVISION: 00



Typical layout of a bus stop
Concrete or bitumen surface

No	DATE	REVISION	CONSULT ENG	DR
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PROJECT
CONSTRUCTION OF LUTANANDWA ACCESS ROAD AND BRIDGE - PHASE 1
BID NO.: 35 OF 2022

TITLE
STANDARD DRAWING
TYPICAL BUS STOP DETAILS FOR SURFACED ROADS

ISSUED FOR TENDER

For: Makhado Municipality 20__/__/__

For: Mont Consulting Engineers 20__/__/__

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MONT/MAKH/RDS/01/2019/TPC15

SHEET 01 OF 01

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AS SHOWN

PAPER SIZE
A1

REVISION
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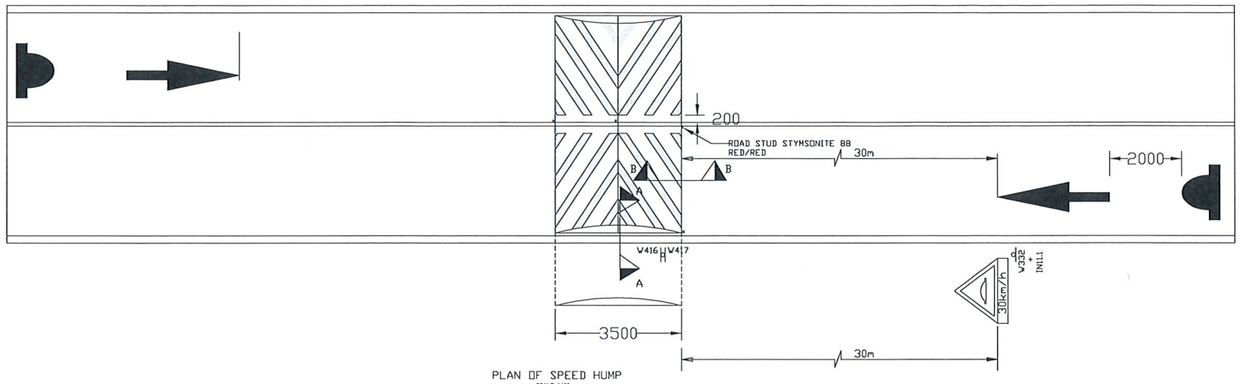
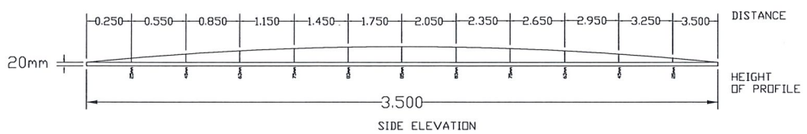
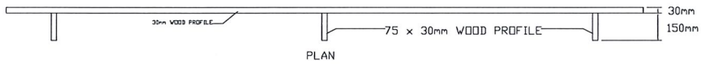


PLAN OF SPEED HUMP
SCALE 1:100

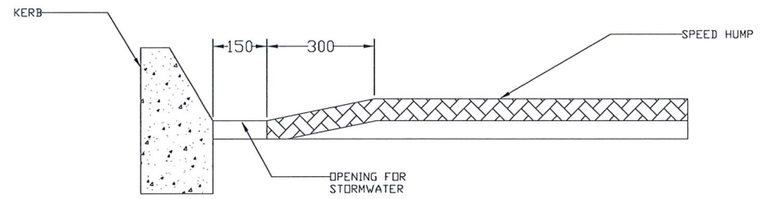


SIDE ELEVATION

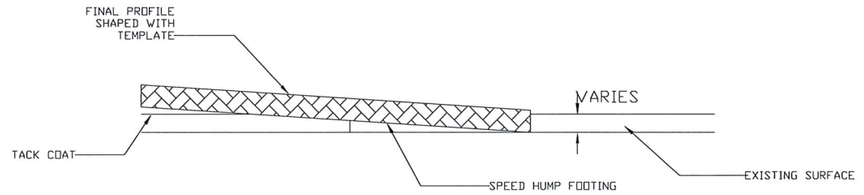


PLAN

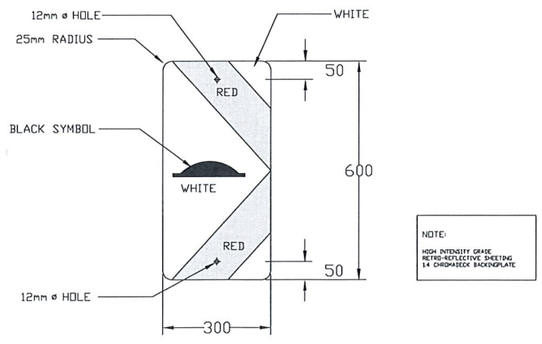
TEMPLATE DETAIL FOR CONSTRUCTION IOF SPEED HUMP
SCALE 1:20



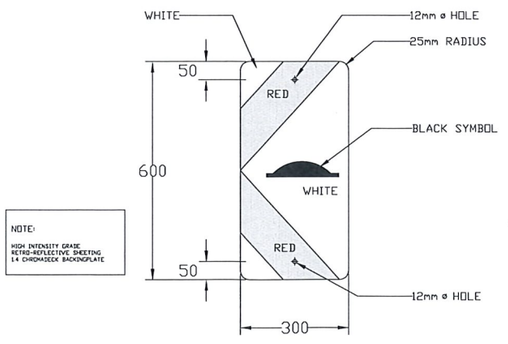
SECTION A-A
CONSTRUCTION DETAIL OF SPEED HUMP
SCALE 1:20



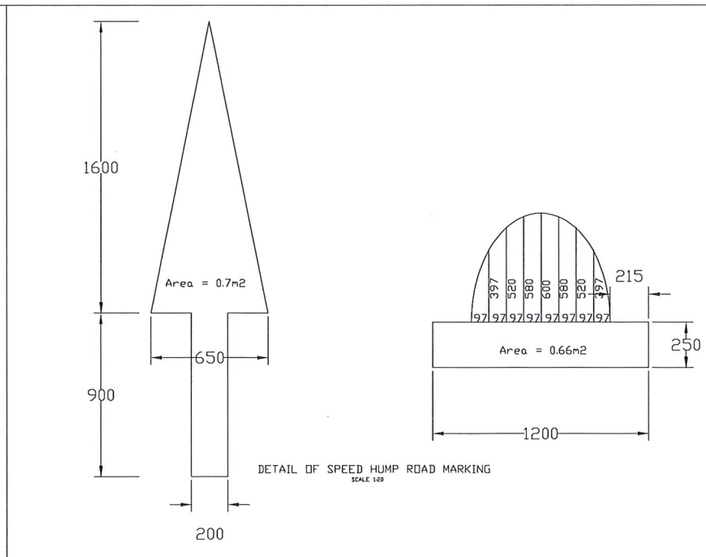
SECTION B-B
CONSTRUCTION DETAIL OF SPEED HUMP
SCALE 1:20



DANGER PLATE SPEEDHUMP (LEFT)
W416
SCALE 1:10



DANGER PLATE SPEEDHUMP (RIGHT)
W417
SCALE 1:10



DETAIL OF SPEED HUMP ROAD MARKING
SCALE 1:20

No	DATE	REVISION	CONSULT ENG	DR.
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-	-	-	-	-
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-	-	-	-	-
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-	-	-	-	-

DESIGNED BY	SZB RANGANA
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PROJECT
CONSTRUCTION OF LUTANANDWA ACCESS ROAD AND BRIDGE - PHASE 1
BID NO.: 35 OF 2022

TITLE
STANDARD DRAWING
SPEED HUMP

ISSUED FOR TENDER

For: Makhado Municipality 20_/_/_

For: Mont Consulting Engineers 20_/_/_

DRAWING No.
MONT/MAKH/RDS/01/2019/TPC16

SHEET 01 OF 01
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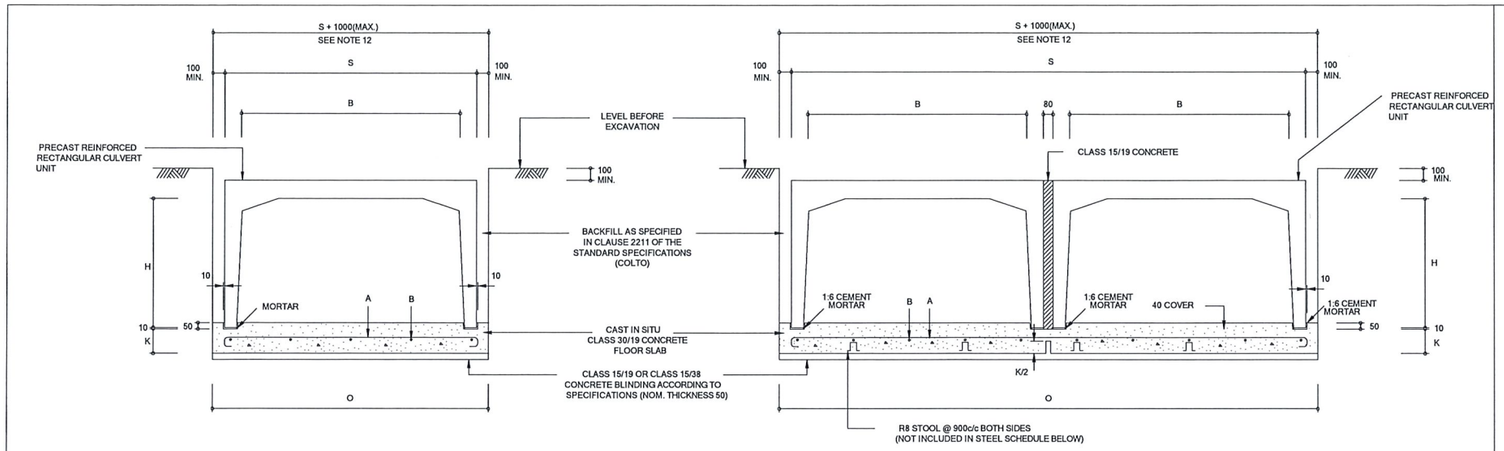
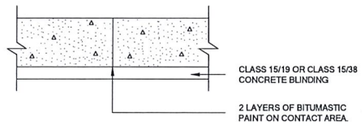


TYPICAL CROSS SECTION OF SINGLE UNIT

TYPICAL CROSS SECTION OF MULTIPLE UNITS



DETAIL OF SHRINKAGE JOINTS IN FLOOR SLABS

(SEE NOTE 11)

NOTES (BOX CULVERTS):

1. CLASS OF CONCRETE TO BE USED AS SHOWN.
2. STEEL REINFORCING TO CONFORM TO SABS 920 TYPE C, CLASS 2, GRADE 1.
3. CONCRETE COVER TO REINFORCING SHALL BE 40mm MIN.
4. DESIGN MASS OF FILL IS 2000 kg/m^3
5. LOAD FACTOR FOR PROOF LOAD OF SABS 986 = 1,5.
6. WORKING STRESS OF HIGH TENSILE (Y) REINFORCING = 210 MPa.
7. PRECAST REINFORCED CULVERTS SHALL COMPLY WITH THE REQUIREMENTS OF SABS 986 & ADDITIONAL TEST LOADING AS SPECIFIED.
8. DIMENSIONS AND REINFORCING DETAILS FOR IN SITU FLOOR SLABS ARE ONLY VALID IF:
   (a) THE HEIGHT OF FILL ABOVE THE CULVERT IS LESS THAN SPECIFIED BELOW:

DIMENSION B	HEIGHT OF FILL
600mm	6,0m
900mm	4,0m
1200mm	3,0m
1500mm	2,5m

   (b) THE TYPE OF MATERIAL UNDER THE FLOOR SLAB IS NOT ROCK.
9. THE FILL HEIGHT OVER CULVERT UNITS SHALL BE 300mm MIN. WHERE THIS CONNOT BE ACHIEVED, A 100mm REINFORCED CONCRETE SLAB (DETAIL AS SPECIFIED BY THE ENGINEER) SHALL BE CAST OVER THE CULVERT UNITS.
10. THE DIMENSIONS IN THE TABLE MAY NOT CONFORM TO ALL MARKETED UNITS. IT MAY BECOME NECESSARY TO REVISE TABULATED DIMENSIONS.
11. MAXIMUM SPACING OF SHRINKAGE JOINTS IN FLOOR SLABS IS 5m.
12. THIS WIDTH MAY VARY, DEPENDING ON THE TYPE OF BACKFILL.
13. FOR THE LOCATION, SIZE AND CLASS OF BOX CULVERTS, SEE LAYOUT PLANS AND LONG SECTIONS AND DRAINAGE SCHEDULES.
14. WATERPROOFING OF PREFABRICATED CULVERT JOINTS SHALL BE WITH 450mm WIDE STRIPS OF BITUTHENE 3000 OR SIMILAR APPROVED BITUMEN IMPREGNATED TAPE.

LOAD STATEMENT

1. ALL PORTAL CULVERTS SHALL BE 150S-LOAD CLASS ACCORDING TO SABS 986 AND THE REQUIREMENTS OF TMH7 AND COLTO.
2. MINIMUM AND MAXIMUM FILL ARE LIMITED (SEE NOTES 8 & 9)

** SEE NOTE 10

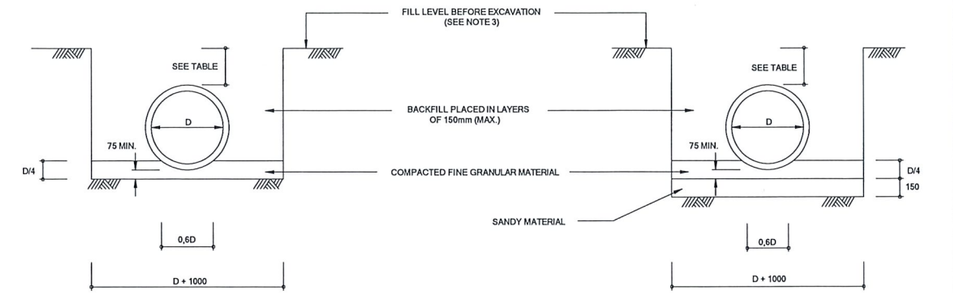
DIMENSIONS					REINFORCING *					
B	H	S **	O **	K	BAR A	L	CUT LENGTH	BENDING	BAR B	BENDING
1x1200	900	1420	1630	175	Y12-160	1550	1750	L / PLACE HOOK AT ALTERNATIVE ENDS	8Y10-200	LENGTH VARIES WITH CULVERT LENGTH / MAX. LENGTH 1000
1x1200	900	1420	1630	175	Y12-160	1550	1750		8Y10-200	

* THE HIGH TENSILE STEEL REINFORCING MAY BE REPLACED WITH MILD STEEL WITH THE APPROVAL OF THE ENGINEER AS FOLLOWS: Y10 REPLACED BY R12 AT SAME SPACING
Y12 REPLACED BY R16 AT SAME SPACING

SCALE ON REDUCED DRAWING

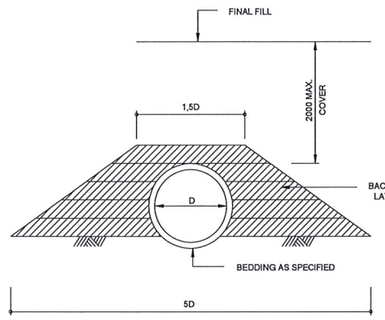
100mm ON ORIGINAL DRAWING

TYPICAL DETAIL OF CAST IN SITU CONCRETE FLOOR SLABS FOR PRECAST BOX CULVERTS



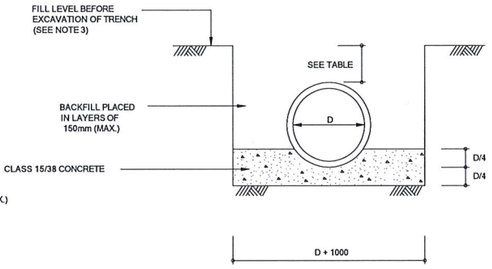
CLASS B BEDDING (IN SOIL)

CLASS B BEDDING (IN ROCK)



EMBANKMENT METHOD

(ONLY WITH APPROVAL OF ENGINEER)



CLASS A BEDDING (CONCRETE)

CLASS A BEDDING (CONCRETE)

NOTES (PIPE CULVERTS):

1. LOADING OF PIPE CULVERTS SHALL BE ACCORDING TO SABS 0102 AND THE GAUTRANS CODE OF PROCEDURE FOR STRUCTURES UP TO DATE.
2. REINFORCED CONCRETE PIPES SHALL COMPLY WITH THE SPECIFICATIONS OF SABS 677.
3. FOR PIPE CULVERTS CONSTRUCTED ACCORDING TO THE TRENCH METHOD, THE TRENCH SHALL NOT BE EXCAVATED BEFORE THE FILL HAS REACHED A LEVEL WHERE THE MINIMUM COVER HAS BEEN OBTAINED AS SHOWN IN THE TABLE.
4. BACKFILL ALONGSIDE AND ABOVE PIPE CULVERTS SHALL BE CONSTRUCTED ACCORDING TO CLAUSE 2211 OF THE STANDARD SPECIFICATIONS (COLTO).
5. WHERE TWO OR MORE PIPE CULVERTS ARE PLACED ALONGSIDE EACH OTHER, THE MINIMUM SPACING BETWEEN ADJACENT PIPES SHALL BE THE MAXIMUM OF 300mm OR D/2.
6. FOR THE LOCATION, SIZE AND CLASS OF PIPE CULVERTS, SEE LAYOUT PLANS AND LONG SECTION AND DRAINAGE SCHEDULES.

TABLE

MINIMUM AND MAXIMUM COVER IN FINAL ROAD PROFILE

NOMINAL DIAMETER (D)	COVER (mm)	CLASS 50D PIPE CLASS B BEDDING	CLASS 50D PIPE CLASS A BEDDING	CLASS 75D PIPE CLASS B BEDDING	CLASS 75D PIPE CLASS A BEDDING	CLASS 100D PIPE CLASS B BEDDING	CLASS 100D PIPE CLASS A BEDDING
600	MIN	—	—	300	200	300	200
	MAX	—	—	3500	4700	5800	7900
750	MIN	—	—	300	200	300	200
	MAX	—	—	3500	4800	5900	8000
900	MIN	300	200	300	200	300	200
	MAX	2200	3000	3700	5000	5900	8000
1050	MIN	300	200	300	200	300	200
	MAX	2200	3000	3700	5000	6000	8100
1200	MIN	300	200	300	200	300	200
	MAX	2300	3100	3800	5100	6000	8100
1500	MIN	300	200	300	200	300	200
	MAX	2300	3100	3800	5100	6000	8100

TYPICAL DETAIL OF PIPE BEDDINGS

No.	DATE	REVISION	CONSULT ENG	DR.
-	-	-	-	-

DESIGNED BY	SZB RANGANA
CHECKED BY	PXA NDLOVU
DRAWN BY	TA MOSIA
CHECKED BY	TE MUVHANGO

MAKHADO MUNICIPALITY
PRIVATE BAG X 2596
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0920
TEL: 015 - 519 3000
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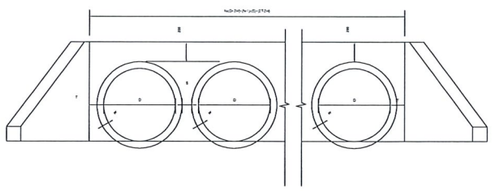
MONT CONSULTING ENGINEERS
PO BOX 1249
FAUNA PARK
0787
TEL: 015 - 291 4173
FAX: 015 - 291 4218
MEMBER OF CESA

PROJECT: CONSTRUCTION OF LUTANANDWA ACCESS ROAD AND BRIDGE - PHASE 2
BID NO.: 35 OF 2022

TITLE: TYPICAL DETAIL : PIPE BEDDING AND CAST IN SITU FLOOR SLABS FOR PRECAST BOX CULVERTS

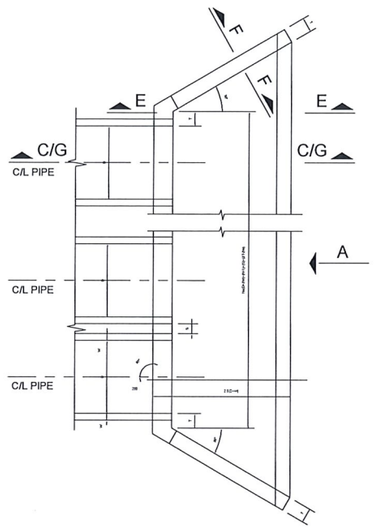
ISSUED FOR TENDER
For: Makhado Municipality 20__/__/__
For: Mont Consulting Engineers 20__/__/__

SHEET 01 OF 01
SCALE: AS SHOWN
PAPER SIZE: A1
DRAWING No.: MONT/MAKH/RDS/01/2019/STW02
REVISION: 00



ELEVATION A
1 : 25

NOTE:
1. SPACING (S) BETWEEN PIPES TO BE 100mm ONLY IF SOILCRETE BACKFILLING IS USED.
2. N = NUMBER OF PIPES.



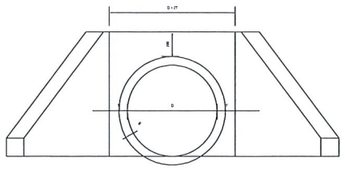
PLAN A
1 : 25

MULTIPLE PIPE CULVERT

NOTE:
1. SPACING (S) BETWEEN PIPES TO BE 100mm ONLY IF SOILCRETE BACKFILLING IS USED.
2. N = NUMBER OF PIPES.
3. EROSION PROTECTION AND ENERGY BREAKING BLOCKS FOR MULTIPLE PIPE CULVERT SIMILAR TO SINGLE PIPE CULVERT.

INSIDE DIA. PIPE (D)	T (mm)	S (mm)
450	150	300
600	150	300
750	150	375
900	175	450
1050	200	500
1200	200	500

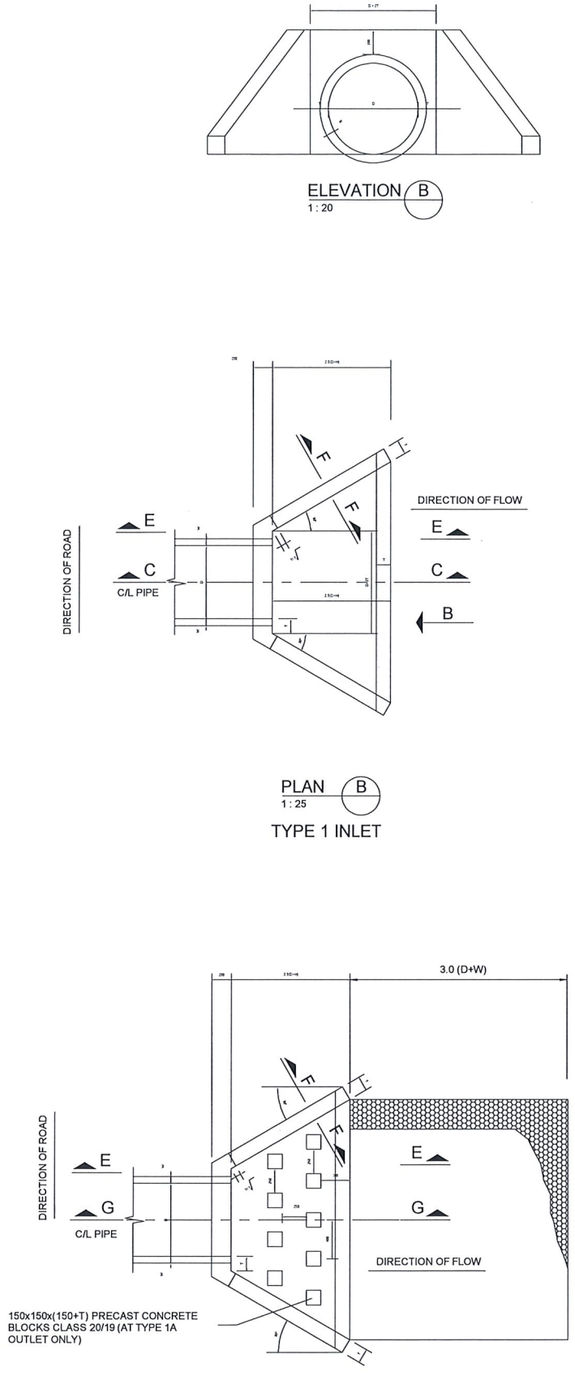
SCALE ON REDUCED DRAWING
100mm ON ORIGINAL DRAWING



ELEVATION B
1 : 20

PLAN B
1 : 25

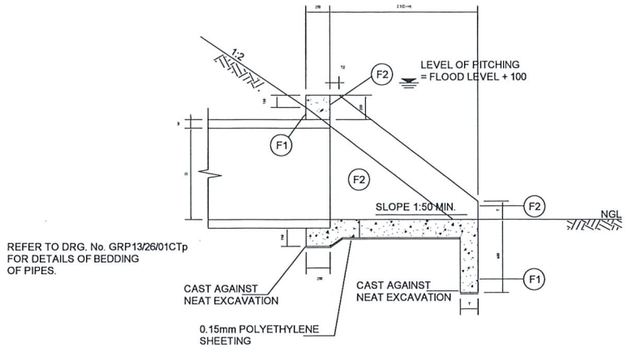
TYPE 1 INLET



NOTE:
IF PIPE DIAMETER LESS THAN 600mm THEN ONLY ONE ROW OF BLOCKS.

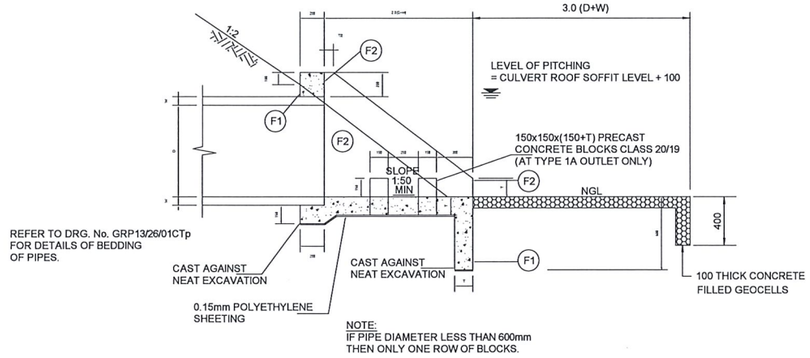
PLAN B
1 : 25

TYPE 1 AND TYPE 1A OUTLET



SECTION C
1 : 20

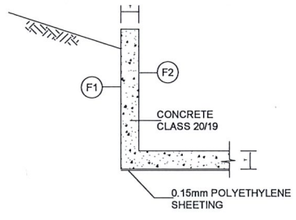
(INLET)



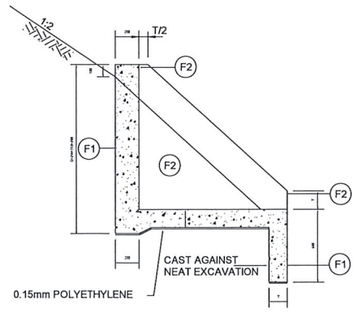
NOTE:
IF PIPE DIAMETER LESS THAN 600mm THEN ONLY ONE ROW OF BLOCKS.

SECTION G
1 : 20

(OUTLET)



SECTION F
1 : 20



SECTION SEC
SCALE REF

NOTES:

CONSTRUCTION

1. ALL EXPOSED CORNERS SHALL BE CHAMFERED 25 x 25
2. CONCRETE COVER TO REINFORCEMENT:-
   FLOOR SLAB & FOOTINGS = 50mm
   WINGWALLS = 40mm
3. CONCRETE FINISH:
   CONCEALED SURFACES = F1
   EXPOSED SURFACES = F2
4. POLYETHYLENE SHEET 0.15mm THICK SHALL BE PLACED UNDER ALL WINGWALL FOOTINGS AND INLET SLAB
5. THIS DRAWING TO BE READ IN CONJUNCTION WITH THE COLTO STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE WORKS FOR STATE ROAD AUTHORITIES AS AMENDED TO DATE
6. THE UPPER LEVEL OF THE FILL ALWAYS PASSES THROUGH A POINT 100mm BELOW THE TOP OF THE HEAD WALL
7. THE MAXIMUM SLOPE OF EARTHWORKS SURROUNDING A CULVERT INLET OR OUTLET SHALL BE 1 : 2

MATERIAL SPECIFICATION:

1. INLET/OUTLET CONCRETE SLABS AND WINGWALLS - CLASS 20/19
   CHARACTERISTIC STRENGTH 20 MPa
   YOUNG'S MODULUS 28 000 MPa
2. REINFORCEMENT (SABS 920 - 1985)
   YIELD STRENGTH TYPE:
   MILD STEEL BARS 250 MPa
   HIGH TENSILE STEEL BARS 450 MPa
   WELDED STEEL FABRIC 450 MPa
3. REINFORCEMENT DETAILS:
   a) FOR 450, 600, 750 & 900 DIA. SEE DRG. No. MONT/MAKH/RDS/01/2016/STW05
   b) FOR 1050 & 1200 DIA. SEE DRG. No. MONT/MAKH/RDS/01/2016/STW06

DESIGN METHOD:

1. LIMIT STATE DESIGN ACCORDING TO TMH7 PART 3 AS AMENDED 1989
2. INLET AND OUTLET STRUCTURES ARE DESIGNED FOR LOADING SPECIFIED IN TMH7 PART 1 AND 2 AS AMENDED 1988 "CODE OF PRACTICE FOR THE DESIGN OF HIGHWAY BRIDGES AND CULVERTS IN S.A."
3. TYPE OF REINFORCEMENT AND SPACING ARE SHOWN ON THE DRAWINGS. THE CONTRACTOR MUST SUBMIT WORKING DRAWINGS AND BENDING SCHEDULES FOR APPROVAL.

FOUNDING MATERIAL:

1. MAX. CALCULATED GROUND PRESSURE - 100kPa
2. FOUNDING LEVEL TO BE APPROVED BY THE PROJECT MANAGER.

HYDRAULIC INFORMATION:

1. SEE DRAINAGE SCHEDULE FOR FLOOD LEVELS, OUTLET TYPE AND HYDRAULIC DATA FOR EACH CULVERT.

EROSION PROTECTION:

1. TO BE PROVIDED WHERE OUTLET VELOCITIES AS INDICATED ON DRAINAGE SCHEDULE > 2m/s

FOR REINFORCING DETAILS REFER TO DRAWING No. MONT/MAKH/RDS/01/2019/STW05 AND MONT/MAKH/RDS/01/2019/STW06

No	DATE	REVISION	CONSULT ENG.	DR.
-	-	-	-	-

DESIGNED BY	SZB RANGANA
CHECKED BY	PKA NDLOVU
DRAWN BY	TA MOSIA
CHECKED BY	TE MUVHANGO

MAKHADO MUNICIPALITY
PRIVATE BAG X 2596
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MONT CONSULTING ENGINEERS
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FAX: 015 - 291 4218

MEMBER OF CESA

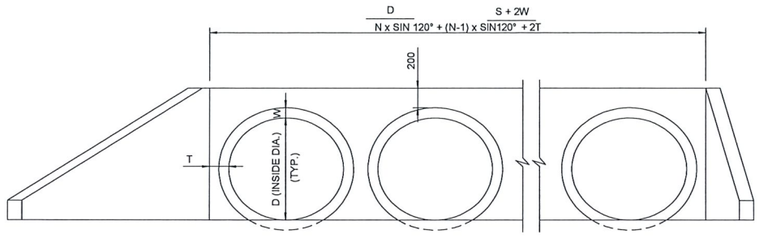
PROJECT
CONSTRUCTION OF LUTANANDWA ACCESS ROAD AND BRIDGE - PHASE 2
BID NO.: 35 OF 2022

TITLE
TYPICAL DETAIL : PIPE CULVERTS 90° TO ROAD (450 TO 1200 DIA. PIPES) CONCRETE DETAILS

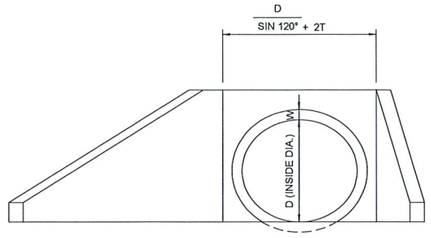
ISSUED FOR TENDER
For Makhado Municipality 20__/__/__
For: Mont Consulting Engineers 20__/__/__

DRAWING No. MONT/MAKH/RDS/01/2019/STW03

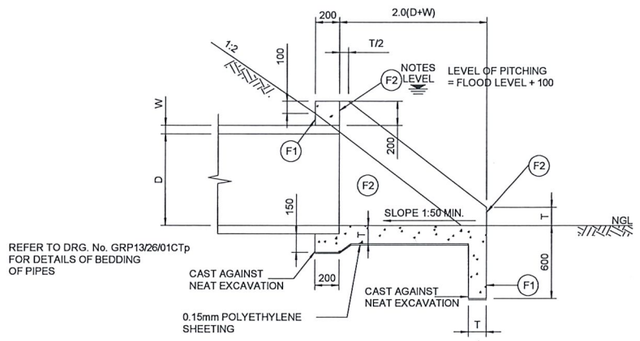
SHEET 01 OF 01
SCALE AS SHOWN
PAPER SIZE A1
REVISION 00



ELEVATION A
SCALE

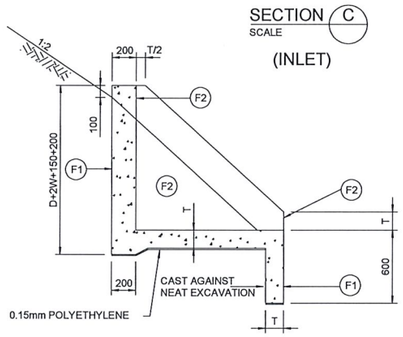


ELEVATION B
SCALE

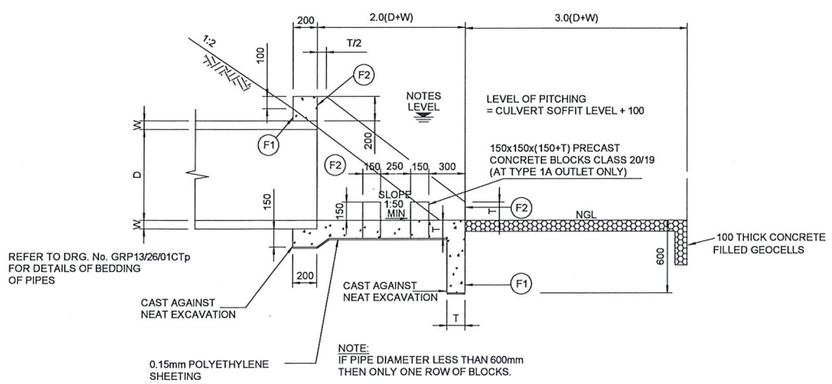


SECTION C
SCALE

(INLET)



SECTION SEC REF
SCALE

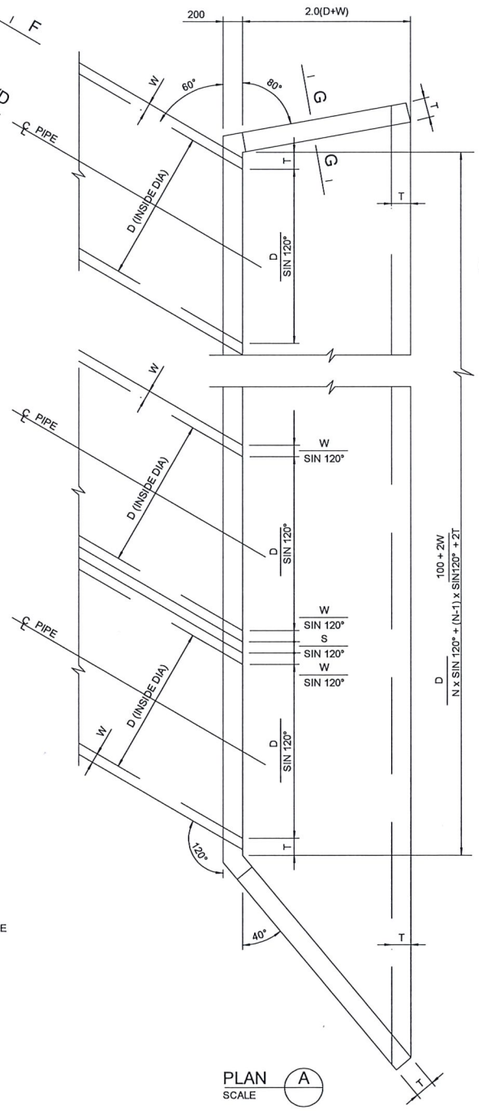


SECTION G
SCALE

(OUTLET)

SCALE ON REDUCED DRAWING

100mm ON ORIGINAL DRAWING

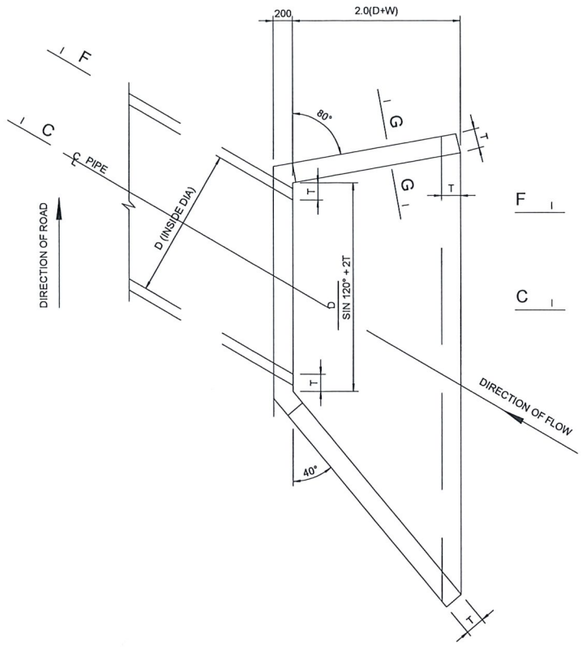


PLAN A
SCALE

TYPICAL INLET AND OUTLET

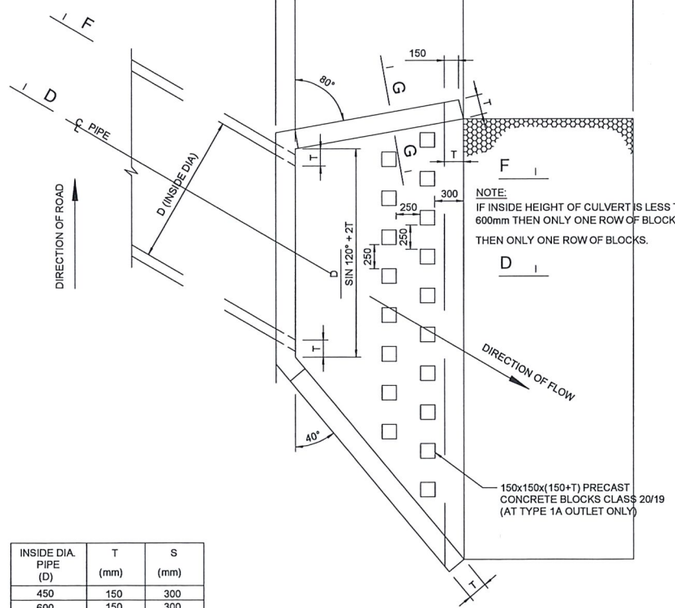
NOTE:
1. SPACING (S) BETWEEN PIPES TO BE 100mm ONLY IF SOILCRETE BACKFILLING IS USED.
2. N = NUMBER OF PIPES.
3. EROSION PROTECTION AND ENERGY BREAKING BLOCKS FOR MULTIPLE PIPE CULVERT SIMILAR TO SINGLE PIPE CULVERT. (SEE SINGLE PIPE CULVERT)

INSIDE DIA. PIPE (D)	T (mm)	S (mm)
450	150	300
600	150	300
750	150	375
900	175	450
1050	200	500
1200	200	500



PLAN B
SCALE

TYPE 1 INLET

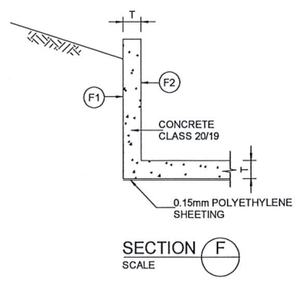


NOTE:
IF INSIDE HEIGHT OF CULVERT IS LESS THAN 600mm THEN ONLY ONE ROW OF BLOCKS.

THEN ONLY ONE ROW OF BLOCKS.

PLAN B
SCALE

TYPE 1 AND TYPE 1A OUTLET



SECTION F
SCALE

NOTES:

CONSTRUCTION

1. ALL EXPOSED CORNERS SHALL BE CHAMFERED 25 x 25
2. CONCRETE COVER TO REINFORCEMENT:-
   FLOOR SLAB & FOOTINGS = 50mm
   WINGWALLS = 40mm
3. CONCRETE FINISH:
   CONCEALED SURFACES = F1
   EXPOSED SURFACES = F2
4. POLYETHYLENE SHEET 0.15mm THICK SHALL BE PLACED UNDER ALL WINGWALL FOOTINGS AND INLET SLAB
5. THIS DRAWING TO BE READ IN CONJUNCTION WITH THE COLTO STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE WORKS FOR STATE ROAD AUTHORITIES AS AMENDED TO DATE
6. THE UPPER LEVEL OF THE FILL ALWAYS PASSES THROUGH A POINT 100mm BELOW THE TOP OF THE HEAD WALL
7. THE MAXIMUM SLOPE OF EARTHWORKS SURROUNDING A CULVERT INLET OR OUTLET SHALL BE 1 : 2

MATERIAL SPECIFICATION:

1. INLET/OUTLET CONCRETE SLABS AND WINGWALLS - CLASS 20/19
   CHARACTERISTIC STRENGTH 20 MPa
   YOUNG'S MODULUS 28 000 MPa
2. REINFORCEMENT (SABS 920 - 1985)
   YIELD STRENGTH TYPE:
   MILD STEEL BARS 250 MPa
   HIGH TENSILE STEEL BARS 450 MPa
   WELDED STEEL FABRIC 450 MPa
3. REINFORCEMENT DETAILS:
   a) FOR 450, 600, 750 & 900 DIA. SEE DRG. No. MONT/MAKH/RDS/01/2016/STW05
   b) FOR 1050 & 1200 DIA. SEE DRG. No. MONT/MAKH/RDS/01/2016/STW06

DESIGN METHOD:

1. LIMIT STATE DESIGN ACCORDING TO TMH7 PART 3 AS AMENDED 1989
2. INLET AND OUTLET STRUCTURES ARE DESIGNED FOR LOADING SPECIFIED IN TMH7 PART 1 AND 2 AS AMENDED 1988 "CODE OF PRACTICE FOR THE DESIGN OF HIGHWAY BRIDGES AND CULVERTS IN S.A."
3. TYPE OF REINFORCEMENT AND SPACING ARE SHOWN ON THE DRAWINGS. THE CONTRACTOR MUST SUBMIT WORKING DRAWINGS AND BENDING SCHEDULES FOR APPROVAL.

FOUNDING MATERIAL:

1. MAX. CALCULATED GROUND PRESSURE - 100kPa
2. FOUNDING LEVEL TO BE APPROVED BY THE PROJECT MANAGER.

HYDRAULIC INFORMATION:

1. SEE DRAINAGE SCHEDULE FOR FLOOD LEVELS, OUTLET TYPE AND HYDRAULIC DATA FOR EACH CULVERT.

EROSION PROTECTION:

1. TO BE PROVIDED WHERE OUTLET VELOCITIES AS INDICATED ON DRAINAGE SCHEDULE> 2m/s

FOR REINFORCING DETAILS REFER TO DRAWING No. /STW05 AND /STW06

No.	DATE	REVISION	CONSULT ENG.	DR.
-	-	-	-	-

DESIGNED BY	SZB RANGANA
CHECKED BY	PXA NDLOVU
DRAWN BY	TA MOSIA
CHECKED BY	TE MUVHANGO

MAKHADO MUNICIPALITY
PRIVATE BAG X 2596
LOUIS TRICHARDT
0920
TEL: 015 - 519 3000
FAX: 015 - 516 6145

MONT CONSULTING ENGINEERS
PO BOX 1249
FAUNA PARK
0787
TEL: 015 - 291 4173
FAX: 015 - 291 4218
MEMBER OF CESA

PROJECT
CONSTRUCTION OF LUTANANDWA ACCESS ROAD AND BRIDGE - PHASE 2
BID NO.: 35 OF 2022

TITLE
TYPICAL DETAIL : PIPE CULVERTS SKEW TO THE ROAD (450 TO 1200 DIA. PIPES) CONCRETE DETAILS

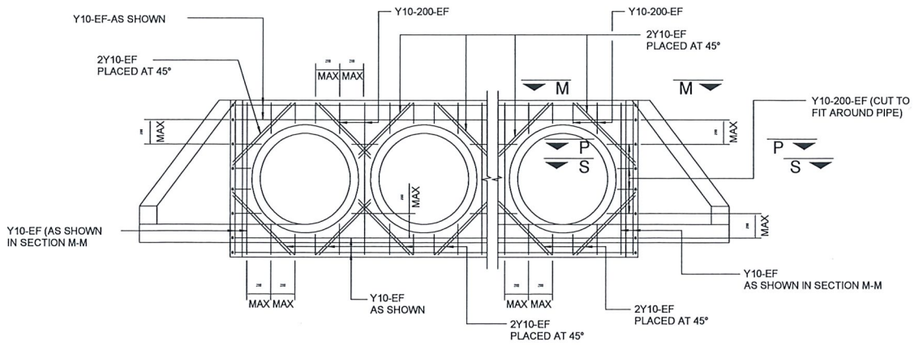
ISSUED FOR TENDER
For Approval

For: Makhado Municipality 20__/__/__

For: Mont Consulting Engineers 20__/__/__

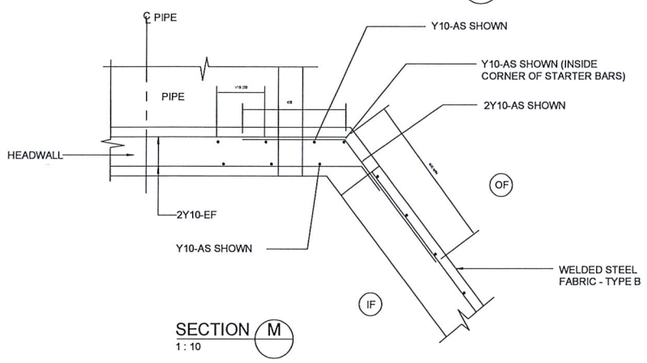
DRAWING No.: MONT/MAKH/RDS/01/2019/STW04

SHEET 01 OF 01
SCALE AS SHOWN
PAPER SIZE A1
REVISION 00

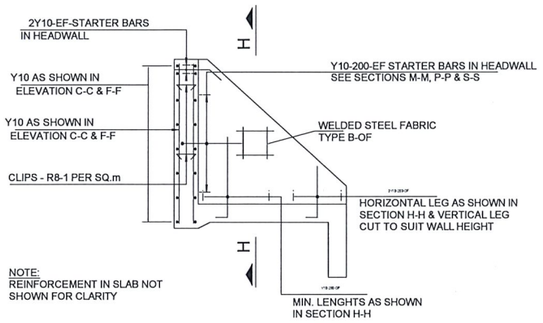


NOTE:
1. STEEL IN WINGWALL AND STARTER BARS NOT SHOWN FOR CLARITY
2. SKEW PIPE CULVERTS SIMILAR
3. COVER TO REINFORCEMENT 40mm

ELEVATION C
1 : 20

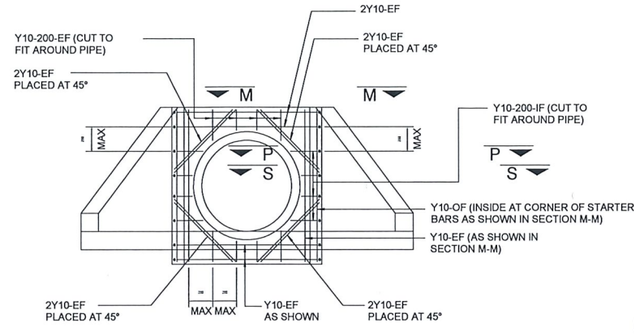


SECTION M
1 : 10



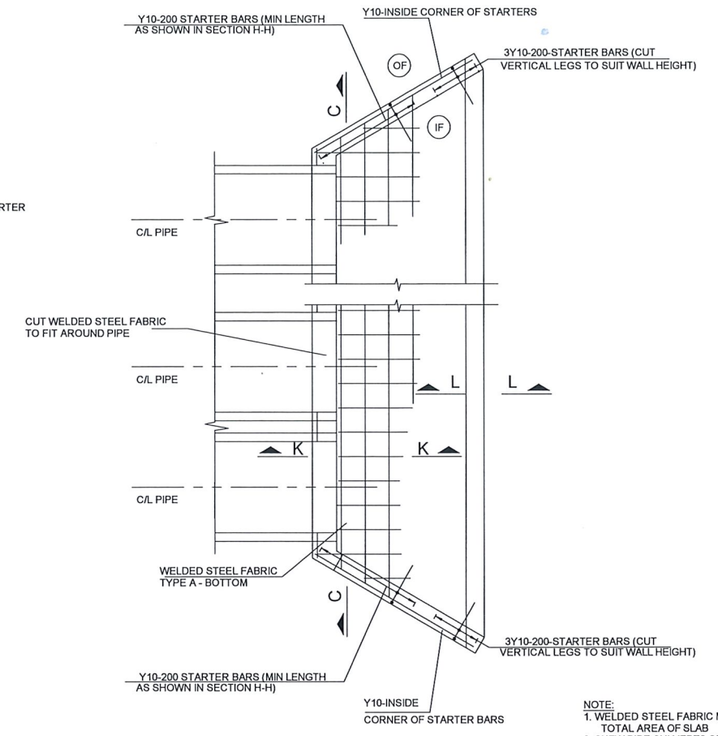
NOTE:
REINFORCEMENT IN SLAB NOT SHOWN FOR CLARITY

TYPICAL WINGWALL ELEVATION
1:20



NOTE:
1. STEEL IN WINGWALL AND STARTER BARS NOT SHOWN FOR CLARITY
2. SKEW PIPE CULVERTS SIMILAR
3. COVER TO REINFORCEMENT 40mm

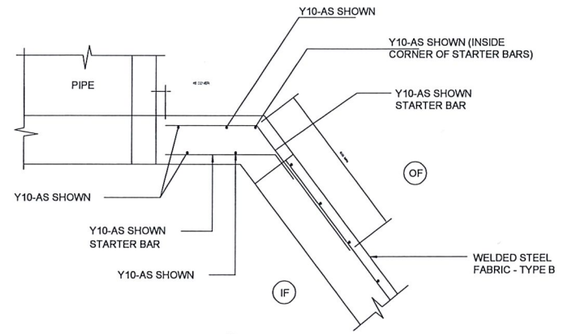
ELEVATION F
1 : 20



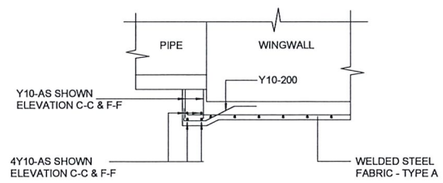
NOTE:
1. WELDED STEEL FABRIC MUST COVER TOTAL AREA OF SLAB
2. SKEW PIPE CULVERTS SIMILAR

PLAN A
1 : 20

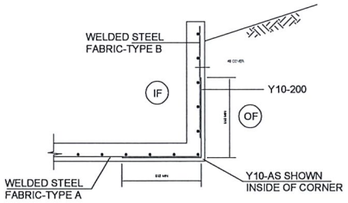
FLOOR SLAB - MULTIPLE PIPE CULVERT



SECTION P
1 : 10



SECTION K
1 : 20



SECTION H
1 : 20

INSIDE DIA. PIPE (D)	T	WELDED FABRIC REF No	
		TYPE A	TYPE B
450	150	245	245
600	150	245	245
750	150	395	245
900	175	395	245

LEGEND

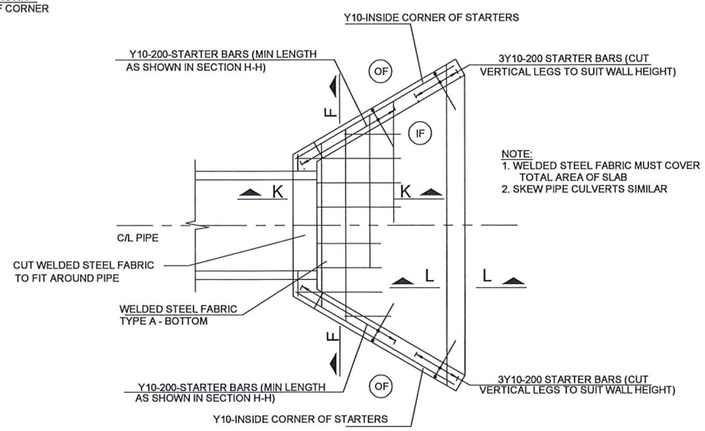
EF = EACH FACE
OF = OUTSIDE FACE
IF = INSIDE FACE

20MPa CONCRETE - BAR LAP LENGTHS

BAR DIA.	10	12
LAP LENGTH	550	660

20MPa CONCRETE - MESH LAP LENGTHS

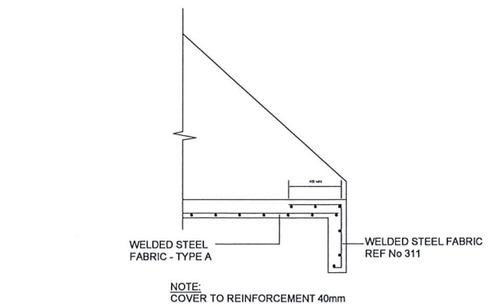
WELDED STEEL FABRIC REF. No.	245	311	395	500	617
MIN LAP LENGTH	450	500	600	650	750



NOTE:
1. WELDED STEEL FABRIC MUST COVER TOTAL AREA OF SLAB
2. SKEW PIPE CULVERTS SIMILAR

PLAN B
1 : 20

FLOOR SLAB - SINGLE PIPE CULVERT



NOTE:
COVER TO REINFORCEMENT 40mm

SECTION L
1 : 20

SCALE ON REDUCED DRAWING
100mm ON ORIGINAL DRAWING

SECTION S
1 : 10

No.	DATE	REVISION	CONSULT ENG	D/R
-	-	-	-	-

DESIGNED BY	SZB RANGANA
CHECKED BY	PXA NDLOVU
DRAWN BY	TA MOSIA
CHECKED BY	TE MUVHANGO

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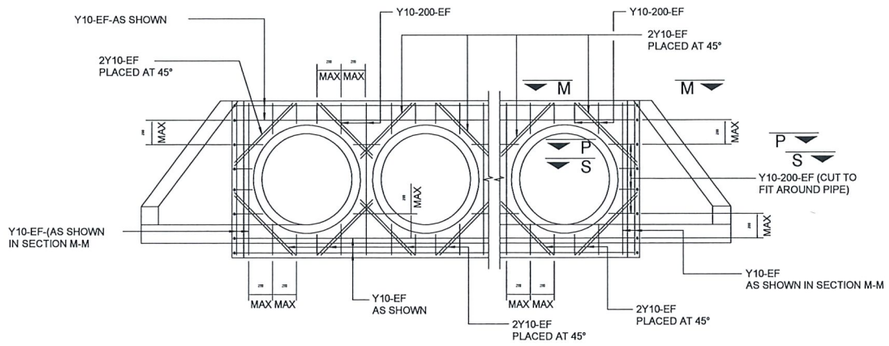
MEMBER OF CESA

PROJECT
CONSTRUCTION OF LUTANANDWA ACCESS ROAD AND BRIDGE - PHASE 2
BID NO.: 35 OF 2022

TITLE
TYPICAL DETAIL : PIPE CULVERTS - 90° & SKEW TO ROAD (450 TO 900 DIA. PIPES) REINFORCEMENT DETAILS

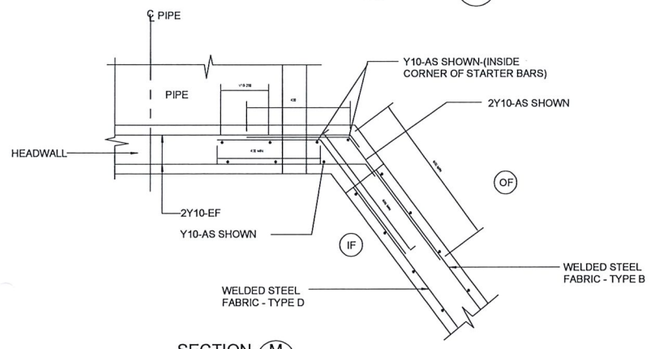
ISSUED FOR TENDER
For Makhado Municipality 20__/__/__
For Mont Consulting Engineers 20__/__/__

SHEET 01 OF 01
SCALE AS SHOWN
PAPER SIZE A1
DRAWING No. MONT/MAKH/RDS/01/2019/STW05
REVISION 00

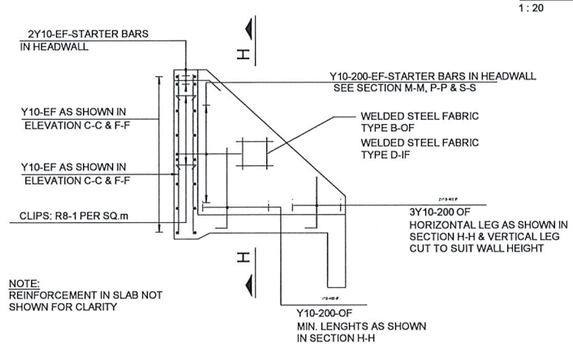


NOTE:
1. STEEL IN WINGWALL AND STARTER BARS NOT SHOWN FOR CLARITY
2. SKEW PIPE CULVERTS SIMILAR
3. COVER TO REINFORCEMENT 40mm

ELEVATION C
1 : 20

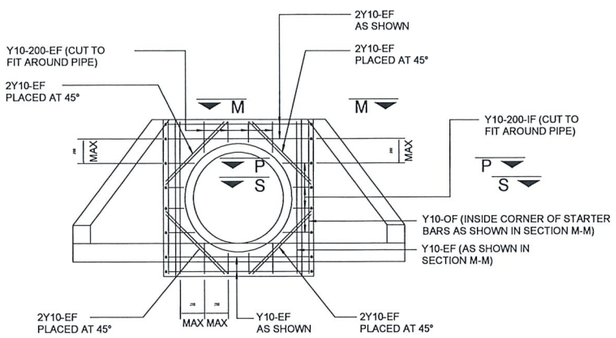


SECTION M
1 : 10



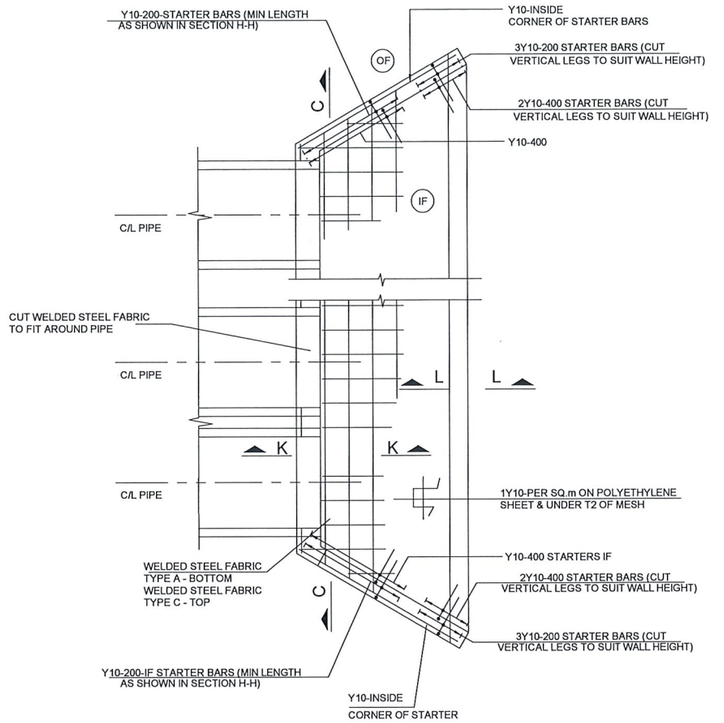
NOTE:
REINFORCEMENT IN SLAB NOT SHOWN FOR CLARITY

TYPICAL WINGWALL ELEVATION
1:20



ELEVATION F
1 : 20

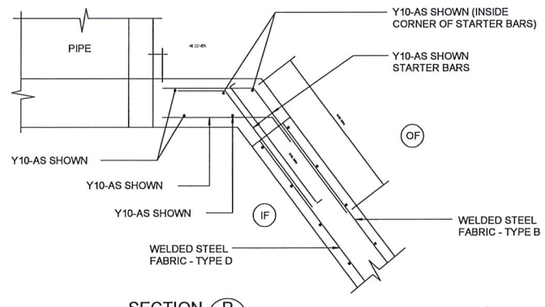
NOTE:
1. STEEL IN WINGWALL AND STARTER BARS NOT SHOWN FOR CLARITY
2. SKEW PIPE CULVERTS SIMILAR
3. COVER TO REINFORCEMENT 40mm



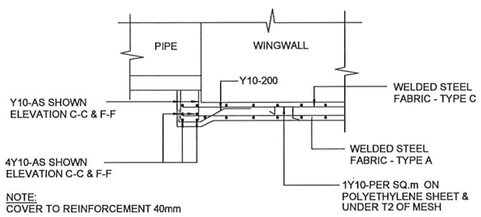
PLAN A
1 : 20

NOTE:
1. WELDED STEEL FABRIC MUST COVER TOTAL AREA OF SLAB
2. SKEW PIPE CULVERTS SIMILAR

FLOOR SLAB - MULTIPLE PIPE CULVERT

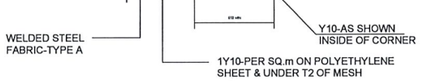


SECTION P
1 : 10



NOTE:
COVER TO REINFORCEMENT 40mm

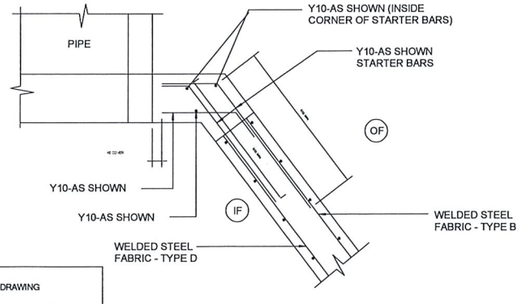
SECTION K
1 : 20



NOTE:
COVER TO REINFORCEMENT 40mm

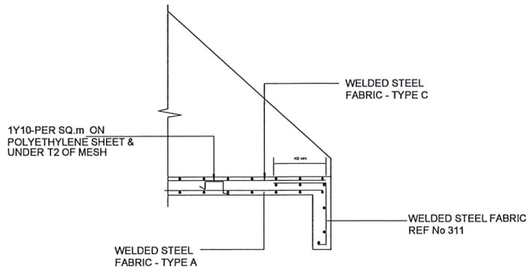
SECTION H
1 : 20

INSIDE DIA. PIPE (D)	T	WELDED FABRIC REF No			
		TYPE A	TYPE B	TYPE C	TYPE D
1050	200	500	311	245	245
1200	200	617	311	245	245



SCALE ON REDUCED DRAWING
100mm ON ORIGINAL DRAWING

SECTION S
1 : 10



NOTE:
COVER TO REINFORCEMENT 40mm

SECTION L
1 : 20

LEGEND

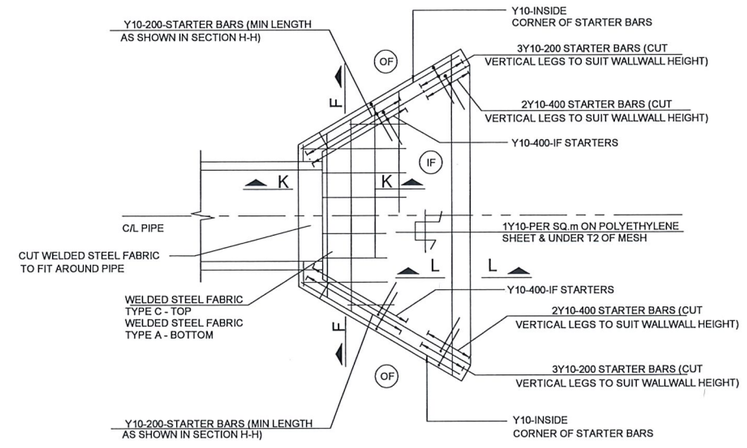
EF = EACH FACE
OF = OUTSIDE FACE
IF = INSIDE FACE

20MPa CONCRETE - BAR LAP LENGTHS

BAR DIA.	10	12
LAP LENGTH	550	660

20MPa CONCRETE - MESH LAP LENGTHS

WELDED STEEL FABRIC REF. No.	245	311	395	500	617
MIN LAP LENGTH	450	500	600	650	750



NOTE:
1. WELDED STEEL FABRIC MUST COVER TOTAL AREA OF SLAB
2. SKEW PIPE CULVERTS SIMILAR

PLAN PLN
SCALE REF

FLOOR SLAB - SINGLE PIPE CULVERT

No	DATE	REVISION	CONSULT ENG.	DR.
-	-	-	-	-

DESIGNED BY	SZB RANGANA
CHECKED BY	PXA NDLOVU
DRAWN BY	TA MOSIA
CHECKED BY	TE MUVHANGO

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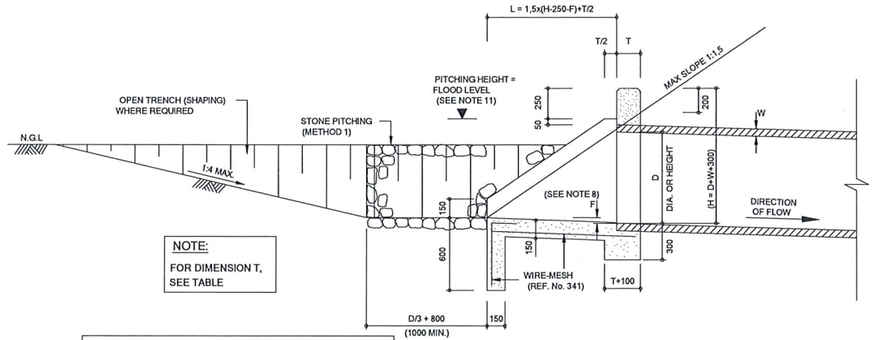
MEMBER OF CESA

PROJECT
CONSTRUCTION OF LUTANANDWA ACCESS ROAD AND BRIDGE - PHASE 2
BID NO.: 35 OF 2022

TITLE
TYPICAL DETAIL : PIPE CULVERTS - 90° & SKEW TO ROAD (1050 & 1200 DIA. PIPES) REINFORCEMENT DETAILS

ISSUED FOR TENDER
For Makhado Municipality 20_/_/_
For Mont Consulting Engineers 20_/_/_

SHEET 01 OF 01
SCALE AS SHOWN
PAPER SIZE A1
DRAWING No. MONT/MAKH/RDS/01/2019/STW06
REVISION 00

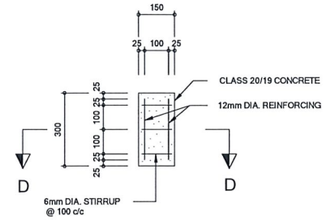


NOTE:
FOR DIMENSION T, SEE TABLE

TABLE			
CULVERT HEIGHT OR DIA.	X	Y	T
450	1000	150	150
600	1200	150	150
750	1500	200	200
900	1800	200	200
1050	2100	250	250
1200	2400	250	250
1500	3000	250	250

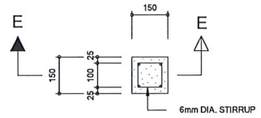
SECTION A-A (SHOWN FOR O-= 90°)

SCALE 1:20



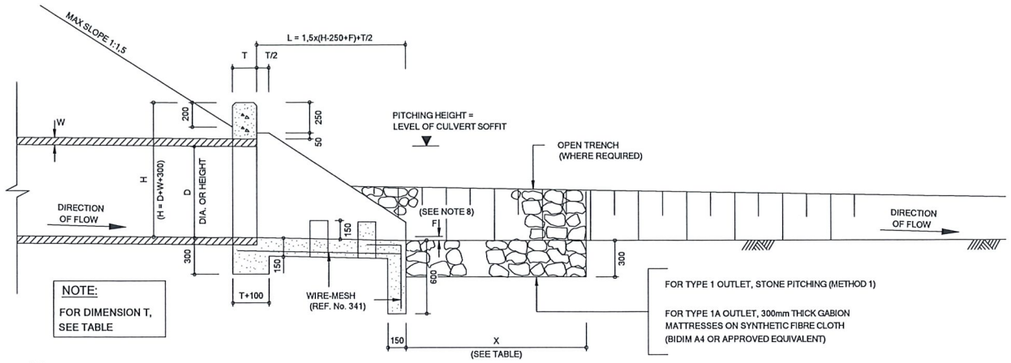
SECTION E-E

SCALE 1:10



SECTION D-D

SCALE 1:10



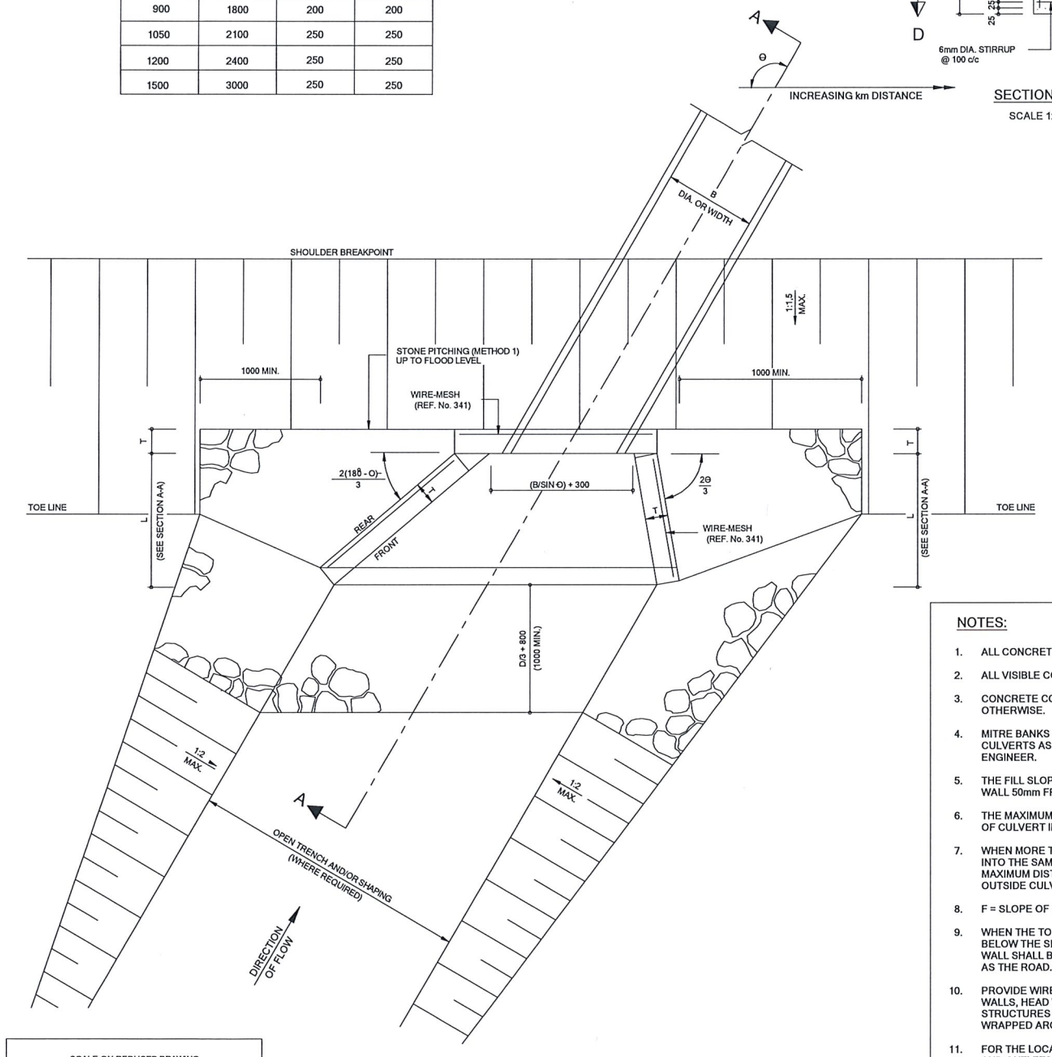
NOTE:
FOR DIMENSION T, SEE TABLE

SECTION B-B (SHOWN FOR O-= 90°)

SCALE 1:20

DETAIL OF PRECAST CONCRETE BLOCKS

SCALE 1:10



SCALE ON REDUCED DRAWING

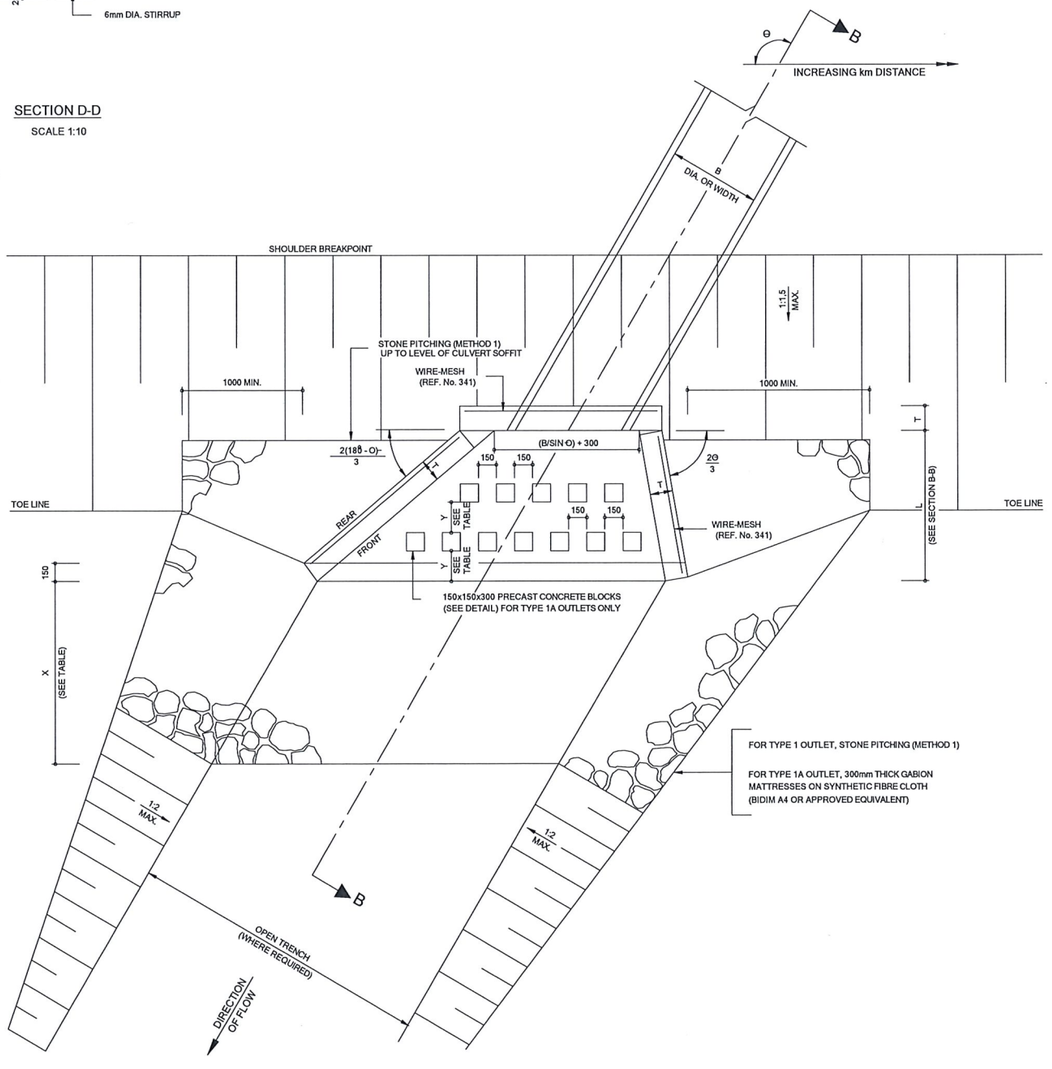
100mm ON ORIGINAL DRAWING

PLAN : TYPE 1 INLET

SCALE 1:20

NOTES:

1. ALL CONCRETE SHALL BE CLASS 30/19.
2. ALL VISIBLE CORNERS SHALL BE 20mm CHAMFERED.
3. CONCRETE COVER TO REINFORCING IS 40mm, UNLESS SPECIFIED OTHERWISE.
4. MITRE BANKS TO BE CONSTRUCTED ON DOWNSTREAM SIDE OF CULVERTS AS SHOWN ON PLANS OR INSTRUCTED BY THE ENGINEER.
5. THE FILL SLOPE SHALL ALWAYS INTERSECT THE CULVERT HEAD WALL 50mm FROM ITS TOP.
6. THE MAXIMUM SLOPE OF ANY EARTHWORKS IN THE PROXIMITY OF CULVERT IN- AND OUTLETS SHALL BE 1:1,5.
7. WHEN MORE THAN ONE PIPE- OR BOX CULVERTS ARE BUILT INTO THE SAME HEAD WALL, DIMENSION B SHALL BE THE MAXIMUM DISTANCE BETWEEN THE INNER WALLS OF THE OUTSIDE CULVERTS.
8. F = SLOPE OF CULVERT x 1,5 x (D+W).
9. WHEN THE TOP OF THE HEAD WALL IS LESS THAN 500mm BELOW THE SHOULDER BREAKPOINT, THE TOP OF THE HEAD WALL SHALL BE BUILT AT THE SAME LONGITUDINAL SLOPE AS THE ROAD.
10. PROVIDE WIRE-MESH REINFORCING (REF. No. 341) IN WING WALLS, HEAD WALLS AND FLOOR SLABS OF IN- AND OUTLET STRUCTURES WITH 400mm LAP TO SHEETS AND 300mm WRAPPED AROUND VERTICAL CORNERS WHERE APPLICABLE.
11. FOR THE LOCATION, TYPE AND FLOOD LEVELS AT CULVERT IN- AND OUTLETS, SEE LAYOUT PLANS AND DRAINAGE AND DRAINAGE SCHEDULES



PLAN : TYPE 1 & TYPE 1A OUTLETS

SCALE 1:20

No	DATE	REVISION	CONSULT. ENG.	DR.
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-

DESIGNED BY	SZB RANGANA
CHECKED BY	PXA NDLOVU
DRAWN BY	TA MOSIA
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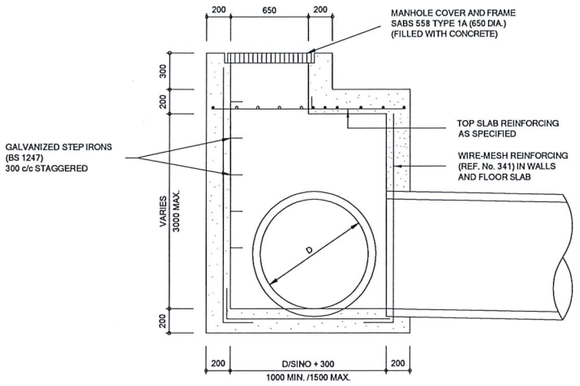
PROJECT
CONSTRUCTION OF LUTANANDWA ACCESS ROAD AND BRIDGE - PHASE 2
BID NO.: 35 OF 2022

TITLE
TYPICAL DETAIL : CULVERT INLET AND OUTLET STRUCTURES TYPES 1 AND 1A

ISSUED FOR TENDER
For Makhado Municipality 20__/__/__
For Mont Consulting Engineers 20__/__/__

SHEET 01 OF 01
SCALE AS SHOWN
PAPER SIZE A1
DRAWING No. MONT/MAKH/RDS/01/2019/STW07
REVISION 00



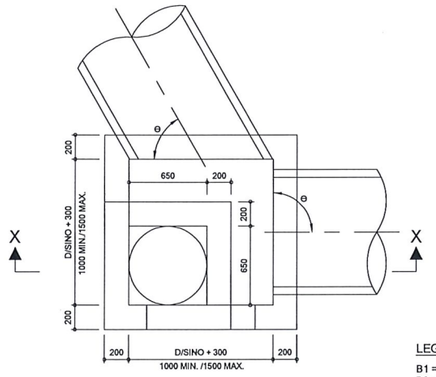
SECTION X-X

NOTES (MANHOLES):

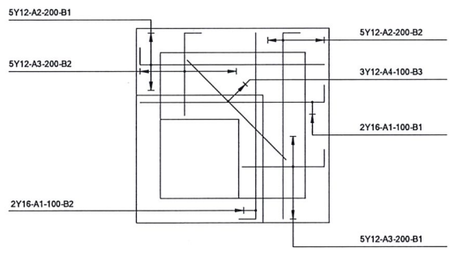
1. ALL CAST IN SITU CONCRETE SHALL BE CLASS 30/19.
2. MINIMUM COVER TO REINFORCING SHALL BE 40mm.
3. ALL VISIBLE CORNERS SHALL BE 20mm CHAMFERED.
4. MANHOLE IS DESIGNED FOR A 80kN WHEEL LOAD WITH 25% ALLOWABLE OVERSTRESS.
5. REINFORCING AS SHOWN IN BENDING SCHEDULE IS FOR A MANHOLE WITH MAXIMUM DIMENSIONS. NUMBER AND LENGTH OF BARS SHALL BE REDUCED TO SUIT SMALLER STRUCTURES.
6. WIRE-MESH REINFORCING IN WALLS AND FLOOR SLABS SHALL HAVE 400mm LAP TO SHEETS AND 300mm WRAPPED AROUND VERTICAL CORNERS.
7. MANHOLES WITH LARGER DIMENSIONS SHALL BE CONSTRUCTED ACCORDING TO THE DETAIL ON MANHOLES AND CATCHPITS FOR LARGE PIPE AND BOX CULVERTS
8. FOR THE LOCATION OF STORMWATER MANHOLES, SEE LAYOUT PLANS AND LONG SECTIONS.

MARK	TYPE	NUMBER	LENGTH	BENDING	Y12	Y16
A1	Y16	4	1970	1820		7,9
A2	Y12	10	1970	1820	19,7	
A3	Y12	10	1120	970	11,2	
A4	Y12	3	1400	1400	4,2	
TOTAL LENGTH (m)					35,1	7,9
TOTAL MASS (kg)					31,2	12,5

BENDING SCHEDULE



PLAN



LEGEND:

B1 = BOTTOM OF BOTTOM LAYERS
B2 = CENTRE OF BOTTOM LAYERS
B3 = TOP OF BOTTOM LAYERS

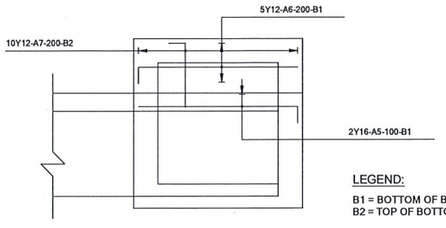
REINFORCING (TOP SLAB)

TYPICAL DETAIL OF STORMWATER MANHOLE

SCALE 1:20

MARK	TYPE	NUMBER	LENGTH	BENDING	Y12	Y16
A5	Y16	2	1970	1820		3,9
A6	Y12	5	1970	1820	9,9	
A7	Y12	10	1270	1120	12,7	
TOTAL LENGTH (m)					22,6	3,9
TOTAL MASS (kg)					20,1	6,2

BENDING SCHEDULE

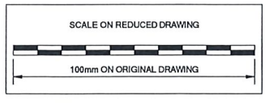


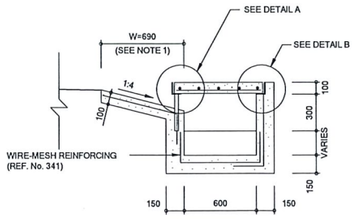
LEGEND:

B1 = BOTTOM OF BOTTOM LAYERS
B2 = TOP OF BOTTOM LAYERS

REINFORCING (MANHOLE TOP SLAB)

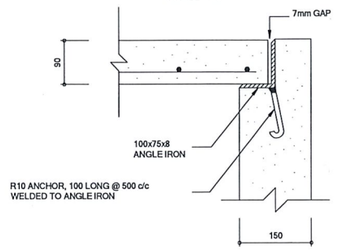
SCALE 1:20





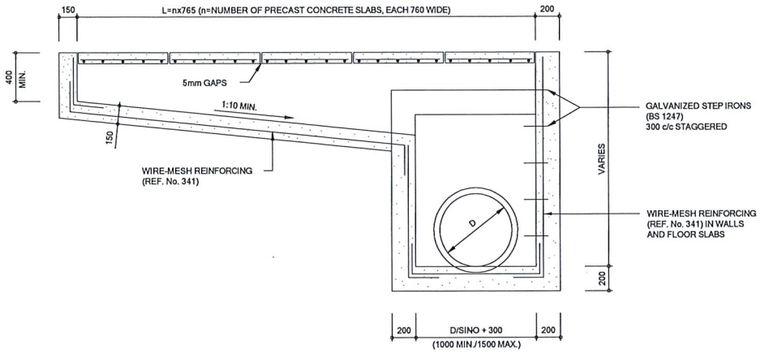
SECTION B-B

SCALE 1:20



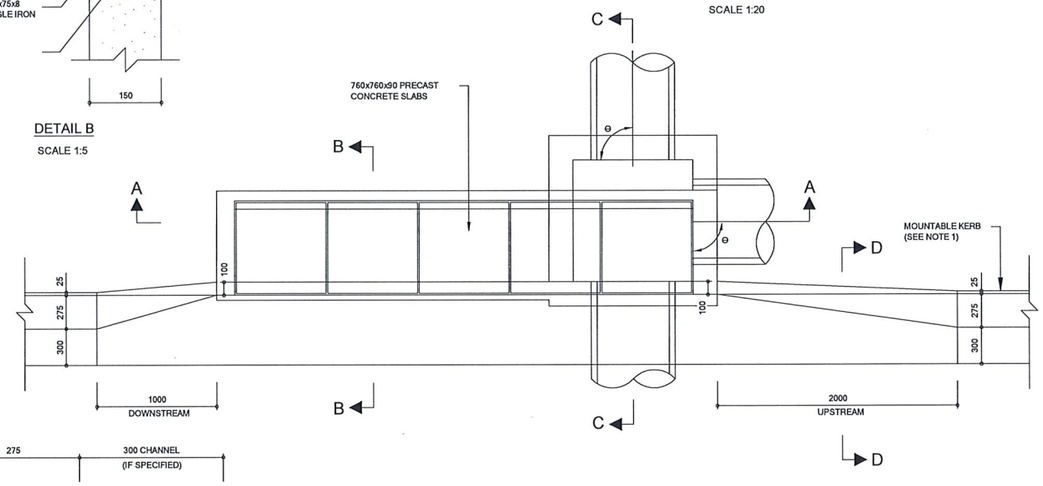
DETAIL B

SCALE 1:5



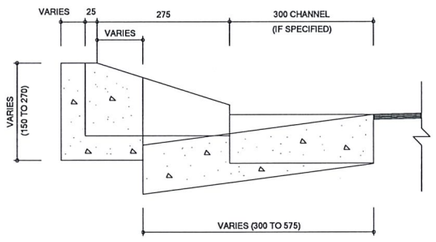
SECTION A-A

SCALE 1:20



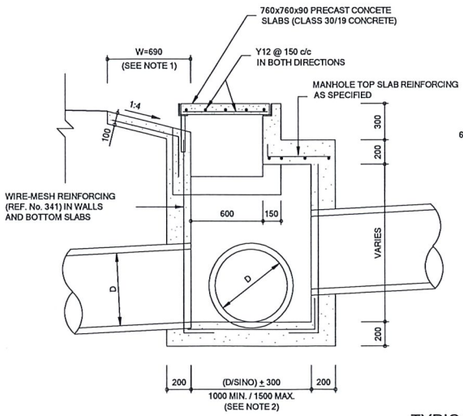
PLAN

SCALE 1:20



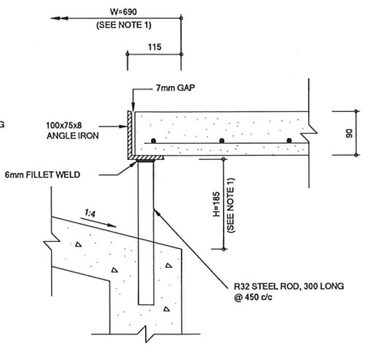
SECTION D-D

SCALE 1:5



SECTION C-C

SCALE 1:20



DETAIL A

SCALE 1:5

TYPICAL DETAIL OF KERB INLET

NOTES (KERB INLETS):

1. KERB INLET AS SHOWN IS FOR A MOUNTABLE KERB. FOR A BATTERED KERB, DIMENSION W=520; H=240 AND TRANSITION SECTIONS SIMILAR.
2. THIS DIMENSION MAY BE REDUCED TO 600mm MIN. FOR SHALLOW KERB INLETS WITH NO CULVERTS ON THE APPLICABLE SIDES.
3. ALL CONCRETE SHALL BE CLASS 30/19, EXCEPT FOR PRECAST CONCRETE SLABS WHERE CLASS 30/19 CONCRETE SHALL BE USED.
4. MINIMUM COVER TO REINFORCING IS 40mm.
5. NUMBER OF PRECAST CONCRETE SLABS FOR EACH KERB INLET ACCORDING TO SPECIFIED LENGTH OF KERB INLET AS SHOWN ON DRAINAGE SCHEDULES, PLANS.
6. ALL VISIBLE CORNERS SHALL BE 20mm CHAMFERED.
7. KERB INLET IS DESIGNED FOR A 80kN WHEEL LOAD WITH 25% ALLOWABLE OVERSTRESS.
8. ALL STRUCTURAL STEEL SHALL COMPLY WITH THE SPECIFICATIONS OF BS 4360 AND ALL WELDING WITH THE SPECIFICATIONS OF SABS 044.
9. ALL STRUCTURAL STEEL SHALL BE PAINTED AS SPECIFIED IN SECTION 8400 OF THE STANDARD SPECIFICATIONS (COLTO).
10. REINFORCING AS SHOWN IN BENDING SCHEDULE IS FOR A MANHOLE WITH MAXIMUM DIMENSIONS. NUMBER AND LENGTH OF BARS SHALL BE REDUCED TO SUIT SMALLER STRUCTURES.
11. WIRE-MESH REINFORCING IN WALLS AND FLOOR SLABS SHALL HAVE 400mm LAP TO SHEETS AND 300mm WRAPPED AROUND VERTICAL CORNERS.
12. FOR LOCATION OF KERB INLETS, SEE LAYOUT PLANS.

No	DATE	REVISION	CONSULT. ENG.	DR.
-	-	-	-	-

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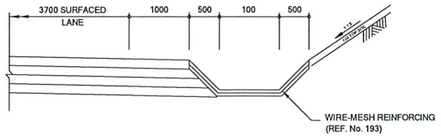
PROJECT: CONSTRUCTION OF LUTANANDWA ACCESS ROAD AND BRIDGE - PHASE 2
BID NO.: 35 OF 2022

TITLE: TYPICAL DETAIL : MANHOLES AND KERB INLETS

ISSUED FOR TENDER
For Makhado Municipality _____ 20_/_/_
For: Mont Consulting Engineers _____ 20_/_/_

DRAWING No.: MONT/MAKH/RDS/01/2019/STW08

SHEET 01 OF 01
SCALE: AS SHOWN
PAPER SIZE: A1
REVISION: 00

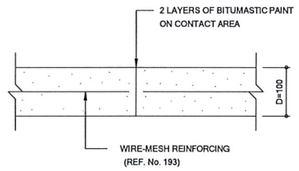


DETAIL OF CONCRETE SIDE DRAIN

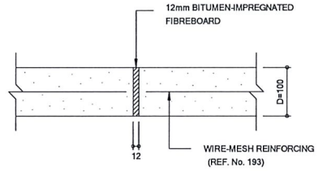
SCALE 1:40

NOTES (SIDE DRAINS):

1. ALL CONCRETE SHALL BE CLASS 30/19.
2. SHRINKAGE JOINTS SHALL BE PROVIDED EVERY 2m AND EXPANSION JOINTS EVERY 20m.



SHRINKAGE JOINT



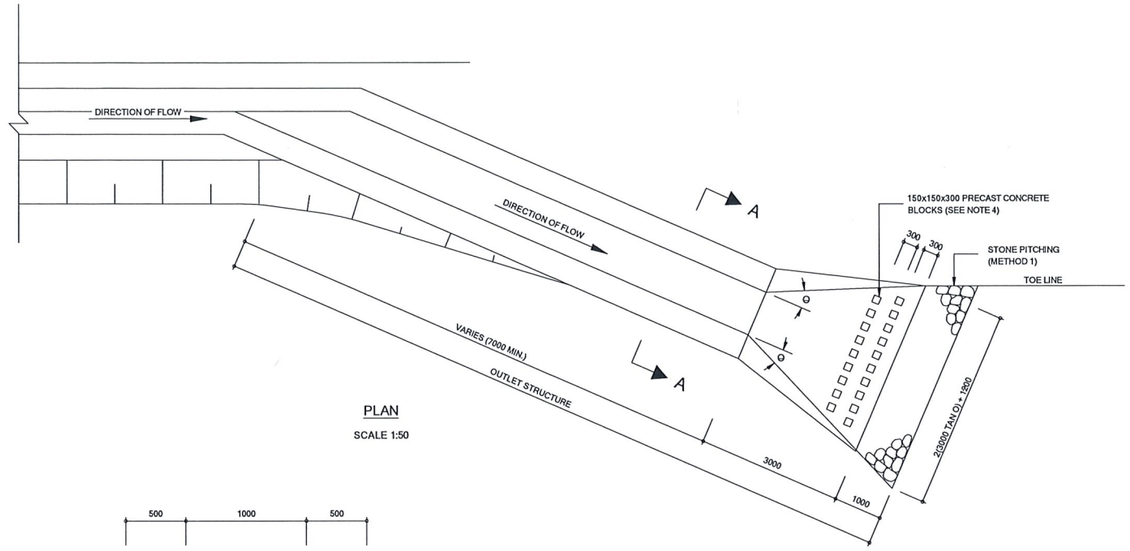
EXPANSION JOINT

DETAIL OF JOINTS

SCALE 1:5

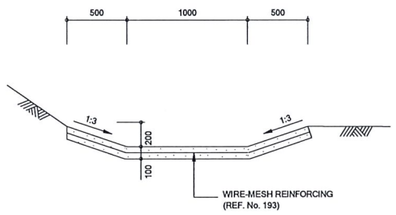
SCALE ON REDUCED DRAWING

100mm ON ORIGINAL DRAWING



PLAN

SCALE 1:50



SECTION A-A

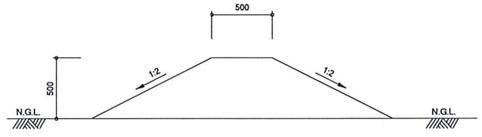
SCALE 1:20

CONCRETE SIDE DRAIN OUTLET

CONCRETE SIDE DRAIN OUTLETS		
ROAD	km DIST.	SIDE

NOTES (SIDE DRAIN OUTLET):

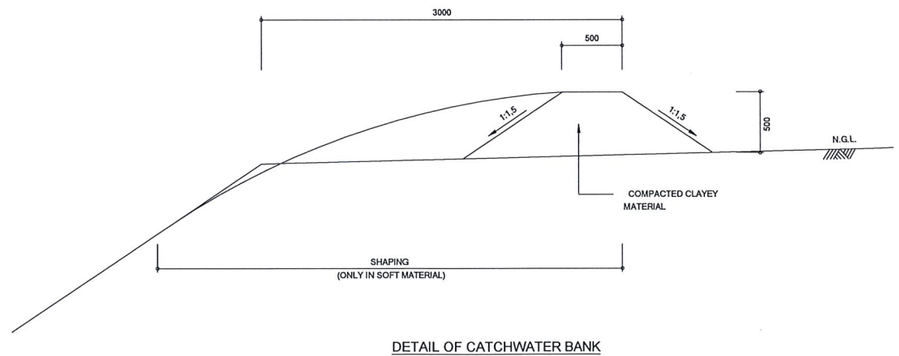
1. OUTLET STRUCTURES MUST BE CONSTRUCTED TO FIT IN WITH SURROUNDING TOPOGRAPHY.
2. ALL CONCRETE SHALL BE CLASS 30/19.
3. SHRINKAGE JOINTS SHALL BE PROVIDED EVERY 2m AND EXPANSION JOINTS EVERY 20m.



DETAIL OF MITRE BANK

NOTES (CATCHWATER BANKS AND MITRE BANKS):

1. MINIMUM LONGITUDINAL SLOPE BEHIND CATCHWATER BANKS SHALL BE 0,5%. IF NECESSARY, A CHANNEL BEHIND THE CATCHWATER BANK SHALL BE FORMED TO OBTAIN THIS SLOPE.



DETAIL OF CATCHWATER BANK

CATCHWATER BANKS AND MITRE BANKS

SCALE 1:20

No	DATE	REVISION	CONSULT ENG.	DIR.
-	-	-	-	-

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MEMBER OF CESA

PROJECT: CONSTRUCTION OF LUTANANDWA ACCESS ROAD AND BRIDGE - PHASE 2
BID NO.: 35 OF 2022

TITLE: TYPICAL DETAIL : CONCRETE SIDE AND MEDIAN DRAINS, CONCRETE SIDE DRAIN OUTLETS, CATCHWATER BANKS AND MITRE BANKS

ISSUED FOR TENDER (Full signature)

For: Makhado Municipality 29/../..

For: Mont Consulting Engineers 29/../..

DRAWING No.: MONT/MAKH/RDS/01/2019/STW09

SHEET 01 OF 01

SCALE: AS SHOWN

PAPER SIZE: A1

REVISION: 00

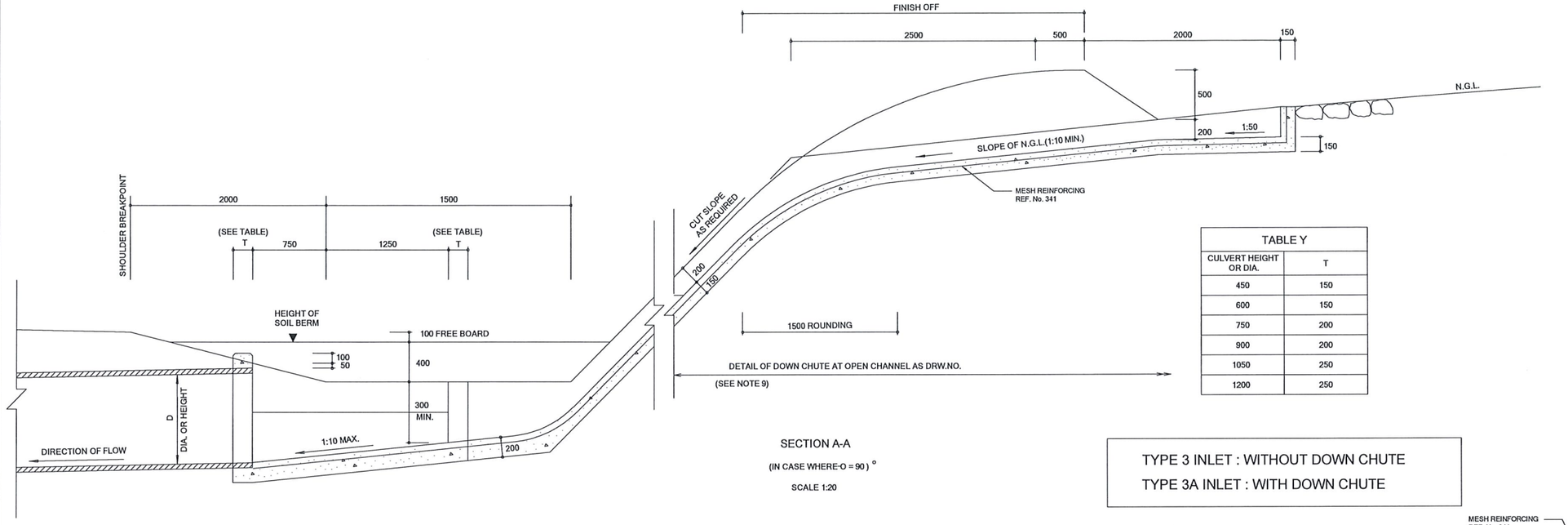
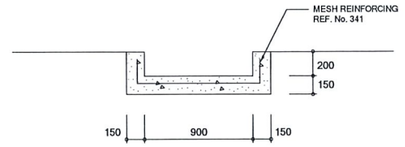


TABLE Y	
CULVERT HEIGHT OR DIA.	T
450	150
600	150
750	200
900	200
1050	250
1200	250

SECTION A-A

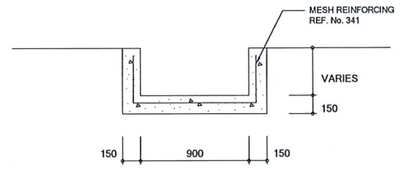
(IN CASE WHERE-O = 90) °

SCALE 1:20



SECTION B-B

SCALE 1:20

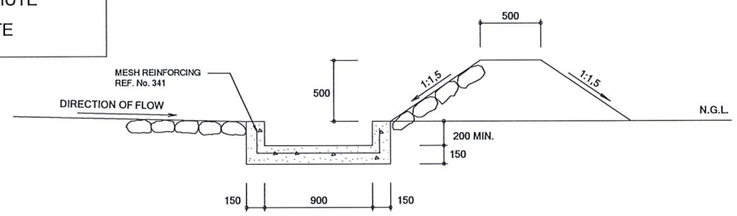


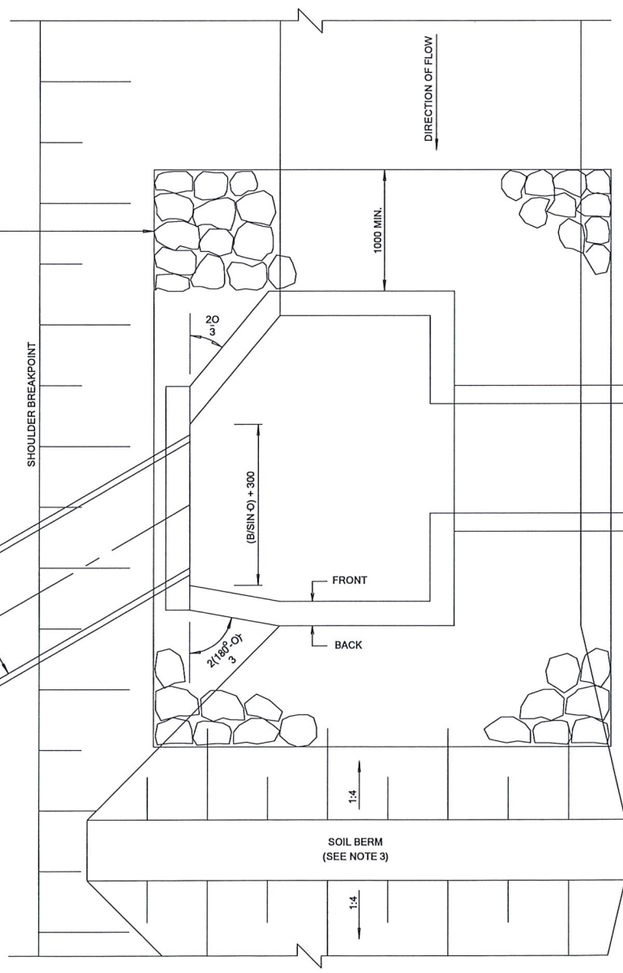
SECTION C-C

SCALE 1:20

TYPE 3 INLET : WITHOUT DOWN CHUTE

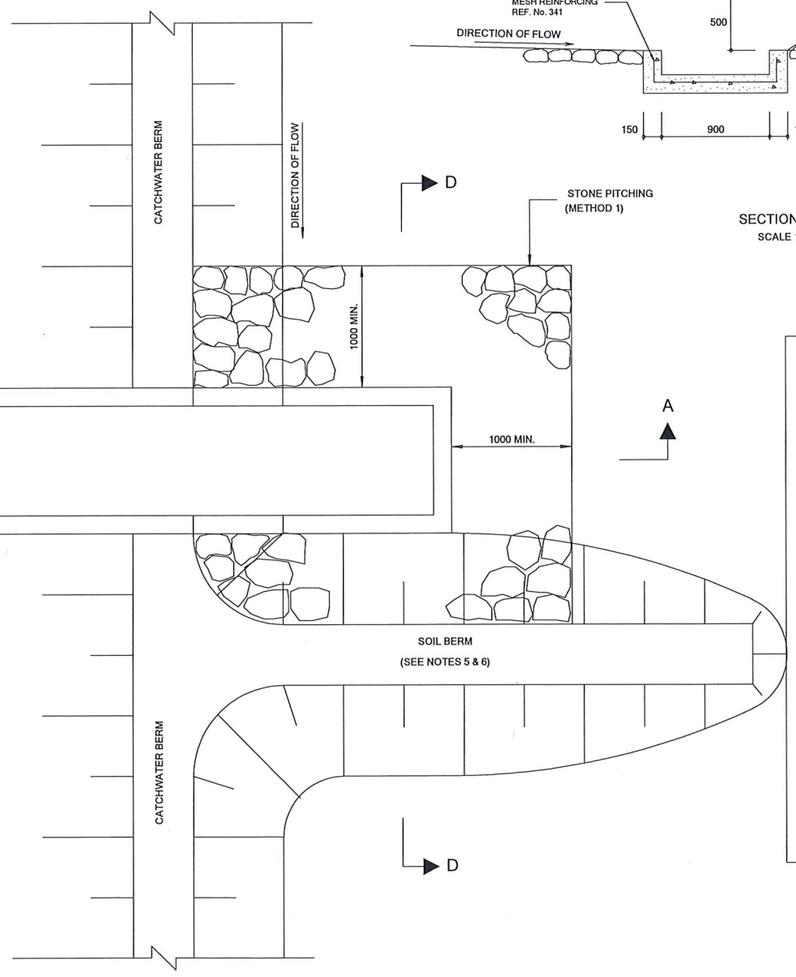
TYPE 3A INLET : WITH DOWN CHUTE





PLAN

SCALE 1:20



SECTION D-D

SCALE 1:20

NOTES:

1. ALL CONCRETE TO BE CLASS 30/19.
2. ALL VISIBLE CORNERS SHOULD BE TAPERED 25mm.
3. WHEN THE SIDE DRAIN INLET IS PLACED AT A LOW POINT,THE BERM FALLS AWAY.
4. WHEN MORE THAN ONE CULVERT IS BUILT INTO THE SAME HEADWALL, THE MEASUREMENT 'B' SHOULD BE THE MAXIMUM DISTANCE BETWEEN THE INNER WALLS OF THE OUTSIDE CULVERTS.
5. THE LENGTH OF THE SOIL BERM BY THE INLET AT THE BACK OF THE CATCHWATER BERM ADJUSTS TO THE SLOPE OT THE NATURAL GROUNDLINE.
6. WHEN THE INLET BEHIND THE CATCHWATER BERM IS AT A LOW POINT, THE SOIL BERM FALLS AWAY.
7. FOR THE LOCATION OF THE TYPES 3 & 3A INLETS, SEE THE DRAINAGE SCHEDULES PLANS.
8. FOR THE FLOOD LEVELS AT EVERY INLET, SEE THE DRAINAGE SCHEDULES.
9. THE DOWN CHUTE AS DRAWN IS FOR THE CASE WHERE A CATCHWATER BERM IS ABOVE THE CUT. WHEN A OPEN CHANNEL IS ABOVE THE CUT.
10. REINFORCING IN WALLS OF INLET STRUCTURES WHEN D > 850:
    AT FRONT : No.245(6,3Ø-200x200)
    AT BACK : No.395(8,ØØ-200x200)
    WITH 600mm LENGTH IN FLOOR SLABS FOR BOTH CASES.
11. MINIMUM CONCRETE COVER FOR REINFORCING IS 40mm

SCALE ON REDUCED DRAWING

100mm ON ORIGINAL DRAWING

No	DATE	REVISION	CONSULT ENG	DR
-	-	-	-	-

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MEMBER OF CESA

PROJECT
CONSTRUCTION OF LUTANANDWA ACCESS ROAD AND BRIDGE - PHASE 2
BID NO.: 35 OF 2022

TITLE
TYPICAL DETAIL : CONCRETE SIDE AND MEDIAN DRAINS, CONCRETE SIDE DRAIN OUTLETS, CATCHWATER BANKS AND MITRE BANKS

ISSUED FOR TENDER
For approval

For Makhado Municipality 25_/_/_

For Mont Consulting Engineers 25_/_/_

DRAWING No. MONT/MAKH/RDS/01/2019/STW10

SHEET 8 OF 51

SCALE AS SHOWN

PAPER SIZE A1

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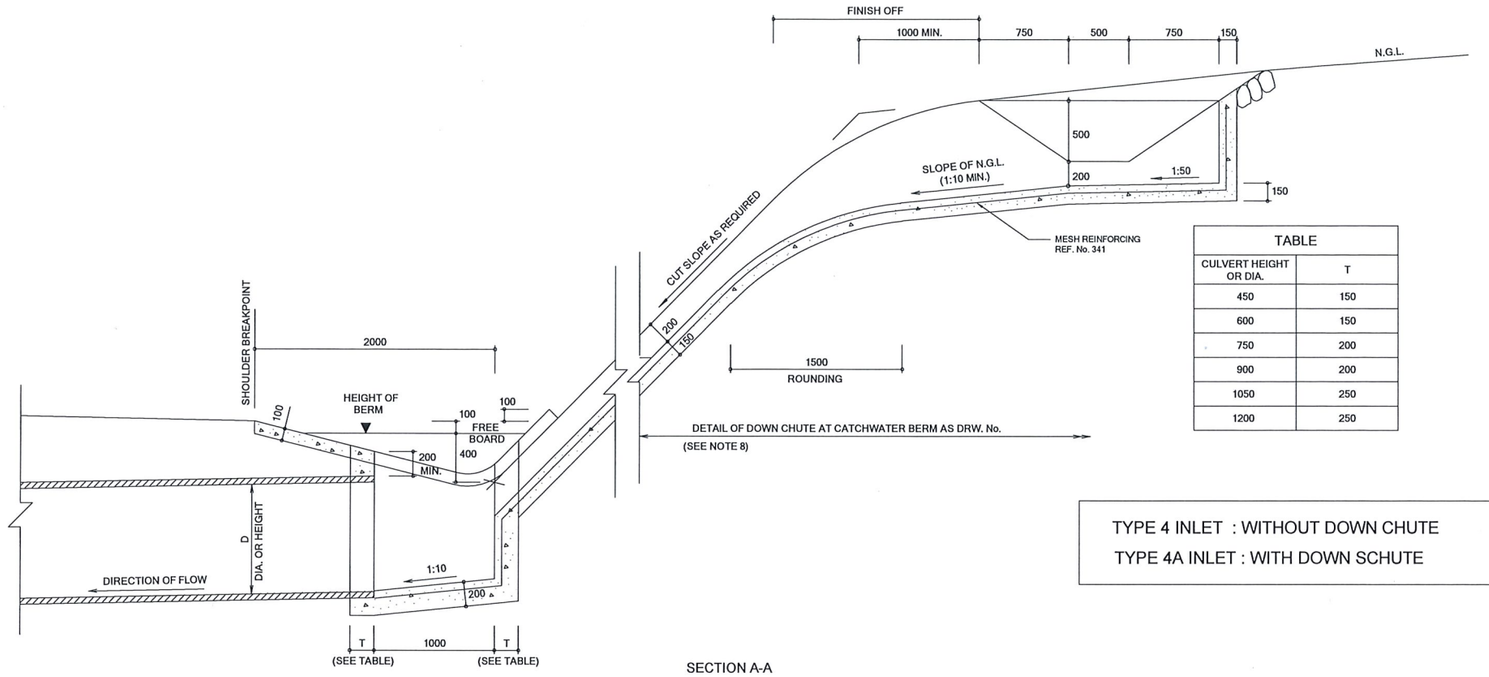


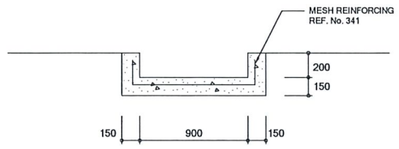
TABLE	
CULVERT HEIGHT OR DIA.	T
450	150
600	150
750	200
900	200
1050	250
1200	250

SECTION A-A

SCALE 1:20

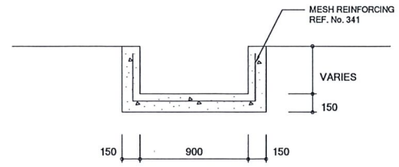
TYPE 4 INLET : WITHOUT DOWN CHUTE

TYPE 4A INLET : WITH DOWN SCHUTE



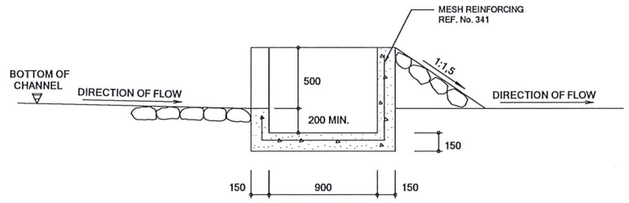
SECTION B-B

SCALE 1:20



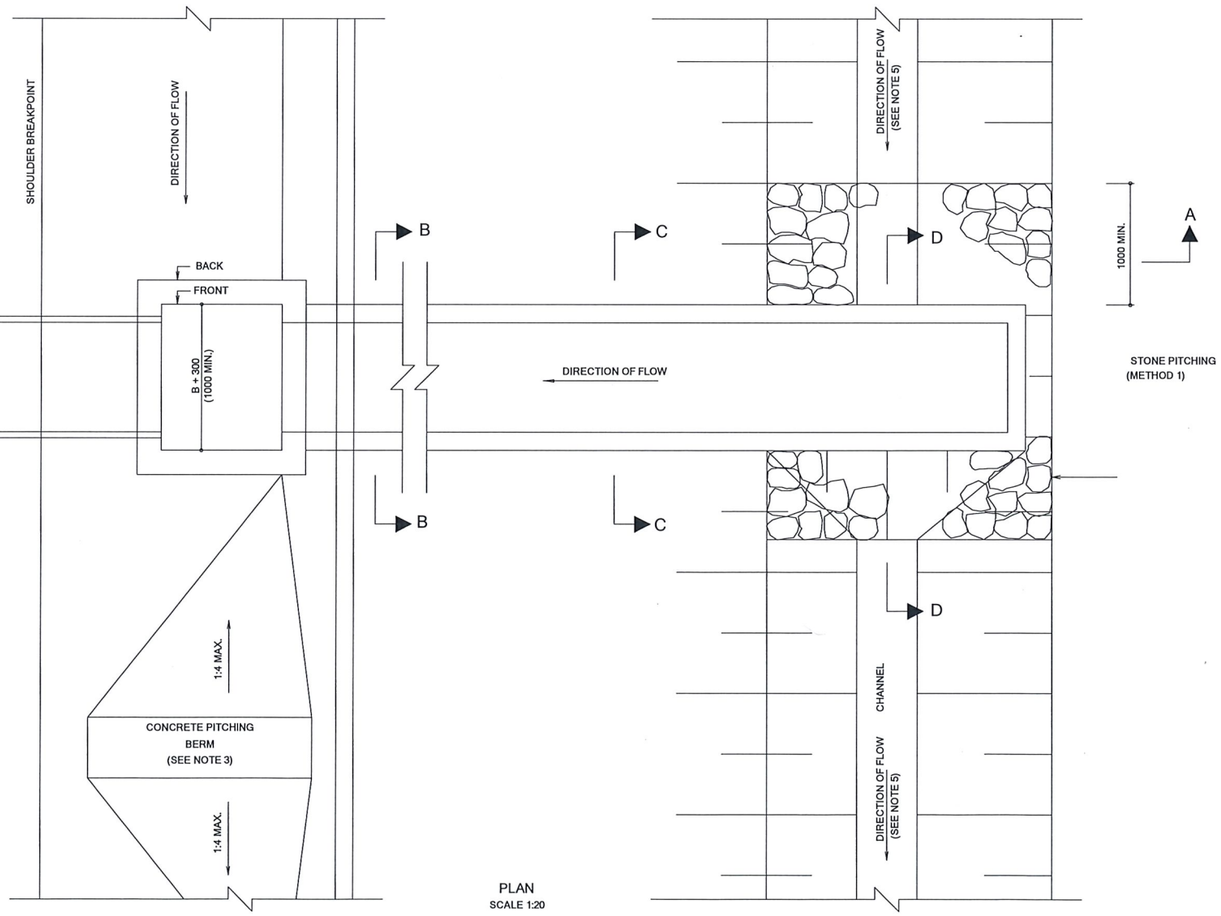
SECTION D-D

SCALE 1:20



SECTION D-D

SCALE 1:20



PLAN

SCALE 1:20

NOTES:

1. ALL CONCRETE TO BE CLASS 30/19.
2. ALL VISIBLE CORNERS SHOULD BE TAPERED 25mm.
3. WHEN THE SIDE DRAIN INLET IS PLACED AT A LOW POINT, THE BERM FALLS AWAY.
4. WHEN MORE THAN ONE CULVERT IS BUILT INTO THE SAME HEADWALL, THE MEASUREMENT 'B' SHOULD BE THE MAXIMUM DISTANCE BETWEEN THE INNER WALLS OF THE OUTSIDE CULVERTS.
5. WHEN THE INLET BEHIND THE CATCHWATER BERM IS AT A LOW POINT, THE INLET STRUCTURE IS SYMMETRICAL FOR THE FLOW FROM BOTH SIDES.
6. FOR THE LOCATION OF THE TYPES 4 & 4A INLETS, SEE THE DRAINAGE SCHEDULES.
7. FOR THE FLOOD LEVELS AT EVERY INLET, SEE THE DRAINAGE SCHEDULES PLANS.
8. THE DOWN CHUTE AS DRAWN, IS FOR THE CASE WHERE AN
9. REINFORCING IN WALLS OF INLET STRUCTURES WHEN D > 850:
   AT FRONT : No.245(6,3o-200x200)
   AT REAR : No.395(8,0o-200x200)
   WITH 600mm LENGTH IN FLOOR SLABS FOR BOTH CASES.
10. MINIMUM CONCRETE COVER FOR REINFORCING IS 40mm

No.	DATE	REVISION	CONSULT. ENG	D/R.
-	-	-	-	-

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CHECKED BY	TE MUVHANGO

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PROJECT: CONSTRUCTION OF LUTANANDWA ACCESS ROAD AND BRIDGE - PHASE 2
BID NO.: 35 OF 2022

TITLE: TYPICAL DETAIL : CATCHWATER & DOWN CHUTE WITH TYPE 4 & 4A INLETS

ISSUED FOR TENDER

For: Makhado Municipality 20__/__/__

For: Mont Consulting Engineers 20__/__/__

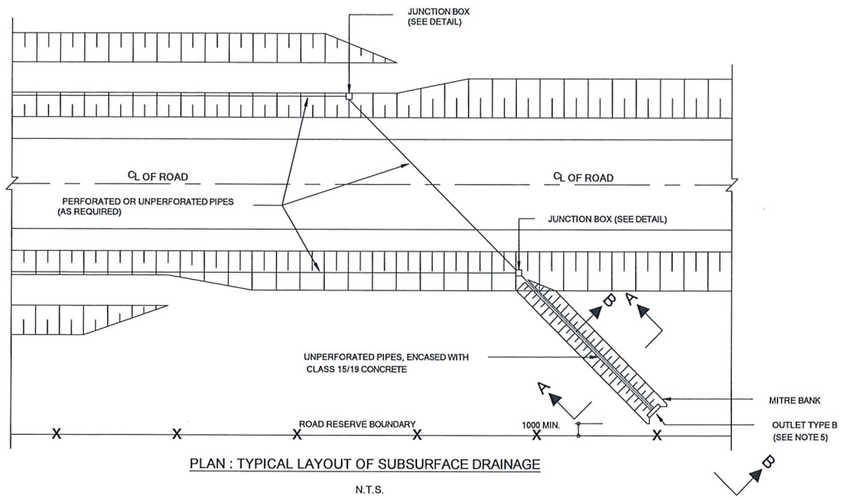
SHEET 01 OF 01

SCALE: AS SHOWN

PAPER SIZE: A1

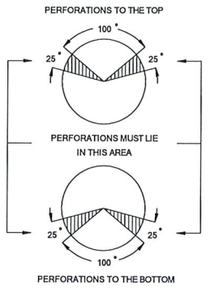
DRAWING No.: MONT/MAKH/RDS/01/2019/STW11

REVISION: 00



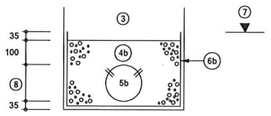
PLAN : TYPICAL LAYOUT OF SUBSURFACE DRAINAGE

N.T.S.



POSITION OF PERFORATIONS

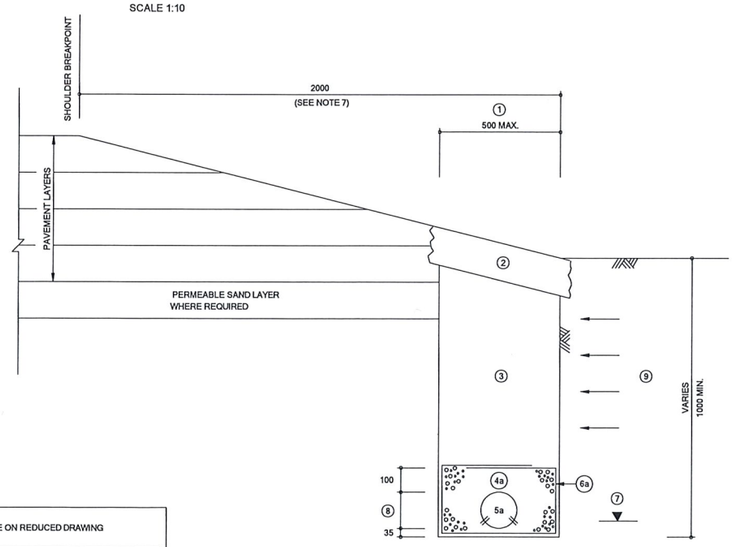
N.T.S.



SUBSURFACE DRAINAGE WITH POLYETHYLENE-LINING

SCALE 1:10

LEGEND	
No.	DESCRIPTION
1	THIS DIMENSION CAN BE REDUCED TO A MINIMUM OF DIA. + 200mm, PROVIDED THAT THE SIZE OF SECTION AREA IS ADEQUATE. ALSO REFER TO CLAUSE 2104(b) OF THE STANDARD SPECIFICATIONS (COLTO).
2	IMPERMEABLE BACKFILL MATERIAL WITH A MINIMUM THICKNESS OF 150mm UP TO THE UPPER SURFACE OF WATERBEARING STRATUM.
3	FILTER SAND OF APPROVED SOURCE AND FINENESS.
4a 4b	FILTER STONE : FINE OR COARSE GRADE AS SPECIFIED IN SUB-CLAUSE 2104(a)(ii) OF THE STANDARD SPECIFICATIONS (COLTO).
5a 5b	PERFORATED PIPE.
6a	SYNTHETIC FIBRE CLOTH (BIDIM A4 OR APPROVED EQUIVALENT).
6b	POLYETHYLENE SHEETING 0,25mm THICK.
7	LEVEL TO WHICH THE SURROUNDING AREA IS DRAINED.
8	OUTSIDE DIA. OF PIPE : 100mm OR 150mm
9	WATERBEARING STRATUM



SUBSURFACE DRAINAGE WITH SYNTHETIC FIBRE CLOTH

SCALE 1:10

SCALE ON REDUCED DRAWING

100mm ON ORIGINAL DRAWING

NOTES:

1. ALL CRITERIA ASSUMES THAT FILTER SAND AND FILTER STONE ARE CONTINUOUSLY GRADED FROM COARSE TO FINE.
2. USE THE ENVELOPE CURVES OF THE WATERBEARING STRATUM, FILTER SAND AND FILTER STONE GRADING AND APPLY CRITERIA TO MOST CRITICAL COMBINATIONS.
3. WHEN INSTRUCTED BY THE ENGINEER, SUBSURFACE DRAINAGE SHALL BE PLACED ON THE INSIDE OF STEPS ON HIGH FILLS IN THE CASE OF STEP CONSTRUCTION.
4. WHEN SUBSURFACE DRAINAGE IS CONSTRUCTED IN SOLID ROCK, THE POLYETHYLENE LINING CAN BE OMITTED.
5. OUTLET TYPE A IS PREFERRED WHEN ALLOWED BY THE SURROUNDING TOPOGRAPHY. OUTLETS MAY ALSO BE COMBINED WITH CULVERT IN- AND OUTLETS.
6. SYNTHETIC ALTERNATIVES FOR THE CONVENTIONAL SUBSURFACE DRAINS (SUCH AS "FIN DRAINS"), WILL ONLY BE ALLOWED WITH THE APPROVAL OF THE ENGINEER.
7. THE DIMENSIONS AS SHOWN ARE TYPICAL FOR ROAD CUTTINGS. IF SUBSURFACE DRAINAGE IS REQUIRED WHERE THE ROAD IS ON FILL, DETAIL MUST BE ADJUSTED ACCORDING TO THE FILL SECTION.
8. THE LOCATION OF SUBSURFACE DRAINAGE AS SHOWN ON THE PLANS IS PROVISIONAL. POSSIBLE ADDITIONS AND/OR OMISSIONS MAY BE INSTRUCTED BY THE ENGINEER DURING CONSTRUCTION AND WILL ALSO DETERMINE THE FINAL LOCATION OF THE OUTLETS.

FILTER CRITERIA:

A. "Dx" IS THE SIEVE SIZE THROUGH WHICH x% OF THE FILTER MATERIAL PASSES. O_{50}(SF) = AVERAGE SIZE OF OPENING IN THE SYNTHETIC FIBRE CLOTH.

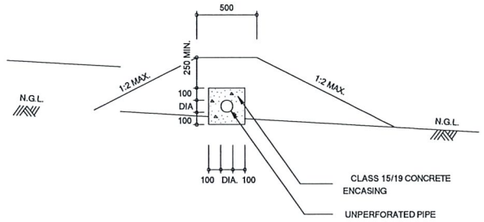
B. FILTER SAND (FS) AS OPPOSED TO WATERBEARING STRATUM(WS):

1. WHEN D_{85} (WS) > 0,05mm:
   (a) TO PREVENT CLOGGING OF FILTER SAND
   D_{15}(FS) < 5 x D_{85} (WS)
   D_{50}(FS) < 25 x D_{50} (WS)
   (b) PERMEABILITY OF SAND
   D_{15}(FS) > 5 x D_{15} (WS)
2. WHEN D_{85} (WS) < 0,05mm:
   (a) TO PREVENT CLOGGING OF FILTER SAND
   D_{15}(FS) < 0,25mm
   D_{05}(FS) > 0,075mm
   (b) PERMEABILITY REQUIREMENTS UNNECESSARY

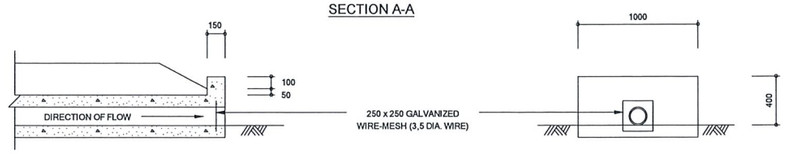
C. FILTER STONE (FST) AS OPPOSED TO FILTER SAND (FS):
   (a) TO PREVENT CLOGGING OF FILTER SAND
   D_{15}(FST) < 5 x D_{85} (FS)
   D_{50}(FST) < 25 x D_{50} (FS)
   (b) PERMEABILITY : STONE SHOULD BE COARSER THAN SAND AT ALL PERCENTAGES.

D. FILTER STONE (FST) AS OPPOSED TO THE OPENING IN THE PIPE:
   TO PREVENT CLOGGING OF PIPE OPENING
   D_{85}(FST) > 1,2 x DIA. OF ROUND PERFORATIONS
   D_{85}(FST) > 1,2 x WIDTH OF GROOVE

E. SYNTHETIC FIBRE CLOTH (SF) AS OPPOSED TO FILTER SAND (FS):
   (a) TO PREVENT CLOGGING OF (SF)
   O_{50}(SF) < D (FS)$_{85}$
   (b) PERMEABILITY OF (SF):
   O_{50}(SF) > D (FS)$_{15}$



SECTION A-A

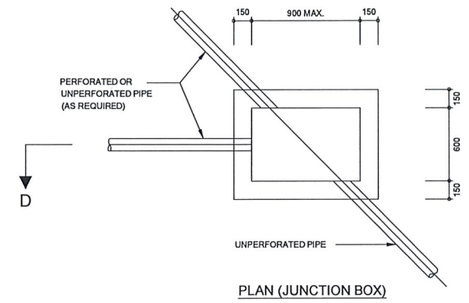


SECTION B-B

FRONT ELEVATION

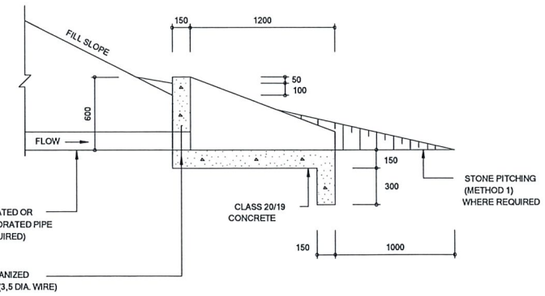
OUTLET TYPE B

SCALE 1:20

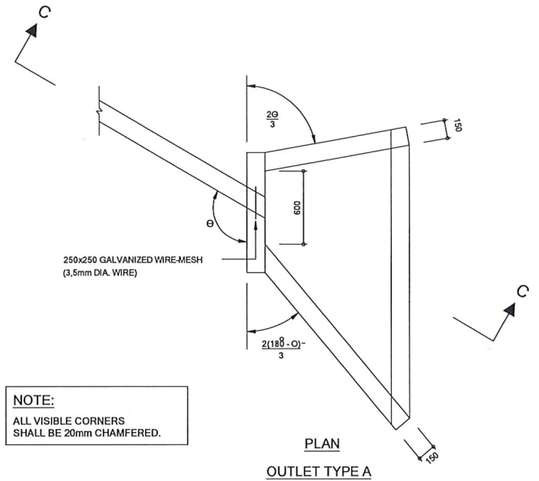


PLAN (JUNCTION BOX)

SCALE 1:20

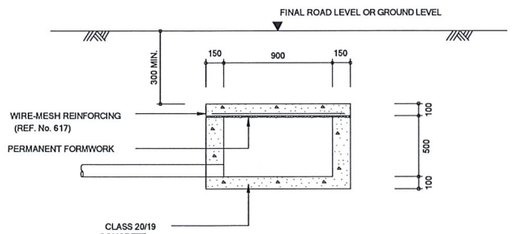


SECTION C-C
(SHOWN FOR Θ = 90°)



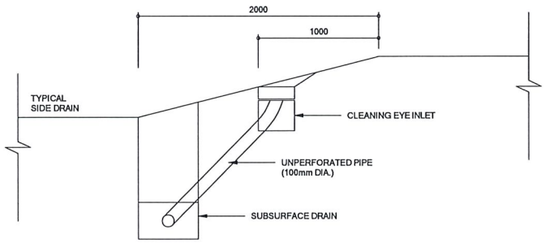
NOTE:
ALL VISIBLE CORNERS
SHALL BE 20mm CHAMFERED.

PLAN
OUTLET TYPE A
SCALE 1:20



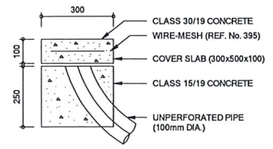
SECTION D-D (JUNCTION BOX)

SCALE 1:20



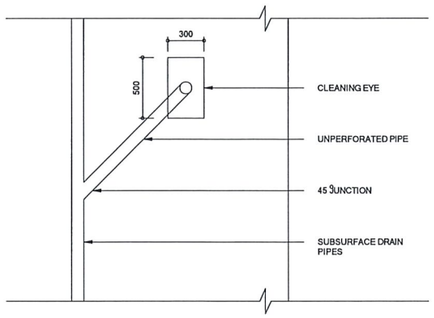
SECTION (CLEANING EYE)

SCALE 1:20



CLEANING EYE INLET

SCALE 1:10



PLAN (CLEANING EYE)

SCALE 1:20

No.	DATE	REVISION	CONS.ENT. ENG.	DR.
-	-	-	-	-

DESIGNED BY	SZB RANGANA
CHECKED BY	PXA NDLOVU
DRAWN BY	TA MOSIA
CHECKED BY	TE MUVHANGO

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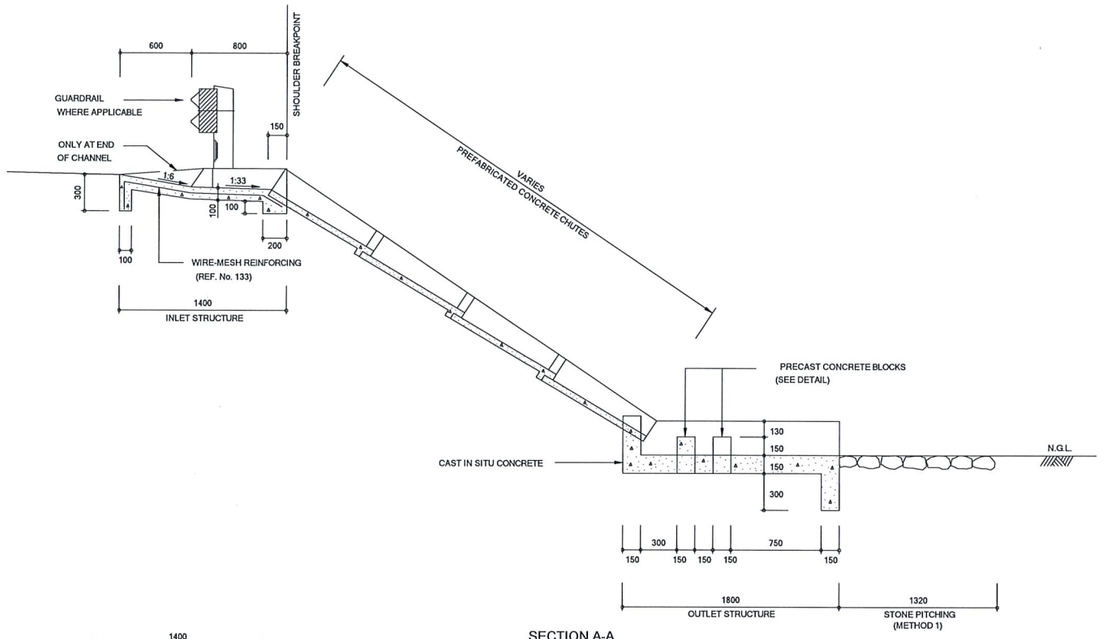
MEMBER OF CESA

PROJECT
CONSTRUCTION OF LUTANANDWA ACCESS ROAD AND BRIDGE - PHASE 2
BID NO.: 35 OF 2022

TITLE
TYPICAL DETAIL : SUBSURFACE DRAINAGE

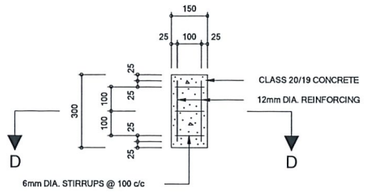
ISSUED FOR TENDER
For Makhado Municipality 20__/__/__
For Mont Consulting Engineers 20__/__/__

SHEET 01 OF 01
SCALE AS SHOWN
PAPER SIZE A1
DRAWING No. MONT/MAKH/RDS/01/2019/STW12
REVISION 00

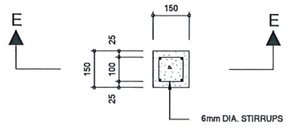


SECTION A-A

SCALE 1:20



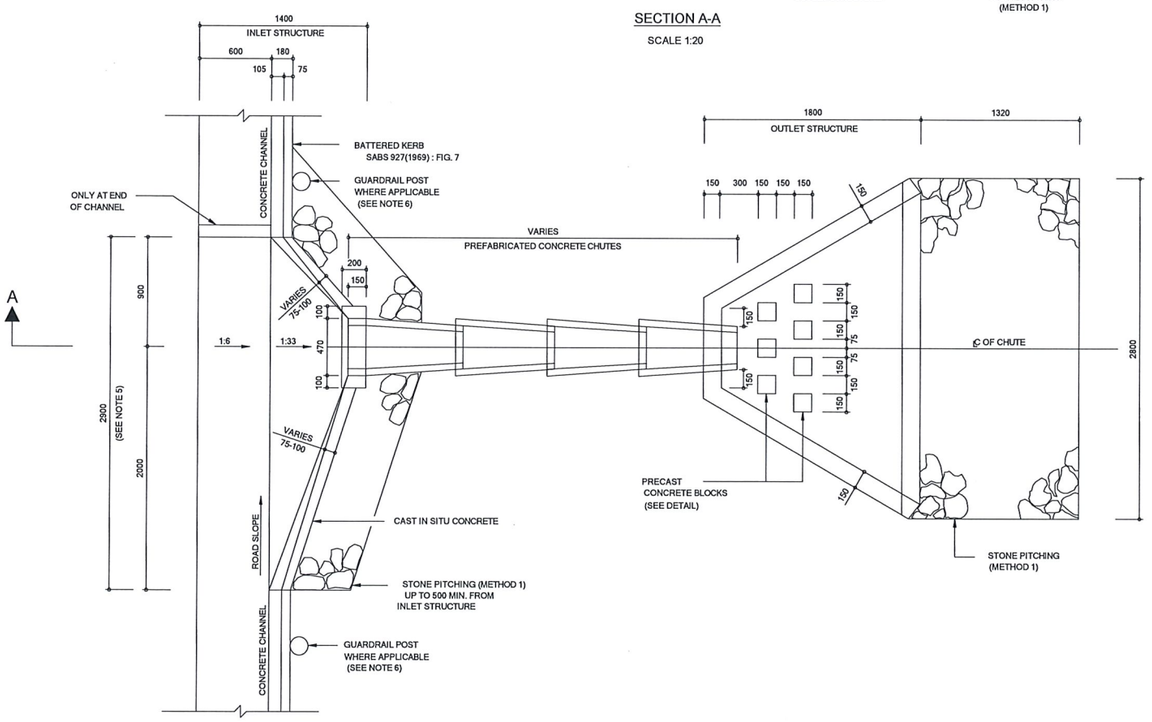
SECTION E-E



SECTION D-D

NOTES:

1. ALL CAST IN SITU CONCRETE SHALL BE CLASS 30/19.
2. ALL VISIBLE CORNERS SHALL BE 20mm CHAMFERED.
3. WIRE-MESH REINFORCING SHALL COMPLY WITH THE SPECIFICATIONS OF SABS 1024.
4. OUTLETS OF CHUTES SHALL BE COMBINED WITH CULVERT IN- AND OUTLETS WHERE POSSIBLE.
5. AT LOW POINTS, THE TOTAL LENGTH OF THE INLET IS 3600mm AND SHALL BE SYMMETRICAL AROUND THE CENTRE LINE OF THE CHUTE.
6. THE LOCATION OF CHUTES SHALL BE ADJUSTED (IF NECESSARY) TO CONSTRUCT THE INLET BETWEEN THE TWO NEAREST GUARDRAIL POSTS. ALTERNATIVELY, GUARDRAIL POSTS SHALL FIT IN WITH THE SPECIFIED LOCATION OF CHUTE INLETS.



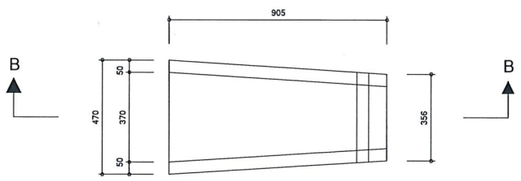
PLAN: CHUTE ON FILL

SCALE 1:20

DETAIL OF PRECAST CONCRETE BLOCKS

SCALE 1:10

SECTION B-B



PLAN

DETAIL OF PREFABRICATED CONCRETE CHUTE

SCALE 1:10

SCALE ON REDUCED DRAWING

100mm ON ORIGINAL DRAWING

No.	DATE	REVISION	CONSULT. ENG	D/R.
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-	-	-	-	-
-	-	-	-	-

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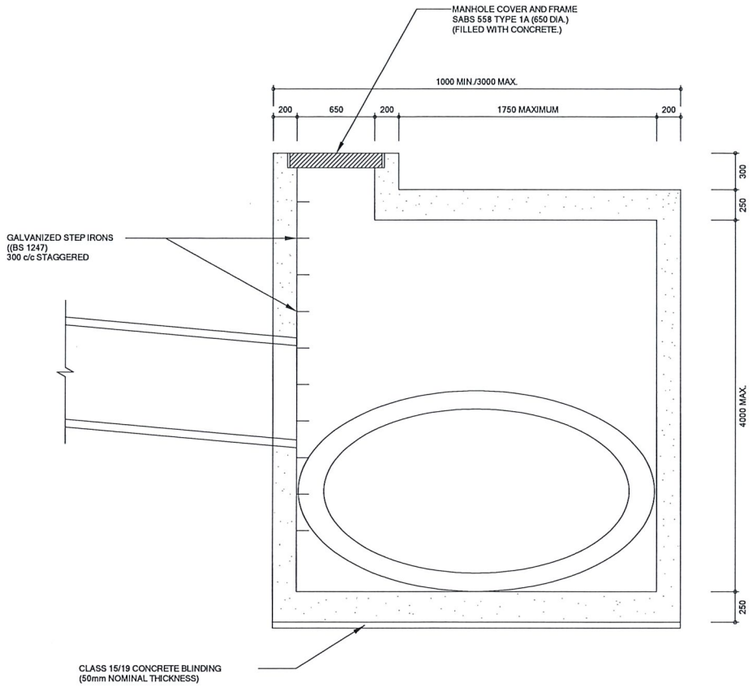
MEMBER OF CESA

PROJECT
CONSTRUCTION OF LUTANANDWA ACCESS ROAD AND BRIDGE - PHASE 2
BID NO.: 35 OF 2022

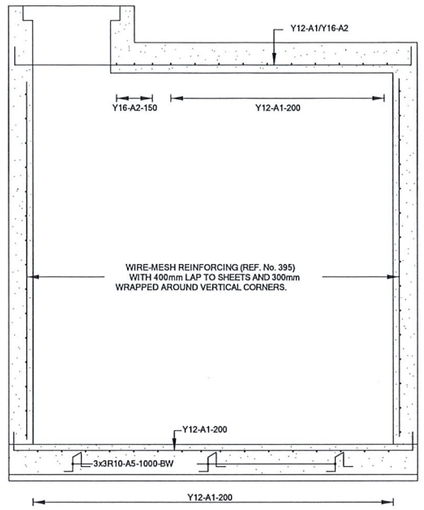
TITLE
TYPICAL DETAIL : DOWN CHUTES ON HIGH FILLS

ISSUED FOR TENDER
For Approval
For Makhado Municipality 20__/__/__
For Mont Consulting Engineers 20__/__/__

SHEET 01 OF 01
SCALE AS SHOWN
PAPER SIZE A1
DRAWING No. MONT/MAKH/RDS/01/2019/STW13
REVISION 00



SECTION A-A



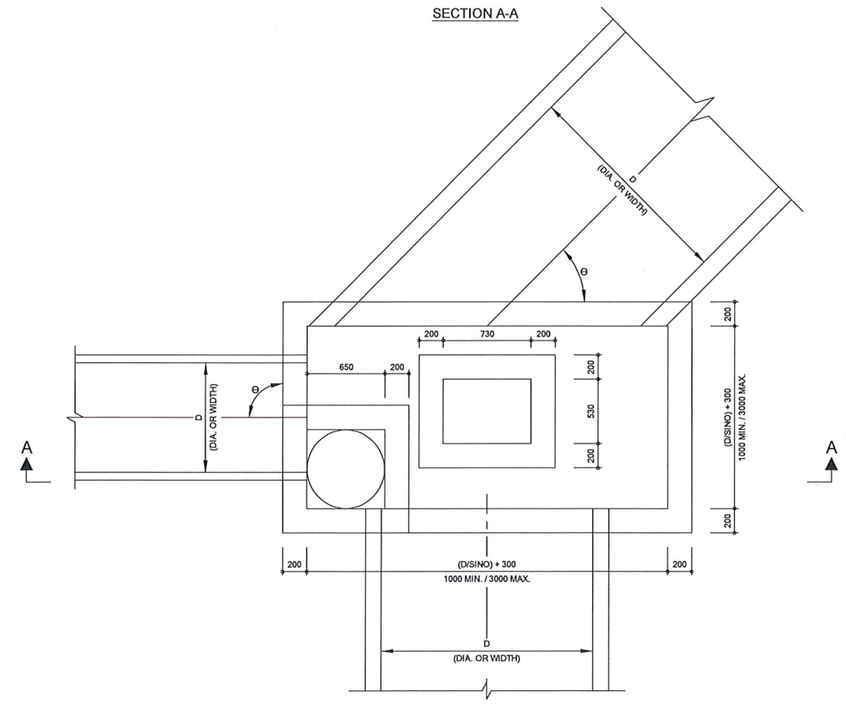
REINFORCING (SECTION A-A)

MARK	TYPE	NUMBER	LENGTH	BENDING	R10/Y10	Y12	Y16
A1	Y12	52	3450	3300		179,4	
A2	Y16	6	3450	3300			20,7
A3	Y12	4	1800	1800		7,2	
A4	Y10	8	2550	2550	20,4		
A5	R10	12	900	200 / 190	10,8		
TOTAL LENGTH (m)					31,2	186,6	20,7
TOTAL MASS (kg)					19,2	165,7	32,7

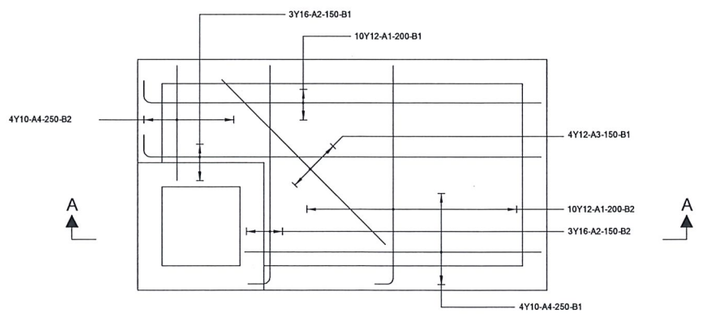
BENDING SCHEDULE

NOTES:

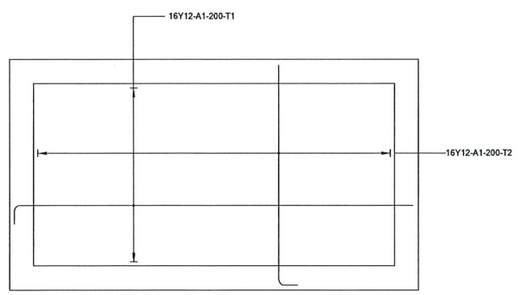
1. ALL CAST IN SITU CONCRETE SHALL BE CLASS 30/19.
2. MINIMUM COVER TO REINFORCING SHALL BE 50mm.
3. ALL VISIBLE CORNERS SHALL BE 20mm CHAMFERED.
4. MANHOLE/CATCHPIT IS DESIGNED FOR A 80kN WHEEL LOAD WITH 25% ALLOWABLE OVERSTRESS.
5. A MANHOLE IS SHOWN ON DRAWING WITH COVER LOCATED IN ONE CORNER. THE INLET GRID FOR CATCHPITS MAY BE LOCATED IN THE CENTRE OF THE STRUCTURE AS SHOWN IN DOTTED LINES ON PLAN, IN WHICH CASE REINFORCING BARS A2 SHALL BE PLACED ON ALL SIDES AND REINFORCING BARS A3 ON ALL CORNERS.
6. REINFORCING AS SHOWN IN BENDING SCHEDULE IS FOR A MANHOLE/CATCHPIT WITH MAXIMUM DIMENSIONS. NUMBER AND LENGTH OF BARS SHALL BE REDUCED TO SUIT SMALLER STRUCTURES.
7. REINFORCING BARS A1 AND A2 SHALL BE PLACED WITH HOOKS STAGGERED.
8. FOR THE LOCATION OF MANHOLES AND CATCHPITS, SEE LAYOUT PLANS.



PLAN



REINFORCING (TOP SLAB)



REINFORCING (BOTTOM SLAB)

SCALE ON REDUCED DRAWING

100mm ON ORIGINAL DRAWING

No.	DATE	REVISION	CONSULT. ENG.	DR.
-	-	-	-	-

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MEMBER OF CESA

PROJECT
CONSTRUCTION OF LUTANANDWA ACCESS ROAD AND BRIDGE - PHASE 2
BID NO.: 35 OF 2022

TITLE
TYPICAL DETAIL : MANHOLES AND CATCHPITS FOR LARGE PIPE AND BOX CULVERTS

ISSUED FOR TENDER
For Makhado Municipality 20__/__/__
For Mont Consulting Engineers 20__/__/__

DRAWING No. MONT/MAKH/RDS/01/2019/STW14

SHEET 01 OF 01
SCALE AS SHOWN
PAPER SIZE A1
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