public works
& infrastructure

Department:
Public Works and Infrastructure
REPUBLIC OF SOUTH AFRICA

B22/011

ROCUREMENT DOCUMENTS

FOR

BLOEMFONTEIN DEEDS OFFICE: UPRADING AND MAINTENANCE OF FIRE PROTECTION SYSTEM

VOLUME THREE: CONTRACT

THE REGIONAL MANAGER
NATIONAL DEPARTMENT OF PUBLIC WORKS & INFRASTRUCTURE
PRIVATE BAG X20605
BLOEMFONTEIN
9300

ENQUIRIES: MR L MARITE
TEL: (051) 408 7510
REF: 14/2/1/4/21/6706

SEPTEMBER 2022

NAME OF TENDERER: _____

CIDB NO.: _____

CSD NO.: _____

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PART C1: AGREEMENT AND CONTRACT DATA

C1.2 CONTRACT DATA

DPW-05: (EC) CONTRACT DATA - (GCC (2010) 2nd EDITION: 2010)

Project title:	Bloemfontein Deeds Office: Upgrading And Maintenance of Fire Protection System

Tender / Quotation no:	BL22/011	**WCS no:**		**Reference no:**	14/2/1/4/21/6706

	PART 1: DATA PROVIDED BY THE EMPLOYER
	CONDITIONS OF CONTRACT
	The General Conditions of Contract for Construction Works, Second Edition, 2010, published by the South African Institution of Civil Engineering, Private Bag X200, Halfway House, 1685, is applicable to this Contract and is obtainable from *www.saice.org.za* Bidders to note that materials procured for the works should be from South African manufactures and suppliers. Imported materials shall only be considered under exceptional circumstances, based on compelling technical justifications, and subject to the approval by the NDPWI.

CONTRACT SPECIFIC DATA

The following contract specific data, referring to the General Conditions of Contract for Construction Works, Second Edition, 2010, are applicable to this Contract:

CLAUSES	COMPULSORY DATA
1.1.1.8	Amend Clause 1.1.1.8 to include the word "rights" to read as follows: "Contract Data" means the specific data which, together with these General Conditions of Contract, collectively describe the rights, risks, liabilities and obligations of the contracting parties and the procedures for the administration of the Contract.
1.1.1.13	Amend Clause 1.1.1.13 as follows, clarify when the defects liability period starts: "Defects Liability Period" means the period stated in the Contract Data, commencing on the date indicated on the Certificate of Completion or Certificates of Completion in the event of more than one Certificate of Completion is issued for different parts of the Works, during which the Contractor has both the right and the obligation to make good defects in the materials, Plant and workmanship covered by the Contract.
	Defects liability period is: **12 months**.
1.1.1.14 & 5.14.7	The time for achieving Practical Completion of the whole of the works is: ***10 Months*** measured from the Commencement Date. The time thus stated includes special non-working days and the year-end break.
	or, if Practical Completion in portions is required, The times for achieving Practical Completion for the portions as set out in the Scope of Works are *mutatis mutandi*: For portion 1 within For portion 2 within For portion 3 within

	For portion 4 within *(followed by further portions as required)*
	The time for achieving Practical Completion of the whole of the Works is: ***46 Months*, measured from the Commencement Date. The time thus stated includes special non-working days and the year-end break.**
1.1.1.15	The name of the Employer is: **The Government of the Republic of South Africa in its Department of Public Works and Infrastructure.**
1.1.1.16	The name of the Engineer is: ***M & C CONSULTING ENGINEERS***
1.1.1.26	The Pricing Strategy is a: **Re-measurement Contract**.
1.1.1.31	Not applicable to this Contract.
1.1.1.35	Insert the definition of "Value of Works" as Clause 1.1.1.35: "Value of Works" means the value of the Works certified by the Engineer as having been satisfactorily executed and shall include the value of the works done, the value of the materials and/or plant and Contract Price Adjustments.
1.2.1.2	**Employer's address:** Physical Address: ***18 President Brand Street*** ***Bloemfontein*** ***9300*** Postal Address: ***P/Bag X20605*** ***Bloemfontein*** ***9300*** Facsimile: Telephone: ***051 408 7510***
	Engineer's address: Physical Address: ***41 Schnehage Avenue*** ***Bloemfontein*** ***9300*** Postal Address: ***P.O. Box 72314*** ***Parkview*** ***2122*** Facsimile: Telephone: ***082 463 1141***
1.3.4	Not applicable to this Contract.

1.3.5	Replace Clause 1.3.5 with the following provisions: (a) The Employer will become the owner of the information, documents, advice, recommendation and reports collected, furnished and/or compiled by the Contractor during the course of, and for the purposes of executing this Contract, all of which will be handed over to the Employer on request, but in any event on the termination and/or cancellation of this Contract for whatever reason. The Contractor relinquishes its retention or any other rights thereon to which it may be entitled. (b) The copyright of all documents, recommendations and reports compiled by the Contractor during the course of and for the purposes of finalizing the Works will vest in the Employer, and may not be reproduced or distributed or made available to any person outside the Employer's service, or to any institution in any way, without the prior written consent of the Employer. The Employer shall have the right to use such material for any other purpose without the approval of information or payment to the Contractor. (c) The copyright of all electronic aids, software programmes etc. prepared or developed in terms of the Contract shall vest in the Employer, who shall have the right to use such material for any other purpose without the approval of, information or payment to the Contractor. (d) In case of the Contractor providing documents, electronic aids, software programs or like material to the Employer, the development of which has not been at the expense of the Employer, copyright shall not vest in the Employer. The Contractor shall be required to indicate to which documents, electronic aids, software programs or like material this provision applies. (e) The Contractor hereby indemnifies the Employer against any action, claim, damages or legal cost that may be instituted against the Employer on the grounds of an alleged infringement of any copyright, patents or any other intellectual property right in connection with the Works outlined in this Contract. (f) All information, documents, recommendations, programs and reports collected or compiled must be regarded as confidential and may not be communicated or made available to any person outside the Employer's service and may not be published either during the currency of this Contract or after termination thereof without the prior written consent of the Employer.
3.1.3	1. The Engineer's authority to act and/or to execute functions or duties or to issue instructions are expressly **excluded** in respect of the following: (a) Appointment of nominated Sub-contractors – clause 4.4.3; (b) Granting of an extension of time and/or ruling on claims associated with claims for extension of time – clauses 5.12.3, 10.1.5; (c) Acceleration of the rate of progress and determination of the cost for payment of such acceleration – clause 5.12.4; (d) Rulings on claims and disputes – clauses 10.1.5, 10.2.3 and 10.3.3; (e) Suspension of the Works – clause 5.11.1; (f) Final Payment Certificate – clause 6.10.9; (g) Issuing of *mora* notices to the Contractor – clauses 9.1.1, 9.1.2.1 and 9.2.1; (h) Cancellation of the contract between the Employer and Contractor – clauses 9.1.1, 9.1.2.1 and 9.2.1.

	2. In order to be legally binding and have legal bearing and consequence, any ruling in respect of the above matters (a) to (h) must be on an official document, signed and issued by the Employer to the Contractor. 3. The Contractor must submit claims, demands, notices, notifications, updated particulars and reports in writing, as well as any other supporting documentation pertaining thereto, in respect of any of the above listed matters (a) to (h), to the Engineer within the time periods and in the format(s) as determined in the relevant clauses of the Conditions of Contract. Failing to deliver such to the Engineer timeous and in the correct format will invalidate any claim and the consequences of such failure will *mutatis mutandis* be as stated in clause 10.1.4. 4. Clauses 6.10.9 and 10.1.5 shall be amended as follows to indicate the limitation on the Engineer's authority in respect thereof: **Clause 6.10.9 – Amend to read as follows:** Within 14 days of the date of final approval as stated in the Final Approval Certificate, the Contractor shall deliver to the Engineer a final statement claiming final settlement of all moneys due to him (save in respect of matters in dispute, in terms of Clauses 10.3 to 10.11, and not yet resolved). The Employer shall within 14 days issue to the Contractor a Final Payment Certificate the amount of which shall be paid to the Contractor within 28 days of the date of such certificate, after which no further payments shall be due to the Contractor (save in respect of matters in dispute, in terms of Clauses 10.3 to 10.11 and not yet resolved). **Clause 10.1.5 – Amend to read as follows:** Unless otherwise provided in the Contract, the Employer shall, within 28 days after the Contractor has delivered his claim in terms of Clause 10.1.1 as read with Clause 10.1.2, deliver to the Contractor his written and adequately reasoned ruling on the claim (referring specifically to this Clause). The amount thereof, if any, allowed by the Employer shall be included to the credit of the Contractor in the next payment certificate. 5. Insert the following under 3.1.3: Provided that, notwithstanding any provisions to the contrary in the Contract, the Employer shall have the right to reverse and, should it deem it necessary, to amend any certificate, instruction, decision or valuation of the Engineer and to issue a new one, and such certificate instruction, decisions or valuations shall for the purposes of the Contract be deemed to be issued by the Engineer, provided that the Contractor shall be remunerated in the normal manner for work executed in good faith in terms of an instruction issued by the Engineer and which has subsequently been rescinded.
3.2.2.1	Amend Clause 3.2.2.1 to insert the word "Plant" to read as follows: Observe the execution of the Works, examine and test material, Plant and workmanship, and receive from the Contractor such information as he shall reasonably require.
3.2.3.2	Amend Clause 3.2.3.2 to insert the word "Plant" to reads as follows: Notwithstanding any authority assigned to him in terms of Clauses 3.2.2 and 3.2.4, failure by the Engineer's Representative to disapprove of any work, workmanship, Plant or materials shall not prejudice the power of the Engineer thereafter to disapprove thereof and exercise any of his powers in terms of the Contract in respect of thereof.
4.8.2.1	Amend Clause 4.8.2.1 to include the word "person", as follows: Makes available to the Employer, or to any such contractor, person or authority, any roads or ways for the maintenance of which the Contractor is responsible, or

4.8.2.2	Amend Clause 4.8.2.2 to include "Employer" and "contractors", as follows: Provides any other facility or service of whatsoever nature to the Employer or to any of the said contractors, persons or authorities,
5.3.1	The documentation required before commencement with Works execution are: Health and Safety Plan (Refer to Clause 4.3) Initial programme (Refer to Clause 5.6) Security (Refer to Clause 6.2) Insurance (Refer to Clause 8.6)
5.3.2	The time to submit the documentation required before commencement with Works execution is: **21 days.**
5.4.2	The access to, and possession of, the Site referred to in Clause 5.4.1 shall be ***not exclusive*** to the Contractor. In the event of access to, and possession of, the Site is not exclusive to the Contractor, the following limitations apply: ***This is a repair and maintenace contract and the site shall remain in full operation and fully occupied by the User/Client at all times. The Contractor shall carry out maintenace and repairs throughout the site, which work shall be programmed as agreed by the User/Client. Due to the high secuirty and sensitivity of the operation the Contractor 's access shall be fully controlled at all timesand all his personnel shall be subject to a secuirty audit and clearance. The Contractor shall make full allowance to work under these conditions with restricted access and hours. Repair work shall be carried out in portions at times to be agreed and programmed with the User/Client .***
5.8.1	The non-working days are: **Saturdays and Sundays**
	The special non-working days are: **(1) Public Holidays;** **(2) The year-end break commencing on 16 December until the Sunday preceding the first working Monday of January of the succeeding year.**
5.9.1	Amend Clause 5.9.1 as follows: On the Commencement Date, the Engineer shall deliver to the Contractor three (3) copies, at no cost to the Contractor, of the drawings and any instructions required for the commencement of the Works. The cost of any additional copies of such drawings and/or instructions, as may be required by the Contractor, will be for the account of the Contractor.
5.13.1	The penalty for failing to complete the Works is: **R*2 600.00* per day**
	<u>or</u>, if completion in portions is required, The penalty for failing to complete portion 1 of the Works is: **R** **per day**. The penalty for failing to complete portion 2 of the Works is: **R** **per day**. The penalty for failing to complete portion 3 of the Works is: **R** **per day**. The penalty for failing to complete portion 4 of the Works is: **R** **per day**. *Followed by further portions as required.* The penalty for failing to complete the whole of the works is: **R*2 600.00* per day**.

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5.14.1	Amend the second paragraph of Clause 5.14.1 as follows: When the Works are about to reach the said stage, the Contractor shall, in writing, request a Certificate of Practical Completion and the Engineer shall, within 14 days after receiving such request, issue to the Contractor a written list setting out the work to be completed to justify Practical Completion. Should the Engineer not issue such a list within the 14 days, the Contractor shall notify the Employer accordingly. Should the Employer not issue such a list within 7 days of receipt of such notice, Practical Completion shall be deemed to have been achieved on the 14th day after the contractor requested the Certificate of Practical Completion.
5.16.1	Amend Clause 5.16.1 to delete the proviso in the third paragraph of this clause.
5.16.2	Amend Clause 5.16.2 as follows: No certificate other than the Final Approval Certificate referred to in Clause 5.16.1 shall be deemed to constitute approval of the Works or shall be taken as an admission of the due performance of the Contract or any part thereof, nor of the accuracy of any claim made by the Contractor, nor shall any other certificate exclude or prejudice any of the powers of the Engineer and/or the Employer.
5.16.3	The latent defect period for all works is: **5 years**.
6.2.1	The type of security for the due performance of the Contract, as selected by the Contractor in the Contract Data, must be delivered to the Employer.
6.2.3	Amend Clause 6.2.3 as follows: If the Contractor has selected a performance guarantee as security, he shall ensure that it remains valid and enforceable as required in terms of the Contract.
6.5.1.2.3	The percentage allowance to cover overhead charges is: **33%, except on material cost where the percentage allowance is 10%.**
6.8.2	Contract Price Adjustment (CPA) will be applicable: ***YES***. If CPA is indicated as 'Yes" above the value of payment certificates is to be adjusted by a Contract Price Adjustment Factor: The value of the certificates issued shall be adjusted in accordance with the Contract Price Adjustment Schedule with the following values: The value of "x" is 0.15. The values of the coefficients are: a = 0.25. (Labour) b = 0.3 (Contractor's equipment) c = 0.3 (Material) d = 0.15 (Fuel) The values of the coefficients for "Repair and Maintenance Project" (RAMP) contracts are: a = 0.35 (Labour) b = 0.20 (Contractor's equipment) c = 0.35 (Material) d = 0.10 (Fuel)

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6.8.2	The urban area nearest the Site is ***BLOEMFONTEIN***. *(Select urban area from Statistical News Release, P0141, Table 7.1.)* The applicable industry for the Producer Price Index for materials is ***MECHANICAL ENGINEERING***. *(Select the applicable industry from Statistical News Release, P01421, Table 11.)* The area for the Producer Price Index for fuel is ***BLOEMFONTEIN***. *(Select the area from Statistical News Release, P01421, Table 12.)* The base month is ***SEPTEMBER 2022***. *(The month prior to the closing of the tender.)*
6.8.3	Price adjustments for variations in the costs of special materials are not allowed.
6.10.1.5	The percentage advance on materials not yet built into the Permanent Works is: **85 %.**
6.10.3	The limit of retention money is dependent on the security to be provided by the Contractor in terms of Clause 6.2.1.
6.10.5	Replace Clause 6.10.5 with the following: In respect of contracts up to R2 million and in respect of contracts above R2 million where the Contractor elects a security by means of a 10% retention, 50% of the retention shall be released to the Contractor when the Engineer issues the Certificate of Completion in terms of clause 5.14.4. The remaining 50% of the retention shall be released in accordance with the provisions of the conditions of contract and will become due and payable when the Contractor becomes entitled, in terms of Clause 5.16.1, to receive the Final Approval Certificate. In respect of contracts above R2 million, where the Contractor elects a security by means of a cash deposit or fixed guarantee of 5% of the Contract Sum (excl. VAT) and a 5% retention of the Value of the Works (excl. VAT), the cash deposit or fixed guarantee, whichever is applicable, shall be refunded to the Contractor or return to the guarantor, respectively, when the Engineer issues the Certificate of Completion in terms of Clause 5.14.4. The 5% retention of the Value of the Works (excl. VAT) shall become due and payable when the Contractor becomes entitled, in terms of Clause 5.16.1, to receive the Final Approval Certificate. In respect of contracts above R2 million, where the Contractor elects a security by means of a cash deposit or a variable guarantee of 10% of the Contract Sum (excl. VAT), the cash deposit or the variable guarantee, whichever is applicable, will be reduced to 5% of the Value of the Works (excl. VAT) when the Engineer issues the Certificate of Completion in terms of Clause 5.14.4. The balance of the cash deposit shall become due and payable or the variable guarantee shall expire when the Contractor becomes entitled in terms of Clause 5.16.1 to receive the Final Approval Certificate.
7.9.1	Insert the following at the end of Clause 7.9.1: Provided that, should the Contractor on demand not pay the amount of such costs to the Employer, such amount may be determined and deducted by the Employer from any amount due to or that may become due to the Contractor under this or any other previous or subsequent contract between the Contractor and the Employer.
8.2.2.1	Insert the following as a second paragraph to Clause 8.2.2.1: The Contractor shall at all times proceed immediately to remove or dispose of any debris arising from damage to or destruction of the Works and to rebuild, restore, replace and/or repair the Works, failing which the

	Employer may cause same to be done and recover the reasonable costs associated therewith from the Contractor.

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8.4.3	Insert a new Clause 8.4.3 as follows: The Contractor shall on receiving a written instruction from the Engineer immediately proceed at his own cost to remove or dispose of any debris and to rebuild, restore, replace and/or repair such property and to execute the Works.
8.6.1.1.1	Amend Clause 8.6.1.1.1 to read as follows: Contract Sum plus 10%.
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: **Nil**
8.6.1.3	Amend Clause 8.6.1.3 to delete reference to limit of indemnity, to read as follows: Liability insurance that covers the Contractor against liability for the death of, or injury to any person, or loss of, or damage to any property (other than property while it is insured in terms of Clause 8.6.1.1) arising from or in the course of the fulfillment of the Contract, from the Commencement Date to the date of the end of the Defects Liability Period, if there is one, or otherwise to the issue of the Certificate of Completion.
8.6.1.5	1. **Public liability insurance** to be effect by the Contractor to a minimum value of: ☒ R5 million **or** ☐ R With a deductible not exceeding 5% of each and every claim. 2. **Support insurance** is to be effected by the Contractor to a minimum value of: R With a deductible not exceeding 5% of each and every claim.
8.6.5	Amend Clause 8.6.5 as follows: Save as otherwise provided in the Contract Data, the insurances referred to in Clause 8.6.1 shall be effected with an insurance company registered in the Republic of South Africa. The Contractor shall submit the insurance policy to the Employer for approval, if so requested.
8.6.7	Amend Clause 8.6.7 as follows: If the Contractor fails to effect and keep in force any of the insurances referred to in Clause 8.6.1, the Employer may cancel the Contract in terms of Clause 9.2.
8.6.8	Insert a new Clause 8.6.8 in provide for high risk insurance for projects executed on areas classified as "High Risk Areas". **HIGH RISK INSURANCE**

	In the event of the project being executed in a geological area classified as a "High Risk Area", that is an area which is subject to highly unstable subsurface conditions that might result in catastrophic ground movement evident by sinkhole or doline formation the following will apply:

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8.6.8	(1) **Damage to the Works** The Contractor shall, from the date of Commencement of the Works until the date of the Certificate of Completion, bear the full risk of and hereby indemnifies and holds harmless the Employer against any damage to and/or destruction of the Works consequent upon a catastrophic ground movement as mentioned above. The Contractor shall take such precautions and security measures and other steps for the protection of the Works as he may deem necessary. When so instructed to do so by the Engineer, the Contractor shall proceed immediately to remove and/or dispose of any debris arising from damage to or destruction of the Works and to rebuild, restore, replace and/or repair the Works, at the Contractor's own costs. (2) **Injury to Persons or Loss of or damage to Properties** The Contractor shall be liable for and hereby indemnifies and holds harmless the Employer against any liability, loss, claim or proceeding arising during the Contract Period whether arising in common law or by Statute, consequent upon personal injuries to or the death of any person whomsoever resulting from, arising out of or caused by a catastrophic ground movement as mentioned above. The Contractor shall be liable for and hereby indemnifies the Employer against any and all liability, loss, claim or proceeding consequent upon loss of or damage to any moveable, or immovable or personal property or property contiguous to the Site, whether belonging to or under the control of the Employer or any other body or person whomsoever arising out of or caused by a catastrophic ground movement, as mentioned above, which occurred during the Contract Period. (3) It is the responsibility of the Contractor to ensure that he has adequate insurance to cover his risk and liability as mentioned in Clauses 8.6.8(1) and 8.6.8 (2) above. Without limiting his obligations in terms of the Contract, the Contractor shall, within 21 days of the Commencement Date and before Commencement of the Works, submit to the Employer proof of such insurance policy, if requested to do so. (4) The Employer shall be entitled to recover any and all losses and/or damages of whatever nature suffered or incurred consequent upon the Contractor's default of his obligations as set out in Clauses 8.6.8 (1), 8.6.8 (2) and 8.6.8 (3). Provided that, should the Contractor on demand not pay the amount of such costs to the Employer, such amount may be determined and deducted by the Employer from any amount due to or that may become due to the Contractor under this or any other existing or subsequent contract between the Contractor and the Employer.
9.1.4	Amend Clause 9.1.4 as follows: In the circumstances referred to in Clauses 9.1.1, 9.1.2 or 9.1.3 (provided that the circumstances in 9.1.3 is not due to the fault of the Contractor, his employees, contractors or agents), and whether or not the Contract is terminated under the provisions of this Clause, the Contractor shall be entitled to payment of any increased cost of or incidental to the execution of the Works which is specifically attributable to, or consequent upon the circumstances defined in Clauses 9.1.1, 9.1.2 or 9.1.3;
9.1.5	Amend Clause 9.1.5 as follows:

	If the Contract is terminated on any account in terms of this Clause (provided that the circumstances in 9.1.3 is not due to the fault of the Contractor, his employees, contractors or agents) , the Contractor shall be paid by the Employer (insofar as such amounts or items have not already been covered by payments on account made to the Contractor) for all measured work executed prior to the date of termination, the amount (without retention), payable in terms of the Contract and, in addition:
9.1.6	This Clause is not applicable to this Contract.

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9.2.1.3.8	Insert a new Clause 9.2.1.3.8 as follows: Has failed to effect and keep in force any of the insurances referred to in Clause 8.6.1,
9.2.4	Insert a new Clause 9.2.4 as follows, to provide for unilateral termination by the Employer: The Employer shall be entitled at any time to unilaterally terminate or cancel this Contract or any part thereof. Save for the following, the Contractor shall not be entitled to claim any other amounts whatsoever in respect of such termination or cancellation of this Contract. The Employer shall be obliged to pay the Contractor as damages and/or loss of profit the lesser of: 9.2.4.1 An amount not exceeding 10% of the Contract Sum; 9.2.4.2 10% of the value of incomplete work; or 9.2.4.3 The Contractor's actual damage or loss as determined by the Employer after receipt of evidence substantiating any such damage or loss.
9.3.2.2	Amend Clause 9.3.2.2 as follows to delete the proviso on lien: The ownership of Plant and unused materials brought onto the Site by the Contractor, and for which the Employer has not made any payment, shall revest to the Contractor and he shall, with all reasonable dispatch, remove from the Site such Plant, materials and all Construction Equipment and Temporary Works.
9.3.3	Insert the following at the end of Clause 9.3.3 After cancellation of the Contract by the Contractor, the Contractor, when requested by the Employer to do so, shall not be entitled to refuse to withdraw from the Works on the grounds of any lien or a right of retention or on the grounds of any other right whatsoever.
10.1.3.1	Amend Clause 10.1.3.1 as follows to insert the word "Plant": All facts and circumstances relating to the claims shall be investigated as and when they occur or arise. For this purpose, the Contractor shall deliver to the Engineer, records in a form approved by the Engineer, of all the facts and circumstances which the Contractor considers relevant and wishes to rely upon in support of his claims, including details of all Construction Equipment, labour, Plant and materials relevant to each claim. Such records shall be submitted promptly after the occurrence of the event giving rise to the claim.
10.1.6	Insert a new Clause 10.1.6 as follows: If the Employer fails to give his ruling within the period referred to in Clause 10.1.5 he shall be deemed to have given a ruling dismissing the claim.
10.2.1	Amend Clause 10.2.1 as follows: In respect of any matter arising out of or in connection with the Contract, which is not required to be dealt with in terms of Clause 10.1 or which does not require the decision or ruling of the Employer, the Contractor or the Employer shall have the right to deliver a written dissatisfaction claim to the Engineer. This written claim shall be supported by particulars and substantiated.

.0.2.2	Amend Clause 10.2.2 as follows: If, in respect of any matter arising out of or in connection with the Contract, which is not required to be dealt with in terms of Clause 10.1 or which does not require the decision or ruling of the Employer, the Contractor or the Employer fails to submit a claim within 28 days after the cause of dissatisfaction, he shall have no further right to raise any dissatisfaction on such matter.

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10.3.2	Amend Clause 10.3.2 as follows to replace "adjudication" with "court": If either party shall have given notice in compliance with Clause 10.3.1, the dispute shall be referred to court proceedings in terms of Clause 10.8, unless amicable settlement is contemplated.
10.3.3	Replace "Engineer" with "Employer".
10.4.2	Amend Clause 10.4.2 as follows to provide for submission to court: If the other party rejects the invitation to amicable settlement in writing or does not respond in writing to the invitation with 14 days, or amicable settlement is unsuccessful, either party may submit the dispute to court.
10.4.4	Amend Clause 10.4.4 to delete reference to "adjudication" and "arbitration" to read as follows: Save for reference to any portion of any settlement or decision which has been agreed to be final and binding on the parties, no reference shall be made by or on behalf or either party in any subsequent court proceedings, to any outcome of an amicable settlement, or to the fact that any particular evidence was given, or to any submission, statement or admission made in the course of the amicable settlement.
10.5 10.6 & 10.7	The entire provisions of these Clauses are not applicable to this Contract.
10.10.3	Amend Clause 10.10.3 as follows to reword and remove reference to "arbitrator": The court shall have full power to open up, review and revise any ruling, decision, order, instruction, certificate or valuation of the Engineer and Employer and neither party shall be limited in such proceedings before such court to the evidence or arguments put before the Engineer or Employer for the purpose of obtaining his ruling.

CONTRACT PARTICIPATION GOAL TARGETS AND CIDB B.U.I.L.D. PROGRAMME

The contractor shall achieve in the performance of the contract the following Contract Participation Goals (CPGs) as described in PG-01.2 (EC): Scope of Work and PG-02.2 (EC): Pricing Assumptions and in accordance with the feasibility study, which forms part of the specifications in the CPG Section of the Specification of this contract.

(a)	Minimum 30% mandatory Subcontracting to SMMEs in accordance with the Preferential Procurement Policy Framework Act, 2000: Preferential Procurement Regulations, 2017 as published in the Government Gazette Notice No. 40553 of 20 January 2017 – Condition of Tender.	***Not applicable***

(b)	Minimum Targeted Local Manufacturers of Material Contract Participation Goal, in accordance with the cidb Standard for Contract Participation Goals for Targeting Enterprises and Labour through Construction Works Contracts as published in the Government Gazette Notice No. 41237 of 10 November 2017, as amended in cidb Best Practice Project Assessment Scheme Notice No. 43726 of 18 September 2020 – Condition of Contract.	***Not applicable***
(c)	Minimum Targeted Local Building Material Suppliers Contract Participation Goal in accordance with the cidb Standard for Contract Participation Goals for Targeting Enterprises and Labour through Construction Works Contracts as published in the Government Gazette Notice No. 41237 of 10 November 2017, as amended in cidb Best Practice Project Assessment Scheme Notice No. 43726 of 18 September 2020 – Condition of Contract.	***Not applicable***

Tender no: BL22/011

(d)	Minimum Targeted Local Labour Skills Development Contract Participation Goal in accordance with the cidb Standard for Contract Participation Goals for Targeting Enterprises and Labour through Construction Works Contracts as published in the Government Gazette Notice No. 41237 of 10 November 2017, as amended in cidb Best Practice Project Assessment Scheme Notice No. 43726 of 18 September 2020 – Condition of Contract.	***Not applicable***
(e)	cidb BUILD Programme: Minimum Targeted Enterprise Development Contract Participation Goal in accordance with the cidb Standard for Indirect Targeting for Enterprise Development through Construction Works Contracts, No 36190 Government Gazette, 25 February 2013, as amended in cidb Best Practice Project Assessment Scheme Notice No. 43726 of 18 September 2020 – Condition of Contract.	***Not applicable***
(f)	cidb BUILD Programme: Minimum Targeted Contract Skills Development Goal in accordance with the cidb Standard for Developing Skills through Infrastructure Contracts as published in the Government Gazette Notice No. 43495 of 3 July 2020, as amended in cidb Best Practice Project Assessment Scheme Notice No. 43726 of 18 September 2020 as amended in cidb Best Practice Project Assessment Scheme Notice No. 43726 of 18 September 2020 – Condition of Contract.	***Not applicable***
(g)	DPWI National Youth Service training and development programme (NYS) – Condition of Contract.	***Not applicable***
(h)	Labour Intensive Works – Condition of Contract.	***Not applicable***
(i)		***Select***
(j)		***Select***

Tender no: BL22/011

	PART 2: DATA PROVIDED BY THE BIDDER
1.1.1.9	The name of the Bidder is: _____
1.2.1.2	The address of the Bidder is: Postal address: _____ _____ _____ **Postal Code:** _____ Tel: _____ Fax: _____ TAX / VAT Registration No: _____ Physical address: _____ _____ _____ **Postal Code:** _____ E-mail address: _____
6.2.1	The security to be provided by the Contractor shall be one of the following: (a) Cash deposit of 10 % of the Contact Sum (excl. VAT) ☐ **YES** or ☐ **NO** (b) Variable performance guarantee of 10 % of the Contract Sum (excl. VAT) ☐ **YES** or ☐ **NO** (c) Retention of 10 % of the value of the Works (excl. VAT) ☐ **YES** or ☐ **NO** (d) Cash deposit of 5 % of the Contract Sum (excl. VAT) plus retention of 5 % of the value of the Works (excl. VAT) ☐ **YES** or ☐ **NO** (e) Performance guarantee of 5 % of the Contract Sum (excl. VAT) plus retention of 5 % of the value of the Works (excl. VAT) ☐ **YES** or ☐ **NO**

	NB: Guarantees submitted must be issued by either an insurance company duly registered in terms of the Insurance Act [Long-Term Insurance Act, 1998 (Act 52 of 1998) or Short-Term Insurance Act, 1998 (Act 53 of 1998)] or by a bank duly registered in terms of the Banks Act, 1990 (Act 94 of 1990) on the pro-forma referred to above. No alterations or amendments of the wording of the pro-forma will be accepted.

Department
Public Works and Infrastructure
REPUBLIC OF SOUTH AFRICA

DPW-10.2 (EC): VARIABLE CONSTRUCTION GUARANTEE (GCC (2010) 2nd EDITION: 2010)

Director-General
Department of Public Works and Infrastructure
Government of the Republic of South Africa

FOR ATTENTION

Lebo Marite
Private Bag ***X20605***
Bloemfontein
9300

Sir,

VARIABLE CONSTRUCTION GUARANTEE FOR THE EXECUTION OF A CONTRACT IN TERMS OF GCC (2010) 2nd EDITION 2010

1. With reference to the contract between _____

_____ (hereinafter referred to as the **"contractor"**) and the Government of the Republic of South Africa in its Department of Public Works and Infrastructure (hereinafter referred to as the **"employer"**), Contract/Tender No: ***BL22/011***, for the ***BLOEMFONTEIN DEEDS OFFICE: UPGRADING AND MANINTENANCE OF FIRE PROTECTION SYSTEM*** (hereinafter referred to as the **"contract"**) for the sum of R , ( ), (hereinafter referred to as the **"contract sum"**).

I / We, _____

in my/our capacity as _____ and hereby

representing _____ (hereinafter referred to as the **"guarantor"**) advise that the **guarantor** holds at the **employer**'s disposal the sum of R , ( ) being 10% of the **contract sum** (excluding VAT), for the due fulfilment of the **contract**.

2. I / We advise that the **guarantor**'s liability in terms of this guarantee shall be as follows:

   (a) From and including the date on which this guarantee is issued and up to and including the day before the date on which the last **certificate of completion** of works is issued, the **guarantor** will be liable in terms of this guarantee to the maximum amount of 10% of the **contract sum** (excluding VAT);

   (b) The **guarantor**'s liability shall reduce to 5 % of the **value of the works** (excluding VAT) as determined at the date of the last **certificate of completion** of works, subject to such amount not exceeding 10% of the **contract sum** (excluding VAT);

   (c) This guarantee shall expire on the date of the last **final approval certificate**.

3. The **guarantor** hereby renounces the benefits of the exceptions *non numeratae pecunia; non causa debiti; excussionis et divisionis;* and *de duobus vel pluribus reis debendi* which could be pleaded against the enforcement of this guarantee, with the meaning and effect whereof I/we declare myself/ourselves to be conversant, and undertake to pay the **employer** the amount guaranteed on receipt of a written demand from the **employer** to do so, stating that (in the **employer**'s opinion and sole discretion):

   (a) the **contractor** has failed or neglected to comply with the terms and/or conditions of the **contract**; or

Tender no: ***(Insert Tender Number)***

(b) the **contractor**'s estate is sequestrated, liquidated or surrendered in terms of the insolvency laws in force within the Republic of South Africa.

4. Subject to the above, but without in any way detracting from the **employer**'s rights to adopt any of the procedures provided for in the **contract**, the said demand can be made by the **employer** at any stage prior to the expiry of this guarantee.
5. The amount paid by the **guarantor** in terms of this guarantee may be retained by the **employer** on condition that upon issue of the last **final approval certificate**, the **employer** shall account to the **guarantor** showing how this amount has been expended and refund any balance due to the **guarantor**.
6. The **employer** shall have the absolute right to arrange his affairs with the **contractor** in any manner which the **employer** deems fit and the **guarantor** shall not have the right to claim his release on account of any conduct alleged to be prejudicial to the **guarantor**. Without derogating from the aforegoing, any compromise, extension of the construction period, indulgence, release or variation of the **contractor**'s obligation shall not affect the validity of this guarantee.
7. The **guarantor** reserves the right to withdraw from this guarantee at any time by depositing the guaranteed amount with the **employer**, whereupon the **guarantor**'s liability ceases.
8. This guarantee is neither negotiable nor transferable, and

   (a) must be surrendered to the **guarantor** at the time when the **employer** accounts to the **guarantor** in terms of clause 5 above, or
   (b) shall lapse in accordance with clause 2 (c) above.
9. This guarantee shall not be interpreted as extending the **guarantor**'s liability to anything more than payment of the amount guaranteed.

SIGNED AT _____ **ON THIS** _____ **DAY OF** _____ **20**_____

AS WITNESS

1. _____

2. _____

By and on behalf of

_____

_____

_____

(insert the name and physical address of the guarantor)

NAME: _____

CAPACITY: _____
(duly authorised thereto by resolution attached marked Annexure A)

DATE: _____

A. **No alterations and/or additions of the wording of this form will be accepted.**

B. **The physical address of the guarantor must be clearly indicated and will be regarded as the guarantor's *domicilium citandi et executandi,* for all purposes arising from this guarantee.**

C. **This GUARANTEE must be returned to:** _____

_____

DPW-10.4 (EC): FIXED CONSTRUCTION GUARANTEE GCC (2010) 2nd EDITION: 2010

Director-General
Department of Public Works and Infrastructure
Government of the Republic of South Africa

FOR ATTENTION

Lebo Marite
Private Bag ***X20605***
Bloemfontein
9300

Sir,

FIXED CONSTRUCTION GUARANTEE FOR THE EXECUTION OF A CONTRACT IN TERMS OF GCC 2ND EDITION 2010

1. With reference to the contract between _____

_____ (hereinafter referred to as the "**contractor**") and the Government of the Republic of South Africa in its Department of Public Works and Infrastructure (hereinafter referred to as the **"employer"**), Contract/Tender No: ***BL22/011***, for the ***BLOEMFONTEIN DEEDS OFFICE: UPGRADING AND MANINTENANCE OF FIRE PROTECTION SYSTEM*** (hereinafter referred to as the **"contract"**), for the sum of R , ( ), (hereinafter referred to as the **"contract sum"**).

I / We, _____

in my/our capacity as _____ and hereby

representing _____ (hereinafter referred to as the "**guarantor**") advise that the **guarantor** holds at the **employer**'s disposal the sum of R , ( ) being 5% of the **contract sum** (excluding VAT), for the due fulfillment of the **contract**.

2. The **guarantor** hereby renounces the benefits of the exceptions *non numeratae pecunia; non causa debiti; excussionis et divisionis;* and *de duobus vel pluribus reis debendi* which could be pleaded against the enforcement of this guarantee, with the meaning and effect whereof I/we declare myself/ourselves to be conversant, and undertake to pay the **employer** the amount guaranteed on receipt of a written demand from the **employer** to do so, stating that (in the **employer**'s opinion and sole discretion):

   (a) the **contractor** has failed or neglected to comply with the terms and/or conditions of the **contract**; or
   (b) the **contractor**'s estate is sequestrated; liquidated or surrendered in terms of the insolvency laws in force within the Republic of South Africa.

3. Subject to the above, but without in any way detracting from the **employer**'s rights to adopt any of the procedures provided for in the **contract**, the said demand can be made by the **employer** at any stage prior to the expiry of this guarantee.

4. The amount paid by the **guarantor** in terms of this guarantee may be retained by the **employer** on condition that upon the issue of the last **final approval certificate**, the **employer** shall account to the **guarantor** showing how this amount has been expended and refund any balance due to the **guarantor**.

5. The **employer** shall have the absolute right to arrange his affairs with the **contractor** in any manner which the **employer** deems fit and the **guarantor** shall not have the right to claim his release on account of any conduct alleged to be prejudicial to the **guarantor**. Without derogating from the aforegoing, any compromise, extension of the construction period, indulgence, release or variation of the **contractor**'s obligation shall not affect the validity of this guarantee.

6. The **guarantor** reserves the right to withdraw from this guarantee at any time by depositing the guaranteed amount with the **employer**, whereupon the **guarantor**'s liability ceases.

7. This guarantee is neither negotiable nor transferable, and

   (a) must be surrendered to the **guarantor** at the time when the **employer** accounts to the **guarantor** in terms of clause 4 above, or

   (b) shall lapse on the date of the last **certificate of completion** of works.

8. This guarantee shall not be interpreted as extending the **guarantor**'s liability to anything more than the payment of the amount guaranteed.

SIGNED AT _____ **ON THIS** _____ **DAY OF** _____ **20**____.

AS WITNESS

1. _____

2. _____

By and on behalf of _____

_____

_____

(insert the name and physical address of the guarantor)

NAME: _____

CAPACITY: _____
(duly authorised thereto by resolution attached marked Annexure A)

DATE: _____

A. **No alterations and/or additions of the wording of this form will be accepted.**

B. **The physical address of the guarantor must be clearly indicated and will be regarded as the guarantor's *domicilium citandi et executandi,* for all purposes arising from this guarantee.**

C. **This GUARANTEE must be returned to:** _____

_____

_____

PART C2: PRICING DATA

C2.1 PRICING INSTRUCTIONS

PG-02.1 (EC) PRICING ASSUMPTIONS – GCC (2010) 2nd Edition 2010

Project title:	***BLOEMFONTEIN DEEDS OFFICE: UPGRADING AND MAINTENANCE OF FIRE PROTECTION SYSTEM***		
Tender / Quotation no:	*BL22/011*	**Reference no:**	*14/2/1/4/21/6706*

C2.1 Pricing Assumptions

C2.1.1 GENERAL

The Bill of Quantities forms part of the Contract Documents and must be read and priced in conjunction with all the other documents comprising the Contract Documents, which include the Conditions of Tender, Conditions of Contract, the Specifications (including the Project Specification) and the Drawings.

C2.1.2 DESCRIPTION OF ITEMS IN THE SCHEDULE

The Bill of Quantities has been drawn up generally in accordance with Civil Engineering Quantities 1990 issued by the SA Institution of Civil Engineers.

The short descriptions of the items in the Bill of Quantities are for identification purposes only and the measurement and payment clause of the Standardized Specifications and the Particular Specifications, read together with the relevant clauses of the Project Specification and directives on the drawings, set out what ancillary or associated work and activities are included in the rates for the operations specified.

C2.1.3 QUANTITIES REFLECTED IN THE SCHEDULE

The quantities given in the Bill of Quantities are estimates only, and subject to remeasuring during the execution of the work. The Contractor shall obtain the Engineer's detailed instructions for all work before ordering any materials or executing work or making arrangements for it.

The Works as finally completed in accordance with the Contract shall be measured and paid for as specified in the Bill of Quantities and in accordance with the General and Special Conditions of Contract, the Specifications and Project Specifications and the Drawings. Unless otherwise stated, items are measured net in accordance with the Drawings, and no allowance has been made for waste.

The validity of the contract will in no way be affected by differences between the quantities in the Bill of Quantities and the quantities finally certified for payment.

C2.1.4 PROVISIONAL SUMS

Where Provisional sums or Prime Cost sums are provided for items in the Bill of Quantities, payment for the work done under such items will be made in accordance with Clause 45 of the General Conditions of Contract 2004. The Employer reserves the right, during the execution of the works, to adjust the stated amounts upwards or downwards according to the work actually done under the item, or the item may be omitted altogether, without affecting the validity of the Contract.

The Tenderer shall not under any circumstances whatsoever delete or amend any of the sums inserted in the "Amount" column of the Bill of Quantities and in the Summary of the Bill of Quantities unless ordered or authorized in writing by the Employer before closure of tenders. Unauthorized changes made by the Tenderer to provisional items in the Bill of Quantities, or to the provisional percentages and sums in the Summary of the Bill of Quantities will lead to the disqualification of the Tenderer.

C2.1.5 PRICING OF THE BILL OF QUANTITIES

The **bills of quantities / lump sum document** forms part of and must be read and priced in conjunction with all the other documents forming part of the **contract documents**, the Standard Conditions of Tender, Conditions of Contract, Specifications, Drawings and all other relevant documentation.

The prices and rates to be inserted by the Tenderer in the Bill of Quantities shall be the full inclusive prices to be paid by the Employer for the work described under the several items, and shall include

full compensation for all cost and expenses that may be required in and for the completion and maintenance during the defects liability period of all the work described and as shown on the drawings as well as all overheads, profits, incidentals and the cost of all general risks, liabilities and obligations set forth or implied in the documents on which the Tender is based.

Each item shall be priced and extended to the "Total' column by the Tenderer, with the exception of the items for which only rates are required, or items which already have Prime Cost or Provisional Sums affixed thereto. If the Contractor omits to price any items in the Bill of Quantities, then these items will be considered to have a nil rate or price.

The Tenderer is required to check the Bills of Quantities and the numbers of the pages and should any be found to be missing or in duplicate, or should any of the typing be indistinct, or any doubt of obscurity arise as to the meaning of any description or particulars of any item, or if this Tender Enquiry contains any obvious errors, then the Tenderer must immediately inform the Principal Agent and have them rectified or explained in writing as the case may be. No liability whatsoever will be admitted by reason of the Contractor having failed to comply with the foregoing instruction.

No alterations, erasures, omissions or additions is to be made in the text and/or conditions of these Bills of Quantities. Should any such alterations, amendments, note/s or addition be made, the same will not be recognized, but reading of these Bills of Quantities as originally prepared by the Quantity Surveyor will be adhered to.

The contractor is cautioned that the use of any quantities appearing in these Bills of Quantities for the purpose of ordering material, it is done at own risk and no liability whatsoever will be admitted by the Employer or Quantity Surveyor for the correctness of such Quantities. Unless otherwise stated, items are measured net in accordance with the drawings, and no allowance is made for waste.

The prices and rates to be inserted by the Tenderer in the Bills of Quantities shall be the full inclusive prices to be paid by the Employer for the work described. Such prices and rates shall cover all costs and expenses that may be required in and for the execution of the work described, and shall cover the cost of all general risks, liabilities, and obligations set forth or implied in the documents on which the tender is based, as well as overhead charges and profit. Market related prices shall be inserted as these will be used as a basis for assessment of payment for additional work that may have to be carried out. The Employer reserves the right to balance the Bill rates where deemed necessary within the Tendered Amount.

A price or rate is to be entered against each item in the Bills of Quantities, whether the quantities are stated or not. An item against which no rate is/are entered, or if anything other than a rate or a nil rate (for example, a zero, a dash or the word "included" or abbreviations thereof) is entered against an item, it will also be regarded as a nil rate having been entered against that item, i.e. that there is no charge for that item. The Tenderer may be requested to clarify nil rates, or items regarded as having nil rates; and the Employer may also perform a risk analysis with regard to the reasonableness of such rates.

Should the full intent and meaning of any description not be clear, the bidder shall, before submission of his tender, call for a written directive from the principal agent, failing which it shall be assumed that the contractor has allowed in his pricing for materials and workmanship in terms of National Best Practice.

All items for which terminology such as "inclusive" or "not applicable" have been added by the Tenderer will be regarded as having a nil rate which shall be valid irrespective of any change in quantities during the execution of the Contract.

The Tenderer shall fill in rates for all items where the words "rate only' appear in the "Total" column. "Rate Only" items have been included where:

(a) variations of specified components in the make-up of a pay item may be expected; and
(b) no work under the item is foreseen at tender stage but the possibility that such work may be required is not excluded.

For 'Rate Only" items no quantities are given in the "Quantity" column but the quoted rate shall apply in the event of work under this item being required. The Tenderer shall however note that in terms of

the Tender Data the Tenderer may be asked to reconsider any such rates which the Employer may regard as unbalanced.

Descriptions in the Bills of Quantities are abbreviated and comply generally with those in the "PW 371" and the principles contained in the latest version of the SANS 1200 in South Africa. It is the intention that the abbreviated descriptions be fully described when read with the applicable measuring system and the relevant preambles and/or specifications. However, should the full intent and meaning of any description not be clear, the bidder shall, before submission of his tender, call for a written directive from the principal agent, failing which it shall be assumed that the contractor has allowed in his pricing for materials and workmanship in terms of National Best Practice.

The price quoted against each item of this Bills of Quantities shall cover the full inclusive cost of the complete work to which it refers, as described in the Conditions of Contract and Specifications and as shown on the Drawings and shall allow for labour, material, transporting, loading, storage, supervision, commissioning, wastage, as well as the builders profit and attendance.

The Tenderer must ensure that he fully completes all columns of the Bill of Quantities including the Final Summary. The fully priced bill of quantities must be submitted with the tender or The Final Summary and the Section Summary pages MUST be returned with the tender document as indicated the PA-03 Notice and Invitation to Tender / PA-04 Notice and Invitation for quotation.

The tenderers are to ensure that they have read and understood the project specifications included in C3: Scope of Work. All the information provided in the Scope of Works form part of the work and must be included in the rates.

"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 is 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"

C2.1.6 VALUE ADDED TAX

The **contract sum** must include for Value Added Tax (VAT). All rates, provisional sums, etc. in the **bills of quantities / lump sum document** shall be in Rands and cents and shall include all levies and taxes (other than VAT). VAT will be added in the summary of the Bill of Quantities. The rates must however be net (exclusive of VAT) with VAT calculated and added to the total value thereof in the Final Summary. All rates and amounts quoted in the Bill of Quantities

C2.1.7 CORRECTION OF ENTRIES

Incorrect entries shall not be erased or obliterated with correction fluid but must be crossed out neatly. The correct figures must be entered above or adjacent to the deleted entry, and the alteration must be initialled by the Tenderer.

C2.1.8 ARITHMETICAL ERRORS

Arithmetical errors found in the Bill of Quantities as a result of faulty multiplication of addition, will be corrected by the Engineer at the tender evaluation stage, as set out in the Tender Data.

C2.1.9 CONTRACT DOCUMENTS

The Tenderers are advised to examine the bills of quantities, drawings and specifications including all other contract documents and make themselves thoroughly acquainted with the nature and requirements of the work, as no claim for extra payment in this regard will be entertained. Should any parts of the drawings not be clearly intelligible to the Tender, he must, before submitting his tender, obtain clarification from the Principal Agent.

C2.1.10 UNITS OF MEASUREMENT

The units of measurement described in the Bill of Quantities are metric units for which the standard international abbreviations are used. Non-standard abbreviations which may appear in the Bill of Quantities are as follows:

No.	=	Number
%	=	Percent
Sum	=	Lump sum
PCsum	=	Prime cost sum
Prov sum	=	Provisional sum
$m^3.km$	=	Cubic metre - kilometre
Km-pas	=	kilometre - pass
$m^2.pass$	=	square metre – pass

C2.1.11 TRADE NAMES

Tenderers attention is drawn to the fact that wherever trade names or references to any catalogue have been made in these Bills of Quantities, it is purely to establish a standard for the required material. If use is made of any other equally approved material in lieu of the prescribed trade name or catalogue, the necessary price adjustments will be made.

C2.1.12 CONTRACT DOCUMENTS

The Tenderers are advised to examine the bills of quantities, drawings and specifications including all other contract documents and make themselves thoroughly acquainted with the nature and requirements of the work, as no claim for extra payment in this regard will be entertained. Should any parts of the drawings not be clearly intelligible to the Tender, he must, before submitting his tender, obtain clarification from the Principal Agent.

C2.1.13 PAYMENTS

Interim valuations and payments will be prepared on a monthly basis, all in terms of the conditions of contract.

The contractor is to note that no payment will be made for materials stored off site and in the case of materials being stored on site, payment will only be made for such materials on condition that they have not been delivered to the site prematurely, a tax invoice and proof of payment (ownership) is submitted by the Contractor.

C2.1.14 ACCOMMODATION ON SITE

It is imperative to note that no living quarters for construction workers on site will not be permitted for the full duration of the contract unless otherwise stated in the contract data or permission be granted by the Employer.

C2.1.15 LOCAL MATERIAL UTILISATION REPORT (LOCAL CONTENT)

Bidders to note that materials procured for the works should be from South African manufactures and suppliers. Imported materials shall only be considered under exceptional circumstances, based on compelling technical justifications, and subject to the approval by the NDPWI.

The contractor shall achieve in the performance of this contract the prescribed local content deliverables as listed in PA36 and annexures C thereto in the respective designated sectors as published by Department Trade Industry and Competition (DTIC). The Service Provider shall submit an accumulative monthly report to the Employer's representative indicating the percentage targets achieved which must be reconciled upon completion of the project and to form part of the final account.

The contractor shall be responsible for record keeping, documenting and submission of monthly local material utilization report with supporting documentation to the Employer's representative within 7 working days of the beginning of the successive month, in terms of DTI&C designated industry/sector/sub-sector schedule as per the PA36 and Annexures C attached to the tender document. The final percentage achievement to be reconciled upon completion of the project and form part of the final account.

C2.1.16 CONTRACT PARTICIPATION GOALS

The contractor shall achieve in the performance of this contract the following Contract Participation Goals (CPGs) as indicated below:

Provision for pricing of compliance with the achieving the CPGs is made in the Contract Participation Goal Section of the Bills of Quantities and it is explicitly pointed out that all requirements in respect of the aforementioned are deemed to be priced thereunder and no additional claims in this regard shall be entertained

Monthly progressive reports to be submitted to the Employer's representative indicating the percentage targets achieved which must be reconciled upon completion of the project and to form part of the final account.

C2.1.16.1 Minimum 30% Sub-contracting Contract Participation Goal

MINIMUM 30% MANDATORY SUBCONTRACTING TO SMMES: IMPLEMENTATION OF PREFERENCIAL PROCUREMENT RGULATIONS 2017

30% Mandatory subcontracting is *not applicable* to this project.

Provision is made within the Contract Participation Goal section in the Bill of Quantities for thirty percent (30%) subcontracting to SMMEs in the execution of this project as described in PG-01.1 (EC) SCOPE OF WORKS C3.5.1. The contractor shall price his Profit and Attendance, all inclusive of associated costs to the contractor for implementation. Allowance must be made for submitting reports to the Employer's Representative on a monthly basis in terms of monthly and accumulative targets achieved with audited supporting documentation.

C2.1.16.2 MINIMUM TARGETED LOCAL BUILDING MATERIAL MANUFACTURERS CONTRACT PARTICIPATION GOAL

The Minimum Targeted Local Building Material Manufacturers CPG is *not applicable* to this project.

Provision is made within the Contract Participation Goal section in the Bill of Quantities for the Minimum Targeted Local Building Material Manufacturers CPG in the execution of this project as described in PG-01.1 (EC) SCOPE OF WORKS C3.5.2. The contractor shall price his Profit and Attendance, all inclusive of associated costs to the contractor for implementation. Allowance must be made for submitting reports to the Employer's Representative on a monthly basis in terms of monthly and accumulative targets achieved with audited supporting documentation.

C2.1.16.3 MINIMUM TARGETED LOCAL BUILDING MATERIAL SUPPLIERS CONTRACT PARTICIPATION GOAL

The Minimum Targeted Local Building Material Suppliers CPG is *not applicable* to this project.

Provision is made within the Contract Participation Goal section in the Bill of Quantities for the Minimum Targeted Local Building Material Suppliers CPG in the execution of this project as described in PG-01.1 (EC) SCOPE OF WORKS C3.5.3. The contractor shall price his Profit and Attendance, all inclusive of associated costs to the contractor for implementation. Allowance must be made for submitting reports to the Employer's Representative on a monthly basis in terms of monthly and accumulative targets achieved with audited supporting documentation.

C2.1.16.4 MINIMUM TARGETED LOCAL LABOUR SKILLS DEVELOPMENT CONTRACT PARTICIPATION GOAL

The Minimum Targeted Local Labour Skills Development CPG is *not applicable* to this project.

Provision is made within the Contract Participation Goal section in the Bill of Quantities for the Minimum Targeted Local Labour Skills Development CPG in the execution of this project as described in PG-01.1 (EC) SCOPE OF WORKS C3.5.4. The contractor shall price his Profit and Attendance, all inclusive of associated costs to the contractor for implementation. Allowance must be made for submitting reports to the Employer's Representative on a monthly basis in terms of monthly and accumulative targets achieved with audited supporting documentation.

C2.1.16.5 CIDB BUILD PROGRAMME: MINIMUM TARGETED ENTERPRISE DEVELOPMENT: CONTRACT PARTICIPATION GOALS (CPG)

The Minimum Targeted Enterprise Development CPG is *not applicable* to this project.

A provisional amount has been allowed for within the Contract Participation Goal section in the Bill of Quantities for the Minimum Targeted Enterprise Development CPG in the execution of this project as described in PG-01.1 (EC) SCOPE OF WORKS C3.5.5. The provisional amount allowed is for the appointment of training coordinator, mentor, training service providers and training of the beneficiary enterprises.

The contractor shall price his Profit and Attendance, all inclusive of associated costs to the contractor for implementation. Allowance must be made for submitting reports to the Employer's Representative on a monthly basis in terms of monthly and accumulative targets achieved with audited supporting documentation.

The contractor shall complete a separate bill of quantities upon the award of the project and identification of the respective beneficiaries and the appointment of the training coordinator, mentor, training service providers of which the cost will be offset against the provisional amount allowed in the Bills of Quantities.

C2.1.16.6 CIDB BUILD PROGRAMME: MINIMUM TARGETED TARGETED CONTRACT SKILLS DEVELOPMENT GOALS (CSDG)

The Minimum Targeted Contract Skills Development CPG is *not applicable* to this project.

A provisional amount has been allowed for within the Contract Participation Goal section in the Bill of Quantities for the Minimum Targeted Skills Development CPG in the execution of this project as described in PG-01.1 (EC) SCOPE OF WORKS C3.5.6. The provisional amount allowed is for:

- stipends payable to the beneficiaries
- appointment of training coordinator
- appointment of mentor (where applicable)
- appointment of training service providers
- other additional costs as per table 3 of the Standard

The contractor shall price his Profit and Attendance (all inclusive of associated costs to the contractor for implementation and reporting), based on the provisional amount in the Contract Participation Goal section in the Bill of Quantities. The contractor shall complete a separate bill of quantities upon the award of the project and identification of the respective beneficiaries. The CPG value to be achieved will be based on the actual contract amount which will be offset against the provisional amount allowed for within the Contract Participation Goal section in the Bill of Quantities.

Allowance must be made for submitting reports to the Employer's Representative on a monthly basis in terms of monthly and accumulative targets achieved with audited supporting documentation.

Payment

The contractor shall upon the appointment of beneficiaries, provide a breakdown of all the associated costs. The contractor shall provide a payment schedule as to how the CPG costs will be claimed against for inclusion in the monthly payment certificates.

(a) Payment to the contractor to accommodate Part/Full Occupational qualification and Trade qualifications:

Should the contractor select Part/Full Occupational qualification and Trade qualifications learners, then the employer shall make provision for payment to the contractor as indicated in Table 3 of the Standard.

The contract skills participation goal, expressed in Rand, shall not be less than the contract amount multiplied by a percentage (%) factor given in Table 2 in the Standard for the applicable class of construction works. Should the contractor select Part/Full Occupational qualification and Trade qualifications learners, then the employer shall make provision for payment to the contractor as indicated in Table 3 of the Standard.

No provision for an additional payment item for the payment of the supervisor and/or mentors for the provision of training as provided for in the Contract Participation Goal section in the Bill of Quantities for the training of part/full time occupational learners and/or trade qualification learners. The associated cost is deemed to be included in general supervision on site.

The contractor shall complete a separate bill of quantities upon award, indicating the type and number of beneficiaries as well as the associated Notional Cost of Training to be provided, on which payment will be based.

(b) Payment to the contractor to accommodate Work Integrated Learners and Candidates for professional registration:

Should the contractor select Work Integrated Learners and/or Candidates for professional registration, then the employer shall make provision for payment to the contractor as indicated in Table 3 of the Standard.

Provisional amounts have been included in the Contract Participation Goal section in the Bill of Quantities for the training of Work Integrated Learners and Candidates for professional registration. The contractor shall price his Profit and Attendance (all inclusive of associated costs to the contractor for implementation and reporting), based on the provisional amount in the Contract Participation Goal section in the Bill of Quantities.

The contractor shall complete a separate bill of quantities upon award, indicating the type and number of beneficiaries as well as the associated Notional Cost of Training to be provided, on which payment will be based.

The CPG value to be achieved will be based on the contract amount as defined by the Standard, which will be offset against the provisional amount allowed for within the Contract Participation Goal section in the Bill of Quantities.

The contractor shall apportion the cost of accommodating work integrated learners (P1 and P2 learners) and candidates for professional registration by using Table 3 in the Standard and this cost will be used to determine the Rand value and will be used in determining the contract participation goal in the Bills of Quantities.

Table 3: Notional Cost of Training; Headcount

Source: cidb Standard for Skills Development

Type of Training Opportunity	Provision for stipends (Unemployed learners only)	Provisions for mentorship	Provisions for additional costs*	Total costs	
				Unemployed learners	Employed learners
Method 1					
Occupational qualification	**R7 000**	**R0**	**R9 000**	**R16 000**	**R9 000**
Method 2					
TVET College graduates	**R14 000**	**R0**	**R9 000**	**R23 000**	**N/A**
Apprenticeship	**R14 000**	**R0**	**R12 000**	**R26 000**	**R12 000**
Method 3					
P1 and P2 learners	**R24 000**	**R20 000**	**R4 500**	**R48 500**	**N/A**
Method 4					
Candidates with a 3 year diploma	**R37 000**	**R20 000**	**R4 500**	**R61 500**	**R20 000**
Candidates with 4 year qualification	**R47 000**	**R20 000**	**R4 500**	**R71 500**	**R20 000**

Note: the required CPG will be recalculated based on the awarded tender amount and "Contract amount" once the beneficiaries have been appointed and actual costs are known. The notional cost of providing training opportunities will increase by CPI on an annual basis based on April CPI. Should the rates increase after bid award or during construction the rates will be adjusted as a remeasuarble item.

Example: Training Target Calculation for a R65,7m GB contract

Contract amount	R65 700 000
Contract duration	12 Months
CSDG	0,50%
Minimum CSDG target	0,50% x R65 700 000 = R328 500 (Minimum requirement)

Table 4: Notional cost recalculation upon appointment of beneficiaries

Skills Types	Number of learners	Notional Cost / Learner / Quarter	Notional cost/learner/year	Total Notional Cost over 12 months Contract
Method 2: Workplace learning opportunities, with unemployed TVET graduates	1	R23 000	R92 000	R92 000
Method 3: Candidacy for an unemployed learner with a 3-year qualification	1	R61 500	R246 000	R246 000
Total	2			R338 000

C2.1.16.7 NATIONAL YOUTH SERVICE TRAINING AND DEVELOPMENT PROGRAMME

The National Youth Service Training and Development Programme is *not applicable* to this project.

The programme shall be implemented in terms of the Implementation of the National Youth Service Programme under the Expanded Public Works (EPWP) and shall be priced in the CPG section of the Bills of Quantities.

Provision has been made within the Contract Participation Goal section in the Bill of Quantities for the National Youth Service Training and Development Programme CPG in the execution of this project as described in PG-01.1 (EC) SCOPE OF WORKS C3.5.7. The contractor to price all elements of this section and allowance must be made for submitting monthly reports in the prescribed manner as per examples of reports bound in the specification document.

C2.1.16.8 LABOUR-INTENSIVE WORKS

Labour Intensive Works is *not applicable* to this project

Where labour intensive work is specified in the Bill of Qualities and indicated by "LI" the contractor must price for and include in rates. Contractors are expected to use their initiative to identify additional activities that can be done labour-intensively to comply with the set minimum labour intensity target. Allowance must be made for submitting monthly reports illustrating the value of the works executed under Labour Intensive Works.

C2.2 Submission of Accrual Reports

The Contractor shall submit accrual reports to the client representative at the end of March and September each year for the duration of the Service Contract period from the date of appointment up to and including project closeout. This is to ensure that PMTE complies with the accounting framework GRAP, which requires that PMTE disclose all its accruals as at the end of each reporting date. Allowance must be made for submitting reports to the Employer's Representative on a monthly basis in terms of monthly and accumulative targets achieved with audited supporting documentation.

PART C3: SCOPE OF WORK

PG-01.1 (EC) SCOPE OF WORKS – (GCC (2010) 2nd EDITION: 2010)

Project title:	***BLOEMFONTEIN DEEDS OFFICE: UPGRADING AND MANINTENANCE OF FIRE PROTECTION SYSTEM***		
Tender no:	*BL22/011*	**Reference no:**	*14/2/1/4/21/6706*

C3. Scope of Works

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NOTE: This is an example only. Compiler / Designer to provide the applicable contents.

B: AMENDMENTS TO THE PARTICULAR SPECIFICATIONS

C3.3 PARTICULAR SPECIFICATIONS

C3.4 STANDARD SPECIFICATIONS:

The standard specifications on which this contract is based are the **South African Bureau of Standards Standardized Specifications for Civil Engineering Construction SABS 1200.** *(Note to compiler. "SABS" has been changed to "SANS"; the SABS 1200 specifications are due to be replaced in the foreseeable future by SANS 2100)*

Although not bound in nor issued with this Document, the following Sections of the Standardized Specifications of SABS 1200 shall form part of this Contract:

A - 1986 - GENERAL / D – (etc, to be provide by compiler)

3.5 PROJECT SPECIFICATIONS:

Status

The Project Specification, consisting of two parts, forms an integral part of the contract and supplements the Standard Specifications.

Part1 A contains a general description of the works, the site and the requirements to be met.

Part B contains variations, amendments and additions to the Standardized Specifications and, if applicable, the Particular Specifications.

In the event of any discrepancy between a part or parts of the Standardised of Particular Specifications and the Project Specification, the Project Specification shall take precedence. In the event of a discrepancy between the specifications, (including the Project Specifications) and the drawings and / or the Bill of Quantities, the discrepancy shall be resolved by the Engineer before the execution of the work under the relevant item.

3.5.1 GENERAL

PS-1 PROJECT DESCRIPTION:

The work consists of a 48 month service and maintenance contract and 12 month repair period which runs concurrently. During the first 12 months the existing fire detection and CO2 fire suppression system would be serviced and maintained while the new fire detection and gas systems are being installed. After the new fire detection and CO2 fire suppression system have been completed (12 months), a 36 month guarantee and maintenance period for the new installation follows. The building will be kept in full use and will be fully occupied throughout the 48 month period. During this period the building is to be kept fully fire protected at all times. All work is to be carried out within the occupied building in accordance with a program to be agreed with the user. The repair phase consists of the replacement of the fire detection and evacuation system, and the replacement of the CO2 gas fire suppression system with an IG 55 inert gas system as described below.
The 48 month maintenance work is to be evaluated monthly and compensated on a points based system based on interim inspections and work done: each month 10 components of the installations being maintained will be inspected by the engineer and a maximum of 10 maintenance points will awarded if all maintenance has been satisfactorily carried out on the 10 inspected components. Should maintenance not have been carried out, or should the inspected systems not be found to be in a fully and properly maintained condition the Engineer shall deduct a maintenance point for each wanting component. The engineer's decision shall be final and binding in this regard. Payment shall be paid per point awarded each month.

FIRE DETECTION AND EVACUATION SYSTEMS:

The new smoke detection system shall be an digital IP based analogue addressable intelligent system to SANS 10139 and BS 5839 Part 1 divided into separate designated fire zones all linked to a fully addressable, EN54 parts 2&4 approved fire panel in the security equipment room linked to a "maestro" type monitor and display panel. The new master panel shall provide the fire detection functions of the non-gassed areas and shall be interfaced with each of the 7 new gas control systems supplied under this contract (and 4 existing gas systems operated by SARS) and their dedicated two zone fire detection panels and gas control systems. Zoning shall assist with location of a fire in the building and interfaced with the evacuation systems. The system shall incorporate PC software for computer and monitoring (maestro type mimic panel to be provided with 3D graphic systems) and shall be Bacnet compatible and shall be interfaced with the BMS system (existing); also to be interfaced through software or relays with the lift installation and the HVAC systems to provide the required shut down, monitoring, control and interface.
The design is for A BS5839-1 Classification L2 System which includes automatic fire detection on all escape routes and rooms leading onto escape routes. An L2 system can also include additional areas deemed as a high risk not included in the escape routes and adjoining rooms, such as kitchens and stores. The sounders in the building should be according to the description in the BS5839 Category L2 description as above.
The existing fire detection systems in the building are to be kept operational while the new systems are installed so that the working building is kept protected at all times. Similarly existing gas systems are to be disconnected only when the new system is up and operational on a zone by zone basis in conjunction so that the building remains protected at all times.

All existing detection and gas systems are to be removed and not reused for the new installations; suitable wire ways may be reused with the approval of the engineer

The existing building voice evacuation system, controlled from the security room, and shall be interfaced with the fire systems for the automatic muting of fire zone sounders after the manual selection and voice addressing of the evacuation zones through the front end microphone. To this end the normal fire annunciation and evacuation system shall always have preference and shall only be interrupted (after a delay) by the operator to silence it and address each fire/evac zone in the building (or any combination of zones) through his microphone.

IG 55 INERT GAS INSTALLATIONS

The scope of work to be carried out under this sub-contract shall consist of the design co-ordination, supply of materials, manufacture, delivery, installation, commissioning, handing over and maintenance of the 7 off independent Proinert room gas flooding systems in the 4 separate basement level document archives/storage rooms (no ceilings in these areas); the two ground floor level document archives; the first floor server room. The 7 off independent, dedicated two zone, double knock fire detection systems for the automatic control and activation of the gas installations in each area ; the lock-out units for the manual and automatic operation of the gas systems in each area ; the power supplies for the gas and detection systems, their associated alarms and fire and relief damper systems, the associated plant fire shut down relays - to this end the contractor shall activate the HVAC motorized fire dampers and local control panels (which shall be powered and controlled from the respective gas zone through the fire panel- interface) ; each gas zone shall include a dedicated digital IP fire panel which shall be network interfaced with the building's main fire detection and control panel for alarm and monitoring purposes.

Four (4) existing SARS gas systems shall also be interfaced and monitored through the main fire panel

The isolation dismantling and removal of the existing HP CO2 gas systems, their piping, controls and wiring and the making good and sealing of the building structure where the piping and wiring are removed.

The sealing and leak testing of each gas zone: each gas area shall be pressurised and the leakage measured by a recognized testing agency. All openings in the building fabric shall be sealed and fire stopped under this contract to achieve the integrity levels required by NFPA in order to hold the undiluted gas charge for the designated extinguishing period for deep seated Class A paper fires.

Some building work is to be carried out to fire proof the gas enclosures: this to include bricking up of windows and plastering of the walls ; fitting steel plates to widow recesses; replacing normal glazing with fire rated pyran glass.

In addition to the LCD "maestro "mimic display a hard wired, master monitoring mimic panel in the Ground floor security room (AO size) shall display the status of the individual gas zones and their lockout panels. For the 7 new gas areas and 4 existing SARS areas

3.5.2 AMENDMENTS TO THE STANDARD AND PARTICULAR SPECIFICATION:

C3.5.3 PARTICULAR SPECIFICATIONS:

C3.6 STANDARD MINIMUM REQUIREMENTS

In terms of section 5(2) of the Construction Industry Development Board Act, 2000 (Act no. 38 of 2000) (the Act), the Construction Industry Development Board is empowered to establish and promote best practice standards, Standard Requirements and Guidelines which includes the following but not limited to:

C3.61 cidb Best Practice: Green Building Certification, No. 34158 Government Gazette, 1 April 2011

C3.6.2 cidb Standard for Developing Skills through Infrastructure Contracts, No. 36760 Government Gazette, 23 August 2013

C3.6.3 cidb Standard for Indirect Targeting for Enterprise Development through Construction Works Contracts, No 36190 Government Gazette, 25 February 2013

C3.6.4 Preferential Procurement Policy Framework Act, 2000: Preferential Procurement Regulations, 2017, No. 40553 Government Gazette, 20 January 2017

C3.6.5 cidb Standard for Contract Participation Goals for Targeting Enterprises and Labour through Construction Works Contracts, No. 41237 Government Gazette,10 November 2017

C3.6.6 cidb Standard for Minimum Requirements for Engaging Contractors and Sub-Contractors on Construction Works Contracts, No. 41237 Government Gazette, 10 November 2017

C3.6.7 cidb Standard for Minimum Requirements for Engaging Contractors and Sub- Contractors on Construction Works Contracts, No. 42021 Government Gazette, 9 November 2018

C3.6.8 cidb Standard for Developing Skills through Infrastructure Contracts, No. 43495 Government Gazette, 3 July 2020

C3.7 CONTRACT PARTICIPATION GOALS AND CIDB BUILD PROGRAMME

The contractor shall achieve in the performance of the contract the following Contract Participation Goals (CPGs) as indicated below. Provision for pricing of compliance with the achieving the CPGs is made in the Contract Participation Goal Section of the Bills of Quantities and it is explicitly pointed out that all requirements in respect of the aforementioned are deemed to be priced thereunder and no additional claims in this regard shall be entertained:

C3.7.1 Minimum Thirty Percent (30%) Mandatory Sub-contracting Contract Participation Goal

MINIMUM THIRTY PERCENT (30%) MANDATORY SUBCONTRACTING TO SMMES: IMPLEMENTATION OF PREFERENCIAL PROCUREMENT RGULATIONS 2017

30% Mandatory subcontracting is *not applicable* to this project.

It is the requirement of the employer that the contractor enhances the use of local Small, Micro and Medium Enterprises (SMME's) in executing this contract, irrespective whether the 30% Participation Goal is applicable or not.

The thirty percent (30%) mandatory Sub-contracting shall be achieved in the execution of the contract. in terms of in accordance with the Preferential Procurement Policy Framework Act, 2000: Preferential Procurement Regulations, 2017 as published in the Government Gazette Notice No. 40553 of 20 January 2017.

(a) SMME's involvement of at least **insert applicable percentage, both in words and figures** of the tender amount at the time of tender to be sourced from within **insert applicable kilometerskm** radius of the project site with the intention to maximize use of local SMMEs within **insert applicable Ward/s, Municipal District, Town, City, Province**,
(b) SMME's involvement of at least **insert applicable percentage, both in words and figures** of the Tender Value to be sourced from within **insert applicable kilometerskm** radius of the project site.

Bidders are cautioned not to under-price items earmarked to be executed by SMMEs as adjustment to too low rates will not be entertained by the Employer.

Bidders to sub-contract a minimum of thirty percent (30%) of the tender amount including VAT at the time of tender (All inclusive, Including VAT). to any one or more of the following categories:

a. An EME or QSE
b. An EME or QSE which is at least 51% owned by black people
c. An EME or QSE which is at least 51% owned by black people who are youth
d. An EME or QSE which is at least 51% owned by black people who are women
e. An EME or QSE which is at least 51% owned by black people with disabilities
f. An EME or QSE which is at least 51% owned by black people living in rural or underdeveloped areas or townships
g. A co-operative which is at least 51% owned by black people
h. An EME or QSE which is at least 51% owned by black people who are Military veterans
i. More than one of the categories referred to in paragraphs (a) to (h).

Bidders to refer to the CSD for a list of prospective sub-contractors provided with the tender. The bidder to refer to the CSD website should the list provided be insufficient.

Bidders must ensure that the sub-contractors conform to the following:

a. Possess relevant accreditation where applicable;
b. Be registered with relevant bodies (CIDB, various Councils, etc.) where applicable;
c. Possess necessary capabilities to deliver the sub-contracted work;
d. Meet the requirements in terms of the stipulated designated groups; and
e. Geographical located at the place where the project will be delivered. Geographical location must be determined using the following criteria:
   - Relevant Ward. If not available;
   - Relevant neighbouring Wards. If not available;
   - Relevant Local Municipality. If not available;
   - Relevant District Municipality. If not available;
   - Relevant Metro. If not available;
   - Relevant Province. If not available;
   - Relevant Neighbouring Province. And If not available;
   - Anywhere within the borders of South Africa.

It is the bidder's responsibility to source alternative SMMEs should the parties with whom agreements were entered into at the time of tendering either no longer exist or do not perform or render work of an acceptable standard, subject to the approval by the Employer. Failure to achieve the **minimum thirty percent (30%)** SMME participation based on the tender amount including VAT, will result in a **insert applicable percentage, both in words and figures** penalty on the amount of work on which there is no compliance (Excluding VAT), unless the contractor can prove to the Employer's satisfaction that the non-achievement was beyond his/her control.

The bidder shall submit monthly reports in terms of monthly achievement and accumulative targets achieved including audited supporting documentation to the Employer's Representative.

The bidder shall submit monthly reports in terms of monthly achievement and accumulative targets achieved including audited supporting documentation to the Employer's Representative.

C3.7.2 Minimum Targeted Local Material Manufacturer Contract Participation Goal

The Minimum Targeted Local Building Material Manufacturers CPG is *not applicable* to this project.

It is the requirement of the employer that the contractor enhances the use of local Small, Micro and Medium Enterprise Local Material Manufacturers (SMME's) in executing this contract, irrespective whether a minimum percentage Participation Goals is applicable or not.

The Minimum Targeted Local Manufacturers of Material Contract Participation Goal, in accordance with the cidb Standard for Contract Participation Goals for Targeting Enterprises and Labour through Construction Works Contracts as published in the Government Gazette Notice No. 41237 of 10

November 2017, as amended in cidb Best Practice Project Assessment Scheme Notice No. 43726 of 18 September 2020.

A Targeted Local Material Manufacturer is a targeted enterprise that operates or maintains a factory or establishment that produces on its premises materials or goods required by the principal contractor for the performance of the contract.
Note: Adapted from SANS 10845-7:2015, definition 2.13

Preference shall be given to the Targeted Local Material Manufacturer where feasible in **insert applicable Ward/s, Municipal District, Town, City, Province**, and provided that:

(a) Such materials comply in all respects with the specific requirements of PW371 and SANS specifications,
(b) The non-availability of such materials shall not adversely affect the desired progress of the specific works,
(c) The use of such suppliers shall not constitute grounds for any claim for increased cost in respect thereof,
(d) Materials of at least **insert applicable percentage, both in words and figures** of the total value of materials purchased excluding VAT to be sourced from within **insert applicable kilometerskm** radius of the project site,
(e) Material of at least **insert applicable percentage, both in words and figures** of the total value of materials purchased excluding VAT to be sourced from within **insert applicable kilometerskm** radius of the project site.

Failure to achieve the minimum **insert applicable percentage, both in words and figures** Targeted Local Material Manufacturer participation expressed as a percentage of the original tender amount, excluding allowances and VAT, will result in a **insert applicable percentage, both in words and figures** penalty of the prorate targeted value of materials not complied with unless the contractor can prove to the Employer's satisfaction that the non-achievement was beyond his/her control.

The bidder shall submit monthly reports in terms of monthly achievement and accumulative targets achieved including audited supporting documentation to the Employer's Representative.

C3.7.3 Minimum Targeted-Local Building Material Suppliers Contract Participation Goal

The Minimum Targeted Local Building Material Suppliers CPG is *not applicable* to this project.

It is the requirement of the employer that the contractor enhances the use of local Small, Micro and Medium Enterprise Local Material Suppliers (SMME's) in executing this contract, irrespective whether a minimum percentage Participation Goals is applicable or not.

The Minimum Targeted Local Manufacturers of Material Contract Participation Goal shall be achieved in accordance with the cidb Standard for Contract Participation Goals for Targeting Enterprises and Labour through Construction Works Contracts as published in the Government Gazette Notice No. 41237 of 10 November 2017, as amended in cidb Best Practice Project Assessment Scheme Notice No. 43726 of 18 September 2020 – Condition of Contract..

A targeted supplier is a targeted enterprise that

a) owns, operates or maintains a store, warehouse or other establishment in which goods are bought, kept in stock and regularly sold to wholesalers, retailers or the public in the usual course of business; and
b) engages, as its principal business and in its own name, in the purchase and sale of goods.

Note: Adapted from SANS 10845-7:2015, definition 2.14

Preference shall be given to the local material suppliers where feasible in the **insert applicable Ward/s, Municipal District, Town, City, Province**, and provided that:

(a) Such materials comply in all respects with the specific requirements of PW371 and SANS specifications,
(b) The none availability of such materials shall not adversely affect the desired progress of the specific works,
(c) The use of such suppliers shall not constitute grounds for any claim for increased cost in respect thereof,

(d) Materials of at least **insert applicable percentage, both in words and figures** of the total value of materials purchased excluding VAT to be sourced from within **insert applicable kilometerskm** of the project site,

(e) Material of at least **insert applicable percentage, both in words and figures** of the total value of materials purchased excluding VAT to be sourced from within **insert applicable kilometerskm** of the project site.

Failure to achieve the minimum **insert applicable percentage, both in words and figures** Targeted Local Material Manufacturer participation expressed as a percentage of the original tender amount, excluding allowances and VAT, will result in a **insert applicable percentage, both in words and figures** penalty of the prorate targeted value of materials not complied with, unless the contractor can prove to the Employer's satisfaction that the non-achievement was beyond his/her control.

The bidder shall submit monthly reports in terms of monthly achievement and accumulative targets achieved including audited supporting documentation to the Employer's Representative.

C3.7.4 Minimum Targeted Local Labour Skills Development Contract Participation Goal

The Minimum Targeted Local Labour Skills Development CPG is *not applicable* to this project.

It is the requirement of the employer that the contractor enhances the use of local labour in executing this contract. This is required to be done through the use of both traditional building techniques and labour-intensive construction techniques careful and considered construction planning and implemented in the project irrespective whether a minimum percentage Participation Goal is applicable or not.

The Minimum Targeted Local Skills Development Contract Participation Goal shall be achieved in accordance with the cidb Standard for Contract Participation Goals for Targeting Enterprises and Labour through Construction Works Contracts as published in the Government Gazette Notice No. 41237 of 10 November 2017, as amended in cidb Best Practice Project Assessment Scheme Notice No. 43726 of 18 September 2020 – Condition of Contract..

Targeted labour: individuals who:

a) are employed by the principal contractor, sub-contractor or targeted enterprises in the performance of the contract;
b) are defined as the target group in the targeting data; and
c) permanently reside in the target area or who are recognized as being residents of the target area on the basis of identification and association with and recognition by the residents of the target area.

Adapted from SANS 10845-7:2015, definition 2.12

Targeting of labour by skills categories is only permissible within categories of semi-skilled and unskilled labour.

Contract participation goals for semi-skilled and unskilled labour shall be limited to on-the-job training to targeted labour to enable such labour to master the basic work techniques required to undertake the work in accordance with the requirements of the contract and in a manner that does not compromise worker health and safety. In the case of targeted labour, the certification of records shall be in accordance with SANS 10845-8.

Beneficiaries will be sourced from the **insert applicable Ward/s, Municipal District, Town, City, Province** for the full duration of the Construction Period, employed by either the principal contractor, sub-contractors or targeted enterprises. The total number of working days to complete the Works amount to **insert number of working days as determined by the Construction Period** working days. The minimum CPG participation for Targeted Local Labour Skills Development is **insert applicable percentage, both in words and figures**, expressed as a percentage of the total number of working days required to complete the Works. The contractor shall attain or exceed the CPG in the performance of the contract. Failure to achieve the minimum Targeted Local Labour Skills Development CPG will result in a payment reduction of **R5 000** (Excluding VAT), per working day which training has not been provided to the workforce in attendance, unless the contractor can prove to the Employer's satisfaction that the non-achievement was beyond his/her control.

The bidder shall submit monthly reports in terms of monthly achievement and accumulative targets achieved including audited supporting documentation to the Employer's Representative.

C3.7.5 CIDB BUILD PROGRAMME: Minimum Targeted Enterprise Development Contract Participation Goal

The Minimum Targeted Enterprise Development CPG is *not applicable* to this project.

The aim of this best practice standard for indirect targeting for enterprise development in accordance with the Standard for Indirect Targeting for Enterprise Development (published in Government Gazette 36190 of 25 February 2013), as amended in cidb Best Practice Project Assessment Scheme Notice No. 43726 of 18 September 2020 – Condition of Contract. is to promote enterprise development by providing for a minimum contract participation goal (CPG) of **five percent (5%)** of the contract amount as defined in the Standard (Tender amount, excluding allowances and VAT on selected contracts to be undertaken by joint-venture partners or to be sub-contracted to developing contractors that are also to be beneficiaries of enterprise development support from the main contractor.

The lead partner or main contractor shall dedicate a **minimum five percent (5%)** of the tender value at the time of award, excluding allowances and VAT, to provide developmental support to targeted subcontractor or joint venture partner applicable to contracts in Grades 7 to 9, General Building and Civil Engineering contracts. Preference will be given to insert type of enterprises, e.g. General Building, Electrical, Mechanical, Plumbing, etc. .It could be either or any combination of all Enterprises.

The contractor shall attain or exceed the enterprise development goal in the performance of the contract. Failing to achieve the Participation Goal will result in A) a thirty percent (30%) penalty of the value not achieved, excluding VAT, unless the contractor can prove to the Employer's satisfaction that the non-achievement was beyond his/her control.

The bidder shall submit monthly reports in terms of monthly achievement and accumulative targets achieved including audited supporting documentation to the Employer's Representative.

C3.7.5.1 Criteria

The main or lead partner of the successful bidder shall:

(a) There must be a needs analysis for indirect targeting and development or skill standard and should be development in at least any two developmental areas namely;

- Administrative and cost control systems
- construction management systems and plans
- planning, tendering and programming
- business; technical; procurement skills
- legal compliance
- credit rating/history; financial loan capacity/history
- contractual knowledge

(b) The above needs analysis shall be mutually agreed upon between contractor and targeted enterprise

(c) The contractor shall appoint an enterprise development coordinator to:

- perform needs analysis on the targeted enterprise to identify developmental goals
- develop a project specific enterprise development plan to improve the targeted enterprise/s performance in the identified developmental areas
- provide internal mentorship support to improve the targeted enterprise/s performance
- monitor and submit to the employer's representative a monthly enterprise development report thereby reporting on the progress of the agreed development areas with the targeted enterprise/s

- submit a project completion report to the Employer's representative for each targeted enterprise.

C3.7.5.2 Management

The contractor shall provide a competent person/s to provide internal mentorship to the Targeted Enterprise/s in the two agreed developmental areas.

C3.7.5.3 Competence Criteria for an Enterprise Development Co-ordinator

The enterprise development co-ordinator shall have the following competencies:

- Minimum experience of 5 years in the construction industry at Managerial level as a Site Agent, Contracts Manager, Site Manager, Construction Manager, Business Development Manager or Enterprise Development Manager.
- Minimum experience of 2 years in training and development in Building or Construction; and
- National Diploma or B Degree in the Built Environment or Business Management

C3.7.5.4 Format of Communications

The contractor shall submit to the Employer's Representative:

- *Project interim reports* in the specified format **(ED105P)** detailing interim values of the CPG that was achieved together with an assessment of the enterprise development support provided should be tabled and discussed at least monthly at progress meetings between employer's representative and the contractor;
- *Project completion report* in the specified format **(ED101P)** to the Employer's Representative for acceptance within 15 days of achieving practical completion. The report shall include the value of the CPG that was certified in accordance with the contract, cidb registration numbers of each and every targeted enterprise, and the value of the subcontracted works or of the joint venture entered into; and the participation parameter
- *Enterprise development declaration (**ED104P**).*

C3.7.5.5 The Key Personal

The contractor shall appoint an Enterprise Development Co-ordinator and a competent person/s to provide internal mentorship.

C3.7.5.6 Management Meetings

The contractor shall report to the Employer's Representative on the implementation and progress of the targeted enterprise development and CPG at monthly progress site meetings.

C3.7.5.7 Forms for contract administration

The contractor shall submit to the Employer's Representative the following proformas:

- Form ED 105P Project Interim Report
- Form ED 104P Enterprise Development Declaration
- Form ED 101P Project Completion Report

C3.7.5.8 Records

The contractor shall:

- keep records of the targeted enterprise development
- keep records of the payments made to the targeted enterprises in relation to the CPG.
- ensure all the documentation required in terms of the Standard is provided with each monthly progress payment certificate and according to a prescribed format where applicable.

C3.7.5.9 Payment Certificates

The contractor shall:

- achieve the measurable CPG and providing enterprise development support to the targeted enterprise/s as per the Standard.
- submit payment certificates to the Employer Representative at intervals determined in the Contract.

C3.7.5.10 Compliance requirements

Non-compliance with the Best Practice Project Assessment Scheme

The wording of regulation 27A of the cidb regulations makes provision for the Board to enforce the cidb code of conduct in the event of clients being found to be in breach of the best practice project assessment scheme.

- Not including the requirements of the cidb standards in the conditions of tender
- Not registering the award of contract on the cidb Register of Projects (RoP)
- Not reporting practical completion on the cidb Register of Projects (RoP)

3.7.6 **CIDB BUILD PROGRAMME: Minimum Targeted Contract Skills Development Goal (CSDG)**

The Minimum Targeted Contract Skills Development CPG is *not applicable* to this project.

The contractor shall achieve or exceed in the performance of the contract the Contract Skills Development Goal (CSDG) established in the Standard for Developing Skills through Infrastructure Contracts (published in Government Gazette No 43495 of 3 July 2020, as amended in cidb Best Practice Project Assessment Scheme Notice No. 43726 of 18 September 2020 – Condition of Contract.

Failing to achieve the targeted Contract Skills Development Goal will result in A) a **thirty percent (30%)** penalty of the value of the portion not achieved, excluding VAT, and B) the issuing of completion certificates only after the completion certificate of achieving the skills development goal, counter-signed by the relevant individuals has been submitted, unless the contractor can prove to the Employer's satisfaction that the non-achievement was beyond his/her control.

The contractor shall apportion the learners in the different construction activities based on the scope of work. The cost of accommodating learners will be determined by using Table 3 in the Standard and this cost will be used to determine the value in Rand and will be added to the provision for training as provided for in the Preliminary and General section in the Bill of Quantities/Pricing schedules/Activity schedule.

C3.7.6.1 Methodology

The contractor shall achieve the measurable contract skills development goal by providing opportunities to learners requiring structured workplace learning using one or a combination of any of the following in relation to work directly related to the contract or order:

Method 1: structured workplace learning opportunities for learners towards the attainment of a part or a full occupational qualification;

Method 2: structured workplace learning opportunities for apprentices or other artisan learners towards the attainment of a trade qualification leading to a listed trade (GG No. 35625, 31 August 2012) subject to at least sixty percent (60%) of the artisan learners being holders of public TVET college qualifications;

Method 3: work integrated learning opportunities for University of Technology or Comprehensive University students completing their national diplomas;

Method 4: structured workplace learning opportunities for candidates towards registration in a professional category by a statutory council listed in Table 1 above.

The contract skills participation goals, expressed in Rand, shall not be less than the contract amount multiplied by a percentage (%) factor given in Table 2 in the Standard for the applicable class of construction works.

Table 2: Contracting skills development goals for different classes of engineering and construction works contracts

Class of construction works as identified in terms of Regulation 25 (3) of the Construction Industry Regulations 2004		**Construction skills development goal (CSDG) (%)**
Designation	**Description**	
CE	Civil Engineering	0.25
CE and GB	Civil engineering and General Building	0.375
EE	Electrical Engineering works (buildings)	0.25
EP	Electrical Engineering works (infrastructure)	0.25
GB	General Building	0.5
ME	Mechanical Engineering works	0.25
SB	Specialist	0.25

The contractor shall apportion the learners in the different construction activities based on the scope of work. The cost of accommodating learners will be determined by using Table 3 in the Standard and this cost will be used to determine the value in Rand and will be added to the provision for training as provided for in the Preliminary and General section in the Bill of Quantities/Pricing schedules/Activity schedule.

Table 3: Notional Cost of Training per Headcount

Source: cidb Standard for Skills Development

Type of Training Opportunity	Provision for stipends (Unemployed learners only)	Provisions for mentorship	Provisions for additional costs*	Total costs	
				Unemployed learners	Employed learners
Method 1					
Occupational qualification	R7 000	R0	R9 000	R16 000	R9 000
Method 2					
TVET College graduates	R14 000	R0	R9 000	R23 000	N/A
Apprenticeship	R14 000	R0	R12 000	R26 000	R12 000
Method 3					
P1 and P2 learners	R24 000	R20 000	R4 500	R48 500	N/A
Method 4					
Candidates with a 3 year diploma	R37 000	R20 000	R4 500	R61 500	R20 000
Candidates with 4 year qualification	R47 000	R20 000	R4 500	R71 500	R20 000

Note: the required CPG will be recalculated based on the awarded tender amount and "Contract amount" once the beneficiaries have been appointed and actual costs are known. The notional cost of providing training opportunities will increase by CPI on an annual basis based on April CPI. Should the rates increase after bid award or during construction the rates will be adjusted as a remeasuarble item.

(a) (a) The successful contractor may employ part/full occupational qualification learners, trade qualification learners, work integrated learners or candidates directly or through a Skills Development Agency (SDA), (A1 - List of cidb accredited SDAs).

(b) The successful contractor must employ at least sixty percent (60%) of the learners from an FET / TVET college should the contractor select to have part/full occupational qualification learners and trade qualification learners contributing to the CSDG.

(c) The successful contractor shall employ at least **insert applicable percentage, both in words and figures** from eligible part/full occupational qualification learners, trade qualification learners, work integrated learners or candidates (delete that which is not applicable) in the employment of the employer.

(d) The successful contractor shall ensure that no single method shall contribute more than seventy five percent (75%) of the CSDG for the contract.

(e) The successful contractor may only place thirty three percent (33%) employed employees or that of his subcontractors contributing to the CSDG.

(f) The contractor shall employ at least sixty percent (60%) of the learners from a Public FET / TVET college should the contractor select to have trade qualification learners (Method 2) contributing to the CSDG.

(g) One of the objectives of the project is to train **insert applicable number, both in words and figures** Occupational qualifications, trade qualification, work integrated learners – P1 and P2 learners, professional candidates. (Delete that which is not applicable)

C3.7.6.2 Management

(a) The successful contractor must keep site records regarding the part/full occupational qualification learners', trade qualification learners', work integrated learners' or candidates' (delete that which is not applicable) progress, site attendance, hours worked and other relevant information as required by the Standard.

(b) The successful contractor shall provide the required number of appropriately qualified mentors to the maximum number of part/full occupational qualification learners, trade qualification learners, work integrated learners in the proportion as specified in the Standard.

(c) The successful contractor shall provide a supervisor to manage the training of the part/full occupational qualification learners, trade qualification learners, work integrated learners, candidates. (delete that which is not applicable)

(d) The successful contractor shall submit to the employer's representative a baseline training plan in the specified format (Pro-forma A2) for the part/full occupational qualification learners, trade qualification learners, work integrated learners, candidates (delete that which is not applicable)within 30 days of start of the contract.

(e) The successful contractor shall submit to the employer's representative project interim report in the specified format (Pro-forma A3) on the progress of each of part/full occupational qualification learner, trade qualification learner, work integrated learner, candidate (delete that which is not applicable) every three months.

(f) The successful contractor shall submit to the employer's representative the names and particulars in the specified format (Pro-forma A4) of the supervisor, mentors for the part/full occupational qualification learners, trade qualification learners, work integrated learners or candidates (delete that which is not applicable) within 30 days of start of the contract.

(g) The successful contractor shall keep a daily record of all the part/full occupational qualification learners, trade qualification learners, work integrated learners, candidates on site and their daily activities and shall be made available to the employer's representative on request.

(h) The successful contractor shall submit to the employer's representative the reports on the progress and status of the part/full occupational qualification learners, trade qualification learners, work integrated learners or candidates (delete that which is not applicable) with the monthly invoice for the payment certificate.

(i) The successful contractor shall have health and safety inductions for all part/full occupational qualification learners, trade qualification learners, work integrated learners or candidates (delete that which is not applicable).

(j) The successful contractor shall conduct entry and exit medical tests of all part/full occupational qualification learners, trade qualification learners, work integrated learners or candidates (delete that which is not applicable).

(k) The successful contractor shall provide personal protective equipment (PPE) to all part/full occupational qualification learners, trade qualification learners, work integrated learners or candidates (delete that which is not applicable) at the start of their employment on site.

(l) Based on the agreed skills methods the contractor may employ part/full Occupational Qualification Learners and /or Trade Qualification Learners and/or Work Integrated Learners and/or Candidates (delete that which is not applicable) directly or through a Skills Development Agency (SDA), training provider or skills development facilitator (Form A1 - List of cidb accredited SDAs). The contractor shall ensure that no more than one Method shall be applied to any individual concurrently in the calculation of the CSDG for the contract.

C3.7.7 NATIONAL YOUTH SERVICE TRAINING AND DEVELOPMENT PROGRAMME (NYS)

The National Youth Service Training and Development Programme is *not applicable* to this project.

The programme shall be implemented in terms of the Implementation of the National Youth Service Programme under the Expanded Public Works (EPWP) and shall be priced in the CPG section of the Bills of Quantities. Monthly reports are to be submitted to the Employer's Representative.

Failure by the contractors to achieve the specified number to be trained in the NYS section of the CPG section within the Bills of quantities will result in a payment reduction as per bill of quantities per person, excluding VAT unless the contractor can prove to the Employer's satisfaction that the non-achievement was beyond his/her control.

C3.7.8 LABOUR-INTENSIVE WORKS

Labour Intensive Works is *not applicable* to this project.

Where labour intensive work is specified in the Bill of Qualities and indicated by "LI" the contractor must price for and include in rates. Contractors are expected to use their initiative to identify additional activities that can be done labour-intensively to comply with the set minimum labour intensity target. Allowance must be made for submitting monthly reports illustrating the value of the works executed under Labour Intensive Works.

Failure by the contractor to achieve the specified value of the Labour Intensive Participation Goal as stipulated within the Bills of quantities will result in a thirty percent (30%) penalty of the value of the works not done by means of labour intensive methods, excluding VAT, unless the contractor can prove to the Employer's satisfaction that the non-achievement was beyond his/her control.

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

Labour-intensive works:
Labour-intensive works shall be constructed/maintained using local workers who are temporarily employed in terms of the scope of work. A **thirty percent (30%)** penalty of the value of the works will be imposed on items where unauthorised use of plant was used to carry out work which was to be done labour-intensively.

Labour-intensive competencies of supervisory and management staff:
Contractors shall only engage supervisory and management staff in labour-intensive works that have completed the skills programme including Foremen/ Supervisors at NQF level 4 "National Certificate: Supervision of Civil Engineering Construction Processes" and Site Agent/ Manager at NQF level 5 "Manage Labour-Intensive Construction Processes" or equivalent QCTO qualifications (See Appendix C) at NQF outlined in Table 1

C3.7.8.1 GENERIC LABOUR-INTENSIVE SPECIFICATION

Contractors are referred to the Guidelines for the Implementation of Labour-intensive Infrastructure Projects under the Expanded Publics Works Programme (EPWP) for the generic labour-intensive specification applicable to the contract.

This specification establishes general requirements for activities which are to be executed by hand involving the following:

- trenches having a depth of less than 1.5 metres
- stormwater drainage
- roads
- sidewalks and non-motorised transport infrastructure
- water and sanitation

Precedence
Where this specification is in conflict with any other standard or specification referred to in the Scope of Works to this Contract, the requirements of this specification shall prevail

Hand excavateable material
Hand excavateable material is:
a) granular materials:
i) whose consistency when profiled may in terms of table 2 be classified as very loose, loose, medium dense, or dense; or
ii) where the material is a gravel having a maximum particle size of 10mm and contains no cobbles or isolated boulders, no more than 15 blows of a dynamic cone penetrometer is required to penetrate 100mm;
b) cohesive materials:

i) whose consistency when profiled may in terms of table 2 be classified as very soft, soft, firm, stiff and stiff / very stiff; or
ii) where the material is a gravel having a maximum particle size of 10mm and contains no cobbles or isolated boulders, no more than 8 blows of a dynamic cone penetrometer is required to penetrate 100mm;

Note
1) A boulder is material with a particle size greater than 200mm, a cobble and gravel is material between 60 and 200mm.
2) A dynamic cone penetrometer is an instrument used to measure the in-situ shear resistance of a soil comprising a drop weight of approximately 10 kg which falls through a height of 400mm and drives a cone having a maximum diameter of 20mm (cone angle of 60° with respect to the horizontal) into the material being used.

Table 2: Consistency of materials when profiled

GRANULAR MATERIALS		COHESIVE MATERIALS	
CONSISTENCY	**DESCRIPTION**	**CONSISTENCY**	**DESCRIPTION**
Very loose	Crumbles very easily when scraped with a geological pick.	Very soft	Geological pick head can easily be pushed in as far as the shaft of the handle.
Loose	Small resistance to penetration by sharp end of a geological pick.	Soft	Easily dented by thumb; sharp end of a geological pick can be pushed in 30-40 mm; can be moulded by fingers with some pressure.
Medium dense	Considerable resistance to penetration by sharp end of a geological pick.	Firm	Indented by thumb with effort; sharp end of geological pick can be pushed in up to 10 mm; very difficult to mould with fingers; can just be penetrated with an ordinary hand spade.
Dense	Very high resistance to penetration by the sharp end of a geological pick; requires many blows for excavation.	Stiff	Can be indented by thumb-nail; slight indentation produced by pushing geological pick point into soil; cannot be moulded by fingers.
Very dense	High resistance to repeated blows of a geological pick.	Very stiff	Indented by thumb-nail with difficulty; slight indentation produced by blow of a geological pick point.

Trench excavation
All hand excavateable material in trenches having a depth of less than 1,5 metres shall be excavated by hand.

Compaction of backfilling to trenches (areas not subject to traffic)
Backfilling to trenches shall be placed in layers of thickness (before compaction) not exceeding 100mm. Each layer shall be compacted using hand stampers;
a) to ninety percent (90%) Mod AASHTO;
b) such that in excess of 5 blows of a dynamic come penetrometer (DCP) is required to penetrate 100 mm of the backfill, provided that backfill does not comprise more than ten (10%) gravel of size less than 10mm and contains no isolated boulders, or
c) such that the density of the compacted trench backfill is not less than that of the surrounding undisturbed soil when tested comparatively with a DCP.

Excavation

All excavateable material including topsoil classified as hand excavateable shall be excavated by hand. Harder material may be loosened by mechanical means prior to excavation by hand. Any material which presents the possibility of danger or injury to workers shall not be excavated by hand.

Clearing and grubbing
Grass and bushes shall be cleared by hand.

Shaping
All shaping shall be undertaken by hand.

Loading
All loading shall be done by hand. Haulage equipment should be selected in a manner that allows loading by hand to the greatest extent possible.

Haul
Excavation material shall be hauled to its point of placement by means of wheelbarrows where the haul distance is not greater than 150m.

Offloading
All material, however transported, is to be off-loaded by hand, unless tipper-trucks are utilised for haulage.

Spreading
All material shall be spread by hand.

Compaction
Small areas may be compacted by hand provided that the specified compaction is achieved. Appropriate rollers should be used where higher (than can be achieved by hand) levels of compaction are required or for large areas.

Grassing
All grassing shall be undertaking by sprigging, sodding, or seeding by hand.

Stone pitching and rubble concrete masonry
All stone required for stone pitching and rubble concrete masonry, whether grouted or dry, must to be collected, loaded, off loaded and placed by hand.
Sand and stone shall be hauled to its point of placement by means of wheelbarrows where the haul distance is not greater than 150m.
Grout shall be mixed and placed by hand.

Manufactured Elements
Elements manufactured or supplied by the Contractor, such as manhole rings and cover slabs, precast concrete planks and pipes, masonry units and edge beams shall not individually, have a mass of more than 320kg. Where the mass of an element exceeds 55 kg, consideration should be given to the size of the element relative to its total mass related to the number of workers who would be needed to lift such mass

C3.8 Submission of Accrual Reports

The Contractor shall submit accrual reports to the client representative at the end of March and September each year for the duration of the Service Contract period from the date of appointment up to and including project closeout. This is to ensure that PMTE complies with the accounting framework GRAP, which requires that PMTE disclose all its accruals as at the end of each reporting date.

C.3.9 Submission of Monthly Local Material Utilisation Report (Local Content)

The contractors shall be responsible for record keeping, documenting and submission of monthly local material utilization report with supporting documentation to the Employer's representative within 7 working days of the beginning of the successive month, in terms of DTI&C designated industry/sector/sub-sector schedule as per the PA36 and Annexures C attached to the tender

document. The final percentage achievement to be reconciled upon completion of the project and form part of the final account.

Failure by the contractors to achieve the specified percentage of local content per designated industry/sector/sub-sector as listed will result in a thirty percent thirty percent (30%) penalty of the value not achieved, excluding VAT, unless the contractor can prove to the Employer's satisfaction that the non-achievement was beyond his/her control. Allowance must be made for submitting monthly reports illustrating the value of local material utilisation report.

Examples of calculating CPGs and related penalties

CPGs values are based on the Tender Amount at the time of the award. Determining the actual values is based either on the Tender Amount including allowances and Vat or the Tender Amount at the time of award excluding allowances and VAT, where Allowances include the following:

- Provisional amounts
- CPG allowances
- Nominated and/or selected subcontractors
- Contract price adjustment (Not provided for within the B of Q by NDPWI)
- Contingency amounts (Not provided for within the B of Q by NDPWI)

CPG values in the CPG Bill of Quantities Section will be recalculated based on the "Tender Amount" or the "Contract Amount" which ever applicable and the provisional amounts adjusted accordingly. Sanctions (penalties) are applicable to all CPGs where the contractor fails to achieve the minimum specified requirements, unless the contractor can prove to the Employer's satisfaction that the non-achievement was beyond his/her control. No penalties will be applied should the CPG value, based on the original "Tender Amount" or the "Contract Amount", has been achieved.

1.1. 30% SMME mandatory subcontracting CPG

When applicable, a minimum of 30% of the total tender amount at the time of award, including all allowances and VAT are to be subcontracted to SMMEs.

CPG calculation example:
"Tender Amount" = R150 mil
CPG 30% subcontracting value = R45 Mil

Calculation of penalty:
Percentage penalty applicable = 5% as specified in the Scope of Works (PG01.1)
CPG Achieved = R30 Mil (R15 Mil shortfall)
Penalty = R15 Mil x 5% = R750 000 Excl. VAT

1.2 Targeted Local Building Material Manufacturers CPG

When applicable, the CPG is expressed as a percentage of the "Contract Amount", i.e. the Tender Amount at the time of award excluding allowances and VAT.

CPG calculation example:
"Tender Amount" = R150 Mil all inclusive of allowances and VAT
"Contract Amount" = R130 Mil (Tender Amount at the time of award excluding allowances and VAT)
CPG to be achieved = 5% as specified in the Scope of Works (PG01.1)
CPG target value = R130 Mil x 5% = R 6,5 Mil (Value of material to be purchased from local manufacturers, excluding VAT)

Calculation of penalty:
Percentage penalty applicable = 10% as specified in the Scope of Works (PG01.1)
CPG target value = R6,5 Mil excluding VAT
CPG Achieved = R5,5 Mil (R1 Mil shortfall) excluding VAT
Penalty = R1 Mil x 10% = R100 000 excluding VAT

1.3 Targeted Local Building Material Suppliers CPG

When applicable, the CPG is expressed as a percentage of the "Contract Amount", i.e. the Tender Amount at the time of award excluding allowances and VAT.

CPG calculation example:
"Tender Amount" = R150 Mil all inclusive of allowances and VAT
"Contract Amount" = R130 Mil (Tender Amount at the time of award excluding allowances and VAT)
CPG to be achieved = 5% as specified in the Scope of Works (PG01.1)

CPG target value = R130 Mil x 5% = R 6,5 Mil (Value of material to be purchased from local suppliers, excluding VAT)

Calculation of penalty:
Percentage penalty applicable = 20% as specified in the Scope of Works (PG01.1)
CPG target value = R6,5 Mil excluding VAT
CPG Achieved = R5,5 Mil (R1 Mil shortfall) excluding VAT
Penalty = R1 Mil x 20% = R200 000 excluding VAT

1.4 Targeted Local Labour Skills Development CPG

When applicable, the CPG is expressed as a percentage of the total number working days required to complete the Works.

CPG calculation example:
"Tender Amount" = R150 Mil all inclusive of allowances and VAT
"Contract amount" = R130 Mil (Tender Amount at the time of award excluding allowances and VAT)
Number of working days required to complete the Works based on the construction period = 600 days
CPG percentage participation to be achieved = 30% as specified in the Scope of Works (PG01.1)
Required number of working days training to be provided = 180 days (600 x 30%)

Calculation of penalty:
Payment reduction = R 5 000 per day for not providing training as specified in the Scope of Works (PG01.1)
CPG = 600 working days x 30% = 180 working days training to be provided
CPG Achieved = 160 days (20 days shortfall where no training was provided)
Penalty = 20 days x R5 000 payment reduction per day= R100 000 excluding VAT

1.5 National Youth Service Programme (NYS) CPG

When applicable, a separate NYS Bill of Quantities will be included in the tender documentation will indicate the number of beneficiaries to be trained.

Calculation of penalty:
Payment reduction per person not trained as stipulated in the NYS Bill of Quantities = R 2 500 per person.
Total number of NYS Beneficiaries as stipulated in the NYS Bill of Quantities = 25
Total Number of NYS beneficiaries trained = 20 (shortfall of 5 beneficiaries)
Penalty = 5 x R2 500 = R12 500 Excl. VAT

1.6 Labour Intensive Works CPG

When applicable, the work to be done by way of Labour intensive methods are specified in the Bills of Quantities with a "LI".

CPG calculation example:
"Tender Amount" = R150 Mil all inclusive of allowances and VAT
"Contract Amount" = R130 Mil (Tender Amount at the time of award excluding allowances and VAT)
CPG value = R10 Mil (Total value of labour-intensive works specified in the Bills of Quantities)

Calculation of penalty:
CPG value = R10 Mil
Percentage penalty applicable = 30% as specified in the PG01.1 Scope of Work
CPG Achieved = 9 Mil (R1 Mil shortfall)
Penalty = R1 Mil x 30% = R300 000 Excl. VAT

1.7 Cidb BUILD Programme: Enterprise Development

When applicable, the Enterprise Development CPG expressed as a percentage of the "Contract amount" = Tender amount at the time of award excluding allowances and VAT. Failure to achieve the minimum Targeted Local Labour Skills Development CPG will result in a payment reduction of an amount specified in the Scope of Works (PG01.1) per working day where training was not provided.

The monetary value of training to be provided is stipulated in the CPG BoQ section. The number of beneficiaries to be trained is dependent on the "Contract Amount" as well the number of beneficiaries appointed which will generally resort under the Grade 1 and 2 cidb categories. The provisional amount will therefore be adjusted in terms of the "contract Amount", the number of beneficiaries to be trained and the actual cost for providing the training.

Part 1: Calculation of 5% CPG example:
"Tender Amount" = R150 Mil all inclusive of allowances and VAT
"Contract Amount" = R130 Mil (Tender Amount at the time of award excluding allowances and VAT)
CPG percentage participation to be achieved = 5% as specified in the Scope of Works (PG01.1)
CPG value = R6,5 Mil (Value of work to be subcontracted to emerging enterprises)

Calculation of penalty
Percentage penalty applicable = 30% as specified in the Scope of Works (PG01.1)
CPG Minimum 5% = R6,5 Mil
Achieved = R5,5 Mil (Only subcontracted work to the value of R5,5 Mil, i.e. R1 Mil shortfall)
Penalty = R1 Mil x 30% = R300 000 Excl. VAT

Part 2: Calculations in terms of training to be done:
The number of enterprises to be developed is subject to the contract amount and the apportionment of the work as per Example 1 below.
Number of enterprises to be trained = 6 x 1 GB subcontractors
Total cost for training = R 1 660 000

Calculation of penalty
Total number of enterprises to be trained = 6
Total number trained = 4 (2 Shortfall)
Training cost per beneficiary = R1 660 000 / 6 = R 276 666,67 per beneficiary
Penalty = R 276 666,67 x 2 x 30% = R166 000 Excl. VAT

B of Q Item	Description	Unit	Rate	Quantity	Amount (R)
5	**Enterprise Development**				
5.1	Enterprise Development of Targeted Enterprise or JV partners				
5.1.1	Appointment of training co-ordinator	Per Quarter	45 000	8	360 000
5.1.2	Appointment of Mentor /Training Service provider	Per Quarter	135 000	8	1 080 000
5.1.3	Needs Analysis and Enterprise Development Plan per Targeted Enterprise	No.	5 000	6	30 000
5.1.4	Monitoring and Interim reporting per targeted enterprise	Per Quarter	20 000	8	160 000
5.1.5	Project Completion report per Targeted Enterprise	No.	5 000	6	30 000
	Provisional Sum to be carried over to CPG bill of quantities				**1 660 000**
	"Contract amount" Tender amount excl. allowances and VAT.	130 000 000			
	CPG Monetary value (5%) to be subcontracted to beneficiaries for training	6 500 000			
	No of enterprises based on the CPG value	6	Grade 1 / 2 GB/CE,ETC.		
	Contract period (months)	24			

Note: Rates to be determined by PQS and adjusted to accepted quotation amounts

1.8 Cidb BUILD Programme: Skills Development (Principal contractor including subcontractors and consultants)

When applicable, the contract skills development participation goals, expressed in Rand, shall be no less than the "contract amount" multiplied by a percentage (%) factor for the applicable class of construction works.

The monetary value of training to be provided is stipulated in the CPG BoQ section. The number of beneficiaries to be trained is dependent on the "Contract Amount" as well the number of beneficiaries appointed which will generally resort under the Grade 1 and 2 cidb categories. The provisional amount will therefore be adjusted in terms of the "Contract Amount", the number of beneficiaries to be trained from which *Method* and the actual cost for providing the training.

CPG Calculation

Table 2: Contracting skills development goals for different classes of engineering and construction works contracts

Source: cidb Standard for Developing Skills through Infrastructure Contracts as published in the Government Gazette Notice No. 43495 of 3 July 2020 (Page 7)

Class of construction works as identified in terms of Regulation 25 (3) of the Construction Industry Regulations 2004		**Construction skills development goal (CSDG) (%)**
Designation	**Description**	
CE	Civil Engineering	0.25
CE and GB	Civil engineering and General Building	0.375
EE	Electrical Engineering works (buildings)	0.25
EP	Electrical Engineering works (infrastructure)	0.25
GB	General Building	0.5
ME	Mechanical Engineering works	0.25
SB	Specialist	0.25

"Contract amount" = Tender amount at the time of award excluding allowances and expenses, and VAT

Contractor CPG:
CPG calculation
"Contract amount" x factor from Table 3 above.

CPG calculation example:
"Tender Amount" = R150 Mil for GB, all inclusive of allowances and VAT
"Contract Amount" = R130 Mil (Tender Amount at the time of award excluding allowances and VAT)
Factor for GB = 0,5% (as per Table 2 above)
CPG in R value = R130 Mil x 0,5% = R650 000 i.e. total cost of training to amount to R650 000

Calculation of penalty:
Percentage penalty applicable = 30% as specified in the Scope of Works (PG01.1)
CPG value = R650 000
Achieved = R550 000 = R100 000 Shortfall
Penalty = R100 000 x 30% = R30 000 Excl. VAT

Calculations based on "Contract Amount" after bid award and after bid award and appointment of beneficiaries

Actual CPG training requirement value after award upon selecting method/s of training and appointment of beneficiaries = R676 000 (Table 4 below) and the provisional amount allowed for to be adjusted accordingly. The new monetary value of training required will then form the basis for determining penalties applicable. No penalties will be applied should the CPG value, based on the "Contract Amount" be achieved.

Table 4: Notional cost recalculation upon appointment of beneficiaries.

Source: cidb Standard for Developing Skills through Infrastructure Contracts as published in the Government Gazette Notice No. 43495 of 3 July 2020 (Page 10)

Skills Types	**Number of learners**	**Notional Cost / Learner / Quarter**	**Notional cost / learner / year**	**Total Notional Cost over 12 months Contract**
Method 2: Workplace learning opportunities, with unemployed TVET graduates	2	R23 000	R92 000	R184 000
Method 3: Candidacy for an unemployed learner with a 3-year qualification	2	R61 500	R246 000	R492 000
Total	4			R676 000

Note: the required CPG will be recalculated based on the awarded Tender amount and "Contract Amount" once the beneficiaries have been appointed and actual costs are known

Note: The notional cost of providing training opportunities will increase by CPI on an annual basis based on April CPI as published by Stats SA. The rates will be adjusted as an adjustment to the provisional amounts should the rates increase after bid award or during the construction period

FIRE DETECTION AND C02 GAS EXTINGUISHING INSTALLATIONS

NATIONAL DEPARTMENT OF PUBLIC WORKS: BLOEMFONTEIN

BLOEMFONTEIN DEEDS OFFICE REPLACEMENT OF EXISTING FIRE DETECTION AND CO2 GAS EXTINGUISHING INSTALLATIONS WITH IG 55 CLEAN AGENT, PROINERT GAS SYSTEMS AND 36 MONTH ADDITIONAL MAINTENANCE CONTRACT

BLOEMFONTEIN DEEDS OFFICE

REPLACEMENT OF EXISTING FIRE DETECTION AND CO2 GAS EXTINGUISHING INSTALLATIONS WITH IG 55 CLEAN AGENT, PRO INERT GAS SYSTEMS

PART A

SPECIFICATION FOR THE SUPPLY, DELIVERY, INSTALLATION AND COMMISSIONING OF THE SMOKE DETECTION AND EVACUATION INSTALLATIONS

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BLOEMFONTEIN DEEDS OFFICE

SPECIFICATION FOR THE SUPPLY, DELIVERY, INSTALLATION AND COMMISSIONING OF THE SMOKE DETECTION AND EVACUATION INSTALLATIONS

SECTION 1

STANDARD CONDITIONS IN RESPECT OF THE SUPPLY, DELIVERY AND INSTALLATION OF ELECTRICAL AND MECHANICAL EQUIPMENT, PLANT AND MATERIALS

1. TESTS AND FINAL DELIVERY

1.1 Tests

After completion of the Works and before first delivery is taken, a full test will be carried out on the installation for a period of sufficient duration to determine the satisfactory work thereof. During this period the whole of the Works will be inspected and the Contractor shall make good, to the satisfaction of the Representative/Agent or main Contractor, any deficiencies that may arise.

The Contractor shall provide all instruments and equipment required for testing as well as any water, power and fuel required for the commissioning and testing of installations at completion.

1.2 Final Delivery

As prescribed in the Conditions of Contract.

2 COMPLIANCE WITH REGULATIONS

(a) The installation shall be erected and tested in accordance with the following Acts and regulations.

(i) the latest issue of SABS 0142: "Code of Practice for the Wiring of Premises",

(ii) the Occupational Health and Safety Act, 1993 (Act 85 of 1993) as amended,

(iii) The Local Government Ordinance 1939 (Ordinance 17 of 1939) as amended and the municipal by-laws and any special requirements of the local supply authority,

(iv) the Fire Brigade services Act 1993 Act 99 of 1987 as amended,

(v) The National Building Regulations SANS 10400 and Building Standards Act 1977 (Act 103 of 1977) as amended,

(vi) The Post Office Act 1958 (Act 44 of 1958) as amended,

(vii) The Electricity Act 1984 (Act 41 of 1984) and

(viii) the Regulations of the local Gas Board where applicable

(ix) SANS 10400: The National Building Regulations and Building Standards

(x) Fire Detection Installations :SANS 10139 and BS 5839 Part 1

(xi) Fire evacuation and loud speaker systems : BS5839 part 8 and the newer European Standard EN54-24.

BLOEMFONTEIN DEEDS OFFICE

SPECIFICATION FOR THE SUPPLY, DELIVERY, INSTALLATION AND COMMISSIONING OF THE SMOKE DETECTION AND EVACUATION INSTALLATIONS

SECTION 2

SMOKE DETECTION AND EVACUATION INSTALLATIONS

1 **GENERAL AND SCOPE OF WORK**

1.1 This part of the specification describes the specific requirements for this installation. Where the requirements of the Detail Specification are in conflict with the requirements of the Detailed Specification the requirements of the Detailed Specification must be adhered to.

1.2 The smoke detection and evacuation installations shall be carried out by a specialist contractor who is entirely familiar with this type of work and has a previous track record in this field on recent projects of a similar size and complexity. He shall have drawing office facilities and shall be able to produce detailed drawings and schematics of the configured proposed installations

1.3 The installation shall comply with the following standards and methods:

1.4 The Occupational Health and Safety Act (Act No 85 of 1993) as amended.

1.5 The Code of Practice for the Wiring of Premises SABS 0142.

1.6 The by-laws and regulations of the Local Municipal Authority.

1.7 The local fire regulations.

1.8 The Department of Public Works Standard Specifications for Security Equipment F.P.O 9E Revised : September 1995; Fire Security Automatic Fire Alarm Installation: FPOSE: June 1994.

1.9 SABS 0400 –The Application of the National Building Regulations.

1.10 the Occupational Health and Safety Act, 1993 (Act 85 of 1993) as amended

1.11 Local Government Ordinances and the municipal by-laws and any special requirements of the local supply authority, the Fire Brigade services Act and the Pretoria Fire Department requirements

1.12 The National Building Regulations and Building Standards

1.13 SANS 10139 and BS 5839 Part 1

1.14 Fire rated cable PH 30 to BS 5839

1.15 Fire evacuation and loud speaker systems : BS5839 part 8 and the newer European Standard EN54-24.

1.16 Fire rated evacuation system cables to BS 6387 fire performance standards. This cable is highly fire resistant and tested to maintain 3 hours of electrical integrity during a fire.

2 EXTENT OF WORK

2.1 A complete new intelligent fire detection, break glass and evacuation installation shall be provided as Specified and shown on the drawings for the existing Deeds Building. A new front end shall be installed in the existing main security room consisting of a new digital 4 loop main fire panel fitted with network card and linked via looped network to 10 off gas zone standalone double knock fire detection and gas control panels. The system shall be interfaced with the existing building voice evacuation panel for manual evacuation by the operator. The system shall be interfaced to a "Maestro" type PC and display and is to be supplied with windows based software to enable mapping , mimic panels, programming and monitoring of the fire system , gas zone status , fire and control panels, alarm and fault monitoring systems and evacuation systems. The system shall include a digital data storage system capable of monitoring up to 90 days of operation and shall be linked to a remote BMS system with printer. The graphic interface shall incorporate display mimics and 3D layout drawings of the building and fire systems which shall be configured, programmed, tested and commissioned and handed over in a fully operational condition.

2.2 The existing fire detection installations shall be dismantled and removed altogether and new systems installed. The removal shall be phased in conjunction with the progress of the new installations so that all parts of the building shall be monitored for fire at all times through either the new or old system or both. Where existing wire ways are suitable for reuse they may be used otherwise new wireways to be provided with all systems being fully conduited with steel conduits and metal clad kopex.

2.3 The new fire detection system shall be network interfaced with the stand alone gas fire panels and control systems for monitoring, alarm and evacuation purposes. The double knock fire detection systems in the gas protected areas shall operate independently of the main building fire systems and shall be dedicated to the automatic operation of the gas systems through a local three zone fire panel. The local gas area fire panels shall in turn be monitored by and interfaced with the building fire detection system and automatic and manual voice evacuation systems (delayed fire bell muting only)

2.4 All mains power supplies to all fire equipment shall be run under this contract from the nearest clean power (DA set backed) circuits . All work shall comply to SANS 10142. All network and fire cabling shall be run in fire rated PH30 wiring and CAT6 fire resistant UTP in conduit and trunking

2.5 Building work associated with the installations shall be carried out under this contact by employed specialist builders

2.6 Free maintenance and guarantee of the installations for 12 months after first delivery including the quarterly testing and cleaning of the fire detectors

2.7 Additional 36 months maintenance and guarantee for the entire system including quarterly testing and cleaning of the fire detectors

3 SPECIFICATION AND DETAILS OF INSTALLATION

3.1 All detectors and fire system components shall be metal conduited to trunking and shall terminate in plasticised metal clad copex connectors. Trunking, wireways and termination boxes shall be installed by the fire contractor to his requirements as indicated on shop drawings to be approved. To this end the fire contractor shall prepare suitable dimensioned drawings showing the complete layout of the fire detection and evacuation systems and the wire way requirements. Existing built in wire ways and conduits shall be used where these are available and suitable, otherwise new galvanised conduit installation shall be used: all conduits and wire ways shall be chased into walls and made good where possible ; alternatively surface installations shall be allowed in plant rooms and storage areas provided these are neatly installed with all conduit runs running true and perpendicular to the structure at all times

3.2 The existing security control room at the main entrance shall house the "front end" of the fire detection and evacuation systems. All equipment shall be wall or rack mounted in this room (which shall also house the gas system central monitoring status and fire panels) and the existing building voice evacuation system which is to be retained and interfaced with the new fire detection and gas extinguishing systems. The existing building voice evacuation system needs to be modified and interfaced with the new fire systems allowing the operator to address the fire and gas zones while muting the zone fire detection sounders – after a delay

3.3 The new building smoke detection system shall be an IP based digital addressable intelligent system to SANS 10139 and BS 5839 Part 1 divided into separate designated fire zones for each floor and for each gas protected area (interfaced with the separate independent fire panels controlling the gas discharge in the 7 off new gas zones and 4 off existing SARS gas zones for monitoring and evacuation purposes) all network linked to a fully addressable intelligent master fire panel (linked to a "Maestro" type graphic display and monitoring PC). The Graphics alarm display computer shall show the status of all panels in the network, and allow control functions to be remotely operated.

3.4 The new master panel shall provide the fire detection functions of the non gassed areas and shall monitor the gas protected areas, to this end it shall be interfaced with each of the 7 new and 4 existing SARS gas control systems and their dedicated two zone, double knock, digital fire detection panels and gas control systems. Zoning shall be displayed on the "maestro" mimic and shall assist with the location of a fire in the

building and interfaced with the separate voice evacuation systems (which shall also be monitored on the "Maestro" display PC). The fire systems and the digital fire panels shall be interlinked on a dedicated LAN which shall also interface the digital gas lock out units and respective local double knock fire systems.

3.5 The Main fire panel shall be Bacnet compatible and shall be interfaced with the existing BMS system (existing) to provide HVAC and lift system fire shut down and alarm recording and data/event storage functions. The fire system is also to be interfaced with the automatic sprinkler installation and its control valve and flow switches. Fire relays shall also be provided for interface with field plant which is not digitally interfaced on the network through the system. All the above are to be programmed and displayed on the "Maestro 27"" digital LCD screen which shall mimic the entire building and all the gas and fire systems installed.

3.6 The design is for A BS5839-1 Classification L2 System for the offices and general circulation areas which includes automatic fire detection on all escape routes and rooms leading onto escape routes. The L2 system also includes additional areas deemed as a high risk not included in the escape routes and adjoining rooms, such as plant rooms and stores

3.7 The gas protected archive areas shall be designated P1 classification with independent double knock fire detection panels for each gas zone.

3.8 The fire system sounders in the building should be according to the description in the BS5839 Category L2 description as above and P1 in the gas protected archive areas: the fire detection sounders shall be interfaced with the voice evacuation system (for muting) in each gas zone and for the building fire zones on a floor by floor basis ; in the gas protected areas the fire bell shall be interfaced with the voice evacuation system but the gas discharge sirens shall not .

3.9 The existing building fire detection systems are to be disconnected and removed on a zone by zone basis in parallel with the new fire detection and gas installations, programmed so that the building remains protected at all times as it is a working building with valuable documents stored in the archives which are to be fire protected at all times. All existing systems are to be isolated in zones and removed and not reused for the new installations; suitable wire ways may be reused with the approval of the engineer.

3.10 All front end equipment shall be mounted in the main control room with due cognizance of the room and control panel layout and associated ergonomics; the fire panel shall be wall mounted and shall be interfaced with a desk mounted " maestro" type fire mimic and pc programming unit. The fire panel shall include standby battery and emergency power supplies to enable it to continue operating and to provide evacuation alarms and sounders after a 24 hour power failure. The system shall include a 90 day events register which shall record and store all functions and events taking place on the fire panel. The fire system shall also be interfaced with the BMS computer through the bacNet link to interface with other services and to enable programmable software interface and print outs of the recorded fire events

3.11 The existing voice evacuation system shall checked and tested and repaired if necessary. The system is manually controlled from the security room but shall be interfaced with the fire detection primary sounder systems used for the automatic raising of fire alarms in the building. The voice-based system to enable the responsible personnel in the control room with the ability to conduct orderly evacuation and notify building occupants of changing event circumstances on a fire zoned basis; to this end the evacuation system shall be interfaced with the fire panel enabling the system to automatically silence (after an initial delay) the fire sounders and address each fire/evac zone in the building (or any combination of zones) through the voice evacuation speaker system.

3.12 The new fire alarm and annunciation system equipment, sounders, loudspeakers and components shall conform with and shall be designed BS5839 part 8 and the newer European Standard EN54-24.

3.13 Modes of operation are: Automatic fire operation – sounders and alarms activated by the FCP; manual voice communications into each area muting the respective fire annunciation alarms for speech interference.

3.14 Fire alarms and voice evacuation systems shall be different from other operating signals and always at a higher loudness level than the general disturbance sound pressure level by 10 dB (A) with a minimum SPL of 65dB (A) to be achieved in all areas. Any fire signal message has to be in accordance to the standardized emergency signal DIN 33404-3 – Fire annunciation: short, clear, understandable

3.15 The new fire detection and evacuation systems front end shall be installed in the control room and made operational; field work shall be installed on a zone by zone basis and in conjunction with the Gas Installations as sections of the building are handed over for renovation. At any time, therefore the existing and new fire and evac. systems could be working simultaneously in different area of the building . The fire contractor shall test and commission the fire detection and evacuation installations and shall programme the system software and "maestro"display interface accordingly. He shall also be responsible for obtaining, programming and loading all data required to activate the interface systems and the bacnet interface with the BMS and the HVAC shut down and control and the lift systems. Non programmable plant shall be shut down from local fire relays driven by the fire system. Once the system has been activated on a zone by zone basis a complete systems testing and commissioning program shall be carried out for the entire building and all the system components displayed and tested

3.16 Specialist training shall be provided to the operating staff by the Fire Contractor. To this end a series of 2 x 2 hour lectures shall be given and the operators provided with prepared notes, diagrams and manuals.

3.17 The entire installation shall be guaranteed and maintained by the Fire Contractor for 12 months after first acceptance of the system – in accordance with the contract conditions. In addition a further 36 months follow on guarantee and maintenance service shall be priced for the new fire installations- managed and activated through a central, recorded callout centre system

4 **NOTICES**

The contractor shall issue all notices and make the necessary arrangements with Supply Authorities, the Postmaster General, SA Transport Services, Provincial or National Road Authorities and other Authorities as may be required with respect to the installation. The contractor will be held responsible for damage to any existing services brought to his attention by the relevant authorities and will be responsible for the cost of the repairs.

5 **TENDER PRICE**

Tenderers shall complete the information schedule and the price schedule included. Failure to do so will mean that the tender price is taken to be firm in all respects. Tenderer's may quote for the standard equipment complying as closely as possible with this specification, but any deviation from the specification must be fully detailed in a paragraph by paragraph schedule, with reference to the paragraph numbers of this document.

6 **SHOP DRAWINGS AND ORDERING OF MATERIALS**

The contractor shall visit the site and take measurements and prepare comprehensive shop drawings of the proposed systems and installations for approval; he shall order all items of equipment in good time to ensure the timeous completion of the contract. Equipment shall be ordered after approval of the equipment details and associated shop drawings. Shop drawings shall be prepared for each installation and details of all proposed equipment shall be included therein. As built drawings shall be produced and included the operating manuals for each system.

7 **CONTRACT WORK**

Tenderers are required to visit the site and acquaint themselves fully with the working conditions on site (NB the building is fully operational and shall remain so during the course of the contract) access hours to the site, size and location of the site, availability of labour and labour conditions, transport, loading and off-loading, storage and security of stored materials workshop area, scaffolding, cranes and tackles and all tools required for the erection of the installation since the client will not entertain any subsequent claims in respect of lack of knowledge of conditions or any matter arising as a result of non-compliance with these instructions.

The works shall be programmed in conjunction with the user who shall agree and approve the works programme and the disruption of services to an area

At the time of tendering, a date will be determined for all prospective tenderers to visit the site. Representatives of the engineer will be present on that day to answer questions.

8 INFORMATION

The tenderer's attention is drawn to the fact that if the information schedules attached to this specification are not completed or if he fails to submit any other information called for with his tender, his tender may be disqualified. All information shall be submitted in duplicate.

9 MAKING GOOD, BUILDING WORK AND ACCESS

The successful tenderer will be responsible for all the building work associated with the installations and shall employ professional trades men to carry out the necessary works. The high security nature of the building requires that all areas remain secure and that access is always controlled.

Contractor to make good any damage or disturbance to the building fabric, finished surfaces, concrete surfaces, paved surfaces, ceilings, doors and door fittings and other surfaces which he or his employees may have damaged or modified in the course of the construction of the system.

In areas where there are ceilings the ceiling tiles shall be removed and stored in a clean and dry environment and finally replaced "as new" after the installations have been complete. Ceiling tiles shall be cut and penetrated to receive new installations and shall always include mounting bases, escutcheons and trims to present a complete and neat finish

The contractor will be responsible for keeping the site tidy during the course of the construction, and shall remove from the site all redundant materials, rubble and litter resulting from the construction work on a daily basis as this is a working occupied public building

10 REDUNDANT MATERIALS AND EQUIPMENT

All redundant materials shall be removed from the site and disposed of except where the Client requires that it be delivered to the client's stores, in consultation with the client's representative. Nothing to be removed from the site without prior written permission

11 FIRE DETECTION SYSTEM SPECIFICATION

11.1 The building fire detection system shall be a digital IP based addressable microprocessor based intelligent fire detection system with a 4 loop Fire Control Panel supporting up to 126 devices per loop and connected to all zoned field devices, including fire detection, audio evacuation control / interface devices, and break glass units located throughout the protected building area as indicated on the drawings. It shall be network interfaced (peer to peer) with similar digital, three zone dedicated fire detection system in each of the 7 gas protected areas and to the 4 SARS gas protected areas to provide status and alarm reporting. The fire panes shall be EN54 parts 2 &4 approved. The main fire panel shall have both local and remote, programmable input / output capability for monitoring

and display of all fire and gas system conditions and status with powerful and highly configurable software which enables it to interface with remote indicator panels (maestro display) mimic panels, local and remote inputs and outputs for interfacing to third-party equipment, and interfaces to computer-based monitoring and building management systems. Programmable software to enable soft interface with evacuation, alarms, fire brigade, extinguishing system control, and other fire monitoring functions. catered for.

11.2 The fire control panel shall be configured to suit the protected building fire and gas zones ; it shall be networked with the gas fire panels on a peer to peer system configured on a fault tolerant loop format. The system shall interfaced with the voice evacuation system on a fire zone basis providing for early detection, location and evacuation functions. The evacuation system shall be programmed on a similar basis enabling both automatic sounder and voice over evacuation functions into each fire/gas zone and the entire building as programmed. Manual override from the control room shall mute the automatic evacuation (after a delay) and enable the Control room to address each area independently; the fire panel shall also be BACnet compatible and shall be soft interfaced with the building BMS and access control systems. Hard wired relays shall be provided at all HVAC plants and lifts for fire shut down purposes. In put pf c/o contacts to be provided at all monitored fire input points (eg sprinkler fire pumps and flow switches)

11.3 Fire and fault alarms shall be programmed for systems and displayed on the fire panel which shall have sufficient (internal and external) battery power to operate for at least 24h under a power failure condition and at the end of the period support a complete detection and evacuation event . All fault and alarms shall be retained in memory for at least 90 days and shall be retrievable on a chronological basis. The system shall be supplied with a remote event printer for selected print outs .

The fire panel in shall be fitted with a GSM (sim based system) or other radio/wireless device to communicate with the local city fire control room panel which shall monitor and receive fire and fault signals from the Centre. All necessary transmission and receiving equipment shall be supplied and installed in the control room and at the fire station as required and all licences shall be paid for the contract period. The system shall be regularly tested

11.4 The Master Fire Control Panel (MFCP) shall be EN 54 parts 2 & 4 approved. It shall be an analogue addressable 4 loop IP (digital) , intelligent fire panel complete with 24h of battery back-up capacity ; supplied with programmable windows based software through a PC and linked to a "maestro" type display LCD. It shall be networked on a peer to peer interface to the remote gas fire control panels in the building for information and monitoring purposes. It shall support at least 700 programmable addresses and 128 zones.

Matching, independent 3 zone fire and extinguishant control panels shall be supplied and installed for the 7 new gas zones. The panels shall be EBN 54 parts 2&4 approved. The panels shall be complete with power supplies to cover 24 h outages and shall provide a double knock function interface with the gas control panels; the panels shall be digitally networkable and shall be interfaced with the main MFCP

The MFCP's shall incorporate the latest approved electronic development which shall be compatible to the gas control and fire detection systems which shall be networked on a true peer to peer basis using a redundant looped network installed for this purpose

The system shall also be BACnet compatible and shall be soft interfaced with the building BMS system and with the HVAC systems which need to be shut down in the event of a fire and to contain the gas protected zones.

The fire installation shall provide fire relays with c/o contacts (220V AC and 48v DC) potential free, at the HVAC ,lift and security installations where fire interfaces are required for shut down purposes.

The system shall be designed to operate in a user-friendly manner, basic fire alarms functions shall be completely self-explanatory, and shall be understood by a person with minimal training. The "maestro" display shall incorporate all the graphics required to programme, monitor and operate the system

The occurrence of fire alarms shall initiate all early warning functions, annunciation and evacuation procedures; the system shall function and indicate all relevant text and zone information without operator intervention.

The operation of a fire of fault signal, or keyboard operation carried out by an operator, shall not inhibit or delay in any way the receipt of additional alarms.

The main fire panel shall incorporate a GSM or Remrad system which shall communicate directly with the Fire Brigade; the contract shall include for making all arrangements with the fire department and providing any equipment which they may require to process the signal there

11.5 The fire panels in all the buildings shall be designed to operate a 3 security levels, as follows:

Level 1:	No access code	-	Operator
Level 2:	Access code	-	Maintenance
Level 3:	Access code	-	Commissioning

They shall be capable of providing adequate power for the detector and alarm circuit, receiving and transmitting "FIRE" and "FAULT" conditions and the self-monitoring against equipment failures. To this end

they shall have a front panel comprising of indicating L.E.D.'s control keyboard, and plasma text display. The occurrence of an event must instantly display the detail in text upon the screen.

The following visual alarms and indications are required as a standard feature:

a)	MAINS ON	-	lamp
b)	SYSTEMS ON	-	lamp
c)	SYSTEM OFF	-	lamp
d)	FIRE	-	lamp (general warning lamp)
e)	FAULT	-	lamp (general warning lamp)
f)	BATTERY FAULT	-	lamp
g)	FIRE ZONE	-	lamp (1 off for every fire zone)
h)	FAULT CIRCUIT	-	lamp (1 off for each device circuit)

11.3.4 Analogue addressable rate of rise eat and optical smoke detectors shall be used as shown on the drawings. Each detector base shall be totally sealed and wiring shall be glanded in and out in copex so that it is not possible for moisture / water to enter the detector base. In ceiling detectors shall be fitted with remote LEDs for identification purposes.

11.3.5 The system shall be arranged in zones with at least 4 looped circuits which shall be monitored against open circuit, short circuit and earth faults. Each circuit will also monitor detector removal, break glass unit, audible alarm, earth fault. Loop isolators shall be provided and monitored.

11.3.6 All device cabling shall be carried out in screened Fire rated cable PH 30 to BS 5839 (in metal wire ways and conduits); fire alarm sounders and speaker and evac cabling shall be fire rated evacuation system cables to BS 6387 with 3 hr fire sustainability; the network shall be run in CAT 6 structured cabling ; the network shall be UTP cat 6 fire resistant cables to en 50173 (halogen fee, non toxic low smoke).

All mains power supplies for the fire systems are to be provided under this contract to SANS 10142

11.3.7 The Fire Panels shall incorporate integral and remote batteries as required to provide for a 24h service disruption. These shall be monitored for fault and low power conditions

11.3.8 Fire relays shall shut down zone ventilation systems on activation. Potential free contracts rated for switching 220V, 5A shall be provided.

11.3.9 The entire installation shall be tested and commissioned with each device being tested and the appropriate printer confirmation obtained.

As built drawings and operating manuals shall be produced for the installation.

The user client staff shall be trained in the operation of the system so that they can safely operate and reset all normal operating functions.

11.3.10 During the free maintenance and guarantee period A 24 hour reaction time service shall be provided for system faults. Call outs shall be cleared and closed on a 24 h basis .
Monthly maintenance visits shall be carried out and all faults repaired and isolated zones returned into operation. At least 25% of devices shall be serviced, cleaned and tested each month on a rotation basis so that all devices are tested every quarter Printout of all tests shall be kept in the plant log book (to be supplied on completion)

10.3.11 The contractor shall therefore test and clean all devices over a 4 month period and provide documentation to show that the detectors have been cleaned and operated.

Monthly tests of the power supplies, transformers and batteries to be done proving the operation of all systems for 24 h without mains power.

All equipment, power supplies and field communication and signal cabling shall be single point earthed at the UPS and shall be suitably protected from electrical spikes and lightning through proprietary CSIR and SABS approved installations to DPW requirements

Drawings

Refer to drawings ME30487/FD/M1/001 TO 003 and ME30487/IG/M2/001 to 002

INERT GAS INSTALLATIONS

BLOEMFONTEIN DEEDS OFFICE

REPLACEMENT OF EXISTING FIRE DETECTION AND CO2 GAS EXTINGUISHING INSTALLATIONS WITH IG 55 CLEAN AGENT, PRO INERT GAS SYSTEMS

SPECIFICATION FOR THE SUPPLY, DELIVERY, INSTALLATION AND COMMISSIONING OF THE IG 55 PROINERT GAS EXTINGUISHING INSTALLATIONS

PART B: DETAILED SPECIFICATION

PROINERT GAS FLOODING FIRE EXTINGUISHING INSTALLATIONS

1. GENERAL SPECIFICATION

A specialist Fire Subcontractor shall be employed to carry out this work who has at least 10 years experience in this field and is a trained registered installer for the gas system supplied. He shall have been certified as a gas system designer for the proposed systems and shall be entirely familiar with the proprietary software required for the calculation of the piping and gas distribution systems for the IG 55 gas installation specified. The Fire Contractor shall allow for complete design co-ordination, supply, delivery, installation, testing, commissioning and handing over, in working order, of the specified installations in and around the building in such a way that the contract forms a complete working system without any further material, apparatus or labour being required to make it so. All work, labour, material and apparatus required for the completion of this sub-contract, shall be allowed for, and shall form part of this sub-contract (including any necessary building work)
To the effect this contract the Fire Contractor is to coordinate closely with the smoke detection and gas system specialists (under this contact) . The gas control systems and their double knock fire detection panels shall stand alone but shall be compatible with and network interfaced with the main building fire control panel and the "maestro" type display and mimic panels through a networked digital communication protocol so that all the systems are able to communicate digitally with one another and all interactions can be software driven and programmed. Local gas systems and their dedicated double knock fire detection panels shall be entirely stand alone systems with their own power supply and hard wired connections to all plant shut down and gas release systems so that they are entirely autonomous and independent in their operation.

All communication, power and control wiring for the fire systems installed shall be fire rated and screened and conduited in metal conduits and trunking systems

The publications listed below form part of this specification. Each publication will be the latest revision and addendum in effect on the date this specification is issued for construction unless noted otherwise. Except as modified by the requirements specified herein or the details of the drawings, work included in this specification shall conform to the applicable provisions of these publications.

- The by-laws and regulations of the local authority for the particular area in which the site falls.
- SABS 0400: National Building Regulations - 1990 as amended.
- SABS 0139: Fire Detection and Alarm Systems for Buildings - System Design, Installation and Servicing
- BS 5839 - Standard for design and installation of fire detection systems
- NFPA N0 72: National Fire Alarm Code.
- NFPA N0 2001: Clean Agent Fire Extinguishing System
- This supplementary specification is to be read as forming part of the Department of Public Works Standard Specification for Inert Gas Extinguishing Installations.

- All equipment and installations shall comply with the requirements of the Occupational Health and Safety Act nr. 85 of 1993.
- The Department of Public Works "Standard Specification for the Electrical Installation and Electrical Equipment Pertaining to Mechanical Services", Issue IXa December 1999 shall also apply to this contract.

- Where reference is made in this specification and any drawings and documents mentioned therein to the Factories, Machinery and Building Work Act of 1941 and the Machinery and Occupational Safety Act No 6 of 1983, this will be deemed to be replaced by the Occupational Health and Safety Act No 85 of 1993.
- Where conditions are at variance this supplementary specification shall have preference over both the Standard Specifications and the drawings.
- Copies of the Standard Specifications are obtainable from the Director-General: Public Works, Private Bag x 65, Pretoria, 0001.
- SABS 0139: Fire Detection and Alarm Systems for Buildings - System Design, Installation and Servicing
- BS 5839 - Standard for design and installation of fire detection systems
- FPO 4E (STS9) PWD standard specification

Tenderers are required to acquaint themselves with all conditions relating to the contract. The successful tenderer shall be deemed to have satisfied himself as to the nature and extent of the works and no claim for extra expense or for extension of time under this contract will be allowed on the grounds of insufficient information given in the tender documents. All work will be carried out in a working environment to a program agreed by the Client who will accordingly hand over areas, in phases, to the contractor for the implementation of the works

The existing HP CO2 gas installations and their fire detection systems are to be isolated and removed together with their piping and control systems in order to make room for the new IG 55 installations. This is to be done on a gas zone by zone basis –as the Client hands over areas for renovation. The new installations shall also be completed and commissioned on a gas zone by zone basis so that each gas zone is fire protected and returned to the Client for his use.

All document storage and archive areas to be fully protected at all times.

The installation is to be complete in every respect, that is, all piping, fittings, sleeves, hangers, valves, alarm apparatus, gauges, etc., are to be supplied and fixed complete, colour coded and painted as specified hereunder

The Gas zone fire alarms and gas control panels are to be digitally interfaced interface with the main building fire alarm panel (MFCP) and to the "maestro" type monitoring and operating system system (front end located in the central control room). Supervised loop systems are to be utilized and all cables traversing in and out of the protected areas are to be fire rated and screened. Each gas area will work on a complete standalone basis (including the power to the HVAC relay shut downs and the local fire bell and siren annunciation and evac systems and shall have its own power supply to ensure that full protection is possible even after a 24h power shutdown

IG 55 PROINERT GAS FLOODING FIRE EXTINGUISHING SYSTEMS

2. SCOPE OF WORK

The scope of work to be carried out under this sub-contract shall consist of the design co ordination, supply of materials, manufacture, delivery, installation, commissioning, handing over and maintenance of the 7 off, new, independent Proinert room gas flooding systems (4 in the separate basement level document archives, 2 in the two ground floor level document archives,

and 1 in the in first floor server room) the 7 off independent, dedicated three zone, double knock fire detection systems for the automatic control and activation of the gas installations in each area ; the 7 off lock-out and 20 off status units for the manual and automatic operation of the gas systems in each area ; the mains power supplies for the gas and detection systems, their associated alarms and fire and sprung relief damper systems, the associated AC plant fire shut down relays - to this end the fire protection installation shall automatically shut down ventilation systems, activate the HVAC motorized fire dampers and their local control panels (which shall be powered and controlled from the respective gas control unit battery through the fire panel- interface) ; gas zone digital IP fire and gas control panels shall be interfaced with the buildings MFCP main fire detection and control panel for alarm and monitoring purposes.

The isolation dismantling and removal of the existing HP CO2 gas systems, their piping, controls and wiring and the making good and sealing of the building structure where the piping and wiring are removed. Mortar and plaster to be used to seal all openings wherever possible. Where openings have to be left these to be sealed with intumescent sealers/soft plaster/proprietary sealing bags

The sealing and leak testing of each gas zone: each gas area shall be pressurised with a specialised fan pressure and volume monitoring system and the leakage measured and confirmed by a recognized agency. All openings in the building fabric shall be sealed and fire stopped under this contract to achieve the integrity levels required by NFPA and not more than 10 ac/h at 50Pa for any area, in order to hold the room at a 11 % oxygen concentration (min) for the designated 10 minute extinguishing period for Class A surface paper fires, after a discharge. The residual oxygen concentration to be measured and tested at commissioning stage in the gas zone designated by the engineer

In addition to the "maestro" type mimic display a static hard wired (not network dependant) monitoring mimic panel in the Ground floor security room shall display the status of the individual gas zones, their lockout panels settings and the fire condition in the respective gas zone. An A0 size engraved aluminium faced panel with LEDs shall be provided

3. TECHICAL SPECIFICATION

The system shall be designed to provide a Proinert minimum design concentration of 46% by volume (or as recommended by the gas supplier) achieving a 11% oxygen concentration, for extinguishing Class A surface paper archive room hazards and in any electronic areas and/or protected spaces, at 1400m asl and 30 °C. Gas design concentraction shall not exceed 50% for normally occupied spaces, adjusted for maximum space temperature anticipated, with provisions for room evacuation before agent release. The 300bar gas bottles shall be supplied with individual constant flow valve assemblies working at constant low pressure (schedule 40 piping to be used). Discharge times shall be less than 60 s for 95% of the gas. Oxygen residual levels shall not exceed 11% and shall be held there for a period of not less than 10 minutes. (room air leakage tests to be done on commissioning)
The systems shall be complete in all ways. They shall include all mechanical and electrical installation, all detection and control equipment, 300 bar agent storage containers with safety relief valve, racks and clamps for the bottle banks (also cage and weatherproof enclosure for the three external bottle banks) , agent constant discharge valves at each bottle, bottle secondary pressure gauges and primary master gauge with contacts for remote monitoring, a supervised UVO (universal valve operator) for each bank of bottles with all actuation hose connectors between bottles, and all associated proprietary HP pipes and fittings between the bottle banks and the discharge manifold. The manifolds and branch fittings shall be prefabricated for the appropriate number of bottles and made of 304 SS at the appropriate pressure rating (6000psi /413 bar). Each bank to be controlled electrically and pneumatically form the respective zone gas control panel through battery power with 24 h standby capacity. Similarly all audible and visual alarm devices, auxiliary devices and controls, shutdowns, alarm interface, caution/ advisory signs etc shall be independently powered through the battery system. At commissioning comprehensive battery powered testing to be carried out after a 24 h power outage including a full bottle discharge test into each area. User to be issued with

manuals and be fully trained on the operation of the systems and all other operations necessary for operating a functional, approved, Proinert clean agent Suppression Systems to NFPA standards.
The entire system shall be guaranteed and maintained for 12 months. Quarterly maintenance visits shall be allowed and the systems checked for gas pressure and operation. (Additional 36 month maintenance and guarantee to be priced).
The Fire Contractor shall be responsible for sealing and securing the protected spaces against agent loss and/or leakage during the 10-minute "hold" period. Full room integrity tests for each area shall be conducted by a professional testing practise and shall be provided with the commissioning documentation before the gas installations can be accepted. A maximum leakage rate of 10ach/h @ 50Pa shall be allowed.
The system(s) shall be actuated by photoelectric detectors installed for maximum area coverage of 26m² per detector. In the basement archives there are no ceilings so there will only be a single zone room discharge system while in the two ground floor areas there are suspended ceilings which will require separate gas discharge nozzles for ceilings and separate ceiling detectors with extended indicators .
The distribution system and gas piping into each area will be sized using the proprietary software issued by the gas and system manufacturer and shall be programmed and signed by a certified and registered operator trained in its use.

Detectors shall be Cross-Zoned detection requiring two detectors to be in alarm before release

Automatic operation of each protected area shall be as follows:

1 Actuation of 1st detector, within the system, shall:
1.1. Illuminate the "FIRE ALARM" lamp on the control panel face
1.2. Energise the zone fire bells and visual alarm indicator.
1.3. Transfer auxiliary contacts such as: i) Operate door holder/closures on access doors, ii) Transmit a signal to the building fire alarm system iii) Shutdown first stage HVAC equipment (if any)

2. Actuation of 2nd detector, within the system, shall:
2.1. Illuminate the "PRE-DISCHARGE" lamp on the control panel face
2.2. Energize pre-discharge evacuation sirens and strobe device
2.3. Shut down the HVAC system and drive closed all dampers.
2.4. Start evacuation time delay sequence (not to exceed 30 seconds)

3. After completion of the time-delay sequence, the Proinert system shall discharge and the following shall occur:
3.1. Sprung relief dampers shall be automatically opened by the overpressure
3.2. Energize gas discharged sirens and strobe device and door signage "GAS DISCHARGED DO NOT ENTER"
3.3. Illuminate a "Gas Discharged" lamp on the control panel face
3.4. Shut down of all power to any high-voltage equipment in the area
3.5. Energise visual indicator(s) outside the hazard in which the discharge occurred
3.6. Gas discharged siren shall continue to sound until the system is manually reset

The system shall be capable of being actuated by manual discharge break glass devices located at each lock out/ STATUS PANEL, in which case the discharge sequence will resume form step 2 above.

4. MATERIALS AND EQUIPMENT

The Proinert (IG 55) System materials and equipment shall be standard products of a recognized proprietary supplier (similar or equal to FIKE) which shall be UL & ULC listed, FM approved and the supplier's latest design in 300 bar 80 l cylinders.

1. Each modular system shall operate independently, have its own supply of clean agent. Systems shall be designed in accordance with the manufacturers specifications and guide lines for the specific risk
2. The clean agent shall be stored in suitable approved Bottled Storage Containers. Containers shall be super-pressurized with dry nitrogen to an operating pressure of 300 bar at 20 °C. 32.2kg of agent shall be provided per 80l bottle (approximately 145.6kg gross weight). Each bottle to be weighed on site at first delivery tests. Containers shall be of high-strength low alloy steel construction and conform to NFPA 2001.
3. Containers shall be actuated by a supervised resettable UVO electric actuator with manual release located at the master container and connected to its bank of cylinders release valves with pressure actuation hoses . Non-resettable or explosive devices shall not be permitted.
4. Each gas container shall have a pressure gauge which shall indicate that it is charged. The bottle pressure gauge shall be color coded to provide an easy, visual indication of container pressure. The master cylinder shall have a gauge with contacts for automatic supervision and alarm on the mimic and "mestro":this shall be monitored on the Gas control panel for the respective areas and on the central gas monitoring panel in the control room allowing electrical and visual (through a display) supervision of the container contents.
5. Each container shall have a pressure relief provision that automatically before the internal pressure exceeds the safety rating of the containers.
6. Engineered discharge nozzles shall be provided within the manufacturer's guidelines to distribute the agent throughout the protected spaces. The nozzles shall be designed to provide proper agent quantity and distribution in the designated discharge period.
7. Nozzles shall be available in 10 mm through 50 mm pipe sizes: Each size shall be available in I80 and 360 deg. distribution patterns. Chromed Ceiling escutcheon plates can be used with the nozzles to conceal pipe entry holes through ceiling tiles. Pipe systems art each nozzle shall be fully anchored and secured to the structure
8. Distribution piping, and fittings, shall be installed: in accordance with the manufacturer's requirements, NFPA 2001 and, approved piping standards and guidelines. All distribution piping shall be installed by qualified individuals and welders/fitters (holding certificates qualified to SABS for this class of piping) using accepted practices and quality procedures. All piping shall be capped and delivered with caps- any uncapped piping will be condemned and will have to be taken down and cleaned and capped before it can be reused.. A welding plan is to be provided for approval before the piping installation commences . All piping shall be adequately supported and anchored at all directional changes and nozzle locations to the Engineers requirements and approval.
9. Piping and cabling penetrations through the structure shall be chiselled or wet cored (to prevent any dust build up) by a professional coring contractor under this contract ; once the piping is installed openings shall be sealed and fire stopped. All coring and penetrations through structural elements shall be approved by the engineer, in writing, before they are carried out
10. All piping shall be reamed, blown clear and swabbed with suitable solvents to remove burrs, mill varnish and cutting oils before assembly. Pipes shall be blown out with compressed air or nitrogen before they are fitted with nozzles.
11. All pipe threads shall be sealed with Teflon tape pipe sealant applied to the male thread only.
12. Excess gas shall be relieved outside the area by suitably drilled nozzles fitted to the system piping.
13. Sprung relief dampers shall be provided for each gas zone and shall be calculated to maintain the pressure build up to a maximum of 50 Pa during a discharge sequence

5. GAS CONTROL PANEL AND DETECTORS

1. The control system and its components shall be EN 12094-1 , EN 54 parts 1&4 approved for use as a local fire alarm system with gas control and releasing service.

2. The control system shall perform all functions necessary to operate the gas system, interface with the detection system and field devices, actuate all auxiliary functions and shall interface digitally with the main building fire control panel .
3. The control system shall include battery standby power to support 24 hours in standby all the attached and supported fire and gas panels and devices, the HVAC shut down and **fire damper drive systems** and 5 minutes in alarm mode.
4. The control system shall be capable of supporting Cross Zoned Detection and other systems, i.e. manual break glass units.
5. The detectors shall be spaced and installed in accordance with the manufacturer's specifications

6. LOCK OUT UNIT MANUAL RELEASE (ELECTRIC)

1. The electric manual release switch shall be a dual action device which provides a means of manually discharging the Suppression System when used in conjunction with the control system.
2. The Manual Release switch or Manual Pull station shall be a dual action device requiring two distinct operations to initiate a system actuation.
3. Manual actuation shall bypass the time delay functions shall cause the system to discharge and all release and shutdown devices to operate in the same manner as if the system had operated automatically.
4. A Manual Release switch shall be located at the lock out unit at each exit from the protected hazard.
5. Audible and visual alarms: alarms- audible and visual signal devices shall operate from the control panel.
6. A Strobe device shall be placed on each side , and above, each exit door from the protected space together with an advisory signs above each door location
7. Caution and advisory signs shall be provided to comply with NFPA 2001
8. Entrance sign and flashing light: (1) required at each entrance to a protected space
9. Manual discharge sign (1) required at each manual discharge station.
10. Flashing light and sign (1) required over each exit from a protected space.

7 TESTING AND DOCUMENTATION

System inspection and checkout: after the system installation has been completed, the entire system shall be checked out, inspected and functionally tested by qualified, trained personnel, in accordance with the manufacturer's recommended procedures and relevant standards.

1. All containers to be weighed and distribution piping shall be checked for proper mounting and installation.
2. All electrical wiring shall be tested for proper connection, continuity and resistance to earth.
3. The complete system shall be functionally tested, in the presence of the engineer and all functions, including system and equipment interlocks, must be made operational during the final acceptance tests terminating with a full bottle discharge(to be refilled after test) before the system is finally accepted also
4. Each detector shall be tested in accordance with the manufacturer's recommended procedures, and test values recorded.
5. All system and equipment interlocks such as door release devices, audible and visual devices, equipment shutdowns, local and remote alarms, etc. shall function as required and designed.
6. Each control panel circuit shall be tested for trouble by inducing a fault condition into the system
7. Each zone shall be tested for leakage and an integrity certificate shall be issued by an independent testing agency

8 TRAINING

Prior to final acceptance the installing contractor shall provide operational training to each shift of the owners personnel. Each training session shall include control panel operation, fault procedures, supervisory procedures, auxiliary functions and emergency procedures.

9 OPERATION AND MAINTENANCE

Prior to final acceptance, the installing contractor shall provide complete operation and maintenance instruction manuals, four (4) copies for each system. All aspects of system operation and maintenance shall be detailed, including piping isometrics, wiring diagrams of all circuits, a written description of the system design, sequence of operation and drawing(s) illustrating control logic and equipment used in the system. Checklists and procedures for emergency situations, troubleshooting techniques, maintenance operations and procedures shall be included in the manual.

10 SHOP AND AS BUILT DRAWINGS

Equipment schedules, site measured piping and agent storage shop drawings and system sizing calculations shall be produced for approval before the system installation commences and any materials are ordered. Similarly fire detection and wiring drawings shall be provided for approval.

Upon completion of each system, the installing contractor shall provide four (4) copies of system "As-Built" drawings. The drawings shall show actual installation details including all equipment locations (i.e.: control panel(s), agent container(s), detectors, alarms, manuals, etc.) as well as piping and conduit routing details. Show all room or facilities modifications, including door and damper installations and fire relay and fire shut down interfaces to all ventilation plant, lift interfaces and any access control interface.

11 ACCEPTANCE TESTS

A "Test Plan" describing procedures to be used test the systems. The Test Plan shall include a step-by-step description of all tests to be performed and shall indicate the type and location of test apparatus employed. The tests shall demonstrate that the operational and installation requirements of this specification have been met. All tests shall be conducted in the presence of the engineer and shall not be conducted until the Test Plan has been approved.

The tests shall demonstrate that, the entire control system functions as per the design and as intended. All circuits shall be tested: automatic actuation, solenoid and manual actuation, HVAC and power shutdowns, audible and visual alarm devices. Supervision of all panel circuits, including AC and battery power **supplies** shall be tested and quantified. A room pressurization test shall be conducted, in each protected space to detect the presence of openings which would affect the agent concentration levels. All testing shall be carried out to NFPA 2001 appendix A
If room pressurization testing indicates that openings exist which would result in leakage and/or loss of the extinguishing agent, the installing contractor shall be responsible for the proper sealing of the protected space(s). The fire contractor shall responsible for adequately sealing all protected space(s) against agent leakage with suitable fire rated materials. The installing contractor shall inspect all work to ascertain that the protected space(s) have been adequately and properly sealed. The gas suppression system installing contractor shall be responsible for achieving successful room pressurization tests. If the first pressurization test is not successful, in accordance with these specifications the installing contractor shall determine the cause of the test failure. The installing contractor shall conduct additional pressurization tests, at no additional cost to the owner, until a successful test result is obtained. Copies of successful test results shall be submitted to the engineer for his records. The engineer may call for a full gas discharge

test and monitoring of the oxygen residual levels after 10 minutes- which the contractor shall set up, measure and supervise. Upon acceptance by the engineer, the completed system(s) shall be put into service.

12 SYSTEM INSPECTIONS DURING THE MAINTENANCE PERIOD

The Contractor shall attend to callouts on a 24 h turnaround basis through out the contract and maintenance period.
Four (4) quarterly full inspections of each gas and fire system installed shall be carried out during the one-year warranty period. The first inspection shall be at 3 month after hand over. Inspections shall be conducted in accordance with the guidelines and the recommendations of NFPA 2001 and shall include a full discharge routine, checking and cleaning of all fire detectors; checking of all bottle gas pressures; checking of power supplies and battery condition; checking of all status units and alarm systems.

The same testing procedures and frequency shall be carried out on a quarterly basis during the 36 month maintenance period.

Signed documents, measurements and schedules certifying satisfactory system operation for each system shall be provided quarterly on completion of each test.

13 CONTROL PANELS AND ALARM SIGNALS

The status panel shall be placed next to the door on the outside of the particular area to be protected. The panel shall be of stainless steel or aluminium with a matt finish on which the labeling is engraved. The panel shall fitted into a matching aluminium shop fitted enclosure to present a neat compact console at each position with no loose or visible wiring . The entire installation shall be well detailed and of high quality. All cabling in and out of the panels and the field devices shall be concealed. No surface cabling shall be allowed.

The panel shall be equipped with at least the following:

1. A key switch to change the mode from automatic control to manual control The key for the key switch must not be removable in the manual position
2. Two green LED's to indicate that the system is in the automatic mode
3. Two amber LED's to indicate that the system is in the manual mode
4. A key switch to isolate the system
5. Two red warning LED's to indicate the release of agent
6. A buzzer that will indicate that the unlocking or locking of the access door does not agree with the mode switch on the status panel
7. A switch to silence the buzzer
8. A lamp test switch
9. Two amber system fault indication LED's.
10. Manual break glass unit for local manual control

(proprietary systems which provide the same information, controls and displays will be considered)

14 AUDIBLE AND VISUAL ALARMS

1. Fire Bell alarms shall be 150 mm in diameter and there shall be at least one fire bell alarm **installed** in each room protected by gas as shown on the drawings.

2. Sirens shall be installed inside and outside the protected room. Sirens shall, produce an alarm at a sound level of at least 100 dB (A) at 1 rn and it shall be possible to step down their output. The sound shall be a slow whoop slowly ascending from 500 Hz to 1,200 Hz at 2,5s cycles with a completely off period of 0,5 seconds with continuous repeats of the same sequence until silenced.

3. Sirens shall be dual toned or two sirens to be used to generate an evacuation sound and subsequent gas discharged sound.

4. Two tone alarms shall be provided on the fire control panels. The action of the alarm shall be as follows: Fault Alarm – a lower frequency intermittent whistle. Fire Alarm - a higher frequency continuous whistle. These shall be silence- able at the panel

5. All audible alarms shall create a minimum sound level of 65 dB (A) in te protected spaces and maintain frequencies of 500 Hz and 1 000 Hz.

6. Visual alarms: the flashing Indicator LED's on the panel shall flash at 20 to 30 flashes per minute with on/off ratio of between 2: 1 and 4: 1.

7. Warning Notices: Gas warning notices **shall be affixed inside** and **outside of the** gas protected zones. The notices shall have legible white lettering at least 30 mm high on a red background
8. Notice in protected space:

WARNING
PROINERT GAS
WHEN ALARM OPERATES EVACUATE IMMEDIATELY

9. Notice at an entrance to a protected space:

WARNING
PROINERT GAS
WHEN ALARM OPERATES DO NOT ENTER UNTIL VENTILATED

10. Notice at entrance to Gas storage room

WARNING
PROINERT GAS STORAGE
ONLY AUTHORISED ENTRY
DO NOT ENTER UNLESS ROOM IS VENTILATED

11 Notice at every manual activation station

WARNING ACTIVATION OF THIS DEVICE WILL DISCHARGE
PROINERT GAS
EVACUATE ROOM BEFORE DISCHARGE

12 Evacuation Signs

Evacuation signs **shall be placed, if possible, above or otherwise** above all doors giving entry/exit from the **protected room. The sign must not be** legible under normal circumstances, but o**n receipt of the second** detection signal, the sign shall become illuminated by a flashing light. The lettering shall be et least 40 mm in height and the wording as follows:

FIRE ALARM
PROINERT GAS PROTECTED
EVACUATE ROOM/ DO NOT ENTER (respectively)

15 ELECTRICAL SUPPLY

A single phase 230 Volt, 50 Hz AC, 15 amp emergency power supply to be provided adjacent to each GAS control panel in each gas storage room and at each field fire and lock out panel. Each panel shall incorporate local and remote "blue ginger" type charger and battery packs to provide the necessary full power supply after a 24 h power failure. Battery Power shall be to activate fire detection and gas status panels, all field alarms and devices for that system and the HVAC and fire damper drives and relays for shut down of systems .

All equipment connected to the mains supply shall be equipped with over voltage protection spike arrestors to prevent damage to such equipment by lightning or other spikes, or due to over-voltage per SANS 61643-11

Each system shall operate off a 24 volt supply: The power pack for each system shall be suitably rated for the entire system and the external drives eg fire damper drive motors. The power-pack shall be equal or similar to blue ginger and able to accept an incoming single phase supply as described under "Electrical Supply" and shall be equipped with transformers, rectifiers, condensers, 5 year batteries and integrated circuits for the supply of 45AH stabilised power to the systems. Outputs for monitoring the power supply remotely shall be provided with the unit.

16 STANDARDS

The systems offered shall be designed, installed and commissioned in strict accordance with the following standards:

- SABS 10139 - Automatic Fire Detection Systems
- SABS 0142 - Regulations for the wiring of premises
- NFPA 2001 - Standard for Clean Agent Fire Extinguishing Systems

The gas extinguishing mediums shall be IG 55 Argonite/Proinert as listed by name and chemical description in NFPA 2001. The hardware and computerised design are to have achieved approval from at least one of the approval authorities listed below and a copy of this approval is to be included with the tender response. Any tender failing to comply with this instruction will not be considered.

Underwriters Laboratory - USA
Loss Prevention Council - UK

The fire protection system shall include but shall not be limited to the following:

(i) The provision of all necessary equipment, tools, accessories and test equipment necessary to complete and make operational the fire protection system as described herein.

(ii) The timeous provision of all necessary builder's work details to the client showing all necessary openings, sleeves, etc.

(iii) The provision of shop drawings showing all equipment details, equipment positions (including fixing details), sleeves, etc.

(iv) The provision of all necessary tools, scaffolding, labour, supervision, etc necessary to complete the installation as described herein.

(v) The painting and finishing of all equipment, etc as installed as part of this contract.

(vi) The compiling of three sets of manuals including a full schedule of equipment installed, spares lists, "As Built" drawings and all other necessary information as specified elsewhere in this section.

17 DETAILED DESCRIPTION OF WORKS – Proinert flooding System

All storage cylinders shall be installed in the designated gas storage room or in the protected rooms themselves. Vertical standing cylinders with wall and floor mounted retaining steelwork and brackets are to be provided.. Where multiple cylinders are required for the same hazard, a common manifold shall supplied. 300bar cylinders are to be used and the constant flow gas control valve system into the manifold shall provide a constant pressure flow and shall limit the manifolds pressures over the 60 sec discharge period. Proprietary stainless steel manifolds rated for 6000 psi /431 bar ; schedule 40 piping and forged fittings to be used for the field installations. Forged steel fittings to be used and not malleable iron A mild steel cage enclosure, with access for servicing shall be provide for protection of the cylinders in the space. Externally mounted cylinder banks shall be protected with a sheet metal enclosure to keep the weather and rain off the equipment

On multiple cylinder arrangements, one cylinder shall be designated as the pilot cylinder and employ both the restorable electric (solenoid) and manual actuators. All remaining cylinders shall be pneumatically operated from the discharge of the pilot cylinder.

Each cylinder shall be fitted with a flexible discharge hose to facilitate easy installation and system maintenance. Each cylinder valve arrangement must incorporate an agent check valve and pressure gauge.

The amount of Proinert to be provided shall be strictly in accordance with the system manufacturers design calculations for the type of risk. The design is to take into consideration any immovable solid objects which may affect the volume of agent required to reach the desired concentration.

The structural strength of the enclosure shall be determined to ensure (in the event of a discharge) over pressurisation will not cause damage to the protected area. Should the existing room ventilation be insufficient to provide the necessary pressure venting requirements, the design calculations must highlight this and pressure venting shall be installed.

The design calculations shall be based on achieving the design concentration at 30 degrees centigrade at an altitude of 1400 metres. Copies of the detailed design calculation for each area must be submitted to the client **before any installation work commences.**

The Proinert extinguishing system shall be automatically actuated by means of conventional hard wired two zone fire panels system (Digital systems which are compatible with the main fire control panel shall also be acceptable providing they are rated for double knock operation and can operate in an independent stand alone mode). Each protected area shall be fitted with photoelectrical (optical) smoke detectors , spaced to cover a maximum of 25 square metres in all air conditioned areas . A minimum of two detectors are required in each protected enclosure. The detectors are to be wired on independent circuits back to the gas control unit at the entrance to the protected space. Where the protected space includes a raised floor or both the fire detection and suppression systems are to include provision to protect these areas. Ceiling voids shall similarly be protected and shall be sealed off from the surrounding areas via fire walls/partitions. Each area shall be totally independent and shall not rely on other power supplies and systems to operate successfully.

The installation of safety warning signs, audible alarms and auxiliary wiring is the responsibility of the successful contractor. All control cabling associated with the fire

suppression systems is to be terminated in suitable marshalling enclosures at an approved location. The fire detection control system shall include the necessary interface relays to control auxiliary equipment such as air conditioning, potential free relay contacts rated a 10 amps (220vac) shall be provided for this purpose. The relay contacts are to be terminated in numbered wiring terminals housed in a segregated section of the marshalling enclosure.
All cabling shall be EN 50200/BS 8434-1 PH30 minute fire rated and fixed to BS requirements

First knock warning fire bells shall be interfaced with the voice evacuation system allowing announcements to be made into each gas zone. The gas discharge sirens shall, however, operate independently and automatically and shall not be silenced through the evac interface

Conduits and Wireways

All conduits and wire ways on the project will be supplied and installed by the fire contractor

All conduits in areas of exposed slabs will either be cast in concrete (existing) or installed on surface as the case may be.

All conduits in walls will be built in except in pant rooms or face brick/concrete areas where surface galvanised conduit systems are to be used

All wiring required to make complete and operational the fire protection system as described herein shall form part of this contract, this shall include all power and control wiring from the 400V/240V power points provided by the electrical contractor.

18 DRAWINGS

The contractor shall submit, for approval, in principle, all the necessary drawings prior to starting work. Any work started (off site or on site) prior to receiving the engineer's approval of drawings shall be at the contractor's own risk.

The engineer may require from the contractor further detailed drawings and/or calculations which clarify features not adequately shown on the layout drawings. The request for additional details shall not be construed as extending the scope of this contract or altering the programme.

The contractor shall submit two prints of each drawing for approval.

The drawings will be returned to the contractor, within two weeks of their receipt, one copy of each drawing marked "Approved in Principle" or marked with any changes which are necessary.

The contractor shall modify the details and drawings as required. The nature and date of each modification and a distinguishing symbol shall be added and the drawings shall be submitted again for checking and distirbution

Alterations to drawings by the engineer are not intended to change the scope of work unless explicitly stated as doing so. Should any alterations, in the opinion of the contractor, change the scope of work the contractor shall notify the engineer immediately upon receipt of the altered drawings before any further drawing work or fabrication is carried out. Claims for a change of scope made after performance of the work constituting the claimed change of scope of work will not be considered.

19 SERVICE CONDITIONS

All equipment offered shall be suitable for continuous operation under the following site conditions:

Ambient Temperature	34^{O}C maximum, -5^{O}C minimum
Humidity	5% to 95% RH (non condensing)
Altitude	Approximately 1400 masl
Lightning	Severe (tenderers are advised to take cognisance of this and make the necessary allowance for protecting equipment against lightning or power surges to SABS)
Nominal LV Supply	400/231V (no load) 4 wire 3-phase system with earthed neutral
Frequency	50 Hz

The contractor shall be responsible for any discrepancies, errors or omissions in the drawings and other particulars supplied by him whether such drawings or particulars have been approved by the engineer or not, provided that such discrepancies, errors or omissions are not due to inaccurate information or particulars furnished in writing to the contractor.

Three copies of the final manufacturing and installation drawings shall be issued to the engineer by the contractor within ten days of receipt of approval in principle. Further copies shall be provided as may be required by the engineer either before or after final approval.

The contractor shall provide, at his own expense, all copies of drawings required by him in the execution of the work and shall also, at his own expense, supply to the engineer such drawings and copies thereof as are provided for in the specification.

20 RECORD DRAWINGS AND DOCUMENTATION

On completion of the installation, but before final handover, the contractor shall provide a CD plus one print of each of the contract drawings showing the installation as fixed:

(i) Complete installation layout.
(ii) Isometric pipework layouts
(iii) Detailed drawings of all items of plant.
(iv) Electrical layouts and wiring diagrams.
(v) System gas flow calculations and nozzle selection
(vi) Details of any other items requested by the Client.

The drawings shall be sufficient in detail to enable the Employer's staff to maintain, dismantle, reassemble and adjust any part of the works.

The layouts shall show the location of all manual and automatic equipment, controls, control panels, outlets, etc.

21 MAINTENANCE (DURING GUARANTEE PERIOD)

The contractor shall maintain the entire installation as described in this specification for a period of one year from the date of final handover.

The maintenance visits shall be carried out at regular monthly intervals while testing is to be carried out at quarterly intervals.

The maintenance shall cover all items of plant and equipment and shall include replacement of all expendable items including any lost gas due to leakage or faulty system discharges

In addition to the monthly maintenance visits the contractor shall carry out all necessary visits due to failure of any item of the system. The contractor shall attend to all complaints by the Employer logged on the call system within 24 h . Failure to do so will result in R 1200 fine per event per day.

The Contractor shall report to the Employer's nominated representative both on arriving and leaving the site. The Contractor shall provide the Employer and Client with a Service Report for each visit whether scheduled or breakdown.

At each maintenance visit the contractor shall check the function of each system and its equipment and shall ensure that the equipment is performing to specification. All automatic controls and safety devices shall be checked. All electrical control gear, detectors and lamps, etc shall be checked and adjusted or replaced as necessary. Gas pressures in the bottles shall be checked and confirmed

The equipment shall be cleaned where necessary at each scheduled visit.

The contractor shall notify the client prior to the final monthly service so that the Client may accompany the contractor.

The client may at his discretion allow the maintenance period on any item of equipment or section of the installation start at a date prior to final handover if it is put into operation for beneficial use of the Employer prior to final handover, this will not be permitted in cases where final handover is delayed due to the contractor not carrying out remedial work in good time.

The tender price shall include for a full complement of recommended spares for the total 12 month guarantee and maintenance period as well as the following period of 36 months months. Tenderers shall detail the allowance for recommended spares as a detailed breakdown of the total allowance.

22 GUARANTEE

The contractor shall guarantee the entire installation as described in this specification for a period of twelve months from the date of final handover. The guarantee shall provide for all parts, spares and equipment that become defective during the guarantee period and these shall be replaced free of charge. The guarantee shall cover all costs including material, labour, overheads, travelling, etc.

The complete installation shall be guaranteed against defects whether patent or latent as well as against faulty materials and workmanship.

The guarantee shall cover all materials, plant and equipment whether or not it is covered by a manufacturer's guarantee. The contractor shall cede to the Employer the remainder of any equipment guarantee which he has received from his suppliers and which extends beyond the three year period. It shall be the responsibility of the contractor to ensure that the guarantee is transferable.

The client may at his discretion allow the guarantee period on any item of equipment or section of the installation to start at a date prior to final handover if it is put into operation for beneficial use of the Employer prior to final handover. This may be withdrawn in cases where final handover is delayed due to the contractor not carrying out remedial work in good time.

23 OPERATING AND MAINTENANCE MANUALS

The contractor shall provide three copies of the Operating and Maintenance Manuals.

The contractor shall submit for approval to the Client, four weeks before completion of the installation, two copies of the Maintenance and Operating Manuals for the system supplied.

The Client will return these to the contractor within ten working days of their receipt by him, marked with all changes which are necessary.

The contractor shall modify the manuals as required by the client and submit to the client within ten working days, one revised copy of the manual. On completion of the installation, but before the plant is handed over to the Employer, the contractor shall provide the final Operating and Maintenance Manuals for the system supplied in CD format.

The manuals shall be properly indexed to facilitate easy reference.

The manuals shall include:

A list of recommended servicing tools and specialist equipment.
A list of spares with price breakdown to be supplied by the contractor to cover the period of warranty.
A priced list of recommended spares necessary for a period of two years of operation.
Exploded drawings or detailed spares list from which every item of every piece of equipment can be positively identified for ordering replacements.
A list indicating the name and address of the local agent for each item of equipment.
A list indicating the name and address of the manufacturer of each item of equipment.

A copy of all test certificates obtained with the equipment.
A list of recommended lubricants (if applicable).
A preventative maintenance programme for all equipment.
Operating instructions for each item of equipment.
Performance data and/or characteristic curves.
Commissioning data.
Record drawings.
List of recommended spares to be purchased immediately. Detailed reference to every supplier of such spares.
List of recommended tools and instruments to be purchased immediately for servicing, repair and testing purposes.
Proposals for possible training to the staff members (operational and technical).

DETAILED TECHNICAL SPECIFICATION

1 IG 55 PROINERT INERT GAS LT ROOM FLOODING (80l, 300bar bottles to be used in various bottle banks throughout)

Each gas system shall operate in its respective gas zone and shall provide fire protection to the entire area bound by the walls and slabs. The complete system shall include the zone gas status and control panel, the zone fire detection panel, the alarm and evacuation systems, the door monitoring systems and illuminated signage , the manual release break glass systems at the status units located at various exits from the gas zone, the gas piping nozzles and the field fire detection systems, the gas over pressure sprung release dampers. The following gas systems are to be installed an piped complete;

1. Basement zone 1 Archive : 58 bottle system
2. Basement zone 2 Archive: 1 bottle system
3. Basement zone 3 Archive : 36 bottle system
4. **Basement zone 4 Archive: 10 bottle system
5. **Ground floor zone 5 archive and microfiche working area : 18 off bottle system
6. **Ground floor zone 6 archive and registration working area : 15 off bottle system
7. First floor zone 7 Server room : 1 bottle system

**= bottles stored outside in enclosed yard to be protected from the weather

Each system shall be controlled through its own detection, gas and status unit. Each system shall be engineered, supplied, installed and interfaced for monitoring purposes with the Building's fire detection and "maestro" type monitoring graphics, automatic and existing voice PA & evac systems.
The selected IG 55 Proinert gas agent shall be readily available, non toxic, life supporting commercial gas suitable for the intended application.

1.1. The Proinert systems shall be designed for the total flooding of normally occupied spaces for Class A surface fires (47% design concentration for total flooding or as recommended by the Proinert manufacturer and 11% minimum oxygen residual to be held for at least 15 minutes after a discharge);

1.2. An independent, two zone double knock fire detection system using photoelectric optical detectors shall be provided for automatically activating the gas. An interface shall provide first and second knock signals to each zone/system independently. Thereafter the respective Gas Control Unit and fire relays shall control the alarms, evacuation and discharge process into each zone independently. Separate power supplies shall be provided to make the systems totally independent and autonomous . The systems shall be complete in all respects with fire control panel, power supply, gas interlocks, alarms, fire damper control, extract fan control, interface with building fire detection system for alarm and reporting purposes, etc.

1.3. Each Gas Control Unit (status unit) shall incorporate an automatic and manual operating mode through a manual gas release and control station outside each risk. The discharge sequence shall always be as follows:

1.3.1.1. Fire bells on first knock
1.3.1.2. Gas discharge evacuation alarm siren for 30 sec. and HVAC and fire damper shut down on second knock or after manual activation; door release units activated and doors closed
1.3.1.3. Gas discharge with flashing sign
1.3.1.4. Sprung relief dampers for room overpressure
1.3.1.5. Gas discharged flashing illuminated sign over risk entry points.
1.3.1.6. Systems to be manually reset and gas evacuation effected through the HVAC and ventilation systems re-actuated through a supervised reset action .

1.4 Each Gas Control Unit shall incorporate its own power supply which shall be rated for the maximum inrush current required to activate the gas cylinder solenoid valve release system, alarms, bells and door release mechanisms, and to operate fire damper controls and fire relays, in accordance with NFPA requirements. Each system shall have an independent power supply and battery and shall operate independently of external power sources and services for at least 24h

1.5 The power supply to each system's fire damper control panel shall be from the gas system's Blue Ginger power supply unit (mains, transformer, charger and battery system) so that each gas system is self sufficient. The HVAC damper control panels are existing; they shall be controlled and powered by the gas system. Before any gas discharge the HVAC systems shall shut down and fire dampers shall close. Gas Relief dampers shall be sprung at 50 Pa and operate automatically

1.6 Associated system electrical components supplied and installed shall include:

1 Door closers and door release units to close doors before gas is discharged
3. Magnetic door monitors.
4. Illuminated warning and escape signage.
5. Static statutory signage on doors and gas areas
6. Bells, sirens and strobes.
7. Gas cylinder banks with master UVO automatic and manual release with pneumatic connectors and cylinder gas release actuators.
8. Actuation and alarm signals and networked logging and recording at the MFCP and "maestro" display. Interface with the main Building fire control panel for annunciation and logging of events. The field gas system controllers shall be linked through software to the Main Fire Panel and to the "maestro "system .
9. Fire damper control, extract fan control and AC shutdown interface shall all be monitored and logged on the BMS system through a bac net interface
10. All steel trunking and conduiting and fire rated cabling.

Associated mechanical system component supplied and installed shall include:

1. Proprietary manifolds for the various bottle combinations
2. Gas piping and fittings : Schedule 40
2. Gas discharge nozzles sized for the required discharge rate
3. Gas cylinders with pressure gauges and switch (master cylinder) for pressure monitoring , gas and constant flow valves, stainless steel manifold system, gas release valves.
4. Gas cylinder support systems blocks , bottle restraints/chains, expanded metal protection cages and lockable doors. External bottles to have IBR weatherproof roof enclosure and plinth system to elevate the gas bottles

2 HEAVY GRADE GAS PIPING (BS 1600/SANS 62) AND FITTINGS

2.1 Schedule 40 (Piping to ANSI B36.19) seamless piping and forged steel fittings for pipe sizes, up to and including 50mm;

2.2 **Welded** piping to BS 3799 for pipe sizes > 40mm. Welders shall be qualified for this class of pressure in accordance with SABS 044-3/044-5 of 1983 as amended. Welding procedures to API 1104 or ASME Section IX shall be carried out.

2.3 **Flanges : closed system** : forged carbon steel, raised face class 1500 of Table PE1 of BS 1560; **open system** as above but class 600 of Table PE1 of BS 1560.

2.4 **Bolts and Nuts and Washers**: Bolts: BS 4882 grade B7/B7M nuts: grade 2H/2HM of BS4882 washers : BS2410.

2.5 **Gaskets:** compressed asbestos fibre gaskets.

2.6 **Fittings:** forged steel to BS 3799 screwed for sizes <40mm and butt welded grade WPA/WPB of BS1640 for sizes > 40mm (closed pipe) or screwed as above for open ended pipe.

2.7 **Screwed Piping:** heavy grade/ schedule 40 screwed to BS21 for 2000psi op pressure

2.8 ASTM A234 fittings : Class 300 pipe fitting for pipes < 80mm dia; class 600 fitting s for pipes >80mm dia