INFRASTRUCTURE DEPARTMENT

INVITATION TO QUOTE

An invitation is hereby issued to suitably qualified and experienced service providers to provide services as described in the table below:

Quote Number	Quote description	Price and BBBEE	Closing date	Mandatory requirements
RFQ MUT:22/ 2025R	Appointment of a suitably qualified and experienced Service Provider for the Supply and Installation of Firefighting Equipment for the Internal Refurbishments to the Dining Hall (DH) Phase 1 & 2 at MUT Main Campus.	80/20	20 March 2025 @ 12h00	• Valid Tax certificate or PIN • CIPC Certificate • Valid COIDA • Valid SAQCC (South African Qualification and Certification Committee for the Fire Industry)

Mangosuthu University of Technology is committed to the implementation of its Procurement Policy on Broad-based Black Economic Empowerment (BBBEE). For enquiries, please contact Nomonde Mhlungu, email mhlungunb@mut.ac.za, tel. on 031 907 7500.

Quotation documents are to be downloaded via the MUT website and must be sent to the above email address mhlungunb@mut.ac.za from Procurement, Umlazi Campus. No facsimile, late or bids will be accepted. The University does not bind itself to accept the lowest bid and reserves the right to accept the whole or part of any quotation. If you are not contacted within 90 working days after the closing date of the quotation, consider your quotation unsuccessful.

OFFICIAL REQUEST FOR QUOTATION (RFQ)

INSTRUCTIONS: The supplier information must be completed in full, and this document must be signed by authorized personnel. Supplier must carefully read the instructions and the terms and conditions of this document. Failure to adhere to these instructions and terms and conditions may result in rejection of the submission.

Business Unit: Infrastructure Department	**RFQ Number: RFQ MUT 22/2025 R**
RFQ Description:	Appointment of a suitably qualified and experienced Service Provider for the Supply and Installation of Firefighting Equipment for the Internal Refurbishments to the Dining Hall (DH) Phase 1 & 2 at MUT Main Campus.
Requester: Mr. Lubabalo Ngcaweni **Technical Enquires: 031 907 7119 or** **E-mail: ngcaweni.lubabalo@mut.ac.za**	**Buyer: Ms Mhlungu Nomonde**
Request date: 13/03/2025	**Contact no: (031) 907 7500** **E-mail: mhlungunb@mut.ac.za**
Compulsory Briefing/Information session	None
Closing date and Time: 20 March 2025 @ 12h00	**Delivery Address:** **Send via e-mail: mhlungunb@mut.ac.za**
Payment term	30 days in arrears upon receipt of a valid invoice
NB: RFQ documents should be emailed to the email address above. Clarification questions are to be directed to the buyer at the above email address.	

BIDDER/SUPPLIER INFORMATION

Company name:	
Address:	
Contact Number:	
Name & Surname of Authorized person:	
Email:	
Company Registration number	

RFQ FORM

1. I/We hereby render to supply all or any of the supplies and/or to render all or any of the services described in the attached documents to Mangosuthu University of Technology on the items and conditions and in accordance with the specifications stipulated in the RFQ documents (and which shall be taken as part of, and incorporated into, this RFQ) at the prices and on the terms regarding time for delivery and/or execution inserted therein.

2. I/We agree that the offer herein shall remain binding upon me/us and open for acceptance by Mangosuthu University of Technology during the validity period indicated and calculated from the closing time of the RFQ.

3. if I/we withdraw my/our RFQ within the period for which I/we have agreed that the RFQ should remain open for acceptance or fail to fulfil the contract when called upon to do so, Mangosuthu University of Technology may without prejudice to its other rights, agree to the withdrawal of my/or RFQ or cancel the contract that may have been entered into between me/us and Mangosuthu University of Technology and I/we will then pay to Mangosuthu University of Technology any additional expense incurred by Mangosuthu University of Technology having either to accept any less favourable RFQ or fresh RFQs have to be invited, the additional expenditure incurred by the invitation of fresh RFQ and by the subsequent acceptance of any less favourable RFQ, Mangosuthu University of Technology shall also have the right to recover such additional expenditure by set-off against moneys which may be due or become to me/us under this or any other RFQ or contact or against any guarantee or deposit that have been furnished by me/us or on my/our behalf for the due fulfilment of this or any other RFQ or contract and pending the ascertainment of the amount of such additional expenditure to retain such moneys, guarantee or deposit as security for any loss Mangosuthu University of Technology may sustain by reason of my/our default.

4. If my/our RFQ is accepted the acceptance may be communicated to me/us by letter or ordinary post or registered post and that SA Post Office Ltd shall be regarded as my/our agent. Delivery or such acceptance to SA Post Office Ltd shall be treated as delivery to me/us.

5. The law of the Republic of South Africa shall govern the contract created by the acceptance of my/our RFQ and that I/we choose domicilium citandi et executandi in the Republic (full address).

6. I/We furthermore confirm that I/we have satisfied myself/ourselves as to the correctness and validity of my/our RFQ, that the price(s) and rate(s) quoted cover all the work/items(s) in these documents; and that the price(s) and rate(s) cover all my/our obligations under a resulting contract. I/we accept that any mistakes regarding price(s) and calculations will be at my/our risk.

7. I/we hereby accept full responsibility for the proper execution and fulfilment of all obligations and conditions devolving on me/us under this agreement as the principal(s) liable for the due fulfilment of this contract.

8. I/We agree that any action from this contract in all respects be instituted against me/us and I/we hereby undertake to satisfy fully any sentence or judgment which may be pronounced against me/us because of such action.

9. I/We declare that I/we have participation /no participation in the submission of any other offer for the supplies/service described in the attached documents. If in the affirmative, state name(s) or RFQ(s) involved.

10. ----------

Are you duly authorized to sign for this RFQ? *YES / NO

11. Has the Declaration of Interest been duly completed and included with the other RFQ forms?
*YES / NO

DECLARATION
I,…… the undersigned (full name)
Certify that the information furnished above is correct. I accept that, in addition to the cancellation contract, action may be taken against me should this declaration prove to be false.

Name & Surname of Authorised person/ Representative	Date:
Signature of a Bidder's Representative	

PRICING SCHEDULE – FIRM PRICES (PURCHASES)

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

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

Name of bidder……	RFQ Number: RFQ MUT 22/2025 R
Closing Time: 12h00	Closing date: 20 March 2025

OFFER TO BE VALID FOR **90** DAYS FROM THE CLOSING DATE OF BID.

1. **Pricing Schedule**

Refer to **Section 5** for Pricing Schedule (To Be Completed by the bidder)
The offered total of the prices inclusive of VAT is:

(In Words)

……

_____

(**In Figures**) **R**_____

2. **Background**

The Mangosuthu University of Technology (MUT) is doing internal refurbishments at the dining hall to ensure the space meets the minimum requirements for efficient utilization, the services of a suitably qualified and experienced service provider for the supply and installation of fire protection equipment for the Internal Refurbishments of the Dining Hall (DH) Phase 1 & 2 at MUT Main Campus.

3. **Scope of Service**

The Scope of Works includes the supply, delivery, installation, testing, commissioning, maintenance, and guarantee of the new fire protection systems in the buildings, as detailed on the drawings and BOQ as follows:

- New fire protection installation, all hose reels and extinguishers, pipework, etc.,
- New fire detection system and,
- New fire evacuation signage.

- Required by: MUT
- At: Mangosuthu University of Technology
- Brand and model ……
- Country of origin …….

- Does the offer comply with the specification(s)? *YES/NO
- If not to specification, indicate deviation(s) …….
- Period required for delivery …….
  *Delivery: Firm/not firm

- Delivery basis ……

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

** “All applicable taxes” include value-added tax, pay as you earn, income tax, unemployment insurance fund contributions and skills development level

DECLARATION OF INTEREST

1. Any legal person, including persons employed by the state[1], or persons having a kinship with persons employed by the state, including a blood relationship, may make an offer or offers in terms of this invitation to bid (includes a price quotation, advertised competitive bid, limited bid, or proposal). Given possible allegations of favouritism, should the resulting bid, or part thereof, be awarded to persons employed by the state, or to persons connected with or related to them, it is required that the bidder or his/her authorised representative declare his/her position about the evaluating/adjudicating authority where-

   - the bidder is employed by the state; and/or

   - the legal person on whose behalf the bidding document is signed, has a relationship with persons/a person who are/is involved in the evaluation and or adjudication of the bid(s), or where it is known that such a relationship exists between the person or persons for or on whose behalf the declarant acts and persons who are involved with the evaluation and or adjudication of the bid.

2. **To give effect to the above, the following questionnaire must be completed and submitted with the bid.**

2.1 Full Name of bidder or his or her representative……..……

2.2 Identity Number: ……..……..……

2.3 Position occupied in the Company (director, trustee, shareholder[2]): …….……..

2.4 Company Registration Number: ……..…...…….

2.5 Tax Reference Number: ……..…….……

2.6 VAT Registration Number: ……....

2.6.1 The names of all directors/trustees/shareholders/members, their identity numbers, tax reference numbers and, if applicable, employee / persal numbers must be indicated in paragraph 3 below.

[1]"State" means –

(a) any national or provincial department, national or provincial public entity or constitutional institution within the meaning of the Public Finance Management Act, 1999 (Act No. 1 of 1999);
(b) any municipality or municipal entity;
(c) provincial legislature.
(d) National Assembly or the National Council of Provinces; or
(e) Parliament.

²" Shareholder" means a person who owns shares in the company is actively involved in the management of the enterprise or business and exercises control over the enterprise.

2.7 Are you or any person connected with the bidder presently employed by the state? **YES/NO**

2.7.1 If so, furnish the following particulars:

Name of person/director/trustee/shareholder/ member:

…….

Name of state institution at which you or the person connected to the bidder is employed :

…….

Position occupied in the state institution:

…….

Any other particulars:

…….

2.7.2 If you are presently employed by the state, did you obtain. The appropriate authority to undertake remunerative. Work outside employment in the public sector? **YES/NO**

2.7.2.1 If yes, did you attach proof of such authority to the bid document? **YES/NO**

(Note: Failure to submit proof of such authority, were applicable, may result in the disqualification of the bid.

2.7.2.2 If no, furnish reasons for non-submission of such proof:

…….

…….

…….

2.8 Did you or your spouse, or any of the company's directors / trustees/shareholders/members or their spouses conduct business with the state in the previous twelve months? **YES/NO**

2.8.1 If so, furnish particulars:

2.8.2

……..

……..

2.9 Do you, or any person connected with the bidder, have any relationship (family, friend, other) with a person employed by the state and who may be involved with the evaluation and or adjudication of this bid? **YES/NO**

2.9. 1 If so, furnish particulars.

……..

……..

2.10 Are you, or any person connected with the bidder, aware of any relationship (family, friend, other) between any other bidder and any person employed by the state. Who may be involved with the evaluation and or adjudication? Of this bid? **YES/NO**

2.10.1 If so, furnish particulars**.**

……..

……

2.11 Do you or any of the directors/trustees/shareholders/members. Of the company have any interest in any other related companies whether or not they are bidding for this contract? **YES/NO**

2.11.1 If so, furnish particulars:

……

……

……

3 Full details of directors / trustees / members / shareholders.

Full Name	Identity Number	Personal Tax Reference Number	State Employee Number / Persal Number

4 DECLARATIONS

I, …….. THE UNDERSIGNED (NAME) CERTIFY THAT THE INFORMATION FURNISHED IN PARAGRAPHS 2 and 3 ABOVE IS CORRECT.

I ACCEPT THAT MANGOSUTHU UNIVERSITY OF TECHNOLOGY MAY REJECT THE BID OR ACT AGAINST ME IN TERMS OF PARAGRAPH 23 OF THE GENERAL CONDITIONS OF THE CONTRACT SHOULD THIS DECLARATION PROVE TO BE FALSE.

……..	……...
Signature	**Date**
…….	……..
Position	**Name**

DECLARATION OF BIDDER'S PAST SUPPLY CHAIN MANAGEMENT PRACTICES

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

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

3 The bid of any bidder may be disregarded if that bidder, or any of its directors have-

a. abused the institution's supply chain management system.
b. committed fraud or any other improper conduct about such system, or
c. failed to perform on any previous contract.

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

Item	Question	Yes	No
4.1	Is the bidder or any of its directors listed on the National Treasury's Database of Restricted Suppliers as companies or persons prohibited from doing business with the public sector? (Companies or persons who are listed on this Database were informed in writing of this restriction by the Accounting Officer/Authority of the institution that restricted after the *audi alteram partem* rule was applied). **The Database of Restricted Suppliers now resides on the National Treasury's website(**www.treasury.gov.za**) and can be accessed by clicking on its link at the bottom of the home page.**	Yes ☐	No ☐

4.1.1	If so, furnish particulars:		
4.2	Is the bidder or any of its directors listed on the Register for Tender Defaulters in terms of section 29 of the Prevention and Combating of Corrupt Activities Act (No 12 of 2004)? **The Register for Tender Defaulters can be accessed on the National Treasury's website (www.treasury.gov.za) by clicking on its link at the bottom of the home page.**	Yes ☐	No ☐
4.2.1	If so, furnish particulars:		
4.3	Was the bidder or any of its directors convicted by a court of law (including a court outside of the Republic of South Africa) for fraud or corruption during the past five years?	Yes ☐	No ☐
4.3.1	If so, furnish particulars:		
4.4	Was any contract between the bidder and any organ of state terminated during the past five years on account of failure to perform on or comply with the contract?	Yes ☐	No ☐
4.4.1	If so, furnish particulars:		

CERTIFICATION

I, ……..…… THE UNDERSIGNED (FULL NAME)

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

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

……... ……..

Signature Date

…… ……..

Position Name of Bidder

CERTIFICATE OF INDEPENDENT BID DETERMINATION

1 This document must form part of all bids[1] invited.

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

3 Treasury Regulation 16A9 prescribes that accounting officers and accounting authorities must take all reasonable steps to prevent abuse of the supply chain management system and authorizes accounting officers and accounting authorities to:

a. disregard the bid of any bidder if that bidder or any of its directors have abused the institution's supply chain management system and or committed fraud or any other improper conduct about such system.

b. cancel a contract awarded to a supplier of goods and services if the supplier committed any corrupt or fraudulent act during the bidding process or the execution of that contract.

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

5 To give effect to the above, the attached Certificate of Bid Determination must be completed and submitted with the bid:

a) Includes price quotations, advertised competitive bids, limited bids, and proposals.
b) Bid rigging (or collusive bidding) occurs when businesses, that would otherwise be expected to compete, secretly conspire to raise prices or lower the quality of goods and/or services for purchasers who wish to acquire goods and/or services through a bidding process. Bid rigging is, therefore, an agreement between competitors not to compete.

CERTIFICATE OF INDEPENDENT BID DETERMINATION

I, the undersigned, in submitting the accompanying bid:

_____

(Bid Number and Description)

In response to the invitation for the bid made by:

_____

(Name of Institution)

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

I certify, on behalf of:_____that:

(Name of Bidder)

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

7. Without limiting the generality of paragraphs 6 above, there has been no consultation, communication, agreement, or arrangement with any competitor regarding:
    (a) prices.
    (b) the geographical area where the product or service will be rendered (market allocation)
    (c) methods, factors, or formulas used to calculate prices.
    (d) the intention or decision to submit or not to submit, a bid.
    (e) the submission of a bid which does not meet the specifications and conditions of the bid; or
    (f) bidding with the intention not to win the bid.
8. In addition, there have been no consultations, communications, agreements, or arrangements with any competitor regarding the quality, quantity, specifications and conditions or delivery particulars of the products or services to which this bid invitation relates.
9. The terms of the accompanying bid have not been, and will not be, disclosed by the bidder, directly or indirectly, to any competitor, before the date and time of the official bid opening or of the awarding of the contract.

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

10. I am aware that, in addition, and without prejudice to any other remedy provided to combat any restrictive practices related to bids and contracts, suspicious bids will be reported to the Competition Commission for investigation and possible imposition of administrative penalties in terms of section 59 of the Competition Act No 89 of 1998 and or may be reported to the National Prosecuting Authority (NPA) for criminal investigation and or may be restricted from conducting business with the public sector for a period not exceeding ten (10) years in terms of the Prevention and Combating of Corrupt Activities Act No 12 of 2004 or any other applicable legislation.

…… ……

Signature Date

CONDITIONS OF RFQ

1. Bidders must submit all necessary documents and complete all forms and questionnaires contained in the RFQ. Each bidder's proposal shall be evaluated against timelines and prices.
2. pricing- do not show separately.
3. Bidders responding to this quotation are deemed to do so, on the basis that they acknowledge and accept all Terms and Conditions of this quotation.
4. RFQ validity period 90 days.
5. The validity period may not be extended unless otherwise stated by the member.
6. Incomplete or late submissions will not be evaluated.
7. Return quotations to the email address provided before the closing date and time.

WHAT IS MUT LOOKING FOR

To appoint a suitably qualified and experienced Service Provider for the Supply and Installation of Firefighting Equipment for the Internal Refurbishments to the Dining Hall (DH) Phase 1 & 2 at MUT Main Campus.

Specification:

See attached **Pricing Schedule**.

Evaluation Criteria

Compulsory documents are to be submitted with RFQ.	**Mandatory Documents**
• **Valid Tax certificate or PIN** • **CIPC Certificate** • **Valid COIDA** • **Valid SAQCC (South African Qualification and Certification Committee for the Fire Industry)**	**YES**
NB: Failure to submit mandatory documents will lead to disqualification.	

OTHER GENERAL REQUIREMENTS:

- CSD MAAA NUMBER ---------- (please insert in the space provided)
- BBBEE Certification – No points will be allocated if not provided.

TO BE COMPLETED BY SUPPLIER BY (Checklist)

• Does this Offer comply with specification, state brand where applicable?	
• Does the bidder have the required experience, state period?	
• Can this order be delivered within the specified period, state delivery period?	
• Do you intend sub-contraction/Partner?	
• Pricing Schedule (Recalculate to ensure accuracy)- Indicate whether prices are firm or non-firm)	
• Declaration of Interest (Read, Understand and Sign)	
• Declaration of Bidder's Past Supply Chain Management Practices (Read, Understand and Sign)	
• Certificate of Independent Bid Determination (Read, understand and Sign)	
• CSD Registration Number (MAAA…….) / CSD report	

PLEASE NOTE: ***MUT reserves the right to appoint or not appoint a service provider for this project. MUT will not necessarily accept the lowest quotation in part or full, it will be MUT's discretion to appoint the most suitable service provider who will add value to MUT.***

Appointment of a suitably qualified and experienced Service Provider for the Supply and Installation of Firefighting Equipment for the Internal Refurbishments to the Dining Hall (DH) Phase 1 & 2 at MUT Main Campus.

ANNEXURE A

BILLS OF QUANTITIES PHASE 1 & 2

MANGOSUTHU UNIVERSITY OF TECHNOLOGY

DINING HALL REFURBISHMENT PHASE 1

FIRE BILL OF QUANTITIES

no.	Description	Unit	Qty	Rate	Amount
	MISCELLANEOUS The costs for the following items shall not be included in the cost rates for work listed in the rest of the BOQ.				
1	Contractor's P&G's, including compliance to OSHA, exit medicals, site supervision, management, site establishment and other relevant MUT specifications.	sum	1		
2	Workshop drawings as specified. Drawings are to be done on CAD, as no hand-drawn mark-ups will be accepted.	sum	1		
3	Builder's work drawings as specified. Drawings to be done on CAD, as no hand-drawn mark-ups will be accepted.	sum	1		
4	As-built drawings as specified. Drawings are to be done on CAD, as no hand-drawn mark-ups will be accepted.	sum	1		
5	4 sets of hardcopy O&M manuals c/w USBs (incl. certificates issued on completion such as electrical compliances, etc., warranties, guarantees, maintenance schedule, etc.). USBs are to contain the entirety of the O&M manuals in digital form, neatly organized.	sum	1		
6	Commissioning & testing of the entire fire services systems by sub-contractor and supplier(s), including pressure testing, reports, etc. The contractor must notify the Engineer of commissioning so that they can be present.	sum	1		
7	Training of user department of the entire fire services systems. The contractor must notify the Engineer of training so that they can be present. O&M manuals are to be handed over at training.	sum	1		
8	Maintenance and guarantee of the complete fire installation for a period of 12 months from the date of completion and handover as per the Standard Specification.	sum	1		
9	Provisional sum - fire stopping (add R10 000).	sum	1	R10 000,00	R10 000,00
10	Provisional sum - Plumbing & Drainage (add R12 000).	sum	1	R12 000,00	R12 000,00
carried forward to the summary page					

	Description	Unit	Qty	Rate	Amount
	FIRE PROTECTION **Drawing No.: LSG-2404-FIRE-500** **Drawing No.: LSG-2404-FIRE-501** All cost rates for the below are to be priced as fully supplied and installed. Where branded equipment is specified, these items are to be equal and approved to the branded model's specifications.				
A	**Fire / Safety Signage in Accordance with SANS 1186**				
	Photoluminescent fire signage, 190mm high, housed in clear anodized aluminium frames, wall-mounted				
1	E3 - 190x380mm	no.	2		
2	E24 - 190x190mm	no.	2		
3	E28 - 190x190mm	no.	6		
4	E29 - 190x190mm	no.	2		
	Illuminated Signage, LED-backlit, mains powered with 3-hour battery backup, wall mounted (single-sided)				
5	E6 - 215x430mm	no	6		
B	**Manual Fire Fighting**				
1	FE-1 - Fire extinguisher c/w wall-mounted backing board covered in F24 chevron signage and extinguisher mounting bracket (4.5kg DCP).	no.	6		
2	Fire hose reel cp valve - Ø25mm	no.	2		
	Galvanized steel pipes and threaded fittings to SABS 62-1 and pipe threads to SABS 1109, for fire protection use: incl. nipples, off-cuts, wastage, fittings, hangers, support brackets, painting.				
3	Straight pipe - Ø25 mm	m	2		
C	**Fire Detection Equipment**				
1	FACP - "Edwards" analogue addressable, 2-loop fire panel, including mounting, electrics, battery back-up (size TBC), electronics wiring, and programming of all connected devices. Model: iO1000	sum	1		
2	M - "Edwards" addressable manual call point, weatherproof - Model: SIGA-278.	no.	7		
	R - "Edwards" addressable control relay module - to shut down AHU during a fire alarm. Model: SIGA-MCR	no.	3		
3	S - "Edwards" addressable point type smoke detector - optical. Model: SIGA-OSD.	no.	28		
4	S/S - "Edwards" addressable sounder with strobe (visual indicator) alarm signal - red - Model: GCSVRF-CVR.	no.	3		
5	Class A wiring - PH30, 2Cx1.5 mm², run in "Bosal" conducting.	m	280		
	carried forward to the summary page				

no.	Description	Amount
	Summary Page	
1	Miscellaneous - Page 4	R
2	Fire Services - Sections A, B & C	R
3	Provisional Sums (Item 9 & 10 Miscellaneous**)**	**R 12 000,00**
	SUB-TOTAL A	**R**
	CONTINGENCIES 10% - TO BE USED UPON APPROVAL BY THE CLIENT	**R**
	SUB-TOTAL B (INCLUDING 10% CONTINGENCIES)	**R**
	ADD: VAT 15%	**R**
	TOTAL PRICE (ALL – INCLUSIVE)	**R**

MANGOSUTHU UNIVERSITY OF TECHNOLOGY

DINING HALL REFURBISHMENT PHASE 2

FIRE BILL OF QUANTITIES

no.	Description	Unit	Qty	Rate	Amount
	MISCELLANEOUS The costs for the following items shall not be included in the cost rates for work listed in the rest of the BOQ.				
1	Contractor's P&G's, including compliance to OSHA, exit medicals, site supervision, management, site establishment and other relevant MUT specifications.	sum	1		
2	Workshop drawings as specified. Drawings are to be done on CAD, as no hand-drawn mark-ups will be accepted.	sum	1		
3	Builder's work drawings as specified. Drawings to be done on CAD, as no hand-drawn mark-ups will be accepted.	sum	1		
4	As-built drawings as specified. Drawings are to be done on CAD, as no hand-drawn mark-ups will be accepted.	sum	1		
5	4 sets of hardcopy O&M manuals c/w USBs (incl. certificates issued on completion such as electrical compliances, etc., warranties, guarantees, maintenance schedule, etc.). USBs are to contain the entirety of the O&M manuals in digital form, neatly organized.	sum	1		
6	Commissioning & testing of the entire fire services systems by sub-contractor and supplier(s), including pressure testing, reports, etc. The contractor must notify the Engineer of commissioning so that they can be present.	sum	1		
7	Training of user department of the entire fire services systems. The contractor must notify the Engineer of training so that they can be present. O&M manuals are to be handed over at training.	sum	1		
8	Maintenance and guarantee of the complete installation for a period of 12 months from the date of completion and handover as per the Standard Specification.	sum	1		
9	Provisional sum - fire stopping (add R10 000,00).	sum	1	R10 000,00	R10 000,00
	carried forward to a summary page				

	Description	Unit	Qty	Rate	Amount
	FIRE PROTECTION **Drawing No.: LSG-2404-FIRE-500A** **Drawing No.: LSG-2404-FIRE-501A** All cost rates for the below are to be priced as fully supplied and installed. Where branded equipment is specified, these items are to be equal and approved to the branded model's specifications.				
A	**Fire / Safety Signage in Accordance with SANS 1186** Photoluminescent fire signage, 190mm high, housed in clear anodised aluminium frames, wall-mounted				
1	E1 - 190x380mm	no.	2		
2	E2 - 190x380mm	no.	1		
3	F22 - 190x380mm	no.	1		
4	F28 - 190x190mm	no.	4		
	Illuminated Signage, LED-backlit, mains powered with 3-hour battery backup, wall mounted (single-sided)				
5	E6 - 215x430mm	no	1		
B	**Manual Fire Fighting**				
1	FE-1 - Fire extinguisher c/w wall-mounted backing board covered in F24 chevron signage and extinguisher mounting bracket (4.5kg DCP).	no.	3		
2	FE-2 - Fire extinguisher c/w wall-mounted backing board covered in F24 chevron signage and extinguisher mounting bracket (5kg CO_2).	no.	2		
3	Fire hose reel cp valve - Ø25mm. Incl. decommissioning, relocation and recommissioning of the existing hose reel.	no.	1		
	Galvanized steel pipes and threaded fittings to SABS 62-1 and pipe threads to SABS 1109, for fire protection use: incl. nipples, off-cuts, wastage, fittings, hangers, support brackets, painting.				
4	Straight pipe - Ø25 mm	m	12		
C	**Fire Detection Equipment**				
1	S - "Edwards" addressable point type smoke detector - optical. Model: SIGA-OSD.	no.	7		
2	S/S - "Edwards" addressable sounder with strobe (visual indicator) alarm signal - red - Model: GCSVRF-CVR.	no.	2		
3	H - "Edwards" addressable combination detector - fixed temperature & rate of rise. Model: SIGA-HRD.	no.	9		
4	M - "Edwards" addressable manual call point, weatherproof - Model: SIGA-278.	no.	1		
5	Class A wiring - PH30, 2Cx1.5 mm^2, run in "Bosal" conducting. Incl. connection to the existing panel (Phase 1)	m	185		
	carried forward to the summary page				

no.	Description	Amount
	Summary Page	
1	Miscellaneous	R
2	Fire Services - Section A, B & C	R
3	Provisional Sums (Item 9 Miscellaneous**)**	**R 10 000,00**
	SUB-TOTAL A	**R**
	CONTINGENCIES 10% - TO BE USED UPON APPROVAL BY THE CLIENT	**R**
	SUB-TOTAL B (INCLUDING 10% CONTINGENCIES)	**R**
	ADD: VAT 15%	**R**
	TOTAL PRICE (ALL–INCLUSIVE)	**R**

Appointment of a suitably qualified and experienced Service Provider for the Supply and Installation of Firefighting Equipment for the Internal Refurbishments to the Dining Hall (DH) Phase 1 & 2 at MUT Main Campus.

ANNEXURE B

FIRE SPECIFICATION PHASE 1 & 2

MANGOSUTHU UNIVERSITY OF TECHNOLOGY

DINING HALL REFURBISHMENT PHASE 1 & 2

FIRE SPECIFICATION

CLIENT:

Mangosuthu University of Technology
301 Griffiths Mxenge Highway,
Durban,
4066

CONSULTING ENGINEER:

LSG Consulting Engineers Inc.
10 Derby Place, Derby Downs Office Park, Westville,
Durban, 3630

Tel. No.: 031 205 2335

REGISTERED NAME OF FIRE CONTRACTOR:
(Refer to clause 3 of Part A.)

INDEX

PART A: DETAILED TECHNICAL SPECIFICATION

1. GENERAL

Where the terms “Main Contractor,” “Builder,” “Electrical Contractor,” “Sub-contractor,” or “Fire Contractor” are used in this document, it is referring to the entity that is tendering for the works and/or their sub-contractors.

The International System of Units (SI) shall be used for all materials, equipment, and measurements.

Words used in the singular, where the context so permits, shall be deemed to include the plural and vice versa.

The Works shall comply with the Standard Specification which details the intrinsic properties (including materials and workmanship) of the installations, in so far as it is not overridden by the Conditions, Detailed Technical Specification (which includes all Drawings and Bill of Quantities) and/or written instructions of the Engineer.

The Fire Contractor is required to check all dimensions on site prior to preparing drawings for the installation of equipment and manufacture of ductwork and shall be held responsible for ensuring that all installed components, ductwork, and pipework conform to the building structure.

2. BRIEF DESCRIPTION OF PROJECT

The works are to be carried out at the Mangosuthu University of Technology dining hall, located in the Umlazi municipality of KZN.

The intent is to install new fire protection, signage and detection systems in the dining, leisure and studying areas, existing fire protection equipment will be reused where viable.

3. SCOPE OF WORKS

The Scope of Works includes the supply, delivery, installation, testing, commissioning, maintenance, and guarantee of the new fire protection systems in the buildings, as detailed on the drawings and BOQ as follows:

- New fire protection installation, all hose reels and extinguishers, pipework, etc.,
- New fire detection system and,
- New fire evacuation signage.

4. RESPONSIBILITIES

By submitting this tender, it shall be assumed the Fire Contractor has fully studied this document. The Contract, as detailed in these specification documents and the accompanying drawings, comprises the manufacture, supply, transport, delivery, hoisting, installation, testing, commissioning, setting in operation, maintenance, leaving in complete working order and guarantee of the entire fire services installation as specified. The Contract (except so far as the Contract otherwise provides) includes the provision of all labour, materials, contractor’s equipment, and everything else, whether of a temporary or permanent nature required.

Responsibility of the Fire Contractor

- Supply, installation, testing and commissioning of all required services,
- Coordination with professionals (electrical, structural, etc.), security, other contractors, etc.,
- Coordination of electrics with the electrical contractor, fire linkage with the Fire contractor, etc., and where these fellow contractors are not available, the responsibility shall fall upon the Fire Contractor,
- Provision of Builder’s Work and Shop drawings,

- Provision of As-built drawings and O&M manuals complete with USBs (4 copies), commissioning data, maintenance schedules, compliance certificates, etc., and
- 12-month free maintenance and guarantee period.

5. SYSTEM DESIGN

All workmanship and materials used in this installation shall be of the highest quality and, where not fully covered by this specification, shall conform with best modern practice, as determined by the Engineer. All work shall comply with the latest SABS/SANS regulations, CIBSE commissioning codes and the OSH Act, as amended.

6. PROGRAMME

i) Building work shall commence soon, and the Fire Contractor shall be required to commence work immediately upon receipt of instructions to proceed. The Main / Fire Contractor must state the complete construction time in months and coincide with the programme requirements from the Employer.

ii) The Fire Contractor shall submit a copy of their Programme to the Engineer for approval. After submission to and approval by the Engineer of such Programme, the Fire Contractor shall adhere to the order of procedure and method stated therein, unless they obtain the written permission of the Engineer to vary such order or method.

iii) The Fire Contractor is responsible for coordinating site Works under the Contract to suit the Programme. Exact dates must be known for the delivery of major equipment to meet key installation dates.

iv) The times required for the submission of the Builder's Work drawings shall be two (2) weeks, and Shop drawings shall be one (1) week from the date of acceptance of this Tender unless otherwise stated.

v) The entire fire protection installation must be commissioned, tested, and taken over by the Engineer as noted in the Commissioning Programme.

7. BUILDER'S WORK

i) All Builder's Work including openings or holes through the building structure or partition walls; trenches, ducts and cutting; and all plinths, concrete bases, supports, etc. required for the installations shall be carried out as part of the building works by the Main Contractor (or the Fire Contractor, as the case may be), provided that the Fire Contractor has submitted full details of such requirements within a reasonable time to the Engineer for approval, so that due consideration may be given before they commence the building works in accordance with the building programme in the areas concerned. After obtaining the said approval of the Engineer, the Main Contractor may carry out the Builder's Work as the works proceed.

ii) The Main Contractor must carry out all "cutting-away" and "making-good" as required to facilitate the work.

iii) The FIRE Contractor shall ensure that such work is essential for the execution of the installations. If any of such work is proved to be non-essential, unnecessary and/or abortive, the Fire Contractor shall bear the full cost of such works including but not limited to any unnecessary or incorrect cutting-away and making-good and shall reimburse the Employer for all costs incurred in this connection.

iv) All expenses properly incurred, and losses suffered by the Employer because of the Fire Contractor's failure to comply with the above requirements are recoverable by the Employer from the Fire Contractor as a debt under the Contract.

8. DRAWINGS

The Fire Contractor shall produce and co-ordinate the following drawings of all services included in this contract: Builder's Work drawings, Shop drawings (Design & Installation drawings) and As-built drawings. The Fire Contractor shall provide at least four (4) hardcopies and one electronic copy (CAD and PDF), for each of the aforementioned drawings.

It shall be binding upon the Fire Contractor to establish with or obtain from the Main Contractor the scheduled time of commencement and programming of all building work impacting the Fire Contractor in respect of this clause. The Fire Contractor shall allow reasonable time in the Programme for vetting of the Shop and Builder's Work drawings by the Engineer and for drawing resubmissions as necessary. When submitting any drawings, the Fire Contractor

shall advise the Engineer if early approval is necessary to avoid delay in completion of the Works. Approvals by the Engineer shall not be deviated from, unless authorized in writing by the Engineer.

Any extra expense incurred due to any addition and/or amendment made by the Fire Contractor after the drawings mentioned above have been submitted or due to the untimely submission of drawings shall be for the Fire Contractor's account.

8.1. Shop Drawings

- The Fire Contractor shall, in the stated or in adequate time before each section of the work proceeds, prepare, and submit for acceptance by the Engineer, detailed Shop drawings to demonstrate how they propose to install the works.
- No equipment shall be delivered to the site and no work shall be executed until the Shop drawings have been approved in writing by the Engineer. All alterations to Shop drawings, whether due to co-ordination or otherwise, shall be carried out by the Fire Contractor at their expense. Work installed or equipment ordered prior to approval of the Shop drawings shall be liable to rejection by the Engineer, and removal and/or replacement by the Fire Contractor, at the Fire Contractor's cost.

8.2. Builder's Work Drawings

- The Fire Contractor shall, in the stated or in adequate time before each section of the work proceeds, prepare, and submit for acceptance by the Engineer, detailed Builder's Work drawings. These drawings shall be fully dimensioned and contain all openings required in the slabs, walls and partitions and equipment foundation details with weights and sizes.
- No Builder's Work shall be executed until the Builder's Work drawings have been approved in writing by the Engineer. All alterations to the Builder's Work drawings, whether due to co-ordination or otherwise, shall be carried out by the Fire Contractor at their expense. Work performed before the approval of the Builder's Work drawings shall be liable to rejection by the Engineer, and removal and/or replacement by the Fire Contractor, at the Fire Contractor's cost.

8.3. As-built Drawings

- The Fire Contractor shall submit, no later than two (2) weeks after Practical Completion (or Sectional Completion as the case may be) of the Works, detailed As-built drawings to the Engineer for approval. These drawings shall be complete with all details concerning the mechanical installations, along with appropriate pipework, ductwork and cable sizes, pressures and flow rates for recommissioning purposes and access points for operating and maintenance purposes. The Fire Contractor shall ensure all As-built drawings are an accurate representation of the installations, before submitting them to the Engineer.
- The Fire Contractor shall provide one hardcopy and one electronic copy (CAD and PDF) of the approved As-built drawings (included as part of each of the 4 required O&M manuals and USBs) to the Engineer for distribution.
- The Fire Contractor shall provide and install in the relevant major plant room glass-framed, non-fading prints of the following:
    - Schematic diagrams showing the layouts and positions of the major equipment items and identification of all valves and dampers with the final settings/adjustment for regulating devices, and
    - Plant room record drawings showing all plant items, pipework, ductwork, etc. including all electrical and control schematics and diagrams.

Glazing shall be the polished plate of not less than 6mm thickness mounted in a natural finish, extruded, and anodised aluminium frames with the prints mounted on acid-free mounting board and the whole backed with marine grade plywood not less than 8mm thick.

9. QUALITY OF MATERIALS AND WORKMANSHIP

i) The Fire Contractor shall, upon the request of the Engineer, furnish him with documentary proof to his satisfaction that the materials are of the quality specified. Samples of materials for testing, if required, shall be supplied by the Contractor, free of charge.

ii) Where applicable, all material shall be in accordance with the relevant standard specifications of the SABS and/or other standards as specified in the technical specifications.

iii) The Engineer reserves the right to reject any work or part thereof that, according to his judgement, does not meet the highest standards of material and workmanship and to enforce replacement of the work at the expense of the Fire Contractor.

10. EQUIPMENT AND MATERIAL

i) The installation shall include everything necessary and installed to the approval of the Engineer. The design and installation of the equipment required for adherence to the Standards and Codes may not have been indicated in detail in the Specifications; but will nevertheless be considered included in the Contract Value.

ii) The Fire Contractor shall submit catalogues and manufacturer's specifications of the proposed equipment and material, in English and SI units, for the approval of the Engineer in writing before any equipment or material is procured.

iii) It is the intent of these Specifications that wherever a manufacturer of a product is specified, the terms “equal and approved” are used. The substituted item must conform in all respects to the specified item and written approval of the Engineer is necessary before any equipment or material is procured.

iv) Consideration will not be given to claims that the substituted items meet the performance requirements with lesser construction (such as lesser exchange surface, etc.). Performance as delineated in schedules and in the specifications, shall be interpreted as minimum performance. In many cases, equipment is oversized to allow for pickup loads which cannot be delineated under the minimum performance.

v) Substituted equipment, where permitted and approved, must conform to space requirements. Any substituted equipment that cannot meet space requirements, whether approved or not, shall be replaced at the Fire Contractor’s full expense.

vi) All other things being equal, preference shall be given to South African manufactured materials and/or equipment. All equipment and/or materials required for the installation under these Specifications shall be new and without blemish or defect.

vii) The Engineer’s decision shall be final.

11. PROTECTION OF WORKS

i) The Fire Contractor shall be held responsible for any damage of equipment during transport and installation as well as any damage to the building and shall repair any such damage at its own expense. Where equipment cannot be repaired to an “as-new” condition, it will be completely replaced at the expense of the Fire Contractor.

ii) Equipment delivered to the site shall be stored in a well-protected area where it cannot be damaged.

iii) All cases of theft or fire must immediately be reported to the Main Contractor and Engineer with full details. Failure to do so may result in these cases of theft or fire not being considered.

12. SITE SUPERVISION

i) The Fire Contractor shall keep on the site a competent and technically qualified site supervisor to control, supervise and manage all their installations on site. The site supervisor shall be vested with suitable powers to receive instructions from the Engineer or their representative.

ii) The site supervisor shall be technically competent and have adequate site experience for the installations. The qualified and competent site supervisor shall have a minimum of 5 years of on-site experience for similar types of installation works. The Fire Contractor shall immediately replace the site supervisor whose experience, skill, or competency is, in the opinion of the Engineer, found to be inadequate for the work.

iii) All tradesmen must be experienced in the trade and the works carried out shall be to the satisfaction of the Engineer.

13. PIPEWORK

The Fire Contractor shall supply and install all pipework, valves, fittings, etc. as specified and/or shown on the Tender drawings and in accordance with the Standard Specification.

The following types of piping shall be installed:

Fire Pipework - Galvanized Steel

14. ELECTRICAL EQUIPMENT AND WIRING

The complete electrical installation and all electrical equipment and materials covered under this Contract shall comply will all relevant standards, including the following:

- SANS 10142-1:2017 (as amended),
- Occupational Health and Safety Act, 1993,
- Normal requirements laid down by Eskom,
- Latest requirements of the IEC and British Standard Institute, where no SANS codes of practice exist,
- All rules and regulations issued by local and other authorities having jurisdiction over the Contract,
- The Standard Specification and drawings appended hereto.

Any deviation from these specifications shall be conditional upon the written approval of the Architect, Engineer or his appointed representative.

The Fire Contractor shall employ the services of an electrical specialist, who shall be responsible for the application, engineering, documentation, supply, installation, commissioning, and maintenance of the system.

The Fire Contractor shall secure the approval of all authorities required for the installation. The Engineer or their representative reserves the right to call for test certificates and characteristic curves of every item of equipment to prove compliance – with the standard to which it is built – in manufacture and performance. Test certificates shall be issued by a recognized testing authority and shall be submitted at the same time called for.

Every effort shall be taken to protect materials – either fixed or unfixed – from damage. All items shall be protected against the ingress of dust and moisture so that no damage results to any item or system. All large items requiring removal and exceeding 25 kg in mass, shall be fitted with lifting lugs or eyes. All items of equipment mounted outdoors, or in a wet or possibly wet environment, shall be weatherproof.

Supply and installation shall include all equipment detailed on the approved Shop drawings and wiring diagrams. The equipment, such as starters, contactors, relays, etc., used in the electrical installation shall be fully catalogued products. All items of the electrical installation shall be readily accessible for quick and easy replacement. Adequate space shall be provided around all items for easy removal of parts.

Commissioning shall include the validation of the systems as detailed on the Shop drawings and wiring diagrams; and demonstrating that the electrical system does in fact provide the sequence of operation, control and safety operation as detailed on the approved wiring diagrams. In addition, commissioning shall involve the close cooperation of the electrical specialist contractor and the automatic control system contractor with the Fire Contractor in adjusting the electrical system to provide the results intended.

Methods of recording and presentation shall be required for incorporation in the O&M manuals and display in the plantrooms. Other documentation required shall include the installation, testing and maintenance instructions, including the performance curves/selection tables for the expected range of operating conditions.

On completion of all inspections, tests and commissioning of the Works, the Contractor shall issue the Engineer with a certificate of compliance by an accredited person.

15. CONTROL AND MONITORING SYSTEM

Controllers are to be provided and installed as per the Drawings / BOQ.

16. PAINTING

Where painting is specified, the following shall apply:

- Steel surfaces shall be properly cleaned by removing all dirt, oil, scale, and rust by brushing and sanding until a clean shiny surface is obtained. Hereafter a metal primer shall be applied.
- Galvanized surfaces shall be cleaned with a galvanizing cleaning agent and then washed with clean water to remove the factory-applied protection against white rust. Hereafter a calcium plumbate primer shall be applied, followed by an undercoat between 24 and 72 hours after application of the primer.
- Other surfaces shall be cleaned by removing all dirt and a primer as specified by the paint supplier for the particular surface shall be applied.
- The primer coat shall be followed by a matt undercoat and a final topcoat of high gloss enamel of an approved colour. Each layer of paint shall be clearly distinguishable from each other by means of different colours and each layer shall be properly sanded before the following coat is applied.
- All paint shall at least be of SABS quality for industrial use and shall be approved by the Engineer. Equipment shall be painted according to the National Colour Standards for Paint, SANS 1091, as amended.

17. OPERATING & MAINTENANCE (O&M) MANUALS

Before completion of the Works, the Contractor shall hand, free of charge to the Engineer, four (4) copies of the O&M manuals and 4-OFF USBs for the entire plant covered by the Works as specified in the Standard Specification. Training as per the Standard Specification is mandatory.

Manuals shall be available two weeks before the practical completion of the installation, and no handover shall be considered without these manuals.

18. MAINTENANCE AND SERVICING

i) All equipment supplied, and work done as part of this Contract shall be maintained and guaranteed for a period of one year from the date of practical completion. This includes statutory maintenance as specified by the relevant SANS specifications. The Fire Contractor shall service the equipment and attach the necessary stickers with service dates and next due date to all equipment before practical completion shall be achieved.

ii) The Fire Contractor is responsible for all material and labour during this period.

iii) The Fire Contractor shall visit the installation on a monthly basis and do the scheduled maintenance as prescribed in the operating instructions. On completion of the monthly visit, a full report shall be prepared and submitted to the Engineer within 5 days of the visit.

iv) In case of a breakdown, the Fire Contractor shall react within a reasonable time and repair the installation to the satisfaction of the Engineer. Should the Fire Contractor, at the discretion of the Engineer, not react within reasonable time, the Engineer shall commission another contractor and the cost thereof shall be recovered from the defaulting Fire Contractor.

19. COMMISSIONING

- The installation shall be commissioned in accordance with the NFPA Standard for Commissioning, or any other recognized commissioning procedure or code approved by the Engineer.
- The Contractor shall submit a commissioning program to the Engineer at least two weeks prior to the commencement of commissioning and shall at the same time notify the Engineer of the code or procedure to which the plant will be commissioned.
- The results of all checks and measurements shall be recorded in writing during the commissioning period. Commissioning records shall be handed over to the Engineer prior to the first acceptance of the plant. The commissioning records shall also be included in the operating manuals.

20. TRAINING

The Fire Contractor shall train the Employer's site staff after commissioning has been completed. The site staff shall receive enough instructions to ensure that they are fully conversant with the equipment concerned. The operating manuals shall be used during training.

PART B: PROPOSED DETAIL OF EQUIPMENT

The Tenderer shall fully detail the proposed equipment below.

1. FIRE SIGNAGE

Manufacturer: _____

Type & Material: _____

2. FIRE HOSE REELS

Manufacturer: _____

Type & Model: _____

3. FIRE EXTINGUISHERS (DCP)

Manufacturer: _____

Type & Model: _____

4. FIRE PROTECTION RETICULATION PIPEWORK

Manufacturer: _____

Type & Material: _____

5. SMOKE/HEAT DETECTOR

Manufacturer: _____

Type & Model(s): _____

6. FIRE ALARM PANEL

Manufacturer: _____

Type & Model: _____

7. FIRE HORN SOUNDER/VISUAL INDICATOR

Manufacturer: _____

Type & Model: _____

8. MANUAL CALL POINT

Manufacturer: _____

Type & Model: _____

9. CONTROL RELAY MODULE

Manufacturer: _____

Type & Model: _____

Note: Tenderer is to submit additional details of other valves and fittings offered, as appropriate.

PART C: STANDARD SPECIFICATION

The Standard Specification applies to and is to be read in conjunction with the Detailed Technical Specification, which covers the equipment, materials and operational methods required. In so far as the conditions herein contained are at variance with anything contained in the Detailed Technical Specification or the drawings, the Contract shall be interpreted in terms of the Detailed Technical Specification and the drawings for each service.

Furthermore, as the Standard Specification covers all sections of mechanical works of the building services, certain sections may not apply if these services are not covered in the Detailed Technical Specification.

The Fire Contractor shall be taken to mean the person, firm or company who shall be accepted as the successful tenderer and installer of the Contract Works described in the Detailed Technical Specification and shall include their legal representatives, administrators, successors and/or assigns who shall be deemed to have entered into a contractual agreement with the Employer or Main Contractor, as the case may be.

It is in the interests of the Fire Contractor to notify the Engineer when the installation has reached various stages of completion so the Engineer may inspect the installation and point out discrepancies. These inspections shall be considered informal and under no circumstances shall they, in part or in whole, invalidate the requirements of the Contract. Any costs incurred in correcting discrepancies shall be for the Fire Contractor's account.

CODES OF PRACTICE, LAWS AND STANDARDS

All workmanship and materials used in the execution of the Works shall be of the highest class, and where not fully covered by the Standard Specification or Detailed Technical Specification, shall be carried out in conformity with best modern practice, as determined by the Engineer.

The entire installation shall comply fully with all relevant requirements of Governmental and Local Authorities whose jurisdiction embraces the location of the Site of the Works and the equipment provided for these installations which shall comply in every respect with the following (excepting only where exemption from any such regulations has first been obtained in writing from the said Authorities, provided that the prior approval of the Engineer has been obtained for the application for any exemption):

- National Building Regulations and Building Standards Act (Act 103 of 1977), as amended,
- Occupational Health and Safety Act (Act 85 of 1993), as amended, and
- The relevant and applicable specifications of the South African National Standards (SANS).

Wherever relevant, this Standard Specification shall be understood to be amplified to embrace Codes of Practice and Standards promulgated by recognized authorities in the field of Fire Services, and all other branches of engineering science applicable to this project.

Standards referred to in this Standard Specification are the latest edition, including all amendments, published three calendar months or longer before the closing date of tender.

It shall be assumed that the Fire Contractor is conversant with the abovementioned requirements. Should any requirement, bylaw, or regulation, which contradicts the requirements of this document apply or become applicable during the erection of the installation, such requirement, bylaw, or regulation shall overrule this document and the Fire Contractor shall immediately inform the Engineer of such a contradiction. Under no circumstances shall the Fire Contractor carry out any variations to the installation in terms of such contradictions without obtaining written permission to do so from the Engineer.

It shall be the responsibility of the Fire Contractor to make the necessary arrangements at their own expense with the local supply authority and to supply the labour, equipment and means to inspect, test, commission and hand over the installation.

1. FIRE HOSE REELS AND HYDRANTS

All fire hose reels shall comply with the requirements of SANS 543, as amended, and be installed in accordance with SANS 10105-2 and SANS 10400-W, as amended. All fire hydrants shall comply with the requirements of SANS 1128-1, as amended, and be installed in accordance with SANS 10105-2, as amended, and maintained in accordance with SANS 1475-2, as amended.

1.1. Installation

Fire hydrants should be located in a firemen's lift lobby or emergency stairwell, where provided in a building, and shall be distributed in such a manner that the fire hose can reach every part of the relevant area. Any hydrants shall be provided with an appropriate fire hose of 24 or 30m in length, together with couplings and a 16mm internal hose diameter nozzle, all of which shall comply with the requirements of SANS 1128-2, as amended.

Fire hydrants and hose reels shall be provided in the positions as indicated on the Fire Protection drawings, subject to the approval of the local authority.

Fire hydrants and hose reels shall be installed to ensure they are readily accessible and immediately available in the event of a fire. The installation shall provide easy and unobtrusive access to the use of the equipment. The positions of the fire hydrants and hose reels shall be identified by means of fire signage complying with the provisions of SANS 1186-1, as amended.

2. FIRE EXTINGUISHERS

All portable fire extinguishers installed shall comply with the requirements in SANS 1910, as amended, and shall be installed, maintained, and serviced by competent persons in accordance with SANS 1475-1 and 10105-1, as amended. Operating instructions shall be provided for each type of fire extinguisher installed.

2.1. Installation

Fire extinguishers shall be provided in the general positions as indicated on the Fire Protection drawings, however, to be confirmed with the Engineer prior to procurement and installation.

Fire extinguishers shall be mounted on brackets or installed in marked cabinets. The positions of the fire extinguishers shall be identified by means of fire signage complying with the provisions of SANS 1186-1, as amended.

Installation of fire extinguishers shall be such that the carrying handle of the extinguisher is not more than 1.5m above the floor level. Where the extinguishers are to be installed in cabinets, the cabinets may not be provided with a lock of any type. It shall be easily openable to provide unobtrusive access to the equipment and the removal of it from the cabinet.

3. FIREWATER PIPEWORK

3.1. General

i) All pipework shall be cut accurately to measurements established on-site and installed into place without springing or forcing; and are to be properly clear of windows, doors, and other openings. All pipework shall be reamed after cutting and shall be clean, straight, and free of defects.

ii) Drawings are generally diagrammatic and indicative of work to be installed. Run and arrangement of pipework shall be approximate as indicated, subject to modification as required to suit conditions on site to avoid interference with work of other trades and to allow for convenient and accessible location of all parts of the pipework system. All required offsets, fittings, valves, taps, drains, etc. might not be indicated. Refer to and carefully check conditions on site and other services arrange work accordingly and install all offsets, fittings, valves, taps, drains, etc. required to meet such conditions.

iii) Pipework runs shall be straight and direct, in general forming right angles with or parallel to walls or other pipework, and neatly spaced. Pipework shall be installed so that there is sufficient clearance between the finished coverings of pipework, fittings and adjoining work. Pipework shall be hung at or in the ceiling from construction above as close as possible to the bottom of slabs, beams, etc., maintaining maximum headroom at all times. No item shall be installed to lower than the established ceiling height without written permission. Sleeves are to be provided where pipework passes through partitions, beams, slabs, etc.

iv) Valved and capped connections shall be provided for the drainage of the entire system at all low points to facilitate maintenance.

v) Unions or flanged connections shall be provided at connections to all equipment, shut-off valves, apparatus and specialities requiring disconnection for repairs, replacement, and adjustment.

vi) No cold springing shall be done except in the presence of the Engineer who must approve all operations before being carried out. Cold springing is defined as misalignment, any error in alignment, which requires more than 50 kg push or pull to bring into place. Where cold springing is called for on the drawings, the Engineer will observe the cold spring put in at each point indicated.

vii) Where necessary, adequate temporary supports shall be installed during erection so as not to overstress pipework or equipment to which pipework is connected.

viii) All supports shall employ heavy commercial hardware to BS EN 12845 and no perforated straps or strip steel shall be used.

ix) Where necessary, provision shall be made to minimize vibration of pipework. Pipework which is subject to vertical movements shall be provided with springs or other suitable supports.

x) Hangers shall be assembled in such a manner that they cannot be disengaged by any pipe or support steel movement.

xi) Pipework installed on racks shall lie directly on the steel except where shown with shoes. The Fire Contractor shall ensure that the corners of the support steel are smoothed off by filing or grinding.

xii) No pipe shall be supported from another pipe except where it is detailed as such on the Engineer's drawings.

xiii) The Fire Contractor shall be responsible for determining the sizes, quantities, types, and spaces of pipe hangers, supports and support devices not shown on the drawings. It shall be in accordance with this specification. The Fire Contractor shall be responsible for the supply and installation of all such hangers, supports and support devices. The Contractor shall supply details of all calculations to the Engineer for approval and shall supply the Engineer with two marked-up prints showing the location and types of all supports installed in addition to those specifically detailed.

xiv) During construction activities, all pipe ends shall be kept plugged to prevent any ingress of dirt, rubble etc. These plugs shall only be removed once construction activities necessitate to do so.

3.2. Above-Ground Pipework Installations

i) Pipework material shall comply with the following Specifications and Standards:

- Black and hot-dipped zinc-coated (galvanized) welded and seamless steel pipe - ASTM A 795

ii) Nuts, clips, eye rods, angle brackets, or other fasteners shall not be welded to pipes or fittings. Flanges shall be in accordance with ASME B16.5. Steel slip-on boss flanges for welding shall have a nominal pressure at least 10% in excess of the maximum fluid pressure.

iii) Bolts in flanges are to be high tensile steel and of the correct length such that no more than 1.5 clear threads protrude beyond the nuts after tightening to the correct torque.

iv) In flanged joints, new gaskets shall be used for every assembly operation unless such an assembly is intended solely for initial fitting. The Fire Contractor shall supply sufficient gaskets to meet this requirement. Gasket material shall be fibre composition or similar material suitable for pressure and temperature service.

v) Pipes joined with grooved fittings shall be joined by a listed combination of fittings, gaskets, and grooves. Grooves cut or rolled on pipe shall be dimensionally compatible with the fittings.

vi) All pipework, including non-metallic pipes, shall be marked continuously along its length by the manufacturer in such a way as to properly identify the type of pipe. This identification shall include the manufacturer's name, model designation, or schedule.

vii) All pipes shall be marked according to the requirements of the local authority or as specified by the Engineer. All surface pipes shall be painted to the required colour as specified by the Engineer.

viii) All pipework and fittings shall be pressure tested and certified to the Engineer's specifications.

ix) For screwed piping, the Fire Contractor shall use wrought iron fittings to ASME B1.20.1. Eccentric fittings shall be used at changes in pipe size. No bushing shall be used in lieu of reducing fittings. Screwed joints shall be screwed up tightly using an approved jointing compound such as PTFE tape. Hemp joints will not be accepted.

x) Pipework joints up to 50 mm in diameter shall be allowed to be screwed and socketed. 65 mm and larger shall be welded or grooved joint coupling type.

3.3. Underground Pipework Installations

i) Unless otherwise specified, all underground pipework greater than 50 mm in diameter shall be Class E uPVC with rubber ring-type joints.

ii) All bends shall be uPVC Class E type fittings with rubber ring joints.

iii) All other fittings such as T-pieces, flanges, etc. shall be bitumen-dipped cast iron rubber ring jointed fittings.

iv) No solvent weld-type fittings will be allowed.

v) All cast iron fittings shall be coated and wrapped.

vi) All pipework shall be laid on a 100 mm sand-bedding cradle and covered with 300 mm sand before backfilling.

vii) All backfilling shall be to the Engineers specification and approval.

viii) Pipework trenching for flexible pipe bedding:

Area	Minimum	Main Fill
Vehicle traffic	1 100	Soilcrete
Under surface bed	600	Soilcrete
Other areas	900	90% MOD AASHTO

ix) All thrust blocks shall be cast between the pipe and the undisturbed trench material.

x) No concrete shall come into direct contact with the uPVC pipe. At the thrust blocks the bend shall be wrapped with a "Densopol 80 HT tape" or equal and approved.

xi) All pipes shall be laid with at least a 900 mm cover to the top of the pipe.

xii) Marker blocks to standard detail shall be installed at all tees or changes of directions.

xiii) HDPE pipe connections to uPVC pipes up to 50 mm in diameter can be done by means of SG iron-manufactured saddles with the appropriate gaskets and cadmium-plated bolts and nuts.

xiv) All pipe crossings under traffic areas shall be backfilled with soilcrete and compacted as specified.

xv) All pipework shall be pressure tested with all joints uncovered, to the satisfaction of the Engineer.

xvi) Any pipe buried shall have at least 900 mm cover and steel pipes shall be coated and wrapped with approved corrosion protective material and tested in the presence of the Engineer.

3.4. Pipe Supports, Hangers, Anchors and Brackets

i) All pipe hangers, brackets, supports, stanchions, and anchors shall be designed, supplied, and installed by the Fire Contractor in accordance with Section 6 (Hanging, Bracing and Restraint of System Piping) of the NFPA 13 Standard for Installation of Sprinkler Systems - latest edition.

ii) All pipe hangers, brackets, hanger rods, fasteners, supports, stanchions, and anchors shall be designed considering the following:

Maximum Distance Between Hangers (m) for Difference Pipe Diameters (mm)											
Pipe Description	**20**	**25**	**32**	**40**	**50**	**65**	**80**	**100**	**125**	**150**	**200**
Steel pipe except threaded light-wall	3	3.6	3.6	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Threaded light-wall steel pipe	N/A	3.7	3.7	3.7	3.7	3.7	N/A	N/A	N/A	N/A	N/A
Copper tube	2.4	2.4	3	3	3.7	3.7	3.7	4.5	4.5	4.5	4.5
CPVC	1.7	1.8	2	2.1	2.4	2.7	3	N/A	N/A	N/A	N/A
Polybutylene (IPS)	N/A	1.1	1.4	1.5	1.8	N/A	N/A	N/A	N/A	N/A	N/A
Polybutylene (CTS)	0.9	1	1.2	1.3	1.6	N/A	N/A	N/A	N/A	N/A	N/A

Ductile iron	N/A	N/A	N/A	N/A	N/A	N/A	4.5	4.5	N/A	4.5	4.5

These spans may be exceeded when clearly necessary, provided the working stress in the longitudinal axis plus bending stress, does not exceed 69 MPa.

iii) Components of any pipe support shall be securely attached to each other by means of bolts or threaded rods with nuts and washers.

iv) All components of all pipe supports shall be galvanized.

v) All support components shall be true to shape and free from sharp corners. All boltholes shall be accurately located and free from distortion.

vi) Pipe supports shall be capable of withstanding loads equivalent to the relevant proof test loads as listed in the SANS 10287 table 5, as amended.

vii) The proof test load shall not cause failure or damage to the hanger assembly. Test loads shall be applied to pipe clips using appropriately sized mandrels.

viii) Critical movement in hanger assemblies shall be taken up by the pre-measurement load indicated in the table, before final proof test loads are applied. Test loads shall be applied gradually without any sudden change in magnitude.

ix) The final method of supporting all of the piping shall be approved by the Engineer and shall have been tested by an approved authority to comply with the stress loadings of this specification.

3.5. Use of Denso type

Where Denso protection is required, the following specifications must be adhered to:

- Piping to be prepared using Denso Primer, Denso HT Inner Wrap and Denso PVC Outer Wrap.
- Fittings and pipe work other than cast iron must be hot dip galvanized prior to wrapping.
- Denso HT shall be applied by hand and wrapped in a clockwise direction with a minimum 55% overlap; Two layers shall be applied.
- Denso PVC Outer Wrap must be wrapped in an anti-clockwise direction with a minimum 25% overlap, over the second Denso layer.
- Buried flanges are to be encapsulated in Denso Mastic prior to the application of the Denso HT tape; and
- The wrapping of pipework must extend at least 150mm above finished ground level and be secured with bandit strapping. In such cases, the PVC tape must be painted with an appropriately compatible ultraviolet-resistant paint.

3.6. Pressure Testing

i) All piping shall be pressure tested before being taken into use and this test shall be witnessed by the Engineer.

ii) The Fire Contractor shall provide two pressure tests to the entire system. The first test shall consist of a compressed air test to a minimum pressure of 1 000 kPa. The second pressure test shall consist of a water test to a minimum pressure of 1 600 kPa and shall only be performed once the complete system has been installed and inspected and approved by the Engineer. The water to be used for the water pressure test shall be sterilized as described in this specification. On completion and approval of the water pressure test, the system shall be drained and flushed and only filled with approved water from the completed water supply system on approval from the Engineer.

iii) For water tests, completed sections of the pipe installation shall be filled with water after all outlets have been plugged, sealed, or closed. The section of pipe shall be hydraulically pressure tested by means of a suitable manually operated or mechanically driven pressure pump. A pressure of at least 1.5 times the working pressure of the class rating of pipes or fittings, with a minimum pressure of 1 600 kPa shall be applied for a period of time specified in the specifications or as recommended by the manufacturers.

iv) Tests shall not be performed against closed valves.

v) Leakages that occur shall be measured calculated and checked against the allowable losses.

vi) For underground pipe installations, if the completed section of pipe complies with all specifications and passes the tests and inspection, it could be approved and the Fire Contractor may be instructed to backfill the open sections of the trench at the joints and connections, where applicable. The Fire Contractor shall then proceed to build all the valve chambers, inspection chambers, etc.

3.7. Sterilization of Fire Water Systems

i) Pipe systems including all fittings shall be completely and fully sterilized before being taken into use. The pipe system shall be filled with potable water chlorinated to a concentration of 15 mg of chlorine per liter of water. The chlorinated water shall remain in contact with the inner surface of the pipeline for a period of not less than 24 hours. The pipe system shall be filled with chlorinated water in such a manner that no chlorine shock is created, or air is trapped in the pipeline.

ii) At least 14 days prior to the commencement of sterilizing, the Fire Contractor shall submit full details of the proposed method of sterilizing the pipeline to the Engineer for his approval.

iii) The cost of water for filling the pipeline for sterilizing shall be borne by the Fire Contractor.

iv) The Fire Contractor shall provide all necessary materials, tools, equipment, and labour necessary to sterilise the pipeline. After sterilizing the pipeline, the Fire Contractor shall, at no extra cost, empty the pipeline and dispose of the water in a manner approved by the Engineer.

v) The Fire Contractor may use the following products as a source of chlorine:

- Chloride of lime yielding 33% free chlorine by mass,
- Calcium hypochlorite yielding 70% free chlorine by mass, or
- Chlorine gas applied by chlorinator.

vi) Once sterilization is completed, an approved water quality test shall be carried out to a minimum number of 10% of the total water points. These shall be randomly selected, evenly spread and marked on drawings. These tests shall include a full bacteriological test. Test results shall be handed to the Engineer. Test results shall be included in the O&M manuals. Each abortive test shall be for the Fire contractor's account.

4. FIRE SIGNAGE

The general escape route and fire protection equipment signage shall comply with the requirements in SANS 1186, as amended, in terms of type, dimensions, colour and material.

4.1. Installation

All signs shall be free from rough and sharp edges, warping, dents, cavities, and other surface irregularities. Signs shall not be prone to fading. Coated surfaces shall be smooth, and free from grittiness, runs, sags, wrinkles, brush marks, and orange peel.

Fire signage shall be provided in the general positions as indicated on the Fire Protection drawings, however, are to be confirmed with the Engineer prior to procurement and installation, and shall:

- Be clearly visible and by no means obscured by permanent or temporary obstructions,
- not create a hazard,
- Be placed where it can be seen readily and where it will provide optimal warning, and
- Be manufactured from the most effective materials for protection against corrosive elements in an area of corrosive chemicals and substances.

5. FIRE DETECTION

5.1. System Design & Installation

The entire system shall be configured to meet the requirements of a type L2/M system as per SANS 10139:

The System shall comprise an analogue addressable panel with microprocessor-based fire alarm control equipment to offer flexibility in both design and operation. The System shall be of modular concept for easy tailoring of system design, to meet the full requirements of this project.

The complete facility shall be protected by a fully Analogue Addressable Fire Alarm System. A range of smoke detectors, manual call points, control relays and sounders shall be installed throughout the building.

5.2. Fire Alarm Control Panel

The Main Control Panel will be equipped with sufficient loop cards to meet the needs of the entire project. There shall be sufficient spare capacity to cater for at least the full requirement plus 20% spare.

The FACP shall incorporate a number of features to allow easy operation through a user-friendly menu. It shall have a Graphical LCD display and non-tactile membrane-type switches/keypad in durable plastic. For reliability, it shall have its own on-board circuit protection and multiprocessor architecture. The keypad shall include means to enter two minimum-level passwords to prevent unauthorized manual control. The system shall be on and off-site programmable by using the keypad and, also by connecting a PC to the communication port on the main processor/display board. The system will be capable of providing fire, fault, action, supervisory, disable and monitoring facilities.

The FACP shall be fully configurable and expandable at the owner's site without the need for a handheld programmer. All the configurations shall be done by the control panel.

The FACP shall be of modular construction, capable of monitoring 2 monitored detection loops. Each loop shall be capable of accommodating a minimum of 127 addressable devices. It must be possible to add extra 2 loop expansion boards.

Each loop length maximum of 1.2km
Detectors (Smoke, heat, flame), manual call points, modules, and sounder strobe shall be connected on the same two-wire loop.

Each device and zone shall have its own 40-character text message allocation; also each device shall be linked to a software zone. Can be the device detailed and type, sensitivity and address on the control panel.

The Main FACP shall be capable of a minimum of 32 zone indications per panel and have 3 common 1-amp rated sounder circuits and 2 common 1-amp rated auxiliary relay contacts. The Panel shall have 32 programmable contacts on the front facia for use in controlling plants such as lifts, air-conditioners and pumps. The panel shall have an internal event printer; this shall be mounted within the same enclosure. The printer shall have the facility to be programmed to print alarms only; failure of the printer must not affect any other part of the system.

The FACP shall have a one-man walk test facility to periodically test the detectors without having to continually manually reset from the panel. The test feature shall have a silent mode option.

The FACP shall automatically program to switch the sounders to Day/Night mode whereby any alarm condition is recognized outside normal hours shall provide an evacuation signal throughout the entire premises.

The FACP shall have an internal memory lock to prevent unauthorized data entry and shall also have a 2000-memory event log for system information which shall be stored in non-volatile memory.

The FACP shall have the facility to network on Fibre Optic to other panels and repeaters, while communication to colour graphics shall be via RS232.

Alarm and faults shall be indicated as for a fire alarm via the LCD along with an associated LED and printer. A buzzer shall sound in the event of an alarm, pre-warning of fault.

The FACP shall have a verification facility to delay acceptance of alarms until they can be confirmed and shall meet the applicable standard. All the devices in the zone can be configured for verification through the panel. Manual call points or contact devices connected to a loop will be separated and will not be verified.

In the event of a fire alarm, the FACP unit shall operate the alarm signal throughout the building in accordance with the cause and effects and any additional requirements laid down by the Local authorities:

- Signal the local authority fire brigade via Auto Dialler/GSM
- Activate all control by event function related to the alarm

- Signal to graphic monitoring station
- Release door with the hold-open device shall be signaling to release on the affected floor.
- Operate fire dampers, and shut down HVAC, and general exhaust fans.

The Batteries and charger shall maintain the entire system, plus 20% for a minimum period of 24 hours standby in the event of mains failure. After 24 hours have elapsed the system shall be capable of initiating a full global alert and evacuating for a minimum period of 30 minutes.

The system shall be capable of handling a minimum of 64 networked panels.

The network shall be peer-to-peer with each panel generating commands to other panels as required. The network shall be fibre optic wiring up to 1.2km between two panels.

Each control panel shall operate independently by performing its own specific control, alarm supervision and history gathering. A system which requires a master or slave is not acceptable.

5.3. Repeater Panels (If Applicable)

A Repeater panel shall be connected via fibre optic output and installed in the Mechanics Room on the Ground Floor. The repeater panel shall have basic control, and have an LCD large display. The repeater panels shall be installed in slim-line, aesthetically pleasing enclosures.

5.4. Intelligent Photoelectric Smoke Sensor

The Photoelectric Smoke Sensor shall operate on a 'Fuzzy Logic Technology', by the use of a minimum of an 8-bit processor, to enable the sensors to store and analyse fire scenarios, thereby reducing susceptibility to false alarms and improving the sensitivity. The sensitivity of the device shall be variable. The device shall compress with remote indicator output. The addressable code for the device shall be static and located in the base.

The detector shall be capable of the features: sounder /strobe base at a minimum of 85dBA or isolator base. The detector base shall have no electronic circuit and shall include a separate twist-lock base.

5.5. Manual Call Points

The Manual Break Glass Call Point shall have a response time of less than 1 second and shall have a very low standby current, incorporating a status LED, which flashes when polled or is continuously lit when operated. An additional set of volt-free change-over contacts shall be incorporated for additional local signalling as required. The addressable code for the device shall be electronically programmed and stored in the sensor and be non-volatile. The addressable code for the device shall be static and located in the base.

5.6. Addressable Monitor Module (If Applicable)

The Monitor shall be installed to interface the Annunciator Panel in the Fire Hose Reel Pump House to monitor the pump conditions: Pump Run, Pump Fail, Low Battery etc., and supervisory tamper switch. All field wiring to be fully monitored for alarm and fault conditions. The interface shall be designed for 1st fix of the back plate will all terminations and be free of all electronics. The intelligent interface shall be installed at the commissioning stage. The addressable code for the device shall be electronically programmed and stored in the sensor and be non-volatile. The programming of this code shall be facilitated by a digital electronic hand-held device. This unit shall have 16 inputs and 2 outputs.

5.7. Addressable Interface Module

The Interface shall have a relay input with NO and NC volt-free contacts, these shall be separately driven under the control of the fire alarm panel. The output relay shall be rated to switch up to 1A 120V AC. A single input shall be provided with open and short circuit monitoring, which shall enable monitoring for confirmation signal that the plant under control has operated. If the relay has not operated within a programmed period of time a specific fault shall be generated.

The interface shall be designed for 1st fix of the back plate will all terminations and be free of all electronics. The intelligent interface shall be installed at the commissioning stage. The addressable code for the device shall be static and located in the base.

5.8. Circuit Isolator

The short circuit isolator shall be installed at least every twenty devices and or each separate fire zone and between floors. The circuit isolator shall be used to protect the installation wiring in the event of a short in the cables. Should a fault occur the isolator shall automatically disconnect the loop either side of the short, the control panel shall recognize this disconnection and shall communicate in both directions. This process will enable a limited number of devices to be off line whilst the fault is being investigated and repaired. Once the short is removed the isolators shall automatically reinstate the loop connection. The isolator shall incorporate an LED, which illuminates when the short is detected on the loop circuit.

5.9. Addressable Remote Sensor Indicator

Remote Indicators shall be installed at the Fire Hose Pump House and at another location determined on site. The remote indicators shall be linked to any number of detectors within the given location. The remote indicator shall be installed in a clearly identifiable location. The remote indicator shall fit onto a standard electrical accessory box.

5.10. Sounder Base

The sounder shall be loop powered low-profile design and shall incorporate an individual loop address; the unit shall neatly be incorporated within the sensor to ensure aesthetics are maintained. The sounder shall be rated 89dBA at 1 meter and 30 units per loop. The addressable code for the device shall be stored in the sounder and be non-volatile. The programming of this code shall be facilitated by a hand-held device.

5.11. Sounder-Strobe Base

The sounder shall be loop powered low-profile design and shall incorporate an individual loop address; the unit shall neatly be incorporated within the sensor to ensure aesthetics are maintained. The sounder shall be rated 90dBA at 1 meter and 30 units per loop. The addressable code for the device shall be static and located in the base.

5.12. Sounder & Strobe Loop Powered

The sounder and strobe shall be sited on the loop; surface mounted and shall incorporate an individual address. The sounder shall be rated 97 dBA at 1 meter and 30 units per loop. The addressable code for the device shall be static and located in the base. Weather resistant version should be utilized for external applications.

Addressable Sounder and Strobe Separate 24V

The sounder and strobe shall be surface mounted and shall incorporate an individual loop address, the addressable code for the device shall be static and located within the base. Weather resistant version should be utilised for external applications.

5.13. Intelligent Power Supplies

The specialist shall determine how many distributed power supplies shall be required for the complete project. Each power supply shall be fully monitored by the fire detection system for:

- Mains Healthy
- Mains Fail
- Charger Mail Function (Low Voltage)
- Batteries Mail Function (Low Amperage)

The Batteries and charger shall maintain the full load of the connected load, plus 20% for a minimum period of 24 hours stand-by, in the event of mains failure. After 24 hours has elapsed the system shall be capable of initiating a full global alert and evacuate or operation of all equipment reliant on the PSU for its supply for a minimum period of 30 minutes.

5.14. Electrical Installation

The Fire Alarm system shall be installed used fire rated cable. The fire rated cable shall be a minimum of 0.8 mm and shall be red Low Smoke and Fume (LSF) outer sheaf. The Fire rated capable shall be clipped directly to the building fabric for single and double cable runs. The Clips shall be fire rated metal with a LSF Coated Red finish. The clips shall be fixed suitably and shall be no greater than 300mm between fixings. Where there are more than 2 cables,

the cables shall be installed on a suitable galvanized tray or in trunking. Where cables run below 2.4 meters from the finished floor level then all cables shall be installed within galvanized conduit.

Correct corresponding termination devices and boxes shall be used. All devices shall be terminated using a compression lock gland coloured red manufactured in LSF material. Where devices are fixed surface a suitable LSF shroud shall be used.

Before any devices are connected the contractor must fully demonstrate and prove the quality of the installation for loop integrity, continuity, resistance and capacitance.

The system specialist shall install all devices, this shall include 2nd fix and 3rd fix. Prior to completion of the project, the system specialist must demonstrate the entire system to the approval of the Consultant. The entire system shall have been 100% tested independently prior to the demonstration to the Consultant. Should any items fail during the test a new and complete 100% re-test shall be carried. The specialist will be responsible for any costs involved with re-testing the system.

The system specialist will be responsible for providing complete and detailed manuals for the entire system. The manuals shall be fully detailed and shall describe the operation and function of each part of the system.

5.15. Drawings & Approval

Suitable layouts for the required installation are attached hereto.
The successful Tenderer shall take cognisance of other disciplines such as air conditioning ducts and equipment, lights etc, and shall consult the Main Contractor regarding these before submitting his/her detailed drawings to avoid any clashes with other services. Approval by the Engineer for the detailed shop drawings shall not absolve the Contractor from responsibility in respect to the accuracy of his dimensions and the potential clashes with other services. The Tenderer ensure that all measurements in the shop drawings have been checked on-site prior to installation.

5.16. Commissioning & Testing

The various detection and alarm systems and interfaces shall be fully commissioned, and the Tenderer shall allow for at least 2 training sessions with client-appointed personnel after the Hand-over tests are completed.

5.17. Operating & Maintenance Manuals

Full installation, operating and maintenance instructions shall be supplied in triplicate with each system and shall include schematics and detailed wiring drawings with a full component list indicating component values and sources of supply. Equipment will not be deemed accepted until such information is made available to the Department.

5.18. Inspection & Maintenance

Tenderers shall provide and allow for a full inspection of the detection and alarm systems by the Engineer before the Take-Over Date. Tenderers shall also provide and allow for three complete inspections with alarm tests every three months and for alarm tests only on the 12th month. After the completion of the 12-month maintenance period, the Client may insist on entering into a comprehensive maintenance contract with the installer for a period ranging from one to five years, at the sole discretion of the Client.

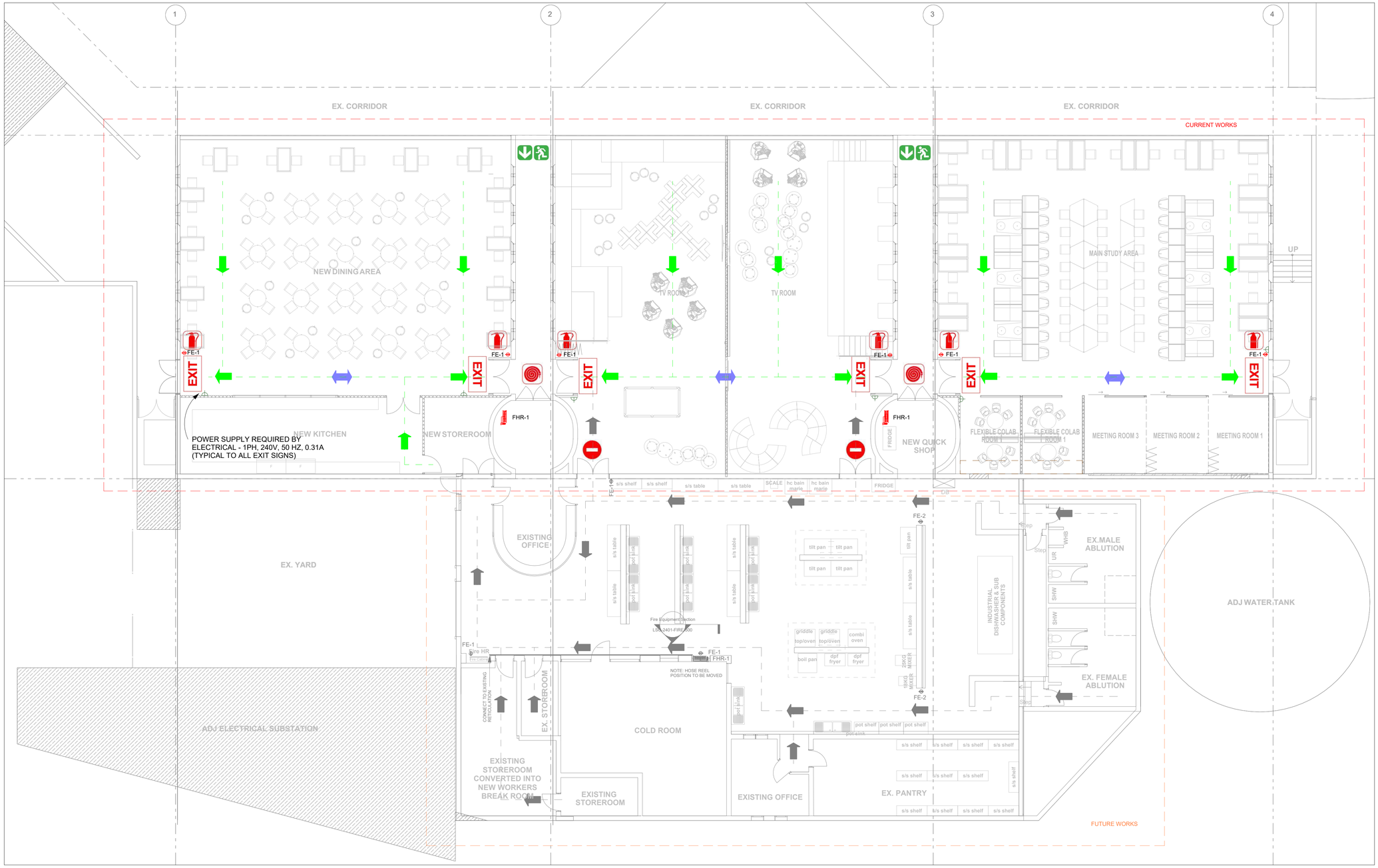
5.19. Guarantees

The complete installation shall carry a 12-month guarantee against defective materials and/or workmanship from the Take-Over Date.

Appointment of a suitably qualified and experienced Service Provider for the Supply and Installation of Firefighting Equipment for the Internal Refurbishments to the Dining Hall (DH) Phase 1 & 2 at MUT Main Campus.

ANNEXURE C

PHASE 1 DRAWINGS



2 Fire Protection Layout - Ground Floor

1 : 100

FIRE - EQUIPMENT SCHEDULE		
NO.	REF.	DESCRIPTION
6	FE-1	FIRE EXTINGUISHER - 4.5 kg DCP
2	FHR-1	FIRE HOSE REEL - 30m

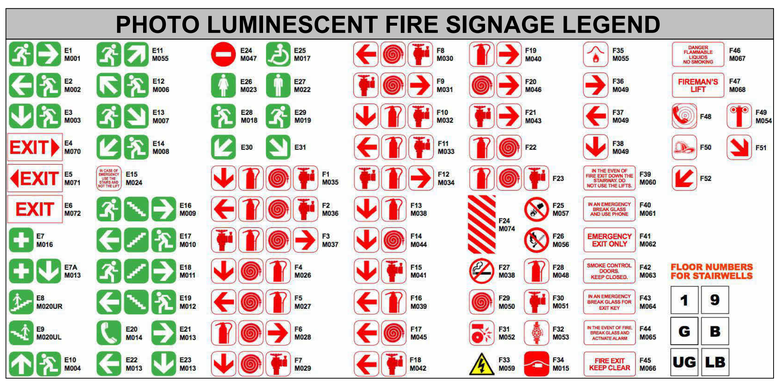
ELECTRICAL LEGEND	
	1PH POWER SUPPLY AND ISOLATOR. TO BE WEATHER PROOF IF EXPOSED TO THE ELEMENTS. REQUIREMENTS AS PER EQUIPMENT SCHEDULES.
	3PH POWER SUPPLY AND ISOLATOR. TO BE WEATHER PROOF IF EXPOSED TO THE ELEMENTS. REQUIREMENTS AS PER EQUIPMENT SCHEDULES.

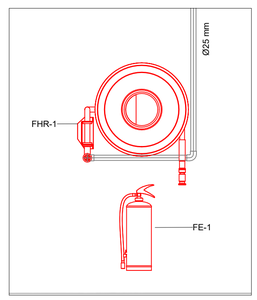
COLOUR LEGEND	
	PHASE 2 - FUTURE IMPLEMENTATION
	FIRE PROTECTION PIPEWORK AND EQUIPMENT
	FEEDER ROUTE
	FIRE ESCAPE ROUTE

FIRE SIGNAGE SCHEDULE				
REF	NO.	HEIGHT	COMMENTS	POWER SUPPLY
E3	2	190mm	WALL MOUNTED - PHOTOLUMINESCENT	-
E6	6	215mm	WALL MOUNTED - ILLUMINATED	1Ph, 240V, 50Hz, 0.31A
E24	2	190mm	WALL MOUNTED - PHOTOLUMINESCENT	-
F28	6	190mm	WALL MOUNTED - PHOTOLUMINESCENT	-
F29	2	190mm	WALL MOUNTED - PHOTOLUMINESCENT	-

FIRE PROTECTION LEGEND	
	TB - TWIN BOOSTER CONNECTION WITH BRASS CONNECTORS AND PRESSURE GAUGE
	FH - FIRE HYDRANT WITH PRESSURE GAUGE
	FHR - FIRE HOSE REEL
	FE - FIRE EXTINGUISHER

PHOTO LUMINESCENT FIRE SIGNAGE LEGEND





1 Fire Equipment Section

1 : 20

FOR TENDER

LIST OF REVISIONS

NO.	DATE	DESCRIPTION	BY
T00	29/10/24	Issued for Tender	PL

FIRE PROTECTION NOTES

1. THE FULL FIRE PROTECTION INSTALLATION IS TO BE IN ACCORDANCE WITH SANS 10400-T: 2024, AND THE REQUIREMENTS OF THE LOCAL AUTHORITY.
2. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER DRAWINGS ISSUED BY THE VARIOUS CONSULTANTS OF VARIOUS DISCIPLINES – IN PARTICULAR ARCHITECTURAL, STRUCTURAL, ELECTRICAL, MECHANICAL, AND CIVIL. ANY DISCREPANCIES BETWEEN THE DRAWINGS ARE TO BE BROUGHT TO THE ATTENTION OF THE ARCHITECT AND ENGINEER PRIOR TO ANY WORK BEING PUT IN HAND.
3. NO COMBUSTIBLE MATERIALS ARE TO BE USED IN THIS PROJECT, INCLUDING THE ROOF STRUCTURE, CEILINGS, FLOORING, WALLS, AND INTERNAL FINISHES. THE CONTRACTOR IS TO SEEK GUIDANCE FROM THE FIRE ENGINEER WHERE ANY COMBUSTIBLE MATERIALS ARE REQUIRED.
4. THE CONTRACTOR AND ALL SUB-CONTRACTORS ARE TO CHECK ALL DIMENSIONS AND LEVELS ON SITE PRIOR TO THE COMMENCEMENT OF ANY WORK, OR THE ORDERING OF ANY MATERIALS AND EQUIPMENT.
5. SHOP DRAWINGS AND EQUIPMENT SCHEDULES ARE TO BE SUBMITTED TO THE ENGINEER FOR APPROVAL BEFORE THE RELEVANT PROCUREMENT OR INSTALLATION.
6. ALL PIPEWORK SIZES INDICATED ON THE DRAWINGS ARE NOMINAL DIAMETER, UNLESS OTHERWISE STATED.
7. ALL FIRE PIPEWORK FOR FIRE HOSE REELS OR HYDRANTS ABOVE GROUND IS TO BE SEAMLESS GALVANISED MEDIUM STEEL TO SABS 62, PAINTED SIGNAL RED. PIPEWORK GREATER THAN 0150MM SHALL HAVE A WALL THICKNESS OF AT LEAST 6MM AND FLANGED.
8. ALL FIRE PIPEWORK UNDERGROUND SHALL BE SUITABLY PROTECTED AGAINST CORROSION WITH TWO LAYERS OF FULLY OVERLAPPING DENSO WRAP.
9. WHERE ANY PORTION OF A PIPE PASSES THROUGH A WALL OR FLOOR, SUCH PORTION MUST BE INSTALLED INSIDE A SLEEVE OF INTERNAL DIAMETER AT LEAST 15MM PLUS THE NOMINAL DIAMETER OF SUCH PORTION.
10. WHERE PIPEWORK EXITS THE GROUND, IT MUST BE THROUGH A CONCRETE FOOTING, AND ANY UNDERGROUND BEND MUST HAVE A CONCRETE SUPPORT BLOCK.
11. ALL REINFORCED CONCRETE FOOTINGS, BASES, COLUMNS, AND SLABS ARE TO STRUCTURAL ENGINEERS DETAILS AND DRAWINGS.

FIRE STOPPING & STABILITY

1. WHERE ANY ELEMENT OF COMPONENT OF A BUILDING IS REQUIRED TO HAVE A PARTICULAR FIRE RESISTANCE, IT SHALL BE FIRE RESISTANCE THROUGHOUT. PARTITION WALLS SHALL BE BUILT UP TO THE UNDERSIDE OF THE ROOF / SOFFIT.
2. SERVICES PENETRATING THROUGH ANY WALL OR FLOOR REQUIRED TO HAVE A FIRE RESISTANCE SHALL BE SEALED IN SUCH A MANNER THAT FIRE SHALL NOT PENETRATE SUCH WALL OR FLOOR. SUCH FIRE STOP SHALL HAVE A FIRE RESISTANCE OF NOT LESS THAN THE REQUIREMENTS FOR STRUCTURAL STABILITY GIVEN IN TABLE 5 OF SANS 10400-T: 2024.
3. CABLE TRAYS TO BE FIRE STOPPED WITH "HILTI' FIRESTOP BRICKS AND SEALED, OR EQUAL AND APPROVED.
4. METAL DUCTWORK AND FIRE DAMPERS TO BE FIRE STOPPED WITH "HILTI' FIRESTOP MORTAR, OR EQUAL AND APPROVED.
5. INDIVIDUAL ELECTRICAL CABLES AND METAL PIPES ARE TO BE FIRE STOPPED WITH "HILTI' FS-ONE MAX INTUMESCENT MASTIC, OR EQUAL AND APPROVED.
6. INDIVIDUAL PLASTIC PIPES ARE TO BE FIRE STOPPED WITH "HILTI' FIRESTOP COLLARS AND SEALED, OR EQUAL AND APPROVED.
7. ANY STRUCTURAL ELEMENT OR COMPONENT SHALL COMPLY WITH TABLE 5 OF SANS 10400-T:2024. STEEL SHALL BE PAINTED WITH PYRO-COTE INTUMESCENT PAINT, OR EQUAL AND APPROVED.
8. ALL FIRE STOPPING MEASURES ARE TO BE DONE IN ACCORDANCE WITH THE MANUFACTURER'S INSTALLATION INSTRUCTIONS.

OPENINGS IN WALLS

1. ALL OPENINGS FOR STEEL DUCTWORK, HVAC EQUIPMENT, AND LOUVRES ARE TO BE 50MM LARGER ON EACH SIDE THAN THE SIZE SHOWN ON THE DRAWINGS. A TIMBER FRAME OF THICKNESS 25MM SHALL BE INSTALLED TO BORDER THE OPENING.
2. ALL OPENINGS FOR PIPEWORK (OR INTERNAL DIAMETER OF SLEEVES) ARE TO BE 15MM LARGER THAN THE OUTSIDE DIAMETER OF THE PIPE PASSING THROUGH.
3. OPENINGS ARE TO BE MADE GOOD AND FIRE STOPPED AS NECESSARY AFTER INSTALLATION.

CONSULTANT INFORMATION

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Consulting Mechanical & Wet Services Engineers

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Unit 7&8 Doncaster Park,
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Tel.: +27 (12) 346 8676

DESIGN INFORMATION

DRAWN:	DESIGNED:	CHECKED:	DATE:
MJS	PL	GG	29/10/24

CLIENT INFORMATION

CLIENT LOGO: MUT MANGOSUTHU UNIVERSITY OF TECHNOLOGY

CLIENT NAME: Mangosuthu University of Technology

PROJECT INFORMATION

PROJECT DESCRIPTION: Dining Hall, TV Room & Study Facilty

PROJECT NAME: MUT - Refurbishments to the Exisiting Dining Hall

ADDRESS: 511 Griffiths Mxenge Highway, Umlazi

SITE DESCRIPTION: University

DRAWING INFORMATION

DRAWING TITLE: Phase 1 - Fire Protection Layout - Consolidated Ground Floor

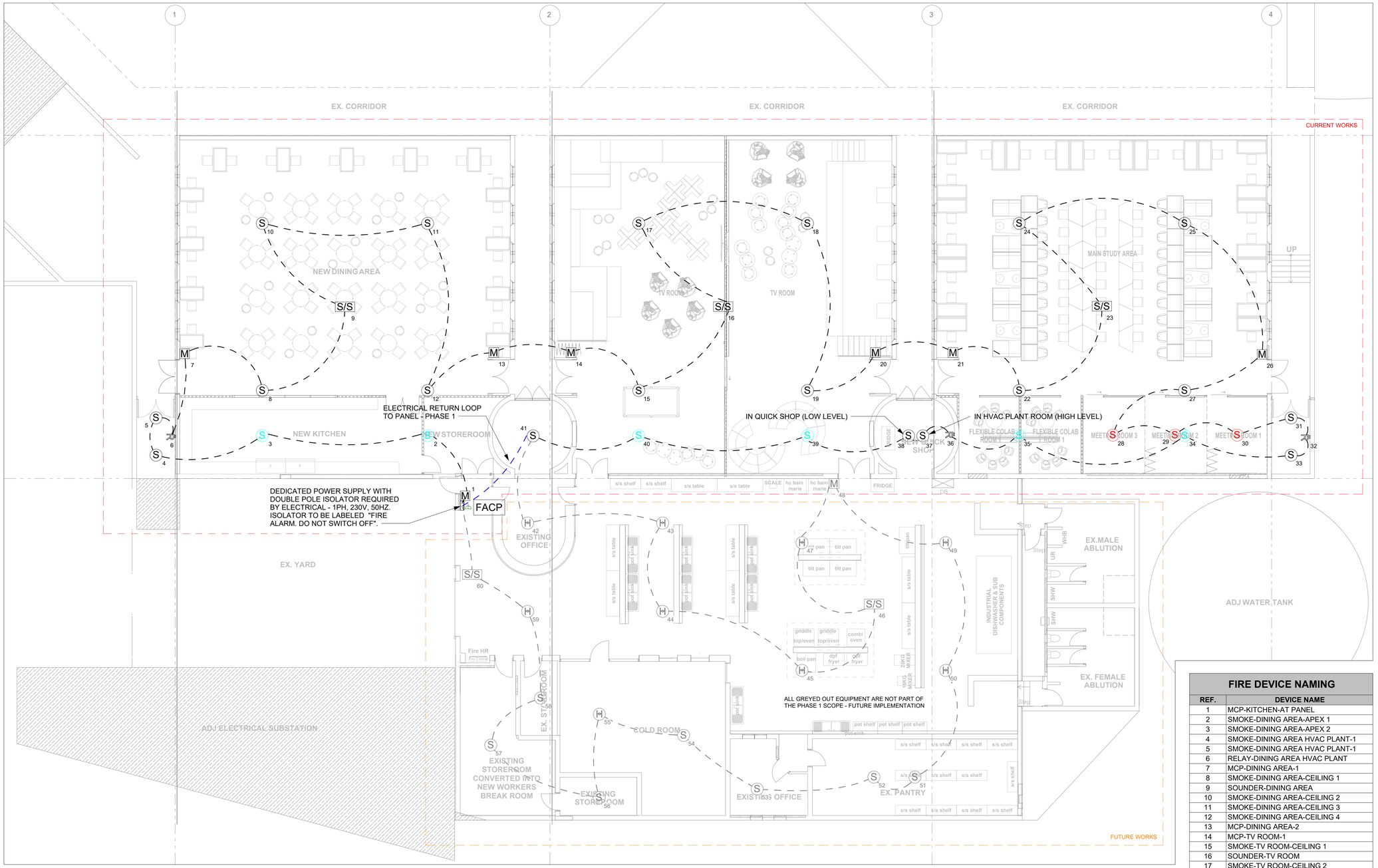
DRAWING SCALE: As indicated

SHEET SIZE: A1

DRAWING NUMBER: LSG-2401-FIRE-500

REVISION: T00

REFERENCE DRAWING: 209-100-MUT-DH-E100.dwg | DATE: 11/10/2024 |



1 Fire Detection Layout - Ground

1 : 100

FIRE ALARM DEVICE SCHEDULE

REF	NO.	DESCRIPTION	MODEL
FACP	1	"EDWARDS" ADDRESSABLE FIRE AND ALARM CONTROL PANEL - 2-LOOP WITH BATTERY BACK-UP	iO1000
M	7	"EDWARDS" ADDRESSABLE MANUAL CALL POINT	SIGA-278
R	3	"EDWARDS" ADDRESSABLE CONTROL RELAY MODULE - TO SHUTDOWN AHU DURING ALARM	SIGA-MCR
S	28	"EDWARDS" ADDRESSABLE POINT TYPE SMOKE DETECTOR - OPTICAL	SIGA-OSD
S/S	3	"EDWARDS" ADDRESSABLE FIRE ALARM WITH HORN SOUNDER AND VISUAL INDICATOR - WEATHERPROOF - RED	GCSVRF-CVR

CAUSE & EFFECT CHART

CAUSE	EFFECT							
Panel 1 - Loop 1	Audible and visual alarm in fire detection panel	All audible and visual alarms operate in building	AHUs to shut down	All audible and visual alarms in building silence	Fire detection panel audible alarm silence	Fire detection panel visual alarm silence	AHUs reset to normal operation	System restored to normal
FIRE ALARM								
Any fire detector operates	X	X	X					
Any manual call point is operated	X	X	X					
FAULT ALARM								
Wiring short	X							
Detector is disconnected from base	X							
Any line device in disconnected	X							
Mains power fault to panel	X							
PANEL ACTIONS / REPAIRS								
Operator activates fire alarm	X	X	X					
Operator presses silence				X	X			
Maintenance repair fault						X		X
Operator presses reset							X	X

FOR TENDER

LIST OF REVISIONS

NO.	DATE	DESCRIPTION	BY
T00	29/10/24	Issued for Tender	SG

ELECTRICAL LEGEND

	1PH POWER SUPPLY AND ISOLATOR. TO BE WEATHER PROOF IF EXPOSED TO THE ELEMENTS. REQUIREMENTS AS PER EQUIPMENT SCHEDULES.

FIRE ALARM LEGEND

S/S	ADDRESSABLE HORN SOUNDER / VISUAL INDICATOR (RED)
M	ADDRESSABLE MANUAL CALL POINT
S	ADDRESSABLE SMOKE DETECTOR (OPTICAL - STANDARD CEILING LEVEL)
S	ADDRESSABLE SMOKE DETECTOR (OPTICAL - HIGH ELEVATION CEILING)
S	ADDRESSABLE SMOKE DETECTOR (OPTICAL - MOUNTED ON ROOF APEX)
H	COMBINATION HEAT DETECTOR - FIXED TEMPERATURE & RATE OF RISE
R	CONTROL RELAY MODULE - ADDRESSABLE - SHUT DOWN AHU
	FIRE PANEL - ADDRESSABLE

NOTES:

1. ALL ADDRESSABLE SYSTEM WIRING TO BE CLASS A WITH SEPARATE WIRE WAYS AND CONDUITS FOR THE INCOMING AND OUTGOING WIRES FROM THE FIRE ALARM PANEL WITH SHORT CIRCUIT ISOLATORS AT THE END OF EVERY DETECTION ZONE, AT MINIMUM. ALL CONVENTIONAL SYSTEM WIRING TO BE CLASS B WITH END OF LINE DEVICES INSTALLED ON EACH LOOP.
2. ALL WIRING TO BE HAVE A MINIMUM FIRE RESISTANCE OF PH 30 (30 MINUTES). ALL WIRING TO BE RUN IN DEDICATED AND GROUNDED "BOSAL" OR EQUIVALENT GALVANISED STEEL CONDUITS. WHERE WIRING CROSS, THIS MUST BE DONE AT 90° ANGLES.
3. I/O ALLOCATIONS AND LINE DEVICE ADDRESSES ARE TO BE DETERMINED ON SITE BY THE INSTALLING CONTRACTOR.
4. CABLE ROUTING TO FOLLOW THE PRINCIPLES SHOWN ON THIS DRAWINGS HOWEVER FINAL ROUTES TO BE DETERMINED ON SITE BY THE INSTALLING CONTRACTOR.
5. ALL DIMENSIONS AND LEVELS ARE TO BE VERIFIED ON SITE BEFORE COMMENCING SETTING OUT, WORKSHOP DRAWINGS OR CONSTRUCTION AND MANUFACTURING.
6. USE FIGURED DIMENSIONS ONLY. ALL DIMENSIONS ARE SHOWN IN mm.
7. DISCREPANCIES, ERRORS AND OMISSIONS ARE TO BE REPORTED IMMEDIATELY TO THE DESIGNER AS SOON AS THEY BECOME EVIDENT.
8. ALL WORK CARRIED OUT TO BE IN STRICT ACCORDANCE TO THE SPECIFICATIONS.
9. ALL WORK IN SITE IS TO CONFORM TO SANS 10139, GOOD BUILDING PRACTICE AND ALL OTHER RELEVANT NATIONAL BUILDING CODES AND STANDARDS.
10. ALL EQUIPMENT TO BE SUBMITTED TO THE DESIGNER FOR APPROVAL PRIOR TO PROCUREMENT.
11. ALL WALL MOUNTED ALARM EQUIPMENT (BELLS, SIRENS, STROBES, ETC. TO BE MOUNTED AT 2500mm AFFL.
12. FIRE ALARM CONTROL PANEL(S) TO BE MOUNTED AT 1650mm AFFL TO TOP OF PANEL.
13. MCPs TO BE MOUNTED AT 1400mm AFFL
14. POINT TYPE SMOKE DETECTORS TO BE INSTALLED AT CEILING LEVEL.
15. INSTALLATION TO INCLUDE ALL SAFETY SIGNAGE REQUIRED AS PER RELEVANT SANS REGULATIONS.
16. SYSTEM OPERATION AND SET POINTS TO BE AS PER THE SPECIFICATION AND CAUSE AND EFFECT CHART.

FIRE DEVICE NAMING

REF.	DEVICE NAME
1	MCP-KITCHEN-AT PANEL
2	SMOKE-DINING AREA-APEX 1
3	SMOKE-DINING AREA-APEX 2
4	SMOKE-DINING AREA HVAC PLANT-1
5	SMOKE-DINING AREA HVAC PLANT-1
6	RELAY-DINING AREA HVAC PLANT
7	MCP-DINING AREA-1
8	SMOKE-DINING AREA-CEILING 1
9	SOUNDER-DINING AREA
10	SMOKE-DINING AREA-CEILING 2
11	SMOKE-DINING AREA-CEILING 3
12	SMOKE-DINING AREA-CEILING 4
13	MCP-DINING AREA-2
14	MCP-TV ROOM-1
15	SMOKE-TV ROOM-CEILING 1
16	SOUNDER-TV ROOM
17	SMOKE-TV ROOM-CEILING 2
18	SMOKE-TV ROOM-CEILING 3
19	SMOKE-TV ROOM-CEILING 4
20	MCP-TV ROOM-2
21	MCP-STUDY AREA-1
22	SMOKE-STUDY AREA-CEILING 1
23	SOUNDER-STUDY AREA
24	SMOKE-STUDY AREA-CEILING 2
25	SMOKE-STUDY AREA-CEILING 3
26	MCP-STUDY AREA 2
27	SMOKE-STUDY AREA-CEILING 4
28	SMOKE-MEETING ROOM 3
29	SMOKE-MEETING ROOM 2
30	SMOKE-MEETING ROOM 1
31	SMOKE-STUDY AREA HVAC PLANT-1
32	RELAY-STUDY AREA HVAC PLANT
33	SMOKE-STUDY AREA HVAC PLANT-1
34	SMOKE-STUDY AREA-APEX 1
35	SMOKE-STUDY AREA-APEX 2
36	RELAY-TV ROOM HVAC PLANT
37	SMOKE-TV ROOM HVAC PLANT
38	SMOKE-QUICK SHOP
39	SMOKE-TV ROOM-APEX 1
40	SMOKE-TV ROOM APEX 2
41	SMOKE-TUCKSHOP

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DESIGN INFORMATION

DRAWN:	DESIGNED:	CHECKED:	DATE:
MJS	SG	GG	24/10/24

CLIENT INFORMATION

CLIENT LOGO: MUT MANGOSUTHU UNIVERSITY OF TECHNOLOGY

CLIENT NAME: Mangosuthu University of Technology

PROJECT INFORMATION

PROJECT DESCRIPTION: Dining Hall, TV Room & Study Facilty

PROJECT NAME: MUT - Refurbishments to the Exisiting Dining Hall

ADDRESS: 511 Griffiths Mxenge Highway, Umlazi

SITE DESCRIPTION: University

DRAWING INFORMATION

DRAWING TITLE: Phase 1 - Fire Detection Layout - Consolidated Ground Floor

DRAWING SCALE: As indicated

SHEET SIZE: A1

DRAWING NUMBER: **LSG-2401-FIRE-501**

REVISION: **T00**

REFERENCE DRAWING: 209-100-MUT-DH-E100.dwg | DATE: 11/10/2024 |

Appointment of a suitably qualified and experienced Service Provider for the Supply and Installation of Firefighting Equipment for the Internal Refurbishments to the Dining Hall (DH) Phase 1 & 2 at MUT MainCampus.

ANNEXURE D

PHASE 2 DRAWINGS

1 Fire Protection Layout - Consolidated Ground Floor

1 : 100

FIRE - EQUIPMENT SCHEDULE

REF.	NO.	DESCRIPTION
FE-1	3	FIRE EXTINGUISHER - 4.5 kg DCP
FE-2	2	FIRE EXTINGUISHER - 6L WET CHEMICAL - CLASS F
FHR-1	1	FIRE HOSE REEL (SWING TYPE) - 30m

ELECTRICAL LEGEND

	1PH POWER SUPPLY AND ISOLATOR. TO BE WEATHER PROOF IF EXPOSED TO THE ELEMENTS. REQUIREMENTS AS PER EQUIPMENT SCHEDULES.
	3PH POWER SUPPLY AND ISOLATOR. TO BE WEATHER PROOF IF EXPOSED TO THE ELEMENTS. REQUIREMENTS AS PER EQUIPMENT SCHEDULES.

COLOUR LEGEND

PHASE 1 - COMPLETED WORKS
FIRE PROTECTION PIPEWORK AND EQUIPMENT
FEEDER ROUTE
FIRE ESCAPE ROUTE

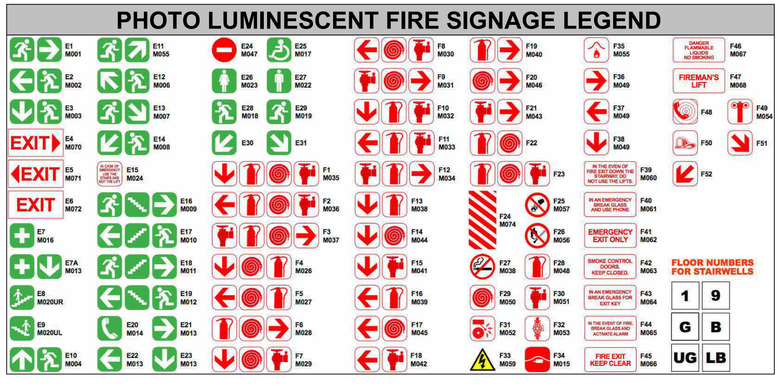
FIRE SIGNAGE SCHEDULE

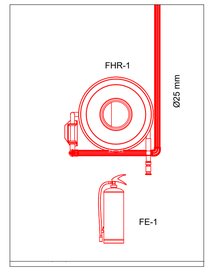
REF	NO.	HEIGHT	COMMENTS	POWER SUPPLY
E1	2	190mm	WALL MOUNTED - PHOTOLUMINESCENT	-
E2	1	190mm	WALL MOUNTED - PHOTOLUMINESCENT	-
E6	1	215mm	WALL MOUNTED - ILLUMINATED	1Ph, 240V, 50Hz, 0.31A
F22	1	190mm	WALL MOUNTED - PHOTOLUMINESCENT	-
F28	4	190mm	WALL MOUNTED - PHOTOLUMINESCENT	-

FIRE PROTECTION LEGEND

	TB - TWIN BOOSTER CONNECTION WITH BRASS CONNECTORS AND PRESSURE GAUGE
	FH - FIRE HYDRANT WITH PRESSURE GAUGE
	FHR - FIRE HOSE REEL
	FE - FIRE EXTINGUISHER

PHOTO LUMINESCENT FIRE SIGNAGE LEGEND





2 Fire Equipment Section

1 : 25

FOR INFORMATION

LIST OF REVISIONS

NO.	DATE	DESCRIPTION	BY
I00	27/11/24	Issued for Information	PL
I01	02/12/24	Issued for Information	PL

FIRE PROTECTION NOTES

1. THE FULL FIRE PROTECTION INSTALLATION IS TO BE IN ACCORDANCE WITH SANS 10400-T: 2024, AND THE REQUIREMENTS OF THE LOCAL AUTHORITY
2. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER DRAWINGS ISSUED BY THE VARIOUS CONSULTANTS OF VARIOUS DISCIPLINES – IN PARTICULAR ARCHITECTURAL, STRUCTURAL, ELECTRICAL, MECHANICAL, AND CIVIL. ANY DISCREPANCIES BETWEEN THE DRAWINGS ARE TO BE BROUGHT TO THE ATTENTION OF THE ARCHITECT AND ENGINEER PRIOR TO ANY WORK BEING PUT IN HAND.
3. NO COMBUSTIBLE MATERIALS ARE TO BE USED IN THIS PROJECT, INCLUDING THE ROOF STRUCTURE, CEILINGS, FLOORING, WALLS, AND INTERNAL FINISHES. THE CONTRACTOR IS TO SEEK GUIDANCE FROM THE FIRE ENGINEER WHERE ANY COMBUSTIBLE MATERIALS ARE REQUIRED.
4. THE CONTRACTOR AND ALL SUB-CONTRACTORS ARE TO CHECK ALL DIMENSIONS AND LEVELS ON SITE PRIOR TO THE COMMENCEMENT OF ANY WORK, OR THE ORDERING OF ANY MATERIALS AND EQUIPMENT.
5. SHOP DRAWINGS AND EQUIPMENT SCHEDULES ARE TO BE SUBMITTED TO THE ENGINEER FOR APPROVAL BEFORE THE RELEVANT PROCUREMENT OR INSTALLATION.
6. ALL PIPEWORK SIZES INDICATED ON THE DRAWINGS ARE NOMINAL DIAMETER, UNLESS OTHERWISE STATED.
7. ALL FIRE PIPEWORK FOR FIRE HOSE REELS OR HYDRANTS ABOVE GROUND IS TO BE SEAMLESS GALVANISED MEDIUM STEEL TO SABS 62, PAINTED SIGNAL RED. PIPEWORK GREATER THAN Ø150MM SHALL HAVE A WALL THICKNESS OF AT LEAST 6MM AND FLANGED.
8. ALL FIRE PIPEWORK UNDERGROUND SHALL BE SUITABLY PROTECTED AGAINST CORROSION WITH TWO LAYERS OF FULLY OVERLAPPING DENSO WRAP.
9. WHERE ANY PORTION OF A PIPE PASSES THROUGH A WALL OR FLOOR, SUCH PORTION MUST BE INSTALLED INSIDE A SLEEVE OF INTERNAL DIAMETER AT LEAST 15MM PLUS THE NOMINAL DIAMETER OF SUCH PORTION.
10. WHERE PIPEWORK EXITS THE GROUND, IT MUST BE THROUGH A CONCRETE FOOTING, AND ANY UNDERGROUND BEND MUST HAVE A CONCRETE SUPPORT BLOCK.
11. ALL REINFORCED CONCRETE FOOTINGS, BASES, COLUMNS, AND SLABS ARE TO STRUCTURAL ENGINEERS DETAILS AND DRAWINGS.

FIRE STOPPING & STABILITY

1. WHERE ANY ELEMENT OF COMPONENT OF A BUILDING IS REQUIRED TO HAVE A PARTICULAR FIRE RESISTANCE, IT SHALL BE FIRE RESISTANCE THROUGHOUT. PARTITION WALLS SHALL BE BUILT UP TO THE UNDERSIDE OF THE ROOF / SOFFIT.
2. SERVICES PENETRATING THROUGH ANY WALL OR FLOOR REQUIRED TO HAVE A FIRE RESISTANCE SHALL BE SEALED IN SUCH A MANNER THAT FIRE SHALL NOT PENETRATE SUCH WALL OR FLOOR. SUCH FIRE STOP SHALL HAVE A FIRE RESISTANCE OF NOT LESS THAN THE REQUIREMENTS FOR STRUCTURAL STABILITY GIVEN IN TABLE 5 OF SANS 10400-T: 2024.
3. CABLE TRAYS TO BE FIRE STOPPED WITH "HILTI' FIRESTOP BRICKS AND SEALED, OR EQUAL AND APPROVED.
4. METAL DUCTWORK AND FIRE DAMPERS TO BE FIRE STOPPED WITH "HILTI' FIRESTOP MORTAR, OR EQUAL AND APPROVED.
5. INDIVIDUAL ELECTRICAL CABLES AND METAL PIPES ARE TO BE FIRE STOPPED WITH "HILTI' FS-ONE MAX INTUMESCENT MASTIC, OR EQUAL AND APPROVED.
6. INDIVIDUAL PLASTIC PIPES ARE TO BE FIRE STOPPED WITH "HILTI' FIRESTOP COLLARS AND SEALED, OR EQUAL AND APPROVED.
7. ANY STRUCTURAL ELEMENT OR COMPONENT SHALL COMPLY WITH TABLE 5 OF SANS 10400-T:2024. STEEL SHALL BE PAINTED WITH PYRO-COTE INTUMESCENT PAINT, OR EQUAL AND APPROVED.
8. ALL FIRE STOPPING MEASURES ARE TO BE DONE IN ACCORDANCE WITH THE MANUFACTURER'S INSTALLATION INSTRUCTIONS.

OPENINGS IN WALLS

1. ALL OPENINGS FOR STEEL DUCTWORK, HVAC EQUIPMENT, AND LOUVRES ARE TO BE 50MM LARGER ON EACH SIDE THAN THE SIZE SHOWN ON THE DRAWINGS. A TIMBER FRAME OF THICKNESS 25MM SHALL BE INSTALLED TO BORDER THE OPENING.
2. ALL OPENINGS FOR PIPEWORK (OR INTERNAL DIAMETER OF SLEEVES) ARE TO BE 15MM LARGER THAN THE OUTSIDE DIAMETER OF THE PIPE PASSING THROUGH.
3. OPENINGS ARE TO BE MADE GOOD AND FIRE STOPPED AS NECESSARY AFTER INSTALLATION.

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DESIGN INFORMATION

DRAWN:	DESIGNED:	CHECKED:	DATE:
MJS	PL	GG	02/12/24

CLIENT INFORMATION

CLIENT LOGO: MUT MANGOSUTHU UNIVERSITY OF TECHNOLOGY

CLIENT NAME: Mangosuthu University of Technology

PROJECT INFORMATION

PROJECT DESCRIPTION: Dining Hall, TV Room & Study Facilty

PROJECT NAME: MUT - Refurbishments to the Exisiting Dining Hall

ADDRESS: 511 Griffiths Mxenge Highway, Umlazi

SITE DESCRIPTION: University

DRAWING INFORMATION

DRAWING TITLE: Phase 2 - Fire & Evacuation Layout - Consolidated Ground Floor

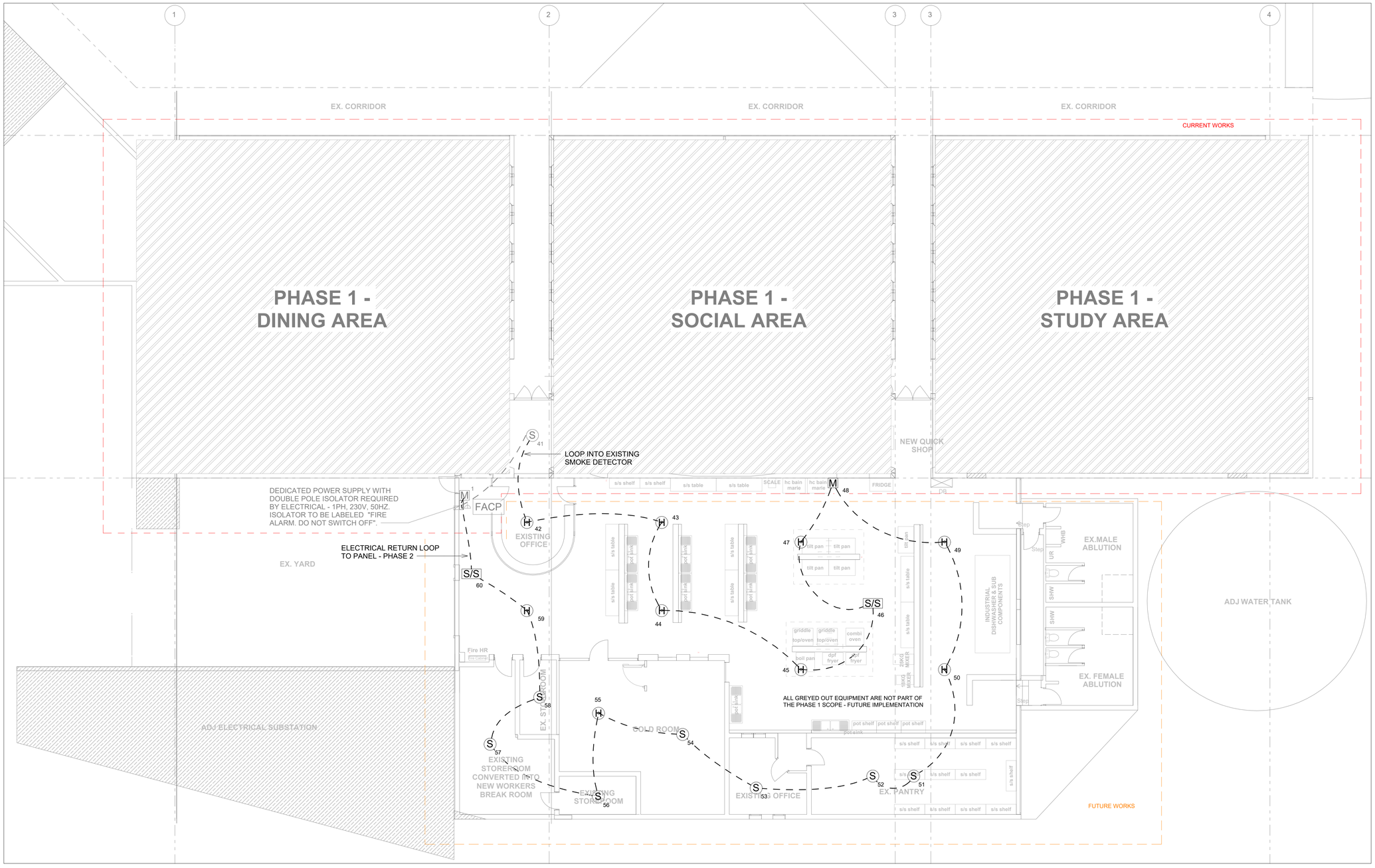
DRAWING SCALE: As indicated

SHEET SIZE: A1

DRAWING NUMBER: **LSG-2401-FIRE-500A**

REVISION: **I01**

REFERENCE DRAWING: 209-100-MUT-DH-E100.dwg | DATE: 16/07/2024 |



1 Fire Detection Layout - Consolidated Ground Floor

1 : 100

CAUSE & EFFECT CHART								
CAUSE	EFFECT							
Panel 1 - Loop 1	Audible and visual alarm in fire detection panel	All audible and visual alarms operate in building	AHUs to shut down	All audible and visual alarms in building silence	Fire detection panel audible alarm silence	Fire detection panel visual alarm silence	AHUs reset to normal operation	System restored to normal
FIRE ALARM								
Any fire detector operates	X	X	X					
Any manual call point is operated	X	X	X					
FAULT ALARM								
Wiring short	X							
Detector is disconnected from base	X							
Any line device in disconnected	X							
Mains power fault to panel	X							
PANEL ACTIONS / REPAIRS								
Operator activates fire alarm	X	X	X					
Operator presses silence				X	X			
Maintenance repair fault						X		X
Operator presses reset							X	X

FIRE ALARM DEVICE SCHEDULE			
REF	NO.	DESCRIPTION	MODEL
H	9	"EDWARDS" ADDRESSABLE COMBINATION DETECTOR - HEAT & SMOKE	SIGA-HRD
M	1	"EDWARDS" ADDRESSABLE MANUAL CALL POINT	SIGA-278
S	7	"EDWARDS" ADDRESSABLE POINT TYPE SMOKE DETECTOR - OPTICAL	SIGA-OSD
S/S	2	"EDWARDS" ADDRESSABLE FIRE ALARM WITH HORN SOUNDER AND VISUAL INDICATOR - WEATHERPROOF - RED	GCSVRF-CVR

FIRE DEVICE NAMING	
REF	DEVICE NAME
42	COMBINATION-KITCHEN 1
43	COMBINATION-KITCHEN 2
44	COMBINATION-KITCHEN 3
45	COMBINATION-KITCHEN 4
46	SOUNDER-KITCHEN 1
47	COMBINATION-KITCHEN 5
48	MCP-KITCHEN 1
49	COMBINATION-KITCHEN 6
50	COMBINATION-KITCHEN 7
51	SMOKE-PANTRY 1
52	SMOKE-PANTRY 2
53	SMOKE-OFFICE 1
54	SMOKE-FREEZER ROOM 1
55	COMBINATION-COLD ROOM 1
56	SMOKE-STORE 1
57	SMOKE-BREAK ROOM 1
58	SMOKE - STORE (2) 1
59	COMBINATION-KITCHEN 8
60	SOUNDER-KITCHEN 2

FOR INFORMATION

LIST OF REVISIONS			
NO.	DATE	DESCRIPTION	BY
I00	27/11/24	Issued for Information	PL
I01	02/12/24	Issued for Information	PL

ELECTRICAL LEGEND

	1PH POWER SUPPLY AND ISOLATOR. TO BE WEATHER PROOF IF EXPOSED TO THE ELEMENTS. REQUIREMENTS AS PER EQUIPMENT SCHEDULES.

FIRE ALARM LEGEND

S/S	ADDRESSABLE HORN SOUNDER / VISUAL INDICATOR (RED)
M	ADDRESSABLE MANUAL CALL POINT
S	ADDRESSABLE SMOKE DETECTOR (OPTICAL - STANDARD CEILING LEVEL)
S	ADDRESSABLE SMOKE DETECTOR (OPTICAL - HIGH ELEVATION)
S	ADDRESSABLE SMOKE DETECTOR (OPTICAL - WALL MOUNTED)
H	COMBINATION HEAT DETECTOR - FIXED TEMPERATURE & RATE OF RISE
	FIRE PANEL - ADDRESSABLE

NOTES:

1. ALL ADDRESSABLE SYSTEM WIRING TO BE CLASS A WITH SEPARATE WIRE WAYS AND CONDUITS FOR THE INCOMING AND OUTGOING WIRES FROM THE FIRE ALARM PANEL WITH SHORT CIRCUIT ISOLATORS AT THE END OF EVERY DETECTION ZONE, AT MINIMUM. ALL CONVENTIONAL SYSTEM WIRING TO BE CLASS B WITH END OF LINE DEVICES INSTALLED ON EACH LOOP.
2. ALL WIRING TO BE HAVE A MINIMUM FIRE RESISTANCE OF PH 30 (30 MINUTES). ALL WIRING TO BE RUN IN DEDICATED AND GROUNDED "BOSAL" OR EQUIVALENT GALVANISED STEEL CONDUITS. WHERE WIRING CROSS, THIS MUST BE DONE AT 90° ANGLES.
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13. MCPs TO BE MOUNTED AT 1400mm AFFL.
14. POINT TYPE SMOKE DETECTORS TO BE INSTALLED AT CEILING LEVEL.
15. INSTALLATION TO INCLUDE ALL SAFETY SIGNAGE REQUIRED AS PER RELEVANT SANS REGULATIONS.
16. SYSTEM OPERATION AND SET POINTS TO BE AS PER THE SPECIFICATION AND CAUSE AND EFFECT CHART.

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DRAWING INFORMATION

DRAWING TITLE: Phase 2 - Fire Detection Layout - Consolidated Ground Floor

DRAWING SCALE: As indicated

SHEET SIZE: A1

DRAWING NUMBER: **LSG-2401-FIRE-501A**

REVISION: **I01**

REFERENCE DRAWING: 209-100-MUT-DH-E100.dwg | DATE: 16/07/2024 |