CONSTRUCTION OF NEW KURUMAN HOSPITAL-ACCIDENT & EMERGENCY WARD

BOOK 2

PROCUREMENT DOCUMENTS
FOR THE
CONSTRUCTION OF NEW KURUMAN HOSPITAL-ACCIDENT & EMERGENCY WARD, KURUMAN DISTRICT HOSPITAL

CLIENT

Akhona Gonya
Northern Cape Dept of Health
Private Bag X5049
Kimberley
8301

Email: akhona7gonya@gmail.co
Tel: 053 830 0724

PRINCIPAL AGENT

Moeketsi Wesi
Amahle Multi-Disciplinary & Projects (Pty) Ltd
59 Chappel Street
Kimberley
8301

Email: monde@amahle.co.za
Tel: 010 006 5447

BID NR: NCDOH/PSP/003/INFRA/2025
CLOSING DATE: 07 November 2025
CLOSING TIME: 11:00

BIDDER'S NAME: .....

BOOK 2 OF 2

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HEALTH AND SAFETY SPECIFICATIONS



Health

Department of Health
NORTHERN CAPE
John Taolo Gaetsewe District

Project Health and Safety Specification
In terms of OHS ACT 85 0f 1993 & and Construction Regulations 2014

Project: Construction of Kuruman District Hospital

For: Northern Cape Department of Health

Project Directory	
Project Client	
Name: The Northern Cape Department of Health 144 Du Toitspan Road Belgravia Kimberley 8301	Contact Details:
OHS Consultant	
Name: EQProject Managers and Safety Solutions (PTY) LTD 20 Ebden Street Queenstown 5320	Contact Details: 045 838 7080 Cell Number: 0722560805 Email address: eqpmss@gmail.com

Project Details	
Provisional Start Date:	
Provisional Completion Date:	
Proposed Contract Duration:	
Proposed Project Value:	TBA
Notification of Construction Work:	Yes
Construction Work Permit Application:	N/A
Required Safety Personnel:	Fully Registered Pr.CHSO
Prepared by:	Eric Nqampi
Date Prepared:	11 August 2025

PROJECT HEALTH AND SAFETY
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1. PURPOSE

The purpose of this document is to provide health and safety information pertaining to the specific project risks known by the Client, Designer and Client Agent. These risks are applicable to this project and may not necessarily be common knowledge to the Contractor. The information encapsulated in this document serve to align the Principal Contractor towards the achievement of the required compliance to the OHS Act (Act 85 of 1993), the Construction Regulations of 2014 and all the other relevant legislative mandates, regulations and attributed Norms and Standards revolving around the scope of works delineated for the nature of this project.

The Principal Contractor must take this information into account and ensure that their tenders include adequate resources to deal with the matters detailed in this document. Compliance must be ensured by the Contractor and Appointed Sub-Contractor to all relevant legislation. Safeguarding of employees, sub-contractors and other persons affected by the construction activities must be ensured.

1.1 Reference should be made to the following documentation in conjunction with this safety specification (including existing surveys, drawings, and reports):

(a) Engineers Drawings
(b) Designers Input
(c) Tender Documents
(d) Legal mandates and relevant Municipal By-Laws

References used for the drafting of this specification.

OHS Act (ACT 85 of 1993) – Occupational Health and Safety act 85 of 1993 and all regulations promulgated under this act, special reference to Construction Regulations 2014

NEMA (ACT 107 OF 1998) – National Environmental Management Act 107 of 1998 and

relevant specific environmental management acts promulgated under this act, special reference to NEM: WA (Act 59 of 2008).

NEM: WA (Act 59 of 2008) – National Environmental Management: Waste Act 59 of 2008 and regulations promulgated under this act, with reference to the National Waste Management Strategy, the Waste Classification Regulations and supporting Norms and Standards.

Electrical Regulations – Under department of Minerals and Energy

The Waste Classification and Management Regulations, 2013, published as Government Notice No. R. 634 of 23 August 2013

The National Norms and Standards for the Assessment of Waste for Landfill Disposal, published as Government Notice No. R. 635 of 23 August 2013.

Electrical Regulations – Under department of Minerals and Energy

COIDA Act - Compensation for Occupational Injuries and Diseases Act

Due to potentially dangerous operations being undertaken in construction, there is a possibility of incidents and accident which may lead to injuries or fatalities. In many instances non-compliances to the Occupational Health and Safety Act (OHS Act) have resulted in severe consequences for the parties involved. The Project Client is determined to ensure the highest health and safety standards throughout the Contract.

To ensure this The Project Client / Client Agent has prepared and published this document. This document should be used as a guideline for minimum levels of awareness and guidance for health and safety requirements for this Contract. The responsibility for adhering to these requirements rests with the Contractors.

Every Employer will provide and maintain, as far as reasonably practicable, a set working environment that is safe and without risk to the health of his employees. OHS Act 8 (1)
Compliance with the OHS Act and Regulations will not be limited to this specification and the definitions contained in this document.

Tenderers are expected to be conversant with the requirements and effect of health and safety legislation, in particular the Construction Regulations, 2014, and the Occupational Health and Safety Act, 85 of 1993. Provision must be made in the tender submission to comply with all legal requirements.

The Contractor's personnel will be responsible implementation all necessary legislative requirements. Document control and record systems associated with the legislation must be kept by the Contractor.

This document should be used to assist them Contractor towards achieving compliance with the OHS Act.

The Specification will be implemented during construction of the works Project Client / Client Agent has control over.

2. CLIENT STATEMENT OF COMMITMENT TO OCCUPATIONAL HEALTH AND SAFETY MANAGEMENT.

The Northern Cape Department of Health (The Client) is committed to ensure that compliance to all the relevant legislation regarding Occupational Health and Safety is maintained and no accident occurs.

i. This document must be used as a means of measuring performance of all parties entering a contract with the project Client or Contractor in Occupational Health and Safety Standards.

ii. The Project Client does not accept any liability which may result from the Contractor failing to comply with the Document; the Contractor remains responsible for achieving the required performance levels.

iii. This document forms part of the Contract, and Contractors are required to make it part of their Contracts with Sub-Contractors and Suppliers.

The successful Contractor will ensure that a Site-Specific Health and Safety Plan complying with all the relevant legal requirements and this document is compiled and approved by the Client/Client Agent before commencement of Construction.

2.1 PROJECT DETAILS

Description of Work

Construction of Kuruman District Hospital Accidents, Emergency unit, surgical ward and operating theatre in phased approach.

The principal contractor will be responsible for the demolition of the existing structure and will construct a new building. Demolition plan must be submitted for approval prior the start of demolition work.

2.2 EXISTING ENVIRONMENT

The project will take place at the existing Kuruman District Hospital. The plan is to demolish the walls where the hospital will be extended and connect the new structure to the demolished area. Geotechnical investigations will be conducted to understand the soil properties of the area and to also use the information for design purposes.

The required safety notices and signs must be displayed at the construction area indicating PPE and safety requirements, members of the public and municipal personnel must be warned regarding construction activities that will take place in the area. Clear notices indicating “DANGER CONSTRUCTION AREA” and “DANGER DO NOT ENTER” must be displayed at work areas.

The contractor must implement control measures to ensure dust created by the construction work is managed correctly and does not become a health risk to building occupants and other persons visiting the area.

Contractor must also provide the necessary training and precautionary measures when moving construction equipment, machinery, and materials on national roads and through residential area to construction site to ensure the safety of members of the public and road users. Stop and goes will be implemented to control the traffic flow and any heavy construction vehicle will be escorted by a flag personnel when leaving or doing its turns on public road.

The Contractor must ensure compliance to Section 9 of the OHS Act 85 of 1993.

General duties of employers and self-employed persons to persons other than their employees:

- Every employer shall conduct his undertaking in such a manner as to ensure, as far as is reasonably practicable, that persons other than those in his employment who may be directly affected by his activities are not thereby exposed to hazards to their health or safety.

- Every self-employed person shall conduct his undertaking in such a manner as to ensure, as far as is reasonably practicable, that he and other persons who may be directly affected by his activities are not thereby exposed to hazards to their health or safety.

Hazards particular to this project Baseline Risk Assessment

2.3 BASELINE RISK ASSESSMENT

Significant Risks and Hazards identified by the Client/Designer/Client Agent.

The following potential sources of risk to the health and safety of persons on site have been identified, as per the risk assessment which accompanies this health and safety specification, and must, as a minimum, be appropriately addressed by the Principal Contractor's health and safety plan. In addition, the Principal Contractor must perform its own activity risk assessments to enable it to take precautions to protect the health and safety of persons on site, to comply with the Principal Contractor's obligations under the Act and all Regulations made thereunder, including the Constructions Regulations.

All such precautionary measures and procedures must be included in the Principal Contractor's health and safety plan, which must be submitted to the Clients health and safety agent for review and approval and where applicable should include:

- Noise.
- Demolitions.
- Rehabilitation of previously demolished structures.
- Dust management.
- Drilling (Breaking of walls).

- Formwork and support work.
- Scaffolding.
- Construction vehicles and mobile equipment.
- Electrical tools and electrical machinery.
- Electrical installations
- Housekeeping.
- Stacking and storage.
- Fire risks and fire prevention.
- Hot work (steel cutting and welding).
- Portable electrical equipment.
- Drug and alcohol use.
- Fall protection.
- Use of ladders and material.
- Working in elevated position/ at height.
- Materials hoist
- Excavations.
- Water hazards
- Site establishment.
- Concrete work.
- Installation of hoarding.

The risk assessment to be included in the health and safety plan must clearly indicate:

- The methodology used to implement the risk assessments.
- A distinct breakdown of processes and activities covered therein.
- Subsequent hazards identified.
- Risk calculations considering consequence, frequency, and likelihood.
- A competent Risk assessor must be appointed by the Principal Contractor to oversee the holistic implementation of risk assessments.

NOTE:
Please refer to end of Safety Specification for minimum control measures required to address these risks.

The following materials and substances have, or may have, to be used in the works or is present and are identified as potentially posing special health and / or safety hazards during the project. Appropriate measures will need to be specified for their control**:**

- Cement.
- Diesel.
- Petrol.
- Disinfectant agents.
- Paint.

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The following Project Client safety rules and/or requirements are to be observed:

Safety Rules

MANUAL LIFTING	Keep your back straight, Bend the knees, don't reach and lift, Get help for heavy loads.
FALLS & FALLING OBJECTS	Look before you step, keep all walk areas clean, stay out from under loads, don't use unsafe ladders
WORKING WITH ELECTRICITY	Avoid contact with energized electrical circuits, always use insulated tools, always use appropriate insulated rubber gloves and goggles, follow lock out and tag out procedure requirements never work on energized systems
UNSAFE USE OF TOOLS	Inspect regularly, report all defects at once, use the right tool safely, Put it away safely
PROTECTIVE EQUIPMENT	Ensure you use the correct PPE for the job at hand
HOUSEKEEPING	A clean job is a safe job, use waste bins, Pile materials safe and neat, Remove hazardous debris
TEAMWORK	Plan all work with safety - Protect fellow workers

Labour Records

At the end of each week the contractor will provide a written record, in schedule form reflecting the number and description of tradesmen and labourers employed by him and all his sub-contractors on the works each day. The record must also indicate total amount of people on site as well as total hours worked for the week.

GENERAL PROJECT INFORMATION

The purpose of this section is to provide general health and safety information about construction risks which are applicable to the construction industry. The Contractor must take all information in this section into account and ensure that their tenders include adequate resources to deal with the matters detailed below. All relevant risks must be dealt with in compliance with legislation**.**

3. STANDARD OCCUPATIONAL HEALTH AND SAFETY SPECIFICATION

3.1. SCOPE

1. This Section covers the requirements for eliminating and mitigating incidents and within the Contract. The scope addresses minimum legal compliance, hazard and risk management, promotion of a health and safety culture amongst all parties involved in the project and those affected by the activities taking place.

2. Contractors employed by The Project Client / Project Agent must ensure that the provisions of the specifications are applied both on the site and all off site activities relating to this project.

3. The Contractor must enforce the provisions of these Specifications amongst all subcontractors and suppliers for the project.

3.2. INTERPRETATION

3.2.1 APPLICATION

The Occupational Health and Safety Specification contains clauses that are applicable to building / construction and impose pro-active controls associated with activities that impact on human health and safety as it relates to plant and machinery. Compliance to the requirements of the Act is in addition to the requirements of the Occupational Health and Safety Specification and form part of the Contractor's responsibility. The Client / Client Agent will monitor that the Contractors compliance with the requirements of the OHS Act.

3.2.2 DEFINITIONS

For the purpose of this Occupational Health and Safety Specification following the definitions, hereunder will apply:

"agent" means a competent person who acts as a representative for a Client.

Construction Work *(as defined in the Construction Regulations, 2014)* means any work in connection with—

a) the construction, erection, alteration, renovation, repair, demolition or dismantling of or addition to a building or any similar structure; or
b) the construction, erection, maintenance, demolition or dismantling of any bridge, dam, canal, road, railway, runway, sewer or water reticulation system; or the moving of earth, clearing of and, the making of excavation, piling, or any similar civil engineering structure or type of work.

Competent person
Means a person who

(a) has in respect of the work or task to be performed the required knowledge, training and experience and, where applicable, qualifications, specific to that work or task: Provided that where appropriate qualifications and training are registered in terms of the provisions of the National Qualifications Framework Act, 2000 (Act No. 67 of 2000), those qualifications and that training must be regarded as the required qualifications and training.
(b) Is familiar with the Act and with the applicable regulations made under the Act;

"construction manager" means a competent person responsible for the management of the physical construction processes and the coordination, administration and management of resources on a construction site;

"construction site" means a work place where construction work is being performed;

"construction supervisor" means a competent person responsible for supervising construction activities on a construction site;

"construction vehicle" means a vehicle used as a means of conveyance for transporting persons or material, or persons and material, on and off the construction site for the purposes of performing construction work;

"certificate of compliance" means

(a) a certificate with a unique number obtainable from the chief inspector, or a person appointed by the chief inspector, in the form of Annexure 1 J and issued by a registered person in respect of an electrical installation or part of an electrical installation; or

(b) a certificate of compliance issued under the Electrical Installation Regulations, 1992;

"client" means any person for whom construction work is being performed;

"electrical contractor"
means a person who undertakes to perform electrical installation work on behalf of any other person, but excludes an employee of such first-mentioned person;

"electrical installation"
means any machinery, in or on any premises, used for the transmission of electricity from a point of control to a point of consumption anywhere on the premises, including any article forming part of such an electrical installation irrespective of whether or not it is part of the electrical circuit, but excluding
(a) any machinery of the supplier related to the supply of electricity on the premises; (b) any machinery which transmits electrical energy in communication, control circuits, television or radio circuits;

(c) an electrical installation on a vehicle, vessel, train or aircraft; and

(d) control circuits of 50 V or less between different parts of machinery or system components, forming a unit, that are separately installed and derived from an independent source or an isolating transformer;

"Electrical Installation Regulations, 1992" means the Electrical Installation Regulations, 1992, promulgated by Government Notice No. R. 2920 of 23 October 1992;

"fall arrest equipment" means equipment used to arrest a person in a fall, including personal equipment, a body harness, lanyards, deceleration devices, lifelines or similar equipment;

"fall prevention equipment" means equipment used to prevent persons from falling from a fall risk position, including personal equipment, a body harness, lanyards, lifelines or physical equipment such as guard-rails, screens, barricades, anchorages or similar equipment;

"fall protection plan" means a documented plan, which includes and provides for -

- all risks relating to working from a fall risk position, considering the nature of work undertaken;
- the procedures and methods to be applied in order to eliminate the risk of falling; and

- a rescue plan and procedures;

"fall risk" means any potential exposure to falling either from, off or into;

Hazard
Means a source of or exposure to danger which may cause injury or damage to persons or property;

Hazard identification
Means the identification and documenting of existing or expected hazards to health and safety of persons which are normally associated with the type of construction work being executed or to be executed;

"health and safety file " means a file, or other record containing the information in writing required by these Regulations;

"health and safety plan" means a site, activity or project specific documented plan in accordance with the Client's health and safety specification;

"installation work" means

(a) the installation, extension, modification or repair of an electrical installation;
(b) the connection of machinery at the supply terminals of such machinery; or
(c) the inspection, testing and verification of electrical installations for the purpose of issuing a certificate of compliance;

"master installation electrician" means a person who has been registered as a master installation electrician in terms of regulation 11 (2) for the verification and certification of the construction, testing and inspection of any electrical installation;

"medical certificate of fitness" means a certificate contemplated in regulation 7(8);

"National Building Regulations" means the National Building Regulations made under the National Building Regulations and Building Standards Act, 1977 (Act No. 103 of 1977), and promulgated by Government Notice No. R. 2378 of 30 July 1990, as amended by Government Notices No's R. 432 of 8 March 1991, R. 919 of 30 July 1999 and R. 547 of 30 May 2008;

"principal contractor" means an employer appointed by the Client to perform construction work;

"Professional Engineer or Professional Certificated Engineer" means a person holding registration as either a Professional Engineer or Professional Certificated Engineer in terms of the Engineering Profession Act, 2000 (Act No. 46 of 2000);

"registered person"
means a person registered in terms of

(a) regulation 11; or
(b) regulation 9 of the Electrical Installation Regulations, 1992, as an electrical tester for single phase, an installation electrician or a master installation electrician, as the case may be;

Risk
Means the probability or likelihood that a hazard can result in injury or damage.

Risk assessment
Means a program to determine any risk associated with any hazard at a construction site, in order to identify the steps needed to be taken to remove or control such hazard

"scaffold" means a temporary elevated platform and supporting structure used for providing access to and supporting workmen or materials or both; "shoring" means a system used to support the sides of an excavation and which is intended to prevent the cave-in or the collapse of the sides of an excavation;

"supplier"
in relation to a particular electrical installation, means any person who supplies or contracts or agrees to supply electricity to that electrical installation
Site
Means the area in the possession of the Contractor for the construction of the works. Where there is no demarcated boundary it will include all adjacent areas, which are reasonably required for the activities for the Contractor;

"temporary works" means any falsework, formwork, support work, scaffold, shoring or other temporary structure designed to provide support or means of access during construction work;

The Act
Means, unless the context indicates otherwise, the Occupational Health and Safety Act, 1993 (Act No. 85 of 1993) and Regulations promulgated there under.

3.3 GENERAL HEALTH AND SAFETY PROVISIONS

3.3.1 NOTIFICATION OF INTENTION TO COMMENCE CONSTRUCTION WORK

A contractor who intends to carry out any construction work other than work contemplated in regulation 3(1), must at least 7 days before that work is to be carried out notify the provincial director in writing in a form similar to Annexure 2 if the intended construction work will—

(a) include excavation work;
(b) include working at a height where there is risk of falling;

(c) include the demolition of a structure; or
(d) include the use of explosives to perform construction work.

A contractor who intends to carry out construction work that involves construction of a single storey dwelling for a client who is going to reside in such dwelling upon completion, must at least 7 days before that work

3.3.2 ASSIGNMENT OF CONTRACTOR'S RESPONSIBLE PERSONS TO SUPERVISE HEALTH & SAFETY ON SITE

3.3.2.1 Construction Manager

1. A principal contractor must in writing appoint one full-time competent person as the construction manager with the duty of managing all the construction work on a single site, including the duty of ensuring occupational health and safety compliance, and in the absence of the construction manager an alternate must be appointed by the principal contractor.

2. Where the construction manager has not appointed assistant construction managers as contemplated in Construction Regulation 8(2) or, in the opinion of an inspector, a sufficient number of such assistant construction managers have not been appointed, that inspector must direct the construction manager in writing to appoint the number of assistant construction managers indicated by the inspector, and those assistant construction managers must be regarded as having been appointed under Construction Regulation 8(2).

3. No construction manager appointed under Construction Regulation 8(1) may manage any construction work on or in any construction site other than the site in respect of which he or she has been appointed.

4. A construction manager must in writing appoint construction supervisors responsible for construction activities and ensuring occupational health and safety compliance on the construction site.

3.3.2.2 Assistant Construction Manager

A principal contractor must upon having considered the size of the project, in writing appoint one or more assistant construction managers for different sections thereof: Provided that the designation of any such person does not relieve the construction manager of any personal accountability for failing in his or her management duties in terms of this regulation.

3.3.2.3 Construction Safety Officer

1. A contractor must, after consultation with the client and having considered the size of the project, the degree of danger likely to be encountered or the accumulation of hazards or risks on the site, appoint a full-time or part-time

construction health and safety officer in writing to assist in the control of all health and safety related aspects on the site: Provided that, where the question arises as to whether a construction health and safety officer is necessary, the decision of an inspector is decisive.

2. No contractor may appoint a construction health and safety officer to assist in the control of health and safety related aspects on the site unless he or she is reasonably satisfied that the construction health and safety officer that he or she intends to appoint is registered with a statutory body approved by the Chief Inspector and has necessary competencies and resources to assist the contractor.

3.3.2.4 Construction Supervisor

1. A contractor must, upon having considered the size of the project, in writing appoint one or more competent employees for different sections thereof to assist the construction supervisor contemplated in Construction Regulation 8(7) and every such employee has, to the extent clearly defined by the contractor in the letter of appointment, the same duties as the construction supervisor: Provided that the designation of any such employee does not relieve the construction supervisor of any personal accountability for failing in his or her supervisory duties in terms of this regulation.

2. Where the contractor has not appointed an employee as contemplated in Construction Regulation 8(8), or, in the opinion of an inspector, a sufficient number of such employees have not been appointed, that inspector must instruct the employer to appoint the number of employees indicated by the inspector, and those employees must be regarded as having been appointed under Construction Regulation 8(8).

3. No construction supervisor appointed under Construction Regulation 8(7) may supervise any construction work on or in any construction site other than the site in respect of which he or she has been appointed: Provided that if a sufficient number of competent employees have been appropriately designated under Construction Regulation 8(7) on all the relevant construction sites, the appointed construction supervisor may supervise more than one site.

The Contractor will submit proof of supervisory appointments and any relevant appointments in writing (as stipulated by the OHS Act), prior to commencement of work.

3.3.3 COMPETENCY FOR CONTRACTOR'S RESPONSIBLE PERSONS

The Contractor's responsible persons will be competent in health and safety and will have undergone Health and Safety Management Courses.

Typical courses will include, HIRA, Legal liability, Incident Investigation, Construction regulations 2014 and OHS Act training. Proof must also be provided that the relevant appointed responsible person has experience related to the work that will be conducted.

3.3.4 COMPENSATION OF OCCUPATIONAL INJURIES AND DISEASES ACT 130 OF 1993 (COIDACT)

The Contractor will submit a letter of good standing with the Compensation Insurer to The Project Client / Client Agent, within 10 working days from receipt of the Letter of Acceptance from The Project Client / Client Agent prior to commencing work on site.

3.3.5 OCCUPATIONAL HEALTH AND SAFETY POLICY

1. The Contractor shall have a HSE Policy (or policies) in line with the OHS Act 85 of 1993 section 7 requirements, the policy shall be duly signed by an authorised signatory. The policy must address commitments relating to the protection of the Health and Safety of Contractor's personnel and others, as well as the protection of the environment, in and about the execution of the works.

2. Copies of the contractors HSE Policy shall be provided as and when contractors are appointed.

3. The Contractor shall prominently display a copy of the policy in the workplace where his employees normally report for service.

3.3.6 HEALTH AND SAFETY ORGANOGRAM

The Contractor will submit an organogram to the Client/ Client Agent, outlining the Health and Safety site team appointments as required by the OHS Act. The organogram must include the legal reference under which each person is appointed as well as the persons contact details (Cell phone number and e-mail address).

3.3.7 RISK ASSESSMENT FOR CONSTRUCTION WORK

1. A contractor must, before the commencement of any construction work and during such construction work, have risk assessments performed by a competent person appointed in writing, which risk assessments form part of the health and safety plan to be applied on the site, and must include—

    (a) the identification of the risks and hazards to which persons may be exposed to;
    (b) an analysis and evaluation of the risks and hazards identified based on a documented method;

(c) a documented plan and applicable safe work procedures to mitigate, reduce or control the risks and hazards that have been identified; (d) a monitoring plan; and (e) a review plan.

2. A contractor must ensure that as far as is reasonably practicable, ergonomic related hazards are analysed, evaluated, and addressed in a risk assessment.

3. A contractor must ensure that all employees under his or her control are informed, instructed, and trained by a competent person regarding any hazard and the related work procedures and or control measures before any work commences, and thereafter at the times determined in the risk assessment monitoring and review plan of the relevant site.

4. A principal contractor must ensure that all contractors are informed regarding any hazard that is stipulated in the risk assessment before any work commences, and thereafter at the times that may be determined in the risk assessment monitoring and review plan of the relevant site.

5. A contractor must consult with the health and safety committee or, if no health and safety committee exist, with a representative trade union or representative group of employees, on the monitoring and review of the risk assessments of the relevant site.

6. A contractor must ensure that copies of the risk assessments of the relevant site are available on site for inspection by an inspector, the client, the client's agent, any contractor, any employee, a representative trade union, a health and safety representative or any member of the health and safety committee.

7. A contractor must review the relevant risk assessment—

(a) where changes are affected to the design and or construction that result in a change to the risk profile; or
(b) when an incident has occurred.

Ergonomics must be addressed in the risk assessment – Refer to ERGONOMICS REGULATIONS, 2019

Issue Based Risk Assessment

As circumstances and needs arise, separate risk assessment will need to be conducted. An additional risk assessment will need to be conducted when for example:

(a) A new operation introduced onto site.
(b) A system for work is changed.
(c) After an accident or a 'near miss' has occurred

Continuous Risk Assessment

1. This should take place continually, as it forms an integral part of day-to-day management.

2. It should be conducted by frontline supervisors on a **DSTI (Daily Safe task instruction)** on site and it is essential that formal training is provided to enable the said personnel to be efficient in conducting said assessment. The Contractor must ensure that the Risk Assessment identifies the hazards present in work activities on site. This must be followed by an evaluation of the risks involved considering those precautions already being taken.

3.3.8 HEALTH AND SAFETY REPRESENTATIVE(S)

The Contractor will ensure that a Health and Safety Representative(s) are /is elected for every 20 employees on site and trained to carry out his / her functions. The appointment must be in writing. The Health and Safety Representative will carry out regular inspection, keep records and report to the supervisor to take appropriate action. He / She will attend Health and Safety Committee Meetings. The Health and Safety Representative will be part of the team that will investigate incidents, accidents & non-conformances.

3.3.9 HEALTH AND SAFETY COMMITTEE

The Contractor will ensure that monthly health and safety meetings are held, and minutes are kept on record. Meetings must be organized and chaired by the Contractor's Responsible Person. The Contractor will ensure that the *Health and Safety Representative(s)* is/are invited to attend the meeting as observer. Copies of the minutes must be made available to the Client/ Client Agent or Inspector.

3.3.10 INDUCTIONS & TRAINING

1. The Contractor will ensure that all employees under his / her control have gone through and internal health and safety induction ***before being allowed to perform any task on site,*** a copy of the induction material must also be available as proof of topics discussed during induction. The Contractor will keep a copy of the attendance register of all his / her employees who attended the induction. The contractor must ensure that as new employees are brought to site during the project, they must also undergo inductions before being able to perform any task on site.

2. Employees are responsible for their own Health and Safety and that of their co-workers within their work area. They shall be made aware of their responsibilities during induction and awareness sessions which include:

    - Familiarising themselves with their workplaces and Health and Safety procedures.

- Working in a manner that does not endanger them or cause harm to others.
- Keeping their work area tidy.
- Reporting all incidents / accidents / occupational ill-health and near misses.
- Protecting fellow workers from injury.
- Reporting unsafe acts and unsafe conditions.
- Reporting any situation that may become dangerous.
- Carrying out lawful orders and obeying HSE rules.

3. The Contractor shall ensure that all Contractors' personnel are adequately trained in the type of work / tasks to be performed. This training shall extend to include relevant procedures, Hazard Identification and Risk Assessment. Contractor's personnel shall have the appropriate qualifications and shall work under competent supervision. Copies of records of appropriate training and qualifications for all employees shall be kept and maintained.

3.3.11 MEDICAL CERTIFICATES OF FITNESS

A Principal Contractor must ensure that all his or her employees have a valid medical certificate of fitness specific to the construction work to be performed and issued by an occupational health practitioner in the form of Annexure 3 of Construction Regulation 2014. This medical certificate must specifically state that the person is fit for duty and must also highlight any medical restrictions identified. ***The contractor must keep a detailed register in his safety file for all employees with restrictions and document how the restrictions are being managed.***

3.3.12 AWARENESS

The Contractor will conduct, toolbox talks twice weekly and before any hazardous work takes place. The talks will cover the relevant, daily, activity and an attendance register must be kept and signed by all attendees. A record of the content of the topic will be kept on the site health a safety file.

3.3.13 COMPETENCY

1. After the Contractor has identified the training to be conducted, based on the Hazard Identification Risk Assessment (HIRA); he / she will send the relevant persons on appropriate courses and keep certificates of training for reference.
2. The Contractor shall keep a record of all employees including the Subcontractor's employees, indicating their date of induction, relevant skills, and licenses, and be able to produce this list at the request of the Client/Client Agent.

3.3.14 GENERAL RECORD KEEPING

The contractor will keep and maintain Health and Safety records to demonstrate compliance with the Occupational Health and Safety Specification and the Act. The contractor will ensure that all records of incidents, spot fines, training etc. are kept on site. All documents will be available for inspection by The Project Client / Client Agent or Inspectors.

3.3.15 GENERAL INSPECTION, MONITORING AND REPORTING

The Contractor will carry out daily inspections and investigate all incidents and report to The Project Client / Client Agent. The contractor will be required to keep records of all inspections and investigations which were undertaken and any other inspections and investigations by person's authorised to do so.

3.3.16 INTERNAL AUDITS

The contractor's responsible Safety Officer will conduct monthly Health and Safety Audits to ensure compliance with the OHS Act 85 of 193 requirements and Occupational Health and Safety Specification and communicate the findings to the Client Agent monthly. Records of audits must be kept, and non-conformance reported, investigated and corrective action must be taken to prevent re-occurrence.

3.3.17 EXTERNAL AUDITS

1. The Project Client / Client Agent will conduct health and safety audits to ensure compliance with the Occupational Health and Safety Specification and any relevant Health & Safety Legislation. All documentation held by the Contractor will be available for inspection.

2. Audits and Inspections may be conducted on an ad-hoc basis without informing the Contractor.

3. Any findings observed during these audits will be placed on an audit action plan that will show the deviation, the reason for the deviation occurring, the proposed actions that will be taken to correct the deviation, responsible person's name, proposed close out date, actual closed out date and a signature of the contractor's responsible person confirming the close out.

3.3.18 EMERGENCY PROCEDURES

1. The Contractor will submit a detailed Emergency Procedure for approval by The Project Client / Client Agent prior to commencement on site. The procedure will detail the response plan including the following key personnel:

   (a) List of key personnel,

(b) Details of emergency services,

(c) Actions or steps to be taken in the event of the emergency; and

(d) Information on hazardous materials / situations, including each material's hazardous potential impact or risk on the environment or human and measures to be taken in the event of an accident.

2. Emergency procedures will include, but will not be limited to fire, spills, accidents to employees, use of hazardous substances, electrical shock, or contact, etc. The Contractor will advise The Project Client / Client Agent in writing of any on site emergencies, together with a record of action taken, within 24 hours of the emergency occurring. A contact list of all service providers (Fire Department, Ambulance, Police, Medical and Hospital, etc.) must be maintained and available to site personnel.

3.3.19 FIRST AID BOX AND FIRST AID EQUIPMENT

The Contractor will appoint in writing a First Aider(s) with a minimum Level 2 First Aid Competency. The appointed First Aider(s) are to be sent for accredited first aid training before starting on site, or must be in possession of a valid certificate, of which copies are to be kept on site. The Contractors will provide, on site, First Aid Boxes, adequately always stocked, and ensure that the First Aid Box is accessible and fully controlled by a qualified First Aider. In addition, the location of these boxes must be indicated by means of Health and Safety Signage. A picture with the name and contact number of the First Aider on duty must be on displayed in all relevant areas.

3.3.20 ACCIDENT / INCIDENT REPORTING AND INVESTIGATION

1. The Contractor will in addition to the prescribed requirements of the OHS Act investigate, record, and report all reportable incidents. The investigations will be conducted by a qualified person or persons who have sufficient knowledge to carry out an investigation. In the case of a serious injury, meaning one in which a loss of man-hours are experienced exceeding 7 days, an independent investigator must be appointed by the Contractor. All incidents on site must be reported to the Client Agent within 1 hour of occurrence by means of a telephone call or SMS.

2. The Contractor shall investigate all incidents immediately and supply to the Client/Clients Agent a written report within 3 days, which shall include:

    - Date, time and place of incident;
    - Description of incident;
    - Root causes of incident/accident;
    - Type of injury and/or (if any);
    - Medical treatment provided (if any);
    - Persons involved;
    - Loss or damage sustained (if any);
    - Names and contact details of witness/s;

3.3.21 HAZARDS AND POTENTIAL SITUATIONS COMMUNICATION

The Contractor will immediately notify other Contractors or Sub-contractors of any hazardous or potentially hazardous situations, which may arise during performance of the activities.

3.3.22 Personal Protective Equipment (PPE) and Clothing

1. The In terms of Section 8 of the OH&S Act, the duty of the Contractor is to take steps to eliminate or mitigate (hierarchy of control measures) any

hazard or potential hazard to the safety or health of employees before resorting to PPE.

2. The Contractor's personnel and Contractor's visitors shall use risk-based PPE, approved by SANS or the relevant internationally recognised authority, at all times, as a minimum.

3. The relevant standard of PPE shall be recorded on the appropriate method statement or assessment to allow workers to ensure that they have been provided with the correct type of PPE.

4. Additional PPE shall be identified from task risk assessments for specific areas where access is permitted.

5. Symbolic signs in terms of SANS 1186 indicating the type and use of PPE shall be placed at all entry points to the Contractor's yard and areas of the works under its control.

6. The Contractor will clearly outline procedures to be taken when PPE or clothing is:

   (a) Lost or Stolen
   (b) Worn Out or Damaged
   (c) When and where it must be worn or used

3.3.23 OCCUPATIONAL HEALTH AND SAFETY SIGNAGE

1. The Contractor will provide adequate on site OHS signage complying with **SANS1186 requirements**. OHS signage will include, but will not be limited to, Construction area, Hard Hat / Helmet Area; Safety Goggles, Safety Shoes to be worn on site; Dust Masks to be worn in areas where there might be exposure to excessive dust; Ear Plugs / Muffs to be worn where there might be exposure over 85 dBa; Gloves; Safety Goggles; Safety Harness, etc. The Contractor will be responsible to maintain the quality and replacement of signage. Type of signage needed will be determined by the existing hazards and risks on site.

2. The contractor will also be required to display all relevant COVID-19 Instructive and informative posters at the offices and works areas.

3.3.24 CONSOLIDATED HEALTH AND SAFETY FILE

The Contractor will in accordance with Construction Regulation 7(1)e, hand a consolidated health and safety file to the client on completion of construction work, this must include records of drawings, designs, entry/exit medicals, incident investigations, non-conformances raised or received, risk assessments as well as significant information regarding the construction of the completed structure.

3.3.25 PERMITS

1. The Contractor will issue a permit for all hazardous or dangerous activities to be carried out during construction. The following is a list of hazardous activities which need a permit:

   (a) Working in Confined Space;
   (b) Use of a Hazardous Chemical Substance, e.g., Asbestos, Lead.
   (c) Use of Explosives and Blasting; and
   (d) Piling.

2. Wayleave applications must be done at George Municipality Electrotechnical Department. There must be a wayleave specifically for each area of work.

3.3.26 CONTRACTORS

The Principal Contractor will ensure that all contractors under his / her control are complying with the Occupational Health and Safety Specification, requirements by the OHS Act 85 of 1993, and any relevant legislation which may relate to the activities directly or indirectly. Each subcontractor must sign a 37(2) agreement as well as some Construction regulations 7(1)(c)(v) contractor appointment before being allowed to perform any work.

3.4 OCCUPATIONAL SAFETY

3.4.1 Stacking of Materials

A contractor must, in addition to compliance with the provisions for the stacking of articles in the General Safety Regulations, 2003, ensure that –

(a) A competent person is appointed in writing with the duty of supervising all stacking and storage on a construction site.
(b) Adequate storage areas are provided.
(c) Demarcated storage areas must be created; and
(d) Storage areas are to be kept neat and under control.

3.4.2 Housekeeping and General Safeguarding on Construction Sites

A contractor must, in addition to compliance with the Environmental Regulations for Workplaces, 1987, promulgated by Government Notice No. R. 2281 of 16 October 1987, ensure that suitable housekeeping is continuously implemented on each construction site, including –

(a) The proper storage of materials and equipment.
(b) The removal of scrap, waste, and debris at appropriate intervals.
(c) Ensuring that materials required for use, are not placed on the site to obstruct means of access to and egress from workplaces and passageways.
(d) Ensuring that materials which are no longer required for use, do not accumulate on, and are removed from the site at appropriate intervals.
(e) Ensuring that waste and debris are not disposed of from a high place with a chute, unless the chute complies with the requirements set out in regulation 14(6).
(f) Ensuring that construction sites in built-up areas adjacent to a public way are suitably and sufficiently fenced off and provided with controlled access points to prevent the entry of unauthorized persons; and
(g) Ensuring that a catch platform or net is erected above an entrance or passageway or above a place where persons work or pass under or fencing off the danger area if work is being performed above such entrance, passageway, or place so as to ensure that all persons are kept safe in the case of danger or possibility of persons being struck by falling objects.

3.4.3 Hazardous Chemical Substances (HCS)

1. In addition to the requirements in the HCS Regulations, the principal contractor must provide proof in the Health and Safety Plan that:

a) Material Safety Data Sheets (MSDS's) of the relevant materials / hazardous chemical substances are available prior to use by the contractor. Mention should be made how the principal contractor is going to act according to special/unique requirements made in the relevant MSDS's. All MSDS's will be always available for inspection by the agent.
b) Exposure monitoring is done according to OESSM and by an Approved Inspection Authority (AIA) and that the medical surveillance programme is based on the outcomes of the exposure monitoring.
c) How the relevant HCS's are being/going to be controlled by referring to:
    i. Limiting the amount of HCS
    ii. Limiting the number of employees
    iii. Limiting the period of exposure
    iv. Substituting the HCS
    v. Using engineering controls
    vi. Using appropriate written work procedures
d) The correct PPE is being used.
e) HCS are stored and transported according to SABS 072 and 0228.
f) Training with regards to these regulations was given.

2. The H&S plan should refer to the disposal of hazardous waste on classified sites and the location thereof (where applicable).

3. The First Aider must be conversant with all the MSDSs and how to treat HCS-related incidents appropriately.

3.4.4 Noise Induced Hearing Loss

Where noise is identified as a hazard the requirements of the NIHL regulations must be complied with and the following must be included / referred to in the Health and Safety Plan. The Contractor must be able to:

(a) Proof of training with regards to these regulations.
(b) That monitoring carried out by an AIA and done according to SABS 083.
(c) Medical surveillance programme is established and maintained for the necessary employees.
(d) Control of noise by means of:
    i. Engineering methods considered.
    ii. Admin control considered.
    iii. Personal protective equipment considered.
    iv. Describe how records are going to be kept for 40 years.

3.4.5 Pressure Vessels Including Gas Cylinders

The Contractor will comply with Pressure Equipment regulations, including:

(a) Providing competency and awareness training to the operators;
(b) Providing PPE or clothing;
(c) Providing and maintain appropriate signage in areas Pressure equipment are
(d) used.
(e) Inspect equipment regularly and keep records of inspections.
(f) Providing appropriate firefighting equipment (Fire Extinguishers).

3.4.6 Fire Extinguishers and Fire Fighting Equipment

The Contractor will provide adequate, regularly serviced fire extinguishers located at strategic points on site. The Contractor will keep spare serviced portable fire extinguishers. The Contractor will have adequate persons trained or competent to use the Fire Fighting Equipment. Safety signage will be posted, indicating locations of fire extinguishers.

3.4.7 Hired Plant and Machinery

The contractor will ensure that any hired plant and machinery brought to site is safe for use. The necessary requirements as stipulated by the OHS Act as well as those that are stipulated by this Occupational Health and Safety Specification, will apply. Health and Safety Induction is to be conducted with any hire plant or machinery operators and attendance of appropriate toolbox talks ensured. All operators of hired plant or machinery must be in possession of valid operator's certificates and medical certificates of fitness, as per requirement by the OHS Act.

3.4.8 Portable Electrical Tools / Explosive Power Tools

1. A contractor must, in addition to compliance with the Electrical Installation Regulations, 2009, and the Electrical Machinery Regulations, 1988, promulgated by Government Notice No. R. 1593 of 12 August 1988, ensure that –

(a) before construction commences and during the progress thereof, adequate steps are taken to ascertain the presence of and guard against danger to workers from any electrical cable or apparatus which is under, over or on the site;
(b) all parts of electrical installations and machinery are of adequate strength to withstand the working conditions on construction sites;
(c) the control of all temporary electrical installations on the construction site is designated to a competent person who has been appointed in writing for that purpose;
(d) all temporary electrical installations used by the contractor are inspected at least once a week by a competent person and the inspection findings are recorded in a register kept on the construction site; and
(e) all electrical machinery is inspected by the authorized operator or user on a daily basis using a relevant checklist prior to use and the inspection findings are recorded in a register kept on the construction site.

3.4.9 Hand Tools

All hand tools (hammers, chisels, spanners, etc.) must be inspected by the user prior to use. Tools with sharp points in toolboxes must be protected with a cover. No make-shift tools on site. All cold chisels used on site shall be fitted with a hand guard to prevent hand injuries in case of a miss with the hammer.

All contractors shall have a user policy for use of craft knives. Knives shall not be carried in clothing pockets with an open blade. The Contractor shall ensure that the appropriate cut resistant PPE is worn by the user. Cut resistant material coverage

should include the forearm of the non-knife holding hand unless other safety measures are taken.

3.4.10 High Voltage Electrical Equipment & Electrical Regulations

High Voltage Electrical Equipment

1. The Contractor will ensure that, where the work is under, on or near high-voltage electrical equipment the Electrical Regulations, together with safety instructions (Regulations of the Owner of the Equipment) are complied with.

2. Such equipment includes: -

    - Eskom and the Local Authority equipment
    - The Contractor's own power supply; and
    - Electrical equipment being installed but not yet taken over from a Contractor by The Project Client / Client Agent.

3.4.11 Public Health and Safety

The Contractor will ensure that each person working on or visiting a site, and the surrounding community, will be made aware of the dangers likely to arise from on-site activities and the precautions to be observed to avoid or minimize those dangers. Appropriate health and safety signage will be posted at all times. No visitor will be allowed on site without permission of the Construction Supervisor or his/her Assistant. All visitors must complete a register, which should include the name, reason for visit, and contact detail of said person. The Contractor will ensure that the site is fenced on all sides with a minimum requirement of 1600 mm Diamond mesh, galvanised fence, this fence must have a gate fitted to ensure security and stop unwanted entrance to site. The gate must be closed at all times and access must be controlled.

Both the Project Client / Client Agent and the Contractor have a duty in terms of the OHS Act to do all that is reasonably practicable to prevent members of the public and others being affected by the construction processes to be aware and put preventative measure in place. The public or visitors will go through a brief health and safety induction detailing hazards and risks they may be exposed to and what measures are in place to control these hazards and risks.

3.4.12 Night Work

The Contractor will not undertake any night work without prior arrangement and a written permit from The Project Client / Client Agent. The Contractor will ensure that adequate lighting is provided for all night work and failure to do so will result in work being stopped.

3.4.13 Facilities for Safekeeping and Eating Area (Mess Room) for workers.

A temporary structure to serve as a mess room or eating area must be provided by the Principal Contractor.

3.4.14 Fall Protection

1. A contractor must –

   (a) designate a competent person to be responsible for the preparation of a fall protection plan;
   (b) ensure that the fall protection plan contemplated in paragraph (a) is implemented, amended where and when necessary and maintained as required; and
   (c) take steps to ensure continued adherence to the fall protection plan.

2. A fall protection plan contemplated in Construction Regulation 10(1), must include –

   (a) a risk assessment of all work carried out from a fall risk position and the procedures and methods used to address all the risks identified per location.
   (b) the processes for the evaluation of the employees' medical fitness necessary to work at a fall risk position and the records thereof.
   (c) a programme for the training of employees working from a fall risk position and the records thereof.
   (d) the procedure addressing the inspection, testing and maintenance of all fall protection equipment; and
   (e) a rescue plan detailing the necessary procedure, personnel and suitable equipment required to affect a rescue of a person in the event of a fall incident to ensure that the rescue procedure is implemented immediately following the incident.

3. A contractor must ensure that a construction manager appointed under regulation 8(1) is in possession of the most recently updated version of the fall protection plan.

4. A contractor must ensure that –

   (a) all unprotected openings in floors, edges, slabs, hatchways, and stairways are adequately guarded, fenced, or barricaded or that similar means are used to safeguard any person from falling through such openings.
   (b) no person is required to work in a fall risk position unless such work is performed safely as contemplated in Construction Regulation 10(2).
   (c) fall prevention and fall arrest equipment are -

i. approved as suitable and of sufficient strength for the purpose for which they are being used, having regard to the work being carried out and the load, including any person, they are intended to bear; and

ii. securely attached to a structure or plant, and the structure or plant and the means of attachment thereto are suitable and of sufficient strength and stability for the purpose of safely supporting the equipment and any person who could fall; and

(d) fall arrest equipment is used only where it is not reasonably practicable to use fall prevention equipment.

5. Where roof work is being performed on a construction site, the contractor must ensure that, in addition to the requirements set out in Construction Regulation 10 (2) and (4), it is indicated in the fall protection plan that –

(a) the roof work has been properly planned;
(b) the roof erectors are competent to carry out the work;
(c) no employee is permitted to work on roofs during inclement weather conditions or if any conditions are hazardous to the health and safety of the employee;
(d) all covers to openings and fragile material are of sufficient strength to withstand any imposed loads;
(e) suitable and sufficient platforms, coverings or other similar means of support have been provided to be used in such a way that the weight of any person passing across or working on or from fragile material is supported; and
(f) suitable and sufficient guard-rails, barriers and toe-boards or other similar means of protection prevent, as far as is reasonably practicable, the fall of any person, material or equipment.

3.4.15 Scaffolding

All scaffolding used shall comply with the OHS Act and Construction Regulations as well as SANS 10085.

All scaffolding shall be inspected by a competent person on a daily basis as a minimum and also before use following weather conditions that could have made the scaffolding unsafe e.g. wind, rain which could make ground conditions unstable. Inspections shall be carried out on scaffolds that may be affected by adverse weather conditions.

Users of scaffolding shall carry out a visual inspection on a daily basis, before use. If unsafe conditions are found or suspected, the scaffold shall be isolated until a thorough inspection has been made. A visual inspection shall be carried out at the end of the shift and if unsafe conditions are found or suspected the scaffold shall be isolated until above is applied.

An appropriate scaffolding tagging system shall be used to confirm the status of scaffolding for use or not to be used. The footing or anchorage points for scaffolds shall be sound, rigid, and capable of carrying the maximum intended load without settling or displacement. Unstable objects such as barrels, boxes, loose brick, or concrete blocks shall not be used to support scaffolds or planks.

The Contractor must give preference to using scaffold stairs instead of ladders for all scaffolds. These scaffolds must be fitted with a kick place at the bottom of each stair section. The kick plate shall be able to prevent a member of contractors' personnel slipping down the staircase and sliding between the floor and the mid-rail.

3.4.16 Ladders (Portable)

All ladders shall have an identification tag, logged in a ladder register, and inspected monthly by a competent person and by the user prior to use.

Damaged ladders shall be marked as "DAMAGED" and removed from the Project Site (or at other places, if any, as may be specified under the Contract as forming part of the Site) and replaced with ones in good condition.

All ladders used for access shall be secured. Contractor's Personnel climbing a ladder with a fall exposure greater than 8 meters shall be protected by an approved cage, ladder climbing device, or using a body harness, lanyard, or lifeline system.

When ascending or descending ladders, Contractor's Personnel shall always maintain three points of contact and shall face the ladder. Portable metal ladders shall not be used in the vicinity of energized electrical circuits. Portable straight ladders shall not be used without non-skid bases.

The ladder shall be placed so that the distance between the bottom of the ladder and the supporting point is approximately 1/4 of the ladder length between supports. When dismounting from a ladder at an elevated position (as at a roof), the employee shall ensure that the ladder side rails extend at least 1 meter above the dismount position, or that grab bars are present.

Contractor's Employees shall wear a body harness and lanyard and tie off to a secure anchor whenever both hands must be used for the job or whenever Contractor's Personnel are exposed to a fall more than 2 meters. Step ladder legs shall be fully spread, and the spreading bars locked in place. Step ladders shall not be used as straight ladders.

3.4.17 Barricading

Areas where a restriction or prevention of unauthorised persons accessing (e.g., trenches, excavations, wall, and floor openings, etc.) is required will be provided with barricades and guards to prevent entry.

All barricading shall be of the rigid type, unless otherwise approved by the Engineer, and secure in assembly.

Contractors shall utilize warning signage that has been approved by the Engineer. All openings and edges must be barricaded with solid barricading to withstand an impact of at least 85kg. Physical barriers and warning signage shall be provided to prevent persons falling into openings in floors, stairwells, staircases, open-sided buildings, and any structure during erection, where dangerous openings exist. Safety net should also be provided if there is movement of people underneath the building that is being renovated or upgraded. The safety net will prevent equipment falling from height that can cause injuries to the members of the public. The first preventive measure is to provide hoarding so that no persons walks underneath the area under refurbishment or construction.

3.4.18 Severe Weather

The Contractor shall conduct operations in a manner that do not put personnel at risk from weather and weather-related injury.

3.4.19 Lifting Machine and Tackle

The Principal Contractor shall ensure that all lifting machinery and tackles are inspected prior to use, and in addition to it, monthly. The principal contractor shall appoint a competent lifting machinery and tackle inspector who will insect the equipment daily or before use, considering that:

- All lifting machinery and tackle have a safe working load clearly indicated.
- Records of inspections and load testing certificates are kept onsite.
- There is a proper supervision in terms of guiding the loads which includes a trained banks man to direct and check lifting tackle if it is safe for use.
- Heavy precast concrete culverts and concrete pipes will be lifted using the lifting machine.

3.4.20 Temporary Works/Formwork

All activities that will be carried out using temporary works/formwork are to be guided by the Construction Regulation 12, as quoted:

1) A contractor must appoint a temporary works designer in writing to design, inspect and approve the erected temporary works on site before use.

2) A contractor must ensure that all temporary works operations are carried out under the supervision of a competent person who has been appointed in writing for that purpose.

3) A contractor must ensure that—
    a) all temporary works structures are adequately erected, supported, braced, and maintained by a competent person so that they are

capable of supporting all anticipated vertical and lateral loads that may be applied to them, and that no loads are imposed onto the structure that the structure is not designed to withstand.

b) all temporary works structures are done with close reference to the structural design drawings, and where any uncertainty exists the structural designer should be consulted;

c) detailed activity specific drawings pertaining to the design of temporary works structures are kept on the site and are available on request to an inspector, other contractors, the client, the client's agent or any employee;

d) all persons required to erect, move or dismantle temporary works structures are provided with adequate training and instruction to perform those operations safely;

e) all equipment used in temporary works structure are carefully examined and checked for suitability by a competent person, before being used;

f) all temporary works structures are inspected by a competent person immediately before, during and after the placement of concrete, after inclement weather or any other imposed load and at least on a daily basis until the temporary works structure has been removed and the results have been recorded in a register and made available on site;

g) no person may cast concrete, until authorization in writing has been given by the competent person contemplated in paragraph (a);

h) if, after erection, any temporary works structure is found to be damaged or weakened to such a degree that its integrity is affected, it is safely removed or reinforced immediately;

i) adequate precautionary measures are taken in order to—
    i. secure any deck panels against displacement; and
    ii. prevent any person from slipping on temporary works due to the application of release agents;

j) as far as is reasonably practicable, the health of any person is not affected through the use of solvents or oils or any other similar substances;

k) upon casting concrete, the temporary works structure is left in place until the concrete has acquired sufficient strength to safely support its own weight and any imposed load, and is not removed until authorization in writing has been given by the competent person contemplated in paragraph (a);

l) the foundation conditions are suitable to withstand the loads caused by the temporary works structure and any imposed load in accordance with the temporary works design.

m) provision is made for safe access by means of secured ladders or staircases for all work to be carried out above the foundation bearing level;

n) a temporary works drawing or any other relevant document includes construction sequences and methods statements;

o) the temporary works designer has been issued with the latest revision of any relevant structural design drawing;

p) a temporary works design and drawing is used only for its intended purpose and for a specific portion of a construction site; and

q) the temporary works drawings are approved by the temporary works designer before the erection of any temporary works.

4) No contractor may use a temporary works design and drawing for any work other than its intended purpose.

When encountered with having to operate underneath existing surface infrastructure systems such as railways, wayleaves and existing services and having to operate using formwork and temporary support structures, the abovementioned guidelines are to be adhered to.

3.5 OCCUPATIONAL HEALTH

1. Exposure of workers to occupational health hazards and risks are very common in any work environment, especially in construction. The occupational hazards and risks may enter the body in three ways:
   (a) Inhalation e.g. cement dust.
   (b) Ingestion through swallowing.
   (c) Absorption through the skin (pores) e.g. painting or use of thinners.

2. All contractors are to ensure that where employees are exposed to airborne contaminants, preemployment medicals should be conducted to ensure fitness to work under such conditions.

3. All contractors will be responsible for the full cost of medical treatment that his staff may require; the contractor is therefore required to ensure that all his personnel are medically fit.

4. All Contractors should ensure that Occupational Hygiene surveys are conducted as per the Occupational Health and Safety Act to ensure employees is not exposed to hazards. Risk Assessments should identify areas where surveys are to be conducted.

3.6 DUTIES OF THE PRINCIPAL CONTRACTOR

The Principal Contractor must develop the health and safety plan in line with the health and safety specification. The plan will be evaluated and approved for implementation. The Principal Contractor must do his / her internal monitoring systems such as internal audits and inspections. The Client Agent will conduct audits to check compliance monthly.

The Principal Contractor must appoint a Full-time health and safety officer **(Fully Registered Construction Health and Safety Officer (SACPCMP registered).** The Principal Contractor must appoint a competent risk assessor as well as the incident investigator. Candidate Construction Health and Safety Officer will not be accepted.

3.7 HOARDING

The construction activities will be taking place in a built-up area with local residents anticipated to be entering, exiting, and travelled through the identified working sites. This will require the implementation of vigorous hoarding/barricading methods with highly visible signage. It is therefore critical that the principal contractor posts notices for the general public and routine awareness programmes for the duration of their activities.

3.8 EXCAVATIONS

Excavations are the source of many serious injuries that have been recorded in our industry. It is proper to expect the Principal Contractor to excavate when all the components that will be used on the excavations have already been procured. Construction Manager will be expected to cooperate with the Construction Health and Safety Officer to manage the risks that are associated with excavations. Detailed method statements and safe working procedures must be developed and communicated with principal contractor personnel. All excavation operations, method statements and safe working procedures are to be guided by the prescripts of **Construction Regulation 13**.

The method statements must account for the timeous backfilling of opened excavations following the completion of the installations/work associated with them. Given the nature of operations and the location of the working zones, no new excavations are to be opened from Wednesdays onwards, furthermore, no excavations/trenches are to be left opened during weekends and public holidays. All operations related to excavations and trench-works are to be completed by EOB on

Thursdays on a weekly basis, and on the day before a public holiday. Failure to comply to this directive will result in a contractual penalty.

3.9 DEMOLITIONS AND SUBSEQUENT REHABILITATION

Given the nature of this construction project, the Principal Contractor needs to adhere to the underlying prescripts of Construction Regulation 14 (Demolition Work), which dictates the minimum conditions to assimilate during demolition work:

1) A Contractor must appoint a competent person in writing to supervise and control all demolition work on site.
2) A Contractor must ensure that before any demolition work is carried out, and to ascertain the method of demolition to be used, a detailed structural engineering survey of the structure to be demolished is carried out by a competent person and that a method statement on the procedure to be followed in demolishing the structure is developed by that person.
3) During a demolition, the competent person contemplated in sub regulation (1) must check the structural integrity of the structure at intervals determined in the method statement contemplated in sub regulation (2), in order to avoid any premature collapses.

The abovementioned conditions are inexhaustive and dictate that a more holistic approach towards the adherence of the basic requirements of the Act and its Regulations, must be implemented by the Principal Contractor. In addition, a rehabilitation process must be followed to mitigate the adverse effects of the demolition that has been conducted. All the waste and debris produced by the demolition procedure must be removed from the site as soon as it is reasonably practicable, and that they are disposed of in accordance with the applicable legislation.

The conditions for mitigating the prevalence of hazardous waste material will be triggered giving rise to the need to assimilate the guides encompassed in the following legislative prerequisites into the relevant method statement and rehabilitation plan:

1) OHS Act – Occupational Health and Safety act 85 of 1993 and all regulations promulgated under this act, special reference to Regulations for Hazardous Chemical Agents, 2021

2) NEMA (ACT 107 OF 1998) – National Environmental Management Act 107 of 1998 and relevant specific environmental management acts promulgated under this act, special reference to NEM: WA (Act 59 of 2008).

3) NEM: WA (Act 59 of 2008) – National Environmental Management: Waste Act 59 of 2008 and regulations promulgated under this act, with reference to the National Waste Management Strategy, the Waste Classification Regulations and supporting Norms and Standards.

4) The Waste Classification and Management Regulations, 2013, published as Government Notice No. R. 634 of 23 August 2013

5) The National Norms and Standards for the Assessment of Waste for Landfill Disposal, published as Government Notice No. R. 635 of 23 August 2013.

5. Penalties and Non-Conformances

Minor	**Medium**	**Severe**
Penalty: R100 p/count	**Penalty: R500 p/count**	**Penalty: R5000 p/count**
Non conformance	**Non conformance**	**Non conformance**
Activity stoppage	**Activity stoppage**	**And/ or project/ activity stoppage**
Toilets not serviced / clean. No clean drinking water on site. No weather protected eating area provided.	Scaffold safety signage not in place safe/unsafe. No certificates of fitness for employees working at heights (incl. ceilings, ladders, scaffold & working platforms / mobile plant operators.	Employees working at heights without harnesses / fall protection equipment. Anchor lines not in use when working at heights.
Non-use of PPE supplied – hard hats, safety shoes, reflective vest, dust mask, goggles & hearing protection.	No design load available for scaffold designs, scaffold not approved by competent designer.	No project specific health and safety specifications or general health and safety specifications supplied to sub-contractors timeously.
Non completion of registers.	Sub-contractors not audited monthly.	Sub-contractors working without a H&S plan approval.

Lack of H&S signage at work areas – warning of dangerous construction activities.	Working without training or appropriate H&S method statements.	No CoC's available for electrical work completed on site.
Tools and equipment identified in poor condition during inspections.	Legal non-conformance not addressed from previous audit within agreed time frame.	Invalid Letters of Good Standing. No First Aider on site.
Poor housekeeping	No internal OHS monthly audit	No Registered Construction H&S Officer (SACPCMP) on site.
	Change of Critical legal appointments without notifying the client and client representative.	Principal Contractor allowing employees to commence work without Valid Medical Certificates of fitness issued by Occupational Medical Practitioner

ANNEXURE A

Notification of Intention to Commence Construction / Building work	To be completed and logged with the Department of Labour	Before commencement on site
Assignment of Responsible Person to Manage Building Work	All relevant appointments as per OHS Act	Before commencement on site
Assignment of Responsible Person to Supervise Building Work	All relevant appointments as per OHS Act	Before commencement on site
Medical Certificates of Fitness for all personnel on site	As per specifications and OHS Act	Before commencement on site
Competency for Responsible Persons	As per specifications and OHS Act	Before commencement on site
Compensation of Occupational Injuries and Diseases Act (COIDA) 130 of 1993	COIDA Requirement	Before commencement on site and during construction period
Occupational Health and Safety Policy	Contractor's Responsibility	At tender stage
Health and Safety Organogram.	Contractor's Responsibility	Before commencement on site
Health & Safety Representative	Section 17 OHS Act	Submit as soon as there are more than 20 employees on site

Assignment of Contractor's Responsible Persons

ANNEXURE B

The contractor **will** make the following appointments where applicable and ensure that CV's and competency certificates are attached to the relevant appointments* but are not limited to:

CEO Section 16.1 Board Resolution or declaration
(Competent Person for OHS) - OHS 16(2)*
Construction Manager CR 8(1)*
Construction Safety Officer - CR 8(5)
Construction Work Supervisor - CR 8(7)*
Construction Work Assistant Supervisor - CR 8(8)*
Risk Assessor - CR 9(1)

Competent Person to perform Risk Assessment Training – CR 9(3)
Fall Protection Planner CR 10(1)
Construction Vehicle & Mobile Plant Operator - CR23(1)(d)*
Temporary Electrical Installation Inspector CR 24
Housekeeping Supervisor CR 27
Stacking & Storage Supervisor - CR 28(a)
Fire Equipment Inspector - CR 29(h)
Emergency Coordinator - ER 9
H&S Committee Chairperson - OHS 19 (*where applicable)*
First Aider/s - GSR 3 **(Compulsory)**
Hazardous Chemical Substance Supervisor - HCS Regulations
Health and Safety Representative - OHS 17(1) (*where applicable)*
Portable Electrical Equipment Inspector EMR 10
Incident / Accident Investigator - GAR 9(2)
PPE Inspector – GSR 2
COVID-19 Compliance Officer

OTHER Occupational Health and Safety Specification REQUIREMENTS

ANNEXURE C

The contractor will comply and not be limited to the following requirements:

What	**When**	**Output**	**Reference information**
Awareness training Toolbox talks	Twice a week and before hazardous work is carried out	Attendance Register	
DSTI	Daily before work starts	Signed document	
Health and Safety Committee Meetings	Monthly	Minutes signed by the employer (Contractor) Covering: a) Health and Safety Representative Checklist	

Health and Safety Reports	Monthly	Report covering: a) Incidents/Accidents and Investigations b) Non-conformance c) Health and Safety Training d) HIRA Updates e) Internal and External Audits	Incident reporting and investigation for The Project Client / Client Agent & Contractor form
General Inspections	As per Occupational Health and Safety Specification and OHS Act	Report on Occupational Health and Safety Specification and OHS Act compliance: a) Scaffolding b) Lifting Machinery c) Excavations	
General Inspections	Monthly	Covering: a) Firefighting Equipment b) First Aid boxes c) Portable Electrical Equipment d) Ladders e) Vehicle & plant inspections	
Record keeping	Ongoing	Covering: a) General complaints b) Fines c) General incidents d) MSDS e) Surveillance Medicals f) Inspection Register	
Permits	Before commencement with certain activities	As stipulated by the Occupational Health and Safety Specification and the OHS Act / Construction Regulations	

SAFETY FILE REQUIRMENTS

ANNEXURE D

The contractor will comply and not be limited to the following requirements:

Item	Description
1.	OHS Act section 37.2 Agreement & **CR 5(1)(k) Principal Contractor Appointment**
2.	EHS Plan ***(Approved by Client as well as contractor responsible person)***
3.	Contractor Policies ***(As well as proof of communication to employees)***
4.	Scope of Work & ***Letter of award of contract***
5.	Contractor Public Liability Insurance Cover **(Proof of cover and policy number)**
6.	Notification of Construction Work to Department of Labour (Copy) **Stamped by DOL**
7.	Client SHE Specifications ***(Proof of communication to Construction Manager & Supervision)***
8.	Letter of Good Standing with a Licenced Compensation Commissioner (COID)
9.	Organisation Structure ***(Must indicate legal appointment reference, contact number as well as e-mail address where applicable)***
10.	Induction ***(Copy of training material and proof of training)***
11.	Risk Assessments ***(Approved risk assessment by contractor and Agent as well as proof of communication to all employees)***
12.	Area Emergency Plan site specific ***(Proof of communication to employees)***
13.	All Safe work procedures relevant to tasks that will be performed tasks identified as high-risk activities during risk assessment process
14.	Incident Investigation Procedure and Documents
15.	Appointments Letters ***(Copy of legal appointments and competency/CV/Certificates)***

16.	Site Specific Audits and Internal Audits/Inspection Arrangements ***(Client as well as internal)***
17.	Personal Protective Equipment ***(Proof of issue as well as monthly inspections by supervision)***
18.	Workers Welfare Facilities &Waste Management ***(Plot plan and inspections)***
19.	Toolbox Talks ***(Topics and proof of communication)***
20.	Site EHS Meetings Arrangements
21.	Equipment/Tools Inspections Checklist/Registers
22.	Medical Surveillance Certificates
23.	Copy of the Act & WCL2 Forms
24.	MSDS'S of all chemicals that will be used on site (16 Point MSDS as required by law)
25.	Fall Protection Plan

ACKNOLEDGEMENT OF OHS SPECIFICATION

Name of Company_____

I/We_____

Hereby certify that I/we acquainted ourselves with the Health and Safety Act 85 Of 1993 as well as the Construction Regulations, 2014 and all conditions contained herein as laid down by the State for the carrying out of construction work for which I/We submit our response.

I/We further agree that the State shall recognise no claim from me/us for relief based on allegations that I/We overlooked any tender requirements or failed to take into account the purpose of completing the documentation as required.

*Signed at*_____*On this the*_____ *Day Of*_____*20__*

_____ _____

WITNESS *NAME IN BLOCK LETTERS*

_____

For and on behalf of Contractor

_____ _____

Contractors Signature *I.D of Signatory*

BASELINE RISK ASSESSMENT FOR THE CONSTRUCTION OF KURUMAN DISTRICT HOSPITAL

COMPANY	BASELINE RISK ASSESSMENT
COMPILED BY	ERIC NQAMPI
DATE OF ASSESSMENT	11 August 2025
SCOPE OF WORK	Construction of Kuruman District Hospital
REVIEW DATE	EVERYONE (1) year or after reportable incident or change in scope of work.

HAZARD IDENTIFICATION AND RISK ASSESSMENT

Health

Department of Health
NORTHERN CAPE
John Taolo Gaetsewe District

Probability Index			Severity index injury /disease			Severity index (Production)			Severity index due to Environment			Severity index (Financial impact)			Frequency index		
	5	Almost certain to inevitable		5	Fatal		5	No production for at least 12 months		5	Permanent effects		5	Greater than R500 000.00		5	Hazards permanently present
	4	Probable		4	Permanently disabling injury		4	Loss of 1 month or more		4	Long term > 2 years		4	R100 000. 00 – R499 999,00		4	Hazards arises every week
	3	Improbable		3	Likely to be absent for more than 14 days		3	Loss of 1 week in production		3	Medium – 6 months to 12 months		3	R10 000.00 – R99 999.00		3	Hazards arises every month
	2	Less than even a chance		2	Medical recovery within 14 days		2	Loss of 1 day in production		2	Short term 1 day to six (6) months		2	R1 000.00 – R9 999.00		2	Hazards arises every year
	1	Highly improbable		1	First aid only		1	Loss of half day in production		1	Insignificant effect		1	R0 – R999.00		1	Hazards arises every five (5) years
	0	Not probable		0	Near misses		0	No loss of time but production affected by shock of employees		0	No aspect or impact		0	No cost involved		0	No hazards exists

PRIORITY OF ACTION				ACTION TO BE TAKEN
RISK VALUE	A	75 – 100%	Immediate	Training, Safe Work Practice, Method Statements & detailed action plans
	B	60 – 74%	Within 1 week	Training, Safe Work Practice, Method Statements & detailed action plans
	C	45 – 59%	Within 1 month	Training, Safe Work Practice, Method Statements & detailed action plans and registers
	D	30 – 44%	Within 6 months	Training and Safe Operating Procedures

BASELINE RISK ASSESSMENT FOR UPINGTON COMMUNITY LEARNING

		E	15 – 29%	Within 12 months	Training
		F	0 – 14%	As reasonable	Training

Ref No.	Sequence of Activity in Action	Hazards (Safety, Health, and environment)	Risk rating E (L + C)				Control Measure	Control Effectiveness Rating	
			Exposure (E)	Likelihood (L)	Consequence (C)	Risk Rating		Control Type	Control effectiveness rating
1.	Site Establishment	• Damage to Construction equipment, Vehicles, heavy lifting equipment etc. • Damage to existing electrical or Telecommunication lines. • Damage to property of client or private properties. • Construction vehicle crashes with site personnel or members of the public causing injuries and fatal accidents.	2	3	4	14	• The principal contractor will be required to develop and submit prior to commencement of work a risk assessment, health and safety plan, the method statements and all relevant supporting documentation to ensure that all overall activities are properly planned. • When using lifting equipment and cranes to assist with site establishment or construction work, ensure that all relevant risk assessments and method statements are conducted & employees are briefed on the risks involved. • Use competent employees to fulfil functions during the activities. • Ensure that sites are suitably and sufficiently fenced off and provided with controlled access points to prevent the entry of unauthorized persons. • The principal contractor must provide a detailed site establishment methodology prior commencement of activities.	Administrative	Satisfactory
2.	Location, exposure,	• Possible damage to existing	3	3	3	18	• The principal contractor must obtain the relevant details and drawings depicting existing services of	Administrative	Satisfactory

	and protection of known and unknown existing underground services	property e.g electrical supply or water line which could lead to disruption of municipal services. • Electrocution of contractor personnel through the direct contact with underground/over head powerlines which may lead to injury or, in the worst case, fatality.					all kinds from the Competent Authorities, prior to commencement of activities. • Relevant risk assessments and safe working procedures or must be developed and implemented accordingly. • Existing services are to be located, identified, and subsequently safeguarded. • Competent supervision and adequate pre-task training and induction required prior to activities. • Excavations opened overnight to be barricaded or fenced with a fence that is at least 1m in height. • No excavations must be left open over weekends and public holidays.		
3.	Site access and drivers on site.	• Possible collision of construction vehicles and/or mobile plants with site personnel, property, or members of the public while operating at work areas. • Unroadworthy vehicles/plants, drunk drivers, poor road, and weather	2	3	4	14	• A clear demarcation, and separation of working spaces or areas between the Principal Contractor and members of the public or residents must be established. • Traffic accommodation and signage to be installed before any construction work may commence. • Traffic movement to be observed and manually controlled where necessary. All visitors must be warned of the current heavy construction traffic at the entrance/exit point of the site. • All vehicles and mobile plants are to be checked for roadworthiness and safety before they are allowed onsite.	Engineering, Administrative & PPE	Satisfactory

		conditions causing collisions leading to personnel injuries and fatality.					• All construction vehicle drivers and operators are to be tested for alcohol on a regular basis. • All site personnel must be issued and always wear reflective vests while on site for visibility		
4.	Hazardous Chemical Substances	Exposure to hazardous chemical substances such as cement, paint and e.t.c, resulting skin and eye irritation	4	2	3	20	• Before any employee is allowed to use HCS, they must be trained and made aware of possible hazards as per MSDS. Correct and relevant PPE should be issued and worn to mitigate any possible risk of exposure.	Administrative and the use of PPE	Good
5.	Electricity	Electrical shock due to contact with live electrical wire	3	5	3	24	• Develop detailed method statement and ensure that it is implemented. • Exclusion zones to be created with rigid barriers and warning signs. • No machine to be operated in an area where any part of machine or equipment can contact electrical wire. • All persons to be provided with training in the hazards associated with live electrical wire. • Provide employees with relevant PPE	Combination of Administrative process and PPE	Satisfactory
	Electricity	Electrical shock or electrocution due to the use of unsafe electrical equipment (including generators)	3	5	3	24	• Electrical equipment to be inspected by an authorised operator or inspector on a daily basis prior to use. • Details of these inspections to be recorded in a register which will be kept on site at all times.	Administrative	Satisfactory
	Electricity	Electrical shock or electrocution due to contact with live overheard power lines	3	5	3	24	• Electrical artisans need to be mindful of existing electrical wires. Before any equipment is used on a work site, an assessment should be carried out and reports of such assessments kept in the Contractor's SHE file.	Administrative	Satisfactory

BASELINE RISK ASSESSMENT FOR UPINGTON COMMUNITY LEARNING

6.	Ladder: to gain access to excavations, trenches, and elevated positions.	Falling from the ladder leading to injuries	3	3	3	18	• Must be inspected by a competent person. • Principal contractor to appoint such a competent person in writing and must ensure that no worker uses a scaffolding that is not approved for use by a competent person. • Provide personal protective equipment	Administrative	Good
7.	Erecting working platforms	Poor manual handling leading to sprains, strains, and fractures.	4	3	5	32	• The principal contractor must appoint in writing a temporary works designer who will design, inspect, and approve the erected temporary works on site before use. Temporary works must be carried out under the supervision of a competent person appointed in writing as a temporary works supervisor. • Train employees on good lifting techniques. • Providing suitable working platforms for working conditions.	Administrative	Good
8.	Moving pipes for employees	Poor terrain Incorrect type of trolley to lift materials. Repetitive lifting of materials Damage to existing equipment.	4	3	5	32	• Train employees on good lifting techniques • Introduce the lifting machinery to avoid accidents to employees. • Existing equipment must be protected throughout the construction activities. • Only lifting equipment designed for lifting may be used to lift pipes and to put them in trenches. Lifting equipment must be operated by a trained operator who is appointed In writing. • Every lifting equipment must have a load test certificate and the maximum mass load which may	Administrative	Good

BASELINE RISK ASSESSMENT FOR UPINGTON COMMUNITY LEARNING CENTRE

							be carried at any one time must be displayed on the lifting equipment.		
9.	Drilling and grinding	Flying particles that can cause asthma.	4	3	5	32	Machine guard to be fitted and ensure that the machine is working properly. Inspection and pre checks to be conducted before using any driven machine. Employees to be issued with relevant PPE.	Engineering and administrative	Satisfactory
10.	Excavation work	Excavated trenches left open resulting in employees and members of the public tripping and falling causing injuries.	4	3	5	32	• All excavation work must be supervised by a competent person who is appointed in writing as an excavation's supervisor. • All excavations must be inspected, and a register must be kept in the contractor's OHS file. • All open excavations must be barricaded off with a high visibility orange and yellow net that is not shorter than 1 meter in height. • Signs warning of open excavations must be installed. • No excavations or trenches may be left open over weekends and public holidays.	Administrative Engineering solution	Good
11.	Improper stacking and storage	Material falls due to improper stacking causing injuries to persons.	3	4	4	24	• Stacking should be supervised by competent person. Best stacking practices should be applied. Training for those responsible for discharging this duty should be provided. • No stormwater pipes or any other construction material may be stacked blocking the residents' gates or against residents' fences.	Administrative	Good
12.	Portable Electrical Equipment	Noise will be generated by portable electrical equipment which will lead to noise induced hearing loss	2	2	3	10	• Principal Contractor to provide PPE (Ear Protection). Workers should be rotated to reduce exposure. Noise must be measured and if found to be more than 85 decibels, the contractor must provide means to mitigate the impact.	Administrative	Satisfactory

BASELINE RISK ASSESSMENT FOR UPINGTON COMMUNITY LEARNING CENTRE

13.	Removal of old services	Unsafe removal of underground services leading to electrocution, waterline bursts/disruption in supply of services.	4	5	4	36	• The Principal Contractor must ensure that the removal of old services is included in the health and safety plan. A detailed method statement must be submitted for review and approval before any work can be carried out. Such plans must be shared with the employees once approved. • Employees must be provided with the relevant PPE such as gloves and goggles.	Administrative	Good
14.	Mistakes in operation by employees and operators	Lack of training leads to mistakes, use of equipment incorrectly	4	5	4	36	• All employees on site to be properly inducted. • Competent supervision to be provided on site.	Administrative	Good
15.	Mixing of concrete	Hand mixing of concrete done on the ground resulting in environmental pollution and back pains and hand injuries	4	5	4	36	• No mixing of concrete is to be done on the ground. The principal contractor must provide damkos and mixing of concrete must be done on top it to protect the environment. • Employees must be trained on safe working procedures for working with concrete. • Relevant PPE such as gloves and goggles must be provided for employees.	Engineering and administrative controls	Good
16.	Housekeeping	Housekeeping not being maintained daily. Generated waste, scrap and debris not removed from site at reasonably appropriate intervals.	4	3	4	28	• Housekeeping to be maintained daily. • Hoarding must be maintained daily and must be kept up to standard.	Administrative	Good

BASELINE RISK ASSESSMENT FOR UPINGTON COMMUNITY LEARNING CENTRE

		Construction areas near occupied offices not sufficiently hoarded.							
17.	Working at elevated position / heights	Falling objects Employees working at heights not having necessary competency to work at heights.	4	5	5	40	• Tools to be secured while working at heights to prevent falling from heights. • Adequate training and awareness to be provided to employees on working in elevated/fall position.	Engineering and administration	Good
18.	Fall protection	Employees not working according to approved fall protection plan. Employees not trained on fall protection plan. Lack of supervision to ensure that workers are implementing the approved fall protection plan.	4	5	5	40	• Fall Protection plan to be communicated among all employees by means of induction training and toolbox talks. • Employees to have the necessary competency in order to qualify to work at heights. • Fall protection plan to be updated throughout the project life span. • Fall protection plan to address all site-specific conditions.	Engineering and administration	Good
19.	Oil and attributed tools and equipment.	Oil, diesel, petrol, and grease spillage Oil/ grease being flushed down drains	3	4	3	21	• All cleaning and servicing of plant and equipment to be conducted in a controlled manner and working area. • No oil or grease to be disposed of down drains or into the stormwater systems. • Empty oil/ grease containers to be removed from site and disposed of as per regulations on disposal of hazardous chemical waste.	Administrative	Good

BASELINE RISK ASSESSMENT FOR UPINGTON COMMUNITY LEARNING CENTRE

20.	Demolition of part of existing structure	Wall collapsing to people causing multiple injuries and fatalities	3	4	4	24	• Conduct thoroughly risk assessment before you commence with demolition work. • Relocating people who might be affected by this activity. • Principal Contractor must submit a demolition plan for approval before they commence with demolition work. • Demolition work to be supervised by competent person. • The area to be demolished to be cordon off and no person should be allowed to gain access in that area. • Hoarding must be in place to prevent unauthorised person from gaining access to a dangerous area.	Engineering, administrative and PPE	Good
21.	Temporary works	Collapse of the structure that has not cured properly causing multiple injuries and fatalities. Failure of the temporary works due to poor design or poor construction methods.	5	5	5	50	• Competent temporary works designer to be appointed, preferable a structural engineer. • Temporary works designer to design all temporary works and sign off whatever needs to be signed. • Temporary work designer to execute his duties as contemplated in Construction Regulation 12	Engineering, administrative and PPE	Good

BASELINE RISK ASSESSMENT FOR UPINGTON COMMUNITY LEARNING CENTRE

1. **A risk level is attributed to each circumstance in the following manner.**

   - Low Risk = 1 – 15
   - Medium Risk = 16 – 30
   - High Risk = 31 – 50

2. **Risk Ranking calculation**

   2.1 Consequence

   - Medical Treatment only or less (minor injury) = 2
   - Average Lost Time Injury = 4
   - Major Injury = 6
   - Fatality or Permanent disabling injury = 8

   2.2 Probability

   - Not likely to occur in our lifetime = A
   - Could occur = B
   - Has happened = C
   - Common Occurrence = D

   2.3 Calculation of Risk

   - Consequence = probability x frequency

3. **Evaluation of results**

   Activities listed in the high-risk zones must be seen as tasks requiring immediate attention. Administration will in most instances solve some of the problems satisfactory, administration would involve training and awareness programmes to educate employees about the hazards and risks associated with their tasks.

   An implementation plan must be devised to address the outstanding issues which may need engineering solution or PPE if all attempts fail. The action plan must be cognisance of the specific hazards that need to be eliminated.

4. **Assessment Team**

   The following professionals were involved in the design of this baseline risk assessment for the Construction of Upington Learning Centre:

   Eric Nqampi – Pr. CHSA
   Dunyiswa Nosana: Candidate CHSA
   Siviwe Dandala: Candidate CHSA

5. **Task Specific Risk Assessment**
   Should the baseline risk assessment indicate tasks in high-risk zone, a specific task risk assessment must be conducted. The assessment will then target the specific tasks and hazards attached to the identified activity.

6. **Required and Existing Control Measures**

   - Safe Work Procedures
   - Training
   - Medical Examination
   - Supervision
   - Risk assessment
   - Mitigation measures
   - Consequence management

ELETRICAL INSTALLATION SPECIFICATIONS

DETAILED TECHNICAL SPECIFICATION

PERTAINING TO THE

ELECTRICAL, CCTV AND SECURITY INSTALLATION

TO THE

KURUMAN HOSPITAL ACCIDENT AND EMERGENCY FACILITY

DETAILED TECHNICAL SPECIFICATION

SCOPE OF CONTRACT

GENERAL DESCRIPTION OF THE WORKS

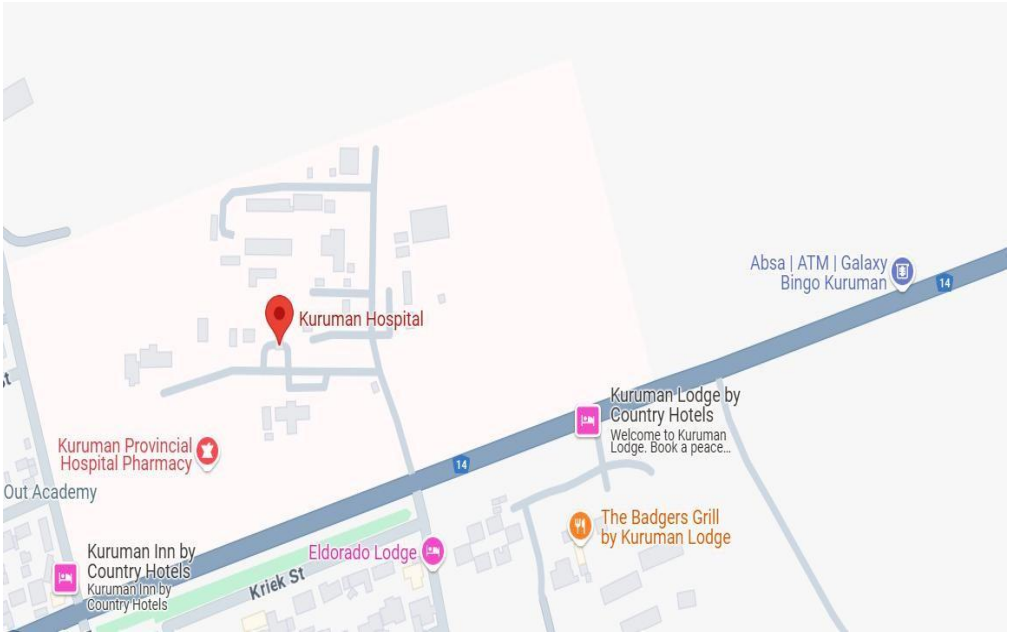
This tender is for the Kuruman Hospital Accident and Emergency ward, which entails the new electrical installation of lighting, power, CCTV and Security system

Please refer to indicative drawings for information, issued with tender, read in conjunction with the bills of quantities for further detail on the scope of works.

Please note that the Bill of Quantities and Scope of works included in this tender are subject to change and it is likely that the scope of works will increase, the BoQ does not necessarily represent definitive and or confirmed scope of works.

LOCATION OF THE BUILDING AND SITE

1 Main Street, Ga-Segonyana, Kuruman.



OTHER SERVICES EXTERNAL & INTERNAL TO BUILDING

The contractor shall ensure that he is familiar with the existing services layouts of the electrical and other services which will be installed in the building, before commencing with any installation work.

Should any problems occur in this regard, the contractor shall immediately inform the consulting engineers.

PARTICULARS OF SYSTEM AND SERVICE CONDITIONS

Supply Authority	Landlord supply
Primary Voltage	11 000-volt 3 phase A.C.
Secondary Voltage	400/230-volt 3 phase A.C.
Frequency	50 Hertz
No. of phases	Three
No. of wires	Primary 3: Secondary 4
System earthing 400/230-volt	Neutral terminal of transformer earthed

BUILDING CONSTRUCTION PERIOD

The building construction period will be provided by the builder in the form of a building programme. The contractor will be expected to fit in with this programme.

SCOPE OF WORK

The electrical contract covers all work of an electrical nature as detailed in this specification and Bill of Quantities, and as shown on the drawings. The tender drawings are for information purposes only, Tenderers are required to price the BOQ's.

Scope will involve Stripping out and making safe of existing while keeping essential services operational as the store will be operating during the revamp

We note that there will be night time work required during the construction period

The new electrical Installation shall comply with and be in accordance with:

- SANS 10142 Part 1 and 2
- 'OHS Act' to the 'Occupation Health & Safety Act 85 of 1993'
- SANS 10400 Building Regulations
- IUSS Building Guidelines

The complete commissioning, testing and handing over of all the above items (Including properly circuited As Built Drawings)

GUARANTEE

The contractor will be required to guarantee the installation, exclusive of equipment supplied by others, against faulty workmanship and materials for a period of **one year (12 months)** from the date that the Electrical Consulting Engineer has signed the works completion lists and putting into service for the benefit of the owners.

COMMISSIONING, WITNESSING & HANDOVER

The Consultant must witness and verify the operation of the entire system. Prior to this, the Contractor must also undertake full commissioning of the system. These commissioning instructions must be provided in a checklist format that requires the Contractor and Consultant's initials.

Prior to offering for acceptance any aspect of the Electrical Installation, the Contractor must have completed, snagged (zero snagging objectives) and tested all systems. It is essential that the works are completed, checked and signed off by both the Contractor and Consultant prior to formal offer to the Client.

Documentation must be issued prior to the agreed Client demonstration dates for review by the Consultant, not on the date of demonstration.

All of the above information must be included in a commissioning report compiled by the Contractor, detailing all the results from the commissioning. This report must include in addition to the above:

- Detailed list of all commissioning dates, records of all functional / commissioning testing undertaken.
- List of any future seasonal testing required and a written list of outstanding commissioning issues.
- The outcomes and changes made to the building as a result of the commissioning process, accounting for all the recommendations.

The following documents will be required for the project handover

AS-BUILT DRAWINGS

This is to include scale drawings showing the following information:

a) The As-Build drawings must include MLV schematics of the entire electrical system, lighting and small power layouts together with the infrastructure cableways and wireways layouts.
b) All drawings shall accurately indicate each circuit including the circuit number and the DB it is fed from.
c) The MLV schematics must include the correct cable and wire sizes used.
d) Any variations to consulting engineers' drawings must be hand marked and issue on date of practical completion to Amahle Multi-Disciplinary and Projects.

4.4.2) OPERATION & MAINTENANCE MANUALS

This is to include all the equipment operational manuals together with a building specific manual detailing the operation of the Electrical System is functional. This is to include a building specific document detailing all maintenance that will be required on the system as well as detailing what profession will be required to action each item. The building specific manuals must be able to be understood by the building manager and provide skill sets requirements should the information be technically intense and require specialists to manage certain aspects of the building. The completed commissioning reports must be included together with all signed handover and approval documents

The following documentation must be part of the handover process and must be included in the 3(three) copies of O&M Manuals:

- Specification sheets of the type of lighting fixtures used.
- Specification sheets of the socket outlets, isolators and light switches used.
- Lighting attic stock schedule indicating the type and quantity handed over.
- Critical spares schedule
- Test / commissioning sheets (signed off by both the Contractor and Consultant)
- Guarantees and warranties are formally offered in accordance with the contract
- Training documentation (in electronic and hard copy), including a schedule of all those operatives that have attended training.
- The commissioning results, certification, graphics, schedules, warrantees and test sheets must all form part of the documentation.

TRAINING

Training must be done to ensure that building management staff have all the information and understanding needed to operate and maintain the features and systems in the building. Training for the Client's support staff must have been undertaken prior to acceptance of any systems. This must be provided for 6 individuals.

Training must include the following:

- Going through the Operation & Maintenance manuals and explaining what it contains and what the purpose of each document is.
- The required maintenance required for the system.
- A presentation on the system used and its expansion capabilities
- Allow each operator hands on experience on the system to familiarize them to the system and ask any related questions.
- All occupational Health and Safety issues must be explained to the staff.
- A detailed troubleshooting guide must be reviewed, showing methods to troubleshoot problems on the system.
- A handover certificate shall be completed to record the acceptance of the package for any given project. For formal handover to occur, the preceding sections must have been adhered to with associated documentation. Subject to the requirements of the Contract, Practical Completion will not be given until satisfactory handover of the system has been achieved.

PROVISIONAL BILL OF QUANTITIES

PERTAINING TO THE

ELECTRICAL, CCTV AND SECURITY INSTALALTION

TO THE

KURUMAN HOSPITAL ACCIDENT AND EMERGENCY FACILITY

NOTES TO BOQ

GENERAL NOTES APPLICABLE TO THIS PROVISIONAL BILL OF QUANTITIES

a) These Bills of Quantities contain pages numbered consecutively in each Bill as indicated in the Index. Before the Tenderer submits his tender he should check the number of pages, and if any are found missing or duplicated, or if the figures or writing indistinct or the Bills of Quantities contain any obvious errors, he should apply to the Engineer at once and have same rectified, as no liability whatsoever will be admitted by the Engineer in respect of errors in tender due to the foregoing.

b) The Bills of Quantities form part of and must be read in conjunction with the Specification which document contains the full descriptions of the work to be done and material and equipment to be used and unless otherwise described in the Bills of Quantities, reference should be made to the Specification for the full meaning of descriptions of work to be done and materials and equipment to be used in this service.

c) The total tender price in the tender form shall constitute the contract price of the successful Tenderer. Tenderers are advised to check their item extensions and total additions, as no claim for arithmetical errors will be considered.

d) No alterations, erasure or addition is to be made in the text of the Bills of Quantities. Should any alteration, erasure or addition be made, it will not be recognised but the original wording of the Bills of Quantities will be adhered to.

e) The Priced Bills of Quantities of the successful Tenderer will be checked, and the Engineer reserves the right to call for adjustments to any individual price and to rectify any discrepancy whilst the total tender price, as submitted, remains unaltered.

f) The quantities in these Bills of Quantities are **not** to be used for ordering material

g) Quantities given in these Bills of Quantities should be regarded as **provisional and are subject to re-measurement**.

h) The responsibility for the accuracy of the quantities written into the Bills remains the person who prepared the Bills. The Tenderer shall be relieved of responsibility of measuring quantities at the tender stage, and the tender sum submitted shall be in respect of the quantities set out in the Bills, although he will be required to make his assessment of items such as brackets, fixings, etc., from details stated in the Bills and shall include in the item prices for such small installation materials as are required for the complete installation in accordance with the Specification.

i) The successful Tenderer and Employer or his agent may agree that the total of any Bill or Bills, including any variations by way of additions thereto or deductions therefrom, represents a fair and accurate quantification of the items set out in the Bills and the parties may agree final payment on that basis. In the event of any dispute as to the quantities, then the disputed item or items shall be adjusted where necessary.

j) Variations in the scope and extent of the work included in the Bills shall be allowed to meet the Employer's requirements and shall be measured and costed at rates entered in the bills, where appropriate, and shall form an addition to or deduction from the total of the Bills. Any items or variation for which rates have not been included in the Bills shall be agreed and priced as non-scheduled items in accordance with the provisions of the contract.

- The rules governing the extent and costing of the variation shall be those provided for in the Conditions of Contract.
- Variations to the planning before the work has been executed shall be priced as above. Alterations to work already executed cannot necessarily be priced as above and must be reviewed on its merits.
- The appropriate portion of the P & G sum is to be adjusted proportionately to the nett additions or omissions of the variations to the contract.

k) Unless a separate rate for the supply and for the installation of any item is specifically called for, the supply and installation costs of any items shall be fully included in the unit price.

- The description of each item shall, unless otherwise stated herein, be held to include making, conveying and delivering, unloading, storing, unpacking, hoisting, setting, fitting and fixing in position, cutting and waste, patterns, models and templates, plant, temporary works, return of packings, establishment charges, profit and all other obligations arising out of the conditions of contract.

l) All outlet boxes up to 100 x 100mm are measured as one item regardless of the number of entries.

- Conduit boxes shall always include the fixing to the conduit with lock and bush nuts as specified.

m) Industrial switch and plug units shall include the fixing to conduit as specified.

n) Outlet boxes shall be without covers and draw boxes shall include covers, screws, etc.

o) Light switches, switch plugs, dimmer units, etc., shall include screws, cover plates, and other equipment specified.

p) All fittings and accessories always include the connections thereto. All light fittings shall be complete with lamps unless otherwise stated in the Bill.

q) An additional length of 300mm per conductor has been measured for conductors drawn into conduit, per termination point. The tenderer shall allow in his rate for any conductor lengths required for his own purposes, in addition to the 300mm measured.

r) All measurements are nett, unless otherwise stated, and Tenderers shall allow in the rate for wastage.

s) The quantities and rates included for day work shall form part of the tender price, but Tenderers shall note that this item must be regarded as provisional and will only be payable to the Contractor when a written order to this effect has been issued.

t) All provisional sums shall be expended as directed by the Engineer and any balance remaining shall be deducted from the amount of the contract sum.

u) The prices and rates inserted in these Bills of Quantities do not include 5% Principal Contractor's Discount.

v) All items described as "Provisional" shall be measured as executed and paid for according to prices in the Bills of Quantities and any unexpended amounts shall be deducted from the amount of the contract sum. No work for which "Provisional" items are provided shall be commenced without written instructions from the Engineer.

w) Items for which "NIL" has been inserted in the "QUANTITY" column shall be priced as rates only, and no amount shall be inserted in the "AMOUNT" column for these items. These rates will be used later to price any additions to, or exclusions from the electrical installation.

x) PRICES AND RATES TO BE DEEMED FULLY INCLUSIVE

- All prices and rates inserted in these Bills of Quantities shall, unless specifically otherwise stated, be deemed to be inclusive of all overhead costs and general items and associated with the completion of the contract, including:

y) The items mentioned above.

z) Labour of every description including additional costs incurred in working overtime, weekends, public holidays, etc., to meet the stipulated programme dates.

aa) Provision and maintenance of all plants, equipment, machines, trucks and other vehicles, tackle, tools, staging, sheds, stores and temporary works necessary for the due and proper performance of the Sub-Contract Works, establishment charges and all fuel, operating costs and depreciation pertaining to plant, equipment, etc.

bb) Taxes, sales tax and duties.

cc) Overheads and profit.

dd) All charges required by the Sub-Contractor in connection with Preliminary and General, site establishment and the like.

ee) All obligations arising out of this Schedule of Terms and Conditions and all costs and charges deemed necessary for complying with the terms and conditions herein.

ff) All matters arising out of the execution of the Sub-contract works whether specifically mentioned in this Schedule or not.

gg) Attendance at progress meetings and ensuring that programme requirements and revisions thereto are met with.

hh) All costs incurred in conforming to Statutory and Regulatory Requirements.

ii) Processing of progress claims and other administration work.

jj) Contractual obligations regarding guarantees.

kk) Rates given for copper earth wire and insulated copper conductors below the size of 6mm shall include for all termination required to complete a circuit.

ll) All PC amounts and provisional sums are nett. Any profit and attendance on P./C. amounts and provisional sums required by the Contractor shall be added in the appropriate space in the Schedule of Quantities.

mm) The successful tenderer will be required to measure drawings as they are made available. This measure will not include tenant requirements. Tenant requirements will be required to be measured separately. The successful tenderer will be required to submit their measures within 14 days of drawings being issued.

MECHANICAL INSTALLATION SPECIFICATIONS

KURUMAN HOSPITAL: ACCIDENT AND EMERGENY UNIT

TECHNICAL SPECIFICATION FOR AIR CONDITIONING AND VENTILATION INSTALLATIONS

VARIABLE REFRIGERANT SYSTEM

01 DESCRIPTION OF PROPOSED SYSTEM

01.1 GENERAL

The proposed system is a low energy **air-cooled direct expansion Variable Refrigerant System (*VRS*) with Inverter Heat Recovery**, and in line with ***Green Building*** design principles**.** The VRS system would be a multiple indoor connected to one outdoor unit and can simultaneously cool and heat at the same time from the same system. This system to be used in all treatment rooms and offices as indicated on the drawings.

The **outdoor compressor units** are to be located outside the building on a dedicated plantroom, and refrigerant would be reticulated to indoor units by means of a refrigerant pipe system. The outdoor units would incorporate inverter hermetically sealed scroll compressors operating on refrigerant R410a. An efficient brushless DC motor will be used to drive the compressor and will be inverter controlled. A DC motor will drive the condenser fan.

Indoor units are to be installed in the ceiling void and zoned to serve each room individually. This arrangement allows for individual room control for heating or cooling as required per room. It also allows for economical after-hours use of the air conditioning system, when only certain rooms may be in use..

Each indoor unit would contain the necessary washable removable (clip in/out) filters and filter box, fire resistant insulation, coil and 3-speed supply air fan. Return air would be drawn into the unit through return air grilles provided in the ceiling as detailed on the drawing and mixed with a regulated amount of outside air. Hideaway indoor units shall be provided with a supply air diffusers as indicated on the drawings, a formed insulated condensate drain pan and hose (some indoor units are to be supplied with condensate drain pump kit). The indoor units shall be connected to the supply air grille/diffuser with a rubber connection or insulated flexible duct in order to eliminate possible vibration transmission. Air would be evenly distributed to the occupied areas by means of constant volume ceiling mounted diffusers or grilles (refer drawing). Condensate drains to be provided with suitable **cleanable** trap to prevent transfer of smells from the drainage system and where possible is to use the trap of a wash hand basin. A short length of transparent tubing is to be provided at the connection to the drain pan. All drain lines are to have a suitable fall to prevent standing water. Note that Condensate drain pump kits are specified on all models. Ensure that condensate pipe is suspended every 800-1000mm and the fall to be 1:100 or better, and ensure the collective drainpipe is big enough.

All indoor units will have dedicated controllers. The controller will be installed on the wall at +-1350mm above finished floor level (or on same level as light switch) which will provide the occupant with control within a tolerance of 1.5ºC of the design temperature which is 22.5ºC. Controllers will be wired to the indoor units. The controller to enable on/off switching, fan speed control and temperature selection. The controller screen shall be backlit, and the text shall be large enough to read. All the buttons on the controller shall be soft touch.

If **cooling or heating is required in a room after hours**, only a fraction of the plant needs to operate, and not the entire plant.

Ventilation ducting, refrigerant piping and communication cable will be reticulated through the building (as per drawings)..

01.2 AUTOMATIC CONTROL SYSTEM

No group controller required.

01.3 REFRIGERANT PIPING & INSULATION FOR VARIABLE REFRIGERANT SYSTEM (*VRS*)

- Pipe sizes, depending on the equipment make selected, to be accurately calculated by manufacturer (*VRF* specialist) and included in the budget estimate costs, complete with installation costs.
- The HVAC contractor to comply with refrigerant piping lengths, piping size, joint and header selections strictly in accordance to the *VRF* manufacturers requirements.
- Refrigerant pipe for the *VRF* shall be made of phosphorous deoxidized copper using two types :

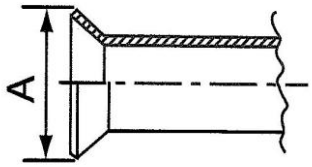
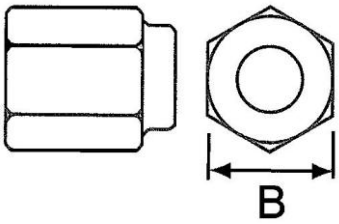
  A. Type-O : Soft copper pipe (annealed copper pipe), can be easily bent with human's hand.

  B. Type-1/2H pipe : Hard copper pipe (Straight pipe), being stronger than Type-O pipe of the same radical thickness. Maximum allowed tensile stress is 61N/mm^2. The 0.2% proof strength shall be 61N/mm^2.
- The maximum operation pressure of R410a air conditioner is 4.30 MPa. The refrigerant piping should ensure the safety under the maximum operation pressure. We recommend pipe size as Table below. Pipes of radical thickness 0.7mm or less shall not be used.

Table : Copper pipe size and radial thickness for R410a VRF

Dia Size (mm)	Dia Size (inch)	Radial thickness (mm)	Pipe type
06.35	1/4"	0.8	Type-O
09.52	*3/8"*	0.8	Type-O
12.7	1/2"	0.8	Type-O
15.88	5/8"	1.0	Type-O
19.05	3/4"	1.2	Type-O
19.05	3/4"	1.0	Type-1/2H
22.2	7/8"	1.0	Type-1/2H
25.4	1''	1.0	Type-1/2H
28.58	1-1/8"	1.0	Type-1/2H
31.75	1-1/4"	1.1	Type-1/2H
34.93	1-3/8"	1.2	Type-1/2H
41.3	1-5/8	1.43	Type-1/2H

Due to the relative higher operation pressure of R410a, the flare connection should follow dimensions mentioned below so as to achieve adequate resistance.

Flare pipe	Pipe size	A (For R410a)
	dia 6.35 [1/4]	9.1
	dia 9.52 [3/8”]	13.2
	dia 12.70 [1/2”]	16.6
	dia 15.88 [5/8”]	19.7
	dia 19.05 [3/4”]	24.0
Flare nut	Pipe size	B (For R410a)
	06.35 [1/4”]	17.0
	09.52 [3/8”]	22.0
	015.88 [5/8”]	29.0
	012.70 [1/2”]	26.0
	019.05 [3/4”]	36.0

Refrigerant charging calculation

- Original charge of refrigerant and the maximum total charge:- At factory shipment, refrigerant is charged in the outdoor unit. When extending the piping in the field, additional charge of refrigerant is needed and to be costed by HVAC contractor in accordance to the manufacturers (VRF specialist) calculations. **The manufacturer maximum allowable total charge in the air conditioner system should not be exceeded.**

Caution for refrigerant leakage R410A

- The HVAC Contractor and/or air conditioning system specialist shall ensure safety against refrigerant leakage according to local regulations or standards and must comply fully to this clause. The following standard may be applicable if no local regulation or standard is available.

Refrigerant property

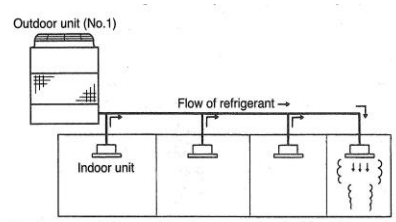
- R410a refrigerant is harmless and incombustible. R410a is heavier than indoor air in density. Leakage of the refrigerant in a room has possibility to lead to a hypoxia situation. Therefore, the Critical concentration specified below shall not be exceeded even if the leakage happens.
- Critical concentration
    - Critical concentration hereby is the refrigerant concentration in which no human body would be hurt if immediate measures can be taken when refrigerant leakage happens.
    - Critical concentration of R410a: 0.30kg/m3 . (The weight of refrigeration gas per 1 m3 air conditioning space.) The Critical concentration is subject to IS05149, EN378-I
- For the VRF, the concentration of refrigerant leaked should not have a chance to exceed the Critical concentration in any situation.

Confirm the Critical concentration and take countermeasure

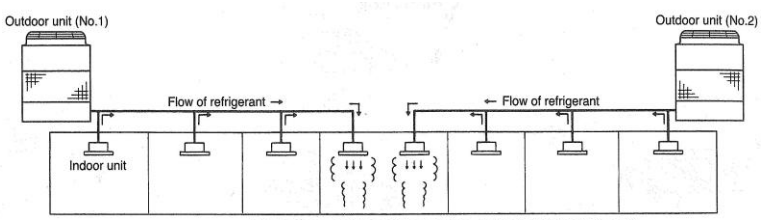
- The maximum refrigerant leakage concentration (Rmax) is defined as the result of the possible maximum refrigerant weight (Wmax) leaked into a room divided by its room capacity (V). It is referable to Fig. below. The refrigerant of Outdoor unit here includes its original charge and additional charge at the site.

- The additional charge is calculated according to the refrigerant charging calculation of each kind of Outdoor unit, and shall not be over charged at the site. Procedure 1 -3 tells how to confirm maximum refrigerant leakage concentration (Rmax) and how to take countermeasures against a possible leakage.

Figure below - The maximum, refrigerant leakage concentration



Maximum refrigerant leakage concentration (Rmax)
Rmax=Wmax / V (kg/m^3)



Maximum refrigerant leakage concentration (Rmax)
Rmax=Wmax / V (kg/m^3)
where, Wmax=W1+W2
W1: Refrigerant weight of Outdoor unit No.1
W2: Refrigerant weight of Outdoor unit No.2

- Procedure:
  1. Find the room capacity (V), If a room having total opening area more than 0.15% of the floor area at a low position with another room/space, the two rooms/space are considered as one. The total space shall be added up.
  2. Find the possible maximum leakage (Wmax) in the room. If a room has Indoor unit(s) from more than 1 Outdoor unit, add up the refrigerant of the Outdoor units.
  3. Divide (Wmax) by (V) to get the maximum refrigerant leakage concentration (Rmax).
  4. Find if there is any room in which the maximum refrigerant leakage concentration (Rmax) is over 0.30kg/m3. If no, then the VRS is safe against refrigerant leakage. If yes, following countermeasure is recommended to do at site.

- Countermeasure
  1. Countermeasure 1: Let-out (making V bigger) . Design an opening of more than 0.15% of the floor area at a low position of the wall to let out the refrigerant whenever leaked e.g. make the upper and lower seams of door big enough.
  2. Countermeasure 2: Smaller total charge (making Wmax smaller) e.g. Avoid connecting more than 1 Outdoor unit to one room, e.g. Using smaller model size but more Outdoor units, e.g. Shorten the refrigerant piping as much as possible.
  3. Countermeasure 3: Fresh air in from the ceiling (Ventilation) : As the density of the refrigerant is bigger than that of the air. Fresh air supply from the ceiling is better than air exhausting from the ceiling.

  Fresh air supply solution refers to Fig. 2 to 4 below

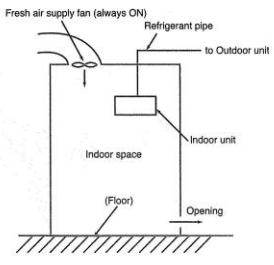


Fig. 2. Fresh air supply always ON

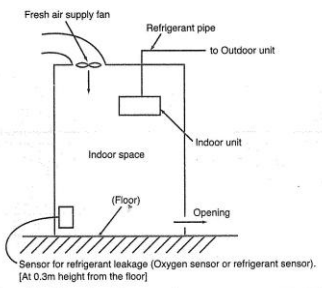


Fig. 3. Fresh air supply upon sensor action

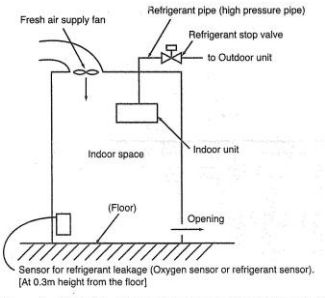


Fig. 4. Fresh air supply and refrigerant shut-off upon sensor action

- ***Note 1***. Countermeasure 3 should be done in a proper way in which the fresh air supply shall be on whenever the leakage happens.
- ***Note 2***. In principle, the VRS manufacturers requires proper piping design, installation

and air-tight testing after installation to avoid leakage happening. In the area should earthquake happen, anti-vibration measures should be fully considered. The piping should consider the extension due to the temperature variation.

- All refrigerant piping and fittings shall be insulated in accordance with the HVAC General Technical Specification, to the *VRF* manufacturers' and the engineers satisfaction.

- All pipe supports / trays exposed to the weather shall be hot dip galvanized or constructed of other non corrosive robust strong material.

Refrigerant pipe installation

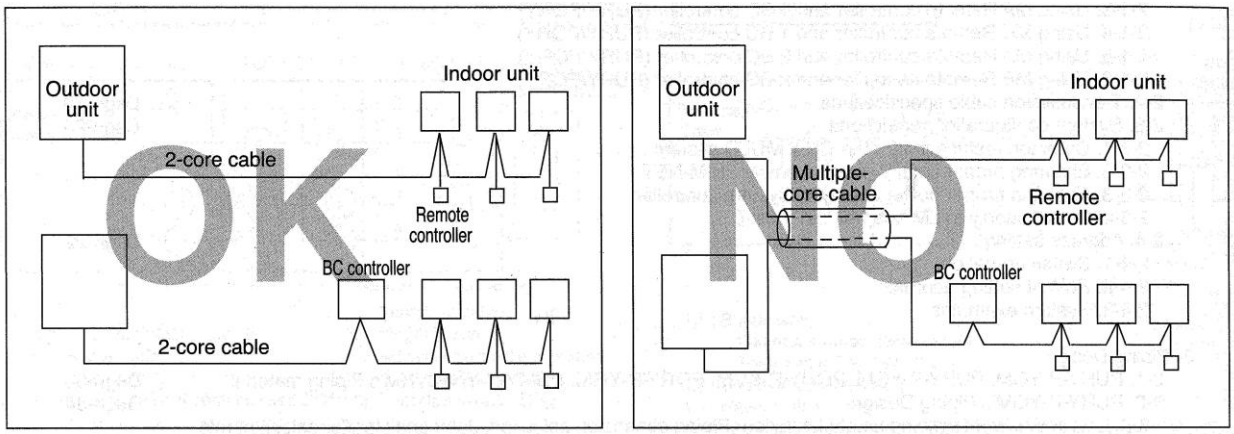
- During brazing of pipework, Nitrogen must flow through the pipes putting it under positive pressure
- Must perform flushing and cleaning of pipes.
- Must perform air tightening test to prevent refrigerant leakage.
- Must perform vacuum drying to prevent moisture in refrigerant circuits.
- Must use correct and purpose-made tools (e.g. copper tube cutter, no saw) when installing piping and connections.
- Must store pipes correctly (i.e. with seal plugs, store pipes on stand). Under no circumstances must dirt enter in pipes. Should dirt in pipes be the cause of system failure, the contractor is responsible for replacement of failed systems free of charge.
- Must ensure correct security is in place to prevent copper pipes theft (stored or installed). We will not accept any time or cost claims as result of copper pipe theft.
- Must install refnet according to supplier specification manual.

01.4 TRANSMISSION CABLE CONNECTIONS BETWEEN INDOOR AND OUTDOOR UNITS

The HVAC contractor to comply with the following:

General cautions for transmission cable connections between indoor and outdoor units

1. Follow the ordinance of local authorities for the technical standard related to electrical equipment, wiring regulations, and guidance of each electric power company.
2. Wiring for control (hereinafter referred to as transmission cable) shall be 100mm or more apart from power source wiring so that it is not influenced by electric noise from power source wiring. (Do not insert transmission cable and power source wire in the same conduit.)
3. Be sure to provide designated grounding work to outdoor unit.
4. Give some allowance to wiring for electrical part box of indoor and outdoor units, because the box is sometimes removed at the time of service work.
5. Never connect 380-415V or 220-240V power source to terminal block of transmission cable. If connected, electrical parts will be burnt out and it will be the contractor to repair at his cost.
6. Use 2-core shield cable for transmission cable. If transmission cables of different systems are wired with the same multiple-core cable, the resultant poor transmitting and receiving will cause problems. Daisy chain cabling with 2 core 1,5mm² non-polarity shielded cable should be used.



01.5 ELECTRICAL SWITCHBOARDS AND WIRING

Electrical contractor to provide 400V 50Hz power (via cable)to: **IMPORTANT- this to be agreed with electrical consultant.**

1. The DB board that feeds the VRF system, with a fire alarm relay
2. The electrical contractor to provide Voltage and Surge protectors that are built into their upstream electrical boards, as a standard, which covers the incoming supply to our entire board.

HVAC contractor to provide: **IMPORTANT- this to be on HVAC drawing.**

1. Wiring and Isolators adjacent to each outdoor unit 400V 50Hz
2. Wiring and Isolators adjacent to each indoor unit and BS boxes (or refrigerant flow control devices) 220V 50Hz
3. Wiring from the fan coil units to the isolator by HVAC contractor, as well as wiring to the F.C.U.'s. controls and temperature sensors and/or group controllers and outdoor units.

02 EQUIPMENT CAPACITIES, SCHEDULES & SPECIFIC REQUIREMENTS

IMPORTANT NOTE: HVAC CONTRACTOR MUST :-

- ***COST ALL THE EQUIPMENT IN THE EQUIPMENT CONTROL SCHEDULES***
- ***COMPLETE ALL SCHEDULES AFTER TENDER AND SUBMITTED TO THE ENGINEER.***
- **All performance data is to be given at actual site operating conditions.**
- **Any deviation from the specification relating to equipment included in the main offer is to be specifically listed in THIS Section.**

02.1 INVERTER HEAT RECOVERY VARIABLE REFIGERANT SYSTEM (VRS)

The contractor to comply to the following items:

1. Description of proposed system in this document
2. Air-conditioning and Ventilation General Technical Specification
3. The *VRS* comprises of outdoor units, indoor units, refrigerant controllers, electronic controls, sensors, thermostats, wires, joints, headers and all this equipment must be from the same supplier.
4. The contractor must provide a technician in the role as a supervisor for the duration of the project and maintenance period. This technician shall attend and successfully complete a training course at the VRF manufacturer and obtain a certificate for passing the course. The technician shall have detailed knowledge of the VRF installation, piping installation, commissioning procedures etc.
5. Storage strictly to supplier's recommendations.
6. Design based on **MISTUBISHI UNITS**
7. Outdoor-, indoor- and refrigerant controller units to be microprocessor controlled utilizing R410a ozone friendly refrigerant.

8. Two system descriptions follow and contractor must comply with these options:

7.1. System Description for HEAT RECOVERY INVERTER VARIABLE VOLUME SPECIFICATION – 2-PIPE

1. Provide simultaneous heating and cooling via a process of heat recovery and re-direction of refrigerant. R410A refrigerant.
2. For installation simplicity a maximum use of two refrigerant pipes only
3. The BS units switches the system between cooling and heating modes, thus supplying simultaneous heating or cooling.
4. Make minimum use of pipe work connections to reduce the possibility of leaks. Minimize the welding to reduce labour required.
5. Systems must incorporate an integrated oil recovery process taking only a few seconds.
6. System must continue to operate between changes of modes from cooling to heating and vice versa.
7. Incorporation of a Night time quiet operation of 49dB on the condensers must be possible.
8. Condensers heat exchangers to have Anti-corrosion salt and acid rain protection Pre-coated galvanized metal casings. Powder coated
9. Protection devices must include;
10. High pressure protection: High pressure switch 4.15MPa (601 psi)
11. Inverter circuit: Over-voltage and over-current protection for AC bus & Over-heat protection
12. Compressor/fan: Over-heat protection/Thermal switch
13. Condensers are to have maximum of two compressors per system. At least one of these is to be an inverter scroll hermetic compressor.
14. The External Static Pressure of the condensers should be a minimum of 60Pa.
15. The internet air conditioning management system must incorporate Ethernet protocol as a standard feature.
16. Refnet Joints and headers and insulation for this to be from the same supplier as

the in- and out-door units.

17. The system must be able to perform a refrigerant containment check to indicate if refrigerant leakage has occurred.
18. Each indoor unit must be treated as an individual zone.
19. Provide diversity on system between 50-130% of condenser capacity. Select on 110%
20. All Capacity correction factor calculations to be done by VRS Specialist
21. BS Controllers: Galvanized metal casing. Provide diversity on system between 50-130% of condenser capacity. HVAC contractor to ensure that a condensate drain point and 220V isolator is supplied adjacent to controllers. Must have PC board fuse and be complete with fixing brackets.

9. Compliance statements to be included for by the HVAC Contractor for the Cooling Only and Heat Pump VRV systems.
10. The VRS shall be factory tested with a certified quality assurance system and shall be manufactured in a facility with an ISO 14001 certified environmental management system.
11. If doubt exists as to the scope and requirements of the control system, the contractor to directly contact the consulting engineers.
12. **Controls, safeties and diagnostics**

Controls

a. Unit controls shall include as a minimum: microprocessor, LOCAL/OFF/REMOTE switch, and a 6-digit diagnostic display with keypad.
b. Shall be capable of performing the following functions:
    i. Automatic compressor lead/lag switching
    ii. Capacity control based on leaving chilled fluid temperature with return fluid temperature sensing
    iii. Limiting the chilled fluid temperature pull-down rate at start-up to an adjustable range of 0.1ºC to 1.1ºC per minute to prevent excessive demand spikes at start-up.
    iv. Enable adjustment of leaving fluid temperature according to the return fluid temperature or by means of a 0-10 V signal to the outdoor temperature.
    v. Provide a dual set point for the leaving fluid temperature activated by a remote contact closure signal.
    vi. Enable a 2-point demand limit control (from 0 to 100%), activated by a remote contact closure of a 0 to 10V signal.
    vii. Control compressors operation.
    viii. Enable automatic lead-lag of two condensers in a single system.

Diagnostics

c. Display module shall be capable of displaying set points, system status (including temperatures , pressures, run time and percent loading) and any alarm or alert conditions.
d. Control module, in connection with the microprocessor, shall be capable of displaying the output of a full load run test to verify operation of every switch, sensor, fan and compressor.

Safeties

e. Unit shall be equipped with all necessary components, and in conjunction with the control system shall provide the unit with protection against the following:
    i. Loss of refrigerant charge.
    ii. Reverse rotation.
    iii. Low chilled fluid temperature.
    iv. Low oil pressure (per compressor).
    v. Voltage imbalance.
    vi. Ground current fault.
    vii. Thermal overload,.
    viii. High pressure.
    ix. Electrical overload,
    x. Loss of phase.
    xi. Current imbalance.

xii. PC Board Fuse

f. Fan motors shall be individually protected by a circuit breaker.
g. Control shall provide general alarm remote indication for each refrigeration circuit.
h. Control system shall have a RS485 serial output port.
i. Additional controls required as detailed later in this specification.

13. Operating characteristics

1. Unit shall be capable of starting and running at full load at outdoor ambient temperatures from 0ºC to 35ºC.
2. Unit shall be capable of starting up with 25ºC entering fluid temperature to the evaporator.

14. Electrical requirements

1. Unit electrical power supply shall enter the unit as per manufacturer's requirements.
2. Outdoor Unit shall operate on 3-phase power supply.
3. Unit with two compressors shall have a factory-installed, star-delta starter to minimize electrical inrush current.
4. Control voltage shall be supplied by a factory-installed, non-fused electrical disconnect for the power supply.

12. Indoor Units

1. Coils to be copper tube with aluminum fins. The fins shall be surface coated with a corrosion inhibiting substance, preferably factory applied.
2. Each unit is to be fitted with a return air plenum. Filters are to be easily removable from the units from the bottom or from the side (clip in/out), and to be removable, washable PP honeycomb fabric, 15-20mm wide,
3. Insulated formed watertight corrosion resistant drip trays below coils.
4. The unit casing is to be insulated with minimum 10mm high-density self-fire extinguishing material.
5. Direct driven fan motor, variable speeds as standard.
6. External casing to be galvanized
7. Condensate drains to be provided with suitable **cleanable** trap to prevent transfer of smells from the drainage system and where possible is to use the trap of a wash hand basin. A short length of transparent tubing is to be provided at the connection to the drain pan. All drain lines are to have a suitable fall to prevent standing water. Note that Condensate drain pump kit are specified on all models. Ensure that condensate pipe is suspended every 800-1000mm and the fall to be 1:100 or better, and ensure the collective drain pipe is big enough.
8. Sound pressure levels of each model of the FCU will be required at time of material submittal
9. The final handing and coordination of the FCU is the contractor's responsibility.
10. Storage strictly to supplier's recommendations.
11. Fan motor, scrolls and wheels to be easily removable in-situ.
12. Units are to be supported on anti-vibration mounts or rubber "grommets" to prevent vibration being transmitted into the slab over or below in the case of floor standing units.
13. The HVAC sub-contractor to ensure that the hide-away unit selection takes the pressure drop over the duct and diffuser into account. Detail calculations to be submitted to the Consultant.
14. The schemes indicated on the tender drawings are indicative only of the preferred ducting and piping routes co-coordinated by the Professional Team.
15. The HVAC sub-contractor is responsible for meeting the specified cooling capacities at the design on coil and ambient conditions.
16. All refrigerant pipe sizing, positioning of all condensing units and the responsibility for ensuring that the manufacturer's maximum recommended refrigerant piping length is not exceeded, remains the HVAC sub-contractor's responsibility.
17. Provide access to filter, fan and motor drip tray, valves and controls.
18. No materials shall be used, that encourages the growth of bacteria and fungi in the presence of moisture.
19. Fan Coil Units shall be selected at medium speed to provide the specified capacities at against the system resistance specified (Use ESP 40 Pa if nothing specified).
20. The maximum coil face velocity of the Fan Coil Unit not to exceed 300 fpm (1.5 m/Sec).

Kuruman Hospital

REVISION 0

Works Information Document
for the Rational Design of Wet Services Plumbing

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WET SERVICES

1. INTRODUCTION

This specification must be listed under the various sub-headings in the Bill of Quantities and must be fully understood and taken as acknowledged for full pricing, as detailed in the B.O.Q.

This specification is intended to define the basis on which the various wet services systems, which serve the A and E unit ase designed by, the Wet Service Engineers.

The design of such system is done on the understanding by ourselves, that this building will incorporate high grade systems and finishes to cater for the extensive business and comfort requirements of its operators.

Specification of special items e.g. heat pumps, booster/circulation/sump pumps, etc., will be on a design supply bases by specialist consultant/ supplier.

The proposed material and pipe fittings shall be of high quality, robust and require low maintenance.

The system has been designed in a manner that is serviceable and easy to maintain through rodding/inspection eyes, manholes etc.

The following areas form part of scope:

- Internal domestic water system (hot and cold water)
- Sanitary drainage system
- Domestic plant rooms

Exclusions:

- Rain/storm water reticulation, design by Civil Engineer;
- Fire protection systems and Rational Fire Design, design by Fire Engineer;
- All external water and drainage systems to Municipal sewer connections, design by Civil Engineer;

2. SOIL AND WASTE DRAINAGE

The drainage design is based on the engineering criteria of SANS 10400 P, T, W, SANS 10252-1 &2 SANS 10254, SABS 0400 : 1990, and other relevant institutional requirements, "The Application of the National Building Regulations".

The drainage system is HDPE (high density polyethylene) "Geberit or similar approved" drainage system with "Butt Welded" fittings. This system shall provide a potential leak proof installation and must be installed strictly to manufacturers requirements.

The drainage system ventilation pipes connect the various drainage systems and discharges to the atmosphere at roof level.

Maintenance of the drainage system is provided by strategically placed rodding eyes, allowing access to the pipework to remove blockages if required.

3. POTABLE COLD WATER SYSTEM

The primary water supply shall be through Municipal water mains. New proposed extensions to be supplied via existing domestic water storage tanks and booster pump system.

The system pressure to domestic fittings shall not exceed 600 kPa at the furthers point, the lowest pressure shall not be below 250 kPa. A balanced pressure shall be maintained throughout the building.

Isolating valves will be provided to ensure ease of maintenance throughout the system.. Rubber lined sound absorbing brackets will be used throughout. All the above to comply with "Greenstar Rated" (as good practice) building requirements.

4. HOT WATER SYSTEM

The hot water system will be designed in accordance with SANS 10400-XA.

The primary source of heat generation shall be direct heating air to water heat pumps to produce hot water. The hot water system will be on a circulation loop with circulation pumps and insulated to minimise heat losses, and "dead legs" to comply with Part XA.

5. ACOUSTIC ENGINEERING FOR THE PLUMBING INSTALLATION

Items incorporated include:-

- Rubber lined sound insulating pipe brackets.
- Caulking of slab and wall pipe penetrations with heavy mass mineral wool.
- Low velocity sizing of pipelines.
- Soft start variable speed booster pumps.

6. ENERGY AND WATER SAVING

The following design methods and equipment installation shall be implimented, to achieve the maximum in energy and water savings.

- Insulated hot water reticulation.
- Low dual flush type WC's.

7. SPECIALIST SPECIFICATION

All specialist installations such as pumping systems, hot water generation and heating etc., shall be PC items, which shall be installed by the relevant specialist contractor as a sub-contractor to the main contractor. The main contractor shall be responsible for the on-site co-ordination of all these elements into the other plumbing system to achieve a complete operating system meeting the design criteria.

The main contractor shall be responsible for the on-site co-ordination of these elements into the overall plumbing system to render a complete operating system that performs to the required criteria.

All work shall be carried out strictly in accordance with the relevant SABS specifications and local regulations.

8. PLANT AND MATERIALS

All plant and equipment, materials shall wherever possible, be available locally. Imports shall be subject to special permission being granted by the project Engineer.

The supplier of materials, plant and equipment shall provide full back-up support and guarantees. Written guarantees shall be submitted to the project engineer before ordering or procurement.

The pipe manufacturer/supplier shall provide guarantees for the pipe materials against defects, the sub-contractor shall be liable for the cost of damages due to any failure relating to defective materials.

Written guarantees shall be submitted before work commences on site.

Plant and equipment such as pump-sets and hot water generation plant shall be factory tested and inspected, approved by the engineer and pre-approved by the engineers before delivery to site.

9. MATERIAL SPECIFICATION

The materials of pipes, fittings and plant, shall be of a high quality, durable and require low maintenance, shall be safe to use, operate and be compatible with the specific water quality of the project.

The pipe manufacturer must train all plumbers from the appointed plumbing contracting company to carry out the pipe installation correctly. Only trained and approved plumbers are/shall be allowed to work on the installation of piping on the project.

Completed sections of the piping system shall be tested and pressure tested as per the pipe manufacturers requirements and/or pressure test as per SANS 10252-1, whichever is the highest pressure.

The piping system shall be charged with water constantly and as built position shall be marked on a drawing to monitor and track progress. System testing shall not be postponed to the final completion stages. All testing shall be witnessed and recorded by an independent approved QA officer.

Only material used from one manufacturer shall be used in various categories – unless otherwise noted.

10. INSTALLATION OF PIPE WORK AND MATERIALS

All pipes and fittings shall be installed strictly in accordance with the requirements of the relevant SABS Standards, Codes of Practice, Institutional Requirements and the Manufacturers'/Suppliers' requirements, all of which shall be approved by the engineer prior to construction.

All pipes shall be marked and labelled with colour coding bands and directional flow arrows at regular intervals as specified by the SABS (minimum of 2000mm intervals).

Abbreviated description of services on piping i.e. Cold water – CW, Hot water – HW, Hot water return – HWR, Sanitary Drainage – SD. All valves, water meters and equipment shall be numbered.

- Pipes shall be "fixed" and not allowed to "swing".

- The approved manufacturer shall specify and guarantee the method of fixing to concrete and other structures including the support spacing for the various pipe sizes and manufacturers details. (With its contents).

- Minimum support spacing shall be specified by the pipe manufacturer for the various pipe diameters.

- Appropriate insulation shall be provided to separate dissimilar materials. Appointed plumbing contractor to ensure this is strictly adhered to.

- The complete pipe installation shall be cleaned and sterilised according to SANS 10252-1.

- Pipes shall only pass in sleeves through walls and other structures.

- Pipes in plaster shall be installed in such a manner as to allow easy access for maintenance and operation.

- All pipes where fixed or supported with metal supports or brackets, shall be insulated with a suitable material.

- Only pipes from one approved manufacturer shall be used and no other pipes from other manufacturers shall be allowed on site.

- The mark of the approved manufacturer shall clearly displayed. If any problem occurs on the piping during or after the completion of the installation then it shall be deemed that the pipes have been provided by the approved manufacturer.
- The approved manufacturer shall provide guarantees for the integrity and suitability of the pipes for the water to be used and the installation.

- The pipes and fittings shall be guaranteed by the manufacturer against any structural failure.

- The manufacturer shall submit in writing all his requirements and specifications for the *subcontractor* to install the pipe work and to enable him to provide the guarantee.

- The manufacturer shall specify the method of jointing and guarantee it.

- The *sub-contractor* shall obtain inspection reports from the manufacturer and submit these to the *contractor* for approval at the following intervals of the work:

    - At 25%

    - At 50%

    - At 75%

    - At completion of work, or on a monthly basis.

- All pipes installed across expansion joints of the building shall be provided with suitable expansion fittings.

- All exposed pipes, supports and equipment shall be cleaned, treated and painted with one coat suitable primer, one undercoat and one finishing coat of high gloss enamel paint to architect's specification.

The piping manufacturer shall be approved/accepted by the engineers and owner/client before installation.

Domestic Drinking Water Supply Pipes (Hot and Cold)

The material of choice is listed on the drawings, but the following alternatives will be considered on the hot and cold water systems, from 50mm and smaller (use internal diameters only), from Geberit and Valsir.

All bracketing, support, anchoring, fixing and installation methods, shall be as per the piping manufacturer's specification and approved prior to installation.

All hot water piping shall be insulated as per SANS 10252-1 and SANS 10400-XA and SANS 204, to prevent heat loss as per requirements.

The plumbing sub-contractor shall provide specification/material data of insulation to project engineer for approval.

The insulation shall be ODP compliant to meet the required green building standards.

Sanitary Drainage Piping

The material of choice for:-

- Building, is HDPE (high density polyethylene) piping, pipes shall be heat tempered after the production process to ensure a neat installation and all pipes and fittings shall be of the same grade HDPE to ensure sound fusion welds.

Special Valves and Other Valves and Equipment eg. by-pass valves etc.

All valves as indicated by the Engineer shall be approved and shall be marked with a metal tag, numbered by means of an engraved 20 (TWENTY), and locked with a galvanised OR CHROMED chain and a master keyed padlock in terms of the building master key schedule.

All valve numbers shall be indicated on the Drawings of Record and master keys for the special valves shall be handed over with the O&M Manuals to the *client/facilities manager*, by the appointed plumbing contractor.

Special Back Flow Stops

Special approved back flow preventers shall be provided for the floor drain drainage system where it connects into the sanitary drainage system where indicated on the drawings.

Prevent backflow on floor drains, and other low level sanitary drainage fittings.

Floor Drains

Floor drains shall be installed as indicated on the drawings. The floor drain positions are shown on the drainage drawings. The floor drains shall have outlets sizes as shown on the drawings and shall have removable covers to provide direct access to the drain pipes.

The floor drains shall be connected to a waste water fitting. Shower floors dropped 85mm.

11. SPECIAL ITEMS

The sub-contract includes a number of special items which shall form part of the plumbing and drainage installation. (Pumps, hot water plant, etc.)

The *specialist sub-contractor* shall be responsible for the procurement, construction, completion and commissioning of the complete systems which shall comply strictly to the performance specifications.

The *specialist sub-contractor* shall guarantee that each system fully complies with the performance specifications. ***Full design details, shop drawings, and specifications shall be submitted to the Engineer for approval before any manufacturing.***

It shall be noted that the *specialist sub-contractor* is responsible for the "manufacturing, construction, engineering" of these systems and to guarantee that it shall operate as per the Engineers performance, design criteria, ***but all these systems shall be approved by the Engineer before manufacturing and installation on site.***

The specialist sub-contractor shall be responsible for approval of the engineering and completed installations from the Local Authority or any other relevant institutional body. All certificates of approval shall be submitted to the Engineer for record purposes.

The specialist sub-contractor shall guarantee the required performance and the satisfactory operation of the special items. **He shall demonstrate and operate and maintain in terms of the guarantee, the systems for a period of 52 weeks after completion**.

The specialist sub-contractor shall be responsible for the system compliance to all necessary regulations, SANS, SABS and CIBSE requirements.

Operation and Maintenance (O&M) Manuals

The O & M manuals shall consist of the following: -

- List of contents (Index)
- Introduction
- General description of the functions of each of the systems of the building and drainage works, i.e.:

  Sanitary drainage systems.
  Cold water system with pumps.

12. PRESSURE TESTING OF COMPLETED SECTIONS OF THE INSTALLATION

The Site Supervisor shall witness all testing procedures and report and record the results.

If the results are positive he shall pass and approve the work.

Pipes and equipment shall be submitted to a pressure test at lease 1,5 times the working pressure as per SABS 0242. Drainage pipes shall be pressure tested according to manufacturer's specifications.

The tests shall be prepared and demonstrated by the Contractor to the satisfaction of the QA Supervisor and/or the Engineer.

The Contractor shall provide all the necessary testing equipment and materials, etc.

All specialised installations, installed by specialists shall be tested by the installer of these systems. Upon a successful test, the installer shall provide a test certificate stating the test procedure in detail and also furnish the guarantee for the equipment.

13. PROGRESS REPORTS

The QA Supervisor shall compile and submit detailed reports for the Engineer's attention on a regular basis.

The reports shall cover the following aspects: -

- Areas checked.
- Services checked.
- Quality of work inspected.
- Remedial action taken, if needed.
- Training of workers for pipe material.
- Inspection frequency of supplier and comments if any.
- Progress of works on site.
- General report back on all his/her duties as outlined above.

14. PLUMBING CERTIFICATE

Once works completion, as defined by the JBCC Principle Agreement, has been achieved on all the above mentioned services, the plumber shall issue a completion certificate indicating the following:-

- The registration number of the responsible plumber.
- Compliance to the required SABS 0400, A15 and Manpower Training Act 1931 (Act No. 56 of 1981).
- Inspection and tests by responsible plumbing with SABS PP2, SABS P7 (1) (2) and PP26/PP27.
- System inspected, tested and disinfected according to SABS 0252 9.2.
- Guarantee period for workmanship and installation (show dates).

GENERAL SPECIFICATION

GAS INSTALLATION

Part 2

GENERAL REQUIREMENTS FOR THE MEDICAL GAS, COMPRESSED AIR AND VACUUM INSTALLATION

2.1 SCOPE

These general requirements shall apply to and be read in conjunction with the detailed requirements following hereafter. Should any items in the detailed requirements be in variance with these general requirements, the detailed requirements shall apply.

The scope of this specification covers the supply, installation, testing and commissioning of a piped medical gas, compressed air and vacuum system complete with control supply banks, vacuum and compressed air plant and equipment.

2.2 MATERIALS

All material, equipment, fittings etc. used in this project, shall be new, unused, of the best quality for the application and comply with the latest revision of the BS and SABS Specifications and Codes of Practice where applicable.

2.3 STATUTORY AND REGULATORY REQUIREMENTS

3.1. The installation and equipment shall comply with the following regulations, where applicable:

3.1.1. SABS 10142/Code of Practice for the wiring of premises.

3.1.2. Machinery and Occupational Safety Act.

3.1.3. Standard Building regulations.

3.1.4. Local Municipal By-Laws and Regulations as well as the regulations of the Local Electrical Supply Authority.

3.1.5. Local Fire Regulations.

3.1.6. Regulations of the Post Office.

3.1.7. Regulations of the Local Gas Board.

3.1.8. Regulations of the Local Water Board.

3.1.9. SABS 0224-1990 : Non-flammable medical gas pipeline systems

3.2 All losses, costs or expenditures, which may arise as a result of negligence to comply with the regulations applicable to this service, as specified above, shall be for the account of the Contractor.

3.3 Should any requirements, by-law or regulations, which applied at the time of tender or which become applicable during the erection of the installation, contradicts any requirements of this or the supplementary specification, such requirements, by-laws or regulation shall overrule this or the supplementary specification and the Contractor shall inform the Engineer immediately of such a contradiction when and if it comes to his attention.

2.4 PROTECTION OF EQUIPMENT AND WORKS

The Contractor shall be responsible for the repair of any damage to the building caused by his workmen as well as the replacement of any equipment damaged during transit or erection on site. The Contractor shall take all precautions to prevent any such damage and shall take all the necessary precautions to protect the property, equipment, and life during the installation.

2.5 WORKMANSHIP AND MATERIALS

5.1 The installation shall be carried out at a high standard of workmanship and to the satisfaction of the Engineer and shall include all the material and equipment required for the successful operation of the installation.

5.2 The Contractor shall, where requested to do so, submit samples of equipment and material to the Engineer for approval prior to the installation. Samples may be retained in the Engineers possession until the contract is completed, after which they will be returned.

5.3 Any material considered faulty or incorrectly or badly erected or fixed, shall be replaced by the Contractor without any additional charges. The Contractor shall be held responsible for the correctness of all dimensions as set out.

5.4 The Engineer will inspect the installation from time to time during the progress of the work. Discrepancies will be pointed out to the Contractor and these shall be remedied at the Contractor's expense. Under no circumstances shall these inspections relieve the Contractor of his obligations in terms of the documents.

2.6 DRAWINGS AND APPROVAL OF EQUIPMENT

Preliminary drawings, indicating pipe runs, sizes and position of terminal points, will be issued by the Engineer. The successful tenderer shall submit detail technical specifications and drawings of all equipment offered, for the approval of the Engineer. Any equipment installed without the prior approval of the Engineer, may have to be removed at the Contractor's expense. Approved drawings of the Engineer shall not relieve the Contractor of his responsibilities for the correctness of dimensions and detail and to ensure the operation of the system and to carry out work in terms of the contract.

2.7 COMPLETION

On completion, the Contractor shall give notice, in writing, to the Engineer, who shall inspect the installation. On completion, the Contractor shall also arrange for an inspection by the Supply Authority and a copy of the acceptance certificate or approval notice, shall be submitted to the Engineer, if applicable.

2.8 INSPECTION OF SITE

Tenderers shall visit the site before tendering and satisfy themselves as to the local conditions, the accessibility of the site, the full extent and nature of the work to be done and the conditions affecting the execution of the contract generally. Claims on the grounds of lack of knowledge, in such respects or otherwise, will not be entertained.

2.9 CIVILS

All civil work performed by others.

2.10 GUARANTEES

All plant and equipment will be guaranteed for a period of 12 (twelve) months from date of take-over, during which the Contractor will, at no extra charge, service and maintain the installation on a basis as decided by the Client and Engineer.

2.11 MAINTENANCE MANUALS/AS BUILT DOCUMENTATION

Three complete sets of maintenance manuals/operating procedures and as-built documentation will be supplied to the client upon take-over. The client will approve such manuals and any alterations will be immediately implemented. It must be noted that no retention, as specified in paragraph 10, Part 1, will be released until approved copies of the above have been received.

2.12 EQUIPMENT

2.13 Piping

a. General

The medical gas, compressed air, and vacuum services shall be piped in seamless, degreased, and de-oxidized copper tubing specially manufactured for medical gas installations. All piping and fittings shall be delivered to site with the open ends sealed to prevent ingress of dirt or grease. Pipes shall be cut to accurate site measurements to prevent springing and forcing or unnecessary joints during installation. The cut ends of pipes shall be neatly trimmed and cleaned of any burrs before installation. All piping shall be in a clean new condition, oil, and dirt free. Great care shall be taken to maintain pipes in a clean, oil and grease-free condition during installation.

b. Pipe Quality

All piping used for a medical gas installation shall be seamless, de-oxidized, degreased copper specially manufactured and treated for medical gas installations. The pipes shall be eddy current tested to ASTME 243 and bore cleanliness to ASTME 280.All pipes shall be half hard in 3m or 6m lengths, boxed with ends capped and colour coded. Maksel class MG pipe or equivalent shall be acceptable.

c. Pipe joints

Pipes shall only be joined by means of capillary solder type jointing sleeves or bushes or where equal size pipes are joined, the one end of one pipe shall be wedged to a depth of at least one pipe diameter with a suitable sized swaging tool. The excessive use of sleeving and elbows must be avoided in preference to swage joints and pipe bends.

d. Pipe fittings

Pipefittings manufactured from lengths of piping shall not be acceptable. Only factory produced capillary weld type copper fittings shall be acceptable. All changes in direction in the pipeline, requiring bends or offsets of radiuses more than 5 times the outside diameter of the pipe or tube, may be made with the use of a suitable pipe bending machine or spring. Flattening, buckling or thinning of the pipe wall material at the bend or offset, shall not be allowed.

e. Pipe welding

Only capillary weld fittings to ISO 2016 standard shall be used for this installation and fittings shall be soldered with Silver solder such as SILFOS Eutectic or similar. Pipe ends and fittings shall be thoroughly cleaned before applying a thin even layer of water-soluble flux to both ends. Excess flux shall be

cleaned off after soldering. Soft solder or brass brazing is not acceptable. Heating of the capillary joint shall be by means of a soft LPG flame or electric resistance heating. Over heating of joints shall be prevented.

f. Pipe installation

i. Colour coding and painting

All medical gas pipelines should be colour coded in accordance with the table below. Pipelines in unoccupied areas will be colour coded by means of bands at regular intervals (so that identification can take place easily without having to trace the pipeline) at valves, branches and before and after passing through walls.Further to the above identification labels should be applied on each pipeline at regular intervals and adjacent to isolation valves. Each label will be correctly colour coded, will indicate the type of gas and will have provision to indicate the direction of the flow of gas.

GAS	BAND 1	BAND 2
OXYGEN	WHITE	
NITROUS OXIDE	ULTRAMARINE BLUE	
VACUUM	PRIMROSE YELLOW	
L.P.AIR	BLACK	WHITE
H.P. AIR	SALMON PINK	
SCAVENGING	LIGHT ORANGE	

ii. Pipelines in walls or structures

Where gas pipelines have to be concealed in walls or structures, the pipelines shall be routed through suitable hard protective sleeves or metal channels built into the walls or cast into the structure and shall have no joints in the section that is built in. Pipe runs are to be kept against walls or slabs and steel brackets must be used where the above is not possible. Where pipelines crosses other services they should be supported on both sides of the crossing and prevented from touching them. Supports shall be of the “PVC holder bat” type and steel brackets should be suitably treated to minimise corrosion. Brackets are to be fastened to slab by means of powder actuated fasteners or expanded concrete anchors. Care should be taken to prevent electrolytic action between pipes and supports. The centre distance of supports shall not exceed the following up to and including sizes:

iii. Pipelines in ducts and trenches

No medical gas pipelines may be installed in the same duct or trench where fuel or oil pipes or electrical cables are installed. Ducts and open trenches, carrying medical gas pipelines, shall be well ventilated.

iv. Pipelines surface mounted

Surface mounted pipelines shall be installed at least 2400mm above finished floor level. Where such pipelines are exposed to possible damage or abuse, the gas /pipelines shall be suitably protected by means of properly secured metal sleeves. Pipe runs are to be kept against walls or slabs and steel brackets must be used where the above is not possible. Where pipelines crosses other services they should be supported on both sides of the crossing and prevented from touching them. Supports shall be of the “PVC holder bat” type and steel brackets should be suitably treated to minimise corrosion. Brackets are to be fastened to slab by means of powder actuated fasteners or expanded concrete anchors. Care should be taken to prevent electrolytic action between pipes and supports. The centre distance of supports shall not exceed the following up to and including sizes:

v. Pipelines buried in ground

All underground buried piping, shall be installed in corrosion proof robust pipe sleeves, and sloped to the one end to allow for condensation drainage.

vi. Pipe supports and fixing

Pipelines shall be supported at centre distances not exceeding the following:

OD of pipe in mm	Max. centre distance of support (m)
Up to 10 mm Ø	1,00
12 - 15 mm Ø	1,5
22 - 28 mm Ø	2,00
35-54 mm Ø	2,50
Greater than 54mm	3

Pipes shall be supported in straight and plumb lines. Pipe support brackets shall consist of a robust bracket mounted to the wall or structure and a saddle clamp to clamp the pipeline to the bracket. Special care shall be taken to prevent electro-lithic reactions between the copper gas pipelines and the support brackets. Plastic support brackets for pipes larger than 15mm will not be permitted. Where several pipelines of different diameters are routed together, all the pipes shall be supported at the support centre distance applicable to the smallest diameter pipe. Where medical gas pipes are routed in central services areas like roof spaces or ceiling voids, the gas pipes shall be installed 150mm clear from any other services. No pipes shall be supported from other pipes. Pipe hangers shall be secured in walls and structures by means of expandable fasteners. Only hot-dipped galvanized mild steel or stainless-steel hangers and fasteners, shall be used to secure the pipe clamping brackets.

g. Pipe configuration

All pipe runs vertical or horizontal, shall comply with the following configuration:

From top to bottom or left to right, as appropriate.

Oxygen, Nitrous oxide, Vacuum, Low-pressure air, 50/50 Oxygen/Nitrous oxide, High-pressure air, Carbon

Dioxide, Nitrogen, and scavenging air.

h. Connecting the system

After installation of all the pipelines but before mounting and connecting the terminal outlets, the complete pipe system shall be blown through to remove any dirt or moisture within the pipe system. Medical, oil free, compressed air supplied in cylinders by a recognized medical gas supplier, shall be used for this purpose. This to be witnessed by the Client.

i. Cross connection testing

After fitting the terminal outlets, each pipe system shall, alternatively, be pressurized with medical compressed air, to a pressure of at least 500kPa. Only terminal units for the system under pressure should record pressure readings under test. After each system has been tested and before proceeding to test the

next system, the pressure in the previously tested system, shall be released to atmosphere to ensure that only the system to be tested, shall be under pressure. The Engineer or Client or his designate shall observe these tests.

j. Leak test

After the installation and connection of the terminal units, the pipe systems that will operate under positive gas pressure shall be pressurized with medical compressed air to a pressure of 1000 kPa. All joints shall then be coated with a soap solution to check for leaks. After testing, the tested joint shall be dried with a cloth. After all the joints have been leak tested, the system shall be sealed off from the pressure source and the system pressure recorded for a period of 24 hours during which period the pressure shall remain constant when adjusted for temperature variances. Vacuum piping shall be similarly tested under 90-kPa vacuum.

k. Purging and final testing

Upon successful completion of the pressure tests, the pressure source shall be disconnected and removed from the system. Each system shall then be connected to the proper gas source, which it shall supply. The systems shall then be pressurized and purged of the test gas by opening the appropriate system outlet nearest to the supply source, until the gas purity at this outlet, corresponds with the source gas purity. This process shall be repeated at each gas outlet starting nearest the source and ending at the furthest outlet from the source. All outlet points shall now be tested to ensure that the correct gas emanates from the outlet labelled for the particular gas. These tests shall be carried out in the presence of the Client or his designate.

12.2 Valves

Only Full flow 3-piece ball valves are acceptable on all pressure systems; The full flow ball valves have forged bronze or stainless-steel bodies with double neoprene seat seals and "O"-ring stem seals and shall be rated for operating pressures of 1000 kPa. The valve shall be so designed that only a quarter turn of the lever type handle shall open or close the valve. The valve body shall easily be removed without disturbing the pipe connections to the valve. All valves shall be fitted with seals and packings, which shall not be affected by any of the medical gases. No oil, grease, or combustible lubricants shall be used in the valves. The diaphragm valves shall not be affected by any of the medical gasses. Valves shall be provided with a sweated medical gas quality tube extension for making connections to the pipe system. To prevent heat damage to the valve seals, when soldering the valve into the system, the valve body shall be removed during the solder process.

a. Positioning of isolating valves

Isolating valves in main and branch lines, shall be installed in positions which are easily accessible in emergency conditions yet out of reach for tampering by unauthorized persons. These valves shall be installed at a minimum height of 2.4 metres above finished floor level. Isolating valves serving a single or group of outlets in an area on a floor shall be placed in the same area as the outlet or outlets they serve. These valves shall be placed in easily accessible areas for skilled maintenance staff but shall not be readily accessible to the public or unauthorized persons. These valves shall be mounted in valve boxes mounted or built into a wall.

b. Valve boxes

Isolating valves shall be mounted in valve boxes built into or mounted against a wall. The valve boxes shall be fitted with transparent hinged doors marked **"MEDICAL GASSES"**. Each valve in the valve box shall be clearly marked in accordance with its function and the area served. The underside of the valve box shall be at least 2400mm above the floor level. The valve box doors shall be fitted with handles and catches and shall not be lockable.

2.14 Medical gas outlet points

General

All outlet points shall be of chrome-plated bronze, self-closing and sealing type. The internal parts of outlet points for a particular type of gas, shall not be inter-changeable with that of another type of gas outlet point.The connection into the outlet point of each particular type of gas outlet shall be unique for that particular type of gas and shall differ from all other types of gas outlets, to prevent the connection of medical equipment to the wrong gas outlet by accident. Each medical gas outlet shall be identified with a clearly marked label as well as a colour coded cover plate.

b. Outlet point configuration

When facing an outlet point panel, the gas outlets shall be mounted in the following sequence, from left to right:

Oxygen, Nitrous Oxide, Vacuum, Low Pressure Air, 50% Oxygen/50% Nitrogen Mix, High Pressure Compressed Air, Carbon Dioxide, Nitrogen and Scavenging.

ARCHITECTURAL INSTALLATION SPECIFICATION

1 Detailed Designs – Architecture

6.1 Design Principles

6.2 Specifications and Finishes for Floors

6.2.1 Codes Of Practice

SANS 10155: 1980 Accuracy in buildings
SANS 10107: 2011 Code of Practice for the Design & Installation for Ceramic Tiling
SANS 10043: 2009 The installation of wood and laminate flooring
SANS 10109-2: 2004 Concrete floors. Part 2: Finishes to concrete floors
SANS 10070: 2012 The installation of resilient thermoplastic and similar flexible floor covering materials

6.2.2 Construction

All new surface beds and suspended concrete floors to comply with the structural engineers' details, specifications, and shall, unless specified otherwise, comply with the Class 2 floor classification.

Class	Description	Max Deviation (mm)
1	For floors requiring minimum irregularity, such as large format specialised warehouses and stores with an epoxy or vinyl floor finish. May necessitate the use of special methods and will require close supervision	2
2	Suitable for the major proportion of construction work	5
3	Suitable for floors where regularity is not important	10

Table 1-1 Classification of floors

6.2.3 Screeds

Bonded Screeds To New Concrete Surface Beds and Suspended Slabs

All new concrete surface beds, shall, unless specified otherwise and only once they are in a hardened state, receive a wood floated screed finish, minimum 25mm and maximum 50mm thick.

Where the screed is anticipated to exceed or exceeds 50mm in thickness, reinforcing mesh as per the structural engineer's specification shall be required.

All screeds shall be applied in one single operation, unless practically impossible to do so at which point the manufacturers written guidance, if applicable, as well as the structural engineers written specifications and permission shall be obtained prior to applying the screed in more than one operation.

Permissible Deviations from datum level
All screeds shall ensure that the specified floor classification as per Table 1-4 is achieved.

6.2.4 Joints

All screeds and floor coverings shall be installed without any interference whatsoever with any of the structural joints in the concrete surface bed and suspended floors.

The installation of all floor coverings shall allow for movement joints, other than structural joints, in strict compliance with the manufacturer's specifications.

All structural and movement joints that are expressed in the floor coverings shall, except in the case of an epoxy finish or if specified otherwise, receive a flat transition strip as per the architect's details and specification.

6.2.5 Floor Coverings

REF	TYPE	SIZE (mm)	SUPPLIER	SUPPLIER CODE
FC-01	Anti-static vinyl	2	Polyflor	SD 5110
Static dissipative vinyl floor sheets laid in the long direction with welded joints. Polyfor approved adhesive.				
REF	**TYPE**	**SIZE (mm)**	**SUPPLIER**	**SUPPLIER CODE**

FC-02	Anti-static vinyl	2	Polyflor	SD 5110
Static dissipative vinyl floor sheets laid in the long direction with welded joints. Polyfor approved adhesive.				
REF	**TYPE**	**SIZE (mm)**	**SUPPLIER**	**SUPPLIER CODE**
FC-03	Anti-static vinyl	2	Polyflor	SD 5110
Static dissipative vinyl floor sheets laid in the long direction with welded joints. Polyfor approved adhesive.				
REF	**TYPE**	**SIZE (mm)**	**SUPPLIER**	**SUPPLIER CODE**
FC-04	Anti-static vinyl	2	Polyflor	SD 5110
Static dissipative vinyl floor sheets laid in the long direction with welded joints. Polyfor approved adhesive.				
REF	**TYPE**	**SIZE (mm)**	**SUPPLIER**	**SUPPLIER CODE**
FC-05	Vinyl	500 x 500 x 4	Polyflor	Noppe Stud 707
Synthetic rubber floor tiles. Colour: cool blue. Polyfor approved adhesive.				
REF	**TYPE**	**SIZE (mm)**	**SUPPLIER**	**SUPPLIER CODE**
FC-06	Anti-static vinyl	2	FC-01	Anti-static vinyl
Static dissipative vinyl floor sheets laid in the long direction with welded joints. Polyfor approved adhesive.				
REF	**TYPE**	**SIZE (mm)**	**SUPPLIER**	**SUPPLIER CODE**
FC-07	Porcelain	600 x 600	t.b.c	t.b.c
Full-bodied porcelain floor tile, non-slip finish. Colour: to later spec. TAL “Goldstar 6” tile adhesive or similar approved. TAL “High Traffic Grout”. Colour: dove grey.				
REF	**TYPE**	**SIZE (mm)**	**SUPPLIER**	**SUPPLIER CODE**
FC-08	Porcelain	600 x 600	t.b.c	t.b.c
Full-bodied porcelain floor tile, non-slip finish. Colour: to later spec. TAL “Goldstar 6” tile adhesive or similar approved. TAL “High Traffic Grout”. Colour: dove grey. • To be applied in multi-purpose room				

REF	TYPE	SIZE (mm)	SUPPLIER	SUPPLIER CODE
FC-09	Vinyl	2	t.b.c	t.b.c

Vinyl floor sheets to match existing.

Polyfor approved adhesive.

- To be applied in existing areas affected by alterations and additions.

REF	TYPE	SIZE (mm)	SUPPLIER	SUPPLIER CODE
FC-10	Porcelain	300 x 300	t.b.c	t.b.c

Full-bodied porcelain floor tile, non-slip finish. Colour: to later spec.

TAL “Goldstar 6” tile adhesive or similar approved.

TAL “High Traffic Grout”. Colour: dove grey.

- To be applied decontamination and sputum room only.

REF	TYPE	SIZE (mm)	SUPPLIER	SUPPLIER CODE
FC-12A	Anti-static vinyl	2	Polyflor	SD 5110

Static dissipative vinyl floor sheets laid in the long direction with welded joints (Colour: Green)

- Polyfor approved adhesive.

REF	TYPE	SIZE (mm)	SUPPLIER	SUPPLIER CODE
FC-12B	Anti-static vinyl	2	Polyflor	SD 5110

Static dissipative vinyl floor sheets laid in the long direction with welded joints (Colour: Orange)

- Polyfor approved adhesive.

REF	TYPE	SIZE (mm)	SUPPLIER	SUPPLIER CODE
FC-12C	Anti-static vinyl	2	Polyflor	SD 5110

Static dissipative vinyl floor sheets laid in the long direction with welded joints (Colour: Red)

- Polyfor approved adhesive.

REF	TYPE	SIZE (mm)	SUPPLIER	SUPPLIER CODE
FC-SK01	Tile	100	t.b.c	t.b.c

All walls to tiled floors to received 100mm high tile skirting to match floor.

6.3 Specifications and Finishes For Walls

6.3.1 Codes Of Practice

SANS 10155: 1980	Accuracy in buildings
SANS 1090: 2009	Aggregates from natural sources — Fine aggregates for plaster and mortar
SANS 2001-EM1:2007	Construction works - Part EM1: Cement plaster
SANS 50197-1:2013	Cement Part 1: Composition, specifications, and conformity criteria for common cements
SANS 10400-K:2011	The application of the National Building Regulations Part K: Walls

6.3.2 Construction

All new masonry walls to comply with the SANS 10155: 1980 - Accuracy in buildings permissible deviations in walls as per Table 1-2.

All new drywall partitions to be constructed using the *Gyproc Sound Resistant Wall System* with 15mm thick *Gyproc SoundBloc*, and to comply with Table 1-3.

1	2	3
Description	**PD** mm	
	Grade	
	II	I
Position on plan		
PD of fair-faced specified side of wall from the designed position	± 15	± 10
Length		
Up to and including 5 m	± 15	± 10
Over 5 m, up to and including 10 m	± 20	± 15
Over 10 m	± 25	± 20
Height		
Up to and including 3 m: brickwork	± 10	± 5
Up to and including 3 m: blockwork	± 15	± 10
Over 3 m, up to and including 6 m	± 20	± 15
Over 6 m	± 25	± 20
Wall thickness	± 15	± 10
Level of bed joints		
Length up to but not exceeding 5 m	± 10	± 5
Over 5 m but not exceeding 10 m	± 15	± 10
Over 10 m but not exceeding 20 m	± 20	± 15
Add for every 5 m in excess of 20 m	± 5	± 5
Straightness, max.		
In any 5 m (not cumulative): brickwork	15	10
In any 5 m (not cumulative): blockwork	10	5
Verticality		
In any 8 course: brickwork	± 10	± 5
In any 3 m	± 15	± 10
Finished surfaces		
PD of any point from a 2 m straight-edge placed in any direction on the wall, max.	6	3

Table 1-2 Permissible deviations in masonry work (SANS 10155: 1980 Accuracy in Buildings p29)

DESCRIPTION	PD, mm	
	Grade	
	II	I
Position on plan PD of fair-faced specified side of wall from the designed position	±15	±10
Length Up to and including 5m	±15	±10
Over 5m, up to and including 10m	±20	±15
Over 10m	±25	±20
Height Up to and including 3m	±10	± 5
Over 3m, up to and including 6m	±20	±15
Over 6m	±25	±20
Straightness, max. In any 5m (not cumulative)	15	10
Verticality In any 2m	±10	± 5
In any 5m	±15	±10
Finished surfaces PD of any point from a 2m straight-edge placed in any direction of the wall, max.	6	3

Table 1-3 Permissible deviations in drywall partitions and lightweight internal walls (General specification for drywall partitions and lightweight internal walls South African Building Interior Systems Association 2nd Ed, June 2004)

6.3.3 Plaster To Masonry Walls

Existing and New Masonry and Concrete Walls
All existing masonry and concrete walls shall be stripped off all existing plaster.

All plaster to existing and new masonry and concrete walls, shall, unless specified otherwise, be a min 10mm and max 20mm thick, with a steel trowelled finish.

Where the plaster is anticipated to exceed or exceeds 20mm in thickness, reinforcing mesh as per the structural engineer's specification shall be required.

Each plaster coast shall be applied in one single operation, unless practically impossible to do so at which point the manufacturers written guidance, if applicable, as well as the structural engineers written specifications and permission shall be obtained prior to applying any single coat of plaster in more than one operation.

The chasing of plaster is expressly prohibited, however where the chasing of plaster is unavoidable, the minimum cover thickness of the plaster over chased services and reinforcing mesh as per the structural engineer's specification shall be required.

The moisture content of all walls as measured with a Doser Hygrometer (or equivalent) shall not, at the time of applying the primer, exceed BD 2 scale - 8% or less.

Permissible Deviations from datum level
All plaster shall ensure that Grade II accuracy as per SANS 10155: 1980 - Accuracy in buildings as per Table 1-2 is achieved.

6.3.4 Rhinolite To Drywall Partitions

All drywall partitions to be skimmed with 1 x coat 2.5mm thick *Rhinolite* or similar approved.

6.3.5 Joints

All plaster, skim coat and wall coverings shall be installed without any interference whatsoever with any of the structural joints in the walls.

The installation of all plaster, skim coat and wall coverings shall allow for movement joints, other than structural joints, in strict compliance with the manufacturer's specifications.

All structural and movement joints that are expressed in the plaster and wall coverings shall, except in the case of an epoxy or resin finish or if specified otherwise, receive a flexible "*Polymer Paintable Joint Sealant"* as per the structural engineers' details and specification.

6.3.6 Wall Coverings

REF	TYPE	SIZE (mm)	SUPPLIER	SUPPLIER CODE
WC-01	Porcelain	300 x 300	t.b.c	t.b.c
All walls to ablutions and kitchens to receive full height, full-bodied porcelain walls tiles, glazed wood look finish. Colour: light grey TAL "Goldstar 6" tile adhesive or similar approved. TAL "High Traffic Grout". Colour: dove grey. TAL "Superflex" liquid waterproofing system and membrane, full height to all shower walls.				
REF	**TYPE**	**SIZE (mm)**	**SUPPLIER**	**SUPPLIER CODE**
WC-02	Porcelain	300 x 300	t.b.c	t.b.c
All entrance halls/lobbies to receive full height, full-bodied porcelain walls tiles, glazed finish. Colour: to later spec. TAL "Goldstar 6" tile adhesive or similar approved. TAL "High Traffic Grout". Colour: dove grey.				
REF	**TYPE**	**SIZE (mm)**	**SUPPLIER**	**SUPPLIER CODE**
WC-03	Vinyl	500 x 500 x 4	Polyflor	Noppe Stud 129
All walls to cleaners' stores and isolation areas to receive full height synthetic rubber floor tiles. Colour: mercury. Polyfor approved adhesive.				
REF	**TYPE**	**SIZE (mm)**	**SUPPLIER**	**SUPPLIER CODE**
WC-04	Paint	n/a	Dulux	To later spec
All plastered walls and drywall partitions to receive 1 x coat "*Dulux 1 Step prep Water Based Primer, Sealer and Undercoat"*, or similar approved, minimum 16hrs overcoating time, to be followed by 2 x coats *Dulux Easy Care Washable and Tough PVA"*, or similar approved. Minimum 48hrs drying time between successive coats.				
REF	**TYPE**	**SIZE (mm)**	**SUPPLIER**	**SUPPLIER CODE**
WT-TR01	Aluminium	12	Kirk Marketing	ASE120
M•Trim straight edge trim to suit 10-12mm thick tile.				

REF	TYPE	SIZE (mm)	SUPPLIER	SUPPLIER CODE
WT-TR02	Aluminium	12	Kirk Marketing	ATICP120
M•Trim tile-in corner protector suit 10-12mm thick tile to all exposed tiled wall and column corners.				
REF	**TYPE**	**SIZE (mm)**	**SUPPLIER**	**SUPPLIER CODE**
FT-TR02	Aluminium	12	Kirk Marketing	AMJ120
M•Trim movement joint to suit 10-12mm thick tile.				

6.4 Specifications and Finishes for Internal Concrete Soffits

6.4.1 Codes of Practice

SANS 10155: 1980	Accuracy in buildings
SANS 1090: 2009	Aggregates from natural sources — Fine aggregates for plaster and mortar
SANS 2001-EM1:2007	Construction works - Part EM1: Cement plaster
SANS 50197-1:2013	Cement Part 1: Composition, specifications, and conformity criteria for common cements

6.4.2 Construction

Soffits to Existing and New Concrete Suspended Slabs

All loose plaster to existing concrete soffits, shall be removed.

All damaged plaster in exposed areas shall be made good and unless specified otherwise, the thickness and finish shall match the existing plaster finish.

All exposed plaster to existing and new concrete suspended slabs, shall, unless specified otherwise, be a min 10mm and max 20mm thick, with a steel trowelled finish.

Where the plaster is anticipated to exceed or exceeds 20mm in thickness, reinforcing mesh as per the structural engineer's specification shall be required.
Each plaster coast shall be applied in one single operation, unless practically impossible to do so at which point the manufacturers written guidance, if applicable, as well as the structural engineers written specifications and permission shall be obtained prior to applying any single coat of plaster in more than one operation.

The chasing of plaster is expressly prohibited, however where the chasing of plaster is unavoidable, the minimum cover thickness of the plaster over chased services and reinforcing mesh as per the structural engineer's specification shall be required.

The moisture content of all walls as measured with a Doser Hygrometer (or equivalent) shall not, at the time of applying the primer, exceed BD 2 scale - 8% or less.

Permissible Deviations from datum level

All plaster shall ensure that Grade II accuracy as per SANS 10155: 1980 - Accuracy in buildings as per Table 1-2 is achieved.

6.4.3 Joints

All plaster shall be installed without any interference whatsoever with any of the structural joints in the concrete suspended floors.

All visible structural and movement joints that are expressed in the plastered or painted soffit, shall, except in the case of a painted finish, or if specified otherwise, receive a flexible "*Polymer Paintable Joint Sealant"* as per the structural engineers' details and specification.

6.4.4 Plastered and Un-Plastered Soffits

All exposed plastered and un-plastered soffits shall receive 1 x coat "*Dulux 1 Step prep Water Based Primer, Sealer and Undercoat"*, or similar approved, minimum 16hrs overcoating time, to be followed by 2 x coats *Dulux Easy Care Washable and Tough PVA"*, or similar approved. Minimum 48hrs between successive coats.

The moisture content of all exposed plastered and un-plastered soffits as measured with a Doser Hygrometer (or equivalent) shall not, at the time of applying the primer, exceed BD 2 scale - 8% or less.

6.5 Specifications and Finishes for Bulkheads and Ceilings

6.5.1 Codes of Practice

SANS 10155: 1980	Accuracy in buildings
	General specification for drywall partitions and lightweight internal walls South African Building Interior Systems Association 2nd Ed, June 2004

6.5.2 Construction

All new bulkheads and ceilings shall comply with to comply with the SANS 10155: 1980 - Accuracy in buildings permissible deviations in floors and ceilings.

1	2	3	4
Description	**PD** mm		
	Grade		
	III	II	I
Floors: level of finished surface			
PD from the designed level of any point on a floor surface	± 20	± 15	± 10
PD in level between any two points 6 m apart, max.	15	10	5
PD at any point above a 3 m straight-edge placed level in any direction (avoid abrupt changes of the level), max.	10	6	3
Ceilings: level of finished surface			
PD in level of any point on a ceiling from the designed level	± 20	± 15	± 10
PD in level between any two points 6 m apart, max.	15	10	5
PD at any point above a 3 m straight-edge placed level in any direction, max.	10	6	3

Table 1-4 Permissible deviations in floors and ceilings (SANS 10155: 1980 Accuracy in Buildings p33)

6.5.3 Drywall Bulkheads

All drywall bulkheads shall be constructed with 12mm thick plasterboard or similar approved, on "*CAPCO Steel Brandering System"* and with aluminium shadow line plaster trims and transition strips all around. All wet areas to receive a moisture resistant board to architects prior written approval.

REFER TO REFLECTED CEILING PLAN DRAWING FOR FINAL DETAILS FOR BOTH PRICING AND CONSTRUCTION.

All drywall bulkheads to be skimmed with 1 x coat 2.5mm thick *Rhinolite* or similar approved.

Permissible Deviations from datum level

All bulkheads and flush plastered/nail up ceilings shall comply with Grade II accuracy as per SANS 10155: 1980 - Accuracy in buildings as per Table 1-4.

6.5.4 Drywall Flush Plastered/Nail Up Ceilings

All drywall flush plastered/nail up ceilings shall be constructed with 12mm thick plasterboard or similar approved, on "*CAPCO Steel Brandering System"* and with aluminium shadow line plaster trims and transition strips all around. All wet areas to receive a moisture resistant board to architects prior written approval.

All drywall flush plastered/nail up ceilings to be skimmed with 1 x coat 2.5mm thick *Rhinolite* or similar approved.

Bathrooms And Kitchens (12mm Moisture Resistant Board To Be Used for ALL Wet Areas)

All suspended bulkheads to receive 1 x coat "*Dulux 1 Step prep Water Based Primer, Sealer and Undercoat"*, or similar approved, minimum 16hrs overcoating time, to be followed by 2 x coats *Dulux Bathroom + White"*, or similar approved. Minimum 48hrs between successive coats.

The moisture content of all suspended drywall bulkheads as measured with a Doser Hygrometer (or equivalent) shall not, at the time of applying the primer, exceed BD 2 scale - 8% or less.

Entrance Hall/ Lobbies

All suspended bulkheads to receive 1 x coat "*Dulux 1 Step prep Water Based Primer, Sealer and Undercoat"*, or similar approved, minimum 16hrs overcoating time, to be followed by 2 x coats *Dulux Easy Care Washable and Tough PVA"*, or similar approved. Minimum 48hrs between successive coats.

The moisture content of all suspended drywall bulkheads as measured with a Doser Hygrometer (or equivalent) shall not, at the time of applying the primer, exceed BD 2 scale - 8% or less.

Stores

All suspended bulkheads to receive 1 x coat "*Dulux 1 Step prep Water Based Primer, Sealer and Undercoat"*, or similar approved, minimum 16hrs overcoating time, to be followed by 2 x

coats *Dulux Easy Care Washable and Tough PVA"*, or similar approved. Minimum 48hrs between successive coats.

The moisture content of all suspended drywall bulkheads as measured with a Doser Hygrometer (or equivalent) shall not, at the time of applying the primer, exceed BD 2 scale - 8% or less

Electrical DB And Data Rooms

All suspended bulkheads to receive 1 x coat "*Dulux 1 Step prep Water Based Primer, Sealer and Undercoat"*, or similar approved, minimum 16hrs overcoating time, to be followed by 2 x coats *Dulux Easy Care Washable and Tough PVA"*, or similar approved. Minimum 48hrs between successive coats.

The moisture content of all suspended drywall bulkheads as measured with a Doser Hygrometer (or equivalent) shall not, at the time of applying the primer, exceed BD 2 scale - 8% or less

Permissible Deviations from datum level

All drywall flush plastered/nail up ceilings shall comply with Grade II accuracy as per SANS 10155: 1980 - Accuracy in buildings as per Table 1-4.

6.5.5 Suspended Lay-in Ceilings

All lay-in ceilings shall be constructed with 600 x 600mm "CAPCO EXPOSED T (T38/24W)" system, suspended from the building structural members, with 9mm thick ECO-TEC VINYLCLAD gypsum tiles (white), with 20mm SHADOW LINE WALL TRIM when abutting against a wall and SIGMA CEILING TRANSITION 20 when abutting against a bulkhead. or similar approved.

Flat to receive 15mm thick THERMOFON ACOUSTIC GYPSUM TILE (white) instead of the ECO-TEC VINYLCLAD tile.

Permissible Deviations from datum level

All suspended lay-in ceilings shall comply with Grade II accuracy as per SANS 10155: 1980 - Accuracy in buildings as per Table 1-2.

6.5.6 Joints

All suspended bulkheads and lay-in ceilings shall be installed without any interference whatsoever with any of the structural joints in the floors and walls.

The installation of all suspended bulkheads and lay-in ceilings shall allow for movement joints, other than structural joints, in strict compliance with the manufacturer's specifications.

All structural and movement joints that are expressed in the suspended bulkheads shall, unless specified otherwise, receive a flexible "*Polymer Paintable Joint Sealant"* as per the structural engineers' details and specification.

6.6 Specifications and Finishes for Joinery

6.6.1 Codes of Practice

SANS 10155: 1980 Accuracy in buildings

6.6.2 Construction

All timber carcasses to be constructed from 16mm thick white melamine boards and 3mm Masonite backing boards, with 16mm thick supawood doors and drawer fronts as per approved shop drawings.

6.6.3 Paint To Supawood Elements

All timber supawood doors and drawer fronts to receive 1 x coat Dulux Duco Spray.

6.7 Specifications and Finishes External Floors & Paving

6.7.1 Codes of Practice

SANS 10155: 1980	Accuracy in buildings
SANS 10107: 2011	Code of Practice for the Design & Installation for Ceramic Tiling
SANS 10043: 2009	The installation of wood and laminate flooring
SANS 10109-2: 2004	Concrete floors. Part 2: Finishes to concrete floors
SANS 10070: 2012	The installation of resilient thermoplastic and similar flexible floor covering materials
SANS 1058:2012	Concrete paving blocks
SANS 1200-MJ:1984	Standard Specification for Civil Engineering Construction: Segmented Paving

6.7.2 Construction

All new surface beds to comply with the structural engineers' details, specifications, and shall, unless specified otherwise, comply with the Class 2 floor classification as per **Error! R eference source not found.**.

All new layer works for paving to comply with civil engineers' details and specifications.

6.7.3 Screeds

Bonded Screeds To New Concrete Surface Beds

All new concrete surface beds, shall, unless specified otherwise and only once they are in a hardened state, receive a wood floated screed finish, minimum 25mm and maximum 50mm thick.

Where the screed is anticipated to exceed or exceeds 50mm in thickness, reinforcing mesh as per the structural engineer's specification shall be required.

All screeds shall be applied in one single operation, unless practically impossible to do so at which point the manufacturers written guidance, if applicable, as well as the structural engineers written specifications and permission shall be obtained prior to applying the screed in more than one operation.

Permissible Deviations from datum level
All screeds shall ensure that the specified floor classification as per **Error! Reference source not found.** is achieved.

6.7.4 Joints

All screeds and floor coverings shall be installed without any interference whatsoever with any of the structural joints in the concrete surface bed and suspended floors.

The installation of all floor coverings shall allow for movement joints, other than structural joints, in strict compliance with the manufacturer's specifications.

All structural and movement joints that are expressed in the floor coverings shall, except in the case of an epoxy finish or if specified otherwise, receive a flat transition strip as per the architect's details and specification.

6.7.5 Riversand Bedding

All precast concrete paving blocks to be bedded in an uncompacted riversand bedding as per SANS 1200-MJ Standard Specification for Civil Engineering Construction: Segmented Paving.

6.8 Specifications and Finishes for External Patios, Stairs and Ramps

All external floors and ramps to receive a 600 x 600mm matt, full body, slip-resistant external porcelain floor tile to be fixed onto substrate with tile adhesive, grout joints and grouting in strict accordance with the manufacturer's specification.

All exposed tile edges to floors to receive an aluminium straight edge trim, by *Kirk Marketing*, or similar approved.

All stair nosing's and ramp landings to receive an aluminium edging with luminescent non-slip insert, all by *Kirk Marketing*, or similar approved.

6.9 Specifications and Finishes for Paved Aprons

All paved aprons to receive a medium interlocking precast concrete paver or clay brick paver as per civil engineers specifications.

6.10 Specifications and Finishes for External Walls

6.10.1 Codes of Practice

SANS 10155: 1980	Accuracy in buildings
SANS 1090: 2009	Aggregates from natural sources — Fine aggregates for plaster and mortar
SANS 2001-EM1:2007	Construction works - Part EM1: Cement plaster
SANS 50197-1:2013	Cement Part 1: Composition, specifications, and conformity criteria for common cements
SANS 10400-K:2011	The application of the National Building Regulations Part K: Walls

6.10.2 Construction

All new masonry walls to comply with the SANS 10155: 1980 - Accuracy in buildings permissible deviations in walls (Table 1-2).

6.10.3 Plaster To Masonry Walls

All plaster to new masonry and concrete walls, shall, unless specified otherwise, be a min 10mm and max 20mm thick, with a steel trowelled finish.

Where the plaster is anticipated to exceed or exceeds 20mm in thickness, reinforcing mesh as per the structural engineer's specification shall be required.

Each plaster coast shall be applied in one single operation, unless practically impossible to do so at which point the manufacturers written guidance, if applicable, as well as the structural engineers written specifications and permission shall be obtained prior to applying any single coat of plaster in more than one operation.

The chasing of plaster is expressly prohibited, however where the chasing of plaster is unavoidable, the minimum cover thickness of the plaster over chased services and reinforcing mesh as per the structural engineer's specification shall be required.

Permissible Deviations from datum level
All plaster shall ensure that Grade II accuracy as per SANS 10155: 1980 - Accuracy in buildings as per Table 1-2 is achieved.

6.10.4 Joints

All plaster and wall coverings shall be installed without any interference whatsoever with any of the structural joints in the walls.

The installation of all plaster and wall coverings shall allow for movement joints, other than structural joints, in strict compliance with the manufacturer's specifications.

All structural and movement joints that are expressed in the plaster and wall coverings shall, unless specified otherwise, receive a flexible "*Polymer Paintable Joint Sealant"* as per the structural engineers' details and specification.

6.10.5 Plastered Walls

All plastered walls to receive 1 x coat "*Dulux Super Grip All Surface Primer coat"*, or similar approved, minimum 16hrs overcoating time, to be followed by 2 x coats "*Dulux Weathergaurd"*, or similar approved. Minimum 48hrs drying time between successive coats.

The moisture content of all walls as measured with a Doser Hygrometer (or equivalent) shall not, at the time of applying the primer, exceed BD 2 scale - 8% or less.

6.10.6 Unplastered Walls

All unplastered walls to receive 2 x coat "*Dulux Brick Dressing, Sealer and Undercoat"*, or similar approved, minimum 18hrs overcoating time.

The moisture content of all walls as measured with a Doser Hygrometer (or equivalent) shall not, at the time of applying the primer, exceed BD 2 scale - 8% or less.

6.11 Specifications and Finishes for External Concrete Soffits

6.11.1 Construction

SANS 10155: 1980	Accuracy in buildings
SANS 1090: 2009	Aggregates from natural sources — Fine aggregates for plaster and mortar
SANS 2001-EM1:2007	Construction works - Part EM1: Cement plaster
SANS 50197-1:2013	Cement Part 1: Composition, specifications, and conformity criteria for common cements

6.11.2 Construction

Soffits to Existing and New Concrete Suspended Slabs
All loose plaster to existing concrete soffits, shall be removed.

All damaged plaster in exposed areas shall be made good and unless specified otherwise, the thickness and finish shall match the existing plaster finish.

All exposed plaster to existing and new concrete suspended slabs, shall, unless specified otherwise, be a min 10mm and max 20mm thick, with a steel trowelled finish.

Where the plaster is anticipated to exceed or exceeds 20mm in thickness, reinforcing mesh as per the structural engineer's specification shall be required.

Each plaster coast shall be applied in one single operation, unless practically impossible to do so at which point the manufacturers written guidance, if applicable, as well as the structural engineers written specifications and permission shall be obtained prior to applying any single coat of plaster in more than one operation.

The chasing of plaster is expressly prohibited, however where the chasing of plaster is unavoidable, the minimum cover thickness of the plaster over chased services and reinforcing mesh as per the structural engineer's specification shall be required.

Permissible Deviations from datum level

All plaster shall ensure that Grade II accuracy as per SANS 10155: 1980 - Accuracy in buildings as per Table 1-2 is achieved.

6.11.3 Joints

All plaster shall be installed without any interference whatsoever with any of the structural joints in the concrete suspended floors.

All visible structural and movement joints that are expressed in the plastered or painted soffit, shall, except in the case of a painted finish, or if specified otherwise, receive a flexible "*Polymer Paintable Joint Sealant"* as per the structural engineers' details and specification.

6.11.4 Plastered and Un-Plastered Soffits

All exposed plastered and un-plastered soffits shall receive 1 x coat "*Dulux 1 Step prep Water Based Primer, Sealer and Undercoat"*, or similar approved, minimum 16hrs overcoating time, to be followed by 2 x coats "*Dulux Weathergaurd"*, or similar approved. Minimum 48hrs between successive coats.

The moisture content of all exposed plastered and un-plastered soffits as measured with a Doser Hygrometer (or equivalent) shall not, at the time of applying the primer, exceed BD 2 scale - 8% or less.

6.12 Specifications and Finishes for External Ceilings and Eaves

6.12.1 Codes of Practice

SANS 10155: 1980	Accuracy in buildings
	General specification for drywall partitions and lightweight internal walls South African Building Interior Systems Association 2nd Ed, June 2004

6.12.2 Construction

All new ceilings to external patios and roof eaves shall comply with to comply with the SANS 10155: 1980 - Accuracy in buildings permissible deviations in floors and ceilings (Table 1-4).

6.12.3 Drywall Nail Up Ceilings

All drywall nail up ceilings shall be constructed with *"Gyproc Moisture Resistant"* board, or similar approved on CAPCO steel brandering system installed as per manufacturers recommendations, subject to architects approval.

Permissible Deviations from datum level

All drywall flush plastered/nail up ceilings shall comply with Grade II accuracy as per SANS 10155: 1980 - Accuracy in buildings as per Table 1-4.

6.13 Specifications and Finishes for Windows and Doors

6.13.1 Codes of Practice

SANS 10155: 1980	Accuracy in buildings
SANS 1090: 2009	Aggregates from natural sources — Fine aggregates for plaster and mortar

SANS 2001-EM1:2007	Construction works - Part EM1: Cement plaster
SANS 50197-1:2013	Cement Part 1: Composition, specifications, and conformity criteria for common cements
SANS 10400-K:2011	The application of the National Building Regulations Part K: Walls

6.13.2 Codes of Practice

All door and window openings in new masonry walls to comply with the SANS 10155: 1980 - Accuracy in buildings permissible deviations in walls (Table 1-2).

6.13.3 Plaster to Door and Window Reveals and Window Cills

Existing and New Masonry and Concrete Walls
All loose and damaged plaster to existing masonry shall be stripped off and made good, with new plaster to match thickness of existing plaster

All plaster to existing and new door and window reveals shall, unless specified otherwise, be min 10mm and max 20mm thick, with a steel trowelled finish.

Where the plaster is anticipated to exceed or exceeds 20mm in thickness, reinforcing mesh as per the structural engineer's specification shall be required.

Each plaster coast shall be applied in one single operation, unless practically impossible to do so at which point the manufacturers written guidance, if applicable, as well as the structural engineers written specifications and permission shall be obtained prior to applying any single coat of plaster in more than one operation.

The chasing of plaster is expressly prohibited, however where the chasing of plaster is unavoidable, the minimum cover thickness of the plaster over chased services and reinforcing mesh as per the structural engineer's specification shall be required.

Permissible Deviations from datum level
All plaster shall ensure that Grade II accuracy as per SANS 10155: 1980 - Accuracy in buildings as per Table 1-2 is achieved.

6.13.4 Precast Concrete Window Cills

All precast concrete window cills to later specification.

6.13.5 Tiled Window Cills

All tiled window cills to later specification.

6.13.6 Door Frames and Leafs

Timber or pressed metal door frames with solid core 5-panel timber or pressed metal door leafs to suit daylight opening.

Fire door frames to suit daylight opening with 2hr fire rated fire doors to be factory finished with a clear varnish.

REFER TO DOOR SCHEDULE FOR FINAL CONFIRMATION.

6.13.7 Window Cills

All precast concrete and tile window cills to receive 1 x coat "*Dulux Super Grip All Surface Primer"*, or similar approved, minimum 16hrs overcoating time, to be followed by 2 x coats "*Dulux Weathergaurd"*, or similar approved. Minimum 48hrs drying time between successive coats.

The moisture content of all walls as measured with a Doser Hygrometer (or equivalent) shall not, at the time of applying the primer, exceed BD 2 scale - 8% or less.

6.13.8 Timber Door Leafs

All timber doors to sanded and sealed with 1 x coat *Dulux Wood Primer* and 2 x coats *"Dulux Woodgard Exterior Double Life Timbavarnish Eggshell"* varnish, or similar approved.

REFER TO DOOR SCHEDULE FOR FINAL CONFIRMATION.

6.14 Specifications and Finishes for Roof Coverings & Rainwater Goods

6.14.1 Codes of Practice

SANS 10400-L:2011 The application of the National Building Regulations Part L: Roofs

6.14.2 Construction

All roof coverings to comply with SANS 10400-L:2011 The application of the National Building Regulations Part L: Roofs

6.14.3 Metal Roof Coverings

All roof coverings to match existing or alternatively the closets possible match with a similar performance rating as the Safintra 0,50mm thick SAFLOK 410 Colorplus® AZ150 interlocking roof sheeting.

6.14.4 Rainwater Goods

All rainwater gutters and downpipes to be made from 0.5mm thick galvanised iron, with factory applied colour to match roof coverings. **NO ONSITE PAINTING WILL BE ALLOWED.**

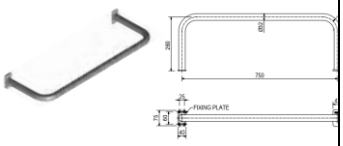
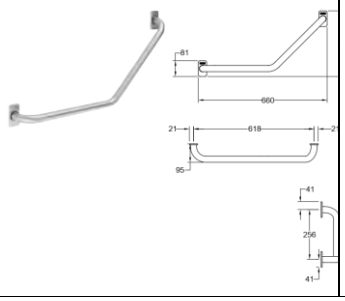
6.15 Sanitary Schedule

Kitchen Sinks		
KEY:	**QTY :**	**DESCRIPTION:**
	**1**	**DOUBLE SINK** FRANKE 'PROJECTLINE' INSET SINK, RECESSED DARINAGE LEDGEAND 38mm DIAMETER WASTE FITTINGS SIZE: 1160mm X 460mm *FINISH: STAINLESS STEEL*

BATHROOMS		
KEY:	**QTY :**	**DESCRIPTION:**
	**10**	**WATER CLOSET** VAAL SANITARYWARE VITREOUS CHINA "PARKTOWN" 90° OUTLETTOP INLET (CODE 431500) OR BACK INLET (CODE 431600) CLOSED RIM BACK-TO-WALL PAN. TOP INLET CAN BE USED WITH AN EXPOSED FLUSHVALVE. *COLOUR: WHITE*
	**10**	**FLUSHVALVE** EXPOSED TYPE, BACK ENTRY TOILET FLUCHVALVE WIH CONTROL STOP AND WALL FLANGE. WITH BENT FLUCH PIPEAND PAN CONNECTOR. *SANS 1240* HORIZONTAL TELESCOPIC ADJUSTMENT (CONTROL STOP VALVEBODY) FOR EASY INSTALLATION. *CODE: FM1-100*
	**10**	**BASIN** VAAL SANITARYWARE WALL HUNG 455 X 290MM "BANTAM" BASIN WITH TWO TAPHOLES, INTEGRATED OVERFLOW AND CHAINSTAY HOLE.

	**20**	**BASIN TAP** MEDICAL ELBOW-ACTION PILLAR TAP, CHROME. INCLUDES: 1/4" TURN CERAMIC DISC HEAD PART, BLUE INDICE, 1/2" BSP MALE INLET, AND FLANGED BACKNUT. IDEAL FOR MEDICAL, KITCHEN AND INDUSTRIAL INSTALLATIONS. SANS 226 TYPE 2.
	**10**	**BASIN WASTE** UN-SLOTTED BATH AQUAWASTE (CLICK-CLACK WASTE) 70mmDIAMETER FLANGE, 40mm LONG SHANK, 1½" BSP MALE OUTLET CONNECTION. *CODE: 318-40* *FINISH: CHROME PLATE*
	**10**	**DOUBLE TOILET ROLL HOLDER WITH SPINDLE SYSTEM** DOUBLE TOILET ROLL HOLDER WITH SPINDLE SYSTEM FRO WALL MOUNTING, STAINLESS STEEL SURFACE SATIN FINISHED, FOLDED FRONT COVER, CYLINDER LOCK WITH FRANKE STANDARD KEY. FOR 2 ROLLS WITH MAX. 120MM Ø, SECOND ROLL WILL BE RELEASED AFTER CONSUMPTION OF FIRST ROLL, WITH SPINDLES, RESERVE ROLL NOT VISIBLE. INCLUDES STAINLESS STEEL SCREWS AND DOWELS. *CODE: RODX672 144 X 138 X 301 359987*
	**10**	**SOAP DISPENSER** LIQUID SOAP DISPENSER FOR WALL MOUNTING, MANUFACTURED FROM 18/10 STAINLESS STEEL, SATIN FINISH. WITH A DEEP DRAWN LID, WELDED BODY AND CYLINDER LOCK WITH STANDARD FRANKE KEY. THE DISPENSER INCORPORATES A 1 LITRE POLYETHYLENE CONTAINER WHICH IS SUITABLE FOR LIQUID AND ANTISEPTIC SOAPS AND LOTIONS. SCREWS AND DOWELS INCLUDED. *CODE: BS618 200 X 130 X 85 359800*

MOBILITY IMPAIRED PERSONS (PARAPLEGIC TOILET)		
KEY:	**QTY :**	**DESCRIPTION:**

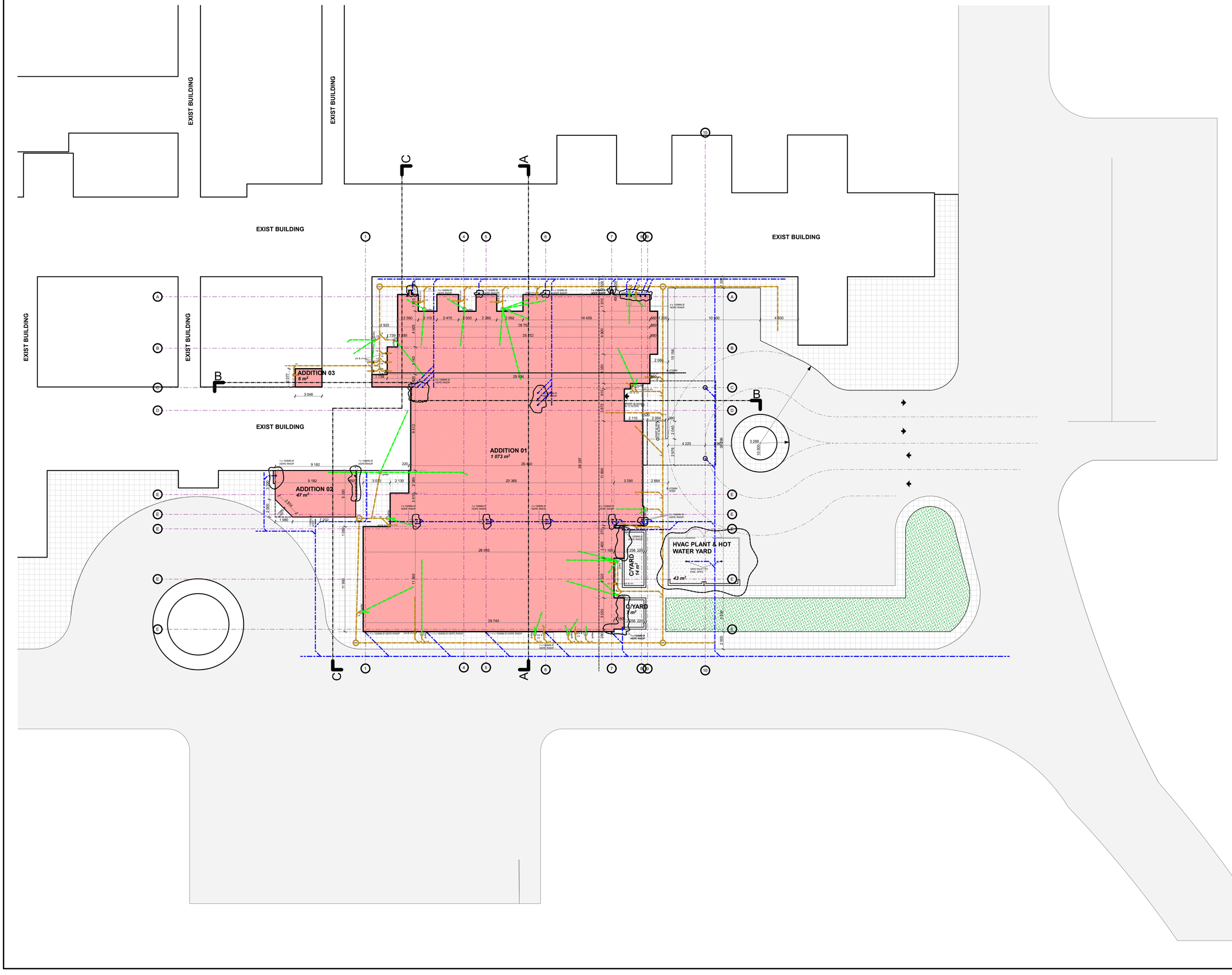
	**10**	**BASIN** VAAL SANITARYWARE CERAMIC FIRECLAY 550 X 400MM RECTANGULAR “SPRINGBOK” BASIN WITH TWO TAPHOLES, INTEGRATED OVERFLOW AND CHAINSTAY HOLE.
	**10**	**WATER CLOSET** VAAL SANITARYWARE VITREOUS CHINA "PEARL PARAPLEGIC” SEMI-CLOSE COUPLED 90° OUTLET OPEN RIM WASHDOWN PAN AND MATCHING 9 LITRE CISTERN COMPLETE WITH LID, FITMENTS, AND PURPOSE MADE C.P. SIDE-FLUSH LEVER (LEFT OR RIGHT). SUPPLIED WITH PURPOSE MADE THERMOSET SEAT AND COVER PLATE.
	**20**	**PARAPLEGIC TOILET TAP** MEDICAL ELBOW-ACTION PILLAR TAP, CHROME. INCLUDES: 1/4" TURN CERAMIC DISC HEAD PART, BLUE INDICE, 1/2" BSP MALE INLET, AND FLANGED BACKNUT. IDEAL FOR MEDICAL, KITCHEN AND INDUSTRIAL INSTALLATIONS. SANS 226 TYPE 2.
	**10**	**CISTERN AND FLUSH VALVE BACKRAIL** FRANKE 750 X 260MM X 32MM Ø GRABRAIL MANUFACTURED FROM 18/10 STAINLESS STEEL, SATIN FINISH TO PREVENT SLIPPING. INCLUDES SCREWS AND DOWELS. *CODE: CNTXBR 750 X 260MM 35992*
	**10**	**ANGLE BAR** FRANKE 618 X 95 X 256MM X 31.8MM Ø GRABRAIL MANUFACTURED FROM 18/10 STAINLESS STEEL, SATIN FINISH TO PREVENT SLIPPING. INCLUDES SCREWS AND DOWELS. *CODE: CNTX700A* 618 X 95 X 256MM *35877*

	**10**	**DOUBLE TOILET ROLL HOLDER WITH SPINDLE SYSTEM** DOUBLE TOILET ROLL HOLDER WITH SPINDLE SYSTEM FRO WALL MOUNTING, STAINLESS STEEL SURFACE SATIN FINISHED, FOLDED FRONT COVER, CYLINDER LOCK WITH FRANKE STANDARD KEY. FOR 2 ROLLS WITH MAX. 120MM Ø, SECOND ROLL WILL BE RELEASED AFTER CONSUMPTION OF FIRST ROLL, WITH SPINDLES, RESERVE ROLL NOT VISIBLE. INCLUDES STAINLESS STEEL SCREWS AND DOWELS. *CODE: RODX672 144 X 138 X 301 359987*
	**10**	**SOAP DISPENSER** LIQUID SOAP DISPENSER FOR WALL MOUNTING, MANUFACTURED FROM 18/10 STAINLESS STEEL, SATIN FINISH. WITH A DEEP DRAWN LID, WELDED BODY AND CYLINDER LOCK WITH STANDARD FRANKE KEY. THE DISPENSER INCORPORATES A 1 LITRE POLYETHYLENE CONTAINER WHICH IS SUITABLE FOR LIQUID AND ANTISEPTIC SOAPS AND LOTIONS. SCREWS AND DOWELS INCLUDED. *CODE: BS618 200 X 130 X 85 359800*

6.16 Architectural Drawings

DRAWINGS

Architectural Drawings


EXIST BUILDING
EXIST BUILDING
EXIST BUILDING
EXIST BUILDING
EXIST BUILDING
EXIST BUILDING
ADDITION 01
1 073 m²
ADDITION 02
47 m²
ADDITION 03
6 m²
C/YARD
14 m²
C/YARD
7 m²
HVAC PLANT & HOT WATER YARD
43 m²
GRID INLET TO ENG. SPEC
1 x 150MM Ø HDPE RWDP
2 x 150MM Ø HDPE RWDP
3 x 150MM Ø HDPE RWDP
4 x 150MM Ø HDPE RWDP
4 x 110MM Ø HDPE RWDP
2 x 160MM Ø HDPE RWDP
110MM Ø HDPE RWDP
150MM Ø HDPE RWDP
110MM STEP
170MM STEP
OVER FLOW GUTTER
1 x 150MM Ø HDPE RWDP
1 x 150MM Ø HDPE RWDP
1 x 150MM Ø HDPE RWDP

REVISIONS

REV.	DATE	DESCRIPTION	ORIG.
A	30-JUN-2025	ISSUED FOR CONCEPT APPROVAL	WJ
B	30-JUN-2025	GENERAL UPDATES UPDATED TRIAGE AS PER USER CLIENT INPUT SUCTION TREATMENT & VACUUM ROOM ADDED	WJ
C	30-JUL-2025	GENERAL REVISIONS: STRUCTURAL SYSTEM AND GRID ADDED	WJ
D	30-JUN-2025	DIMENSIONS, DRAINAGE AND NOTED ADDED	WJ
E	03-AUG-2025	REGISTRATION WAITING AREA M.I.P CUBICLE RELOCATED. GENERAL REVISIONS AS PER CLOUDED AREAS	WJ
F	08-AUG-2025	RAINWATER DISPOSAL NETWORK ADDED. GENERAL REVISIONS TO FLOOR PLAN	WJ

GENERAL NOTES & INSTRUCTIONS TO ALL CONTRACTORS

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CLIENT

health
Department of Health
NORTHERN CAPE

IMPLEMENTING AGENT

AMAHLE
MULTI DISCIPLINARY AND PROJECTS
(Pty) Ltd

59 CHAPEL STREET
KIMBERLEY CBD
Republic of South Africa
mobile +27 71 497 2715
email : wilson@amahle.co.za

PROJECT NAME

NEW ACCIDENT AND EMERGENCY SECTION TO KURUMAN HOSPITAL

ERF NUMBER

**KURUMAN
NORTHERN CAPE**

STREET ADDRESS

**KURUMAN
NORTHERN CAPE**

DRAWING TITLE/DESCRIPTION

GROUND FLOOR LAYOUT

DRAWING ISSUE INFORMATION

ISSUED FOR:

CONCEPT DESIGN	CLIENT APPROVAL	MUNICIPAL APPROVAL
DETAIL DESIGN	QUANTITIES	CONSTRUCTION
COORDINATION	TENDER	AS-BUILT INFORMATION

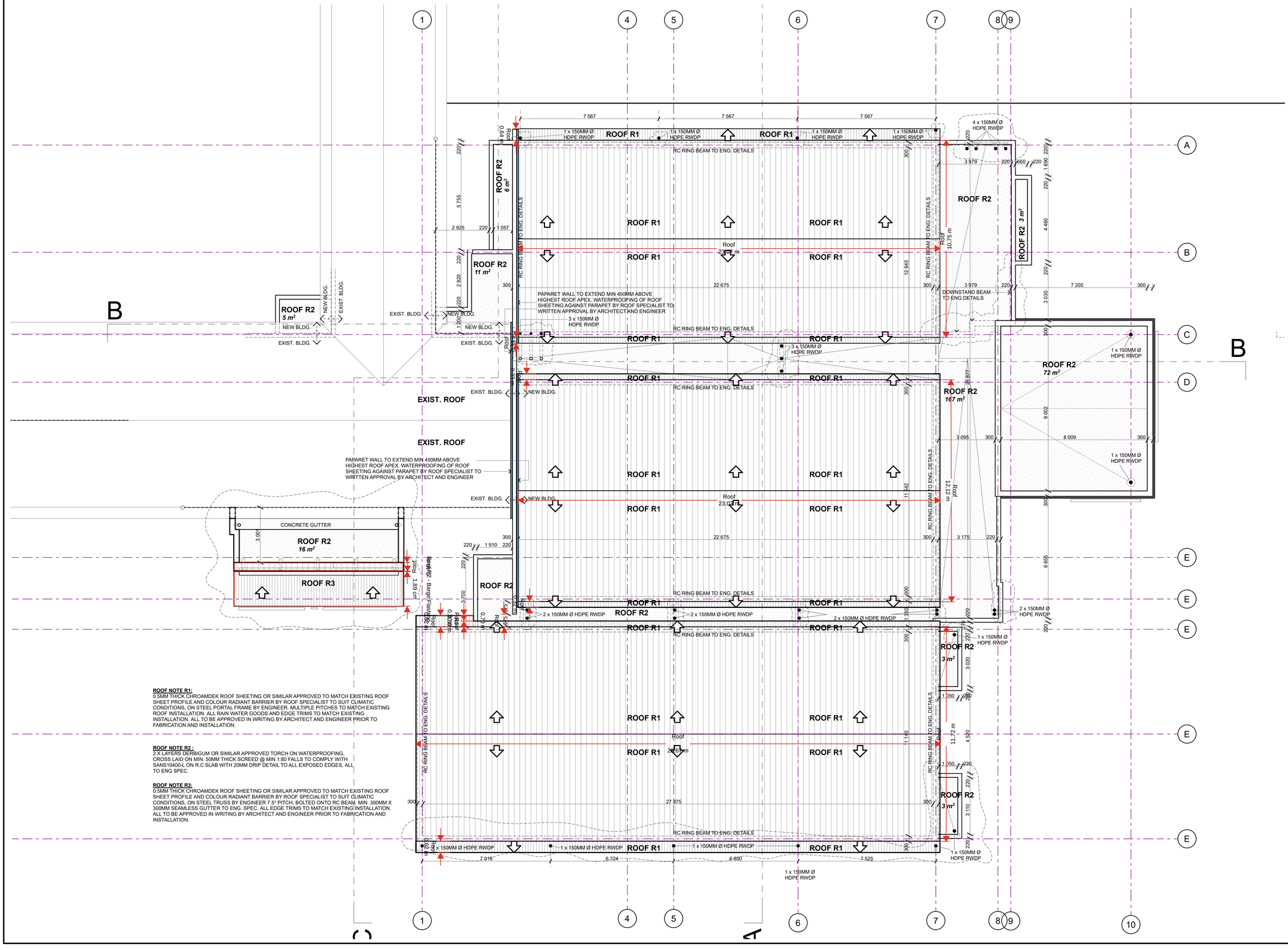
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APPROVED FOR ISSUE BY :

PrArch 7259
SACAP REGISTRATION

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ROOF NOTE R1:
0.5MM THICK CHROAMDEK ROOF SHEETING OR SIMILAR APPROVED TO MATCH EXISTING ROOF SHEET PROFILE AND COLOUR RADIANT BARRIER BY ROOF SPECIALIST TO SUIT CLIMATIC CONDITIONS, ON STEEL PORTAL FRAME BY ENGINEER. MULTIPLE PITCHES TO MATCH EXISTING ROOF INSTALLATION. ALL RAIN WATER GOODS AND EDGE TRIMS TO MATCH EXISTING INSTALLATION. ALL TO BE APPROVED IN WRITING BY ARCHITECT AND ENGINEER PRIOR TO FABRICATION AND INSTALLATION.

ROOF NOTE R2:
2 X LAYERS BERBIGUM OR SIMILAR APPROVED TORCH ON WATERPROOFING, CROSS LAID ON MIN. 50MM THICK SCREED @ MIN 1:80 FALLS TO COMPLY WITH SANS10400-L ON R.C SLAB WITH 20MM DRIP DETAIL TO ALL EXPOSED EDGES, ALL TO ENG SPEC.

ROOF NOTE R3:
0.5MM THICK CHROAMDEK ROOF SHEETING OR SIMILAR APPROVED TO MATCH EXISTING ROOF SHEET PROFILE AND COLOUR RADIANT BARRIER BY ROOF SPECIALIST TO SUIT CLIMATIC CONDITIONS, ON STEEL TRUSS BY ENGINEER 7.5° PITCH, BOLTED ONTO RC BEAM. MIN. 300MM X 300MM SEAMLESS GUTTER TO ENG. SPEC. ALL EDGE TRIMS TO MATCH EXISTING INSTALLATION. ALL TO BE APPROVED IN WRITING BY ARCHITECT AND ENGINEER PRIOR TO FABRICATION AND INSTALLATION.

REVISIONS

REV.	DATE	DESCRIPTION	ORIG.
A	30-JUL-2025	FIRST ISSUE	WJ
B	03-AUG-2025	UPDATED AS PER FLOOR PLAN REVISIONS	WJ
C	08-AUG-2025	RAINWATER DISPOSAL NETWORK ADDED. GENERAL REVISIONS TO SUIT FLOOR PLAN CHANGES. ROOF OVER ENTRANCE UPDATED.	WJ

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health
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IMPLEMENTING AGENT

AMAHLE
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59 CHAPEL STREET
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Republic of South Africa
mobile :+27 71 497 2715
email : wilson@amahle.co.za

PROJECT NAME
NEW ACCIDENT AND EMERGENCY SECTION TO KURUMAN HOSPITAL

ERF NUMBER
KURUMAN NORTHERN CAPE

STREET ADDRESS
KURUMAN NORTHERN CAPE

DRAWING TITLE/DESCRIPTION
ROOF PLAN

DRAWING ISSUE INFORMATION

ISSUED FOR:

CONCEPT DESIGN	CLIENT APPROVAL	MUNICIPAL APPROVAL
DETAIL DESIGN	QUANTITIES	CONSTRUCTION
COORDINATION	TENDER	AS-BUILT INFORMATION

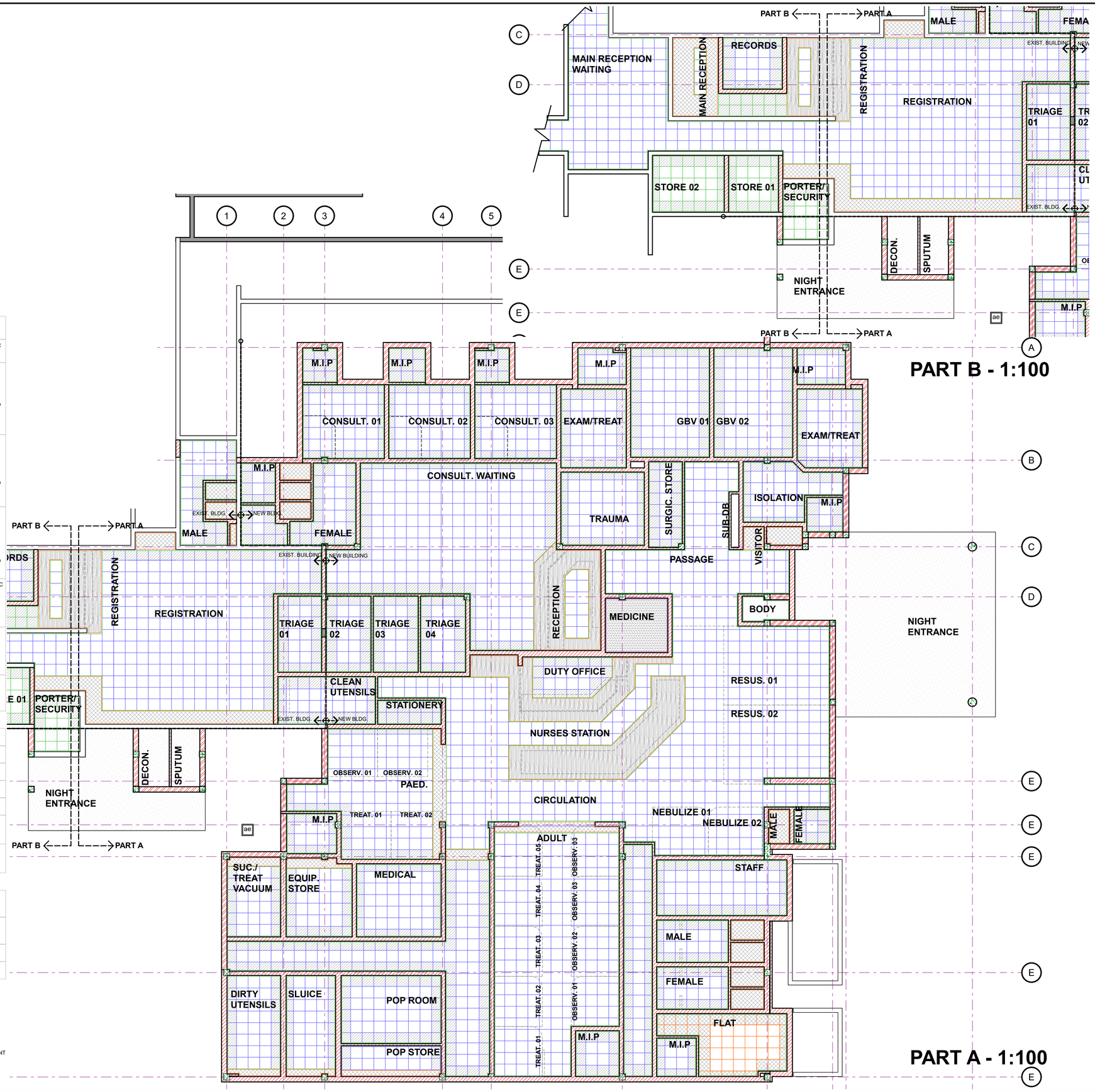
W M I JAVANGWE
APPROVED FOR ISSUE BY :

PrArch 7259
SACAP REGISTRATION

SIGNATURE

START DATE	JOB NUMBER
20-JUN-2025	25-A-NC-001
DRAWN / CHECKED	DWG NUMBER
WJ / WJ	CP-101
PAPER SIZE / DWG SCALE	REV. NUMBER
A1 1:100	C

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CEILING CONSTRUCTION LEGEND

- CEILING SETTING OUT POINT
- CUT CEILING TILE SUCH THAT THE IT IS NO LONGER 600 X 600MM ON ONE OR MORE EDGES
- FLUSHPLASTERED BULKHEAD WITH THE FOLLOWING WHEN ABUTTING ONTO A
  - WALL- SIGMA PLASTER TRIM 30 SHADOWLINE, OR SIMILAR APPROVED
  - DROP IN CEILING - "SIGMA CEILING TRANSITION 20, OR SIMILAR APPROVED.
  - WET AREAS - 12MM THICK MOISTURE RESISTANT PLASTER BOARD TO BE USED
  - DRY AREAS - 12MM THICK PLASTER BOARD TO BE USED
- FLUSHPLASTERED DROPPED BULKHEAD WITH THE FOLLOWING WHEN ABUTTING ONTO A
  - WALL- SIGMA PLASTER TRIM 30 SHADOWLINE, OR SIMILAR APPROVED
  - DROP IN CEILING - "SIGMA CEILING TRANSITION 20, OR SIMILAR APPROVED.
  - WET AREAS - 12MM THICK MOISTURE RESISTANT PLASTER BOARD TO BE USED
  - DRY AREAS - 12MM THICK PLASTER BOARD TO BE USED
- FLUSHPLASTERED CEILING WITH MENTEX 30 4.5MM THICK SHEETS TO PLACED ABOVE AS SECURITY BARRIER TO LATER DETAIL, WITH THE FOLLOWING WHEN ABUTTING ONTO A
  - WALL- SIGMA PLASTER TRIM 30 SHADOWLINE, OR SIMILAR APPROVED
  - DROP IN CEILING - "SIGMA CEILING TRANSITION 20, OR SIMILAR APPROVED.
  - WET AREAS - 12MM THICK MOISTURE RESISTANT PLASTER BOARD TO BE USED
  - DRY AREAS - 12MM THICK PLASTER BOARD TO BE USED
- 600 X 600MM "CAPCO EXPOSED T (T38/24W)" SYSTEM WITH 9MM THICK ECO-TEC VINYLCLAD GYPSUM TILES (WHITE), WITH THE FOLLOWING WHEN ABUTTING AGAINST
  - WALL - 20MM SHADOWLINE WALL TRIM
  - BULKHEAD - "SIGMA CEILING TRANSITION 20, OR SIMILAR APPROVED
- 600 X 600MM "CAPCO EXPOSED T (T38/24W)" SYSTEM WITH 15MM THICK THERMOFON ACOUSTIC GYPSUM TILES (WHITE), WITH THE FOLLOWING WHEN ABUTTING AGAINST
  - WALL - 20MM SHADOWLINE WALL TRIM
  - BULKHEAD - "SIGMA CEILING TRANSITION 20, OR SIMILAR APPROVED
- CONCRETE SOFFIT - PLASTERED AND PAINTED

ELECTRICAL LEGEND

- a — 600 X 600MM LED LIGHT PANEL - ANTI-GLARE
- ae — 600 X 600MM LED LIGHT PANEL - ANTI-GLARE + EMERGENCY BATTERY
- OCCUPANCY SENSOR
- LED DOWNLIGHT - ANTI-GLARE + WATERPROOF
- LED DOWNLIGHT - ANTI-GLARE
- ae — 300 x 1200MM SURFACE MOUNTED FLICKER FREE LED LIGHT - ANTIGLARE + EMERGENCY BATTERY
- aewp — 300 x 1200MM SURFACE MOUNTED FLICKER FREE LED LIGHT - ANTIGLARE + EMERGENCY BATTERY + WATERPROOF

MECHANICAL LEGEND

- 600 X 600MM CEILING DIFFUSER - AIR CONDITIONING
- 600 X 600MM CEILING DIFFUSER - AIR CONDITIONING + FRESH AIR
- fa — 600 X 600 CEILING GRILL - FRESH AIR
- ex — 600 X 600 CEILING GRILL - EXTRACTION

CEILING HEIGHTS

ALL CEILINGS TO BE AT 2900MM ABOVE F.F.L EXCEPT FOR THE FOLLOWINGF AREAS

1. DROPPED BULKEAD TO NURSES STATION AND DUTY STATION @ IS 2400MM ABOVE FFL

ANTI-BANDIT CEILING

THE FOLLOWING ROOMS TO RECEIVE DRYWALL ABOVE CEILING LEVEL WITH 1MM THICK GALVANISED SHEET FIXED TO STUDS ON BOTH SIDES AND 12MM THICK MOISTURE RESISTANT PLASTER BOARD AND ON BOTH BOTH SIDES. ALL TO UNDERSIDE OF ROOF COVERING.

1. MEDICAL ROOM

REVISIONS

REV.	DATE	DESCRIPTION	ORIG.
A	31-JUL-2025	FIRST ISSUE	WJ

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health
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KURUMAN NORTHERN CAPE

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REFLECTED CEILING PLAN

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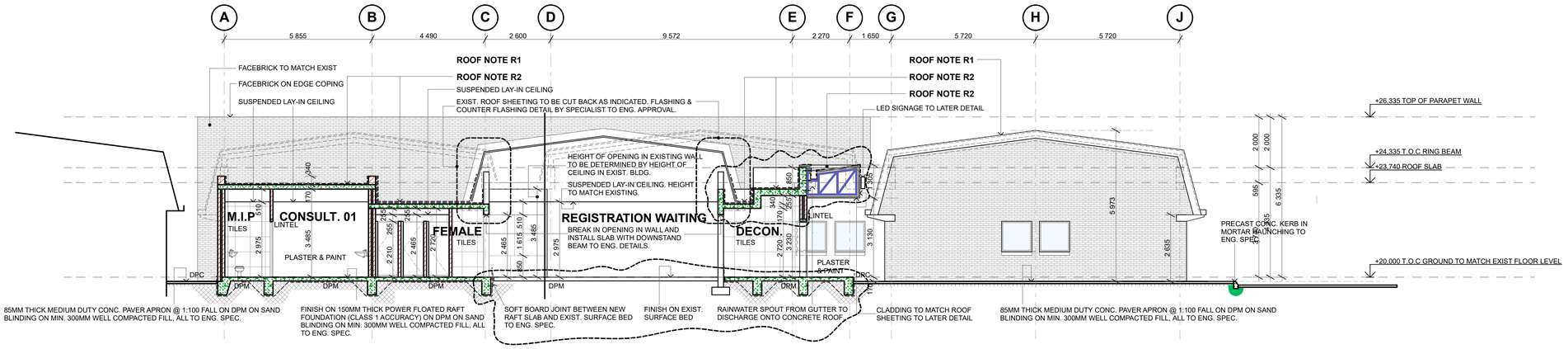
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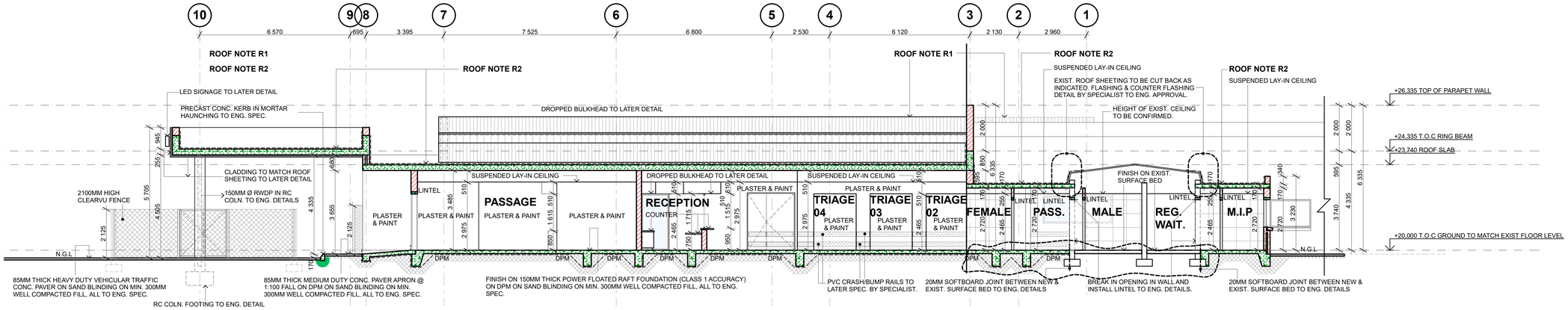
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JOB NUMBER: 25-A-NC-001
DRAWN: WJ
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DWG NUMBER: CP-120
PAPER SIZE: A1
DWG SCALE: 1:100
REV. NUMBER: A

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SECTION C - C 1:100

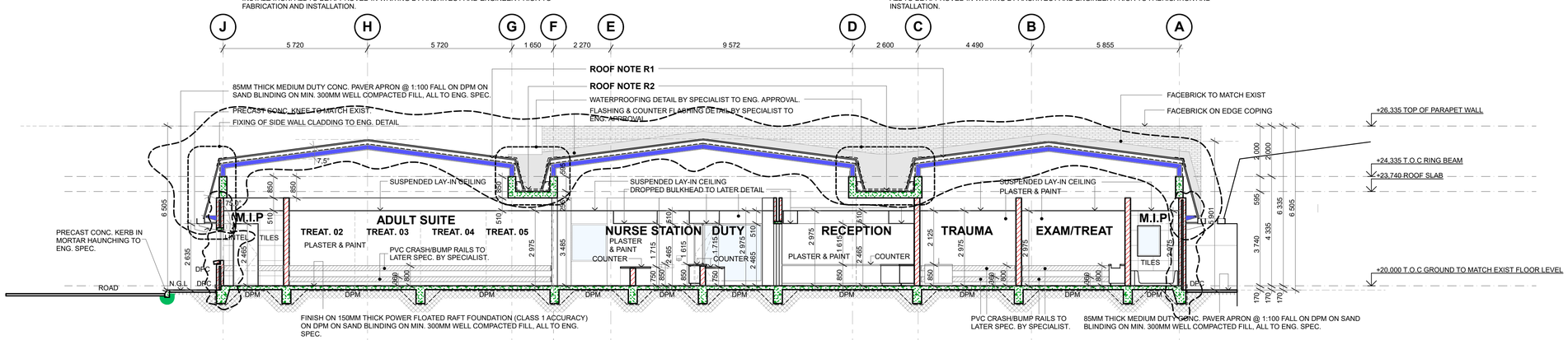


SECTION B - B 1:100

ROOF NOTE R1:
0.5MM THICK CHROAMDEK ROOF SHEETING OR SIMILAR APPROVED TO MATCH EXISTING ROOF SHEET PROFILE AND COLOUR RADIANT BARRIER BY ROOF SPECIALIST TO SUIT CLIMATIC CONDITIONS, ON STEEL PORTAL FRAME BY ENGINEER. MULTIPLE PITCHES TO MATCH EXISTING ROOF INSTALLATION. ALL RAIN WATER GOODS AND EDGE TRIMS TO MATCH EXISTING INSTALLATION. ALL TO BE APPROVED IN WRITING BY ARCHITECT AND ENGINEER PRIOR TO FABRICATION AND INSTALLATION.

ROOF NOTE R2:
2 X LAYERS DERBIGUM OR SIMILAR APPROVED TORCH ON WATERPROOFING, CROSS LAID ON MIN. 50MM THICK SCREED @ MIN 1:80 FALLS TO COMPLY WITH SANS10400-L ON R.C SLAB WITH 20MM DRIP DETAIL TO ALL EXPOSED EDGES, ALL TO ENG SPEC.

ROOF NOTE R3:
0.5MM THICK CHROAMDEK ROOF SHEETING OR SIMILAR APPROVED TO MATCH EXISTING ROOF SHEET PROFILE AND COLOUR RADIANT BARRIER BY ROOF SPECIALIST TO SUIT CLIMATIC CONDITIONS, ON STEEL TRUSS BY ENGINEER 7.5° PITCH, BOLTED ONTO RC BEAM. MIN. 300MM X 300MM SEAMLESS GUTTER TO ENG. SPEC. ALL EDGE TRIMS TO MATCH EXISTING INSTALLATION. ALL TO BE APPROVED IN WRITING BY ARCHITECT AND ENGINEER PRIOR TO FABRICATION AND INSTALLATION.



SECTION A - A 1:100

REVISIONS

REV.	DATE	DESCRIPTION	ORIG.
A	31-JUL-2025	FIRST ISSUE	WJ
B	03-AUG-2025	SECTION C - C ADDED	WJ
C	04-AUG-2025	SECTION B - B ADDED	WJ
D	08-AUG-2025	SECTION C - C ROOF OVER ENTRANCE UPDATED. ALL SECTIONS UPDATED TO REFLECT AS-BUILT CONDITIONS AND TO MATCH ENG. FOUNDATION LAYOUT	WJ

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DRAWING TITLE/DESCRIPTION
SECTION A - A, B - B, C - C

DRAWING ISSUE INFORMATION

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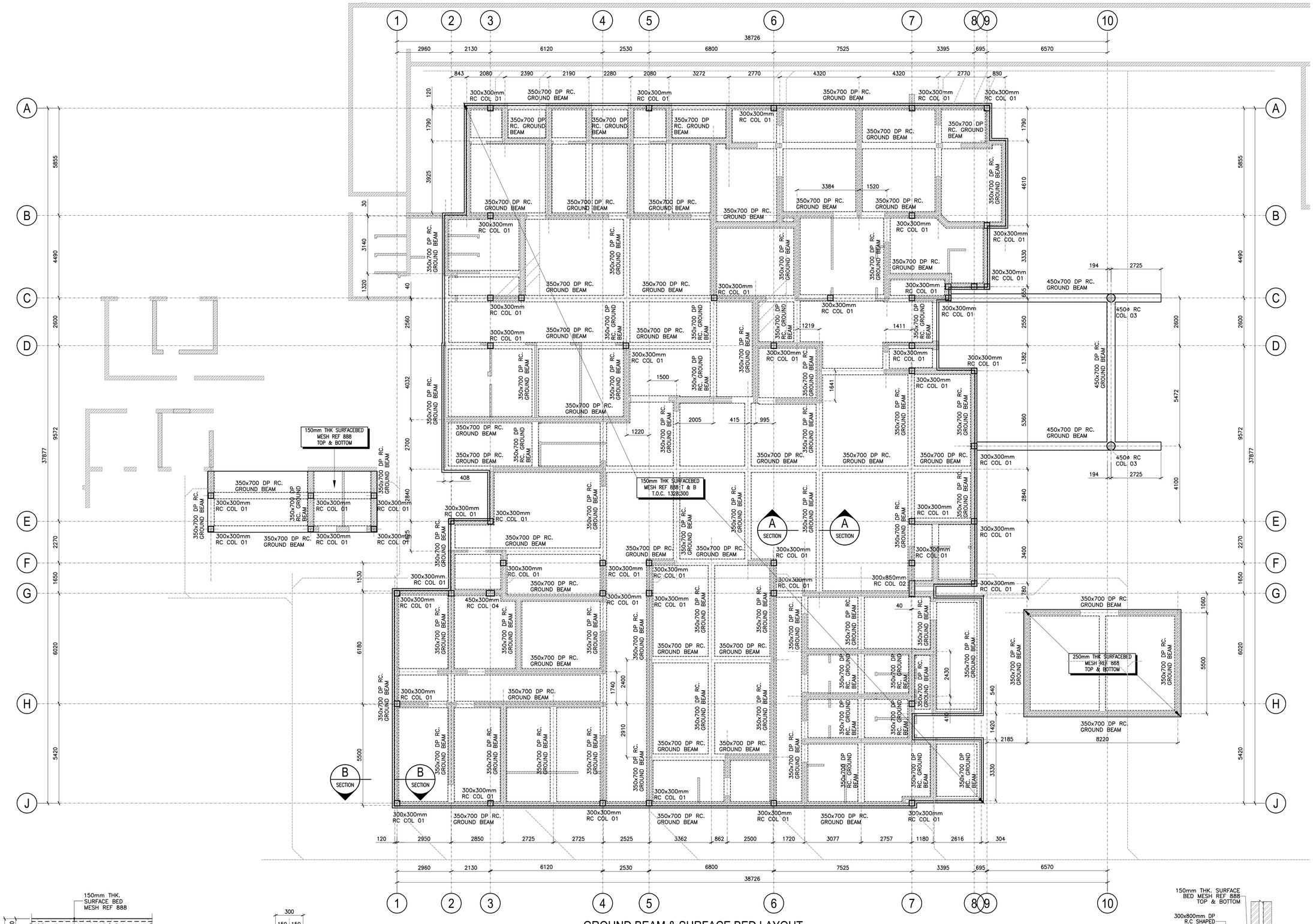
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SIGNATURE

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JOB NUMBER: 25-A-NC-001
DRAWN: WJ | CHECKED: WJ
DWG NUMBER: CP-200
PAPER SIZE: A1 | DWG SCALE: 1:100
REV. NUMBER: D

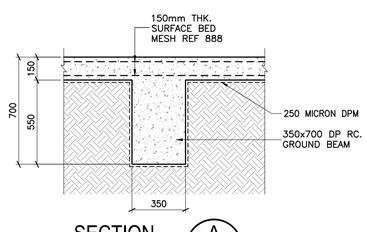
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Structural Drawings

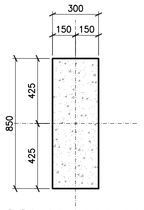


GROUND BEAM & SURFACE BED LAYOUT

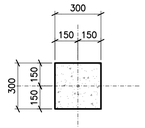
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SECTION A
SCALE 1:20



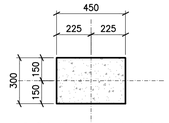
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SCALE 1:20



COL 01 - 300x300
SCALE 1:20



COL 03 - 450Ø
SCALE 1:20

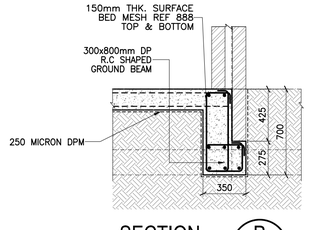


COL 04 - 450x300
SCALE 1:20

PLEASE NOTE
GROUND BEAMS ARE BASED ON THE ASSUMPTION OF A 5000mmø SINKHOLE, PENDING GEOTECHNICAL INVESTIGATIONS.

FOUNDATION/ RAFT QUANTITIES ESTIMATE:

1. ALL GROUND BEAMS: 350x700 DEEP (250kg/m³)
2. ALL GROUND BEAMS: 450x700 DEEP (250kg/m³)
3. ALL CONCRETE GRADES 30MPa
4. ALL COLUMNS 300x300 RC COLUMNS (180kg/m³)
5. ALL COLUMNS 300x850 RC COLUMNS (180kg/m³)
6. ALL COLUMNS 450ø RC COLUMNS (180kg/m³)
7. ALL COLUMNS 300x450 RC COLUMNS (180kg/m³)



SECTION B
SCALE 1:25

/ general notes /

Copyright reserved.

The design on this drawing remains the property of the Architect.

All dimensions, heights and levels to be checked on site before work is put in hand. Any discrepancies to be reported immediately to the Architect.

This drawing is not to be scaled.

All brickwork to be set out using a profile marked at 85mm c/c.

All dimensions as indicated on Plan to be set out on a level horizontal plane.

Quality of craftsmanship and all materials to comply with the relevant SABS standards and SANS 10400.

All floor levels shown on this drawing are unfinished levels.

The Contractor must have a complete set of drawings on site.

/ revisions /

NO	DATE	DESCRIPTION
A	2025-07-30	ISSUED FOR COSTING
B	2025-08-01	ISSUED FOR COSTING
C	2025-08-04	COLUMNS ADDED AS CLOUDED
T	2025-08-13	ISSUED FOR TENDER

..\Draw-2d-Details\Amahle New.jpg

/ professional person /

T. J. MUTSIKIRA

/ council / / reg no /

ECSA	Pr. No. 201670014

/ drawn / / checked /

SK	TJM

/ drawing issued for /

X	INFORMATION ONLY
	LOCAL AUTHORITY APPROVAL
	CONSTRUCTION

/ client /

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/ project description /

KURUMAN DISTRICT HOSPITAL
.
NORTHERN CAPE

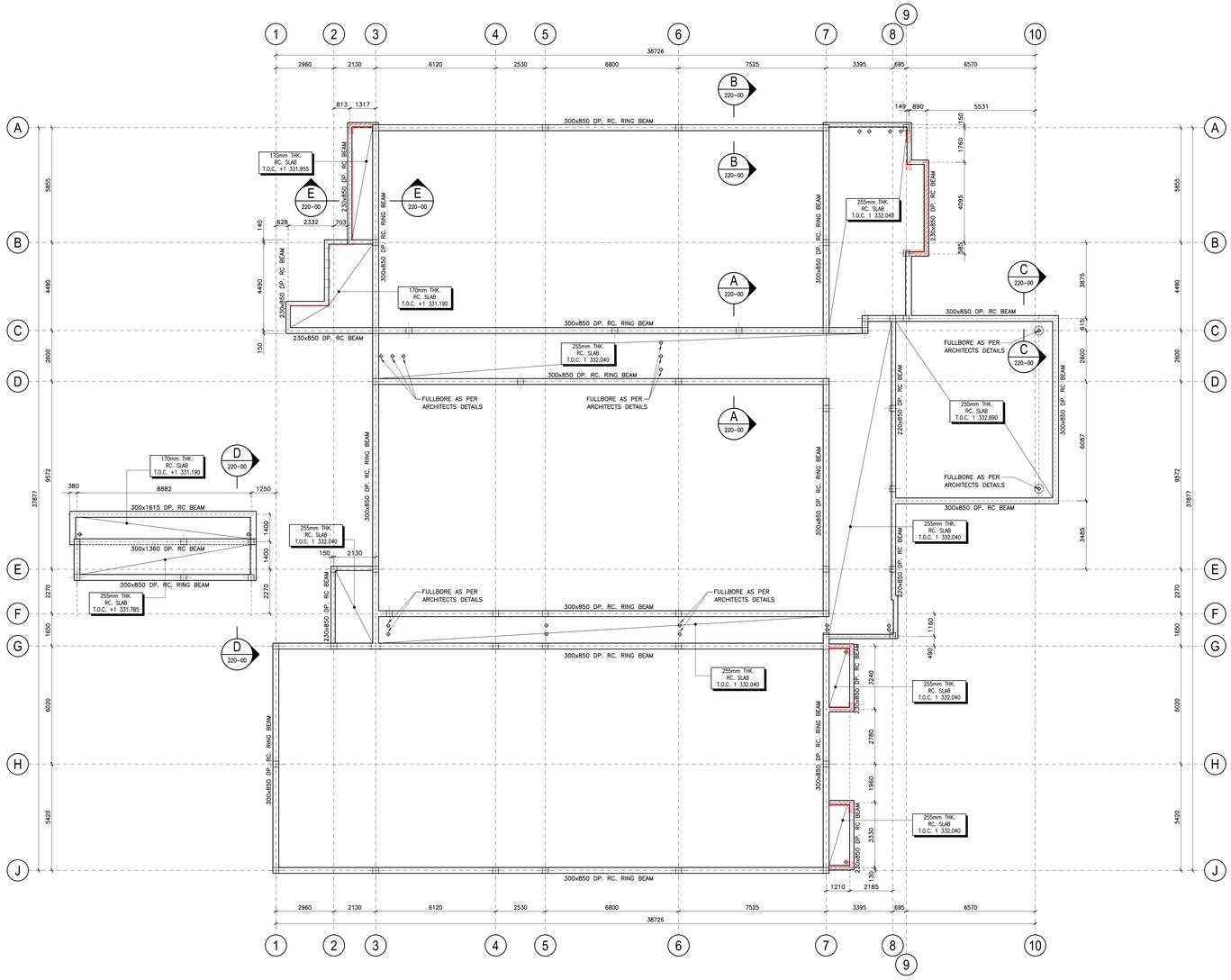
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2025-07-30

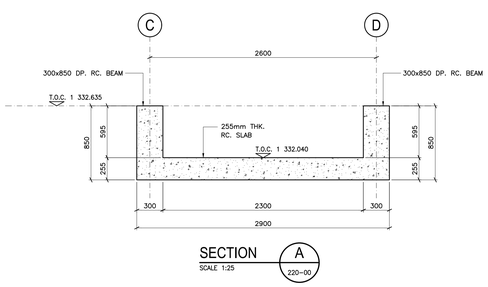
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FOUNDATION & SURFACEBED	AS SHOWN

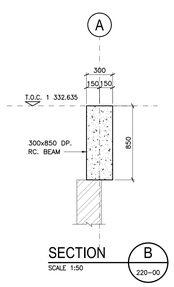
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/ revision no /	T



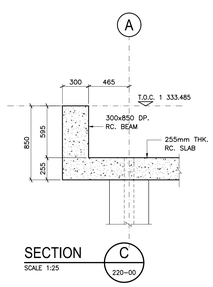
ROOF SLAB LAYOUT
SCALE 1: 100



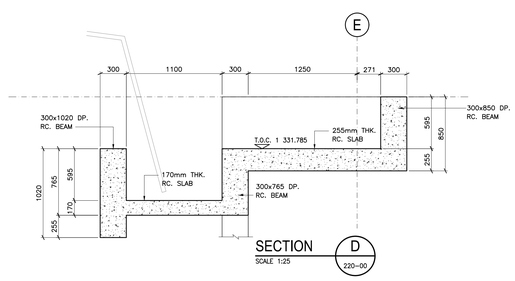
SECTION A
SCALE 1:25



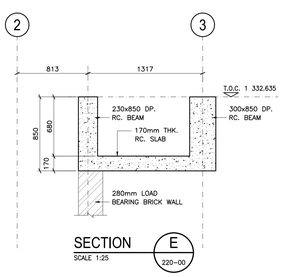
SECTION B
SCALE 1:50



SECTION C
SCALE 1:25



SECTION D
SCALE 1:25



SECTION E
SCALE 1:25

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/ revisions /

NO	DATE	DESCRIPTION
T	2025-08-18	FOR TENDER

AMAHLE MULTI DISCIPLINARY AND PROJECTS (Pty) Ltd

/ professional person /

T. J. MUTSKIRA

/ council /	/ reg no /
ECSA	Pr. No. 201670014

/ drawn /	/ checked /
MM	TJM

/ drawing issued for /

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/ client /

health
Department of Health
NORTHERN CAPE

/ project description /

KURUMAN DISTRICT HOSPITAL
.
NORTHERN CAPE

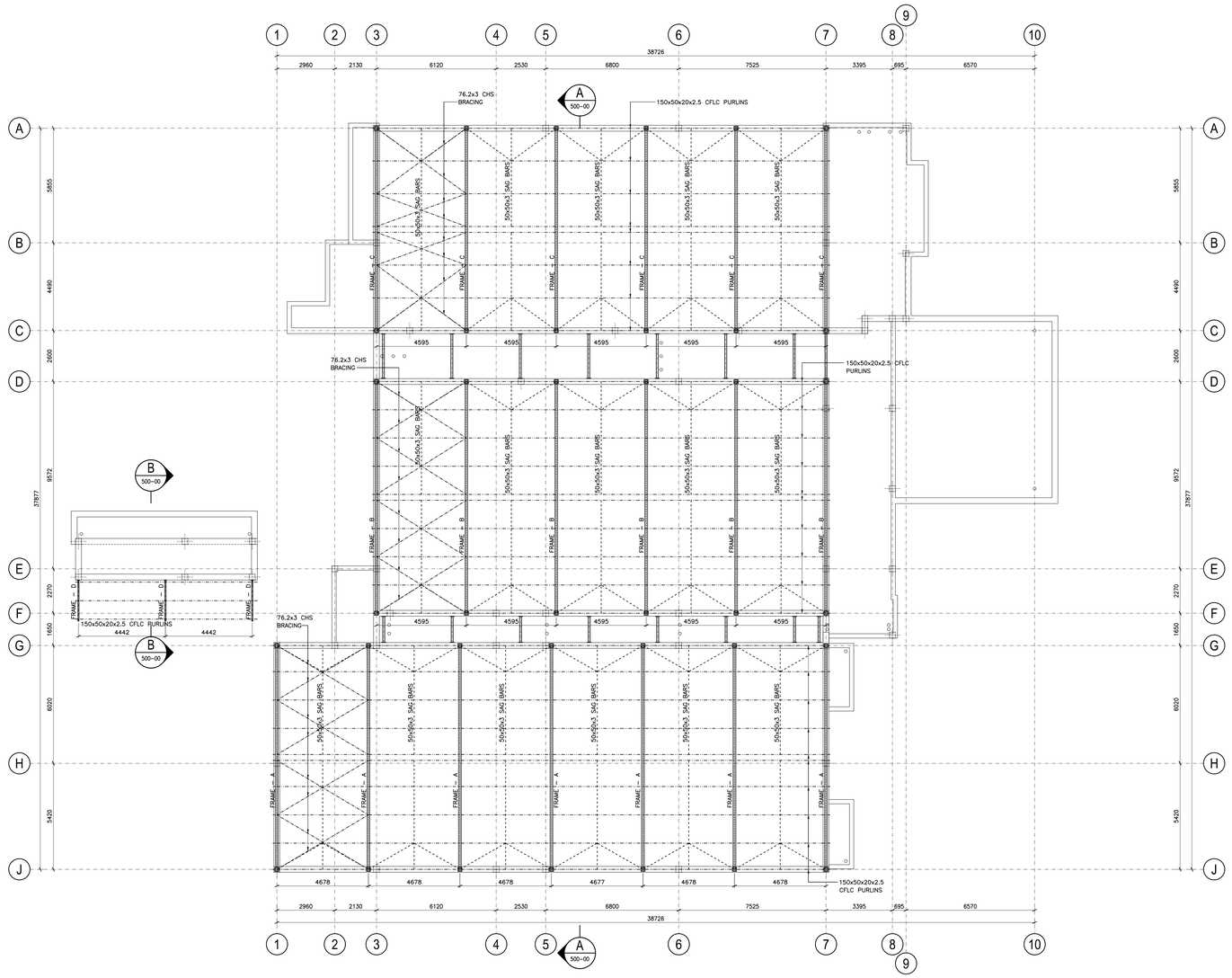
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2025-08-18

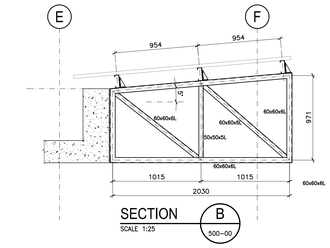
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ROOF LAYOUT AND DETAILS	1:500

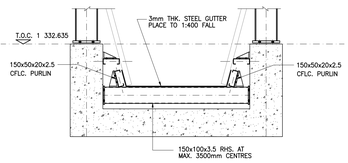
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/ drawing no /	PJ-360-00-220-00
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/ revision no /	T



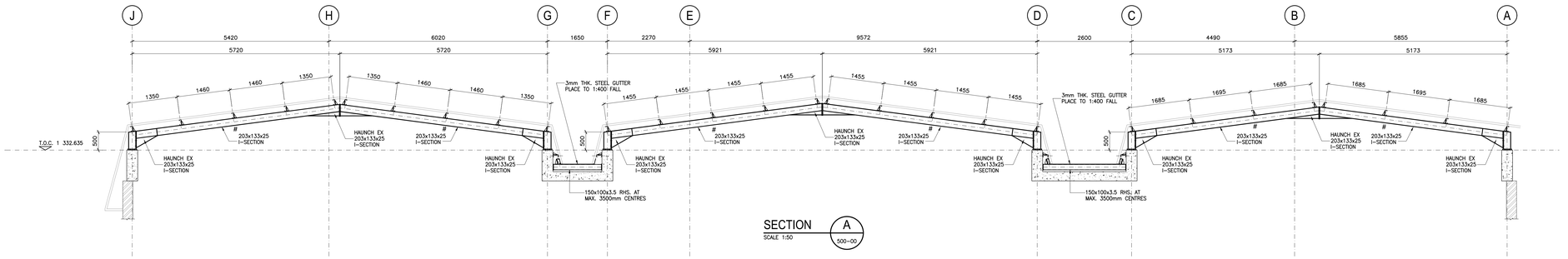
ROOF LAYOUT
SCALE 1: 100



SECTION B 500-00
SCALE 1:25



TYP. GUTTER SUPPORT DETAIL
SCALE 1: 20



SECTION A 500-00
SCALE 1:50

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NO	DATE	DESCRIPTION
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AMAHLE MULTI DISCIPLINARY AND PROJECTS (Pty) Ltd

/ professional person /

T. J. MUTSKIRA

/ council /	/ reg no /
ECSA	Pr. No. 201670014

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MM	TJM

/ drawing issued for /

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health
Department of Health
NORTHERN CAPE

/ project description /

KURUMAN DISTRICT HOSPITAL
.
NORTHERN CAPE

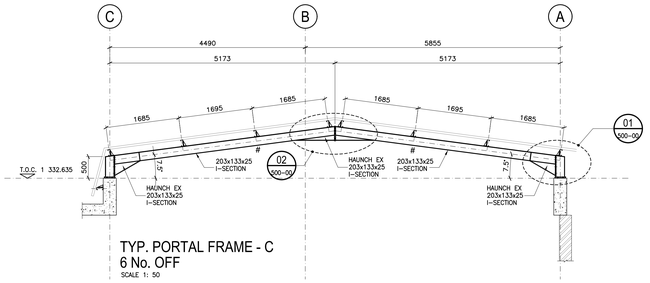
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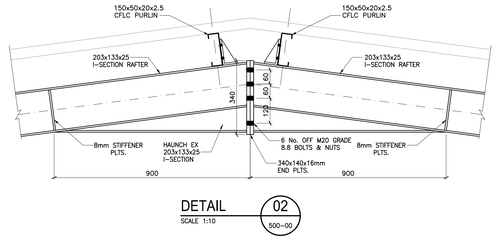
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ROOF LAYOUT AND DETAILS	1:500

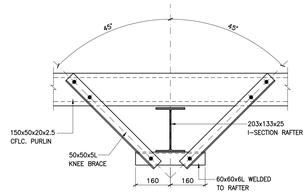
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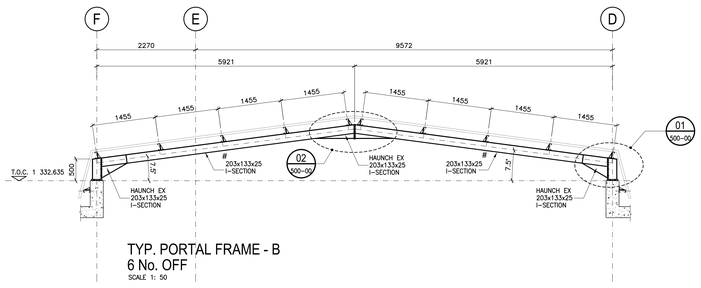
TYP. PORTAL FRAME - C
6 No. OFF
SCALE 1: 50



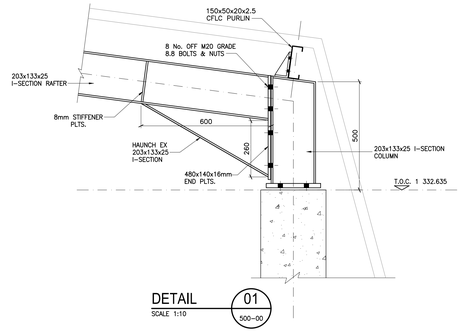
DETAIL 02
SCALE 1:10
500-00



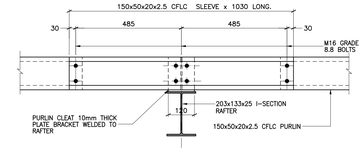
TYPICAL KNEE BRACE (KB) DETAIL #
SCALE 1: 10



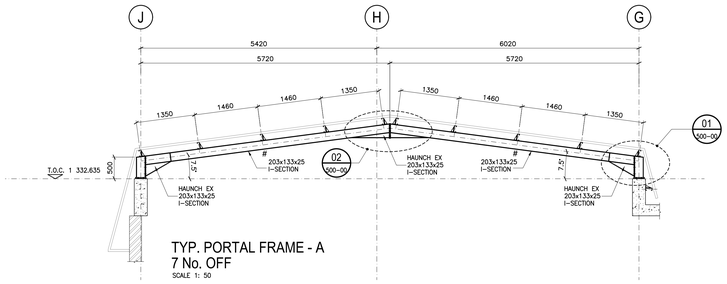
TYP. PORTAL FRAME - B
6 No. OFF
SCALE 1: 50



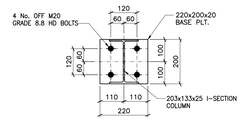
DETAIL 01
SCALE 1:10
500-00



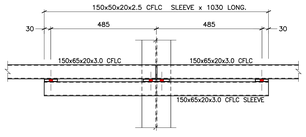
PURLIN SPLICE DETAIL
SCALE 1: 10



TYP. PORTAL FRAME - A
7 No. OFF
SCALE 1: 50



TYP. BASE PLT. DETAIL
38 No. OFF
SCALE 1: 10



PURLIN SPLICE PLAN VIEW
SCALE 1: 10

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NO	DATE	DESCRIPTION
A	2025-08-03	FOR INFO
T	2025-08-18	FOR TENDER

AMAHLE MULTI DISCIPLINARY AND PROJECTS (Pty) Ltd

/ professional person /

T. J. MUTSKIRA

/ council /	/ reg no /
ECSA	Pr. No. 201670014

/ drawn /	/ checked /
MM	TJM

/ drawing issued for /

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/ client /

health
Department of Health
NORTHERN CAPE

/ project description /

KURUMAN DISTRICT HOSPITAL
.
NORTHERN CAPE

/ date of issue /

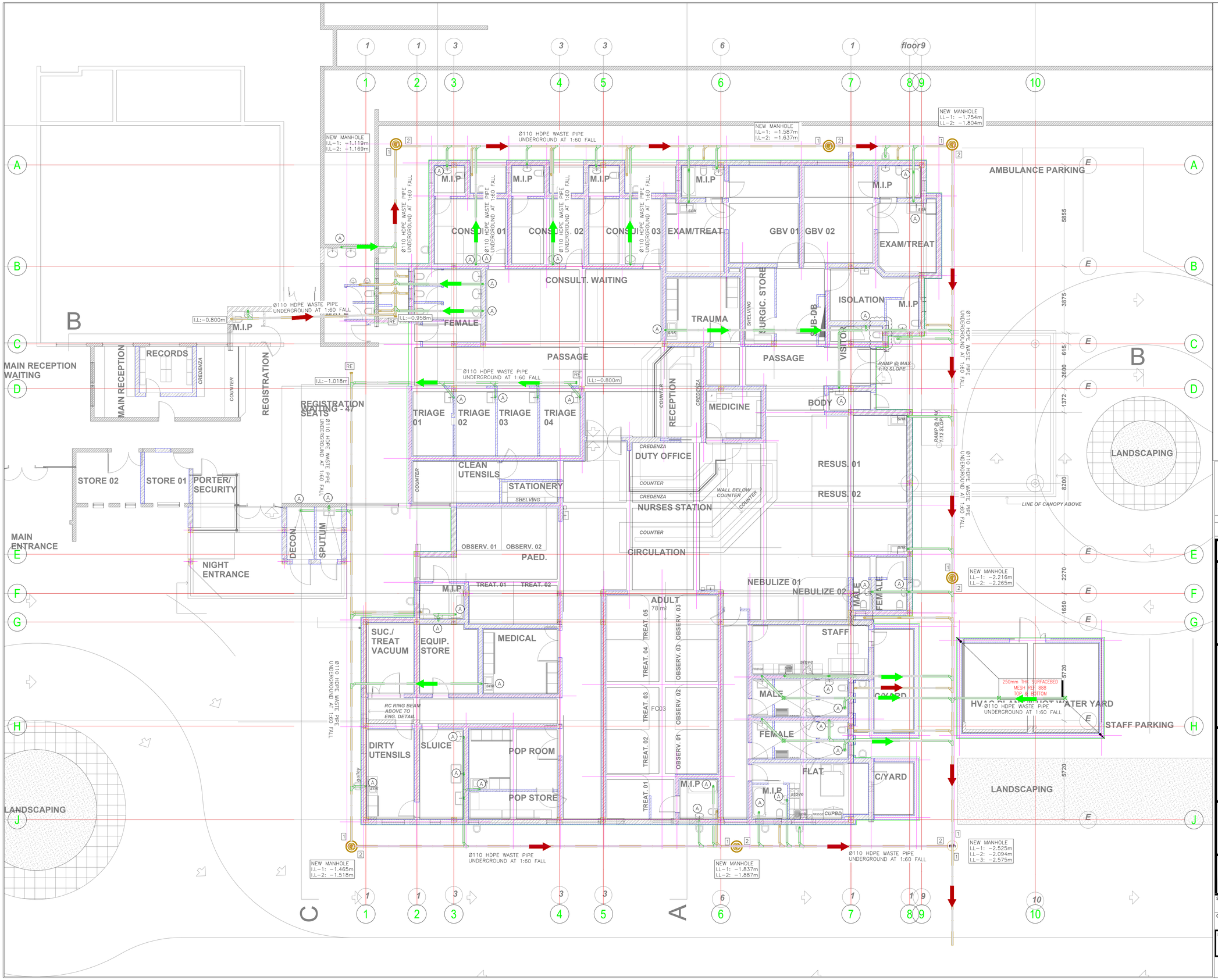
2025-08-18

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ROOF LAYOUT AND DETAILS	1:500

/ file no /	-
/ drawing no /	PJ-360-00-505-00
/ page size /	A0
/ revision no /	T

Civil Drawings



REV	DATE	BY	DESCRIPTION	CHK	APD
A	26.07.2025	I.M	ISSUED FOR INFORMATION	S.C	S.C

DRAWING STATUS:
ISSUED FOR INFORMATION

CLIENT:
the dr&pw
Department:
Roads And Public Works
NORTHERN CAPE PROVINCE
REPUBLIC OF SOUTH AFRICA

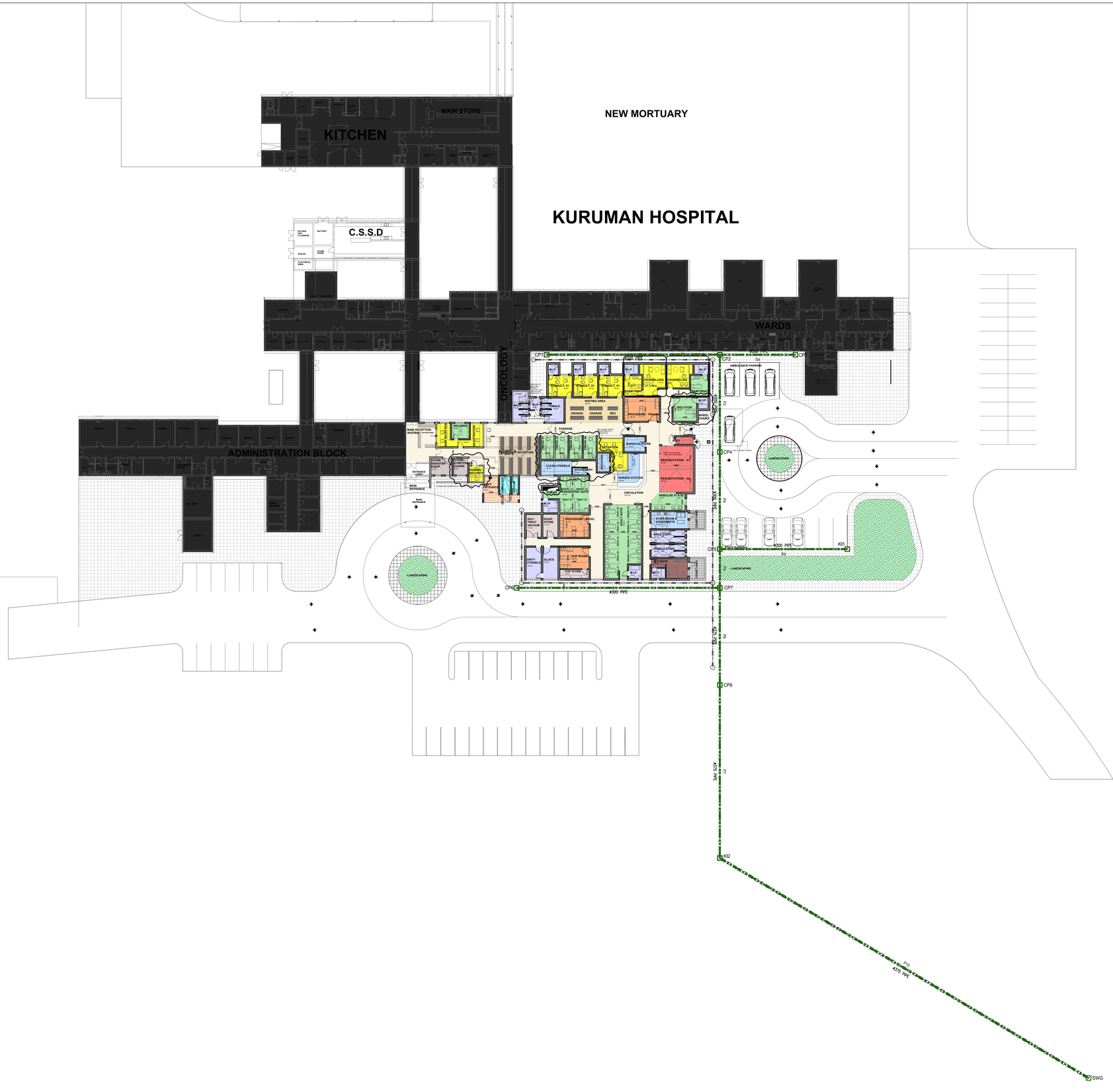
ARCHITECT:
AMAHLE MULTI DISCIPLINARY AND PROJECTS (Pty) Ltd

ENGINEER:
AMAHLE MULTI DISCIPLINARY AND PROJECTS (Pty) Ltd

PROJECT:
NEW ACCIDENT AND EMERGENCY SECTION TO KURUMAN HOSPITAL

TITLE:
DRAINAGE LAYOUT

SCALE @ A1:	CHECKED:	APPROVED:
1:100	S.C	S.C
CAD FILE:	DESIGN-DRAWN:	DATE:
....-D01	I.M	26.07.2025
PROJECT No:	DRAWING No:	REV:
.....	....-D01	A



LEGEND

CP	HDPE CATCH PIT
	NEW HDPE STORMWATER PIPE
KI	KERB INLET
SWG	STORMWATER GRID INLET

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NO	DATE	DESCRIPTION
A	2025-07-30	FOR INFORMATION
T	2025-08-19	FOR TENDER

AMAHLE MULTI DISCIPLINARY AND PROJECTS (Pty) Ltd

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ECSA	Pr. No. 201670014

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Department of Health
NORTHERN CAPE

/ project description /

KURUMAN HOSPITAL

NORTHERN CAPE

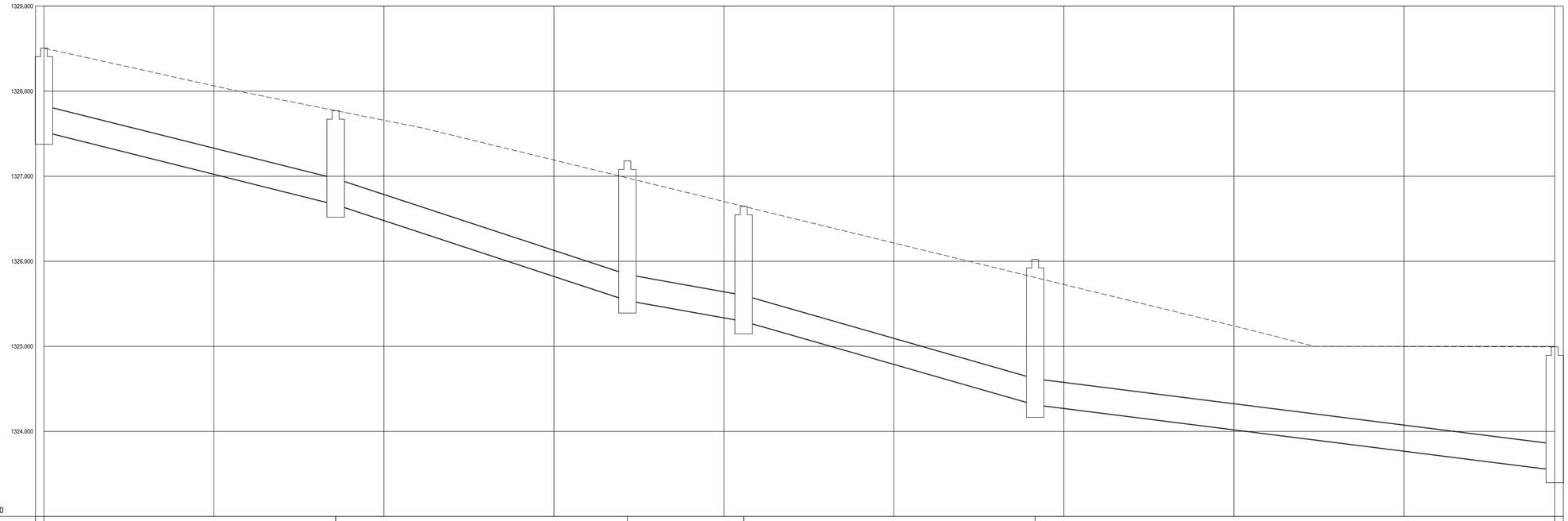
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2025 - 08 - 19

/ drawing description /

/ drawing name /	/ scale /
STORMWATER LAYOUT	1:250

/ file no /	-
/ drawing no /	PJ-360-00-110-00
/ page size /	A0
/ revision no /	T

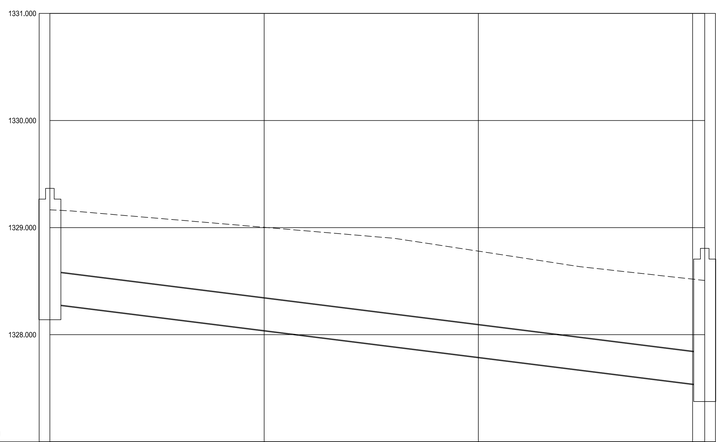


SCALES:
Horizontal 1:250
Vertical 1:50

DATUM 1323.000

REFERENCE	CP2	Ø300 mm Corrugated HDPE Pipe	CP4	Ø300 mm Corrugated HDPE Pipe	CP5	Ø300 mm Corrugated HDPE Pipe	CP7	Ø300 mm Corrugated HDPE Pipe	CP8	Ø300 mm Corrugated HDPE Pipe	KI2	
DISTANCE (m)	0.000		17.160		34.321		41.160		58.170		88.877	
GROUND LEVEL	1328.056		1327.771		1326.980		1326.646		1325.810		1324.984	
PIPE INVERT LEVEL	1327.026		1326.668		1325.541	1325.541	1325.297	1325.297	1324.515	1324.515	1323.548	
SLOPE / LENGTH	5.0% (1:20.0) 17.16m			6.6% (1:15.2) 17.16m			3.6% (1:28.0) 6.84m		5.7% (1:17.5) 17.15m		2.5% (1:39.8) 30.57m	

Manhole CP2 to KI2

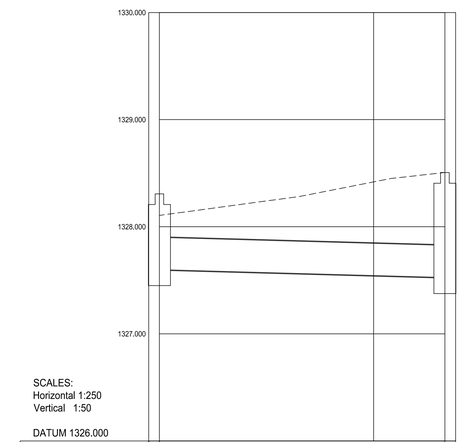


SCALES:
Horizontal 1:250
Vertical 1:50

DATUM 1327.000

REFERENCE	CP1	Ø300 mm Corrugated HDPE Pipe	CP2
DISTANCE (m)	0.000		30.687
GROUND LEVEL	1329.166		1328.606
PIPE INVERT LEVEL	1328.266		1327.026
SLOPE / LENGTH	2.5% (1:40.0) 30.57m		

Manhole CP1 to CP2

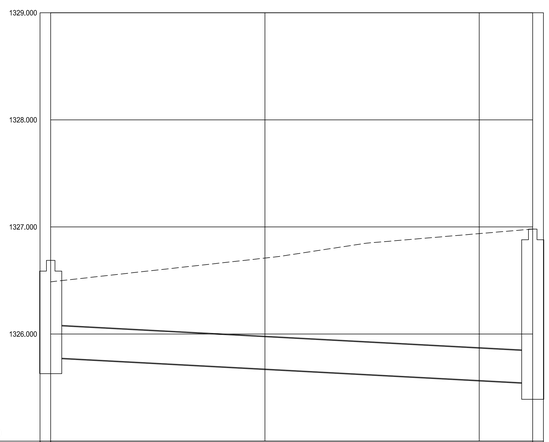


SCALES:
Horizontal 1:250
Vertical 1:50

DATUM 1326.000

REFERENCE	CP3	Ø300 mm Corrugated HDPE Pipe	CP2
DISTANCE (m)	0.000		13.326
GROUND LEVEL	1328.106		1328.606
PIPE INVERT LEVEL	1327.650		1327.026
SLOPE / LENGTH	0.6% (1:180.1) 13.33m		

Manhole CP3 to CP2



SCALES:
Horizontal 1:250
Vertical 1:50

DATUM 1325.000

REFERENCE	KI1	Ø300 mm Corrugated HDPE Pipe	CP5
DISTANCE (m)	0.000		22.550
GROUND LEVEL	1326.488		1326.980
PIPE INVERT LEVEL	1325.790		1325.541
SLOPE / LENGTH	1.1% (1:93.9) 22.55m		

Manhole KI1 to CP5

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health
Department of Health
NORTHERN CAPE

/ project description /

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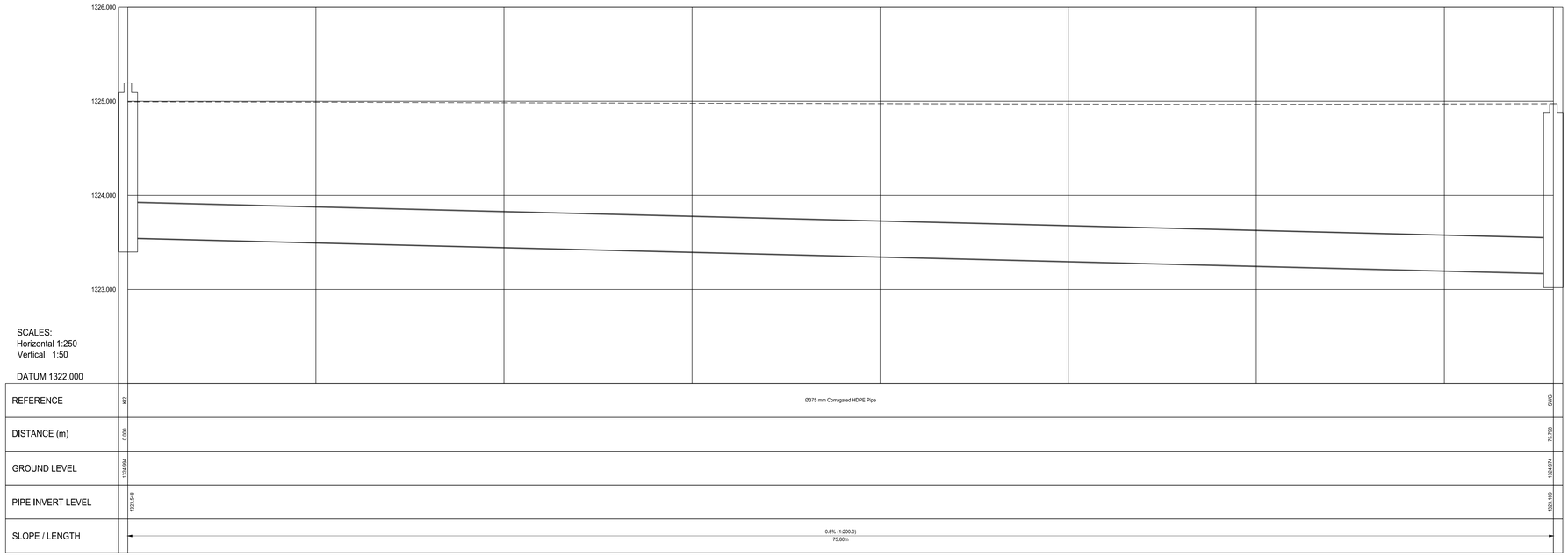
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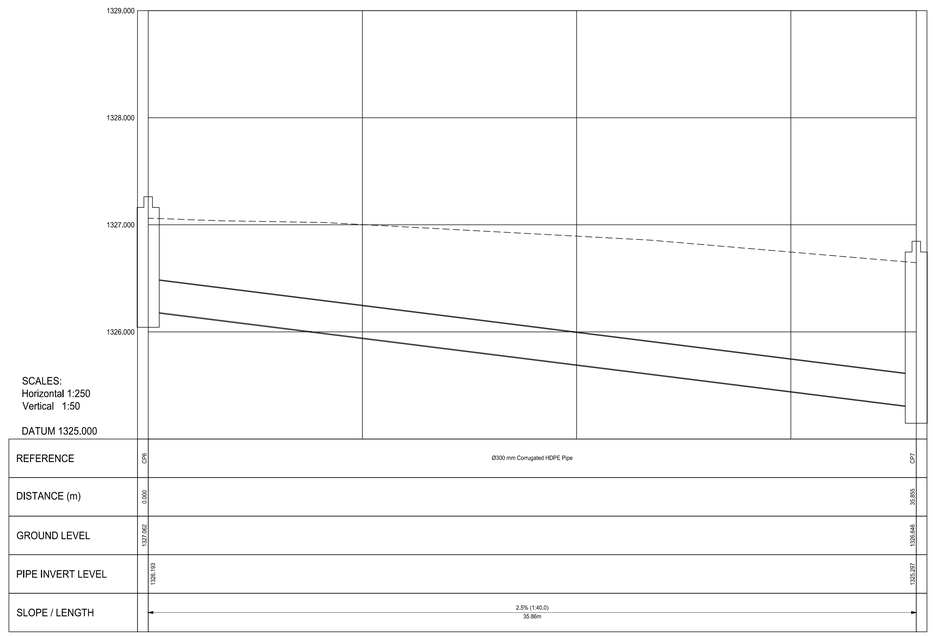
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STORMWATER LONGSECTION 1 OF 2	1:100

/ file no /	-
/ drawing no /	PJ-360-00-115-00
/ page size /	A0
/ revision no /	T



Manhole KI2 to SWG



Manhole CP6 to CP7

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AMAHLE MULTI DISCIPLINARY AND PROJECTS (Pty) Ltd

/ professional person /

T. J. MUTSIKIRA

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ECSA | Pr. No. 201670014

/ drawn / | / checked /

HM | TJM

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/ date of issue /

2025 - 08 - 18

/ drawing description /

/ drawing name /	/ scale /
STORMWATER LONGSECTION 2 OF 2	1:100

/ file no /	-
/ drawing no /	PJ-360-00-116-00
/ page size /	A0
/ revision no /	T

STRUCTURES

STRUCTURE LIST: CP1 - CP2

STRUCTURE NAME	Y	X	RIM LEVEL	SUMP LEVEL	INVERT LEVEL	MATERIAL
CP1	-43764.840	3038619.744	1329.166	1328.356	P1-INV OUT 1328.356	HDPE
CP2	-43795.407	3038619.744	1328.506	1327.592	P1-INV IN 1327.592	HDPE

STRUCTURE LIST: CP2 - KI2

STRUCTURE NAME	Y	X	RIM LEVEL	SUMP LEVEL	INVERT LEVEL	MATERIAL
CP2	-43795.407	3038619.744	1328.506	1327.592	P3-INV OUT 1327.592	HDPE
CP4	-43795.407	3038636.905	1327.771	1326.885	P3-INV IN 1326.885 P4-INV OUT 1326.885	HDPE HDPE
CP5	-43795.407	3038654.065	1326.980	1325.968	P4-INV IN 1325.968 P5-INV OUT 1325.968	HDPE HDPE
CP7	-43795.407	3038660.907	1326.646	1325.580	P5-INV IN 1325.580 P6-INV OUT 1325.580	HDPE HDPE
CP8	-43795.407	3038678.054	1325.810	1324.898	P6-INV IN 1324.898 P7-INV OUT 1324.898	HDPE HDPE
KI2	-43795.407	3038708.621	1324.994	1323.272	P7-INV IN 1323.272	HDPE

STRUCTURE LIST: CP3 - CP2

STRUCTURE NAME	Y	X	RIM LEVEL	SUMP LEVEL	INVERT LEVEL	MATERIAL
CP2	-43795.407	3038619.744	1328.506	1327.592	P2-INV IN 1327.592	HDPE
CP3	-43808.732	3038619.744	1328.106	1327.699	P2-INV OUT 1327.699	HDPE

STRUCTURE LIST: CP6 - CP7

STRUCTURE NAME	Y	X	RIM LEVEL	SUMP LEVEL	INVERT LEVEL	MATERIAL
CP6	-43759.552	3038660.907	1327.062	1326.476	P9-INV OUT 1326.476	HDPE
CP7	-43795.407	3038660.907	1326.646	1325.580	P9-INV IN 1325.580	HDPE

STRUCTURE LIST: KI1 - CP5

STRUCTURE NAME	Y	X	RIM LEVEL	SUMP LEVEL	INVERT LEVEL	MATERIAL
CP5	-43795.407	3038654.065	1326.980	1325.968	P8-INV IN 1325.968	HDPE
KI1	-43817.907	3038654.065	1326.488	1326.081	P8-INV OUT 1326.081	HDPE

STRUCTURE LIST: KI2 - SWG

STRUCTURE NAME	Y	X	RIM LEVEL	SUMP LEVEL	INVERT LEVEL	MATERIAL
KI2	-43795.407	3038708.621	1324.994	1323.272	P10-INV OUT 1323.272	HDPE
SWG	-43860.483	3038747.485	1324.974	1322.893	P10-INV IN 1322.893	HDPE

PIPES

PIPE LIST: CP1 - CP2

PIPE NAME	START INVERT LEVEL	END INVERT LEVEL	3D LENGTH CENTRE TO CENTRE	SLOPE	DIAMETER AND CLASS
P1	1328.356	1327.592	30.577	2.500%	300 mm Corrugated HDPE Pipe

PIPE LIST: CP2 - KI2

PIPE NAME	START INVERT LEVEL	END INVERT LEVEL	3D LENGTH CENTRE TO CENTRE	SLOPE	DIAMETER AND CLASS
P3	1327.592	1326.885	17.175	4.121%	300 mm Corrugated HDPE Pipe
P4	1326.885	1325.968	17.185	5.343%	300 mm Corrugated HDPE Pipe
P5	1325.968	1325.580	6.852	5.666%	300 mm Corrugated HDPE Pipe
P6	1325.580	1324.898	17.161	3.979%	300 mm Corrugated HDPE Pipe
P7	1324.898	1323.272	30.610	5.319%	300 mm Corrugated HDPE Pipe

PIPE LIST: CP3 - CP2

PIPE NAME	START INVERT LEVEL	END INVERT LEVEL	3D LENGTH CENTRE TO CENTRE	SLOPE	DIAMETER AND CLASS
P2	1327.699	1327.592	13.326	0.800%	300 mm Corrugated HDPE Pipe

PIPE LIST: CP6 - CP7

PIPE NAME	START INVERT LEVEL	END INVERT LEVEL	3D LENGTH CENTRE TO CENTRE	SLOPE	DIAMETER AND CLASS
P9	1326.476	1325.580	35.866	2.500%	300 mm Corrugated HDPE Pipe

PIPE LIST: KI1 - CP5

PIPE NAME	START INVERT LEVEL	END INVERT LEVEL	3D LENGTH CENTRE TO CENTRE	SLOPE	DIAMETER AND CLASS
P8	1326.081	1325.968	22.500	0.500%	300 mm Corrugated HDPE Pipe

PIPE LIST: KI2 - SWG

PIPE NAME	START INVERT LEVEL	END INVERT LEVEL	3D LENGTH CENTRE TO CENTRE	SLOPE	DIAMETER AND CLASS
P10	1323.272	1322.893	75.799	0.500%	375 mm Corrugated HDPE Pipe

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/ revisions /

NO	DATE	DESCRIPTION
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T. J. MUTSKIRA

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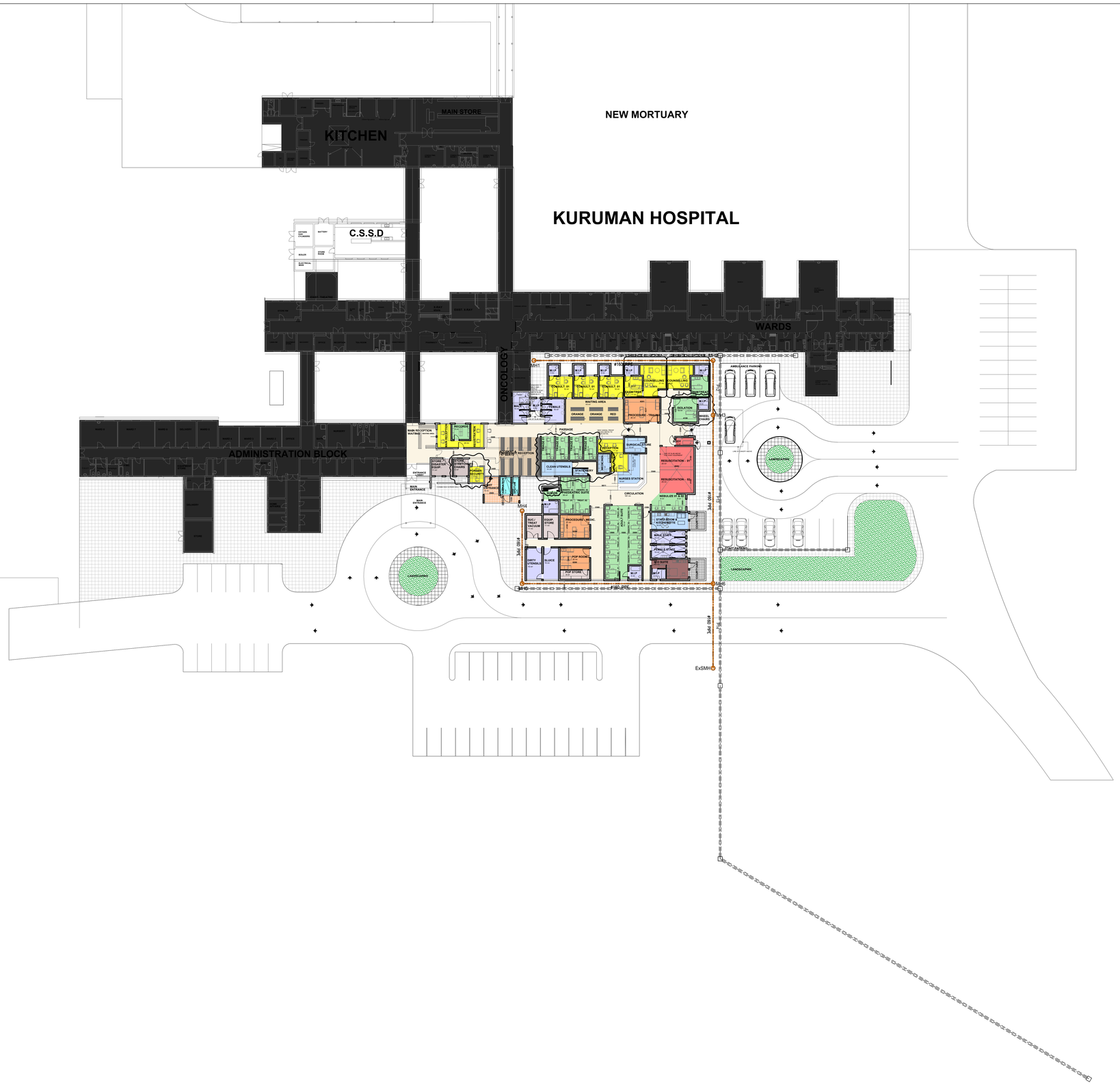
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2025 - 08 - 19

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/ drawing name /	/ scale /
STORMWATER STRUCTURES AND PIPES LIST	1:100

/ file no /	-
/ drawing no /	PJ-360-00-120-00
/ page size /	A0
/ revision no /	T



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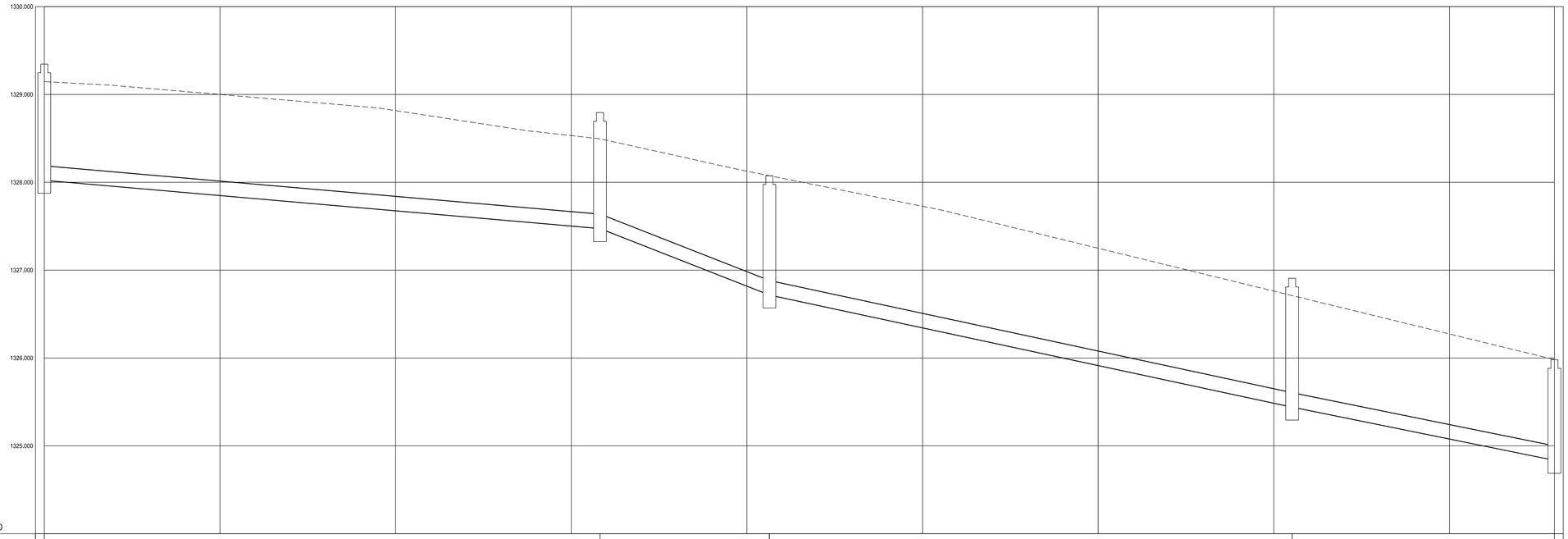
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/ drawing description /

/ drawing name /	/ scale /
SEWER LAYOUT	1:250

/ file no /	-
/ drawing no /	PJ-360-00-130-00
/ page size /	A0
/ revision no /	T

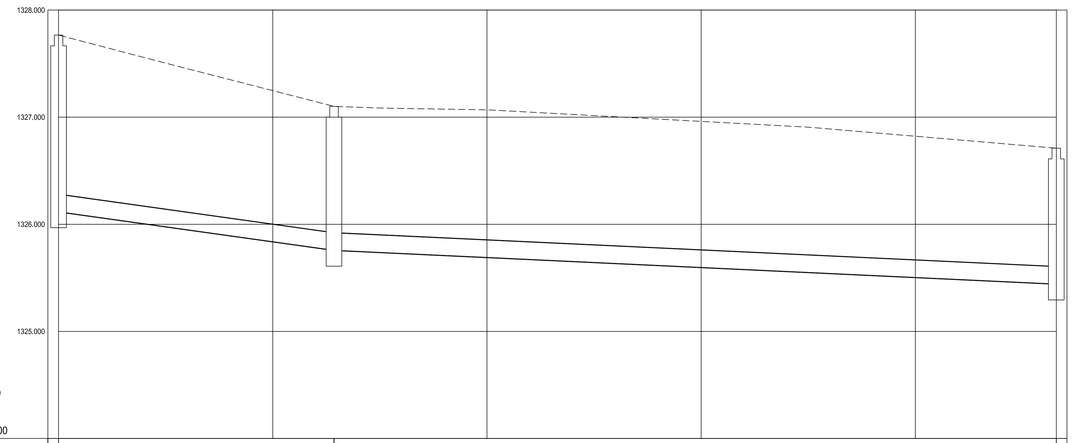


SCALES:
Horizontal 1:250
Vertical 1:50

DATUM 1324.000

REFERENCE	MH1	Ø160 mm Corrugated HDPE Pipe	MH2	Ø160 mm Corrugated HDPE Pipe	MH3	Ø160 mm Corrugated HDPE Pipe	MH6	Ø160 mm Corrugated HDPE Pipe	ExSMH
DISTANCE (m)	0.000		31.638		41.270		71.041		85.975
GROUND LEVEL	1329.146		1328.495		1328.071		1326.711		1325.982
PIPE INVERT LEVEL	1328.025		1327.476		1326.720 1326.720		1325.443		1324.838
SLOPE / LENGTH		1.7% (1:57.6) 31.64m		7.8% (1:12.8) 9.64m		4.3% (1:23.3) 29.76m		4.1% (1:24.7) 14.93m	

MH1 to ExSMH



SCALES:
Horizontal 1:250
Vertical 1:50

DATUM 1324.000

REFERENCE	MH4	Ø160 mm Corrugated HDPE Pipe	MH5	Ø160 mm Corrugated HDPE Pipe	MH6
DISTANCE (m)	0.000		12.858		46.578
GROUND LEVEL	1327.797		1327.151		1326.711
PIPE INVERT LEVEL	1326.116		1326.758 1326.758		1325.443
SLOPE / LENGTH		2.8% (1:35.7) 12.86m		0.9% (1:106.9) 33.72m	

MH4 to MH6

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/ drawing description /

/ drawing name /	/ scale /
SEWER LONGSECTION	1:100

/ file no /	-
/ drawing no /	PJ-360-00-131-00
/ page size /	A0
/ revision no /	T

STRUCTURES

STRUCTURE LIST: MH1 - EXSMH						
STRUCTURE NAME	Y	X	RIM LEVEL	SUMP LEVEL	INVERT LEVEL	MATERIAL
ExSMH	-43794.152	3038674.961	1325.982	1324.838	P14-INV IN 1324.838	HDPE
MH1	-43762.513	3038620.624	1329.146	1328.025	P11-INV OUT 1328.025	HDPE
MH2	-43794.152	3038620.624	1328.495	1327.476	P11-INV IN 1327.476 P12-INV OUT 1327.476	HDPE HDPE
MH3	-43794.152	3038630.265	1328.075	1326.720	P12-INV IN 1326.720 P13-INV OUT 1326.720	HDPE HDPE
MH6	-43794.152	3038660.027	1326.711	1325.443	P13-INV IN 1325.443 P14-INV OUT 1325.443	HDPE HDPE

STRUCTURE LIST: MH4 - MH6						
STRUCTURE NAME	Y	X	RIM LEVEL	SUMP LEVEL	INVERT LEVEL	MATERIAL
MH4	-43760.432	3038647.168	1327.767	1326.118	P15-INV OUT 1326.118	HDPE
MH5	-43760.432	3038660.027	1327.101	1325.758	P15-INV IN 1325.758 P16-INV OUT 1325.758	HDPE HDPE
MH6	-43794.152	3038660.027	1326.711	1325.443	P16-INV IN 1325.443	HDPE

PIPES

PIPE LIST: MH1 - EXSMH					
PIPE NAME	START INVERT LEVEL	END INVERT LEVEL	3D LENGTH CENTRE TO CENTRE	SLOPE	DIAMETER AND CLASS
P11	1328.025	1327.476	31.643	1.737%	160 mm Corrugated HDPE Pipe
P12	1327.476	1326.720	9.671	7.841%	160 mm Corrugated HDPE Pipe
P13	1326.720	1325.443	29.789	4.290%	160 mm Corrugated HDPE Pipe
P14	1325.443	1324.838	14.946	4.053%	160 mm Corrugated HDPE Pipe

PIPE LIST: MH4 - MH6					
PIPE NAME	START INVERT LEVEL	END INVERT LEVEL	3D LENGTH CENTRE TO CENTRE	SLOPE	DIAMETER AND CLASS
P15	1326.118	1325.758	12.863	2.798%	160 mm Corrugated HDPE Pipe
P16	1325.758	1325.443	33.722	0.935%	160 mm Corrugated HDPE Pipe

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/ drawing description /

/ drawing name /	/ scale /
SEWER STRUCTURES AND PIPES LIST	1:100

/ file no /	-
/ drawing no /	PJ-360-00-135-00
/ page size /	A0
/ revision no /	T

OTHER RELEVANT MANUFACTURING STANDARDS:

SABS 0268-1 / SANS 10268-1
SABS 0269 / SANS 10269
SABS 0270 / SANS 10270
SABS 1269 / SANS 1269
SABS 1655 / SANS 1655
SABS 1671 / SANS 1671-1

WELDING NOTATION FOR JOINTS:

SEE SABS 0270 / SANS 10270 PAR 5 AS WELL AS ANNEX A.

W-1A = REF TABLE A.1 FILLET GROUP A FIG 1A.
W-2A = REF TABLE A.1 FILLET GROUP A FIG 2A.
W-3A = REF TABLE A.1 FILLET GROUP A FIG 3A.
W-3B = REF TABLE A.1 BUTT GROUP B FIG 3B.
W-BUTT = REF TABLE A.2 BUTT GROUP B

GENERAL NOTES:

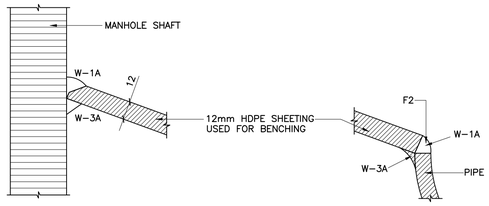
- ALL MATERIALS TO BE HDPE PE-100 AS PER SABS ISO 4427 / SANS 4427
- HOOP STIFFNESS OF MANHOLE SHAFT TO BE 8kN/m².

GENERAL WELDING SPECIFICATION:

- BUTT WELDING OF PIPES TO COMPLY TO SABS 0268-1:1999. SANS 10268-1
- HOT GAS WELDING TO COMPLY TO SABS 0268-3:1999. SANS 10268-3
- HOT GAS EXTRUSION WELDING TO COMPLY TO SABS 0268-4:1999. SANS 10268-4

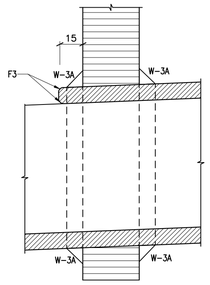
GENERAL FINISHING NOTE:

F1- REMOVE FILLER EXPULSION AND FINISH WELD SMOOTH WITH PIPE SURFACE.
F2- REMOVE FILLER EXPULSION AND FINISH WELD WITH SMOOTH ROUNDED EDGE.
F3- FINISH PIPE WITH SMOOTH ROUNDED EDGE. F4- REMOVE INTERNAL WELDING BEAD.

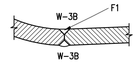


DETAIL 1
1:2

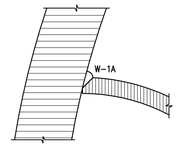
DETAIL 2
1:2



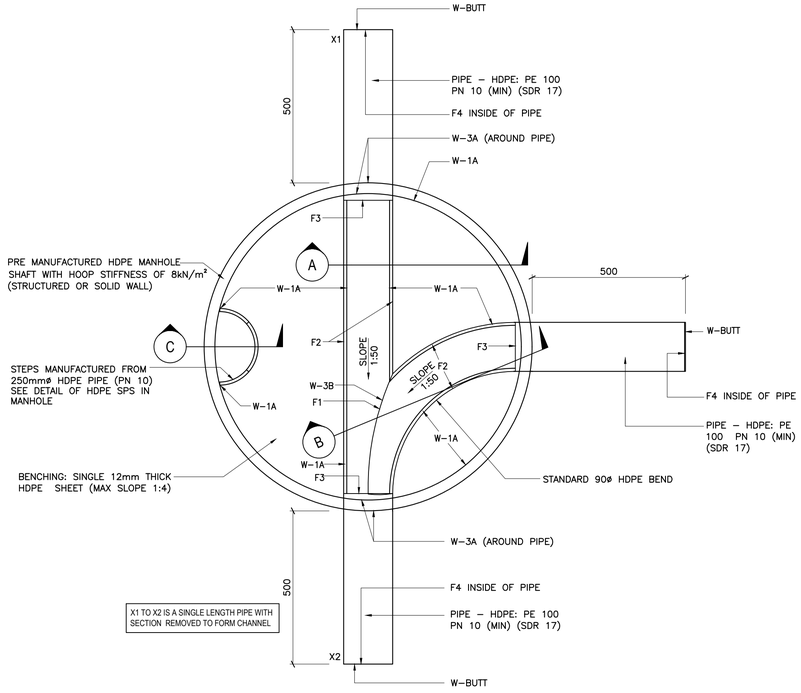
DETAIL 3
1:2



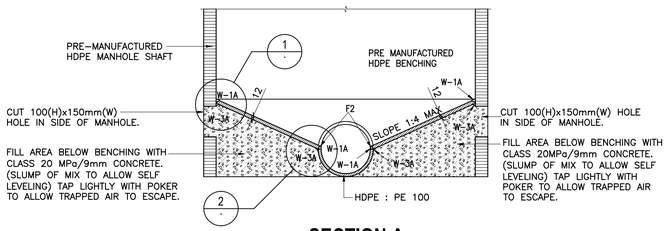
DETAIL 4
1:2



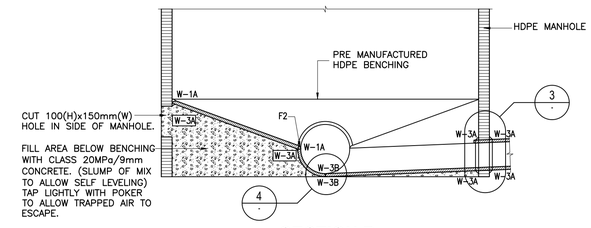
DETAIL 5
1:2



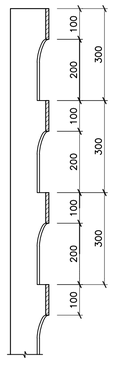
PLAN
TYPICAL WELDING DETAILS FOR HDPE SEWER MANHOLES
1:10



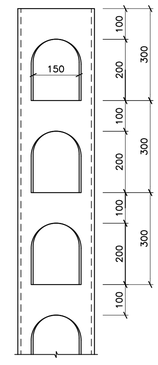
SECTION A
1:10



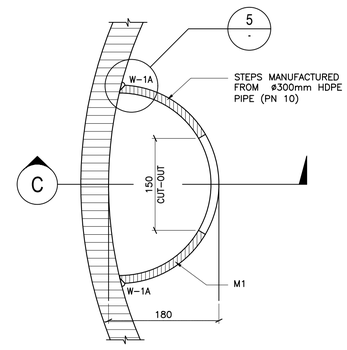
SECTION B
1:10



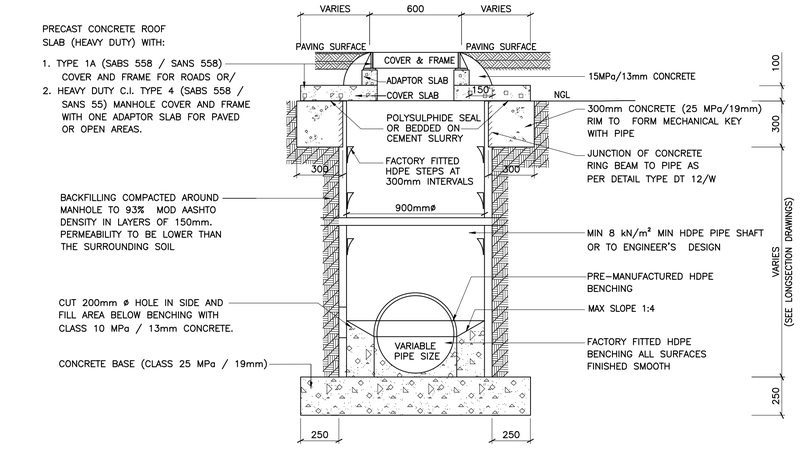
SECTION C
1:10



ELEVATION OF STEPS
1:10

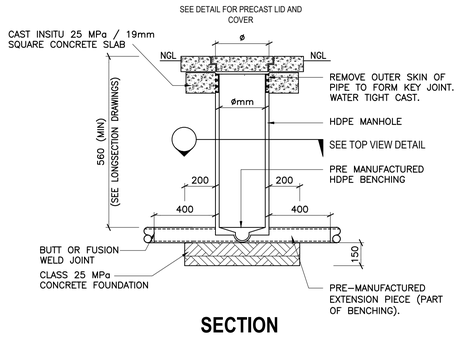


HDPE STEPS IN MANHOLE PLAN
1:5

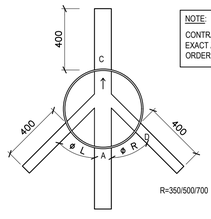


SECTION
900mmØ MANHOLE ON MAIN SEWER LINE (TYPE 1)
1:20

NOTE:
REFER TO LAYOUT PLAN FOR MANHOLE IN- AND OUTLET ANGLES.



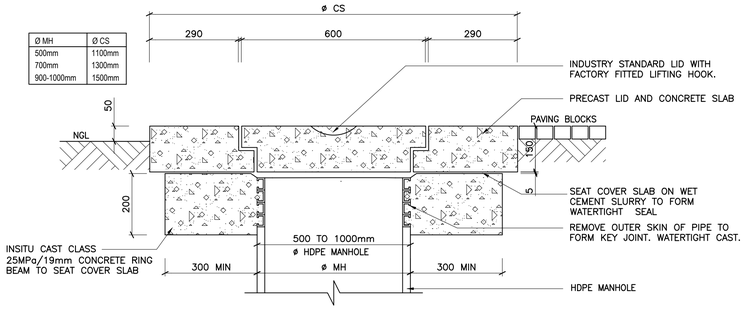
SECTION
HDPE JUNCTION CHAMBER IN OPEN AREAS
1:20



NOTE:
CONTRACTOR TO DETERMINE EXACT ANGLE ON SITE FOR ORDERING FROM MANUFACTURER.

TOP VIEW
STANDARD BENCHING LAYOUT
1:20

Ø MH	Ø CS
500mm	1100mm
700mm	1300mm
900-1000mm	1500mm



STANDARD HEAVY DUTY PRECAST CONCRETE LID
AND COVER SLAB FOR HDPE MANHOLES (1200mm OD)
1:10

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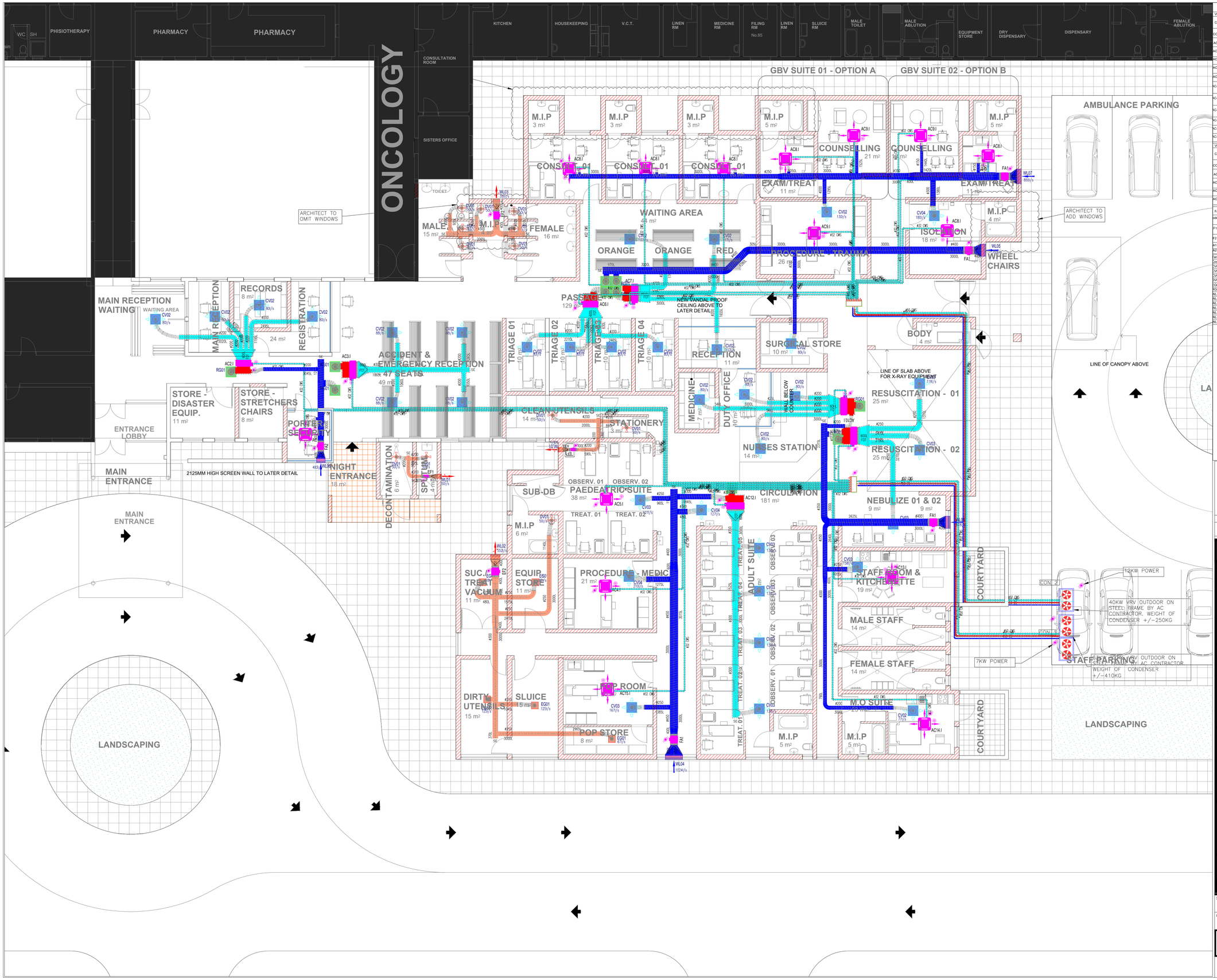
2025-08-19

/ drawing description /

/ drawing name /	/ scale /
STORMWATER AND SEWER MANHOLE DETAILS	AS SHOWN

/ file no /	-
/ drawing no /	PJ-360-00-140-00
/ page size /	A1
/ revision no /	T

Mechanical Drawings



VRV UNITS SCHEDULE SYSTEM 1

Code	Type	Total cool Kw	Total heat Kw	SA Air l/s	RA Air l/s	FA Air l/s	Power Supply	NOTES
CON1	VRV Condenser Unit	63	reverse cycle	-	-	-	400V/114KW	2 off 7KW power points required
AC1.I	VRV C/Cassette Unit Medium Static	2.5	reverse cycle	-	-	15	220V/0.06KW	
AC-2.I	VRV Hideaway Unit Medium Static c/s pump	7	reverse cycle	317	240	107	220V/0.1KW	
AC-3.I	VRV Hideaway Unit Medium Static c/s pump	9	reverse cycle	350	*	350	220V/0.14KW	
AC-4.I	VRV C/Cassette Unit Medium Static	3.5	reverse cycle	-	-	210	220V/0.07KW	
AC-5.I	VRV C/Cassette Unit Medium Static	5	reverse cycle	-	-	127	220V/0.11KW	
AC-10.I	VRV Hideaway Unit Medium Static c/s pump	7	reverse cycle	317	243	103	220V/0.1KW	
AC-11.I	VRV Hideaway Unit Medium Static c/s pump	9	reverse cycle	350	100	250	220V/0.14KW	
AC-12.I	VRV Hideaway Unit Medium Static c/s pump	11	reverse cycle	550	100	520	220V/0.24KW	
AC-13.I	VRV C/Cassette Unit Medium Static	3.5	reverse cycle	-	-	127	220V/0.07KW	
AC-14.I	VRV C/Cassette Unit Medium Static	3.5	reverse cycle	-	-	77	220V/0.07KW	
AC-15.I	VRV C/Cassette Unit Medium Static	3.5	reverse cycle	-	-	167	220V/0.07KW	

VRV UNITS SCHEDULE SYSTEM 2

Code	Type	Total cool Kw	Total heat Kw	SA Air l/s	RA Air l/s	FA Air l/s	Power Supply	NOTES
CON2	VRV Condenser Unit	40	reverse cycle	-	-	-	400V/111.76KW	
AC6.I	VRV Hideaway Unit Medium Static c/s pump	7	reverse cycle	317	-	400	220V/0.1KW	
AC-7.I	VRV Hideaway Unit Medium Static c/s pump	9	reverse cycle	350	133	217	220V/0.14KW	
AC-8.I	VRV C/Cassette Unit Medium Static	2.5	reverse cycle	-	*	80	220V/0.06KW	
AC-9.I	VRV C/Cassette Unit Medium Static	3.5	reverse cycle	-	*	105	220V/0.07KW	

FAN SCHEDULE

Code	No	Type	Flow L/s	Rpm	S.P/ Pa	Power Supply
F1	1	Ø150 In Line Tube Fan Fan	*	*	150	220V/0.2KW
F2	1	Ø315 In Line Tube Fan Fan	*	*	200	220V/0.4KW
A1	4	Ø400 Inline Tube Fan	Varies	*	200	220V/0.7kW
A2	4	Ø315 Inline Tube Fan	*	*	200	220V/0.4kW

Terminal Schedule

Code	Type	Size	Heater	Spigots Ø	Quantity
CV02	CAV	600x600	*	200	22
CV03	CAV	600x600	*	250	10
CV04	CAV	600x600	*	300	3
DV01	EA Valve	Ø200	*	200	12
GG01	Extract Air Fixed Blade	400x400	*	250	5
RG01	Return Air Fixed Blade	600x600	*	350	10
WL01	EA Louvre	250x250	*	-	2
WL02	EA Louvre	550x400	*	-	1
WL03	EA Louvre	400x350	*	-	1
WL04	FA Louvre	1000x400	*	-	1
WL05	FA Louvre	700x400	*	-	2
WL06	FA Louvre	500x400	*	-	1
WL07	FA Louvre	850x400	*	-	1

REV	DATE	BY	DESCRIPTION	CHK	APD
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DRAWING STATUS: ISSUED FOR INFORMATION

CLIENT:
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Department:
Roads And Public Works
NORTHERN CAPE PROVINCE
REPUBLIC OF SOUTH AFRICA

ARCHITECT:
AMAHLE MULTI DISCIPLINARY AND PROJECTS (Pty) Ltd

ENGINEER:
AMAHLE MULTI DISCIPLINARY AND PROJECTS (Pty) Ltd

PROJECT:
NEW ACCIDENT AND EMERGENCY SECTION TO KURUMAN HOSPITAL

TITLE:
HVAC LAYOUT

SCALE @ A1:	CHECKED:	APPROVED:
1:100	S.C	S.C
CAD FILE:	DESIGN-DRAWN:	DATE:
....-M01	I.M	26.07.2025

PROJECT No:	DRAWING No:	REV:
.....	....-M01	A

ONC

SISTERS OFFICE

CONSULT. 01 | CONSULT. 02 | CONSULT. 03 | EXAM/TREAT | GBV 01 | GBV 02 | EXAM/TREAT

CONSULT. WAITING

MALE | FEMALE | M.I.P

TRAUMA | SURGIC. STORE | SHELVING | SUB-DB | ISOLATION | M.I.P | VISITOR

FIRE ESCAPE TO HAVE THUMB TURNS. DOOR NOT TO BE LOCKED, OBSCURED, OBSTRUCTED, COVERED OR HIDDEN DURING OPERATING TIMES

RAMP @ MAX 1:12 SLOPE

PASSAGE | PASSAGE

MAIN RECEPTION WAITING | MAIN RECEPTION | RECORDS | CREDENZA | COUNTER | REGISTRATION

REGISTRATION WAITING - 47 SEATS

TRIAGE 01 | TRIAGE 02 | TRIAGE 03 | TRIAGE 04

COUNTER | RECEPTION | CREDENZA | MEDICINE | BODY

25m

CLEAN UTENSILS | STATIONERY | SHELVING | DUTY OFFICE | CREDENZA | COUNTER | NURSES STATION | CREDENZA | COUNTER | RESUS. 01 | RESUS. 02

RAMP @ MAX 1:12 SLOPE

LANDSCAP

LINE OF CANOPY ABOVE

STORE 02 | STORE 01 | PORTER/ SECURITY | ENTRANCE LOBBY

FIRE EXT. KEEP CLEAR | WOODLOFGANG HOU SKOON

MAIN ENTRANCE

FIRE ESCAPE TO HAVE THUMB TURNS. DOOR NOT TO BE LOCKED, OBSCURED, OBSTRUCTED, COVERED OR HIDDEN DURING OPERATING TIMES

FIRE ESCAPE TO HAVE THUMB TURNS. DOOR NOT TO BE LOCKED, OBSCURED, OBSTRUCTED, COVERED OR HIDDEN DURING OPERATING TIMES

NIGHT ENTRANCE

DECON. | SPUTUM

OBSERV. 01 | OBSERV. 02

PAED.

CIRCULATION

30m

M.I.P | TREAT. 01 | TREAT. 02

ADULT

NEBULIZE 01 | NEBULIZE 02

19m

MALE | FEMALE

STAFF

SUC./ TREAT VACUUM | EQUIP. STORE | MEDICAL

TREAT. 05 | OBSERV. 03

TREAT. 04 | OBSERV. 03

TREAT. 03 | FC03 | OBSERV. 02

TREAT. 02 | OBSERV. 01

TREAT. 01 | M.I.P

MALE | C/YARD

FEMALE

FLAT | C/YARD

M.I.P

25m

HVAC PLANT & HOT WATER YARD

STAFF PARK

LANDSCAPING

DIRTY UTENSILS | SLUICE | POP ROOM | POP STORE

LANDSCAPING

1 | 1 | 3 | 3 | 3 | 6 | 1 | 1 | 9 | 10

FIRE PROTECTION NOTES:

1. ALL WORK TO COMPLY WITH LOCAL FIRE DEPARTMENT REQUIREMENTS & SANS 10400 PART T : 2020
2. FIRE EQUIPMENT IN ACCORDANCE WITH SANS 10400 PART T: 2020 SECTION 4.32 .
3. FIRE HOSE REELS PROVIDED AT A RATE OF 1/500m².
4. PORTABLE FIRE EXTINGUISHERS TO BE INSTALLED IN ACCORDANCE WITH SANS 10105. HOSE REELS TO BE INSTALLED IN ACCORDANCE WITH SANS 10543
5. PORTABLE FIRE EXTINGUISHERS SUPPLIED AT A RATE OF 1/200m² IN ACCORDANCE WITH SANS 10400 PART T : 2020 TABLE 10.
6. PORTABLE FIRE EXTINGUISHERS TO BE HUNG ON PURPOSE MADE BOARDS, AS INDICATED ON PLAN.
7. SUSPENDED CEILING & ITS SUPPORTING MEMBERS TO BE NON-COMBUSTIBLE.
8. NO DANGEROUS GOODS WILL BE STORED IN EXCESS OF THE EXEMPT QUANTITIES AS PER SANS 10263-0 ANNEX A.
9. ALL FIRE EXIT DOORS TO BE 1500mm AND SHALL BE FITTED WITH PANIC BARS. ALL ESCAPE ROUTES TO BE 1500mm WIDE.
10. EMERGENCY LIGHTING TO BE INSTALLED AND DESIGNED IN ACCORDANCE WITH SANS 10400-PART T SECTION 4.30.
11. A MANUALLY ACTIVATED AUDIBLE AND VISUAL ALARM IN ACCORDANCE WITH SANS 10139, AND TO BE INSTALLED AS PER SANS PART T CLAUSE 4.31.
12. MARKING AND SIGNAGE TO COMPLY WITH SANS 10400 PART T CLAUSE 4.29. PICTORIAL SIGNS INDICATING FIRE EQUIPMENT AND MEANS OF ESCAPE TO BE PROVIDED AND TO COMPLY WITH SANS 10400 PART T CLAUSE 4.29.2, 4.29.4. ALL SIGNAGE WILL BE PHOTO-LUMINESCENT AND SUPPORTED WITHOUT THE USE OF ADHESIVE OR COMBUSTIBLE MATERIALS.
13. PHOTO-LUMINESCENT SYMBOLIC SIGNS, INDICATING FIRE EQUIPMENT, TO BE PROVIDED AND TO COMPLY WITH SANS 1186 AND SANS 10400 PART T SECTION 4.32.
14. FLOOR COVERINGS TO COMPLY WITH SANS 10400 PART SECTION T 4.14.
15. WALL COVERINGS TO COMPLY WITH SANS 10400 PART SECTION T 4.15.
16. STRUCTURAL ELEMENTS AND COMPONENTS TO COMPLY WITH SANS 10400 PART T SECTION 4.7
17. WATER SUPPLY TO THE FIRE FIGHTING EQUIPMENT TO COMPLY WITH SANS 10400-2020 PART W AND WITH LOCAL AUTHORITY WATER BY-LAWS.
18. ALL EXPOSED FIRE PIPES TO BE PAINTED RED, ALL ABOVE GROUND PIPES TO BE GALVANIZED PIPES
19. AIR CONDITIONING SYSTEMS SHALL BE AS PER SANS 10400 PART T SECTION 4.42 AND 4.43
20. SMOKE DETECTION AS PER SANS 10400 PART T CLAUSE 4.31.3
21. THE ANSUL FIRE SUPPRESSION SYSTEM SHALL BE INSTALLED AS PER SANS 1850 SECTION 4.7.2
22. MAX TRAVEL DISTANCE 45m

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REPUBLIC OF SOUTH AFRICA

ARCHITECT: AMAHLE MULTI DISCIPLINARY AND PROJECTS (Pty) Ltd

ENGINEER: AMAHLE MULTI DISCIPLINARY AND PROJECTS (Pty) Ltd

PROJECT:
NEW ACCIDENT AND EMERGENCY SECTION TO KURUMAN HOSPITAL

TITLE: FIRE PLAN LAYOUT

SCALE @ A1:	CHECKED:	APPROVED:
1:100	S.C	S.C
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....-F01	I.M	26.07.2025

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PROGRAMMING NOTES

1. The all detection zones must be activated only by devices within their zones
2. Notification Scenario is to be activate on single knock of devices. Note that troubleshooting shall be required to purge the system of these alarms.
3. Fire Scenario is to be activated upon the following conditions:
   - 3.1 A double knock on optical sensors
   - 3.2 Single knock optical sensor / Single knock heat sensor
   - 3.3 Double knock heat sensors
   - 3.4 Single knock breakglass unit along with condition 3.1 or 3.2 or 3.3
4. Fire Scenario within a detection zone must initiate the following:
   - 4.1 Switch HVAC fire dampers closed
   - 4.2 Switch HVAC systems OFF
   - 4.3 Other controls that consultants may deem necessary to switch during such scenario

GENERAL NOTES

1) The fire detection system shall comply with SANS 10139.
2) The fire detection devices shall conform with EN 54.
3) The fire control panel shall be surface mounted at 1500mm affl. at the indicated position. The exact position shall be determined on site.
4) Indication lights shall be installed below the ceiling for the detectors mounted in the ceiling void.
5) The break glass shall be surface mounted at 1400mm affl. at the position as indicated.
6) The devices shall also be installed according to the manufacturer's manual and specifications.
7) Install all the conduits, trunking and other wireways that are required for the installation. The trunking and conduits installation shall be coordinated with the electrical and mechanical contractors.
6) The fire control panel shall be installed complete with batteries and charger as recommended and supplied by the manufacturer.
9) The sensors shall be installed at least 300mm away from the light fittings. This shall be coordinated with the electrical contractor.
10) The position of the break glass or call point shall be coordinated with the position of the light switches.
11) The contractor shall ensure that acceptable sound output levels are achieved with a calibrated dB meter against the ambient noise levels as recommended in the standard.
12) Relays and or 12V/24V potential free relay contacts shall be installed to open the dampers for HVAC systems.
13) The power to the control panel shall be supplied by an electrically qualified and professional individual, with an isolator in the ceiling void. The isolator and the circuit breaker (shall be used solely be for the control panel) feeding the control panel shall be labelled" FIRE ALARM, DO NOT SWITCH OFF"
14) Install trunking (Supplied by the Detection Contractor) to follow loop wire as indicated and tap off to the devices using 25mm diameter steel galvanized conduit or bosal. The exact routes and final positions shall be coordinated with the electrical and mechanical contractors
15) Install the MAMI R.A.C. 2000 transmitter in the ceiling void and link it through 25mm PVC conduit to the control panel.
16) Ensure that transmitter is compatible with the MAMI R.A.C. 2000 Receiver installed in the guard room by others.
17) All ZP3 control panels to be supplied with Class A network loop card (ZZP3AB-NML2), eight programmable output card (ZP3AB-RL8) and Newtwork card (ZP3AB-NET1).
18) All ZP3 RDUB1 Repeat display units to be supplied with ZP3AB-SCB serial control bus driver
19) All void detection to be reticulated through conduit to the underside slab or roof.

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ARCHITECT: AMAHLE MULTI DISCIPLINARY AND PROJECTS (Pty) Ltd

ENGINEER: AMAHLE MULTI DISCIPLINARY AND PROJECTS (Pty) Ltd

PROJECT:
NEW ACCIDENT AND EMERGENCY SECTION TO KURUMAN HOSPITAL

TITLE:
SMOKE DETECTION LAYOUT

SCALE @ A1:	CHECKED:	APPROVED:
1:100	S.C	S.C
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....-F02	I.M	26.07.2025

PROJECT No:	DRAWING No:	REV:
.....	....-F02	A

EXIST. X-RAY

AMBULANCE PARKING

MAIN RECEPTION WAITING

RECORDS

MAIN RECEPTION

CREDENZA

COUNTER

REGISTRATION

REGISTRATION WAITING - 47 SEATS

MALE

FEMALE

M.I.P

CONSULT. 01

CONSULT. 02

CONSULT. 03

EXAM/TREAT

CONSULT. WAITING

PASSAGE

TRAUMA

SHELVING

SURGIC. STORE

SUB-DB

GBV 01

GBV 02

ISOLATION

VISITOR

EXAM/TREAT

RAMP @ MAX 1:12 SLOPE

TRIAGE 01

TRIAGE 02

TRIAGE 03

TRIAGE 04

RECEPTION

MEDICINE

BODY

CREDENZA

DUTY OFFICE

COUNTER

NURSES STATION

WALL BELOW COUNTER

CIRCULATION

RESUS. 01

RESUS. 02

LINE OF CANOPY ABOVE

LANDSCAPING

STORE 02

STORE 01

PORTER/ SECURITY

MAIN ENTRANCE

NIGHT ENTRANCE

DECON.

SPUTUM

CLEAN UTENSILS

STATIONERY

SHELVING

OBSERV. 01

OBSERV. 02

PAED.

M.I.P

TREAT. 01

TREAT. 02

ADULT

78 m²

TREAT. 05

TREAT. 04

TREAT. 03

TREAT. 02

TREAT. 01

OBSERV. 03

OBSERV. 02

OBSERV. 01

NEBULIZE 01

NEBULIZE 02

MALE

FEMALE

STAFF

SUC./ TREAT VACUUM

EQUIP. STORE

MEDICAL

sink

stove

fridge

C/YARD

FC RING BEAM ABOVE TO ENG. DETAIL

FC03

DIRTY UTENSILS

SLUICE

POP ROOM

POP STORE

gulley

FLAT

CUPBD

HVAC PLANT & HOT WATER YARD

1500l HOT WATER STORAGE TANK c/w HEAT PUMPS BY SPECIALIST

STAFF PARKING

5855

3875

615

2600

1372

8200

2270

1650

5720

5720

1 1 3 3 3 6 1 floor9 10

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REPUBLIC OF SOUTH AFRICA

ARCHITECT:

AMAHLE MULTI DISCIPLINARY AND PROJECTS (Pty) Ltd

ENGINEER:

AMAHLE MULTI DISCIPLINARY AND PROJECTS (Pty) Ltd

PROJECT:

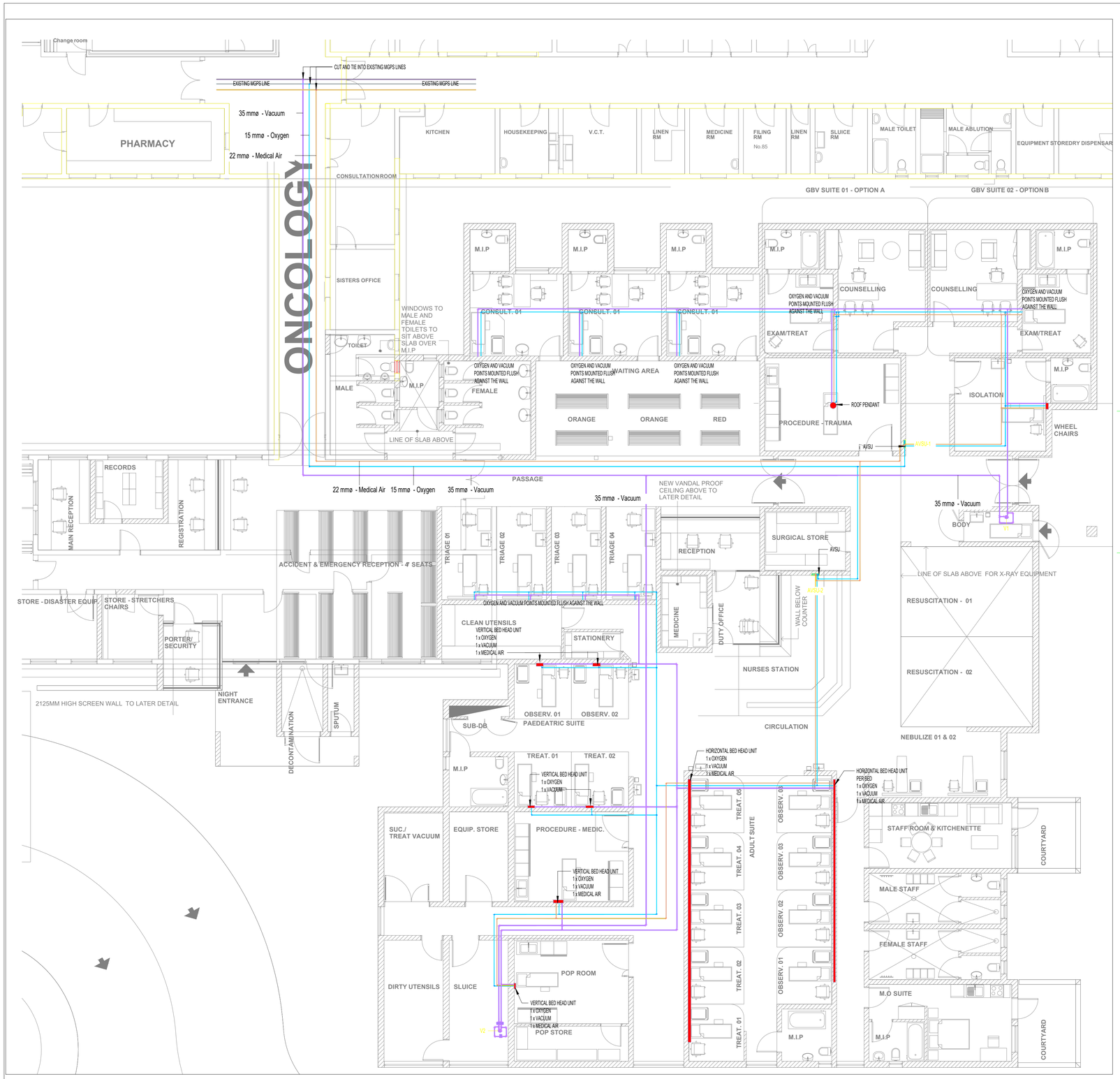
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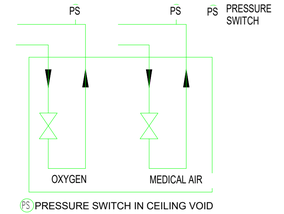
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WATER SUPPLY LAYOUT

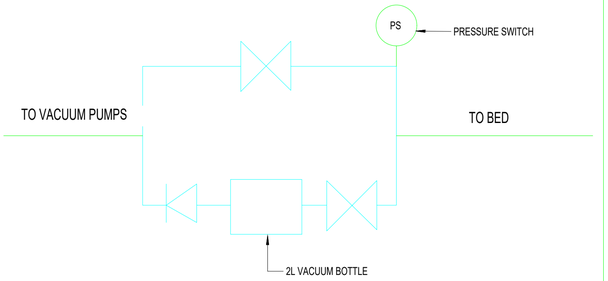
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....-W01	I.M	26.07.2025

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.....	....-W01	A

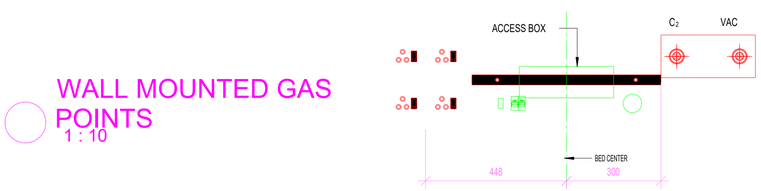




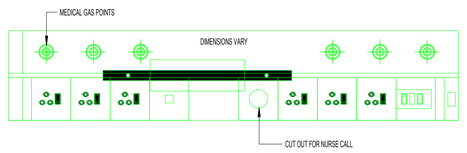
AVSU
1 : 1



VACUUM BOTTLE TRAP
1 : 50



WALL MOUNTED GAS POINTS
1 : 10



HSP
1 : 10

MEDICAL GAS PIPELINE SYSTEMS

MGPS	MEDICAL GAS PIPELINE SYSTEM
MA4	MEDICAL AIR
SAT	SURGICAL AIR
AVSU	AREA VALVE SERVICE UNIT

ALL WORK SHALL COMPLY WITH SANS 7396-1, SANS 10142-1 (ELECTRICAL INSTALLATIONS), AND OTHER APPLICABLE LOCAL REGULATIONS.
THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS, SITE CONDITIONS, AND EXISTING INFRASTRUCTURE BEFORE COMMENCING WORK.
USE ONLY MEDICAL-GRADE COPPER PIPING (DEGREASED AND CLEANED) AS PER SANS 7396-1 FOR ALL MEDICAL GAS PIPELINES.
ALL FITTINGS, VALVES, AND TERMINAL UNITS SHALL BE SPECIFICALLY DESIGNED FOR MEDICAL GAS SYSTEMS AND COMPLY WITH SANS 7396-1.
ALL VALVES TO BE: THREE PIECE, ST ST 90° SWING BALL STAINLESS STEEL, FULL BORE AND INSTALLED SUCH THAT THE DOOR OF THE AVSU CANNOT BE CLOSED WHILE THE VALVE IS IN A CLOSED POSITION.
PIPELINES SHALL BE INSTALLED FREE OF OIL, GREASE, AND CONTAMINANTS. FOLLOW MANUFACTURER CLEANING PROTOCOLS BEFORE COMMISSIONING.
SUPPORT PIPELINES WITH NON-CORROSIVE HANGERS AND BRACKETS AT INTERVALS SPECIFIED IN SANS 7396-1 OR AS PER DESIGN CALCULATIONS.
COLOR-CODE PIPELINES AS PER SANS 7396-1: OXYGEN (WHITE), MEDICAL AIR (BLACK), VACUUM (YELLOW), NITROUS OXIDE (BLUE), CARBON DIOXIDE (GREY), NITROGEN (BLACK), ANESTHETIC GAS SCAVENGING (PURPLE).
APPLY IDENTIFICATION BANDS AND LABELS WITH GAS NAMES OR SYMBOLS AT INTERVALS, JUNCTIONS, AND TERMINAL UNITS AS PER SANS 7396-1.
ENSURE LABELS ARE DURABLE, LEGIBLE, AND RESISTANT TO FADING OR DAMAGE.
OBTAIN APPROVAL FROM THE ENGINEER OR PROJECT MANAGER FOR ANY DEVIATIONS FROM THE DRAWINGS OR SPECIFICATIONS.
VALVE INDICATION STICKERS TO BE STUCK ON CEILING BOARDS LOCAL TO VALVES AS AN INDICATION OF VALVE POSITION.
ALL GAS PIPES THROUGH STRUCTURES TO BE SLEEVED
ALL GAS PIPES TO BE PAINTED AS PER GENERAL SPECIFICATIONS
ALL GAS PIPE SUPPORTS TO BE AS PER GENERAL SPECIFICATION AND TO BE FLAMCO OR EQUIVALENT.
SAMPLE OF SUPPORTS TO BE SUPPLIED PRIOR TO COMMENCEMENT

Mechanical Equipment Schedule

Mark	Family	Type
AVSU-1	AVSU	AVS UNIT INT-2G
AVSU-2	AVSU	AVS UNIT INT-2G
V1	Vacuum Bottle	2L Vacuum Bottle
V2	Vacuum Bottle	2L Vacuum Bottle

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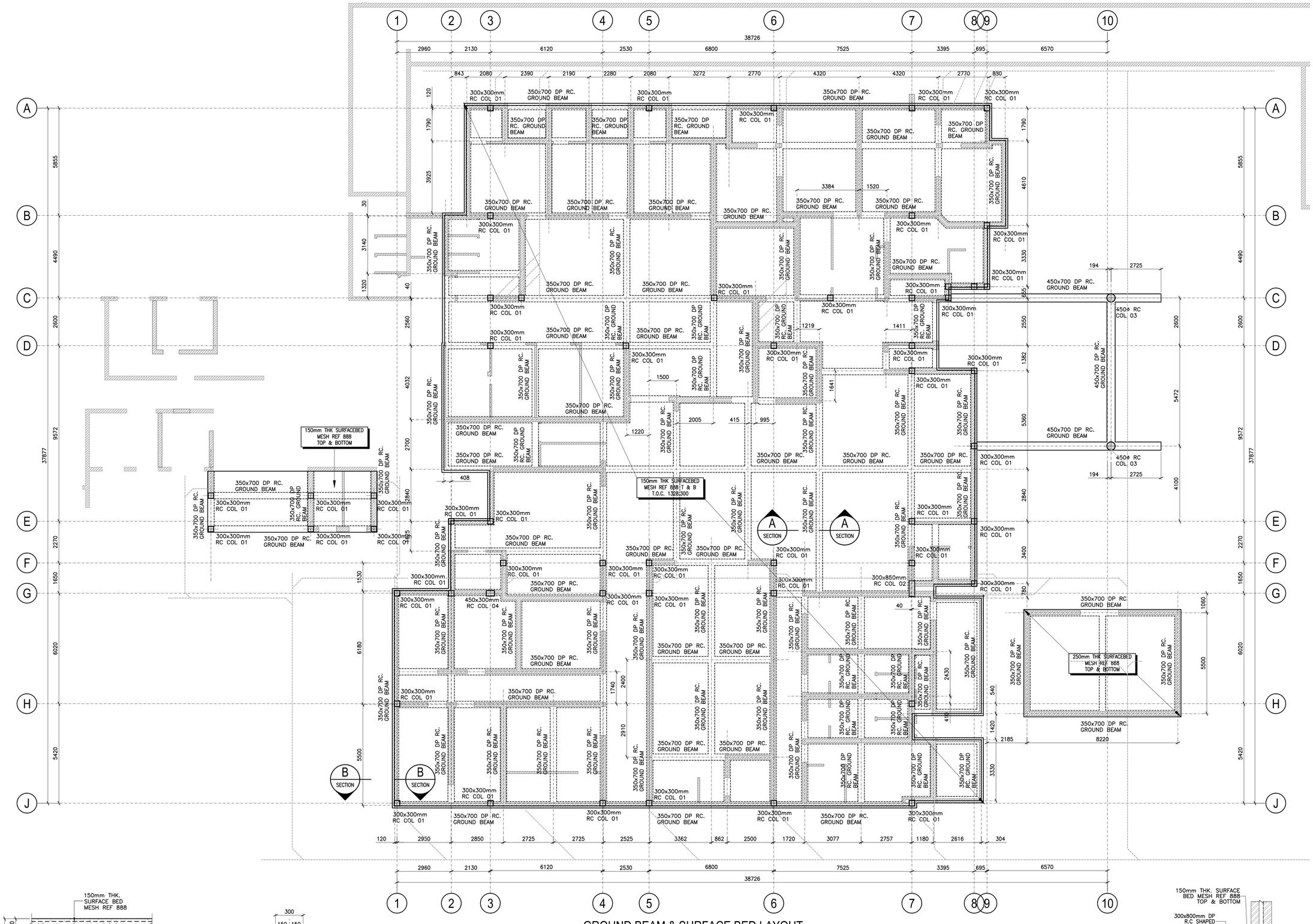
ENGINEER: AMAHLE MULTI DISCIPLINARY AND PROJECTS (Pty) Ltd

PROJECT:
NEW ACCIDENT AND EMERGENCY SECTION TO KURUMAN HOSPITAL

TITLE: MEDICAL GASES LAYOUT

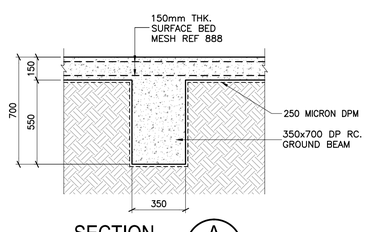
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.....	....-MGS01	A

Electrical Drawings

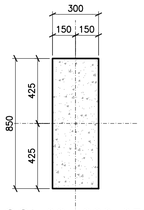


GROUND BEAM & SURFACE BED LAYOUT

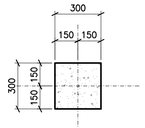
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SECTION A
SCALE 1:20



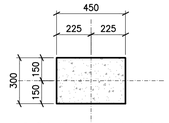
COL 02 - 300x850
SCALE 1:20



COL 01 - 300x300
SCALE 1:20



COL 03 - 450Ø
SCALE 1:20

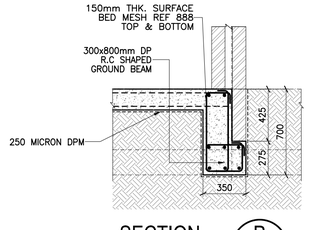


COL 04 - 450x300
SCALE 1:20

PLEASE NOTE
GROUND BEAMS ARE BASED ON THE ASSUMPTION OF A 5000mmø SINKHOLE, PENDING GEOTECHNICAL INVESTIGATIONS.

FOUNDATION/ RAFT QUANTITIES ESTIMATE:

1. ALL GROUND BEAMS: 350x700 DEEP (250kg/m³)
2. ALL GROUND BEAMS: 450x700 DEEP (250kg/m³)
3. ALL CONCRETE GRADES 30MPa
4. ALL COLUMNS 300x300 RC COLUMNS (180kg/m³)
5. ALL COLUMNS 300x850 RC COLUMNS (180kg/m³)
6. ALL COLUMNS 450ø RC COLUMNS (180kg/m³)
7. ALL COLUMNS 300x450 RC COLUMNS (180kg/m³)



SECTION B
SCALE 1:25

/ general notes /

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/ revisions /

NO	DATE	DESCRIPTION
A	2025-07-30	ISSUED FOR COSTING
B	2025-08-01	ISSUED FOR COSTING
C	2025-08-04	COLUMNS ADDED AS CLOUDED
T	2025-08-13	ISSUED FOR TENDER

..\Draw-2d-Details\Amahle New.jpg

/ professional person /

T. J. MUTSIKIRA

/ council / / reg no /

ECSA	Pr. No. 201670014

/ drawn / / checked /

SK	TJM

/ drawing issued for /

X	INFORMATION ONLY
	LOCAL AUTHORITY APPROVAL
	CONSTRUCTION

/ client /

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/ project description /

KURUMAN DISTRICT HOSPITAL
.
NORTHERN CAPE

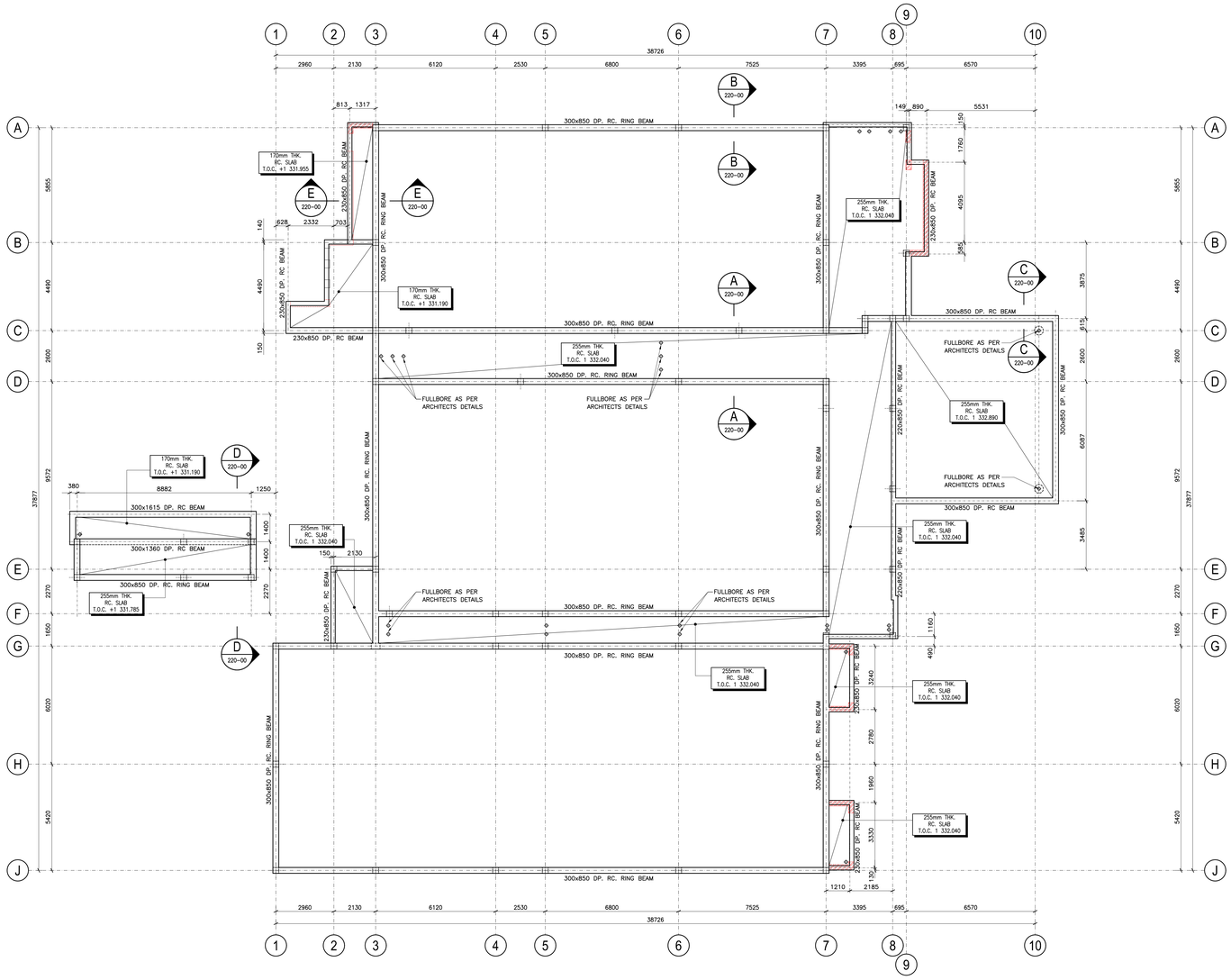
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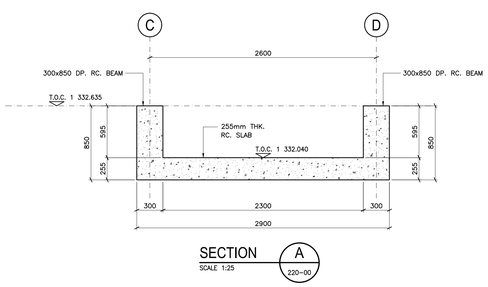
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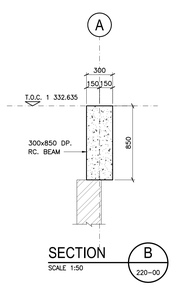
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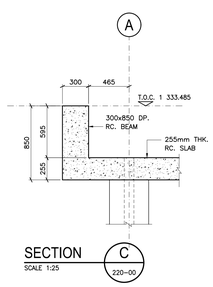
ROOF SLAB LAYOUT
SCALE 1: 100



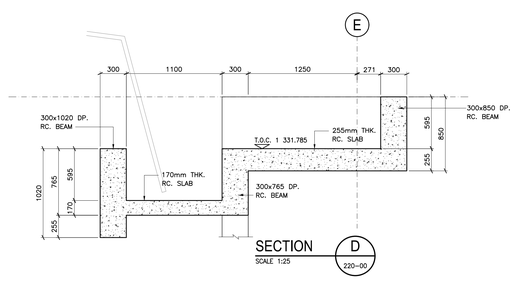
SECTION A
SCALE 1:25



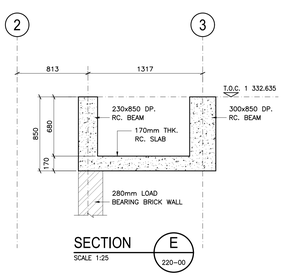
SECTION B
SCALE 1:50



SECTION C
SCALE 1:25



SECTION D
SCALE 1:25



SECTION E
SCALE 1:25

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/ revisions /

NO	DATE	DESCRIPTION
T	2025-08-18	FOR TENDER

AMAHLE MULTI DISCIPLINARY AND PROJECTS (Pty) Ltd

/ professional person /

T. J. MUTSKIRA

/ council /	/ reg no /
ECSA	Pr. No. 201670014

/ drawn /	/ checked /
MM	TJM

/ drawing issued for /

X	INFORMATION ONLY
	LOCAL AUTHORITY APPROVAL
	CONSTRUCTION

/ client /

health
Department of Health
NORTHERN CAPE

/ project description /

KURUMAN DISTRICT HOSPITAL
.
NORTHERN CAPE

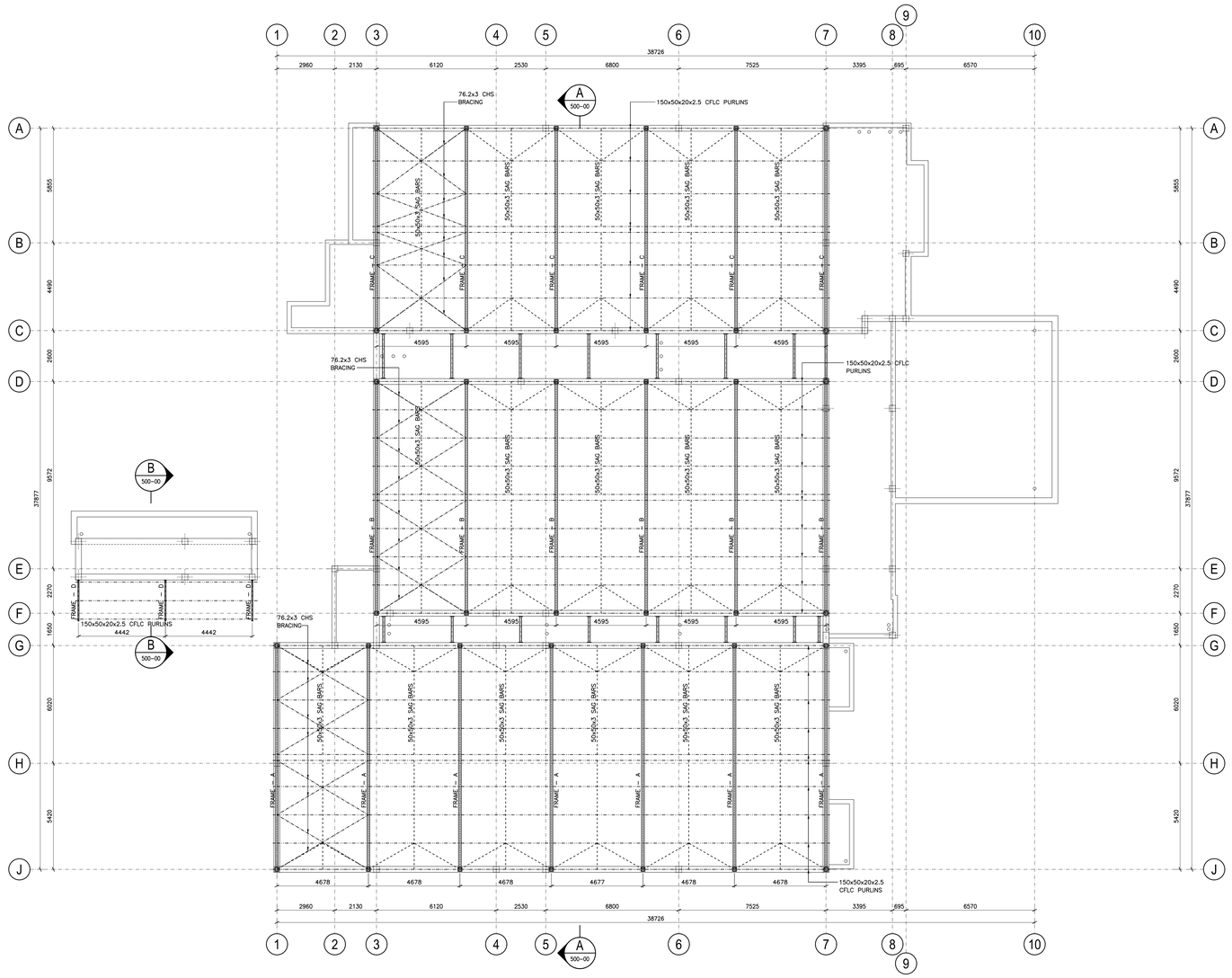
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2025-08-18

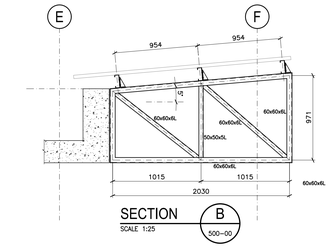
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ROOF LAYOUT AND DETAILS	1:500

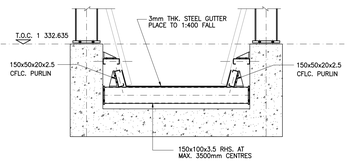
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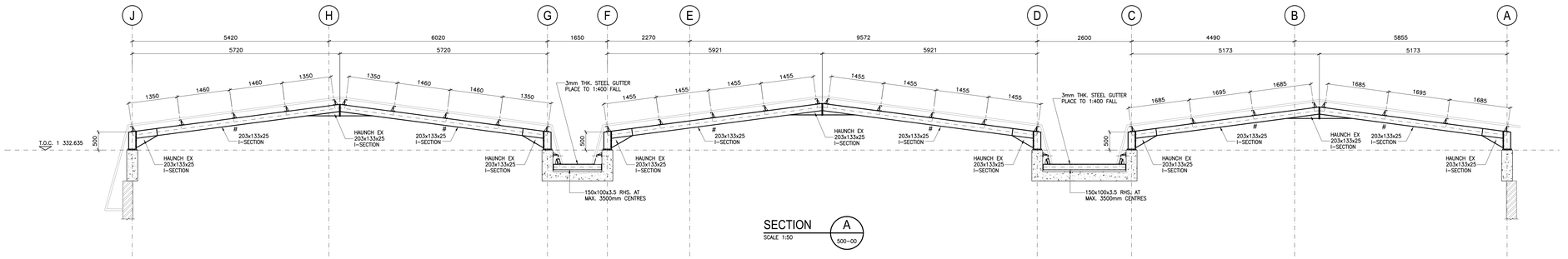
ROOF LAYOUT
SCALE 1: 100



SECTION B 500-00
SCALE 1:25



TYP. GUTTER SUPPORT DETAIL
SCALE 1: 20



SECTION A 500-00
SCALE 1:50

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/ revisions /

NO	DATE	DESCRIPTION
A	2025-08-03	FOR INFO
B	2025-08-18	FOR TENDER

AMAHLE MULTI DISCIPLINARY AND PROJECTS (Pty) Ltd

/ professional person /

T. J. MUTSKIRA

/ council /	/ reg no /
ECSA	Pr. No. 201670014

/ drawn /	/ checked /
MM	TJM

/ drawing issued for /

X	INFORMATION ONLY
	LOCAL AUTHORITY APPROVAL
	CONSTRUCTION

/ client /

health
Department of Health
NORTHERN CAPE

/ project description /

KURUMAN DISTRICT HOSPITAL
.
NORTHERN CAPE

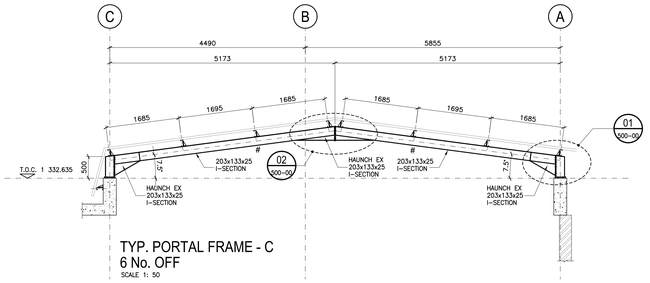
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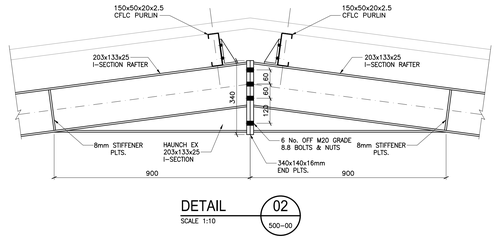
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ROOF LAYOUT AND DETAILS	1:500

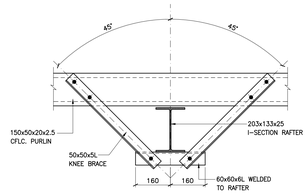
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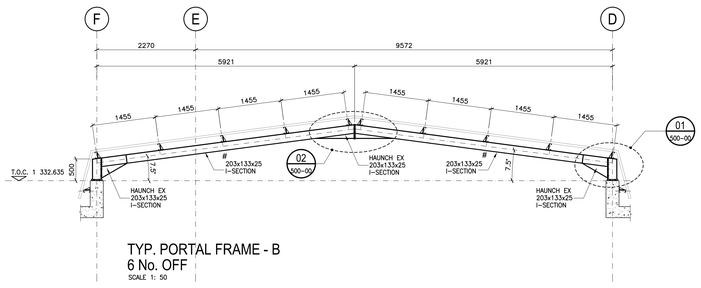
TYP. PORTAL FRAME - C
6 No. OFF
SCALE 1: 50



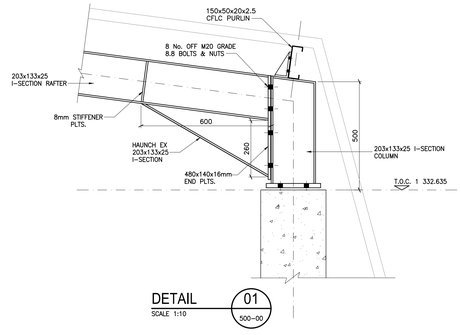
DETAIL 02
SCALE 1:10
500-00



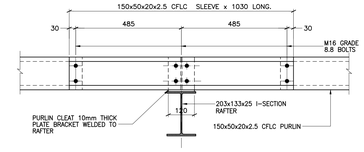
TYPICAL KNEE BRACE (KB) DETAIL #
SCALE 1: 10



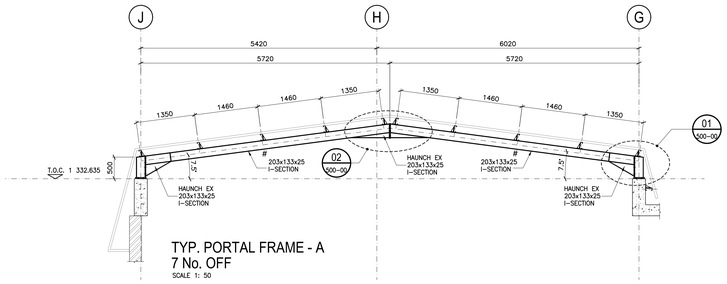
TYP. PORTAL FRAME - B
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SCALE 1: 50



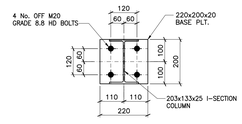
DETAIL 01
SCALE 1:10
500-00



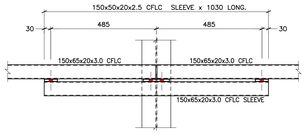
PURLIN SPLICE DETAIL
SCALE 1: 10



TYP. PORTAL FRAME - A
7 No. OFF
SCALE 1: 50



TYP. BASE PLT. DETAIL
38 No. OFF
SCALE 1: 10



PURLIN SPLICE PLAN VIEW
SCALE 1: 10

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health
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NORTHERN CAPE

/ date of issue /

2025-08-18

/ drawing description /

/ drawing name /	/ scale /
ROOF LAYOUT AND DETAILS	1:500

/ file no /	-
/ drawing no /	PJ-360-00-505-00
/ page size /	A0
/ revision no /	T