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Date:	Date:

OCCUPATIONAL HEALTH AND SAFETY SPECIFICATION- NEW NGWELEZANA ONCOLOGY UNT

PREPARED BY:

DIBA BES (PTY) LTD

PREPARED FOR:

KWA ZULU NATAL DEPARTMENT OF HEALTH

health
Department:
Health
PROVINCE OF KWAZULU-NATAL

DOCUMENT CONTROL

ISSUE AND REVISION RECORD

Rev	Date	Originator	Approver	Position	Signature
01	07/11/ 2024	N. Rambau	N. Rambau	Pr. OHS Agent	

Issue and Acknowledgement by Principal Contractor/ Contractor's representative

Rev	Date	Description	Position	Signature
01		OHS Specification		

Issue and Acknowledgement by the Designer/ Principal Agent Representative

Rev	Date	Description	Position	Signature
01		OHS Specification		

INDEMNITY

This specification is based on visual and technical techniques which are limited by time and budgetary constraints relevant to the type and level of investigation undertaken. The specifications given are based on the provisions of the Construction Regulations, 2014, the author(s)' best scientific and professional knowledge as well as information available at the time of assessment. Therefore, the author reserves the right to modify aspects of the report if and when new information becomes available from ongoing research or further work in this field.

Although the author(s) exercised due care and diligence in rendering services and preparing documents, they accept no liability, and the Client, by receiving this document, indemnifies the author against all actions, claims, demands, losses, liabilities, costs, damages and expenses arising from or in connection with services rendered, directly or indirectly by the author and by the use of this document.

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1. DEFINITIONS

“Approved inspection authority” means an inspection authority approved by the chief inspector: Provided that an inspection authority approved by the chief inspector with respect to any particular service shall be an approved inspection authority with respect to that service only**;**

"Approved plan of work" means a written site-specific methodology as contemplated in regulation 15 that is at least co-signed by the asbestos client, registered asbestos contractor and approved inspection authority;

“Building” Includes –

a) Any structure attached to the soil;

b) Any building of such structure or part thereof which is in the process of being erected; or

c) Any prefabricated building or structure not attached to the soil;

“Baseline risk assessment” refer to the construction health and safety risks associated with all standard processes and routine activities in the business

“Certificate of Competency” or “Certificate” means a certificate of competency as a mechanical or an electrical engineer, as the case may be issued in terms of regulation 2(1)

“Chief executive officer”, In relation to a body corporate or an enterprise conducted by the State, means the person who is responsible for the overall management and control of the business of such body corporate or enterprise.

“Client” It is the contract administrator/custodian or agent or project manager construction regulation, 2014. He/she is the person responsible for ensuring that the works or services are executed in terms of the contract, as well as adherence to legislation pertaining to the contract.

“Competent person” OHS Act) means any person having the knowledge, training, experience, and qualifications, specific to the work or task being performed, provided that, where appropriate, qualifications and training are registered in terms of the South African Qualifications Authority Act, 1995 (Act No. 58 of 1995)

"Contractor" means an employer as defined in section 1 of the Act who performs contracted work and includes principal contractors

"Consultant" means a person providing professional advice / service

"Danger" means anything which may cause injury or damage to persons or property

"Demolition" means dismantling, razing, destroying or wrecking of any building or structure or any part thereof

"Employee" means subject to the provisions of subsection (2), any person who is employed by or works for an employer and who receives or is entitled to receive any remuneration or who works under the direction or supervision of an employer or any other person

"Employer" means, subject to the provisions of subsection (2), any person who employs or provides work for any person and remunerates that person or expressly or tacitly undertakes to remunerate him/her, but excludes a TES (ex-labour broker) as defined in section 1(1) of the Labour Relations Act 1956 (Act No. 28 of 1956)

"Fall protect plan" Means a documented plan of all risks relating to working from an elevated position, considering the nature of work undertaken, and setting out the procedures and methods to be applied in order to eliminate the risk

"Hazard" means a source of or exposure to danger

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

"Health and safety equipment" mean any article or part thereof which is manufactured, provided or installed in the interest of the health and safety of any person

"Health and safety file" mean a file or other record in permanent form, containing the information required in relation to the contract

"Health and safety plan" mean a document plan that addresses hazards identified and includes safe work procedures to mitigate, reduce, or control hazards identified

"Health and safety specification" mean a document specification of all construction health and safety requirements pertaining to associated to a contract, so as to ensure the construction health and safety of persons

"Health and safety requirements" mean comprehensive construction health and safety requirements for a contract, project, site, and scope of work. This specification is intended to ensure the construction health and safety of persons, both workers and the public, and the duty of care to the environment. The construction health and safety requirements must be specific to each contract, project, site, and scope of work

"Incident" means an incident as contemplated in section 24(1) and includes an environmental incident and a near miss

"Medical certificate of fitness" means a certificate valid for one year, issued by an occupational health practitioner, issued in terms of the regulations, whom shall be registered with the Health Professions Council of South Africa

"Medical surveillance" means a planned program or periodic examination (which may include clinical examinations, biological monitoring, or medical tests) of employees by an occupational health practitioner or, in prescribed cases, by an occupational medicine practitioner

"Method statement" means a written document detailing the key activities to be performed in order to reduce, as reasonably as practicable, the hazards identified in any risk assessment

"Organisation" may be defined as a group of individuals (large of small) that is cooperating under the direction of executive leadership in accomplishment of certain common objects

"Principal contractor" means an employer, as defined in section 1 of the OHS Act, who intends to tender for or has signed a contract with the Client for services rendered

"Risk" means the probability that injury or damage will occur

"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, reduce, or control such hazard

"Site" means a complex, building, specific project, work site, or the site where agents, clients, principal contractors, contractors, suppliers, vendors, and service providers provide a service to the Client, directly or indirectly

"Safe" means free from exposure to any hazard

"Supplier" means a natural or legal person who renders a service and may include the following current or potential supplier vendor, contractor, consultant

"Task" a segment of work that requires a set of specific and distinct actions for its completion

"Toolbox talk" where the team leader, after conducting pre-task planning, shares all the tasks at hand and discusses task allocation, the identified risks, and the control measures with all his/her team

"The Act" means Occupational Health and Safety Act no. 85 of 1993 and Regulation

"Visitor" is any person who is not permanently employed on the project and will not perform any construction work. A person who visit the project for a period of not more than 3 consecutive days including representatives from the client, facilitators from training organisations and specialist mechanics who assess or repair vehicles, plant or equipment. Employees from Head Office are not deemed to be visitors as they will spend time on the project at various intervals.

2. NEC 4 CLAUSES APPLICABLE TO HEALTH AND SAFETY

2.1. Core Clause 27: Health and Safety

- **Clause 27.4** requires that all parties comply with health and safety laws, standards, and regulations, making health and safety a contractual requirement. This includes adherence to the Construction (Design and Management) Regulations (CDM) in the UK, or similar regulations in other jurisdictions.
- The clause requires the contractor to operate in a way that does not compromise the health and safety of anyone affected by the work.

2.2. Roles and Responsibilities for Health and Safety

- NEC4 ECC (Engineering and Construction Contract) **Clause 25** specifies responsibilities for managing health and safety. The Contractor is responsible for ensuring the health and safety of all people involved and must align with health and safety requirements set out in the Works Information (or Scope in NEC4).
- The Project Manager and Supervisor also play roles in overseeing compliance and ensuring safe working practices on site.

2.3. Early Warning and Risk Reduction (Clause 16)

- Health and safety risks are included as part of the early warning process, where parties notify each other about potential risks to health and safety as soon as they are identified.
- Risk Reduction Meetings are encouraged to mitigate any risks promptly, allowing for collaborative efforts to resolve health and safety issues proactively.

2.4. Health and Safety Plan Requirements

- Works Information (NEC3) or Scope (NEC4) can require a Health and Safety Plan as part of the contractor's submissions. This plan should detail how the contractor intends to ensure safety throughout the project, including emergency response plans and incident reporting protocols.
- NEC4 also includes optional Contractor's Design obligations that outline specific safety standards for design, ensuring the project is safe by design and construction.

2.5. Subcontractor and Supplier Compliance

- The contract requires that subcontractors and suppliers comply with the same health and safety standards as the main contractor. This provision ensures that all levels of the project maintain consistent health and safety standards.
- **Clause 26.1:** If the principal contractor subcontracts work, he is responsible for providing the works as if had not subcontracted. The principal contractor therefore directly responsible entirely for the performance of subcontractors.
- **Clause 26.2:** The principal contractor submits names of sub-contractors he wishes to appoint to the project manager for approval; the project manager may reject a certain subcontractor for reasons stipulated.

- **Clause 26.3:** The principal contractor shall enter into a formal contract with the subcontractor unless the project manager has agreed otherwise.
- **Clause 24.2:** The project manager may, having stated his reasons, instruct the contractor to remove an employee, this includes for subcontractor as well.

2.6. Risk Register and Risk Management

- The Risk Register includes potential health and safety hazards, which must be managed and regularly updated. The register is a tool for identifying and mitigating risks before they become issues.
- The emphasis on health and safety within risk management underscores its importance in the overall risk profile of the project.

2.7. Audits and Inspections

- The Supervisor's Role includes rights to inspect and audit health and safety practices on-site, ensuring that the work complies with health and safety obligations outlined in the contract.
- NEC4 places a stronger emphasis on inspections, giving supervisors the authority to stop work if health and safety risks are identified.

2.8. Contractor's Obligations for Staff Competency

- The NEC contract specifies that the contractor must ensure staff are competent and trained to perform their tasks safely, reducing the risk of accidents due to unqualified personnel.

3. INTRODUCTION

This project specific construction health and safety specification (PSHSS) has been prepared in terms of the Construction Regulations, 2014. It sets out guidelines and minimum levels of awareness and guidance for construction health and safety requirements within the Contract.

Contractual responsibility for adhering to these requirements rests with the Contractors. In particular all employees are encouraged to be pro-active in compliance. The project specific construction health and safety specification forms an integral part of the Contract, and it

must be read in conjunction with the OHS Act,1993, it's Regulations (as amended) and any other legislation and standards relating to work being done, and ensure compliance thereto.

The information relative to the scope of the project, the works etc. is detailed in the tender document, and is considered when developing the construction health and safety plan and associated documentation.

No work may commence without written approval of the construction health and safety plan prepared by the Principal Contractor's Construction Health and Safety Officer. Should there be design changes, or change in the scope of works, an amended PSHSS may be issued. Where amended PSHSSs are issued, the Contractor will be required to ensure a resubmission of an amended CHS plan for approval.

Where applicable the Contractor is to ensure that a similar system is implemented between all subcontractors. The Client appointed CHS Agent will be in constant contact with the project and complete site audits at least monthly, or more frequently if deemed necessary to ensure compliance. All activities on the site and all appropriate documentation will be monitored and reported on to the Client, Principal Agent and Contractor.

Non-conformances will be issued and penalties or work stoppage will be issued where appropriate. Communication between the CHS Officer and the Contractor will be through the Site Agent and may include the Principal Agent as determined at the commencement of the project.

4. PROJECT STAKEHOLDER DETAILS

Client Details	
Client	Kwa Zulu Natal Department of Health
Address	Natalia 330 Langalibalele (Longmarket) Street Pietermaritzburg 3201
Tell	033 395 2111

Website	www.kznhealth.gov.za

Occupational Health and Safety Agent Details (OHS Agent)	
OHS Agent	Diba BES (Pty) Ltd
Address	35 Breamer Street, Lalucia, Durban, 4153
OHS Representative	Mrs. N. Rambau/ Mr. TB. Motau
Tel	072 618 5001/ 060 501 4592
E-mail	info@diba.co.za

5. PROJECT LOCATION

- The project is in the city of Empangeni which is within the King Cetshwayo District, Kwa Zulu Province.

Locality map: New Ngwelezana Oncology Unit

6. SCOPE OF WORKS

Construction of Ngwelezana Oncology Unit

Public areas	• Entrance lobby • Waiting area • Male and female toilets • Universal baby change area
Staff areas	• Office- operational manager • Office- head clinical unit • Office- physicist • Office- radiotherapist • Staff toilet

	• Staff plan office • Small training room • Staff rest room
Consulting suite	• Clinical workshop • Phlebotomy room • Procedure room • Treatment room • Preparations/ vitals room • Consulting room • Committee room • Emergency trolley bay
Service support	• Cleaners room • Clean utility • Dirty utility • Sluice room • Store- surgical • Store- clean linen • Store- equipment

Radiotherapy	• Sub- waiting area • Patients ablutions • Reception • Preparation/ observation room • Procedure room • Store- surgical • Store- physicist • Control room • Bunker- linear accelerator • Bunker- brachytherapy • Bunker- wide bore CT scanner • Control room- Brachytherapy • Patients holding bays • Patient recovery bays
Chemotherapy	• Patient change cubicle • Patient ablutions • Sub-waiting • Reception/ clinical workshops • Procedure room • Chemotherapy treatment room • Ward kitchen • Store- surgical • Cytotoxic pharmacy
Patient area	• 1-bed unit • 2- bed unit 4- bed unit • Assisted shower • En-suite bathroom
Staff areas	• Clinical workstation • Clinical admin area • Staff toilet

	• Staff rest room
Support areas	• Bay- mobile equipment • Bay- resuscitation trolley • Clean utility • Dirty utility • Store- general • Store- surgical/ consumables • Store- equipment • Store- patient kit • Toilet- disables/ public • Treatment room • Ward kitchen

7. LEGAL REFERENCE AND FRAMEWORK

7.1. Act

- Occupational Health & Safety Act of 1993 (OHS ACT)
- Compensation for Injuries & Disease Act 130 of 1993 (COIDA).
- Basic Conditions of Employment Act 75 of 1997.
- National Environmental Management Act 59 of 2008 (NEMA) (waste).
- National Disaster Management Act, 2002
- Environmental Management Act 107 of 1998
- Environmental Management: Air quality Act 39 of 2004
- Atmospheric Air pollution prevention Act 45 of 1965
- National Water Act 36 of 1998
- Water Services Act, 1997
- Constitution of Republic of South Africa 108 of 1996
- Labour Relations Act 66 of 1995.
- Employment Equity Act 55 of 1998.
- Environmental Conservation Act 73 of 1989.

- Hazardous Substances Act 15 of 1973 and many other relevant.
- KwaZulu-Natal Health Act (1/2009)
- KwaZulu-Natal clinic and community health care committees' regulations, 2012
- KwaZulu-Natal hospital boards regulations, 2012

7.2. Regulations

- National Building Regulations
- Disaster Management Act,
- Code of Practice: Managing exposure to sars-cov-2 in The Workplace, 2022
- Construction Regulations, 2014
- Driven Machinery regulations, 2015
- Electrical Installation regulations 2009
- Electrical Machinery Regulations 2011
- Ergonomics Regulations, 2018
- General administrative regulations, 2003.
- General safety regulations, 1986.
- Facilities regulations 2004.
- Hazardous biological agents' regulations 2001.
- Environmental Regulations for workplaces, 1987.
- Explosives regulations, 2003.
- SANS – 10085: 2004 (Scaffold)
- SANS – 11475 (Fire extinguishers)
- SANS – 490 (Alcohol-based hand sanitizer and hand rub)
- The Waste Act, 2008 (Act 59 of 2008)
- The Air Quality Act, 2004 (Act 39 of 2004)
- Hazardous chemical substances regulations, 1995.
- Management of Human Remains Regulations, 2013
- KwaZulu-Natal Health Act (1/2009)
- KwaZulu-Natal clinic and community health care committees' regulations, 2012
- KwaZulu-Natal hospital boards regulations, 2012

8. CONSTRUCTION WORK PERMIT/ NOTIFICATION OF CONSTRUCTION WORK

A client who intends to have construction work carried out, must at least 30 days before that work is to be carried out apply to the provincial director in writing for a construction work permit to perform construction work on projects that will –
1. exceed 365 days and will involve more than 3600-person days of construction work; or
2. the tender value limit is grade 7, 8 or 9 of the Construction Industry Development Board (CIDB) grading.
Grade 7 = R60 000 000
Grade 8 = R 200 000 000
Grade 9 = No limit
A client may appoint a Construction Health and Safety Agent or Construction Health and Safety Manager to apply for this permit from the Provincial Director and construction work may not commence until the permit has been issued by the Provincial Director.
A copy of this permit will be required to be kept in the principal contractor's safety file, and the site-specific number issued by the Provincial Director must be displayed at the site entrance.
A client may appoint a Construction Health and Safety Agent, or Construction Health and Safety Manager based on the scope and risk profile of construction work to represent him/her on matters of health and safety. Provided that, where the question arises as to whether a Construction Health Safety Agent or a Construction Health and Safety Manager is necessary, the decision of an inspector is decisive.
The following minimum documentation will be required during the permit application process:
Principal Contractor's Health and Safety Plan CR 5(1)(m)
Baseline Risk Assessment CR 5(1)(a)
Appointed Principal Contractor's Letter for Good Standing as per CR 5(1)(j)
Issue Register signed by Designer CR 5 (1)(c)
Issue Register signed by Principal Contractor
Declaration signed by Designer CR 5(1)(d) and CV
Principal Contractor made adequate provision for the cost of health and safety measures (Bill of Quantities) CR 5(1)(g)
Proof of Principal Contractor's competency and resources to carry out the construction work safely CR 5(1)(h)
Appointment Letter for Construction Manager, CV, Certificates and List of projects
Appointment Letter of Safety Officer & Safety Officer's Registration for SACPCMP
Principal Contractor's Appointment Letter CR 5(1)(k), Company Profile and CIDB grading
After approval of the Construction Work Permit any changes made to the appointed persons on the annexure 1 must be submitted to Department of Labour for approval before the appointed persons are allowed to commence with their tasks.

PLEASE NOTE THAT THE CONSTRUCTION MANAGER (8(1)) NAMED ON THE CONSTRUCTION WORK PERMIT MUST BE THE SAME PERSON THAT ACTS AS THE CONSTRUCTION MANAGER ON SITE. IF THIS WILL NOT BE THE CASE FOR SOME

REASON THEN THE SAFETY AGENT MUST BE NOTIFIED OF THE CHANGE BY THE PRINCIPAL CONTRACTOR AT LEAST 7 DAYS BEFORE THE CHANGE IS MADE SO THAT THE SAFETY AGENT CAN AMEND THE CONSTRUCTION WORK PERMIT APPLICATION AND ADVISE THE DEPARTMENT OF EMPLOYMENT AND LABOUR ACCORDINGLY.

or

- Appointed principal contractor will submit the notification for constriction work to the local Department of Employment and Labour
- Stamped notification will be displayed on site
- No work will commence before the submission or notification of construction work

9. PSHSS STRUCTURE RESPONSIBILITIES

Any contractor submitting a bid in response to the Client' formal tender request for any construction project, shall prepare and include, in his tender submission, a draft project specific occupational Health and Safety plan, specific to activities / tasks to be performed by the Contractor, based on this specification, the Occupational Health and Safety Act (Act no. 85 of 1993) and its Regulations and all applicable environmental legislation.

The OHS Agent on behalf of the client will evaluate the Principal Contractor's Health and Safety plan to ensure compliance with this PSHS Specification and relevant legislative requirements.

10. SUBMISSION AND EVALUATION OF CONSTRUCTION HEALTH AND SAFETY PLAN

The Principal Contractor will prepare a PSHS File containing the processes / procedures and templates to be applied during the project period for the scope of work as per the PSHS specification issued to them. The Principal Contractor will be evaluated during the contract period against the submitted PSHS File.

The Client will conduct an initial inspection and evaluation of the Principal Contractor's PSHS File for approval purposes to commence work. The Client will allocate 3 days to evaluate the file and to give feedback on the evaluation report of the file to the contractor. If the file has not been approved, the contractor shall ensure that the outstanding documents are submitted in the file for re-evaluation within 4 working days. The approval letter from The

Client must be kept in the PSHS File and any letter issued concerning the evaluation of the file.

On completion of each project the Principal Contractor will submit all documentation required for the Consolidated PSHS File to The Client in an auditable format within 7 days of project completion. It is the responsibility of the Principal Contractor to deliver the consolidated PSHS File to the relevant Client offices. At a minimum, the consolidated PSHS File will contain the following records.

11. CONSTRUCTION PROJECT RISK ASSESSMENT

The project is located with the current Ngwelezana Hospital. It is therefore of great importance that the principal contractor to be appointed is screened and qualified as far as their OHS resources and competencies are concerned. This is to ensure that all risks listed on their baseline risk assessment and more are addressed accordingly.

11.1. Hazard identification & risk assessment

Identification of possible hazards emanating from projects and activities conducted for or on behalf of the Client includes an assessment of site-specific construction health and safety hazards and risks and environmental aspects and impacts that have been identified by The Client as possibly applicable to the contract work for this project. It is by no means exhaustive and is offered as assistance to the tenderers and contractors.

Major risks to the project include the following:

- Parking space (Small parking space in the hospital might cause emergency delays during construction)
- Decanting
- Exposure to Corona virus (Covid-19),
- Exposure to general flu, monkey pox, or Diarrhoea
- Exposure to HIV &Aids
- Access to emergency services
- Public health and safety (Project in residential area)
- Demolition of existing structures
- Biological vectors

- Access to emergency services
- Work carried out at heights
- Onsite construction plant and vehicle movement.

Every Contractor performing construction work shall, before the commencement of any construction work or work associated with the construction work, and during construction work, ensure that a risk assessment is undertaken by a competent person, appointed in writing, and the risk assessment shall form part of the PSHS plan to be applied on the site. Risk assessments shall identify occupational construction health and safety hazards and risks and environmental aspects and impacts emanating from the activity to be performed by the Principal Contractor / Contractor

Based on the risk assessments, the Principal Contractor must develop a set of site-specific occupational PSHS rules that will be applied to regulate the Construction health and safety hazards/aspects of the construction work

The risk assessments, together with the site-specific occupational construction health and safety rules, must be submitted to The Client before commencement on site. These will be included in the PSHS plan. The Contractor shall ensure through his risk management process the hierarchy of controls stipulated as follows, are implemented

11.2. Baseline risk assessments

The Principal Contractor is required to develop a risk assessment taking the resources, competency levels, nature and scale of their organization into consideration for submission during PSHS File evaluation phase. The hazards and risks to which persons, plant, vehicles and facilities may be exposed during the construction should be identified and evaluated. The aspects and impacts resulting in environmental pollution or degradation should also be identified and evaluated.

Measures to reduce or control these risks or hazards should be defined during this assessment. The effectiveness of the measures defined and the baseline risk assessment prepared shall be monitored and reviewed from time to time to ensure that it remains relevant and accurate.

11.3. Issue based risk assessments

The Contractor will be required to carry out separate risk assessments during construction of the project when methods and procedures are varied, for example when:

- Designs are amended;
- New machines are introduced;
- Plant is periodically cleaned and maintained;
- Plant is started-up or shut-down;
- Systems of work change or operations alter;
- Indents or near-misses occur; or
- Technological developments invalidate prior risk assessments.

11.4. Continuous risk assessments

The Occupational Construction health and safety Act (Act no. 85 of 1993) specifically requires that employers shall provide and maintain working environments that are safe and without risk to health.

The general awareness of hazards needs to be raised as work ethic to maintain a safe and risk-free environment on an on-going basis. This is achieved by continuous risk assessments, a form of risk assessment that takes place as an integral part of day-to-day management.

Occupational construction health and safety risks or environmental impacts that are identified during the risk assessment process shall be communicated before the commencement of the said activity to every employee whose work is associated with the risk. Each employee shall sign to confirm understanding of the safety, health or environmental risks in the tasks.

12. ARCHITECTURAL DRAWINGS (SDP)

Site development plan from the Professional Architect will be reviewed according to the applicable benchmark, norms, standards, Acts and Regulations.

13. LEGAL APPOINTMENTS

Copies of appointments must be submitted to the Client together with concise CV's and/or proof of competency of the appointees as part of the Principal Contractor's PSHS plan. The Client must approve all appointments and any changes in appointees or appointments must be communicated to the Client and agreed upon before being implemented.

The Principal Contractor must provide The Client with an organogram listing the staff, their designations and their responsibilities for all contractors that he has appointed or intends to appoint and keep this list updated on a weekly basis.

The Principal Contractor is furthermore required to compile a PSHS Organogram indicating all legislative appointments and/or nominations and their reporting / responsibility structure. This PSHS organogram will include composition of statutory PSHS meetings to be conducted. The following table provides guidance to Principal Contractors on potentially applicable appointments to their scope of work.

14. PRINCIPAL CONTRACTOR'S ACCOUNTABILITIES FOR THEIR CONTRACTORS

If the Principal Contractor needs to introduce a new contractor, the Principal Contractor must first inform the Client. Such contractors must, in every respect, meet the Client's H&S requirements.

Should the Principal Contractor appoint a contractor, the principal contractor would then have the same role and responsibility in relation to the contractors, in a similar way as the Client has in relation to the principal contractor.
The Principal Contractor is directly accountable for the actions of his contractors. The Principal Contractor will also be responsible for initiating any remedial action (recovery plan) that may be necessary to ensure that the contractor complies with all requirements.

The Principal Contractor shall ensure that the contractors appointed have the necessary competencies and resources to perform the work safely. The Principal Contractor shall provide any contractor who is making a bid or appointed to perform construction work, with the relevant sections of the documented Occupational Health and Safety

Specification, who would in turn provide the client/agent with an Occupational Health and Safety Plan for review. The Principal Contractor shall carry out audits on the contractor at least monthly to ensure that their Occupational Health and Safety Plan is being implemented and maintained.

The Client/Agent and/or the Principal Contractor shall stop any contractor from executing construction work which poses a threat to the safety and health of persons or the environment or if it does not comply with the approved Occupational Health and Safety Plan.

The Principal Contractor shall have a disciplinary process and an organisational structured procedure to deal with employees who have transgressed organisational and legal requirements. The Principal Contractor's Construction Manager/Supervisor shall provide a list of names and contact telephone numbers of all his employees as well as the contractor employees on site. This list shall be updated as and when new contractors commence on site.

The Principal Contractor's Construction Manager/Supervisor shall keep a record of all employees including the contractor employees, including date of induction, relevant skills and competences, and be able to produce this list at the request of the relevant officials. These records shall be filed in the H&S File.

The Principal Contractor shall ensure that his managers and supervisors give clear and definite instructions for the work in hand to the personnel for whom they are responsible for. The instructions shall include, but not necessarily be limited to:

- description of the objective/scope of work
- sequence of work/method statements
- hazard identification and risk assessment (prior to commencement of work)
- Precautionary/preventative measures that are to be taken.
- Identification of sensitive features that may be impacted upon by the project.

Employees are responsible for their own health and safety and that of their co-workers in their respective areas of work on the project. They must be made aware of their responsibilities during induction and awareness sessions some of which are:

- 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 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 health and safety rules.

Every employee must undergo site induction provided by the Client before commencement of the contracted work. Only once this induction has been received, will each employee receive a site access permit. It must be highlighted to all employees, that anyone who becomes aware of any person disregarding a health & safety notice, instruction or regulation shall immediately report this to the person concerned. If the person persists, stop the person from working and report the matter to the client Health and Safety Agent/ Project Manager/ Principal Agent and the Principal Contractor Supervisor/ H&S Officer immediately.

15. MANAGEMENT AND SUPERVISION OF CONSTRUCTION WORK

The Principal Contractor shall ensure that the performance of all specified work is managed and supervised in accordance with the requirement of OHS Act CR 8 throughout the contract period.

The number of appointed persons shall be determined by the size and the risk of the project.

16. CONSTRUCTION HEALTH AND SAFETY OFFICER

The Principal Contractor and contractor shall appoint a Construction Health and Safety Officer (> 2-year relevant industry experience) considering the nature and the scope of work being performed in accordance with the requirement of CR 8 (6) and these appointees shall be registered with the SACPCMP.

The appointed safety officer shall be responsible for overseeing overall compliance of H&S issues on the project.

17. PRINCIPAL CONTRACTORS AND SUB-CONTRACTORS

The contractor is expected to develop an Occupational Health and Safety Plan before commencement which meets these requirements as well as all the relevant applicable legislation. The Contractor is and remains accountable for the quality and the execution of his health and safety program for his employees and contractor employees. This Occupational Health and Safety Specification reflect minimum requirements and should not be construed as all encompassing.

18. REGISTRATION FOR WORKMAN'S COMPENSATION

Compensation for Occupational Injuries and Diseases Act, No 130 of 1993. The Principal Contractor will be required to submit a letter of registration and "good-standing" from the Compensation Commissioner or compensation insurer before being awarded the contract.

A current, up-to-date copy of the Compensation for Occupational Injuries and Diseases Act, No.130 of 1993 must be available on site at all times.

Principal Contractor will be required to provide evidence to The Client that all local labourers included in the project are included in the registration and "good-standing" with the Compensation Commissioner or Insurer.

The principal contractor must also have public liability insurance with a registered insurer as per project scope and value.

Additional insurances such as public liability insurance shall also be applicable with the project manager clearly stipulating the cover amount within the suite of contract documents issued to the appointed design and built contractor.

19. MANDATORIES MANAGEMENT

Whenever the Principal Contractor appoints contractors or sub-contractors, it is a requirement that an Occupational Health and Safety Act (Act no. 85 of 1993) Section 37(2) agreement (i.e. Agreement with Mandatary) is entered into between the Principal Contractor and Contractors. The Principal Contractor will ensure that all appointed contractors comply with the Client OHS Specification requirements.

The Principal Contractor will establish a procedure on sub-contractor management and assurance on compliance to the established procedure will be provided to The Client on a monthly basis.

Principal Contractors are required to formally notify The Client before appointing subcontractors. The Client shall approve all specialist subcontractors to be appointed and/or engaged by the Principal Contractor.

20. FALL PROTECTION (WORK CARRIED OUT AT HEIGHTS)

A competent person must be appointed for the management of work carried out at heights is carried out safely as per CR 10 which includes carrying out the following:

A risk assessment will be required for any work to be carried out above two (2) metres from the ground or any floor level. This work will be classified as “work carried out at heights”.

As far as is reasonably practicable, any person working at heights will work from a platform, ladder or other device that is at least as safe as if he is working at ground level. Whilst working in this position he shall be wearing a single belt with lanyard to prevent the person falling from the platform, ladder or other device. This safety belt will be, as far as is possible, secured to a point away from the edge over which the person might fall and the lanyard must be of such a length and strength that the person will not be able to move over the edge.

Alternatively, any platform, slab, deck or surface forming an edge over which a person may fall may be fitted with suitable guard rails at two different heights as prescribed in the relevant South African National Standard for the design, erection, use and inspection of access scaffolding.

Where the requirement in the paragraph above is not practicable, the person will be provided with a full body harness that will be worn at all times and shall be attached above the wearer's head at all times. The lanyard must be fitted with a shock-absorbing device or the person must be attached to a fall arrest system (anchorage connector; body wear; and connecting device) approved by the Client.

Where the requirements in the paragraph above are not practicable, a suitable catch net must be erected.

Employees working in at heights must be trained to work without risk to their health and safety or to the health and safety of others and be declared medically and psychologically fit to perform work at elevated positions.

Where work on roofs is carried out, the risk assessment must consider the possibility of persons falling through fragile material, i.e. skylights and openings in the roof.

21. STRUCTURES

The Contractor must ensure the following:

Only skilled employees are allowed to erect structures and that the skills of these employees are verified at regular intervals.

Steps are taken to ensure that no structure becomes unstable or collapses due to-

- Construction work being performed on it or in the vicinity of it.
- No structure is overloaded to the extent that it becomes unsafe.

The following information will be made available and communicated to the employees before any structure is erected:

- The loading the structure is designed to bear
- The methods and sequence of the construction process

22. DEMOLITION

- A contractor must appoint a competent person in writing to supervise and control all demolition work on site
- A contractor must ensure that before any demolition work is carried out, and in order 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
- A contractor must develop a demolition plan and submit it to the OHS agent for approval

23. EXCAVATION WORKS

Excavation work must be carried out under the supervision of a competent person, who has been appointed in writing. Before excavation work begins the stability of the ground must be evaluated.

Whilst excavation work is being performed, the contractor must take suitable and sufficient steps to prevent any person from being buried or trapped by a fall or dislodgement of material.

No person may be required or permitted to work in an excavation that has not been adequately shored or braced.

Where the excavation is in stable material and where the sides of the excavation are sloped back to at least the angle of repose of the excavated material, shoring or bracing may be left out but only after written permission has been obtained from the appointed competent person.

Shoring and bracing must be designed and constructed to safely support the sides of the excavation.

Where uncertainty exists regarding the stability of the soil the opinion of a competent professional engineer or professional technologist must be obtained whose opinion will be

decisive. The opinion must be in writing and signed by the engineer or technologist as well as the appointed competent person.

No load or material may be placed near the edge of an excavation unless suitable shoring has been installed to be able to carry the additional load.

Neighbouring/adjoining buildings, structures or roads that may be affected or endangered by the excavation must be suitably protected.

Every excavation must be provided with means of access that must be within 6 metres of any worker within the excavation.

The location and nature of any existing services such as water, electricity, gas etc. must be established before any excavation is commenced with and any service that may be affected by the excavation must be protected and made safe for workers in the excavation.

The appointed competent person must inspect every excavation, including the shoring and bracing or any other method to prevent collapse, as follows:

- Daily before work commences
- After every blasting operation
- After an unexpected collapse of the excavation
- After substantial damage to any supports
- After rain

The results of any inspections must be recorded in a register kept on site and in the safety file.

Every excavation accessible to the public or that is adjacent to a public road or thoroughfare or that threatens the safety of persons, must be adequately barricaded or fenced to at least one meter high and as close to the excavation as practicable, regardless of the depth of the excavation.

Every excavation must be provided with warning lights or visible boundary indicators after dark or when visibility is poor.

Upon entering an excavation, the requirements of General Safety Regulation 5, work in confined spaces, must be observed:

- Any confined space may only be entered after the air quality has been tested to ensure that it is safe to breathe and does not contain any flammable or noxious air mixture.
- The confined space must be purged and ventilated of any hazardous or flammable gas, vapour, dust or fumes.
- Employees are to be provided with breathing apparatus and must wear a safety harness with a rope with the free end of the rope being continuously attended to by a person outside the confined space.
- Furthermore, an additional person, trained in resuscitation, to be in full-time attendance immediately outside the confined space.
- All pipes, ducts etc. that may leak into the confined space to be blanked off sufficiently to prevent any leakage or seepage.
- The employer must ensure that all employees have left the confined space after the completion of work.
- Where flammable gas is present in a confined space no work may be performed in close proximity to the flammable atmosphere.

Excavations and other openings must be provided with sufficient barriers to prevent construction vehicles and mobile plant from falling into them

Excavations left open for extended periods of time (exceeding 48 hours) must be approved the relevant Engineer / Construction Supervisor.

24. SCAFFOLDING

Access scaffolding must be erected, used and maintained safely in accordance with Construction Regulations and relevant SA Bureau of Standards Code of Practice. Detailed consideration must be given to all scaffolding to ensure that it is properly planned to meet the working requirements, designed to carry the necessary loadings and maintained in a sound condition. Sufficient material must be available to erect the scaffolding properly.

Scaffolding must only be erected, altered or dismantled by persons who have adequate training and experience and are competent in this type of work and under the continuous supervision of such a person.

25. CONSTRUCTION VEHICLES AND MOBILE PLANTS

The Client will inspect construction vehicles and mobile plant prior to being allowed on a project site. Suppliers of hired vehicles, plant and equipment will be required to comply with this specification as well as the Occupational Health and Safety Act (Act no. 85 of 1993) and its Regulations.

Construction vehicles and mobile plant to be:

- Of acceptable design and construction;
- Maintained in good working order;
- Used in accordance with their design and intention for which they were designed;
- Operated and/or driven by trained, competent and authorised operators/drivers. No unauthorised persons are to be allowed to drive construction vehicles and mobile plant;
- Provided with safe and suitable means of access;
- Fitted with adequate signalling devices to make movement safe including reversing;
- Provided with roll-over protection (where applicable);
- Inspected daily before start-up by the driver, operator and/or user and the findings recorded in a register/log book;
- Fitted with two head and two tail lights that are in good working condition and must be used whilst operating under poor visibility conditions;
- When used for transporting persons must have seats firmly secured and sufficient for the number of persons being transported.

Operators and drivers of construction vehicles and mobile plant must be in possession of a valid medical certificate of fitness issued by an occupational health practitioner in the form of Annexure 3 of the regulations declaring the operator and/or driver fit to operate or drive construction vehicles and mobile plant.

No loose tools, materials etc. are allowed in the driver and/or operators compartment/cabin or in the compartment in which any other persons are transported.

No person shall ride on any construction vehicle or mobile plant otherwise than in a safe place provided thereon for that purpose. Employees shall only be transported if provision for seating and safety belts has been provided with an adequate canopy or rollover protection.

All construction vehicles and mobile plant left unattended at night, adjacent to a freeway in normal use or adjacent to construction areas where work is in progress, must have appropriate lights or reflectors, or barricades equipped with appropriate lights or reflectors, in order to identify the location of the vehicles or plant

Bulldozers, scrapers, loaders, and other similar mobile plant must, when being repaired or when not in use, be fully lowered or blocked with controls in a neutral position, motors stopped and brakes set.

Self-Propelled Mobile Machinery

All Self-Propelled Mobile Machinery must be inspected daily and the findings recorded in a register. Pre-use inspection checklist shall identify critical items that would stop the operator from operating machinery should a defect be detected.

All operators shall be tested on their ability to operate machinery and equipment inspected prior to be used on any of the premises by the Client Project Inspectors and

Responsible Engineer. Relief drivers shall be made available for mobile machinery where there is a need for on-going operations and the contractor shall establish a rotation schedule.

All Drivers/Operators shall be appointed under the applicable legislation prior to operating any type of mobile equipment or machinery:

- If Driver/Operator does not adhere to the rules and regulations his appointment as operator shall be cancelled and he shall not be able to carry on with his duty.
- No Driver/Operator shall be appointed without proof of training, driver’s licence or letter of competency.
- No training of Drivers/Operators on Site.

- No passengers on dump truck, Loaders or Excavators.
- No eating or drinking allowed while operating equipment.
- No vehicle shall be left unattended with engine running or key in ignition.
- Drivers may use no cellular phones during operations.

26. ELECTRICAL INSTALLATION

The installation of temporary electricity for construction shall be in accordance with Construction Regulations and the Electrical Installation Regulations. The Contractor must ensure that:

- Existing services are located and marked before construction commences and the markings maintained during construction;
- Where this is not possible, workers with jackhammers etc. are protected against electric shock by the use of suitable protective equipment e.g. rubber mats, insulated handles etc.;
- Electrical installations and machinery are sufficiently robust to withstand normal working conditions on site;
- Temporary electrical installations must be inspected at least once a week by a competent person and a record of the inspections kept in the PSHS File;

Electrical and Mechanical Lockout

An electrical and mechanical (as applicable) lockout procedure must be developed by the Principal Contractor and submitted to The Client for approval before construction commences. All contractors on site must adhere to this lockout procedure.

27. FIRE PREVENTION AND PROTECTION

The Contractor must ensure that:

- The risk of fire is avoided;
- Sufficient and suitable storage for flammables is provided;

The contractor must ensure that sources of ignition are removed wherever flammable or highly combustible material is present in the workplace, for example:

- Notices prohibiting smoking are displayed and enforced
- Welding and flame cutting is only allowed under controlled conditions that includes written hot work permits
- Only spark-free hand and power tools are used
- No grinding, cutting and shaping of ferrous metals is allowed using electrically driven power tools that produce sparks
- Flameproof switches and fittings are to be used in the flammable atmosphere
- Good housekeeping is maintained to prevent the accumulation of unnecessary combustibles

Maintenance must include:

- Regular inspection of fire equipment by a competent person appointed in writing and keeping a register
- Annual inspection and service by an accredited service provider

A contractor must ensure that:

- All employees are instructed in the use of the firefighting equipment and know how
- to attempt to extinguish a fire;
- A sufficient number of employees are appointed and trained to act as an emergency team to deal with fires and other emergencies;
- Employees are informed regarding emergency evacuation procedures and escape
- routes;
  - Emergency escape routes are kept clear at all times and clearly marked;
  - Evacuation assembly points are demarcated;
  - Evacuation is practiced to ensure that all persons are evacuated timeously;
  - Roll call is held after evacuation to account for all personnel and ensure that no-one has been left behind; and siren or alarm is fitted which is clearly audible to all persons on site.

28. TEMPORARY STORAGE OF FLAMMABLE LIQUIDS ON SITE

28.1. Hazardous Chemical Substances

The Principal Contractor must ensure that:

- Employees receive the necessary information and training to be able to use and store hazardous chemical substances safely;
- Employees obey lawful instructions regarding: the wearing and use of protective equipment, the use and storage of hazardous chemical substances, the cleaning up and disposal of materials containing hazardous chemical substances, housekeeping, personal hygiene and the protection of the environment,
- The risk assessments required in terms of Construction Regulation include employee exposure to hazardous chemical substances and that the necessary measures be taken to protect persons from being detrimentally affected by hazardous chemical substances present or used in the workplace;
- Suppliers provide the necessary information in the form of a material safety data sheet regarding a hazardous chemical substance required to ensure the safe use and storage of that substances;
- An up-to-date list is kept on site of hazardous chemical substances stored and used together with the material safety data sheet of the hazardous chemical substances;
- Hazardous chemical substances containers be clearly marked with the contents and main hazardous category e.g. “Flammable” or “Corrosive” and the reference number of the hazardous chemical substances on the list indicated above;
- Hazardous chemical substances, for example asbestos dust, are not cleared by using compressed air but should be vacuumed;
- No person eats or drinks in a hazardous chemical substance’s workplace; and
- Hazardous chemical substances waste is disposed of safely in terms of hazardous waste disposal requirements.

28.2. Storage Facilities

No petrol or fuel oil shall be stored in bulk on the surface in quantities in excess of two thousand litres in any tank above or below ground level except with the prior written approval of the Chief Inspector. No petrol shall be stored in drums in excess of a total of two hundred litres in any building or other place except with the prior written approval of the Department of Labour Chief Inspector.

No fuel oil shall at any time be stored underground unless it is stored in a suitable container or tank, which does not leak.

Every storage tank provided at any filling station on the surface for the purpose of containing petrol or fuel oil shall be suitably constructed to an acceptable standard that would ensure the safe storage thereof. Suitable means for firefighting shall be installed at a safe location for the extinguishing of fire in the event of an incident. Fire equipment supply shall be appropriate to the quantity being stored.

All storage facilities shall be bunded 110% of the quantity contained and bunded areas will be supplied with a drain facility to enable the bunded area to be drained in a receptacle for disposal in the event of a spill or accumulation of water.

29. ENVIRONMENTAL MANAGEMENT

29.1. Environmental Management Plan

The contractor shall compile and submit, to Diba Bes /The appointed Environmental Control Officer, an Environmental Management Plan (EMP).

29.2. Waste Disposal

The Contractor shall implement and comply with the Environmental Regulations for Workplaces 1987. Project waste materials including hazardous or otherwise regulated waste must be accumulated, stored, and disposed of properly by the contractor and/or agents of the Contractor. The storage and disposal of waste materials shall be pre-approved by the General Contractor. Under no circumstances will project waste be disposed of on-site in waste containers. The Contractor shall provide Health and Safety Agent with a detailed Waste Management Plan.

29.3. Spill Prevention and Control

Project equipment and materials on the property shall be used and stored to minimize the risk of spills and releases. Spill/Leak incidents shall be immediately reported to the Environmental Representative for the site

29.4. Storm Water Prevention

A site storm water prevention plan shall be developed and implemented by the Principal Contractor. The Principal Contractor shall verify that it is always complied with. env

30. HAND TOOLS

- The Principal Contractor must inspect all hand tools before it is brought onto the site.
- As far as possible all hand tools must be numbered and placed on register to be inspected monthly by a person designated to do so.
- Any tools found to be in an unsafe condition must immediately be removed from service and either discarded or rectified.
- No chisels with “mushroomed” heads must be used.
- No hammer shall be used with a cracked or damaged handle.
- All files must be fitted with handles.
- All trolleys, pushcarts, etc. used on site must be identifiable, placed on register and inspected at least once every month.
- Non-sparking tools must be used in areas where the risk of fire or explosion is present.
- No homemade hand tools are allowed on the project.
- All tools shall be attached to a suitable lanyard when utilised in elevated positions.

31. BARRICADING/ HOARDING

Barricading plans are to be presented by the Principal Contractor for any major operations involving site works for approval by KwaZulu - Natal Department of Health and/or the appointed Project Agent/manager. Where areas are unsafe, they should be enclosed with barricading. Examples are people working overhead, welding splatter etc.

Where there is a risk of injury, the area should be barricaded off with secure solid barricades.

Barricading for the prevention of access into areas with a potential risk of injury shall as a minimum be constructed of a handrail, knee-rail and appropriately supported as to prevent any person from falling into the restricted/risk area.

Appropriate signage shall be affixed to the barricade indicating the risk associated (i.e. deep excavation, lifting operations etc.) and the responsible Supervisor and contact details shall be displayed. All barricading shall have a “No Entry” signs on all sides and at each change of direction. Signage shall be placed at 20 m intervals where lengths exceed. All signage shall be a minimum size of 290 mm x 290 mm.

Where no risk exists of injury to personnel such as stacking and storage areas, the use of wire for hand and knee rails netting shall be acceptable to demarcate the area.

All barricades will have a dedicated entrance where it is required that personnel enter the areas.

Appropriate signage shall be placed at the entrance indicating which Contractor has right of entry.

It is the Contractor’s responsibility to remove all redundant barricades directly after use. The Contractor’s Safety Officers will maintain a marked-up site plan indicating where barricades are erected.

It will be a requirement that the contractor protects employees against contact with exposed rebar and poles by the installation of rebar-caps on all exposed areas where there is a potential that an employee could be injured.

*****Danger tape is not allowed for boundary barricading. Danger tape is not allowed for excavations*****

32. SAFETY EQUIPMENT

32.1. Equipment Approval

Authorization for the use of equipment shall be given in writing only after the following minimum requirements and documentation have been verified and shall as a minimum include the following:

- Minimum two lights in front and rear of vehicle
- Reflective Taping;
- First-aid kit, fire-fighting equipment and emergency roadside triangles;
- Tyres in good condition;
- Windscreen clear of cracks;
- Safety belts fitted for all occupants;
- Signage for clear identification;
- Windscreen wipers;
- Warning hooter and reverse alarm;
- Rotating warning lights (where applicable);
- Maximum number of persons indicated;
- Equipment free of oil and other leaks;
- Maintenance/Service & Equipment manuals available;

33. OPERATOR APPROVAL

Authorisation for operators for the use of equipment shall be given in writing only after the following minimum requirements and documentation have been verified and shall as a minimum include the following:

- Operator's Certificate (accredited training organisation);
- Operator's Licence appropriate to the nature of the Mobile equipment;
- Operator's knowledge tested and familiar with the controls for the vehicle;
- Public driver's permit where required;
- Medical fitness certificate.

34. LADDERS

The following requirements for ladders will apply:

- All ladders used on the site shall be constructed and used in compliance with the PSHS Act and Regulations.
- Ladders, which provide access to a working platform, shall extend one metre above
- the platform where it provides access, and shall be secured to prevent slipping.

- Timber ladders shall not be painted other than with clear preserving oils, clear plastics.
- Ladders, which are in a damaged condition, shall not be used and shall be labelled accordingly, and removed from the Premises.
- All Ladders shall be numbered, logged in a register, and inspected monthly.
- A ladder in use shall be held by an assistant and/or properly tied down in position.
- Only ladders that do not conduct electricity shall be used in live electrical sub-stations and switching rooms.
- Ladders shall be removed after use and stored in an appropriate facility as to not expose them unnecessarily to the elements or potential damage by surrounding activities.

35. PORTABLE ELECTRICAL EQUIPMENT

Portable electrical tools and equipment includes every unit that takes electrical power from a 15 ampere plug point and is moved around for use in the workplace for example; drills, saws, grindstones, portable lights, etcetera.

The use, inspection and maintenance of portable electrical tools and equipment shall be as follows:

- Periodical inspections must be carried out by a competent person appointed in writing;
- Inspection results must be recorded in a register;
- The main power source should incorporate an earth leakage protection device or receive power through a double wound transformer or be double insulated and clearly marked as such; and
- All equipment must be fitted with a switch to allow for safe and easy starting and stopping.
- All portable equipment where applicable must be fitted with a robust non-hygroscopic non-conducting handle;
- Live metal parts or parts which may become live must be protected against contact;
- The lamp must be protected by a strong guard;

- The cable lead-in must withstand rough handling;
- Inspections must be undertaken that concentrate on plug, cord, switch and any obvious faults;
- A register be kept for each piece of equipment with findings of regular inspections undertaken to evaluate the condition of these lights; and
- When used in wet/damp/metal container conditions, the lamp must be protected.
- Compliance to section 17 of as promulgated under the Construction regulations 2014

36. EMPLOYEE FACILITIES

36.1. Ablutions

- Principal contractor must provide at least one sanitary facility for each sex and for every 30 employees (1:15).

36.2. Eating Areas

- Principal contractor must provide sheltered eating areas on site and in accordance to Code of practice: Managing exposure to sars-cov-2 in the workplace, 2022.
- Hygiene conditions must be observed and eating areas must be kept clean at all times.

36.3. Safekeeping

- Principal contractor must provide lockers for each employee on site

36.4. Changing Room

- Principal contractor must provide changing rooms for both females and males.

36.5. Portable Water

- Principal contractor must provide safe drinking water for all employees on site.

36.6. Washing Facilities

The Contractor shall ensure the following washing facility standards are met:

- Be maintained in a clean and sanitary condition.
- Have an adequate supply of water for effective washing.
- Have a readily available supply of soap or another suitable cleansing agent.
- Have a readily available supply of single-use towels or a warm-air blower.

- Be located and arranged so that any time a toilet is used, the user can readily wash; and
- When provided in association with a non-water carriage toilet facility:
- Provide a sign or equivalent method of notice indicating that the water is intended for washing; and
- Be located outside of the toilet facility and not attached to it.

37. OCCUPATIONAL HYGIENE MANAGEMENT

The Principal Contractor will be required to establish an occupational hygiene management programme related to the hazards and risks emanating from the work environment, environment and activities / tasks to be performed for or on behalf of the Client. At a minimum, the occupational hygiene management programme will include:

- Medical surveillance management.

38. PERSONAL PROTECTIVE EQUIPMENT

The Principal Contractor is required to continuously identify the hazards in the workplace and deal with them. He must either remove them or, where impracticable take steps to protect workers and make it possible for them to work safely and without risk to health under the hazardous conditions. The Principal Contractor will establish a Personal Protective Equipment Policy and a Personal Protective Equipment study will be conducted to determine the types of Personal Protective Equipment (PPE) to be supplied related to the hazards and risks emanating from the tasks. Cognisance shall be given to the gender of individuals required to where PPE; size required by the employee and size issued.

Personal protective equipment should, however, be the last resort and there should always first be an attempt to apply engineering and other solutions to mitigating hazardous situations before the issuing of personal protective equipment is considered.

Where it is not possible to create an absolutely safe and healthy workplace the Principal Contractor is required to inform employees regarding this and issue, free of charge, suitable

equipment to protect them from any hazards being present and that allows them to work safely and without risk to health in the hazardous environment.

It is a further requirement that the Principal Contractor maintains the equipment, instructs and trains the employees in the use of the equipment and ensures that the employees use the prescribed equipment.

Employees do not have the right to refuse to use and/or wear the equipment prescribed by the employer and, if it is impossible for an employee to use or wear the prescribed protective equipment through health or any other reason, the employee cannot be allowed to continue working under the hazardous condition(s) for which the equipment was prescribed. An alternative solution has to be found that may include relocating the employee.

The Principal Contractor may not charge any fee for protective equipment prescribed by him but may charge for equipment under the following conditions:

- Where the employee requests additional issue in excess of what is prescribed;
- Where the employee has patently abused or neglected the equipment leading to early failure; and
- Where the employee has lost the equipment.
- All employees shall, as a minimum, be required to wear the following personal protective equipment: Protective overalls; Protective footwear; Protective headwear; and Eye, face and ear protection.

39. PUBLIC HEALTH AND SAFETY AND TRAFFIC MANAGEMENT

The Principal Contractor shall organize the site in such a manner that pedestrians and vehicles can move safely and without risks to health, including sufficient and suitable traffic routes and safe walkways with relevant signage.

Appropriate signage must be posted to this effect and all employees on site must be instructed to ensure that non-employees are protected at all times. All non-employees entering the site must receive induction into the hazards and risks of the site and the control measures to be observed.

The Principal Contractor shall recognize that the Community Liaison Officer (CLO) is the link between The Client and the community and provide all reasonable support to the Community Liaison Officer to ensure relevant responsibilities are fulfilled and positive relationships with the community are maintained.

Where activities are performed close to public routes, the Principal Contractor will establish a traffic management plan incorporating the requirements of relevant by-laws. At a minimum, barricading, warning signage and flagmen will be provided to ensure the protection of workers from vehicles in transit. Where required, the Principal Contractor will interact with the local traffic department to establish minimum requirements to be implemented on public routes.

40. SECURITY AND ACCESS CONTROL

The Principal Contractor must establish site access rules and implement and maintain these throughout the construction period. Access control must, amongst other, include the rule that non-employees will not be allowed on site unaccompanied.

The Principal Contractor must develop a set of security rules and procedures and maintain these throughout the construction period.

The Principal Contractor shall:

- Provide a guardhouse for security personnel. The guardhouse should be in good condition and at-least meet minimum requirements as per Environmental Regulations for Workplaces (2281 of 1987) as promulgated under the Occupational Health and Safety Act (Act no. 85 of 1993).
- Supply an access card containing the name, surname, employee number and photograph for all appointed employees (full or part time) for the site.
- Ensure that no person enters the construction site without wearing the necessary Personal Protective Equipment (PPE).
- Ensure that no children are allowed on the construction site.
- Ensure that no family members are sleeping over on the construction site.
- Ensure that no pets are allowed on the construction site.

41. STACKING AND STORAGE

The Principal Contractor must ensure that:

- A competent person is appointed in writing to supervise all stacking and storage on a construction site.
- The storage areas are kept neat and under control;
- The base of any stack is level and capable of sustaining the weight exerted on it by the stack;
- The items in the lower layers can support the weight exerted by the top layers;
- Cartons and other containers that may become unstable due to wet conditions are kept dry;
- Pallets and containers are in good condition and no material is allowed to spill out;
- The height of any stack does not exceed 3 times the base unless stepped back at least half the depth of a single container at least every fifth tier or the approval of an inspector has been obtained to build the stacks higher with the aid of a machine. The operator of the machine must be protected against items falling from overhead off the stack and no items may overhang;
- The articles that make up a single tier are consistently of the same size, shape and mass;
- Structures for supporting stacks are structurally sound and able to support the mass of the stack;
- No articles are removed from the bottom of the stack first but from the top tier first;
- Project Management shall allocate a laydown area for Contractor-supplied items. At all times, the Contractor shall be responsible for the safe and adequate storage of all materials and equipment on site which he is to install, whether they are supplied by him or others. The safe handling, unloading and loading of material receipts and dispatches at site or storage areas shall be the Contractors' responsibility.
- The Contractor shall provide a suitable and adequate lock-up store for the storage of items of equipment and material, which would be damaged or pilfered if stored in the

open. The Principal Contractor shall provide all facilities required for weatherproofing, dust proofing or vermin proofing.

- The Contractor is responsible for the proper storage and maintenance of all equipment until issue of the Certificate of Practical Completion.
- All equipment and materials will be stored on suitable wood poles or pallets which will not protrude more than a meter from any of the stored material. Safe access ways shall be maintained between all stored items preventing employees from having to climb over or under equipment to retrieve the necessary.

42. SYMBOLIC SIGNAGE

Contractors shall use mandatory and prescribed symbolic safety signs at their lay down and site areas. The display of the following signs is mandatory:

- “Radio-Active Material” symbolic signs at radioactive storage areas.
- “Eye Protection” symbolic signs shall be displayed at all grinding machines and at any area where it is mandatory to wear eye protection or where there is danger of an eye injury being sustained.
- “Ear Protection” symbolic signs shall be displayed at all areas where there is a danger of noise induced hearing loss being sustained.
- Every separate room of a workplace shall be consecutively numbered.
- All toilets or urinals shall be marked in a conspicuous place with painted or stencilled letters to indicate the sex for which they are intended.
- The location of every first aid box is to be clearly indicated by means of a sign.
- In any room, cabinet or enclosure where flammable substances are used or stored shall be fixed a suitable and conspicuous sign prohibiting smoking or the use of naked flames in the area.
- At the entrance to premises where machinery is used
- Restricted access on “Authorised Person Only” signs on entry. “No person shall enter the workplace or premises without the permission of the employer or user of the machinery”.
- At every place where machinery is used a notice (English & Pictograms) shall be posted.

- Explosive Power Tool shall have a sign warning people when it is in use.
- Electrical Control Gear. A notice shall be posted so as to warn against the re-closing of a switch of control gear whilst a person is working on such equipment.
- Emergency contact telephone numbers.
- Adequate scaffolding signs. (When applicable).

43. WEEKEND AND AFTERWORK ACTIVITIES

The Principal Contract will notify The Client on the need to conduct work activities after hours or on weekends. No after hour or weekend activities will commence before the Principal Contractor has obtained approval from Kwa Zulu Natal- Department of Health.

44. WELDING ACTIVITIES AND HOT WORK

No Principal Contractor or user of machinery shall require or permit welding or flame cutting operations to be undertaken unless:

- The person operating the equipment has been fully instructed in the safe operation and use of such equipment and in the hazards, which may arise from its use;
- Effective protection is provided and used for the eyes and respiratory system and, where necessary, for the face, hands, feet, legs, body and clothing of persons performing such operations, as well as against heat, incandescent or flying particles or dangerous radiation;
- Leads and electrode holders are effectively insulated; and
- The workplace is effectively partitioned off where practicable and where not practicable all other persons exposed to the hazards are warned and provided with suitable protective equipment.

No Principal Contractor or user of machinery shall require or permit welding or flame cutting operations to be undertaken in a confined space, unless:

- Effective ventilation is provided and maintained; or
- Masks or hoods maintaining a supply of safe air for breathing are provided and used by the persons performing such operations.

No Principal Contractor or user of machinery shall require or permit electric welding to be undertaken in wet or damp places, inside metal vessels or in contact with large masses of metal, unless:

- The insulation of the electrical leads is in a sound condition;
- The electrode holder is completely insulated to prevent accidental contact with current carrying parts;
- The welder is completely insulated by means of boots, gloves or rubber mats; and
- At least one other person who has been properly instructed to assist the welder in case of an emergency is and remains in attendance during operations.

No Principal Contractor or user of machinery shall require or permit welding, flame cutting, grinding, soldering or similar work to be undertaken in respect of any tube, tank, drum, vessel or similar object or container where such object or container:

- Is completely closed, unless a rise in internal pressure cannot render it dangerous; or
- Contains any substance which, under the action of heat, may –
- Ignite or explode; or
- React to form dangerous or poisonous substances, unless a person who is competent to pronounce on the safety thereof has, after examination, certified in writing that any such danger has been removed by opening, ventilating or purging with water or steam, or by any other effective means.

Where hot work involving welding, cutting, brazing or soldering operations is carried out at places, other than workplaces which have been specifically designated and equipped for such work, the Principal Contractor shall take steps to ensure that proper and adequate fire precautions are taken.

45. EMERGENCY PREPAREDNESS, CONTINGENCY, PLANNING AND RESPONSE

The Principal Contractor must appoint a competent person to act as emergency controller and/or coordinator.

The Principal Contractor must conduct an emergency identification exercise and establish what emergencies could possibly develop. He must then develop detailed contingency plans

and emergency procedures, considering any emergency plan that The Client may have in place.

In the event where a contractor incorporates the services of a 3rd party service provider for the provision of Emergency Response Services, the following criteria must be met:

- Identification of 3rd party emergency response services (organization & contact details);
- Notification of contractor to 3rd party emergency response service of incorporation of services into contractor's emergency response plan (written agreement / signed letter).

The Principal Contractor and the other contractors must hold regular practice drills of contingency plans and emergency procedures to test them and familiarise employees with them.

46. FIRST-AID

The Principal Contractor must provide first-aid equipment and have qualified first-aider(s) on site as required by General Safety Regulations promulgated in terms of the Occupational Health and Safety Act (Act no. 85 of 1993).

The contingency plan of the Principal Contractor must include arrangements for the speedy and timeous transporting of injured and/or ill person(s) to a medical facility or of getting emergency medical aid to person(s) who may require it.

The Principal Contractor must have written arrangements in place with his other contractors regarding the responsibility of the other contractors towards their own injured and/or ill employees.

47. PERFORMANCE MONITORING, MEASUREMENT AND ASSESSMENT

A monthly compliance rating will be calculated for each Principal Contractor as per a formula determined by The Client focussing on or incorporating outcomes of assurance (e.g. monthly audit), operational (e.g. behavioural based safety inspection) assessments and other requirements, as necessary.

The Client reserves the right to adjust the monthly compliance calculation formula as and when required – each revision of the monthly compliance calculation formula will be communicated to the Principal Contractor before implementation

48. LOST TIME INJURY RATE (LTIR)

The Principal Contractor is required to maintain a Lost Time Injury Rate of less than or equal to 1.0. The contractor will report his LTIR to The Client on a monthly basis.

Lost-Time Injury (LTI): A work related injury or illness resulting in unfitness or absence from normal work activities and the employee's absence are calculated from the time of the incident / accident. Lost-Time Injuries include injuries / accidents where an employee is placed on light-duty or any other duty for which he/she is not normally employed as a result of an accident / injury.

The Principal Contractor must submit a completed monthly report on injuries on duties and accidents for the month to The Client and Agent by 12:00pm on the last working day of each month.

49. HEALTH AND SAFETY COMMITTEE MEETINGS

- Principal contractor must establish health and safety committee on site. all members must be appointed in writing.
- Site management particularly Project Manager, Construction Manager or Site Agent must form part of Health and Safety Committee and be present in all meetings.
- Health and safety committee meetings must be held at least once a month due to the nature, activities and value of the project.
- Health and safety committee meetings minutes must be made available and attendance register must be signed by all attendees.

50. INCIDENT, ACCIDENT REPORTING AND INVESTIGATION

The Principal Contractor must report all incidents where an employee is injured on duty to the extent that he:

- Dies

- Becomes unconscious
- Loses a limb or part of a limb
- Is injured or becomes ill to such a degree that he is likely either to die or to suffer a permanent physical defect or likely to be unable for a period of at least 14 days either to work or continue with the activity for which he was usually employed

Or where -

- A major incident occurred
- The health or safety of any person was endangered
- Where a dangerous substance was spilled
- The uncontrolled release of any substance under pressure took place
- Machinery or any part of machinery fractured or failed resulting in flying, falling or uncontrolled moving objects
- Machinery ran out of control to The Client within two days and to the Provincial Director of the Department of Labour within seven days from date of incident (Section 24 of the Occupational Health and Safety Act (Act no. 85 of 1993) and General Administrative Regulations), except that, where a person has died, has become unconscious for any reason or has lost a limb or part of a limb or may die or suffer a permanent physical defect, the incident must be reported to both The Client and the Provincial

51. CORRECTIVE ACTIONS

51.1. Non-conformance Management

- Principal contractor is required to closeout all corrective actions identified from monthly compliance / assessments, within 7 (Seven) days from date of the assessment / inspection.

51.2. Corrective Management

- Principal Contractor is required to provide proof of the relevant action(s) taken to the Client representative before the corrective action will be closed-out.
- Documented corrective action must be submitted to the client within 24 hours of receival of Monthly audit report.

51.3. Work Stoppage

- Failure by the Principal Contractor to closeout corrective actions within the prescribed period will results in implementation of the Non-conformance Management Process.
- The Client reserves a right to close the site or activity if Non-conformances are not address.

52. SITE/ PROJECT COMPLETION

- Upon completion, the Principal Contractor must compile risk assessment for removal of unused material including final clearing of the site rubble.
- The risk assessment will be communicated to all the employees who will be involved in removing or demolishing temporary site offices.
- The Principal Contractor must submit all the Safety Files. This will include all the safety documentation from the project.
- The OHS closeout report will be prepared by the OHS Agent and submitted to the client.

53. CORONA VIRUS / COVID-19 REQUIREMENTS (If Promulgated by Government)

53.1. Policies and Procedures (The Principal Contractor must take possible regulatory changes / updates and requirements into consideration).

The Contractor will be required to compile and submit for review and approval, before establishing site, the following documents:

- COVID-19 Policy: To be signed by the Chief Executive Officer 16(1).
- COVID-19 Prevention and Control Management Plan which will include Procedures on how the Department of Health and the Disaster Management Requirements shall be complied with (to comply with and follow order of Hazardous Biological Agents (HBA) for COVID-19 Prevention & Control Management Plan.

- Compliance Commitment letter to be signed by all persons in a supervisory role (Construction Supervisor CR8(1)/ Construction Manager CR8(7)).
- The Contractor shall ensure their induction program to include the requirements of working within the Disaster Management requirements for COVID-19. All staff to be re-inducted prior to starting work.
- The Contractor shall ensure their emergency response plan and first aid procedures to include the requirements of COVID-19.
- The Contractor shall Include COVID-19 in his Baseline Risk Assessment and Issue Based / Task Specific Risk Assessments inclusive of appropriate mitigating factors.

The Contractor shall also take into consideration the OHS Act 85 0f 1993 and Regulations with specifics to the “CODE OF PRACTICE: MANAGING EXPOSURE TO SARS-COV-2 IN THE WORKPLACE, 2022, or as amended.”

The Contractor will also be responsible for the following, which shall be explicitly detailed in there COVID-19 Prevention and Control Management Plan:

- Ensure that all persons on site including Sub-Contractors, Visitors, Client and Professional team comply with the COVID-19 Policies and Procedures.
- The Contractor shall not permit more persons onto site than what is permitted by the gazetted Disaster Management Regulations which may change from time to time.

54. HIV/AIDS AND STI AWARENESS

This contains all requirements applicable to the Contractor for creating HIV/AIDS and STI awareness amongst all of the Workers involved in this project for the duration of the construction period, through the following strategies:

- Raising awareness about HIV/AIDS and STI through education and information on the nature of the disease, how it is transmitted, safe sexual behaviour, attitudes towards people affected and people living with HIV/AIDS and STI, how to live a healthy lifestyle with HIV/AIDS and STI, the importance of voluntary testing and counselling, the diagnosis and treatment of Sexually Transmitted Infections and the closest health Service Providers.

- Informing Workers of their rights with regard to HIV/AIDS and STI in the workplace.
- Providing Workers with access to condoms and other awareness material that will enable them to make informed decisions about sexual practices.

HIV : Human Immunodeficiency Virus

AIDS : Acquired Immune Deficiency Syndrome

STI : Sexually Transmitted Infection

BASIC METHOD REQUIREMENT

In order to achieve the specified objectives with respect to HIV/AIDS and STI awareness, the Contractor must conduct onsite awareness with the Workers, develop and compile an Awareness Plan. The Awareness Plan shall be based on the following information provided by the Contractor:

- Number of Workers and Sub-contractors on site
- When new Workers or Sub-contractors will join the construction project
- Duration of Workers and Sub-contractors on site
- How the maximum number of Workers can be targeted with awareness
- How the Contractor prefers awareness to be scheduled, e.g. three hourly sessions per Worker, or one 2.5-hour workshop per Worker
- Profile of Workers, including educational level, age and gender (if available)
- Preferred time of day or month to conduct awareness
- A Gantt chart reflecting the construction programme, for scheduling of awareness
- Suitable venues for awareness

The Contractor shall submit the awareness Plan for approval. After approval by the Representative/Agent, the Contractor shall make available a suitable venue that will be conducive to education and training.

The Awareness Plan shall address, but will not be limited to the following:

- The nature of the disease;
- How it is transmitted;
- Safe sexual behaviour;
- Post exposure services such as voluntary counselling and testing (VCT) and nutritional plans for people living with HIV/AIDS and STI;
- Attitudes towards other people with HIV/AIDS and STI;
- Rights of the Worker in the workplace;
- How the Awareness Champion will be equipped prior to commencement of the HIV/AIDS and STI awareness programme with basic HIV/AIDS and STI information and the necessary skills to handle questions regarding the HIV/AIDS awareness programme on site sensitively and confidentially;
- How the contractor will support the Awareness Champion;
- Location and contact numbers of the closest clinics, VCT facilities, counselling services and referral systems;
- How the awareness will be presented, including frequency and duration;
- How the awareness will fit in with the construction programme;
- How the contractor will assess the knowledge and attitude levels of attendees to structure awareness accordingly;
- How the video will be used;
- How the contractor will elicit maximum participation from the Workers;
- A questions and answers slot (interactive session)

Displaying of plastic laminated posters and distribution of information booklets. The Contractor shall obtain a set of laminated posters conveying different key messages and information booklets, which are available from all Regional and National Department of Health websites

- Providing workers with access to condoms.
- Ensuring access to HIV/AIDS testing and counselling facilities and treatment of sexually transmitted infections (STI).
- Appointment of an HIV/AIDS awareness representative.

MONITORING

The Contractor shall grant to the Representative/Agent reasonable access to the construction site, in order to establish that the Contractor complies with his obligations regarding HIV/AIDS awareness under this project.

The Contractor must report problems experienced in implementing the HIV/AIDS/STI requirements to the Representative/Agent.

55. GENERAL

Principal Contractor shall comply with the requirements of Occupational Health and Safety Act 85 of 1993.

Any Non-conformances will result on works being stopped immediately. Authority for the works to resume will be approved by the OHS Agent after all Non-conformances are addressed.

KwaZulu-Natal Department of Health

KWAZULU-NATAL PROVINCE
HEALTH
REPUBLIC OF SOUTH AFRICA

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NGWELEZANA HOSPITAL

PROPOSED NEW ONCOLOGY UNIT

INFORMATION AND COMMUNICATION TECHNOLOGY (ICT) SERVICES

CONCEPT REPORT

NOVEMBER 2024

EXECUTIVE SUMMARY

The KwaZulu Natal (KZN) Provincial department of Health plans to build a New Oncology Unit at Ngwelezana Hospital located at Empangeni, in KwaZulu Natal North.

The KZN provincial department of health will make use of an NEC Design and Build Contract for the Implementation of this project.

This report presents the Information Communication Technology (ICT) options considered for the new Oncology Unit in line with the provincial manual. The present conceptual design is still subject to change following the engagement of the relevant stakeholders and the conclusion of all relevant site studies.

TABLE OF CONTENTS

1 INTRODUCTION

1.1 Background to the project

The following concept design report will focus on the following critical aspects of the proposed ICT infrastructure:

- Core equipment
- Distribution equipment
- Edge equipment
- End user equipment;
- Connectivity.

1.2 Purpose of the report

The purpose of this report is for the Design Engineers to explore and present the topology to be employed in the design process for the New Oncology Unit's Information Communication Technology's design.

2 SCOPE OF WORK

2.1 Description of the project

The overall project involves the construction of an oncology unit at the Ngwelezana Provincial Hospital that has the following services and structures amongst others: Oncology Building, Oncology Ward, 1x Linear Accelerators, 1x Brachytherapy and 1x Wide Bore CT Scanner

2.2 Project location

Ngwelezane Tertiary hospital is at Ngwelezane A, Empangeni just off the Thanduyise Drive in the province of KwaZulu Natal. It has latitude 28°46'42.34"S and longitude 31°51'57.51"E as its coordinates. See Locality information **herewith referred to as Figure 1 below.**

The position of the Oncology Unit is provided for within the perimeters of the Hospital. The proposed site is bound by the New Surgical Ward to the South, the Trauma and Casualty Unitto the north and the Admin& Psychiatric Ward on the east.

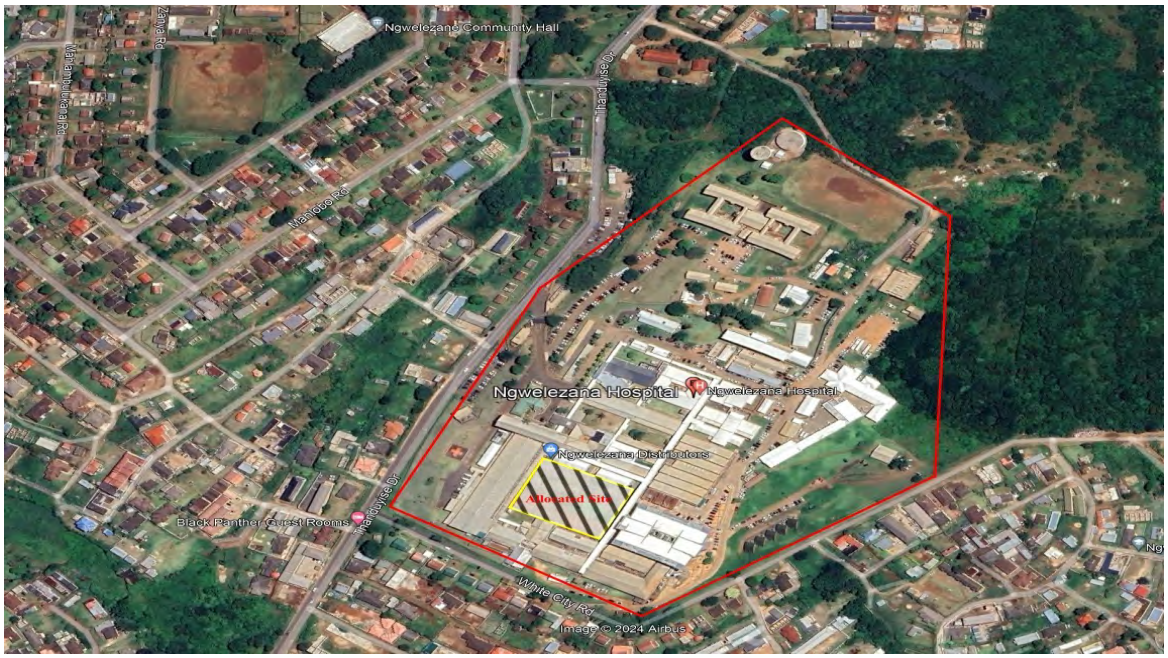

Figure 1: Google map location of Ngwelezana Tertiary Hospital

2.3 Information received

Reference has been made to the following reports during the investigation of the availability and capacity of various infrastructure required for a New Oncology Unit development:

- *Information Communication Technology (ICT) Infrastructure Specifications Manual;*
- *Floor plans for all three level of the building.*

3 PROPOSED TOPOLOGY FOR THE ICT NETWORK

3.1 Introduction

ICT topology refers to the arrangement and interconnection of various components in an information and communication technology system. For a hospital, an effective ICT topology is crucial in ensuring seamless communication, data sharing, and operational efficiency.

This report outlines a proposed ICT topology tailored for a Ngwelezana Hospital, emphasizing key components, their interrelations, and the benefits of the topology in line with KZN Health Department's ICT requirements.

3.2 Proposed ICT Topology Overview

The proposed ICT topology for a hospital is designed to support the diverse needs of healthcare providers while ensuring security and efficiency. By adopting a hybrid star-bus topology, the hospital can achieve optimal communication, data sharing, and operational efficiency, ultimately improving patient care and hospital management. Implementing this topology will position the hospital for success in a rapidly evolving healthcare landscape.

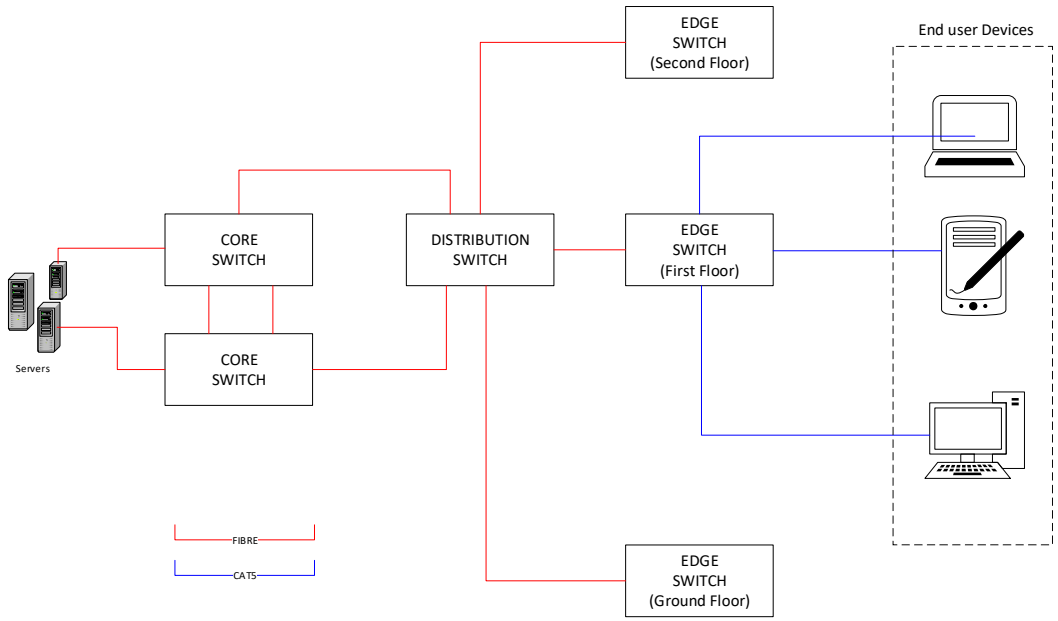

Figure 2: Overview of the topology

The proposed topology for Ngwelezana hospital can be visualized as a "Star-Bus Topology". This combines the strengths of both star and bus topologies, providing flexibility and robustness.

A Star Topology is characterized by a centralized management through a core switch that connects

various departments. A Bus Topology provides efficient data sharing among devices within departments via a shared communication medium but will be used only for critical area of the network.

The topology is adopted with the objective of providing Scalability through the use of hybrid models that allow easy addition of new devices and departments without significant restructuring, Efficiency through a centralized management and quick data routing to reduce latency and enhance communication, cost effectiveness through the efficient use of resources minimizes operational costs while maximizing performance, and finally an enhanced Security through the use of multiple layers of security protect sensitive patient information and ensure compliance with regulations.

3.3 Components of the ICT Topology

The ICT network at Ngwelezana hospital will be divided into the core network components, the end-user devices, the communication system and the data storage.

3.3.1 Core Network Components

The core network components included in the design are:

- Core Switch: a central device that connects all departmental switches and that facilitates efficient data routing and management. Core switches act as the backbone, ensuring efficient data transfer between various parts of the network.
- Departmental Switches: in this case of three floor building, a departmental switch implies a switch that connect various devices located on the same floor

3.3.2 End-user Devices

The end-user devices included in this design include workstation computers used by doctors, nurses, and administrative staff for data entry and access, mobile devices such as Tablets and smartphones for real-time access to patient information and telemedicine, Medical Equipment or devices such as MRI machines, patient monitors, and laboratory equipment that connect to the network for data sharing. Finallly, any other devices used to provide auxiliary services such as access control or security is also considered as end-user device although connected from a dedicated edge or distribution switch.

3.3.3 Communication Systems

The proposed communication system will consist of a Voice over IP through phones for internal and external communication.

3.3.4 Data Storage and Management

A dedicated server will be used as a Data Center acting as a centralized facility for storage systems and backup solutions. This server will host critical a critical application as defined by the hospital record management policy.

The content of the server will be backed up into the provincial department of health or nationa department of health's server.

3.4 Network Security

The network security will be provided through firewalls to protect the network from unauthorized access and cyber threats. Intrusion Detection Systems (IDS will be provided to monitor network traffic for suspicious activities. Finally, access Control will be implemented for role-based access to ensure that only authorized personnel can access sensitive data.

4 PROPOSED ICT NETWORK COMPONENTS

4.1 Introduction

Information and Communication Technology (ICT) architecture is essential for hospitals in enhancing operational efficiency, improving patient care, and ensuring data security. This report outlines a proposed ICT architecture tailored for a hospital in KwaZulu-Natal, focusing on infrastructure, software, communication systems, and security measures.

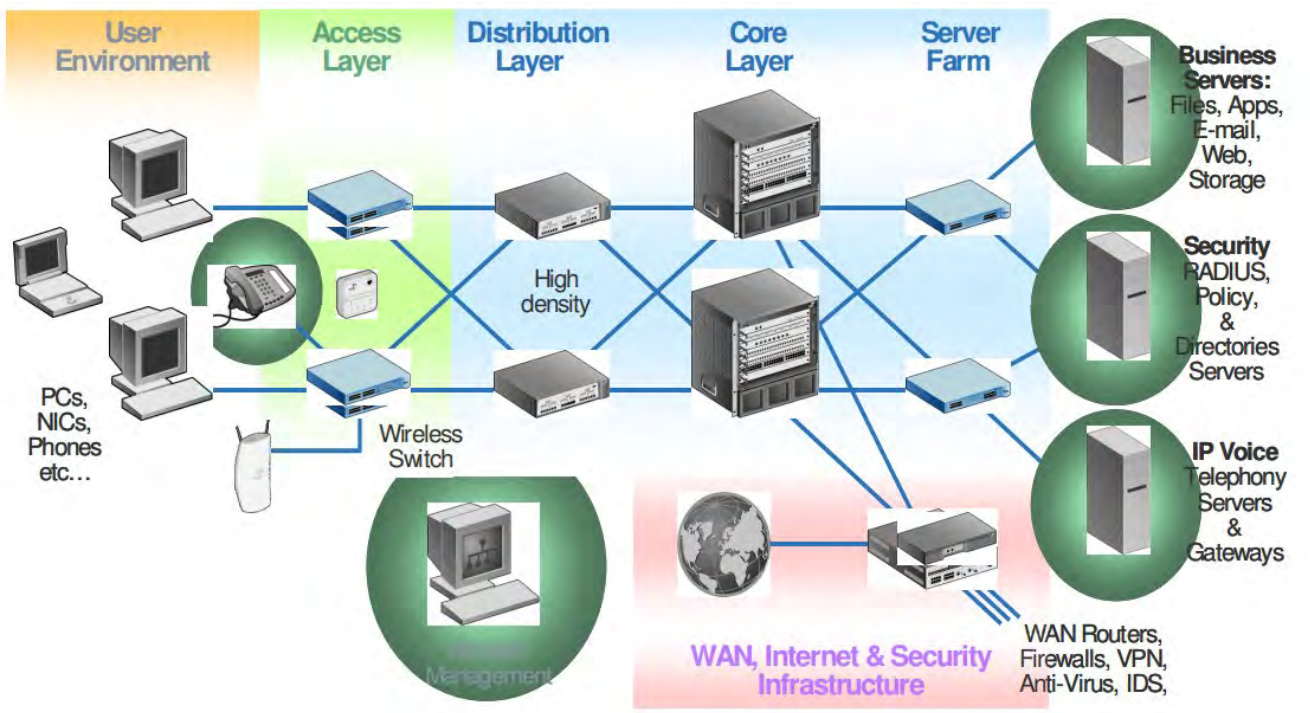

Figure 3: Tiered architecture

4.2 Infrastructure

4.2.1 Data Center

A Centralized location for storing and managing data is included in the design. It will be equipped with high-performance servers, storage systems, and backup solutions.

4.2.2 Network Infrastructure

Wired and Wireless Networks are included in the design to provide connectivity across the hospital.

4.2.3 High-speed Internet Access

To ensure seamless communication and access to cloud services, a high-speed internet access is

recommended. Although the infrastructure is provided, the connection to the internet is the responsibility of the KZN-DOH and is therefore not included in this submission.

4.2.4 Workstations and Mobile Devices

Computers for administrative staff and clinical workstations for healthcare providers as well as mobile devices for nurses and doctors for real-time patient monitoring and information access form a core of information management and communication within the hospital.

These devices ensure communication and efficiency for the staff at the hospital.

4.3 Software Systems

The design caters for the system that is ready for the deployment of various software required to run and manage a hospital. Such software could include but is not limited to those discussed in the following section.

4.3.1 Electronic Health Record (EHR)

EHR provides Comprehensive system for managing patient records, appointments, and billing. It could be used also to facilitate easy sharing of information among healthcare providers.

4.3.2 Hospital Management System (HMS):

HMS is used to manage the hospital's administrative tasks such as inventory, human resources, and financial management. If required, telemedicine software could also be used to enable remote consultations, especially important in rural areas of KwaZulu-Natal.

4.4 Communication Systems

4.4.1 Unified Communication:

The infrastructure is ready to host the integration of voice, video, and messaging services as unified communication system to enhance collaboration among staff.

4.4.2 Patient Communication Systems

The infrastructure is also capable of providing a backbone for an automated appointment reminders and results notifications through SMS and email.

4.5 Security Measures

4.5.1 Data Security

Due to legislation such as POPIA and the confidential nature of health information, data security is important in implement encryption for sensitive patient data both at rest and in transit. This should not be a once off effort but a should be carried out as regular security audits and updates to protect against

breaches.

4.5.2 Access Control

Role-based access control shall be provided to ensure that only authorized personnel can access sensitive information.

4.5.3 Disaster Recovery Plan

Regular backups and a robust disaster recovery strategy to ensure continuity of operations in case of system failures.

5 CONCLUSION

This report provides the design of Ngwelezana Hospital at conceptual level. It provides details of the envisaged infrastructure including the hardware and cabling. Furthermore, it makes reference to the main component of the network on which top the hospital services will be running.