Ministry of Mining, Blue Economy and Maritime Affairs

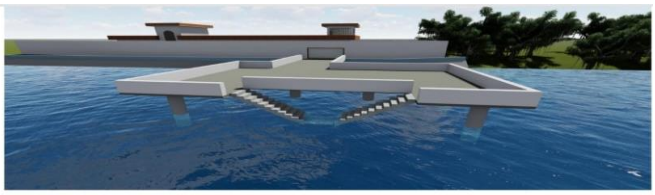
REPUBLIC OF KENYA

# COMPREHENSIVE ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT REPORT

## FOR

## PROPOSED IMPROVEMENT OF MOKOWE FISH LANDING SITE, LAMU COUNTY.

**Coordinate: Latitude 2°14'31.15"S and Longitude 40°52'15.78"E**

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**MAY, 2024**

## CERTIFICATION

This Environmental and Social Impact Assessment Summary Project Report has been prepared by a team of EIA experts lead by Mr. Godfrey Wabomba; NEMA registered EIA/EA Lead Expert No. 6127 and Mr. Antony P. Mbuthia; NEMA registered EIA/EA Lead Expert No. 7395. The Summary project report was prepared in accordance with the requirements of the Environmental (Impact Assessment and Audit) (amendment) Regulations, 2019, pursuant to *The Environmental Management and Coordination Act, (CAP 387).*

## DISCLAIMER

This Environmental Impact Assessment Summary Project Report is strictly confidential to the proponent and any use of the materials thereof should strictly be in accordance with the agreement between the client/proponent, Mr. Godfrey Wabomba (a lead EIA Expert) and Mr. Antony P. Mbuthia (a lead EIA Expert). It is, however, subject to conditions in the Environmental (Impact Assessment and Audit) (amendment) Regulations, 2019.

We, the undersigned, certify that the particulars given in this report are correct to the best of our knowledge.

Signature:  Date: 27/05/2024

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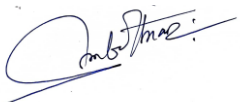
Signature:  Date: 27/05/2024

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**Proponent**

Kenya Marine Fisheries and Social Economic Development Project (KEMFSED) under the State Department for Blue Economy and Fisheries (SDBE&F)

Name: Mr Patrick Kiarah

***National Project Coordinator (NPC)***

Signature_____ Date……..

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## ABBREVIATIONS AND ACRONYMS

| | |
|---|---|
| AOI | Area of Interest |
| BMU | Beach Management Unit |
| CIDP | County Integrated Development Plan |
| CPC | County Project Coordinator |
| CPIU | County Project Implementation Unit |
| DOSHS | Directorate of Occupational Health and Safety Services |
| EIA | Environmental Impact Assessment |
| EMCA | Environmental Management and Coordination Act |
| EMoP | Environmental Monitoring Plan |
| ESIA | Environmental Social Impact Assessment |
| ESMF | Environmental and Social Management Framework |
| ESMP | Environmental and Social Management Plan |
| ESS | Environment Safeguard Specialist |
| ESSO | Environmental Social Safeguards Officer |
| FAO | Food and Agriculture Organization |
| GBV | Gender Based Violence |
| GO | Grievance Officer |
| GRC | Grievance Redress Committee |
| GRM | Grievance Redress Mechanism |
| JPSC | Joint Project Supervision Committee |
| KeFS | Kenya Fisheries Service |
| KEMFSED | Kenya Marine Fisheries and Socio Economic Development |
| KP&LC | Kenya Power and Lighting Company |
| LAWASCO | Lamu Water and Sewerage Company |
| NCA | National Construction Authority |
| NEMA | National Environmental Management Authority |
| NPCU | National Project Coordination Unit |
| OSHA | Occupational Safety and Health Act |
| PDP | Part Development Plan |
| PMCC | Pate Marine Community Conservancy |
| PPE | Personal Protective Equipment |
| PvC | Polyvinyl Chloride |
| RH | Relative Humidity |
| SDFA&BE | State Department of Fisheries, Aquaculture and Blue Economy |
| SL-GRC | Site Level Grievance Redress Committee |
| SSS | Social Safeguards Specialist |
| STI | Sexual Transmitted Infection |
| VCT | Voluntary Counseling and Testing |
| VMGF | Vulnerable and Marginalized Group Framework |
| WIBA | Work Injury Benefit Act |

# EXECUTIVE SUMMARY

Management of priority fisheries stocks and availability of functioning public landing-site infrastructure play a critical role in; centralizing data collection for fisheries management, enable enforcement of compliance, stimulate private sector interest in the fisheries sub-sector, contributing to job creation, strengthening coastal communities' livelihood, increased household income, increase food security, increase the value of fish traded, minimizing post-harvest fish losses and strengthening capacity of community institutions responsible for fishery management. Yet it's an area that remains a major concern to Kenya fisheries sector management. It is in light of this that the Government of Kenya, through SDBE&F requested the World Bank to support the development of the sector through the Kenya Marine Fisheries and Socio-Economic Development (KEMFSED) project as means to exploit the potential and attain economic benefits from the coastal and marine resources. As part of the efforts under KEMFSED project, funding has been committed for the development of landing sites infrastructure. Mokowe landing site in Lamu County is one of such facilities that remains undeveloped in spite of its potential to contribute to the objectives of the blue economy.

The landing site is faced with many challenges including; fishers experiencing low fish prices to avert a lot of post harvest losses due to lack of fish preservation equipment's or ice flakes to preserve fish for the transporters particularly during glut periods, the existing fish banda does not have the capacity to handle the potential amount of fish produced in the area hence fishers being left at the mercy of dealers, the landing site lacks sanitation facilities, lack of water supply to the site, lack power connection, gradual encroachment to the existing parcel of land by private developers and lack of meeting area for fishers. KEMFSED project however, provides an opportunity to improve the landing site. The proposed Mokowe landing site development will trigger the Bank's Safeguard Policies *(OP 4.01 Environment Assessment)* which requires undertaking environmental and social due diligence for all project activities and preparing ESIA for high risk sub-projects. An ESIA report is also required under Kenya's EIA requirement of the Environmental Management and Coordination Act CAP 387. Therefore, the assessment under this study was to identify significant potential impacts of the proposed sub-project to the landing site's physical, biological, social, and economic aspects.

**EIA regulation**

In light of this and according to section 58 of the Environmental Management and Coordination Act CAP 387, it is a requirement under the national legal framework that a proponent carries out an ESIA study before being issued with an EIA license to undertake any project activities that may be considered harmful to the environment. This includes application of the "Environment Impact Assessment and Audit Regulations of 2003"( amended in 2019) and consideration of other national legislation as the Constitution of Kenya 2010, the physical and land use planning Act 2019, The Occupational Safety and Health Act Revised Edition 2020 [2007], The County Governments Act (2012), The National Construction Authority Act 2011, The National

Environment Policy Session paper No. 10 of 2014, and the Environment and Land Court Act, among others. In this regard, a summary project report shall be submitted to NEMA for ESIA licensing. The World Bank safeguards operational policies triggered under the proposed sub-project include; OP/BP 4.04 Natural Habitat, OP/BP 4.11 Physical cultural resources, OP/BP 4.01 Environmental AssessmentTheWorld Bank general Environment, Health and safety guidelines (EHS) and fish processing EHS guidelines have been reviewed to inform on various aspects under the sub-project. In response to the requirements of the law and World Bank safeguards policies, the NPCU and the county government safeguards team prepared the ESIA project report for the proposed construction of Mokowe landing site.

**Proposed Project Objectives**

The project development objective is to improve priority fisheries and mariculture management and increase access to complementary livelihood activities in coastal communities. The aim of the sub-project is to improve fisheries landing site infrastructure under KEMFSED through improvement of Mokowe Landing site. Implementation of the proposed sub-project is anticipated to centralize landings for data collection for fisheries management and compliance enforcement.

**Proposed Project Design**

The proposed works under construction of Mokowe landing site shall consist of improvement to a modern fish Banda, Ablution Block and External works, (*Perimeter wall, drainage, landscaping works, access road works, Jetty, bio-digester, moving bed bioreactor and Dissolved Air Flotation (DAF*) *and street light).*

**Project Location**

The proposed Mokowe fisheries Landing site is located on a piece of land measuring about 0.75 acre (0.304 hectares) owned by department of fisheries under Lamu County Government, the land ownership documents are as attached in Annex II. The proposed project is located in Lamu County, Lamu West Sub- County, Hindi East ward, Mokowe location and in Mokowe Sub-location. The Landing site is located next to Mokowe Jetty in Mokowe area as shown Figure 2-1 from a Google image with the GPS coordinate of the project site being Latitude 2°14'31.15"S and Longitude 40°52'15.81"E.


*Figure 0-1: Google image of Mokowe Landing Site location*

**Estimated Cost**

The estimated cost for construction of the proposed Mokowe landing site is about Kshs. 239,337,275[1]. This cost include construction of a modern fish Banda, Ablution Block and External works (*Perimeter wall, drainage, landscaping works, access road works, Jetty, bio-digester and street light),* labour, environmental management and social monitoring costs, taxes and a factor on inflation for the proposed structures. The breakdown of the project cost is as shown in Table 2-7 under chapter 2. The proposed facility is anticipated to be implemented in a period of about 12 months and a defect liability period of 6 month making the total construction and defect liability period 18 months.

**Approach and Methodology**

The main approach and methods employed during the ESIA study were desktop literature review and field survey. The desktop study involved; reviewing available published and unpublished reports including previous ESIA reports and project design report to compile relevant baseline biophysical and socio-economic information about the study area. Field surveys were conducted on several occasions as indicated in section 1.6 which included environmental and socio-economic data collection. Environmental profiling of the proposed project area was done through assessment of various environmental parameters, including; climatic factors, solid and liquid waste, noise receptors and sources, air quality sources and receptors, landscape, and aesthetic

[1] *The estimate cost is according to the figures provided in the bill of quantities as provided by the project engineer*

value of the proposed project area as indicated in sections 4.3 of this report. The socio-economic survey approach consisted of collecting data from community meeting and various key informants from institutions both for National government agencies and County government departments as indicated in chapter 5. A number of key informants were interviewed. Data needs were based on predetermined socio-economic parameters, as highlighted in section 4.5 and chapter 5.

**Public Consultation and Stakeholder Engagement**

There were several issues that were raised by the community during public participation meeting, and the NPCU together with the CPIU teams gracing the community meeting discussions provided responses to the concerns of the community as captured Table 0-1 under chapter 5 of this report.

Table 0-1: Summary of stakeholders Issues raised and the response

| ISSUES/CONCERNS | RESPONSES FROM KEMSFED TEAM |
|---|---|
| **Scope of Infrastructures at the site**<br><br>The community proposed the following components to be incorporated in the fish landing site facility:<br><br>a. Inclusion of a BMU Office<br>b. Noted that internal organs from fish are useful as fish feed and should not be condemned and destroyed<br>c. Should consider provision of a hotel within the site for the BMU<br>d. The ice plant to be relocated to the old plot<br>Noted that there is no provision for bathrooms and a changing area in the current design | The office will be considered for inclusion in the design.<br><br>The use of internal organs for crab fattening by *Mokowe Mainland CBO* was appreciated as it would enhance their capacity.<br><br>The community was reminded that the freshness of fish during transport was the most critical part of this project.<br><br>The budget set aside will not allow installation of a cold room though the structure is provided for in the design and can be installed later once it becomes essential.<br><br>The funds available may not allow for the inclusion of a hotel facility. |
| **Location of the dispatch area**<br><br>The community noted that the location of the dispatch area was misplaced and will mean that there | The project was to be redesigned to allow for smooth movement of fish from the landing site to the dispatch area. The ice flake machine needs to |

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| | will be a lot of vendors accessing the facility. They suggested that the facility needs to be moved towards the western side where the current machine room is and be easily accessed by community members without interfering with processing operations,<br><br>Noted dispatch area to be easily accessible and also jetty to directly access the cutting and washing area | open out into the processing area and the chilling area nearby for storage of processed fish. The changing room cum toilets should not have access by outsiders. |
| | Members wanted to know whether there are similar project in the country and BMU members to be taken for an exposure visit. | Eng. Angwenyi noted that there were similar and even larger projects similar to Mukowe especially in Kisumu where BMU even have cold trucks to transport fish. He said a visit is possible under the project. |
| | Waste Management at the site<br><br>The community wanted to know if there will be a drain pipe to evacuate waste water ("vumba") into the sea. | The Project Eng. explained that there will be a waste treatment facility for the 3 waste streams, namely: human waste, fish waste and organs and bloodied waste water. He explained there will be an ablution block for human waste management; a solid waste treatment facility for solid and organic waste; and for bloodied waste water, a bio-digester, moving bed bioreactor and Dissolved Air Flotation (DAF) will be used to clean the waste water. |
| | **Parking zone for the vehicles**<br><br>The community wanted to know if there will be a special parking zone for loaded fish transport vehicles | The Project engineer noted that the parking space was county government's facilities and is not included in the design. He was requested to forward those concerns through the BMU to County government. |
| | **Patrol Boat**<br><br>The community requested for a patrol boat | These have not been addressed in the design but can be requested under sub-component 2 of the KEMFSED project. |
| | **Concerns on the encroached land**<br><br>Members requested that the encroached land for the fisheries | CECM assured the participants that they are taking up this matter with the national government and the issue of grabbed land will be resolved soon |

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| jetty outside the present plot needs to be urgently repossessed as they are public utilities | |
| **Water at the site**<br><br>The was a concern about water availability at the site since Mokowe has no piped water supply | It was agreed that water will be supplied to the site by LAWASCO from an existing borehole at mbele mbele. |
| **A food plant near a cargo jetty**<br><br>It was noted that there is fuel cargo jetty near the site and its activities may have impacts such as dust, noise and interference due to movement of vehicles offloading materials at the cargo jetty near the site. | Precautions for safety will be included in the design. This includes a buffer zone of 8700 mm or 8.7m to prevent any overlap in operation between fish landing site and fuel jetty. |
| **GBV:**<br><br>There was a concern as to whether cases of gender-based violence may occur at the landing site. | Fishing is predominantly a male activity and once the fish are landed, women only access the site when looking for fish to buy especially *Mama Karangas* and the design reduces any cases of conflict among the two genders. The BMU members manning the dispatch will be trained on GBV issues and a complaints desk and incident register opened. There will also a GRM committee at the BMU to record and address such issues. The BMU members will also be trained on GBV issues in the conduct of business. The contractor will sign a code of conduct and ensure that it is enforced as there is a potential of sexual exploitation and abuse during recruitment of labor during construction. |
| **Sexual Exploitation and Abuse**<br><br>There were also concern as to whether there will be cases of SEA (sexual exploitation and abuse) during construction and operation of | The contractor will sign a code of conduct and ensure that it is enforced as there is a potential of sexual exploitation and abuse during recruitment of labor during construction phase. The BMU also will document any cases that may arise. Lamu fishing industry has not experienced cases of “sex for fish” |

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| the fish landing site. | and the setup of this landing site may not expose women to SEA during operation. However, the BMU members will be sensitized on SEA and have a GRM committee to enforce adherence to this code during construction. |
| **HIV/AIDS Awareness** | The construction works have a potential to attract migrant skilled workers. Due to staying for long periods away from their families there is a likelihood of them engaging in unprotected sexual activity with locals with a risk of HIV/AIDS exposure. The contractor will sensitize workers on HIV/AIDS awareness and ensure there are condom dispensers within the work site. Workers will be encouraged to know their HIV status and those interested will be facilitated to access Mokowe sub-district hospital for screening. |
| **Labour Issues:**<br><br>The community members wanted the contractor to give local youth opportunities for non- and semi-skilled workers | The NPCU and the County Government of Lamu will negotiate with the contractor to consider local youths for non-skilled opportunities within the contract. |

**Impacts of the Project**

The construction of the proposed landing site facilities is anticipated to have both negative and positive impacts on; county fisheries infrastructure development, contribution to the blue economy, economic empowerment, to the environment and on the society in general, as indicated in chapter 6 of this report.

***Positive Impacts***

The project is anticipated to have an overall positive impact, particularly in enhancing the county fisheries infrastructure development, and contribution to the blue economy in the county and improving the socio-economic potential of the community at Mokowe. Some of the positive impacts are; Contribution to improved management of priority fisheries and mariculture, enhance general economic development, Provision of employment opportunities, maximize employee satisfaction, improve work productivity, Opportunity to provide state of the art facilities and improved working relationship with fisher folks, business opportunities, and centralization of fisheries data collection point.

***The Negative Impacts***

The proposed project is anticipated to have some negative impacts. Some of the negative impacts are; Occupational Health and Safety (*accidents and Injuries*), Public health and safety (*accidents and Injuries*), Leakages and oil spills, Noise and vibrations, Air pollution, Solid Waste generation, Waste water generation, Fire Hazards, Increased Energy consumption, Gender-based violence at community level, Increased Water consumption, Risk of Spread of HIV/AIDS, increase in Grievances, Child Labour risk, Gender Equity in allocation of roles and responsibilities, Sexual Harassment and abuse amongst workers in the workplace, Gender-based violence at community level, GBV: Sexual exploitation and abuse (SEA), Spread of COVID-19 amongst community members during consultation processes and Spread of COVID-19 during construction at work sites. Measures have been put in place to mitigate the negative impacts at construction, operation stages and decommissioning phase as indicated in tables Table 0-2.

**Table 0-2: Environmental and Social Management Plan During Construction**

| ASPECT | MITIGATION MEASURES |
|---|---|
| **Occupational Health and Safety (*accidents and Injuries*)** | ▪ Contractor to complete hazard identification and risk assessment develop a site occupational health and safety action plan detailing safety measures/procedure, equipment to be used, emergency procedures, restriction on site and personnel responsible for safety inspections and controls. This shall be ready and approved by the joint supervising committee before commencing of the proposed works<br>▪ Contractor shall hire and retain a duly qualified construction environment safety and health officer throughout the construction period, to ensure implementation of the safety plan. The Health and Safety Specialist to prepare an Emergency Preparedness and Response Plan for the contractor<br>▪ Train workers on safety and first aid skills before commencing works<br>▪ Encourage daily tool box talks on potential OSH hazards and mitigation measures.<br>▪ Ensure safety of the construction workers by putting fully equipped first aid facility, and having trained first aiders among the workers and injury reporting mechanism. The ration of first aiders to works shall be in line with the OSHA First Aid Rules.<br>▪ Provide appropriate personal protective equipment (PPE) to workers and training on appropriate use. (Reflective jackets, helmets, face masks, ear plugs gloves, safety boots, fall arrestors, welding masks etc.). The safety plan shall identify the mandatory PPEs by the tasks performed.<br>▪ Adequate provision of requisite sanitation facilities for human waste disposal for workers on site<br>▪ Ensure the work place is registered by Directorate of Occupational Health and Safety (DOHS) and maintain the log of all injuries that occur on site in the incident register, corrective actions for their prevention as appropriate.<br>▪ The contractor is required to have WIBA insurance policy to compensate workers in the event of injuries.<br>▪ Provide clean drinking water for the workers to mitigate against dehydration.<br>▪ Have an understanding with a nearby health facility for emergency cases on-site before decisions are made.<br>▪ Adherence to Covid-19 rules/guidelines as provided from time to time by the |

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| | ministry of health and the bank with provision of easily accessible and adequate covid-19 PPE to all persons on site. The specific action to be captured in the contractor ESMP.<br>▪ Training of workers on covid-19 rules and requirements.<br>▪ As applicable, only qualified personnel shall be allowed to operate construction equipment's on site that may require specialized skills. |
| **OHS risks from working above and falling into deep waters** | ▪ To the extent possible, consider working during low tide periods or use pilling for the foundations<br>▪ The workers to be provided with appropriate footwear to reduce the risk of slipping.<br>▪ Ensure workers are provided with life jackets and enforce use at all times when exposed to sites or working under deep waters<br>▪ Ensure workers working on such sites are experienced swimmers<br>▪ Train workers in safety measures when working above deep waters<br>▪ Avoid working at night to reduce cases of drowning<br>▪ Having rescue teams on site in the event of an accidents<br>▪ Provide necessary information on rescue during emergencies. |
| **Public health and safety (*accidents and Injuries*)** | ▪ Ensure the safety of visitors and operators at the landing site by providing safety signs at strategic places around the access roads.<br>▪ Hoarding off working sites to protect the public or unauthorized persons from entry.<br>▪ Use of signs and warnings on sites on areas with high risks.<br>▪ Reduce unnecessary speeding to 30 KPH by the construction vehicles to control for accidents from the movement of pedestrians in the area and particularly Mokowei jetty access road.<br>▪ Prior creation of awareness and sensitization of the public and the operators at the site of any activities that is likely to have an impact in adequate time (*2 weeks)* before commencement.<br>▪ Implement Grievance mechanism and use feedback to improve any management measures as may be necessary. |
| **Visual/ aesthetic Impacts** | • Cleaning of the site and organized siting different construction materials.<br>• Backfilling of soil cuttings<br>• Landscaping of the project site<br>• hoarding of the construction site using appropriate screening materials |
| **Leakages and spills** | ▪ All areas where fuel and hazardous chemicals are stored must be concretized and bunded<br>▪ In the event of hazardous waste leakage or spills, engage authorized waste handlers to dispose of contaminated soils.<br>▪ Disposing of contaminated soils in cutting pit if volumes are low.<br>▪ Use of NEMA licensed hazardous waste handlers to dispose off in licensed disposal areas.<br>▪ Development of site-specific incident management or response plan.<br>▪ Use of an authorized garage or fuel station in the project area by the contractor.<br>▪ No servicing of construction equipment shall be undertaken on site. For emergency works, fuel and oil trays shall be used. |
| **Excessive Noise** | • The contractor to use equipment with low noise levels or fitted with silencers where appropriate.<br>• Regular servicing of the equipment to reduce the possibility of noise from worn-out parts.<br>• Informing the public about the possibility of unusual noise levels, particularly to |

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| | residents and those operating at the site, whenever working on such activities.<br>• Ensure adherence to PPE by workers[2] working on excessive noise and vibration activities<br>• Minimize unnecessary hooting and speeding by construction vehicles.<br>• Restricting noisy activities to be during the day and no noisy activities should be conducted on site at night.<br>• Regular measurement of noise levels and devising control measures. |
| **Air pollution** | • Vehicles to be used on-site to meet NEMA emission standards as required under NEMA air quality regulations.<br>• Reduce unnecessary speeding or idling of construction vehicles<br>• Use of non-lead paints during construction.<br>• Adherence to proper uses of PPE by the workers, especially those working on activities requiring mixing of cement.<br>• Inform the public and residents about activities with possibility of unusual air pollutants<br>• Use of silt screens to reduce dust from site.<br>• Consider wetting all the sand or soil materials being transported to or from the construction site. Where appropriate, cover the materials being transported to avoid being blown by the wind during transportation. |
| **Solid Waste generation** | • Provision of mobile sanitation facilities for adequate human waste management[3] during the construction phase for workers and persons on site.<br>• Promotion and adoption of the principles of waste avoidance, reduction, reuse and recycle. Through avoiding unnecessary generation of waste, use of debris for backfilling where possible, use of waste materials on-site for other purposes where appropriate, or selling to recycling merchants.<br>• Construction workers should be sensitized on appropriate waste handling and disposal of all construction related waste in designated areas<br>• Designate proper waste transfer stations onsite with adequate waste receptacles that encourage segregation and controlled access.<br>• Seek appropriate approvals from NEMA and County Government on management and Disposal of the waste[4].*(this may include using authorized disposal sites, use of NEMA authorized waste pickers/transporters, acquiring dumping certificates, and keeping proper records or use of authorized vehicles to ferry waste from site)*<br>• Consider formulating a site-specific waste management plan informed by waste characterization[5].<br>• Observing waste management standards proposed under NEMA waste management regulations 2006. *( with a particular focus on waste separation and management before disposal)* |
| **Risk of Spread of HIV/AIDS and other STIs** | • Promote STI and HIV/AIDS Prevention messaging<br>• Access to safe sex (condoms-Male and female)<br>• Provide separate sanitary convenience to male and female workers<br>• Provide HIV testing services at the construction site or an MoU with an existing government health facility in the area. |

[2] The measure should be according to the law (Occupation safety and health Act 2007, National Construction Act
[3] According to the Public Health Act Cap 242, 2012 and Occupation safety and Health Act 2007 requirements
[4] Waste management and disposal procedures need to be in accordance to waste management standards proposed under NEMA waste management regulations of 2006 (legal notice 121).
[5] Waste characterization should consider waste from construction site and the contractors' camp if any.

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| | • Support infected workers with access to ARVs from local public health facilities especially those open about their status.<br>• Assist workers access peer counseling services at the nearest health centre to the site |
| **Grievances** | • Establish grievance redress committees at the site<br>• Ensure that there is a trained focal person to facilitate the receipt and management of the grievance resolution process<br>• Ensure contractor staff grievance structures exist<br>• Sensitization and awareness creation among workers and the public on grievance redress mechanisms in place |
| **Effects of Immigrant workers** | ▪ Contractor should use the local workforce as much as possible (preference to local community members on skills locally available).<br>▪ Effective community engagement and strong grievance redress mechanisms on matters related to labour<br>▪ All workers to sign an employment contract including a Code of Conduct governing appropriate behaviour<br>▪ The workforce should be sensitized to local social and cultural practices and be educated on the expected behaviour and conduct<br>▪ Contractor should prepare and enforce a No Sexual Harassment and Non-Discrimination Policy<br>▪ Contractor should prepare and implement a gender action plan<br>▪ The contractor as part of the C-ESMP will Prepare labor Management Plan (LMP ) that included mandatory requirement to procure all unskilled (and as much as possible, semi-skilled) labour as well as locally available materials from the local community while ensuring equal pay for equal work for men, women and people with disability |
| **Child Labour and Protection** | ▪ Ensure no children are employed on site in accordance with national labour laws. This can be done through incorporating prohibitive provisions in the code of conduct and also having the recruitment policies that prohibits child labour.<br>▪ Ensure that any child sexual relations offenses among contractors' workers are promptly reported to the police.<br>▪ Ensure that the CoC and the employment contract has clear measures in dealing with such contraventions |
| **Gender Equity, Sexual Harassment and abuse amongst workers in the workplace** | ▪ The contractor will strive to ensure equitable distribution of employment opportunities between men and women.<br>▪ The contractor should prepare and enforce a No Sexual Harassment and Non-Discrimination Policy<br>▪ Provision of gender disaggregated bathing, changing, sanitation facilities<br>▪ Whenever harassment are recorded on site, the contractor should ensure prompt and effective remedial action<br>▪ The employees should be trained and sensitized on appropriate behavior<br>▪ All workers should sign a code of conduct<br>▪ Sensitization and awareness creation<br>▪ Measures that will allow for the uptake of complaints without the fear of retaliation (whistle blower policy) |
| **Gender-based violence at community level** | ▪ The contractor will implement provisions that ensure that gender-based violence at the community level is not triggered by the Project, including:<br>▪ Effective and on-going community engagement and consultation, particularly with women and girls;<br>▪ Review of specific project components that are known to heighten GBV risk at the |

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| | community level,<br>▪ Specific plan for mitigating these known risks, e.g. sensitization around gender-equitable approaches to employment, representation, management, school pupils etc<br>▪ The contractor will ensure adequate referral mechanisms are in place if a case of GBV at the community level is reported related to project implementation. |
| **Sexual exploitation and abuse (SEA)** | ▪ Develop and implement a SEA/SH prevention and response Action plan with an Accountability and Response Framework as part of the ESMP. The SEA action plan will follow guidance on the World Bank's Good Practice Note for Addressing Gender-based Violence in Investment Project Financing.<br>▪ The SEA action plan will include how the project will ensure necessary steps are in place for:<br>▪ Prevention of SEA: including CoCs and ongoing sensitization of staff on responsibilities related to the CoC and consequences of non-compliance; project-level IEC materials;<br>▪ Response to SEA: including survivor-centred coordinated multi-sectoral referral and assistance to complainants according to standard operating procedures; staff reporting mechanisms; written procedures related to case oversight, investigation and disciplinary procedures at the project level, including confidential data management;<br>▪ Engagement with the community: including development of confidential community-based complaints mechanisms discrete from the standard GRM; mainstreaming of PSEA awareness-raising in all community engagement activities; community-level IEC materials; regular community outreach to women and girls about social risks and their PSEA-related rights;<br>▪ Management and Coordination: including integration of SEA in job descriptions, employments contracts, performance appraisal systems, etc.; development of contract policies related to SEA, including whistle-blower protection and investigation and disciplinary procedures; training for all project management; management of coordination mechanism for case oversight, investigations and disciplinary procedures; supervision of dedicated PSEA focal points in the project and trained community liaison officers. |
| **Spread of COVID-19 amongst community members during consultation processes** | • Electronic means of consulting stakeholders and holding meetings shall be encouraged, whenever feasible. One-on-one engagements with stakeholders while observing social distance and adhering to PPE wearing shall be enforced;<br>• The team carrying out engagements within the public on one-on-one basis will be provided with appropriate PPE for the number of people and stakeholders they intend to meet.<br>• Use traditional channels of communications (TV, newspaper, radio, dedicated phone-lines, public announcements and mail) when stakeholders do not have access to online channels or do not use them frequently. Ensure to allow participants to provide feedback and suggestions.<br>• Hold meetings in small groups, mainly in form of FGDs if permitted depending on restrictions in place and subject to strict observance of physical distancing and limited duration.<br>• In situations where online interaction is challenging, disseminate information through digital platform (where available) like Facebook and WhatsApp & Chat groups.<br>• Ensure online registration of participants, distribution of consultation materials and share feedback electronically with participants. |
| **Spread of** | • The Contractors will develop standard operating procedures (SOPs) for managing the spread of Covid-19 during project execution and submit them for the approval of the |

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| **COVID-19. During construction at work sites** | Joint Supervision committee and the client, before mobilizing to site. The SOPs shall be in line with the World Bank guidance on COVID-19, Ministry of Health Directives and site-specific project conditions;<br>• Mandatory provision and use of appropriate Personal Protective Equipment (PPE) shall be required for all project personnel including workers and visitors;<br>• Install hand washing facilities with adequate running water and soap, or sanitizing facilities at entrance to work sites including consultation venues and meetings and ensure they are used;<br>• Ensure routine sanitization of shared social facilities and other communal places routinely including wiping of workstations, door knobs, hand rails etc.; |
| **Labour Related disputes** | • Prioritize to the extent possible recruitment of local labor<br>• Adherence to labor laws and practices such as the working hours, payment, and no child/forced labor in their workforce<br>• No child labour is allowed on site, children below 18 years shall not be employed in dangerous work.<br>• Ensure the workers have contracts with terms and conditions consistent with national labour laws and policies<br>• The Contractor shall keep complete and accurate records of the employment of labor at the Site to include the names, ages, genders, hours worked, wages paid to all workers |
| **Security Risks** | • Implement a comprehensive security protocol including round-the-clock surveillance, secure fencing, and controlled access points to protect the construction site and personnel from potential terrorist threats and sabotage activities.<br>• Staff Safety Protocols and Training: Develop and enforce strict travel and safety protocols for all personnel, especially for those coming from outside the region.<br>• Provide regular training on security awareness, emergency response, and hostage survival strategies to prepare staff for potential security incidents.<br>• Community Engagement and Local Hiring: Foster goodwill and mitigate the risk of local unrest by actively engaging with the community, understanding their concerns, and prioritizing the hiring of local labor for construction activities.<br>• Establish strong lines of communication and collaboration with National Police Service - law enforcement and national security agencies to benefit from their intelligence, support, and rapid response capabilities in case of a security incident.<br>•<br>• Emergency Preparedness and Response Plan: Create a detailed emergency response plan that includes procedures for evacuation, communication, and crisis management in the event of a security incident.<br>• Conduct regular drills to ensure that all construction personnel are familiar with the plan and can act swiftly and efficiently under pressure. |

**Table 0-3: Environmental and Social Management Plan (ESMP) during Sub-project Operation**

| ASPECT | MITIGATION MEASURES |
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| **Occupational Health and Safety (*accidents and Injuries*)** | • Ensure compliance to Occupational Safety and Health Act Cap. 514 and its Subsidiary Legislations standards including: registering all the proposed sites as work place *modern fish Banda*, *Ablution Block*, constituting a safety committee, providing first aid facilities, conducting emergency drills and annual landing site safety audits.<br>• Provide personal protective equipment (e.g gloves with thermal liners, chaps, safety helmet with thermal liner, thermal hoods, face protectors, insulated safety boots, use of thermal socks etc) to operation and maintenance workers who will be working at the proposed cold room and ice making plant.<br>• Sensitization and awareness creation among workers on proper use and maintenance of cutting equipments and provision of protective equipment (metallic gloves, leather aprons and rubber soles.<br>• ness creation among workers on proper use and maintenance of cutting equipments and provision of protective equipment (metallic gloves, leather aprons and rubber soles.<br>• Demarcate the working space for different activities to minimize flow of processes from crossing.<br>• Employing workers who are physically fit (those who do not have a pre-existing medical condition such as asthma or arthritis)<br>• Tasks rotation for workers working in cold conditions<br>• Sensitization and Awareness on cold condition hazards and symptoms to workers.<br>• Equip cold stores and chill stores with strip curtains to avoid extensive drafts when doors are open<br>• Conduct regular health monitoring to workers working in the cold room.<br>• Recording all injuries that occur on-site to workers while doing their daily duties in the incident register, corrective actions for their prevention should be initiated as appropriate.<br>• Creation of awareness and training of fishers on site on safety and first aid skills by KeFS and coast guards for those who engage in deep sea fishing.<br>• Hiring employees with proper qualifications for specialized and risky tasks during operation and maintenance of the various utility systems.<br>• Adherence to Covid-19 rules as provided by the ministry of health and the Bank while conducting daily duties.<br>• Providing requisite PPE (face mask and gloves for those handling Covid-19 symptomatic patients) and training of workers on covid-19 rules and requirements.<br>• The workers to be rotated to reduce exposure to allergens<br>• Use of gloves particularly while working with fish species known to create allergic reactions<br>• Avoid aerosol-generating activities and proper ventilation of working space. |
| **Public health and safety (*accidents and Injuries*)** | • Constitute a committee on fish landing site management, public safety, sanitation and hygiene<br>• Cordoning off working sites to protect the public or unauthorized persons during repair and maintenance of the different utility systems on site<br>• Provide concrete rails for the jetty to reduce cases of falling<br>• Having a rescue team on site at all time for quick response in case of falling.<br>• Provide adequate lighting to avoid falling and drowning during dark periods for fishers delivering fish at night or early morning when dark<br>• using signage during cleaning, maintenance, or repair to warn the public<br>• Easily accessible fire risk information to the public visiting the landing site |

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| | • Employment of workers certified by the public health officers.<br>• Regular inspection of the fish handling and processing facility by the public health officers.<br>• Sensitization and awareness creation to workers on hygienic handling of the food items at the fish processing facility.<br>• Restriction of non-authorized persons from accessing the fish processing area<br>• Observe disinfection requirement by workers before entry in the fish processing area.<br>• Observe the use of requisite clothing while in the processing facility to avoid contamination.<br>• Regular inspection and repair of the jetty to detect any corroding steel reinforcing the jetty.<br>• Consider protecting the steel using marine paint before concreting the pillars.<br>• Regular monitoring of the conditions of the jetty<br>• Regular maintenance to ensure the structural integrity of the jetty by repainting, replacing worn out or damaged materials. |
| **Solid Waste generation** | • To determine and characterize the amount of fish waste to be generated at the banda<br>•<br>• Sensitization and awareness creation among the landing site users, Mokowe BMU and visitors on the significance of waste separation and in addition provide for waste sorting bins at the landing site with clear labeling.<br>• Promote the use of accredited fishing gears to minimize catch of non-target species<br>• Provide for a waste transfer station (through waste bins) at the landing site for temporal holding of waste before final disposal.<br>• To engage the county government environment and natural resources department mandated with waste management to collect and properly dispose of the waste.<br>• Conduct regular cleaning of the jetty to remove debris and sediment<br>• Sensitization and awareness creation among fishers on reducing capturing non-targeted species.<br>• Recovering of waste streams by adopting the fish processing operation appropriately<br>• Reprocessing the fish waste to fish meals and oils<br>• Recovering proteins from waste water and using for improving animal feeds |
| **Hazardous waste management** | • Procuring and using of durable equipments requiring less replacement by reducing frequency replacement needs<br>• Adoption of solar equipments that are easily repairable and recycling friendly components to reduce the amount of waste generated and pumped into waste management systems<br>• Adopting solar equipment with less hazardous sub-stances by reviewing the environmental health and safety and going for preferred alternatives with less hazardous substances<br>• Use the solar equipment suppliers and servicing logistics to collect and safe disposal of obsolete component after replacement.<br>• Early identification of solar e-waste collection and recycling locally<br>• Consider partnering with NEMA local office for safe collection and disposal of the e-waste. |
| **Noise and Vibration** | • Consider procuring the power backup generator to ensure that the ones with least noise impacts are procured, and using silencers/muffle<br>• Regular servicing of the power backup generators. |

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| **Air Pollution** | • Keep working and storage areas clean at all times<br>• Empty and clean fat traps on regular basis<br>• Store waste products in cold, closed and well ventilated places and for short periods<br>• The waste transfer systems, waste water canals, and water treatment facilities to be covered as a means of reducing the escape of foul smell<br>• To install catalytic devices on the power backup generator to ensure complete burning of waste gases,<br>• Use of clean petroleum that is low in sulphur, lead or other fuel additives,<br>• Proper servicing of generator and other equipment using fuel,<br>• Plant more vegetation as part of beautification and landscaping for carbon sequestration, |
| **Leakage and spillage (generator room and fuel storage areas)** | • Incorporate secondary containment unit within the generator fuel storage<br>• Cleaning the backup generator regularly and checking for leaking parts which if spotted should be tightened if loose or replaced immediately<br>• Regular servicing of the generator to avoid spillage<br>• Cleaning up fuel spills immediately it occurs and disposing off fuel-soaked absorbent materials. The absorbent materials will be maintained on site for emergency use. |
| **Waste water generation** | • Ensure adequate and accessible provision of sanitation facilities and ensure they are regularly cleaned,<br>• Regular sensitization and awareness to users to discourage releasing detergents or other chemical solutions in black water system.<br>• Regular cleaning of the wastewater drainage system<br>• Regular and proper maintenance of the drainage system<br>• Prompt response to any reported blockage and leakages<br>• Sensitization and awareness of users from discharging or emptying any oils to the sewer system particularly from the boat yard.<br>• Treating the waste water through a bio-digester and using the water for landscaping.<br>• Fit grids and screens or traps to remove solid waste from waste water<br>• Application of sludge from waste water treatment as fertilizers by local farmers |
| **Fire Hazards** | • Provide for fire risk and appropriate response equipment (fire extinguishers) as well as signage with short and clear information on fire assembly point, fire exit points, and instructions on how to use fire extinguishers, measures to take, in the event of a fire and the contact to report in the event of a fire.<br>• Train selected staff as fire marshals who can take lead in case of fire emergency in the building<br>• Regular fire drills for the building users<br>• Regular awareness and sensitization on fire safety measures and response to the users of the building.<br>• Clear fire incidents reporting procedures and response. Ensure regular provision of operational emergency reporting contacts.<br>• Regular servicing and maintenance of the fire extinguishers on site.<br>• Ensuring availability of adequate water resources at the landing site at all times for the hydrants as per the OSHA requirements. |
| **Increased Water consumption** | • Sensitization and awareness creation among users of the structures at the site on significance of water conservation measures.<br>• Use of water efficient appliance such as delay taps<br>• Regular maintenance and prompt response to leakage in the water system. |

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| | • Use of alternative water sources eg rain water harvesting<br>• Prompt reporting of leakages through sensitization of the public members<br>• Storage tanks to have floaters to reduce wastage from spills when the tanks are full<br>• Use of cleaning detergents that do not adverse impacts |
| **Increased Energy consumption** | • Sensitization and awareness creation among building users on the significance of energy conservation measures<br>• Sensitization and awareness creation among the maintenance team to continue observing the use of energy-saving electrical appliances on the building.<br>• Proper and regular maintenance of the green energy appliances and equipment provided for in the design of the building.<br>• Monitor energy consumption and keep records<br>• Adopt the alternative sources of energy such as solar<br>• Maximize the use of natural light and ventilation<br>• Adoption of equipment with cooling efficiency for the fish banda.<br>• Increase the use of energy efficient equipment for the fish banda |
| **Spread of COVID-19. During operation at work sites** | • The county departments of fisheries to develop Standard Operating Procedures (SOPs) for managing the spread of Covid-19 during landing site operation and submit them for the approval by the county department of public health before use of the building. The SOPs shall be in line with the World Bank guidance on COVID-19, Ministry of Health Directives and site-specific conditions;<br>• Mandatory provision and use of appropriate Personal Protective Equipment (PPE) shall be required for all landing site users including visitors;<br>• Install hand washing facilities with adequate running water and soap, or sanitizing facilities at building entrance including consultation venues and meetings and ensure they are used;<br>• Ensure routine sanitization of shared social facilities and other communal places routinely including wiping of workstations, door knobs, hand rails etc.; |

**Table 0-4: Environmental and Social Management Plan (ESMP) during Decommissioning.**

| ASPECT | MITIGATION MEASURES |
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| **Occupational Health and Safety (*accidents and Injuries*)** | • Preparation of project decommissioning plan.<br>• Ensure the safety of the decommissioning workers by putting first aid area and injury reporting mechanism<br>• The contractor should consider having a WIBA insurance policy to compensate workers in an event of an accident on site.<br>• Provide personal protective equipment to workers.<br>• Recording all injuries that occur on site in the incident register, corrective actions for their prevention.<br>• Cordoning off demolition sites to protect the public or unauthorized persons<br>• use of signs and warnings on sites with high risks<br>• Creation of awareness and training of workers on-site on safety and first aid skills.<br>• Hiring employees with proper qualifications for specialized and risky tasks.<br>• Ensure compliance to Occupational Safety and Health Act Cap. 514 and it's Subsidiary Legislations. |
| **Occupational** | • Decommissioning of the jetty should be done during the low tides to the extent |

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| **health and safety risks while working in waters** | possible<br>• The workers to be provided with appropriate footwear to reduce the risk of slipping.<br>• Ensure workers are provided with life jackets and enforce use at all times when exposed to sites or working under deep waters<br>• Ensure workers working on such sites are experienced swimmers<br>• Train workers in safety measures when working above deep waters<br>• Avoid working at night to reduce cases of drowning<br>• Having rescue teams on site in the event of an accidents<br>• Provide necessary information on rescue during emergencies. |
| **Leakages and spills** | • In the event of hazardous waste leakage or spills, engage authorized waste handlers to dispose of contaminated soils.<br>• Disposing of contaminated soils in cutting pit if volumes are low.<br>• Use of NEMA licensed waste handlers to dispose of in licensed disposal sites.<br>• Development of site-specific incident management or response plan.<br>• Use of an authorized garage or fuel station in the project area by the contractor or specific concrete and oil traps should be constructed at the contractor's yard. |
| **Excessive Noise** | • Adequate use of PPE by the workers e.g. earplugs<br>• Working on and restricting noisy activities during the day<br>• Reducing the duration of exposure of workers to high occupational noise levels during demolition.<br>• Acquisition of permits/Licenses for any activity with high noise levels eg drilling of walls or slabs for demolition.<br>• Using models of machines and equipment with low noise levels.<br>• workers using drilling or handheld pneumatic equipment to be provided with specialized anti-vibrating gloves,<br>• Switching off vehicles and machines when not in use,<br>• Avoiding unnecessary hooting,<br>• Warnings to be issued to the locals in case of any unusual noise levels,<br>• Ensure that NEMA noise and Vibration standards are observed in all project activities. |
| **Air pollution** | • Workers to use masks when working in dusty conditions during the decommissioning process.<br>• Use all means possible to suppress dust if considered to be a menace during demolishing of obsolete walls or structures on-site |
| **Solid Waste generation** | • Proper disposal of any hazards waste from the decommissioned site.<br>• Preparation of waste management plan to guide waste management and disposal activities of all debris from demolition activities.<br>• Disposal of debris to NEMA authorized damping sites<br>• Use of certified vehicles or NEMA licensed waste disposal firms for waste management and disposal<br>• Demolition to be done during low tide |
| **Spread of COVID-19. During construction at work sites** | • The Contractors will develop standard operating procedures (SOPs) for managing the spread of Covid-19 during project decommissioning and submit for approval to the county department of public, before mobilizing to site. The SOPs shall be in line with Ministry of Health Directives and site-specific project conditions;<br>• Mandatory provision and use of appropriate Personal Protective Equipment (PPE) shall be required for all project personnel |

- Install hand washing facilities with adequate running water and soap, or sanitizing facilities at entrance to work sites including consultation venues and meetings and ensure they are used;
- Ensure routine sanitization of shared social facilities and other communal places routinely including wiping of workstations, door knobs, hand rails etc.;

**ESMP Implementation and Institutional Management**

The implementation of the proposed measures shall include the client State Department for Blue Economy and Fisheries (SDBE&F) through NPCU, the Joint Project Supervision Committee, the supervising consultant, Lamu County government through the CPIU and the contractor who is expected to have an environment, health and safety officer to implement and report on safeguard requirements. Reporting on implementation activities of the proposed improvement of Mokowe landing site infrastructure shall be done at several levels. The sub project supervising consultant in liaison with JPSC shall be in charge of the daily reporting on site on behalf of the client (SDBE&F). The supervising consultant shall in consultation with the contractor's team prepare all the required reports including site meeting minutes and submit to the client (SDBE&F). In addition, the sub-project supervising consultant and the contractor will be required to promptly report any major incidents on site to SDBE&F and relevant authorities as soon as possible. SDBE&F will subsequently report to the Bank, within 24 hrs of the incident occurrence.

The progress reports prepared by the supervising consultant shall be on monthly and quarterly basis. On behalf of the client (SDBE&F), the County and NPCU safeguard specialists shall review the reports and submit to the World Bank for concurrence and guidance. The supervising consultant shall guide the contractor's Environment, Health and Safety Officer in preparing the C-ESMP to guide the implementation of safeguards requirements. The supervising consultant's safeguards officer shall on a daily basis during project implementation supervise the implementation of the C-ESMP, and ESMoP. NPCU Environmental and Social safeguards specialists shall also conduct regular and impromptu monitoring to ensure that all the requirements of the World Bank and National laws are adhered to as captured in the C-ESMP and ESMoP. Although the estimated cost for the implementation of the ESMP and ESMoP is about 5.32 M, the actual costs shall be prepared by the contractor and captured in the C-ESMP. Provisions for the construction phase ESMP will be incorporated in the work's bid documents.

**Conclusion**

In spite of the Fisheries sector being critical in Lamu County, it remains underdeveloped with inadequate infrastructural development. The fisheries sub-sector in the County contributes to over 70% of households' income with an estimated annual turnover of about KES 1.5billion. Infrastructure development remains one of the key areas of focus if the fisheries sub-sector is to be transformed for socio-economic development in the County. Mokowe is an exit point to the market for fish from Lamu and as far as to the border with Somali, but due to lack of infrastructure, the site is faced with a myriad of challenges. Improvement of the landing site shall

therefore be an enabler towards sustainable management of the fish stock and private sector interest and investment in fisheries management. The project has generally positive impacts and for the negative impacts, readily implementable mitigation measures have been proposed. The proposed project area was noted to be a highly modified habitat through anthropogenic activities mainly from settlement and commercial activities. The environmental and social assessment findings indicate that the project impacts are of low impacts. The implementation of the project therefore is not anticipated to significantly influence the physical, biological and social environment. It was further noted that the anticipated impacts shall be of low magnitude due to the size of the project and with mitigation measures having been proposed in this report.

**Mandatory Requirements**

The development of the proposed Mokowe landing site is anticipated to have negative impacts socially and to the physical environment. In spite of the anticipated environmental and social impacts, with proper mitigation measures, the project is environmentally viable. The environmental assessment team proposes the implementation of the sub-project with the following requirement for the sub-project;

- The construction contract shall be between the National Project Coordination Unit of the State Department of Blue Economy and Fisheries, (SDBE&F) and the contractor
- The subcontracts of the contractor will be accepted and cleared by the supervising consultant in charge of the supervision of the works in liaison with JPSC. The supervising consultant will be responsible to ensure that the subcontractors enforce and apply all measures included in this ESIA, including the Environmental Technical clauses attached in the bidding document and contracts.
- The sub-project supervising consultant to ensure full implementation by contractors and subcontractors of the ESMPs during construction/implementation stage
- The contractor's project Engineer and the Environmental, Health and Safety Manager in charge of Environmental and Health and Safety, Labor and Social safeguards officer to prepare a Construction ESMP incorporating safety, as well as emergency preparedness and response plan, to be implemented in construction by the contractor and all its subcontractors.
- The supervising consultant in consultation with the contractor's project Engineer and the Environmental, Health and Safety Manager in charge of Environmental and Health and Safety, Labor and Social safeguards officer to prepare an Operation ESMP (EMoP) to guide the operation and maintenance of the structures and plants, Mokowe BMU and Lamu County fisheries department to do so during operation and decommissioning stages of the project as required.
- The Supervision consultant and the contractor to ensure that the ministry of health and world bank covid-19 guidelines are implemented to the latter at the project site during the construction period and that all the workers commit to observing the rules. The Department of Fisheries, Mokowe BMU and the CPIU to ensure the covid-19 rules are adhered to during operation of the facilities. Covid-19 virus remains dynamic and unpredictable

- The project contractor and Supervision consultant to ensure that compliance with Grievance Redress Mechanism (GRM) and sensitization and awareness is created among construction workers, contractor, subcontractors and the general public, on project GRM structures in place in the event of a need to address or report any emerging issues or any complains by any aggrieved part in the area, and separate mechanism for reporting any Gender based violence and Sexual Exploitation Abuse on site.

# 1. INTRODUCTION

## 1.1. Background

Management of priority fisheries stocks and availability of functioning public landing-site infrastructure play a critical role in; centralizing data collection for fisheries management, enable enforcement of compliance, stimulate private sector interest in the fisheries sub-sector, contributing to job creation, strengthening coastal communities' livelihood, attract high market, increased household income, increase food security, increase the value of fish traded, minimizing post-harvest fish losses and strengthening capacity of community institutions responsible for fishery management. Yet it's an area that remains a major concern to Kenya fisheries sector management. It is in light of this that the Government of Kenya, through SDBE&F requested the World Bank to support the development of the sector through the Kenya Marine Fisheries and Socio-Economic Development (KEMFSED) project as means to exploit the potential and attain economic benefits from the coastal and marine resources. The project aim is to enhance the blue economy sector in supporting coastal livelihoods and contribute to food security. As part of the efforts under KEMFSED project to strengthen community fisheries management institutions established under the Fisheries Management and Development Act, 2016, funding has been committed for the development of landing sites infrastructure. Improvement of the landing sites is an enabler towards sustainable management of the fish stock and private sector interest and investment in fisheries management. Mokowe landing site in Lamu County, Lamu West at Mokowe jetty area is one of such facilities that remains unimproved in spite of its potential to contribute to the objectives of the blue economy.

Lamu County has high marine fisheries potential but with inadequately developed landing sites. Mokowe fish landing site is among the few landing sites in Kenya that is critical for development of marine fisheries management not only to Lamu County but to the nation at large. The landing site is strategically located as a gateway to Lamu fisheries activities, and under Lamu County fisheries department and Mokowe BMU. Mokowe is an exit point to the market for fish from Lamu and as far as to the border with Somali but due to lack of infrastructure, the site is faced with a myriad of challenges including: fishers experiencing low fish prices to avert a lot of post harvest losses due to lack of fish preservation equipments or ice flakes to preserve fish for the transporters particularly during glut periods, the existing fish banda does not have the capacity to handle the potential amount of fish produced in the area hence fishers being left at the mercy of dealers, the landing site lacks sanitation facilities, lack of water supply to the site, lack power connection and lack of meeting area for fishers. Proposals for the construction of a modern fish Banda, Ablution Block and External works, (*Perimeter wall, drainage, landscaping works, access road works, Jetty,* Moving Bed Biofilm Reactor (MBBR), Bio- Reactor and DAF- Dissolved Air Floatation- system *and street light)* at Mokowe landing site, if implemented is anticipated to address some of these issues. There shall be improvement in fisheries management, reduction in post harvest losses, attraction of private sector investors and enforcement of compliance.

The proposed improvement works for Mokowe landing site could have social and environmental implications if not well anticipated and enhanced or mitigated, it is therefore essential to appreciate the environmental and social significance and site conditions likely to be influenced by the sub-project activities, or to influence the project through an assessment. This shall be in line with the World Bank OP/BP 4.01 Environmental Assessment and section 58 of the Environmental Management and coordination Act CAP 387; which requires a project proponent to prepare a comprehensive project report before being permitted to undertake any construction activities with potential harm to the environment or effect to social aspects. This includes observance of related national legislations guiding stakeholder consultation, work place safety, conservation, management and utilization of natural resources.

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## 1.2. The Rationale for the ESIA study

The proposed construction of Mokowe Fish landing site sub-project falls under the World Bank's support to the government of Kenya through investment lending towards transforming and strengthening sectors related to the blue economy, focusing on strengthening fisheries landing site infrastructure. The proposed construction works will thus trigger the Bank's Safeguard Policies *(OP 4.01 Environment Assessment)* which requires undertaking environmental and social due diligence for all sub project activities and preparing environmental and social impact assessment for the sub-projects.

Under section 58 of the Environmental Management and Coordination Act CAP 387, it is mandatory that a proponent prepares a comprehensive project report for the authority to approve any development activities. This includes compliance with the Environment Impact Assessment and Audit Regulations of 2003 and consideration of other national legislations guiding conservation, management, and utilization of natural resources. Therefore, the assessment under this study was to identify significant potential impacts of the sub-project works to the project site's physical, biological, social, and economic aspects.

## 1.3. Objectives and Scope of the ESIA Project Study

### 1.3.1. General Objectives of the ESIA study

The main objectives of the study were to conduct environmental and social assessment for the proposed construction works of Mokowe landing site in line with NEMA and World Bank requirements. The specific objectives of the assessment therefore, focused on;

- Identifying significant potential impacts of the proposed sub-project to the physical, biological, social, cultural, and economic environment during all the project phases (construction, operation and decommissioning).
- Propose mitigation measures to anticipated adverse environment, social and occupational health, and safety impacts throughout all phases of the project while enhancing the positive changes.

- Assess the considerations of climate change adaptation, green building and green energy in the designs of the building ensure the proposed project is environmentally friendly, socially acceptable, and sustainable.

### 1.3.2. The Scope of ESIA Assignment

The scope of the assignment was to;

- Describe the national environmental legislative and regulatory framework for construction and managing the proposed fisheries landing site infrastructure and the associated facilities.
- Description of the proposed sub-project design and proposed works including technology, materials, by products, procedures and processes to be used during construction operation and decommissioning.
- Description of the project area's physical, biological, social, cultural, and economic environment.
- Conduct an assessment of environmental and social impacts due to the proposed construction works.
- Conduct consultations with key stakeholders
- Identify mitigation measures for negative impacts as well as enhancing measures for the positive impacts of the project.
- Develop an environmental and social management plan (ESMP), capturing aspects of gender-based violence GBV, sexual exploitation, and abuse (SEA) and child labor issues.
- Develop an environmental and Social monitoring plan (ESMoP)
- Prepare Grievance Redress Mechanism (GRM)
- Acquire NEMA EIA license

## 1.4. The Study Approach and Methodology

The main approaches applied in the course of collecting environmental and social baseline data, were desktop literature review and field surveys for environmental and social baseline.

### 1.4.1. Stakeholder Identification and Consultation

The identification of key stakeholders - individuals, group of people, or an organization who could affect or be affected positively or negatively by the proposed Mokowe fish Landing site project was undertaken using literature review of the institutional setup and consultative interactions with the public. The analysis of stakeholders involved placing them in categories of (National Government, County Government, Non-Government Organization (NGOs), Project Affected Persons (PAPs) and local communities and assessing the impacts of each group of stakeholders on the project (Strengths, Weaknesses, Opportunities and Threats-SWOT Analysis). According to the EIA requirements and procedure for Environmental Impact Assessment (EIA), the project is required to hold public hearings on the project to seek the views of the people in the communities affected by the project. Public consultation was held on **13th January 2023** in

Mokowe Jetty, Lamu. The participants included BMU officials and members, local communities; local people; CECMs fisheries, Chief officer fisheries, other County authorities and officials; National government institutions (State Depart of Fisheries, Aquaculture and Blue Economy, NEMA, KFS). Methodologies for involving the public were designed and implemented flexibly, adapting and responding to the concerns and proposals of local communities and leaders. Their concerns were considered within the limits cost-effectiveness so as not to cripple the environmental and social assessment budget.

### 1.4.2. Determination of Environmental and Social Baseline Conditions

Environmental and social baseline surveys were conducted within the project area of Mokowe Jetty to establish prevailing biophysical and socio-economic conditions that served as basis for impacts assessment and future monitoring. Baseline conditions were established based on literature review, field biophysical and social surveys, and consultations with relevant stakeholders. Field visits and detailed studies were conducted within the proposed project (Mokowe Fish Landing site), water bodies, and their adjacent territories. The site visits were undertaken on 13th, 14th and 15th January 2023. The different vegetation, climatic parameters, and landscape units were identified and recorded during the site visits. Walk-through-surveys were conducted across project area and all dominant observed plant and animal species were recorded. Literature reviews on information about species (fauna and flora) and associated habitats were also conducted. Review of existing information and data on environmental parameters like rainfall and temperature were undertaken. Review and reference to the existing laws, regulations, policies and working documents relating to biodiversity features to verify how the project conforms to them was also conducted; and consultations with the relevant stakeholders (NEMA, KFS, Fisheries Department, local communities) on the key issues that need special attention and Expert judgment.

### 1.4.3. Historical and Cultural Heritage Assessments

A desktop study (Lamu County CIDP), field surveys (observations and public consultations) were carried out on publicly available scientific publications to determine the archaeological, paleontological, heritage history and location, including tombs, burial sites and genocide memorials of the affected project area. The focus was to illustrate and determine the nature of likely impacts and mitigation recommendations of the proposed development.

### 1.4.4. Socio-Economic Assessment

The consultant compiled the baseline description in the socio-economic aspects in the report. The description of the baseline was produced from a variety of secondary data (such as census statistics from the National Bureau of Statistics, current reports such as County Development Plans, and other documents related to strategic planning) as well as primary data collection through consultation with the locals within the project site and direct observation. Primary information was also provided by the stakeholders who are anticipated to be directly impacted by

the project (fishermen) through public consultation forum. During the phase of impact assessment, socio-economic implications (direct, indirect, and cumulative) that could occur from the construction through operation stages of the project were identified and evaluated. These impacts could be direct, they could be indirect, and they could be cumulative. As the last step of the study, recommendations were made for mitigation strategies that take into account the local context and requirements.

## 1.5. ESIA Project Report Study Team

The Environmental and Social Impact Assessment report for the proposed construction of Mokowe landing site in Lamu County, Mokowe was prepared by a team of officers from KEMFSED NPCU and officers from Lamu county government CPIU. Environmental scoping and subsequent preparation of the Comprehensive ESIA project report were accomplished through several experts' involvement with differing inputs. The ESIA preparation team composition is as indicated in Table 1-1

*Table 1-1: ESIA preparation Team*

| NO | NAME OF EXPERT | POSITION | ORGANISATION |
|---|---|---|---|
| 1. | Muhammed Athuman | County Project Coordinator | CPIU |
| 2. | Antony P. Mbuthia | County Environment Safeguards Officer | CPIU |
| 3. | Joseph Onyango | County Social Safeguards Officer | CPIU |
| 4. | Charles Irungu | Civil/structural engineer | CPIU |
| 5. | Maulama Abubakar | Architecture | CPIU |
| 6. | Abdulfatah Kassim | County Quantity Surveyor | CPIU |
| 7. | Stephen Ndegwa | Fisheries specialist | NPCU |
| 8. | Gladys Okemwa | Fisheries specialist | NPCU |
| 9. | Godfrey Wabomba | Environmental Safeguards Specialist | NPCU |
| 10. | Lazarus Kubasu | Social Safeguards Specialist | NPCU |
| 11. | Juliet Karisa | Marine Biodiversity specialist | NPCU |
| 12. | Stephen Mwangi | Fisheries specialist | NPCU |
| 13. | Richard Ruto | Architect | NPCU |
| 14. | Stephen Angwenyi | Project Engineer | NPCU |

## 1.6. Content and Structure of the Report

### 1.6.1. Purpose of the report

This report is intended to meet the overall assignment objectives of carrying out environmental due diligence for the construction works of the proposed improvement of Mukowe landing site and the associated facilities in accordance with statutory requirements by NEMA on projects under EMCA CAP 387 schedule II. The report will assist NEMA and lead agencies in decision-

making process and ensure that the sub-project activities comply with sound environmental management practices. The report is also intended to assist the project proponent State Department for Blue Economy and Fisheries (SDBE&F), Lamu County Government, Mokowe BMU, Joint Project Supervising Committee (JPSC) and the contractor in their obligation of maintaining environmental integrity during the overall management of the project activities during improvement to a modern fish Banda, Ablution Block and External works, (*Perimeter wall, drainage, landscaping works, access road works, Jetty, bio-digester and street light)* construction, operation and decommissioning. The report is also meant to meet the World Bank safeguards requirements on KEMFSED project to conduct environment and social assessments before undertaking any activities sub-projects.

### 1.6.2. Structure of the Report

The report has been structured in 10 chapters to capture requirements under the project ESMF, VMGF, EMCA CAP 387 and Environmental Impact Assessment and Audit regulations 2003. The report is also consistent with the international best practices as outlined below;

- Chapter 1 introduces the sub-project activities in general, giving the background, project justification, study methodology, and rationale used to achieve the objectives of the study.
- Chapter 2 describes the proposed project design and the various alternatives considered for implementation.
- Chapter 3 highlights the environmental policy, legal and institutional framework that will inform the overall management of the works and its components at various phases of the project cycle.
- Chapter 4 briefly outlines existing environmental baseline information including physical, biological and socio-economic conditions of the project area. The content in the chapter also highlights how the project will influence or be influenced by the baseline conditions,
- Chapter 5 summarizes public and key stakeholder consultative process and the outcomes,
- Chapter 6 give the project impacts both positive and negative impacts associated with proposed project activities at the three phases (construction, operation and decommissioning),
- Chapter 7 presents the project Environmental and Social Management Plan (ESMP) at project constructions, operation and decommissioning,
- Chapter 8 presents Environmental and Social Monitoring Plan (ESMoP),
- Chapter 9 captures the grievance redress mechanism on the sub-project,
- Chapter 10 presents the ESMP assessment team's conclusions and recommendations.

# 2. PROJECT DESCRIPTION

## 2.1. Chapter Overview

This chapter highlights the project location, sub-project objectives, proposed project design, project activities, project resources and by-products, project alternatives and the estimated financial cost for the proposed improvement construction of Mokowe landing site in Lamu County in Mokowe Jetty area.

## 2.2. Project Location

The proposed Mokowe fisheries Landing site is located on a piece of land measuring about 0.75 acre (0.304 hectares) owned by department of fisheries under Lamu County Government, the land ownership documents are as attached in Annex II. The proposed project is located in Lamu County, Lamu West Sub- County, Hindi East ward, Mokowe location and in Mokowe Sub-location. The Landing site is located next to Mokowe Jetty in Mokowe area as shown Figure 2-1 from a Google image with the GPS coordinate of the project site being Latitude 2°14'31.15"S and Longitude 40°52'15.81"E.


*Figure 2-1: Google image of Mokowe Landing Site location*

## 2.3. Sub-Project Development Objectives

The support for improvement and construction of Mokowe landing site under KEMFSED is aimed at improving fisheries management in Lamu County by enhancing centralized fisheries data collection and enforcement of compliance with the Fisheries Act within Lamu County. The construction of Mokowe landing site is therefore anticipated to contribute towards enhancing fisheries management in Lamu County and the nation in general.

## 2.4. Justification of the Project

In spite of the high amount of fish caught in Lamu County, the County does not have a modern fish landing site with the major challenge being encroachment on most of the public landing sites by private developers. Although Mokowe has been designated as an important fish landing site in the County, the site faces similar challenges as for the other landing sites which is the issues of encroachment and has remained undeveloped over the years. In spite of this, Mokowe landing site is one of the key fish market exit point from Lamu County. Fish from the East as far as Somali, finds its way to the market through Mokowe landing site yet the landing site remains with no basic fish handling amenities. Most of the original land at Mokowe landing site has been encroached by private investors over time and its only part of the original landing sites that remains for the proposed development. The fishers are faced with lack of fish preservations facilities whether for fishers going for fishing or preserving fish that has been landed at the site for storage. Key Stakeholder consultations revealed that private enterprises provide ice for the fishers a fact that has skewed business at the landing site. The landing site experience political interference, the existing BMU does not have capacity to manage the landing site activities since they do not have much revenue sources, factions among BMUs were reported at the site *(Bandari Salama, Mainland and Msindwani BMUs at the same site),* failure by fishers to give accurate catch data due to traditional belief, loss of important fish catch data collection due to confusion in data collection/double entry as fish from all over the county is brought to Mokowe as an exit point, the fish landing site do not have water supply and fish is often cleaned by sea water, lack of sanitation facilities for the BMU members and fishers at the site, the landing site is not connected to electricity and lack of meeting area for fishers.

However, KEMFSED project provides an opportunity to construct a modern fish Banda, Ablution Block and External works, (*Perimeter wall, drainage, landscaping works, access road works, Jetty, bio-digester and street light)* at Mokowe landing site. The proposed development if implemented will be handy in addressing the current challenges by centralizing data collection for fisheries management, increase BMU financial collections, provision of sanitation facilities, connection of power, enable enforcement of compliance with fishing law/regulations, job creation, strengthening of coastal communities' livelihood particularly around Lamu county area, increase in household income, increase food security, increase the value of fish traded, minimizing post-harvest fish losses and strengthening capacity of community institutions responsible for fishery management.

By enhancing the capacity of the existing BMUs through targeted interventions, such as training programs, infrastructure development, and institutional strengthening, these challenges can be addressed effectively. Building the capacity of BMUs will enable them to generate additional revenue streams, foster cooperation among member groups, and improve governance structures. This, in turn, will enhance their ability to manage landing site activities sustainably, promote compliance with regulations, and ensure the long-term viability of fisheries resources and the well-being of coastal communities.

## 2.5. Project Design for Proposed Construction of Mokowe Landing Site

The proposed improvement of Mokowe landing site will consist of structures with the following amenities;

i. Fish processing plant
ii. Ablution facilities
iii. Civil external works

### 2.5.1. Proposed Fish banda Building

The Fish banda building shall be a two storey with a height of 7.3 meters from the ground level. The area in space of the Fish banda building is proposed to be 448m2 with ground floor space taking up taking up (51%) and roof floor Spaces (49%) of the total space area. The proposed space accommodation of the building is as captured in the design drawings attached in Annex I. Table 2-1 below is a summary of proposals of how the spaces of the fish banda shall be utilized and the type of finishing envisioned for each space as captured from the design report.

*Table 2-1: Proposed space Accommodation for the fish banda building*

| SPACE | SUB-SPACES |
|---|---|
| **Ground Floor** | Entrance Lobby, Receiving/Weighing, Ice Flake Room, Dispatch Office, Fish Processing area, Fish dispatch area, Chill Room, Store, Gents washroom with an airlock, a changing room, 1 No toilet, 1 No. PWD toilet, 1 No. urinal and lockers, Ladies' washroom with an airlock, a changing room, 1 No toilet, 1 No. PWD toilet and lockers, Women's room, BMU office, Control room, Entrance Lobby, Passage, Staircase and Market Place |
| **Roof floor** | Ice flake Machine Room, Solar Panels area, Solar battery room, Water tanks area, Staircase and Roof terrace |

**Proposed Finishes**

The finishes are proposed to entail paving slabs for paving finishes while the external wall to have rendered finish, marine grade bituminous and marine grade emulsion paints to rendered surfaces. The internal wall finishes will also be plastered and painted with emulsion paint and with glazed ceramic wall tiles. The floor will have polished terrazzo paving, ceramic and granito

floor tiles and a wall to floor carpet. The timber doors will be painted with clear varnish, window grilles are proposed to have corrosion resistant marine metal paint and the ceiling will also be plastered and painted with emulsion paint. The roof terrace floor will be finished with concrete interlocking tiles, on bituminous member on water proofing floor screed and a precast concrete coping on parapet walls.

### 2.5.2. Proposed Ablution Block Building

The Ablution block building shall be a single-storey with a height of 4.5 meters from the ground level. The area in space of the fish gear store and ablution block building is proposed to be 80m2 with internal space taking up taking up (86%) and external Spaces (14%) of the total space area. The proposed space accommodation of the building is as captured in the design drawings attached in Annex I.

Table 2-2 below is a summary of proposals of how the spaces of the ablution block building shall be utilized and the type of finishing envisioned for each space as captured from the design report.

*Table 2-2: Proposed Space Accommodation for the ablution Block Building*

| SPACE | SUB-SPACES |
|---|---|
| **Ground Floor** | Verandah, Gents Washroom with and airlock, 2 No. Wash hand basins, 3 No urinals, 2 No. toilets and 1 No PWD toilet and Ladies Washroom with and airlock, 3 No. Wash hand basins, 2 No. toilets and 1 No PWD toilet |
| **Roof floor** | Roof slab terrace |

**Proposed Finishes**

The finishes are proposed to entail paving slabs for paving finishes while the external wall to have rendered finish, marine grade bituminous and marine grade emulsion paints to rendered surfaces. The internal wall finishes will also be plastered and painted with emulsion paint and with glazed ceramic wall tiles. The floor will have, polished terrazzo paving and ceramic floor tiles. The timber doors will be painted with clear varnish, window grilles are proposed to have corrosion resistant marine metal paint and the ceiling will also be plastered and painted with emulsion paint. The roof terrace floor will be finished with concrete interlocking tiles, on bituminous member on water proofing floor screed and a precast concrete coping on parapet walls.

### 2.5.3. Proposed Pump House Building

The Pump building shall be a single-storey with a height of 3.8meters from the ground level. The area in space of the Pump House building is proposed to be 20m2 with Pump room area taking up taking up (59%), and Verandah area (41%) of the total space area. The proposed space accommodation of the building is as captured in the design drawings attached in Annex IB.

Table 2-3 below is a summary of proposals of how the spaces of the Pump House building shall be utilized and the type of finishing envisioned for each space as captured from the design report.

*Table 2-3: Proposed Space Accommodation for the Pump House Block*

| SPACE | SUB-SPACES | PROPOSED FINISHES |
|---|---|---|
| **Ground Floor** | • Pump room<br>• Verandah | The finishes are proposed to entail paving slabs for paving finishes while the external wall to have rendered finish, marine grade bituminous and marine grade bituminous silicone-based paints to rendered surfaces. The internal wall finishes will also be plastered and painted with emulsion paint and with glazed ceramic wall tiles. The floor will have, polished terrazzo paving and ceramic floor tiles. The timber doors will be painted with clear varnish, window grilles are proposed to have corrosion resistant marine metal paint and the ceiling will also be plastered and painted with emulsion paint. The roof terrace floor will be finished with concrete interlocking tiles, on bituminous member on water proofing floor screed. |
| **Roof** | • Suspended sloping roof slab. | The roof terrace floor will be finished with concrete interlocking tiles, on bituminous member on water proofing floor screed and a precast concrete coping. |

### 2.5.4. Proposed Gate House Building

The Gate House building shall be a single-storey with a height of 3.6 meters from the ground level and a gate entrance with a vehicular gate and pedestrian gate. The area in space of the gate house building is proposed to be 20m2 with internal space taking up taking up (86%) and external Spaces (14%) of the total space area. The proposed space accommodation of the building and gate entrance is as captured in the design drawings attached in Annex I.

**Error! Reference source not found.** Below is a summary of proposals of how the spaces of the Gate House building shall be utilized and the type of finishing envisioned for each space as captured from the design report.

*Table 2-4: Proposed Space Accommodation for the gate house building*

| SPACE | SUB-SPACES |
|---|---|
| **Ground Floor** | Guard House, Gents Washroom, Ladies Washroom, Pedestrian and Vehicular gates |
| **Roofing** | Preprinted box profile Aluminum roofing sheets to timber trusses and roof terrace |

**Proposed Finishes**

The finishes are proposed to entail paving slabs for paving finishes while the external wall to have stone cladding finish, rendered finish, natural stone cladding, marine grade bituminous and marine grade emulsion paints to rendered surfaces. The internal wall finishes will also be plastered and painted with emulsion paint and with glazed ceramic wall tiles. The floor will have ceramic floor tiles. The timber doors will be painted with clear varnish, window grilles are proposed to have corrosion resistant marine metal paint and the ceiling will be chipboard ceiling which will also be painted with emulsion paint.

### 2.5.5. Proposed civil works

The proposed space accommodation of the Civil and External Works is as captured in the design drawings attached in Annex I. Table 2-5 below is a summary of proposals of how the spaces of the building shall be utilized and the type of finishing envisioned as captured from the design report.

*Table 2-5: Proposed Space Accommodation for the Proposed Civil and External Works*

| SPACE | SUB-SPACES | PROPOSED FINISHES |
|---|---|---|
| **Land Reclamation and Jetty; Approx 80m long, 7.5m wide and 15 m high** | -Quay Wall<br>-Piles<br>-R.C beam<br>-R.C Steps<br>-250mm thick R.C Slab<br>-200mm thick R.C<br>-Parapet Wall<br>-Stainless steel handrail<br>-Mooring rings<br>-Bollards<br>-Rubber fenders | **Corrosion Resistant Coating**<br><br>-Preparation of surface by sand blasting toSA 2.5 standard, Supplying and applying approved corrosion resistant coating to steel tubular pile, solvent free epoxy at1000 microns; including any necessary primer; apply strictly to manufacturer's printed instructions<br><br>**Pile Protection**<br><br>Sacrificial anode,gross mass 100kg/anode for Cathodic Protection 3.5 including 50 years guarantee including transport, setting and any other accessories required |
| **External Drainage;** | -Manholes<br>-Gulley traps<br>-Grease traps<br>-1 No. Biodigester<br>-1 No. Bioreactor<br>-oil Interceptor | **Manholes, Gulley traps & Grease Traps**<br><br>-Preparation of surface of steel by Sand blasting; priming with 2 pack epoxy zinc phosphate primer; applying three coats of marine grade gloss oil paint; to Eng details<br><br>**Biodigester, Bioreactor & oil Interceptor**<br><br>-15mm thick cement/sand (1:3) waterproof plaster |

| | | |
|---|---|---|
| | | to walls and soffit of cover slab<br><br>-30mm thick cement/sand (1:3) waterproof screed to surface bed of internal floor |
| **Underground Water tank;** | -250mm thick R.C Base slab<br>-200mm thick R.C suspended slabs<br>-300mm thick R.C walls<br>- R.C beams<br>-Sumps<br>-Soile vent pipes<br>-3m Heavy duty Aluminum cat ladder | -15mm thick cement/sand (1:3) waterproof plaster to walls and soffit of cover slab<br><br>-30mm thick cement/sand (1:3) waterproof screed to surface bed of internal floor<br><br>-Supplying and applying two component flexible cementitious waterproofing treatment to concrete surfaces; suitable for portable water; applied strictly to manufacturer's instructions; provide a 10-year Guarantee |
| **Landscaping Works** | -Grassed areas (300 SM)<br>-Shrubs (100 SM)<br>-Ornamental trees (40 NO.)<br>-Indigenous tress (30 NO.)<br>-Litter bins(6 NO.) | 3 coats of corrosion resistant marine metal paint or other equal and approved to galvanized litter bins |
| **Driveway and Parking; 300m2** | -Subbases<br>-Concrete Paved Blocks<br>-Kerbs<br>-Walkways and Pavements<br>-Stormwater drainage | -Three coats of approved road marking thermoplastic paint on asphalt to surfaces not exceeding 100mm girth (Yellow in colour)<br><br>-Preparation of surface by sand blasting, applying one coat of 2 pack epoxy zinc phosphate primer; applying three coats of marine grade gloss paint |
| **Boundary Wall; 156m** | -Reinforced concrete Columns and Beams<br>-200mm thick coral block Walling | -25mm Thick cement sand (1:3) rendering to columns to receive stone cladding;<br>-25mm Thick cement sand (1:3) rendering to beams<br>-30mm Thick cement sand (1:3) rendering to existing boundary wall.<br><br>**<u>Stone Cladding</u>**<br>25mm thick polished mazeras stone cladding or other equal and approved to columns in cement and sand (1:3) mortar (m/s) with and including galvanised wire reinforcement;pattern to architect's approval |

**Key Pointing**

Extra overdressed stone walling for neat recessed horizontal key pointing in 10mm thick rod in cement mortar (1:3) both internal and external sides of walling: one coat of bituminous paint.

**Gates**

Preparation of surface by sand blasting, apply one coat of 2 pack epoxy zinc phosphate primer; applying three coats of marine grade gloss paint

### 2.5.6. Electrical Design for the Proposed Mukowe Central Fish Landing Site

Electrical Supply and Distribution System is essential as a vital means for the operation of the MUKOWE Central Fish Landing Site during normal utility power, utility power failure, and emergency operation periods. System Supply will be a 3-phase power supply of 11kV step down to 415/240Volts. The proposed electrical works that shall be provided to the proposed building will include:

- Main Power Distribution.
- Standby Power Generating System.
- Solar supply system.
- General Lighting will be provided for all buildings.
- Interior and external, Landscape and Façade Lighting by Specialist Lighting Consultant
- General Emergency Lighting and Exit Signs will be provided.
- Lightning Protection System.
- Earthing and Equip-potential Bonding System.
- Telecommunication and Data System.
- Fire Detection and Alarm System
- Security and surveillance system

#### 2.5.6.1. Electrical MV Intake, Generator Plant Power House and Solar System

Electrical MV Intake, Generator Plant Power room and Solar System

Electricity will be provided by Kenya Power & Lighting Company Ltd at 11KV and will be distributed at 415/240V. A dedicated intake Power House will be provided for Kenya Power & Lighting Company MV equipment and will serve as Utility Company point of isolation at MV side. The Power room will connect the Kenya Power & Lighting Company supply, and the whole Mixed Used Development electrical system. The power house will be turn-over to Kenya Power & Lighting Company and the facility's maintenance staff for their exclusive access and maintenance. The power house will house a total of one (1) no. distribution board with a 400/5A current transformer and its associated fittings, as well as 12 chamber control panel. To ensure power supply reliability, 100% generator backup with 9hrs fuel supply capacity has been

provided for. There will be one no. of Supply, deliver to site, install, test and commission a prime rated 50 KVA 3 phase, 415V, 50Hz diesel generating set with a continuous power factor of 0.8 lagging as directed by the Engineer's specifications. The generator set is to be complete with a sound attenuated canopy and an integral base/belly daily service fuel tank with an operational running capacity of 8 hours. The generator set is to be complete with a sound attenuated canopy and an integral base/belly daily service fuel tank with an operational running capacity of 8 hours. The generators will be connected in parallel using Generator Paralleling Switchgear to allow alternate and sharing operations. There will also be a 40kw (3 Phase) Grid-Tied solar system with 79 No. 75 Cell, 575W Monocrystalline Solar Modules, Rated Current (lm) 8.8A, Efficiency 80%,Cell Specific Safety - Class II, Application Class A, Life time - 25Years, Guarantee - 10Years, Rated voltage (Vm) 17,5v, Cell Efficiency 15% with 1 No. 25KWh Lithium Battery Pack Smart Stirng Energy Storage System (ESS) including a smart Rack Controller. Max Charging & Discharge power: 25kW, IP65, Class A EMC Protection Rating, Type II DC Lightning Protection. Smart Rack efficiency: +98.5%,

#### 2.5.6.2. Medium Voltage Distribution System

Kenya Power & Lighting Company will provide 11 kV electricity supply to the site from Existing Utility 11kV Substations. The proposed LV rooms will be located on the Ground Floor of each facility. The 11kV cables will run from the nearest utility infrastructure manhole just outside the plot boundary to the Utility Company MV room. The exact location of the 11kV supply point or nearest infrastructure manhole shall be consulted to Kenya Power and Lighting Company.

#### 2.5.6.3. Power Supply

Low Voltage distribution for major mechanical and services plants will be provided using a respective Sub-Main Distribution Board/s, Motor Control centre/s, Local Motor Control Panel/s, Distribution Board/s, and feeder/s emanating from respective Low Voltage Switchboard. All major plants will be sub-metered via an electronic digital meter connected to Building Management System for history, event recording, and monitoring. The Electrical Board supplying power will be located near the equipment or within the nearest electrical room. The entire building as a whole will be metered in bulk at the secondary of the dedicated transformer. Utility Company electricity consumption bulk meter is expected to be at the **11kV** voltage. The bulk meter will be located in the main LV room.

#### 2.5.6.4. Main Switchboard

A dedicated set of LV switchboards (MDB) will be provided for the building. The LV switchboard will be located in the main LV rooms. The Low Voltage switchboard (MDB) will be Form 4, Type 6, free-standing, type-tested, fully certified with a minimum fault capacity of 50kA for 1 sec, and fully rated to operate at 50ºC. The Low Voltage Switch Board will comprise but not limited to: The main incoming ACB from utility power and the main incoming ACB from the emergency supply will be electrically and mechanically interlocked and will serve as the

Automatic Transfer Switch (ATS) to avoid parallel supply coming from utility and emergency supply at the same time. Where spare capacity permits, a minimum of 20% spare switchgear space will be provided for all low voltage switch boards.

#### 2.5.6.5. Power Factor Correction

Every installation shall have a power factor within the range of 0.9 lagging to unity. The installation of suitable correction equipment may improve a lagging power factor of less than 0.9. Where a capacitor is installed for power factor correction, it must be provided with a means for its automatic prompt discharge immediately after the supply is disconnected. Power factor correction will be provided at each LV Main Switchboard.

#### 2.5.6.6. Automatic Voltage Regulator (AVR)

A-line Automatic Voltage Regulator (AVR) to compensate voltage variance and ensure safe operation of the electrical system has been provided. AVR shall be an industrial type with a rectifier/ filter circuit to ensure a clean power supply to the electrical system. The AVR will be provided adjacent to each Main LV switchboard to automatically mitigate and improved any voltage variation before entering the building electrical system

#### 2.5.6.7. Final Circuit Distribution Board (DB)

Each Floor will have a number of final circuit distribution boards. All distribution boards will be at least three (3) sections. Each section will be provided with appropriate Earth Leakage Circuit Breaker protection in accordance with Local Authority requirements. It will also include the main isolation switch, with outgoing circuits protected by miniature circuit breakers. Distribution boards will be metal-clad type, complete with a lockable hinged front cover. Distribution boards within the front of house areas will be located within dedicated lockable enclosures or flush into the wall. Distribution boards in plant spaces, back of the house, and service areas will be surface mounted within plant room or dedicated electrical rooms.

#### 2.5.6.8. Lighting

General lighting for public areas such as staircases, corridors, plant rooms, carparks, and staff circulation areas will be provided with LED luminaries for energy-saving purposes and supplied with solar PV. All luminaries in all potentially wet areas and exterior installation shall be IP55 minimum. Lighting for the land site buildingwill take into consideration both functional and aesthetic aspects. Lighting System for spaces and other Front of Building Areas will be designed in collaboration with the specialist and interior designer. Lighting control, in general, will be a Centralized Automatic Lighting Control System using workstation computers, control module, dimmer modules, gateways, user interface, motion and occupancy detectors, etc.

#### 2.5.6.9. Lightning Protection System

The Lightning Protection System will utilize the steel reinforcement in concrete structures as down conductors. Exposed horizontal copper tapes will be provided at roof levels around all roof

parapets, and earth electrodes at ground level will be designed. Lightning protection system shall be designed in accordance with the BS EN 62035.

#### 2.5.6.10. Fire Detection and voice evacuation System

The buildings will be provided with a complete fire alarm system designed and installed in accordance with the NFPA-72 and local Authority Having Jurisdiction (NCCG). The whole building will have about Fire alarm and detection system points, including the smoke detectors, the break glasses, the washers, and the sounders. These devices will be placed at strategic locations such as corridors, entrances, and exit areas where they can be easily accessed in the event of a fire. Each alternate floor of every building in the landing sites will have a Fire Alarm Repeater Panel (FARP).

#### 2.5.6.11. Domestic Water Supply

Water supply will be by gravity from holding tank at roof level. Water will be stored in the UpVC water tank at ground level, including municipal water. Distribution will be via a transfer pump to the UpVC roof water tanks located on the Roof Floors of buildings. There will be no hot water provision for toilets, office spaces.

### 2.5.7. Rain/Storm Water Drainage

All building roof drainage will be collected and piped to the storm water drainage system and collected in a tank for onsite use for washing and landscaping. This will be so because the quality of the water may not be good. Surface running storm water will be collected and directed to storm water utilities of road drainage and channels. In view of flooding effects on the plot the drainage system has been designed as indicated in the civil engineer's design detail to manage surface water flows.

### 2.5.8. Plumbing and drainage fittings

i. **PP-R Pipes:** Due to the light-weight nature, chemical inert, corrosion, scaling and erosion resistant nature of PP-R pipe, they are easy to install, durable and will not react with water or dissolved chemicals in water. Therefore, these pipes will be used instead of copper and many plastic pipes which will not leach harmful chemicals to the water supply in buildings for human consumption.

ii. **Pipes (uPVC Pipes):** Due to the resistance of uPVC pipes to acids and sulphates, this material will be used instead of concrete pipes for ND not exceeding 250 mm in the sewer network. uPVC pipes will also be used for diameters exceeding 200 mm for locations where jointed concrete pipes are unsuitable, such as embankments which are likely to settle, or where very steep gradients result in high velocity and possible pipe erosion, or where water logged areas have to be traversed and concrete pipes become unsuitable because of their porosity.

iii. **Manholes:** Precast concrete manhole rings, which are manufactured locally, will be used for construction of manholes or in-situ construction of manholes. The minimum size

of the manhole for efficient operation and safety will be 1050 mm. Precast manhole rings will be surrounded with a minimum thickness of 150 mm concrete to improve water tightness and stability. For access purposes galvanized mild steel cast iron step irons will be built into the manhole rings. The nominal vertical interval between all the step irons within a given manhole is 300 mm and should be staggered. Due to the high rate of vandalism in connection with cast iron manhole covers, heavy duty triangular mild steel manhole covers filled with concrete will be used.

iv. **Gulley traps:** There shall be 8 No 730 x 730 x 500mm deep gulley traps complete with 400 x 400 x 10mm thick mild steel grating welded to 10mm thick mild steel frame at 30mm centers, hot galvanized and Sand blasting, with 2 pack epoxy zinc phosphate primer and painted with three coats of marine grade gloss oil paint to approval, 150mm thick plastered masonry walls, class 25/20 concrete base, concrete cover too receive grating and all surface finishes.

v. **Grease Trap:** There shall be grease traps complete with 100mm thick concrete class 25/20 to external and internal walling; 150mm thick concrete floor slab Class 25/20, concrete blinding and benching Class 15/20, complete with and including heavy duty double air seal cast iron cover and frame, all to Engineer's details. All steel surfaces shall be Sand blasted; primed with 2 pack epoxy zinc phosphate primer; and painted with three coats of marine grade gloss oil paint.

vi. **There shall be a reinforced concrete petrol interceptor** next to the power house to filter out any hydrocarbon pollutants from spilled generator fuel and oil in order to avoid contamination of water sources and drainage systems. The petrol interceptor will be complete with and including heavy duty double air seal cast iron covers and frames, all to Engineer's details. All concrete surfaces shall be finished with waterproof plaster and screed.

**vii.** There shall be 2 NO. four wheel waste bin with snap fit lid with a locking handle to hold solid waste before being transported to Liwatoni Fish meal plant for processing in fish feed and will also be used by local crab farmers as crab fattening feed.

### 2.5.9. Waste Water Treatment Plants:

The landing site will combine the following waste water treatment plants to form a complete waste water treatment system:

i. Moving Bed Biofilm Reactor (MBBR) Waste Water Treatment System, with a capacity of treating 100PE with an average flow rate of 15,000 lts per day. With a BOD load of 6Kgs per day, Ammonia Nitrogen load of 4Kgs per day. With minimum treated discharge requirement of BOD <30mg/lt, TSS <30mg/lt, Ammonia Nitrogen <20mg/lt. Complete with all Media, Screens, Pumps, Aeration Blowers, Aeration Diffusers, Manifolds, Level sensors, Valves, Piping, Fittings and Accessories to fully conform to the specified discharge requirements. The Moving Bed Biofilm Reactor (MBBR) plant will pretreat waste water using bacteria/biofilm that facilitate B.O.D and C.O.D removal as well as

nitrification and denitrification. The bioreactor will not have moving parts that require maintenance, instead, it will have specially designed submerged media providing an abundant surface area for the bacteria to attach themselves and thrive in multiple layers, thus allowing the MBBR to be very robust and self-regulating in case of accidents like huge P.H fluctuations. The plastic media will be kept in motion within the reactor and avoid being clogged by mechanical agitation from root blower pumps blowing air in the reactor through manifolds evenly distributed at the floor of the reactor. This will ensure the biofilm-covered media remain in contact with the waste water and aerates the waste water to allow not only for growth of the bacteria, but also for the biofilm to effectively digest soluble organic pollutants into biomass, water and carbon dioxide during the reactor's retention time.

ii. There shall also be a 5000lts/ hr Bio- Reactor DAF- Dissolved Air Floatation- system with a bubble size of less than 10um, Dissolved gas efficiency is over 95%, the solid suspended matter content in effluent to be less than 20 mg/L. The treated water with biomass and suspended solids will be fed to the Dissolved Air Floatation (DAF) plant where dissolved air in form of microbubbles will be pumped through it to suspend the biomass and solid particles which will be mechanically skimmed and heavier particles settled at bottom of the plant dislodged. The treated solid waste will be collected and dewatered in a sludge collection chamber for disposal to approved dumping sites. The treated clarified effluent water will then be drained from the plant and used for non-potable activities such as landscaping and cleaning. This waste water treatment system requires less space, cost effective, provides good effluent water quality, has less energy consumption, easy to operate, has high resistance to corrosion, influent heat, P.H and grease leaks compared to other waste water treatment systems

iii. There shall be 1 No. reinforced concrete biodigester of accommodating 1,000 users to treat toilet waste/sewage through an anaerobic process where microorganisms break down the organic matter in the sewage into a nutrient-rich digestate which can be used as fertilizer for agricultural purposes and effluent treated water. The treated water will soak away in a soak pit of 1.2m internal diameter with 150mm thick perforated stone walling and 100mm thick concrete base class 25/20 and 150mm thick RC slab class 25/20; including 600 x 450mm heavy duty manhole cover and frame and 200mm diameter crushed stone chips filling. The biodigester has a great advantage over the conventional septic tank as it covers a smaller land footprint, and it using an anaerobic process to treat waste, it emits less odor, provides a cleaner effluent and a more nutrient rich digestate.

### 2.5.10. Ice Flake Machine, Room Insulation and Accessories

The landing site will have a Modular Ice Flake Machine (Production Capacity 3T/24h, Refrigerating capacity 18Kw, Evaporating temperature -220C, Power consumption 17.5kW, Approx dimensions 2000 X 1600 X 1490mm) comprising of an air cooled condenser, gear motor, water pump, salt mix pump control box and control panel with PLC , Low water sensor

protection, Ice level thermostat, Ice knife and construction made from stainless steel, base frame made from galvanized steel, ice drum/cylinder with stainless steel inner and outer wall fitted with semi-hermetic compressors, stainless steel ball bearings including all other accessories for proper functioning of the unit. The unit shall be as approved and to approved catalogue

### 2.6. Project Resources and By Products

The following are the main resource input in the proposed project but not limited to**:**

i. **Land:** Land is critical for the location of the proposed fish landing site, and has been provided by LAMU County Government at MUKOWE, LAMU County. The land title is as attached in Annex II.

ii. **Water:** Water supply shall be from LAWASCO whose main source is the existing mbele mbele borehole *(The boreholes are the existing main sources of water for LAWASCO)* and rainwater harvesting which will be used for construction of the building. The design has also considered for rain water harvesting and grey water treatment by a combination of a Moving Bed Biofilm Reactor (MBBR) and Dissolved Air Floatation (DAF) plants is proposed and the water shall be used for landscaping purposes.

iii. **Labour:** Different forms of labour, both skilled and unskilled, will be utilized. It is a requirement under KEMFSED project that the contractor higher locals and provides long term contracts to the workers and that child labour in any form shall not be allowed on site or activities associated with the project. This shall apply to the sub-contractors who will be engaged on proposed component activities.

iv. **Construction Materials:** Cement, Sand, Ballast, murram, reinforcement steel bars, Coral Blocks, Aluminum Windows and Doors, Steel Doors, Emulsion Paint, Textured Paint, Granitto Floor Tiles, Acoustic and Gypsum Ceiling, PPR and PVC pipes, Ceramic Sanitary Fittings, Gravel, Water, Soil, Electrical wires, gadgets and equipment, Steel (reinforcement, casement, wiring, and standard fittings), Glass, PVS Material: (tiles, PVC pipes, conduits, and fittings), Concrete and paving, Paints and vanishes, Plant materials – grass and trees seedlings for landscaping.

**v.** **Electrical Works:** Electrical work during construction of the Mokowe Fish Landing site will include installation of electrical gadgets and appliances including conduit cables, lighting apparatus, bulb, sockets, etc. In addition, there will be other activities involving the use of electricity, such as welding and metal cutting, to attain the desired results. The building will also have solar panels that shall supply 40Kw to the landing site facilities. All the electrical works will be carried out by a qualified and experienced professional.

**vi.** **Plumbing:** Installation of pipe-work for water supply will use PvC pipes and distribution will be carried out within the component layout and associated facilities. In addition, pipe work will be done to connect grey water from the Mukowe Fish landing site building to a sequential batch reactor system and to drain storm water from the rooftop into rain water harvesting facilities. Plumbing activities will include plastic cutting, the use of adhesive and wall drilling, among others.

**vii. The proposed Sanitary fittings of the facilities will be as follows;**

- 15mm diameter x 300mm long flexible connectors complete with Integral chrome plated angle valve for connecting the Sanitary fitting to water supply. – **15 NO**
- Robe hook in approved vitreous mounted to concealed screw to wall wedges. **- 10 NO**
- 600X500X300mm Ceramic Asian toilet suite in approved color comprising of squatting pan,'p'or's' trap connector, complete with horizontal outlet to BS 3402 with concealed 32mm (1.25") Brass flush valve soft touch with dual Flow System and square cover push button **– 4 NO**
- Close Couple water closet suite in approved cooler comprising of W.C. bowl,'p'or's' trap connector, heavy duty matching plastic seat and cover with metal top fixed to (chrome plated) hinges and secured to floor or wall and complete with horizontal outlet to BS 3402 with 6 liter valveless Ceramic cistern and fittings including siphon,15mm diameter side inlet ball valves,20mm diameter side overflow, plastic flush bend,inlet connection, ,and chrome-plated lever. – **2 NO**
- Wash Hand Basin with pedestal size 510x420mm with one tap hole and chain stay hole,32 mm diameter chrome-plated pop up chain waste and fittings, approved first quality plastic bottle trap(32mm bottle trap) with 75mm seal.The basin to be supplied and installed complete with 15mm diameter heavy duty chrome plated -Brass Basin Tap – **3NO**
- 450 x 280 mm counter top wash hand basin with single taphole wall bracket and taphole plug, push delay tap, c/w Push open slotted basin, waste 1.25in #A38, bottle Trap 1.25".**- 7 NO**
- Semi recessed toilet roll holder in approved Vitreous of size 165 x 165mm in approved color. **– 12 NO**
- 610 X 610 X 6mm thick polished plate silver backed with beveled edges mirror fixed with clear silicon to 100 x 25mm thick wrot mahogany molded framing in 4 labors plugged to wall using 4No. Wall plugs with 75mm long stainless-steel screws, painted in three coats polyurethane varnish all to approval **– 12 NO**
- Concealed shower fitting consisting of 25mm diameter x 2500mm long PPR riser pipe for showers,25mm diameter chrome plated brass cold-water swivel/adjustable shower rose, Carina handle and Stop Cock – **2 NO**
- Wall mounted soap dispenser with a capacity of about 1.5 Liter and having a press action soap release mechanism complete with fixing screws. including allowing for initial soap supply. The soap dispenser shall be size125x100x290mm high. – **6 NO**
- 15mm diameter heavy duty bib tap or other equal and to approved catalogue **– 5 NO**
- Semi recessed built in soap dish in approved vitreous of size 150x150mm in approved color. **– 2 NO**
- Chrome plated 20mm diameter x 800mm long approved towel rail and brackets as one piece, plugged and screwed into the wall.**- 2 NO**

- Heavy Duty 16SWG Stainless Steel (Grade 316) Single bowl sink, Size 510x310x225mm deep suitable for mounting on counter as manufactured by an approved manufacturer, complete with heavy duty swivel high/long neck brass pillar tap as approved. It shall also comprise of 40mm diameter stainless steel sink waste fitting, chain and plug and 40mm diameter x 75mm deep seal first quality chrome plated Bottle Trap, all to approved catalogue. - **7 NO**
- 16SWG Double Bowl, no Drainer, stainless steel (Grade 316) kitchen sink suitable for mounting on terrazzo counter top. The bowl size to be 450x420x 300mm deep complete with plastic 40mm diameter waste fittings, plugs, chain stays, overflow including 1No.15mm diameter heavy duty wall mount stainless steel bib tap. **– 4 NO**
- (i)Close coupled W.C with 7.5 litter cistern with bottom inlet and overflow.The bowl shall e of size 375 x 560 x 420mm high.The bowl and cistern shall be manufactured from approved vitreous complying with B.S 3402.The unit shall be complete with valveless cistern fitting including syphon,15mm side inlet ball valve,20mm diameter side overflow, plastic flush bend, inlet connector and reversible metallic chrome plated cistern lever. There shall also be a heavy duty seat(25mm high) and cover with chrome plated metal hinges, toilet roll holder,900 x 450 x 6mm thick mirror and Robe hook.(ii)Semi-recessed wall mounted W.H.B of size 600 x 500 x 545mm high with flexible connectors to water taps. The basin shall be manufactured from approved vitreous complying with B.S 3402.It shall have one L/H tap hole with 15mm chrome plated lever action pillar tap, chrome plated waste, first quality bottle trap, pedestal and wall fixing bolts. (iii) Hinged support rail with toilet roll holder 770mm long manufactured in nylon coated aluminum and mounted on a wall fixing plate size 230x100mm,4No. 600mm grab rails with covered wall plates. The Disabled set shall be wheelchair accessible W.C facility. **– 4 SET**
- Urinal Bowl with concealed pipe work complete with pair of bowl supports Plastics complete with '1 ½ diameter domed outlet plated urinal grating. – **3 NO**
- Chrome plated, push button ¾" flush master junior exposed urinal flush valve, top entry with integral ball-o-stop valve and wall plate complete with; exposed chrome plated urinal flush and tall pipe with inlet adaptor and back mount spray rose/spreader. The fittings shall be as 'Docol' or equal and approved. and c/w 1½ ' diameter plastic bottle P-Trap with plastic extension pipe to wall and wall flange. – **3 NO**
- Standard Ceramic Urinal divisions. – **5 NO**

**viii. Fire Fighting System;** The following firefighting equipment will be provided; -

**Hose reels**

-There shall be recessed swinging type hose reel complete with 30 meters of 20mm internal diameter rubber fire hose with nylon spray/jet shut off nozzle, conforming to BS 5274; all wire brushed, cleaned, and painted complete with installation with one coat of red oxide primer, undercoat, and gloss coat to Architects color including banding and color coding to British Standard.

**Portable Fire Extinguishers**

Portable fire extinguishers will be provided in accordance with NFPA 10; Standards for Portable Fire Extinguishers. Extinguishers will be provided at all hazard areas such as kitchens, electrical rooms, garbage rooms, and generators. The Extinguisher types to be provided are:

- Carbon Dioxide gas
- Water Carbon dioxide
- Dry Chemical

In rooms protected by FM-200 type, ABC and CO2 fire extinguishers will be provided in accordance with NFPA requirements.

**Signages and Fire exits**

There will be signages of fire hose Reel, fire exits and fire instructions all as described in the particular specifications and to the Project Engineers' Approval. The fish banda has 3 fire exit points at the weighing area, entrance lobby and fire escape door as shown in the project drawings where people can safely evacuate in the event of a fire.

**Fire assembly points**

There will be 2 No. Fire assembly points at the parking area next to the ablution block and near the landing site gate house to provide a safe and organized location for people to evacuate to, and to ensure that everyone is accounted for in the event of fire. All this is shown in the site plans.

## 2.7. Project Activities, Material and Waste during Construction

Table 2-6 highlights anticipated project activities, materials and source as well as anticipate waste that shall be generated during the implementation of project activities.

Table 2-6: Proposed Materials and Waste

| Element | Proposed Activities | Materials | Equipment's | Expected waste | Sources of materials |
|---|---|---|---|---|---|
| **Foundation** | • Excavation of trenches and column bases.<br>• Foundation walling<br>• Hardcore filling<br>• Murram blinding<br>• Antitermite treatment<br>• Damp proofing | • Coral stone walling<br>• Reinforcement bars<br>• BRC<br>• Hardcore<br>• Antitermite<br>• Murram<br>• Hardcore<br>• DPC and | • Excavators<br>• Tippers<br>• Jembes<br>• Mattock<br>• Fork jembe<br>• Spades<br>• Concrete mixer<br>• Poker vibrator<br>• PPEs | Debris, Dust, Soil | Quarry, Hardware Manufactures and general suppliers. |

| | | | | | |
|---|---|---|---|---|---|
| | course<br>• Concrete works (Blinding, footing, column bases and columns, ground beam, floor slab) | DPM<br>• Cement<br>• Ballast<br>• Formwork<br>• water | • Drum vibrator<br>• Pneumatic hammer (25kg) | | |
| **Reinforced Superstructure (Beams, Columns and Floor Slabs etc.)** | • Formwork placing<br>• Steel fixing<br>• Concreting<br>• Curing of concrete | • Cement<br>• Ballast<br>• Formwork<br>• Reinforcement bars<br>• DPM<br>• Water | • Spades<br>• Concrete mixer<br>• Concrete pump<br>• Poker vibrator<br>• Wheelbarrows<br>• PPEs<br>• Scaffolding<br>• Hoists<br>• 60m3/hr Concrete Pump | Dust, Concrete wastes and steel debris. | Quarry, Hardware Manufactures and general suppliers. |
| **Walling and partitions** | • Coral Block Walling | • Coral stones<br>• Sand<br>• Cement<br>• Hoop Iron | • Levers.<br>• Drills<br>• Grinder<br>• Pickups 3 tons<br>• Tippers 10 tons<br>• Water pump 1000lts/hr | Dust, Concrete wastes and steel debris. | Quarry, Hardwares, Manufactures and Suppliers |
| **Windows** | • Windows fitting<br>• Burglar proofing<br>• Painting<br>• Window Blinds | • Aluminum windows<br>• 6mm Glazing<br>• Steel Burglarproof<br>• Window Blinds | • Drills<br>• Grinder<br>• Paint brush<br>• Portable Electrical welding | Dust, Metal debris, Paint. | Hardware Manufactures and general suppliers. |
| **Doors** | • Door fittings<br>• Painting<br>• Ironmongery | • Aluminum doors<br>• Steel casement and grills doors<br>• Ironmongery | • Drills<br>• Grinder<br>• Paint brush<br>• Portable Electrical welding | Dust, Metal debris, Paint. | Hardware Manufactures and general suppliers. |
| **Finishes** | • Ceiling finishes | • Sand<br>• Cement<br>• Lime<br>• Paint<br>• Stainless Steel Plates | • Drills<br>• Grinder<br>• Paint brush<br>• Trowel<br>• Spades<br>• Scaffold | Dust, Metal, Plastic debris and Paint. | Hardware Manufactures and general suppliers. |

| | | | | | |
|---|---|---|---|---|---|
| | | • Polystyrene | • Portable Electrical welding | | |
| | • Wall finishes | • Sand<br>• Cement<br>• Lime<br>• White glazed Ceramic Wall tiles<br>• Stainless Steel Plates<br>• Polystyrene | • Drills<br>• Grinder<br>• Paint brush<br>• Trowel<br>• Scaffold<br>• Tile cutter<br>• Portable Electrical welding | Dust, Metal, plastic debris, Paint. | Hardware Manufactures and general suppliers. |
| | • Floor finishes | • Sand<br>• Cement<br>• Terrazzo Chips<br>• Plastic strips<br>• Stainless Steel Plates<br>• Polystyrene | • Drills<br>• Grinder<br>• Trowel<br>• Scaffold<br>• Tile cutter<br>• Portable Electrical welding | Dust, Metal, Plastic debris, Paint. | Hardware Manufactures and general suppliers. |
| **Roofing** | • Slab casting<br>• Aluminum roof on steel trusses | • Highyield steel bars to Bs 4461<br>• Aluminium sheets<br>• Hot rolled steel sections | • Human labour,<br>• Concrete mixing machine,<br>• Spades,<br>• Poker Vibrator<br>• Portable Electrical welding | Dust, metal debris | • Quarry incase of stones,<br>• Sand and Ballast, Hardware in cases of steel and Cement |
| **Mechanical Installations** | • Sanitary Fittings Installations<br>• Internal Plumbing works<br>• Rainwater harvesting facilities<br>• Drainage works<br>• Firefighting<br>• Air-conditioning | • Sanitary Fittings (Water Closet, Wash Hand Basis, Kitchen Sinks, Mirrors, Urinals, Soap Dispensers etc.)<br>• PPR and UPVC plumbing and drainage pipes and extra over.<br>• Air- | • Drills<br>• Grinder<br>• etc. | Dust, Metal and Plastic debris, Soil debris. | Hardware Manufactures and general suppliers. |

| | | | | | |
|---|---|---|---|---|---|
| | | conditioning units | | | |
| **Electrical Installations** | • Lighting points, fitting and fixtures<br>• Power points fittings and fixture<br>• Power Supply and Distribution<br>• Solar Installation | • UPVC conduits<br>• Copper Cables<br>• Lighting and Power Fittings and Fixtures (Sockets, Switches, LED lights)<br>• Distribution Board<br>• Solar panels & Batteries. | • Drills<br>• Grinder<br>• Snake wire<br>• etc. | Dust, Metal and Plastic debris, Soil debris. | Hardware Manufactures and general suppliers. |

## 2.8. Sub-Project Activities during Operation

There are several activities that shall be implemented during the operation of the proposed structures that will include but not limited to; Cleaning of the buildings, repair and maintenance of the building components and facilities, flow of traders, handling and processing of fish, maintaining and watering the lawn within the site, human waste management, solid waste management, serving fishers, showering, electric power consumption, using of electronic gadgets, water consumption and interaction among visitors on site, among many other activities. The activities shall have different impacts during the operation of the proposed Mokowe landing site. Mokowe BMU together with Lamu county government through the Fisheries department will be in charge of maintenance and repair of the structures throughout its lifespan unless there is change of use or user in the future. The Mokowe BMU will be capacity built by the Department of Fisheries and Blue Economy together with KEMFSED Lamu on financial management, health and safety issue, hygiene and food safety standards, solid and liquid waste management, fire safety, sustainable operation and maintenance alongside other training needs that may arise.

## 2.9. Sub-Project Alternatives

### 2.9.1. No Action Option

The **"No project"** alternative represents the potential scenario if the construction of the proposed sub-project works is not implemented in the project area. Under this alternative, no improvement or construction of facilities at Mokowe landing site; construction of a modern fish Banda, Ablution Block and External works, (*Perimeter wall, drainage, landscaping works, access road works, Jetty,* Moving Bed Biofilm Reactor (MBBR), Bio- Reactor, DAF- Dissolved Air Floatation-system *and street light)* shall be implemented in order to influence the local physical environment, biological, socio-economic, land use patterns and no investment in enhancing fisheries management and enforcement of compliance shall be done. This option is suitable from an environmental and social management perspective with no negative impacts or changes to the

status quo but not good for social-economic purposes within the project area. The opportunity cost incurred will imply that the challenges affecting fisher at in Lamu County particularly those affiliated to Mokowe landing site will continue. However, if the proposed improvement and construction works for Mokowe landing site is implemented, it is anticipated to address the challenges by centralizing data collection for fisheries management, enable enforcement of compliance, provision of basic amenities for fishers, provide a social hall for the wider Mokowe area community, job creation, strengthening of coastal communities' livelihood, increase in household income, increase food security, increase the value of fish traded, provide storage facilities to minimizing post-harvest fish losses by fishers at Mokowe, enhance availability of fish for the community members whenever they require, and strengthening capacity of community institutions responsible for fishery management.

### 2.9.2. Project Development Option

The proposed improvement and construction of amenities at Mokowe landing site is part of the contributions towards enhancing county fisheries infrastructure development which aimed at improving fisheries management. The sub-project is significant in achieving coordinated and improved management of priority fisheries and enhancing the coastal communities' livelihood. Implementation of the proposed subproject is in addition anticipated to contribute to improved, fish data collection and compliance enforcement, improved fish product quantity and quality, creating employment opportunities, creating business opportunities, improving hygiene standards and environmental conditions at Mokowe landing site, reduced risk and incidences of fish food contaminations, enhance local capacity in fish handling and processing among the fishers, empowering Mokowe BMU institutionally and financially to manage the landing site and contribute positively towards fish data record keeping and management.

### 2.9.3. Alternative Site Selection Option

Foregoing the construction of facilities at Mokowe landing site; construction of a modern fish Banda, Ablution Block and External works (*Perimeter wall, drainage, landscaping works, access road works, Jetty,* Moving Bed Biofilm Reactor (MBBR), Bio- Reactor, DAF- Dissolved Air Floatation- system *and street light)* from Mokowe site to a different location is another option available for consideration, but currently, the proponent does not have an alternative site with land at the project disposal. The site is adjacent to the sea and is appropriate for the proposed development proposals. The physical plan for Mokowe area showed that there are hardly any public spaces in the area other than Mokowe fish landing site. The land has been allotted by the county government for development of a modern fish landing site. Considering the above concerns and assessment of the current proposed site, relocation of the project is not a viable option. Besides, it is not easy to find a similarly suitable site to accommodate the proposed development. Public land in most parts of Lamu County lack titles, unlike for Mokowe site which is under the process of gazettement and soon shall be titled, which could not be a

guarantee if an alternative plot is sought. Most of the plots around the area are private plots and the process of acquiring land could take time and has a cost.

### 2.9.4. Alternative Technologies

The application of the best technology is important in reducing the impacts of the project to the environment or the impact of the environment on the project. Therefore, the project design team took cognizance of appropriate technology existing on the market in the proposed project facilities and activities. Adopting an appropriate modern fish banda, use of large sizes window, energy saving appliances, use of renewable energy, use of recyclable construction material for instance metallic doors instead of wood, use of water saving appliances and treating of grey water through a bio-digester are some of the technologies that have been incorporated in the design of the project to improve green building concepts and climate change adaptations.

## 2.10. Project cost and implementation schedule

The estimated cost for construction of the proposed Mokowe landing site in Lamu County, Lamu West sub-county, Hindi East ward and in Mokowe area is about KShs. 239,337,275.00[6]. This cost include construction of a modern fish Banda, Ablution Block and External works (*Perimeter wall, drainage, landscaping works, access road works, Jetty,* Moving Bed Biofilm Reactor (MBBR), Bio- Reactor, DAF- Dissolved Air Floatation- system *and street light),* labour, environmental management and social monitoring costs, taxes and a factor on inflation for the proposed structures. The breakdown of the project cost is as shown in Table 2-7. The anticipated project implementation period is about 12 months from the time of site handover to the contractor. The defect liability period is anticipated to take about 6 months making the total construction and defect liability period 18 months.

*Table 2-7: Project Cost and Budget*

| ITEM | DESCRIPTION | AMOUNT |
|---|---|---|
| **NO.** | | **Kshs.** |
| 1. | Particular Preliminaries | 200,000.00 |
| 2. | General Preliminaries | 10,100,000.00 |
| 3. | Environmental And Social Management Plan | 5,320,000.00 |
| 4. | Fish Processing Building | 25,459,500.00 |
| 5. | Ablution Block | 5,582,150.00 |
| 6. | Gate House | 1,525,450.00 |
| 7. | Boundary Wall | 5,302,825.00 |
| 8. | Land Reclamation And Jetty | 84,406,900.00 |
| 9. | Driveway And Parking | 9,477,200.00 |
| 10. | Foul Water Drainage | 6,215,000.00 |

[6] *The estimate cost is according to the figures provided in the bill of quantities as provided by the project engineer*

| | | |
|---|---|---|
| 11. | Underground Water Tank | 2,711,600.00 |
| 12. | Landscaping | 356,000.00 |
| 13. | Mechanical Works | 38,331,200.00 |
| 14. | Electrical Works | 21,120,500.00 |
| 15. | Pump Room | 1,436,750.00 |
| 16. | Power House | 3,283,000.00 |
| 17. | Day Works | 509,200.00 |
| 18. | Contingencies and Provisional Sums | 18,000,000.00 |
| | **Grand Total** | **239,337,275.00** |

# 3. POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORK

## 3.1. Chapter Overview

The chapter highlights significant policy, legal framework, international best practice and project implementation and operation institutional framework.

## 3.2. Project Policy Framework

The proposed improvement, operation and decommissioning activities of Mokowe Landing site will need to comply with various existing policies and regulations to safeguard the environment and the local communities. Different stakeholders' input shall be required from different institutions, nationally and at county government level as different policies and institutional interventions are triggered at different phases of the proposed project. The main policies and institutional framework triggered are highlighted in the subsections below. The major laws and regulations include the Constitution of Kenya 2010, the Fisheries Management and Development Act CAP 378, the Environment Management and Coordination Act CAP 387, Environmental Impact Assessment and Audit Regulations (2019), The Public Health Act Cap 242, Revised Edition 2012 [1986], The Physical and Land Use Planning Act 2019, The Occupational Safety and Health Act Revised Edition 2020 [2007], The County Governments Act (2012), The National Construction Authority Act, The National Environment Policy Session paper No. 10 of 2014, and the Environment and Land Court Act, among others. The proposed sub-project activities shall also be implemented in accordance with requirements under the project documents

## 3.3. Policy Framework

**Error! Reference source not found.**Table 3-1 highlights the policies that shall be triggered during the proposed project's implementation and operation. There will be a need to ensure the proposed project activities are in tandem with the policies' requirements as noted in the table below.

*Table 3-1: Relevant Plans and Policies*

| NO. | POLICY INSTRUMENT | KEY PROVISIONS | RELEVANCE OF POLICY TO THE PROJECT |
|---|---|---|---|
| 1. | Kenya Vision 2030 | The vision is a government development strategy to steer Kenya to a middle-income country by the year 2030. It is based on the three pillars of political, social, and economic advancement, and it aims to transform the economy and achieve sustainable growth. | The implementation of the proposed improvement of Mokowe landing site shall enhance the objectives of the policy paper of reforming the fisheries, aquaculture, and blue economy sector to play its key role in the country's socio-economic development. The sub-project shall offer fish traders and the people of Lamu County a chance to access service |

| | | | |
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| | | The vision recognizes the significance of public sector reform as a key enabler. The sector was to be transformed by building and implementing service delivery systems that ensure efficiency, quality, speed, convenience, and dignity in service delivery as well as being globally competitive | delivery by ensuring efficiency, quality, speed, convenience, and dignity in service delivery with a global competitiveness. The facility will also enable Kenya fisheries to ensure fisheries management and enforcement of compliance. |
| 2. | Lamu County Integrated Development Plan 2018-2022 | The CIDP recognizes the significance of fisheries sub-sector to household income, contributing about 70% of the total household income and the focus of the county is to develop marine fisheries, enhance support services and strengthening partnerships with strategic stakeholder. The key focus of the development goals was to infrastructure development to improve fish preservation, handling, sanitation and hygiene The CIDP proposes improvement of fisheries management through training, capacity building the fisheries sub-sector, aquaculture, fishing gear technology, seamanship, in all the sub-counties to conserve the rare and endangered species and the ecosystem. | The county is committed to invest more resources to improve the blue economy in Lamu County. Of significance and relevance to the proposed sub-project, the county proposes infrastructure development to improve fish preservation, handling, sanitation and hygiene. The improvement of the proposed landing site facilities will therefore contribute to required capacity development among the locals on fisheries management and preservation. |
| 3. | National Climate Change Action Plan 2018-2022 | The action plan aims to reduce the impact of climate change to the environment, livelihood and property, food and nutritional security, accessibility to natural resources, health, sanitation and human settlement | KEMFSED project takes deliberate measures to incorporate climate change adaptation measures into the sub-project design. The design of the project has incorporated concepts of promoting water efficiency, use of recycled construction materials and increased use of renewable energy. The plan has been used to guide the design by providing for green building concepts, efficient waste water and solid waste management |

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| | | | through provision of waste bins. |
| 4. | The National Environment Policy Sessional paper No. 10 of 2014 | The policy provides comprehensive strategies for government action regarding the quality of the environment and development. | The project has complied with the policy by integration of environmental sustainability principles at implementation, operation, and decommissions phases for the proposed improvement of existing Mokowe fisheries landing site. The proposed sustainability concepts are as captured in the ESMP of this report and in the design. |
| 5. | National Gender and Development Policy (2000) | The overall objective of the Gender and Development Policy is to facilitate the mainstreaming of the needs and concerns of men and women in all areas in the development process in the country. The construction sector plays a key role in socio-economic development. | Deliberate and affirmative actions have been proposed under this report to encourage all genders to contribute to the proposed sub-project activities as inculcated in the ESMP. The improvement of Mokowe Landing site provides an opportunity for the engendering of the construction sector as a means towards poverty reduction and inclusive socio-economic development. |
| 6. | National Policy for Prevention and Response to Gender Based Violence 2014. | The main objective of the policy is to accelerate the elimination of all forms of gender-based violence in Kenya. | The proposed project shall comply with the policy through the contractor workers signing a code of conduct committing not to engage in any form of GBV whether at the work place or in the community. The project shall also ensure workers sensitization and awareness on GBV and on Sexual Exploitations and Abuse (SEA). |
| 7. | National Land Policy, Sessional Paper No. 3 of 2009. | To provide an overall framework required to address the critical issues of land administration, land access, land use planning, restitution of historical injustices, environmental degradation, conflicts, unplanned proliferation of informal urban settlements, outdated legal framework, institutional framework and information management | The project shall ensure sustainable utilization of land, particularly public land which has been set aside for construction of the proposed project facilities within the project area. The land in Mokowe is owned by Lamu County fisheries department as indicated in the land documentations attached in annex II. |
| 8. | Kenya National Youth Policy | The policy recognizes the significance of the role of youth in | The current development process took into consideration the objective of the |

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| | 2019; Empowered Youth for Sustainable Development | social-economic and political development of the nation and therefore, the policy takes deliberate measures to promote youth empowerment and participation to harness their potential for productive engagement at local, county and national level. | policy. The youth were involved in community consultation process and making decisions on the project. The contractor will undertake to consider employment of local youth during the construction phase. Mokowe BMU and county department of fisheries and blue economy will give priority to local youth for employment during the operation phase when vacancies arise. The Local Member of County Assembly advised the locals to use the proposed social hall for fishing skills transfer to the youth since blue economy is the next wealth creation hub for the locals if they can master the right skills. |
| 9. | The Forest Policy, 2014 | The policy provides a framework for sustainable conservation and equitable utilization of forest resources among different people of Kenya | The policy will come in handy to assist in management of the critical environmental goods and services provided by the Mangorove forest which were noted to be adjacent to the proposed Mokowe fish landing site. The forest is critical for spawning and as feeding area for several fisheries. |
| 10. | The National Occupational Health and Safety Policy Of2012 | This is a framework for safe working environments? it provides basic principles for assessing work related risks and hazards and ways to prevent and mitigate such risks. | The design of the project has factored in the provisions of this policy. However, it will also be of great value during project implementation to provide a framework for compensating work related accidents and diseases. The proponent will need to seek compliance with the provision of the policy in ensuring that workers operate in a safe and healthy environment and that their welfare is safeguarded. |

### 3.4. Legal Framework

During the design of the proposed construction of Mokowe fish landing site, the ESIA team took cognizance of the legislations that will govern the proposed project's activities during implementation, operation and decommissioning phases. Table 3-2 highlights the general legal framework for the coordination of project activities at all phases of the sub-project.

*Table 3-2: The Legal Framework*

| NO. | LEGAL INSTRUMENT | PROVISIONS | APPLICATION OF REGULATIONS TO THE PROJECT |
|---|---|---|---|
| 1. | Constitution of Kenya, 2010 | The constitution outlines principles of environmental and social sustainability. The constitution in article 42 emphasizes the need for a clean and healthy environment by managing substances that may pollute the environment or cause harm to human health. The right to a clean environment is further enforced by article 70.<br>The constitution in article 54(c) requires ensuring people with disabilities have reasonable access to all places, public transport, and information. | The improvement, operation and decommissioning of Mokowe fish landing site infrastructure shall uphold environmental and social considerations through the implementation of the ESMP and ESMoP. The focus shall be on ensuring a clean and healthy environment for all as well as taking into consideration the requirements for people with special needs. The requirement for people with special needs has been considered in the design of the buildings. As well as ensuring natural resources management, under centralized fisheries data collection and management. |
| 2. | The Fisheries Management and Development Act No. 35 of 2016 | The main aim of the Act is to promote conservation, management and development of fisheries and other aquatic resources to enhance the livelihood of the communities dependent on fishing. This is to be achieved through establishment of Kenya Fisheries Service.<br>The act also highlights the functions of the two levels of governance; of significance to this project is the function of SDBE&F to develop fisheries related infrastructure and resource mobilization for conservation management of the fisheries development. And the function of the county government of managing of fisheries related infrastructure. | KEMFSED project is as an effort of the National government to mobilize resources partly to develop fish landing infrastructures and the county government is expected through Mokowe BMU to manage the infrastructure as indicated in the institutional framework of the proposed sub-project. Improvement of Mokowe fish landing site is anticipated to enhance the management, preservation, handling and governance of fisheries resources within Lamu County and beyond. Through centralized fisheries data collection and enforcement of compliance |

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| **Building and Construction** | | | |
| 3. | The National Construction Authority Act No. 41 Revised Edition 2012 [2011] | The Act establishes the National Construction Authority (NCA) which is mandated among other functions to; Oversee the construction industry and coordinate its development; Promote and stimulate the development; improvement and expansion of the construction industry; Prescribe the qualification or other attributes required for registration of contractors; promote and ensure quality assurance in the construction industry; encourage the standardization and improvement of construction techniques and materials; Accredit and certify skilled construction workers and construction sites supervisors and development and publish a code of conduct for the construction industry. | The Act shall be applied in the management of the construction site of the proposed sub-project by ensuring qualified and accredited site personnel, site safety and construction quality standards are adhered to. The site shall also be registered as a construction site by the authority. |
| 4. | The National Construction Authority regulation 2014 | The Regulations requires that any contractor or construction workers working on any construction site in Kenya be registered and accredited by the National Construction Authority. Such persons or firms shall annually renew the certificate of registration according to the provisions of the Act. Other than registration of construction workers and contractors, the Act requires that all construction works, contracts or projects either in the public or private sector be registered with the authority. The owner of such construction sites or contracts shall designate a contact person to liaise with the Authority. And that all construction workers and supervisors be accredited and certified by the | The regulations requirements shall guide on the qualification of contractors and construction workers that shall be allowed to work on site for the proposed improvement of Mokowe fish landing site infrastructure. NCA shall issue approvals and licensing regarding site activities. |

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| | | Authority. | |
| 5. | The Draft National Building Code 2020 | The main objective of the National Building Code is to promote order and safety in construction works and the health and safety of persons in or about construction works.<br>The code provides for the design, construction, operation, inspection, and maintenance of buildings.<br>Sets standards for building materials, products, elements, systems, and services.<br>Provides standards for infrastructure services<br>sets standards for the operations and works at construction sites<br>provides for disaster management at construction sites and<br>Provides for the safety and security of building users and occupants. | The building codes shall guide the contractor, project engineer, and Lamu County CPIU on the expectations of NCA on quality standards regarding construction, operation, and decommissioning activities of the proposed Landing site sub-project. |
| | | **Environment and Natural Resources Management** | |
| 6. | Environmental Management and Coordination Act, EMCA CAP 387 | It sets the legal and institutional framework for the management of environmental issues in the country. | The project triggers the Act to assist in managing and coordinating potential environmental issues likely to emanate from proposed project activities during implementation, operation, and decommissioning. The Act shall guide the relationship between SDBE&F-NPCU, Lamu County CPIU, Contractor and NEMA on matters regarding the environment and public concern. This comprehensive ESIA project report is a requirement under the Act and must be approved before works can commence |
| 7. | The Environment (Impact Assessment and Audit) Regulations, 2003 | The Environmental Regulations (2003) are ingrained under section 147 of the EMCA (Cap 387). The regulations provide for the framework for carrying out EIAs and | The Act guided the development of the ESIA report and shall also come in hand to ensure preparation of annual environmental and social audit reporting during operation as |

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| | | EAs in Kenya. This EIA project report has been conducted in conformity with these regulations and EMCA, Cap 387 | well as decommissioning of the proposed sub-project facilities |
| 8. | EMCA Waste Management Regulations 2006 | The regulations provide for management of different forms of waste streams in the country, given that the project activities during implementation, operation, and decommissioning will result in waste generation. | An increase in waste generation is anticipated during project implementation, operation, decommissioning and the regulations will come in hand to guide its proper management and disposal. Relevant regulation requirements have been captured in the ESMP under chapter 7 |
| 9. | EMCA Air quality regulations of 2014 | The regulation prohibits emissions of air pollutants exceeding permissible levels from controlled areas, stationery sources, mobile sources, occupational exposure, material handling, demolition areas, and waste incineration, open burning of hazardous waste, or from cross-border. The regulation also requires that all emissions be licensed. | The proposed sub-project is anticipated to compromise air quality within the proposed project area during improvement activities, operation and decommissioning and therefore the regulations shall come in hand to guide air quality management standards particularly while working on site. |
| 10. | EMCA Noise and Excessive Vibration Pollution Control Regulations, 2009 | The regulations prohibit loud, unreasonable, unnecessary, or unusual noise which annoys, disturbs, injures, or endangers the comfort, repose, health, or safety of others and the environment. Occupational noise and vibration need to be controlled during the project implementation process. The main sources of noise shall be due to vehicle movement that will be involved in the construction of the project, particularly during the transportation of materials to the site. The other sources shall be general construction activities and conversation on site. | The proposed sub-project is anticipated to have an impact on ambient noise levels within the proposed project area during construction and decommissioning and therefore the regulations shall come in hand to guide noise level management standards. The relevant requirements of the regulations have been incorporated in the project ESMP |
| 11. | EMCA Water Quality Regulations, 2006 | Water quality regulations lay down the standards of domestic water and waste water discharge into the | The regulations shall come in hand to ensure that water supplied to the proposed structures in processing |

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| | | environment. The regulations are meant for pollution control and prevention and provide for the protection of water sources. | the fish meet domestic water supply standards. The regulations shall also ensure that waste water produced from the fish banda and ablution are treated and recycled for use. The quality of the water reused shall ensure that is free of pathogens. This will be achieved through monitoring of the domestic water supply and waste water to ensure compliance with the acceptable standards to prevent pollution. |
| 12. | The Environment and Land Court Act, 2011 | This is an Act of Parliament formulated to give effect to Article 162(2) (b) of the Constitution; to establish a superior court to hear and determine disputes relating to the environment and the use and occupation of, and title to, land, and to make provision for its jurisdiction functions and powers, and for connected purposes. In this regard, those affected by various development ventures that are considered harmful to the environment have structures in place to seek justice, and in so doing, the environment will be safeguarded at all times. | In the event of any environmental-related dispute between NEMA and project contractor, Mokowe BMU, Lamu County CPIU or SDBE&F on issues related to Mokowe fish landing site infrastructure improvement or operation activities, the Act will be triggered in resolving the issues for any aggrieved party. |
| 13. | The Kenya Coastal Guard Act, 2018 | Establishes the Kenya Coast Guard Service (KCGS) to be deployed in the territorial waters for purposes of among, others, enforcing maritime security and safety, pollution control, and sanitation measures; prosecuting maritime offenders, port and coastal security and the protection of maritime resources including fisheries. | The Service will play a critical role in enforcement compliance to fisheries resources management within the fishing grounds for Mokowe fish landing site as well as management of pollution incidences from the docking vessels. |
| 14. | Maritime Zones Act (CAP 371) | The Act consolidates the law relating to the territorial waters and the continental shelf of Kenya. It provides for the establishment and delimitation of the exclusive economic zone (EEZ) of Kenya and for the exploration, exploitation, | Under the proposed sub-project, exploitation of near shore resources is under immense pressure and there is a plan to empower the fishers to exploit deep sea fishing. The Act is relevant to the proposed sub-project |

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| | | conservation, and management of the resources of the maritime zones. The Act domesticates international law on the law of the sea as codified under UNCLOS as it relates to the delimitation of maritime zones for coastal states.<br>The Act establishes and delimits the exclusive economic zone and grants Kenya sovereign rights with respect to the exploration and exploitation and conservation and management of the natural resources (living and non-living) of the zone. The establishment and delimitation of Kenya's EEZ is in accordance with the 1982 United Nations Convention on the Law of the Sea (UNCLOS). | in ensuring that fisheries within the deep sea adhere to regulations |
| 15. | Forest Conservation and Management Act, 2016<br>No. 34 of 2016 | The Act to provide for the development and sustainable management, conservation and rational utilization of all forest resources for the socio-economic development of the country and for connected purposes. The Act recognizes mangrove forest as indigenous forests to be managed on a sustainable basis for purposes of conserving fisheries habitat. | One of the critical habitats within the fishing grounds at Mokowe is the Mangrove forests. KEMFSED project provides an opportunity for the management of the habitats to conserve fisheries resources and BMUs together with associated CIGS/CBOs within Lamu west Sub-county area shall play a critical role in restoration of degraded mangrove areas |
| 16. | Wildlife Conservation and Management Act, 2013 | The Act provide for the protection, conservation, sustainable use and management of wildlife in Kenya. The Act defines "wildlife" to mean any wild and indigenous animal, plant or microorganism or parts thereof within its constituent habitat or ecosystem on land or in water, as well as species that have been introduced into or established in Kenya. All species of fish are therefore recognized as wildlife and fall within the ambit of the Act. The Act has a schedule which declares certain species of fish to be critically endangered, vulnerable, nearly threatened, and protected species and prohibits any person from carrying | The landing site provides an opportunity for the collection of critical fisheries data that will play a critical role in management of fisheries activities. The fish catch data shall provide information on any fish species of concern that are threatened. The Act will be used to monitor the fish species that shall be landed and recorded at the landing site for the protection critically endangered, vulnerable, nearly threatened, and protected species. |

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| | | out any activity involving the listed species. | |
| **Devolved Governance** | | | |
| 17. | County Government, Act 2012 | The County Government Act provides local governance principles, guides the planning and development process, and community participation in the development process. | The Act will come in handy to reduce conflicts between the sub-project and county government physical planning priorities. The Act should be read together with the physical and land use planning Act, 2019 to guide on institutional management framework, land use planning being a devolved function. The statutory approvals for the proposed improvement of Mokowe fish landing site infrastructure will be acquired from Lamu County Government. |
| 18. | The Physical and Land Use Planning Act, 2019 | The Act provides for planning and controlling for physical development in the country in general. The Act read together with the county government Act 2012 will assist in synchronizing the national, local, and project physical planning, controlling for any possible conflicts. | The Act shall also assist Lamu County CPIU in planning for connection to social amenities such as water services and sewerage services in future if any, based on the existing physical planning of the proposed project area. The sub-project should also meet planning requirements of the area. The project shall be approved by the relevant County departments after meeting the requirements of the Act. |
| 19. | Lamu County Public Participation Act, 2016. | An act of the Lamu County Assembly to provide for the establishment of legal framework to facilitate public participation in county government policy processes and service delivery and for connected purposes. | The Act will ensure that stakeholder consultation is a continuous process and concerns incorporated in the designs of the sub-project and also during the operation phase. |
| **Labour Relations and Occupational Safety** | | | |
| 20. | Occupational Safety and Health Act, 2007 | The Acts aim to ensure the safety, health, and welfare of persons at work and non-workers as well as cushion workers against loss of income or livelihood due to occupational accidents or diseases. | The Act shall be applied for the safety of workers and the general public to be ensured during project implementation, operation, and decommissioning phases. The site shall be registered under the Act as a work place at all phases of the |

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| | | | sub-project before commencement of any activities. Relevant safety requirements of the Act have been incorporated in the ESMP |
| 21. | Employment Act 2007 | The main Objectives of the Act is to improve the working condition of employees and protecting their welfare as well as that of the employer | The Act shall be applied to protect workers against; discriminations, sexual harassment, forced labour, protection of wages, employment relations, settlement of disputes and protection of rights and duties in employment. There shall be equal employment opportunities to all and workers through GRM will be able to freely express themselves over the working conditions and terms of engagement. |
| 22. | Work Injury Benefits Act, (2007) | This provides compensation to employees for work-related injuries and diseases contracted in the course of employment. | Requirements of the Act will be applied to ensure that income for workers on the project is assured even where they are not able to work for some injuries or diseases related to working conditions while still under contract. The appointed contractor shall obtain and maintain WIBA compliant insurance cover throughout the project implementation period. |
| 23. | Labour Relations Act 2012 | The Act promotes sound labour relations through the protection and promotion of freedom of association, the encouragement of effective collective bargaining, and the promotion of orderly and expeditious dispute settlement, conducive to social justice and economic development and connected purposes. The Act in Section II Part 6 provides for employees' freedom to associate; section 7 provides for the protection of rights of employees; Part 9 provides for adjudication of disputes, and Part 10 provides for the employees' protection to hold strikes | The Act shall apply to ensure that workers welfare is entrenched into the activities of the proposed sub-projects particularly at construction and decommissioning phases. The workers to be allowed to form associations to air out their grievances. Relevant requirements have been captured in the ESMP and partly under annexes V& VI. The contractor as required under the project will institute grievance redress mechanism where all grievances from workers or the general public access to the site will be promptly addressed as a means |

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| | | lockouts. | to improve Mokowe fish landing site improvement sub-project implementation and operation. |
| | | **Public Health** | |
| 24. | Tobacco Control Act No 4 of 2007 | Promote and protect the rights of non-smokers to live in a smoke-free environment. | Contractor to provide and label the designated smoking area. Same shall be done during operation by Mokowe BMU in consultation with Lamu County CPIU/Health department |
| 25. | Public Health Act, 1986 (Cap 242<br><br>Revised edition 2012) | The Act addresses matters of sanitation, hygiene, pollution, and general environmental health and safety, which are directly related to cases of pollution and contamination of water sources, be it ground or surface. The management of waste water that shall be generated should be managed in a way that shall not cause any public nuisance. | The Act shall be applied to ensure that all sanitation systems for the proposed improvement of Mokowe fish landing site construction and operation activities meet the requirements of the Act. Any food vendors at the site to the workers during construction will also be expected to meet the requirements of the act. |
| | | **Cross Cutting Issues** | |
| 26. | The National Gender and Equality Commission Act 2011 | The Act seeks to promote gender equality and prohibit any form of discrimination against any; women, men, persons with disabilities, the youth, children, the elderly, minorities, and marginalized communities. | That Act shall be triggered particularly during the project construction and operation phase to ensure equal opportunities for all gender. Some of the requirements of the Act have been captured in the ESMP and under annexes V&VI. The design has incorporated requirements for people with disability. |
| 27. | Persons with disability Act No. 14 of 2003 | The Act requires conducive environment to operate for persons with disability to enable such persons to have ease of access and mobility in all public spaces. The Act in section 21 stipulates that persons with disabilities are entitled to a barrier-free and disability-friendly environment to enable such persons to have access to buildings, | The design of the proposed improvement of Mokowe landing site infrastructure is compliant to the requirements of the law by ensuring ease of accessibility and mobility within the structures for such persons with disabilities. |

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| | | roads, and other social amenities, and assistive devices and other equipment to promote their mobility. | |
| 28. | Public Participation Act 2016 | The Act provides a general framework for effective public consultations. It gives effect to the constitutional principles of democracy and the participation of the people. The Act, therefore, gives effect to the principles of public participation as provided for in the constitution. Participation is anticipated to promote transparency and accountability in decision making, promote community ownership of public decisions and promote public participation and collaboration in project governance processes. | The Activities of the proposed sub-project shall require participation of different stakeholders in order to ensure compliance with the principles of the Act. Stakeholder engagement shall be a continuous process throughout the project cycle in addition to the consultations that has been done so far. As indicated in annexes III and VI. |
| 29. | Sexual Offences Act, 2006 | This Act protects people and employees from any unwanted sexual attention or advances by staff members. This act ensures the safety of women, children, and men from any sexual offences, including rape, defilement, and indecent acts. This law will govern the code of conduct of the Contractor's staff and provide repercussions of any wrongdoing.<br><br>The sexual offense act, 2006 supports the Kenya Employment Act of 2007 that a worker should not be harassed sexually to receive preferential treatment at the workplace or detrimental treatment on present or future employment | Any form of GBV and sexual harassment shall not be tolerated on the project site. The Act will come in hand to ensure that all matters related to GBV at workplace are managed appropriately. GRM has been incorporated under this report to ensure that such cases are reported and handled appropriately. All the contractor workers shall be required to sign a code of conduct not to engage in any form of sexual offences while working on the construction of Mokowe Landing site infrastructure. Sensitization and awareness shall be created among workers |
| 30. | HIV and AIDS Prevention and Control Act, 2006 | This is an Act of Parliament providing measures for the prevention, management, and control of HIV and AIDS, to provide for the protection and promotion of public health, and for the appropriate treatment, counseling, support, and | Requirements of the Act will ensure that the contractor together with Lamu County public health department provide for VCT services for employees and locals where appropriate and promote public awareness. This will go a |

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| | | care of persons infected or at risk of HIV and AIDS infection, and for connected purposes. | long way in ensuring stigmatization of HIV and AIDS is reduced as well as managed during the construction period. The project ESMP budget has provided for sensitization and awareness to contractor workers on STI, HIV and AIDS related issues. |
| 31. | The Children Act, 2001 | The Act protects the welfare of children within the Country. The Act identifies Children as a person below the age of 18 years old and protects them from exploitation. Of particular importance to this project is section 10, which protects the child from economic exploitation. Any work that interferes with his/ her education or is harmful to the child's health or physical, mental, spiritual, moral, or social development. | The Act shall be applied to regulate any form of engaging underage to the project activities on site. Child labour in any form shall not be tolerated on the project site and the contractor shall be required under the contract not to engage in any form of child labour on site as provided for under annex VI in this report. |

### 3.5. International Conventions and Treaties

The United Nations and other international institutions have drafted several international treaties and conventions aimed at enhancing social economic development, environmental sustainability and promoting fundamental human rights. The proposed project has incorporated some of the principles from international conventions into mitigation measures under the ESMP as indicated in Table 3-3

*Table 3-3: International Conventions and Treaties Ratified by Kenya and triggered under the sub-project*

| NO | TREATY/CONVENTION | OBJECTIVE | APPLICABILITY TO THE PROJECT |
|---|---|---|---|
| 1. | Convention on the right of the child | The objective of the convention is to protect the rights of a child against abuse and exploitation | The project has considered the convention by not allowing any underage persons to be employed to work at the proposed landing site construction site or during operation. |
| 2. | Convention on the right of the child | The objective of the convention is to protect the rights of a child against abuse and exploitation | The project has considered the convention by not allowing any underage persons to be employed to work at the landing site construction site or during operation. |
| 3. | Convention on the | The objective of the convention is | The sub-project has considered the |

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| | law of the sea | the provision of a framework to assist parties to set marine territorial limits, navigation activities, determine transit regimes and archipelagic status, set exclusive economic zones, continental shelf jurisdiction, deep seabed mining, marine resource exploitation regime, protection of the marine environment, scientific research and settlement of disputes. | convention by recommending the participation of the BMUs and CIGs in restoration of the degraded mangrove forests as part of conservation efforts. Operation of the landing site shall in addition contribute towards enhancing management of near shore fisheries which is highly degraded due to overfishing. The preparation of this report and application of safeguards requirements is also an effort towards compliance to protection of the marine environment. . |
| 4. | Convention on the rights of people with disabilities | The intention of the convention is to protect the rights and dignity of persons with disability | Mokowe fish landing site infrastructure design has considered the rights of people with disability by providing for ease of access and mobility within the fisheries landing site premise. |
| 5. | Constitution of the International Labour Organization and the eight fundamental Convections | To advance social and economic justice through setting international labour standards. | The project has applied the requirements of ILO in the management of the workers working on site. The contractor and the workers shall be required to sign the code of conduct to adhere to fundamental safety requirements at the workplace. Project ESMP in addition has proposed mitigation measures to protect the rights and safety of all workers. |
| 6. | Kyoto protocol and Paris agreement | To mitigate against climate change impacts through climate change adaptation measures. | Climate change adaptation measures such as green energy and building concepts among others have been considered in the design of the project to mitigate against the impacts. |

### 3.6. World Bank Policy and EHS Guidelines

The proposed sub-project falls under the World Bank's support to the government through investment lending towards transforming and strengthening sectors related to the blue economy as part of KEMFSED project, improving of marine fisheries governance. The proposed improvement of Mokowe fish landing site infrastructure will thus trigger the Bank's Safeguard Policies requirements and EHS guidelines as depicted in **Error! Reference source not**

**found.Error! Reference source not found.**, Table 3-4 that requires undertaking environmental and social due diligence through sub-project screening and preparation of ESIA document.

*Table 3-4: Applicable World Bank Policies and EHS guidelines for the Proposed Construction of Mokowe Fish Landing Site Improvement Infrastructure*

| CODE | NAME OF THE POLICY | OBJECTIVES | APPLICATION TO PROJECT |
|---|---|---|---|
| **OP 4.01** | Environmental Assessment | To ensure that environmental and social considerations are integrated into KEMFSED and construction of county landing site infrastructure sub-project's decision making process. The aim is to enhance positive impacts and mitigate negative impacts of the project | The policy is triggered under KEMFSED and the construction of county landing site infrastructure sub-projects. The policy informed ESIA preparation for the proposed Mokowe fish landing site infrastructure, guiding on enhancing positive impacts of the project and mitigating negative ones. |
| **OP 4.04** | Natural Habitats | World Banks Natural habitat operational procedure seeks to ensure that World Bank-supported infrastructure and other development projects take into account the conservation of biodiversity, as well as the numerous environmental services and products which natural habitats provide to human society. The policy strictly limits the circumstances under which any Bank-supported project can damage natural habitats. Specifically, the policy prohibits Bank support for projects which would lead to the significant loss or degradation of any Critical Natural Habitats, whose definition includes those natural habitats which are legally protected, officially proposed for protection, or unprotected but of known high conservation value. | The policy shall guide the implementation of the proposed project and the management of marine resources particularly management of critical habitats by the fishers. |
| **OP 4.11** | Physical cultural resources | This policy addresses physical cultural resources which are defined as movable or immovable objects with cultural significance. Their cultural interest may | The proposed project shall have a chance find procedure in the event of any artifact of significance |

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| | | be at the local, provincial or national level, or within the international community. Physical cultural resources are important as sources of valuable scientific and historical information, as assets for economic and social development, and as integral parts of a people's cultural identity and practices. | |
| | World Bank Group general Environmen t, Health and safety guidelines | The proposed sub-project under KEMFSED triggers: environment, health and safety issues, and considerations of the guidelines shall come in hand to guide on the best course of action, For the different project activities, especially during project implementation, operation decommissioning, regarding air quality issues, waste water management, construction waste management, safety and noise from the construction activities on site | Relevant requirements of the guidelines informed the mitigation measures in the ESMP of this report. |
| | WBG EHS Guidelines for fish processing | The guidelines are industry specific measures that provide Good International Industry Practices associated with fish processing impacts. The EHS guidelines are applicable for project operation phase, identifying impacts and proposing management measures. The guidelines identify solid waste and by-product management, waster water management, water consumption and management, emissions to the air and energy consumption as key environmental issues associated with fish processing. Under occupational health and safety physical hazards, Biological hazards, lifting, carrying, and repetitive work injuries, exposure to chemicals, exposure to cold and exposure to noise and vibrations are issues that occur during the operation of the proposed fish processing facility | The relevant sections of the fish processing EHS guidelines informed the mitigation measures proposed in the ESMP in chapter 6 &7 particularly during the operation activities of the fish landing site facilities. |
| | World Bank policy on access to information, | The World Bank policy on access to information sets out the principles on public access to information in its possession. The Policy is based on five | The ESIA document prepared under the sub-project shall be disclosed to the public ones approved by the bank. |

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| | 2010 | principles which include: Maximizing access to information, Setting out a clear list of exceptions, Safeguarding the deliberative process, Providing clear procedures for making information available and Recognizing requesters' right to an appeals process. |

## 3.7. Project Institutional Framework

### 3.7.1. Regulatory Institutional Framework

Table 3-5 highlights the key regulatory institutions/agencies that shall be involved in overseeing the project activities during the implementation and operation phases to ensure that they meet regulatory standards. Therefore, coordination and consultations shall be required at different levels depending on the activities at hand.

*Table 3-5: Regulatory Supervision of Mokowe fish Landing site improvement Construction and Operation phases*

| NO. | INSTITUTION | RESPONSIBILITY |
|---|---|---|
| 1. | *National Construction Authority (NCA)* | Monitor compliance to design, construction, operation, and maintenance standards of the proposed improvement infrastructure and the associated facilities. The authority ensures that all construction workers and the contractor are accredited and licensed to carry out the construction activities. The Authority shall also monitor the safety of workers and the general public during project implementation and decommissioning. The Authority will in addition register the site during construction. |
| 2. | *Lamu County Government* | The County Government Act 2012 sets the development agenda in the counties by indicating the functions of the devolved system. Land use planning, waste management, fire and disaster management services, water and sanitation services provision are devolved functions. The County government shall approve the structural and architectural design; approve construction; provide water and sanitation services; ensure fire safety; issue the occupational safety certificate before operation and use of the building. The county in addition through the fisheries department and Mokowe BMU will oversee daily operation and maintenance of the proposed landing site structures at the operation phase. |
| 3. | *Mokowe BMU* | The BMU shall be the custodian of the proposed infrastructures at the landing site with the key role being operation and maintenance, collecting of fisheries data reported at the landing, ensuring hygiene and sanitation at the site, paying utility bills and ensuring the sustainability of the fisheries management within the area of jurisdiction. The BMU will also be in charge of the facilities maintaining orders for the visitors to the site |
| 4. | *County Environment* | Ensuring the project adheres to physical planning and environmental standards set by NEMA under various legislations and regulatory standards. |

| | | |
|---|---|---|
| | *Committee* | |
| 5. | *Lamu Water and Sewerage Company (LAWASCO).* | The proposed landing site does not have any water supply but provision of water services to the proposed landing site in future shall be offered by LAWASCO. |
| 6. | *National Environmental Management Authority* | Shall be in charge of overall management and coordination of all matters relating to the environmental issues in the proposed development area through Lamu County Director of Environment (NEMA).<br>Issue the ESIA license authorizing commencement of the project following review and approval of the ESIA project report.<br>Conduct periodic inspection of the project site to monitor adherence with the ESMP developed during the ESIA process |
| 7. | *National Environment Tribunal* | Resolves conflicts between NEMA and any of their clients (KEMFSED, Lamu County CPIU or SDBE &FA) regarding any environmental issues arising during project implementation or operation. |
| 8. | *Environment and Land Court* | Any matter that cannot be resolved amicably between NPCU, Lamu County CPIU, Mokowe BMU and NEMA pertaining to environmental issues arising from the project shall be addressed by the court |
| 9. | *Directorate of Occupational Health and Safety Services (DOSHS)* | The directorate enforces compliance with the OSH Act 2007 and promote workers' safety and health, particularly during the construction and operation of the proposed landing site structures. The work site during construction and operation of the structures shall be registered as a workplace by the department for occupational health and safety.<br>Arbitrate any compensation claims for workers in the project occasioned by incidents of occupational diseases or accidents |
| 10. | *Lamu County Commissioner* | Resolve any security issues, disputes on site and maintaining public order. |
| 11. | *Kenya Power and Lighting Company (KPLC)* | Supply electricity to the proposed building and ensure that all electrical connections comply with safety standards. |

### 3.7.2. Project Implementation and Operation Institutional Framework

Table 3-6 highlights the key project institutional framework that shall be involved in implementation and supervision of safeguards triggered under the sub-project activities, during the implementation and operation phases to ensure that they meet regulatory standards and World Bank requirements. Therefore, coordination and consultations shall be required at different levels depending on the activity at hand.

*Table 3-6: Project Institutional Framework for Construction of Mokowe fish Landing Site Infrastructure*

| NO. | INSTITUTION /PERSONS | RESPONSIBILITY |
|---|---|---|
| 1. | SDBE&F | The state department shall oversee the implementation and supervision of project related activities in consultation with the County Government, including all safeguards requirements, during construction phase of the project. |
| 2. | National Project Coordinator KEMFSED | Provide the linkage, supervision guidance between the NPCU and CPIU. |
| 3. | Project Supervising Engineer | Link the construction team and KEMFSED National project coordination unit (NPCU). Representing the client, supervising contractor at the site in consultation with Joint Project Supervision Committee (JPSC), Works Engineers and general contract management of the contractor |
| 4. | NPCU-Safeguards Specialists (ESS & SSS) | Ensure the environmental and social requirements are prescribed in contractors bidding documents<br>Take overall responsibility of ensuring that the mitigation measures proposed in the ESIA/ ESMP and C-ESMP are implemented.<br>Ensure construction activities are carried out in line with national laws, world bank safeguards operational policies and safeguards instruments prepared under the project (ESIA). Undertake environmental and social audits, EHS audits, capacity building of the contractors team on safeguards issues and Joint Project Supervision Committee (JPSC)<br>Periodic monitoring and surveillance of all project's investment to ensure compliance with the mitigation measures as set out in the ESMP and other contractual requirements,<br>Ensure a functioning grievance redress mechanism and follow-up all environment and social issues raised,<br>Share the monthly and quarterly monitoring reports with the Bank.<br>Report immediately to the World Bank upon occurrence of any significant environmental, social, or health and safety incidents<br>Develop and fully implement including the necessary resources, all operational phase EHS plans |
| 5. | Joint Project Supervision Committee (JPSC) | Joint Project Supervision Committee will be composed of the NPCU Project Engineer, BMU representative, County Civil Engineer, County safeguards officers and NPCU Safeguards team. The JPSC will ensure supervision of works for the proposed infrastructure and safeguards compliance. They will also sign works certificate for contractor's payment. |
| 6. | CPIU's safeguards expert | Assist the contractor in preparation of safeguards Contractor Environmental Social Management Plan required and reporting responsibility. Monitoring contractor implementation of sub-project safeguards requirements. Preparation of monthly and quarterly safeguards |

| | | |
|---|---|---|
| | | monitoring reports. |
| 7. | Contractor | Implement the proposed sub-project according to contractual obligations and observe all safeguards requirement<br>Contractor will have an EHS officer on day to day guidance on project matters on environment, social, health and safety issues<br>Prepare contractor specific ESMP including OHS plans, waste management plans among other plans<br>Obtain the required licenses and permits such as the work place registration permit<br>Provide information to KEMSFED NPCU related to HSE (Health, Safety and Environment) performance, and immediately report any significant environmental incident or worker accident. |
| 8. | Contractor ESHS expert | Ensure implementation of environmental and social safeguards and occupational health and safety requirements during project implementation<br>Maintain log on grievances, accidents and incidents on site.<br>Report on E&S issues in the project progress reports. |

### 3.8. Construction Supervision, Monitoring and Reporting

The technical clauses attached in here under Annex VI and the C-ESMP to be prepared by the contractor shall serve to ensure that the contractor observes his obligations of implementing the requirements of the ESMoP and ESMP as per National laws and World Bank requirements. Reporting on construction activities for the proposed improvement of Mokowe landing site structures shall be done by supervising consultant and the contractor. The supervising consultant shall be in charge of the monthly reporting on site to the County Government and National Government under Joint Project Supervision Committee. The sub-project implementation progress reports prepared by the supervising consultant shall be on monthly and quarterly basis. The client (SDBE&F-NPCU) and Lamu County Government-CPIU shall review the reports and submit to the World Bank for concurrence or guidance. The Joint Project Supervision Committee (JPSC) shall meet at site on a monthly basis. NPCU team shall also conduct quarterly monitoring visits to advice on the progress of the project.

The World Bank team on the other hand shall be conducting semi-annual monitoring mission to advice on the implementation progress. The contractor's site agent/EHS officer shall on a daily basis supervise the implementation of the C-ESMP and ESMoP. The C-ESMP shall be developed by the Contractor's Safeguards Officer from the ESMP in this ESIA. The NPCU safeguards team shall also conduct regular and impromptu monitoring to ensure that all the requirements of the World Bank and National laws are adhered to as captured in the ESMP and ESMoP and are fully implemented. The safeguards team shall also through KEMFSED M&E develop GEMS tool for data collection, remote supervision and monitoring safeguards requirement implementation activities.

### 3.9. Contract Management, Administration and Conflict Resolution

The supervising consultant overseeing the works shall be in charge of managing the project contract on behalf of the client (SDBE&F-NPCU) and Lamu County Government-CPIU. Before, the commencement of Mokowe Fish landing site improvement activities, there shall be clarification of supervision and monitoring procedures and responsibilities, once the contractor is procured. The requisite instruments including the monitoring indicator checklist as *attached* in annex VII shall be refined in alignment to site-specific C-ESMP that shall be prepared by the contractor. The supervising consultant shall also be responsible of resolving any conflicts that arises between the client (SDBE&F) and the contractor. The supervising consultant shall advice the client on the necessary actions that shall be required. Disputes shall be settled amicably through a mutual engagement process that shall be specified in the contract. However, if any dispute arises related to the contract which cannot be resolved amicably among the aggrieved parties, the matter maybe referred to a competent adjudication/arbitration person or institutions in accordance to national laws related to contract management. The identification of an institution or person or procedure agreed upon by the aggrieved party shall be guided by dispute settlement clauses in the contract.

# 4. ENVIRONMENTAL AND SOCIAL BASELINE CONDITION

## 4.1. Chapter Overview

This chapter describes the existing environmental and social baseline conditions within the proposed project Area of Interest (AOI). The conditions described include physical environment, biological environment and socio-economic setting within the AOI.

## 4.2. Project Location and Area of Influence

The proposed Mokowe Fisheries Landing site is located on a piece of land measuring about 0.75 acres (0.3035 hectares) owned by the fisheries department. The land ownership documents are as attached in Annex II. The proposed project is located in Lamu County, Lamu West Sub- County, Hindi ward, Mokowe location and in Mokowe Sub-location. The Landing site is located at Mokowe as shown Figure 4-1 from a Google image. The area has an elevation that ranges from 2-3m depending on the distance from the shoreline and where one picks the points from on the plot, with GPS coordinate of the project site being latitude -2.242020 and longitude 40.871041.


*Figure 4-1:Google Image showing proposed Sub-project Location Site*

## 4.3. Physical Environmental Conditions

### 4.3.1. Climate and Weather Parameters

Satellite derived spatial data for the proposed project area was used for the description of climate and weather patterns of the project area. The study team acquired weather and climatic satellite spatial data from Lamu weather station using the coordinates of the proposed project area. The

station was found to be the nearest to proposed Mokowe landing site project area. The data accessed were for rainfall, temperature, wind speed, relative humidity and radiation from FAO CLIMWAT data base accessed (March 2022).

#### 4.3.1.1. Rainfall

Lamu County generally experiences semi-arid climatic conditions. satellite derived precipitation from Lamu weather station which is nearer to the area of interest *(FAO CLIMWAT data base)* for the past 42 years spanning between the years 1980-2022, acquired using the project area coordinate points were used to determine general monthly average rainfall distribution and annual rainfall amount in the proposed project area. The project area usually experiences a bi-modal rainfall pattern with relatively high rainfalls under the long rains being experienced between March and July compared to the short rains received between September and December as indicated on Figure 4-2. The figure also shows that January and February are the driest months with less than 10mm while May seems to be the wettest month of the year, within the proposed project area. The average annual rainfall within the project area was noted to be about 956mm.

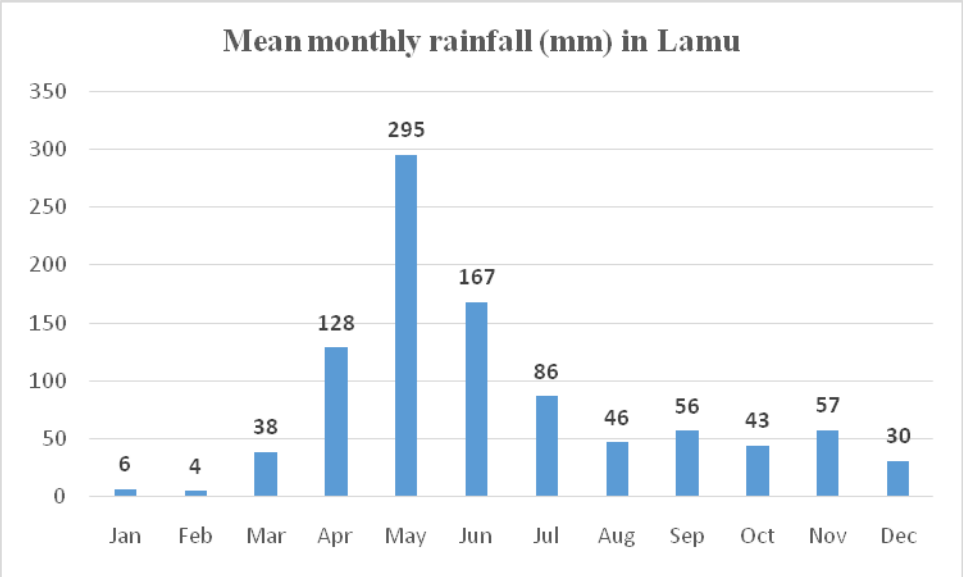



Figure 4-2: Mean Monthly rainfall *source (FAO CLIMWAT data base March 2022)*

#### 4.3.1.2. Temperature

Satellite derived temperature data for the same point and over the same period as indicated in the previous section (4.3.1.1) above was used to compute the air temperature within the project site. The temperature data analysis in the area as indicated in Figure 4-3 shows that March is the warmest months with an average temperature of 29.2˚C while August with an average temperature of 25.5˚C was the coldest. However, the average annual temperature in the project area was noted to be 27.31˚C. The welfare of the workers who will be implementing the project

need to be considered by the contractor to reduce the impacts of high temperature by ensuring sufficient provision of drinking water to avoid cases of dehydration.

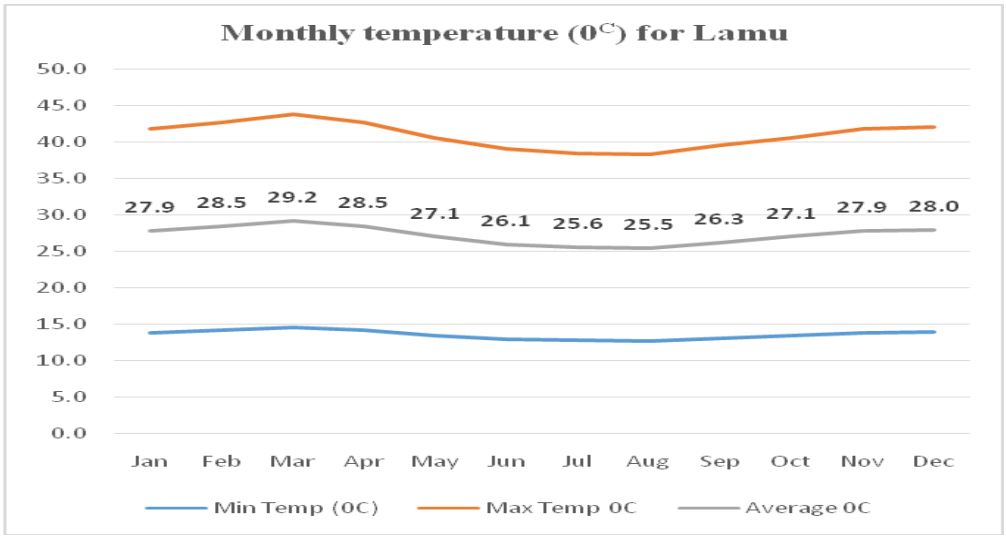



**Figure 4-3: Average Monthly Temperatures source: Lamu weather station (FAO CLIMWAT database March 2022)**

#### 4.3.1.3. Relative Humidity

The average monthly relative humidity within the project Area of Interest (AOI) is about 78.75%. This is comparatively high if compared with most parts in the country. Seasonal mean monthly values fluctuate between 77% in January and February to 83% in May as shown on Figure 4-4. The highlight on relative humidity within the project area is significant given the high solar radiation within the proposed project area that shall lead to increased heat loading among the workers on site. Relative humidity (RH) directly influences the amount of moisture that is evaporated from the skin of workers to the atmosphere. The proposed project area also experiences relatively high winds that shall increase the rate of moisture being carried from the skin. The high relative humidity will be a nuisance to the contractor's team, hence the need to provide enough water to compensate for the heat accumulation to the workers.

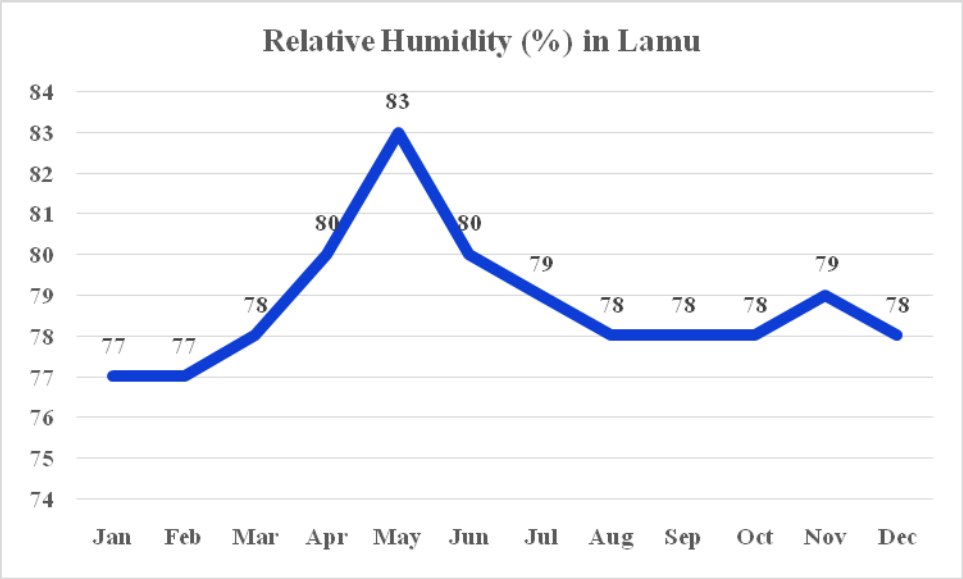



**Figure 4-4: Relative Humidity source: Lamu weather station (FAO CLIMWAT database March 2022)**

#### 4.3.1.4. Wind Speed

The satellite data for wind speed indicated that average monthly wind velocity experienced in the project area is about 1.37m/s with the lowest wind speed of about 1.00m/s being experienced in April and November while the highest is 1.70m/s occurring in January as indicated in Figure 4-5. Wind speeds influence the subsequent changes in the rate of heating, evaporation, transpiration and the microclimate within the working area. The wind speed in addition may cause air pollution by carrying cement or sand particles affecting air quality status on site for the workers and the general community health. The relatively high wind speed within the proposed project area shall be carrying the particulate matter from the construction site dispersing to the surrounding areas.

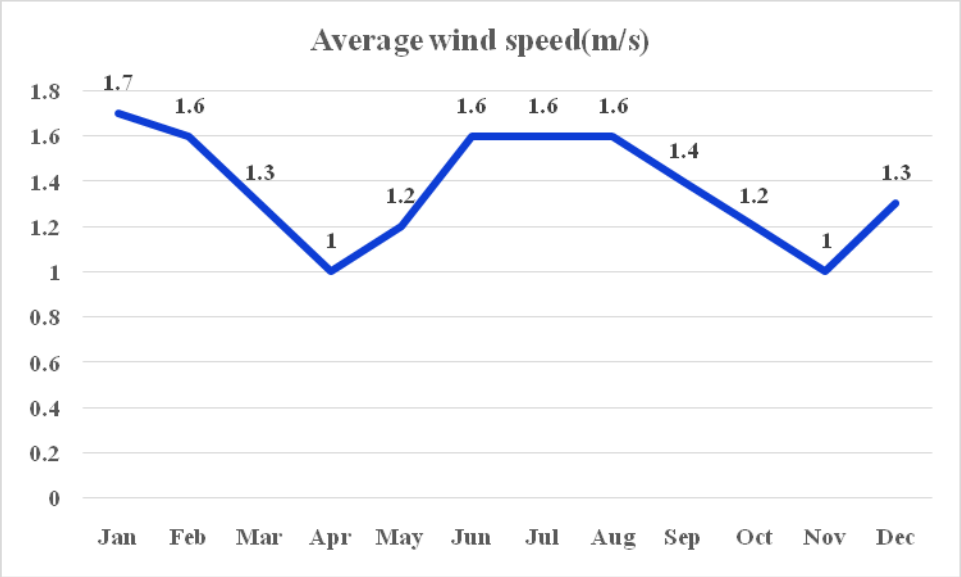



**Figure 4-5: Average Daily wind speed source: Lamu weather station (FAO CLIMWAT database March 2022)**

#### 4.3.1.5. Radiation

The proposed project area experiences an average monthly radiation of about 21.47 Rad (MJ/m$^2$/day) with the maximum radiation of 23.1 Rad (MJ/m$^2$/day) occurring in the month of February, March and October, and a minimum of 18.4 Rad (MJ/m$^2$/day) being experienced in the month of June as indicated in Figure 4-6. The average monthly sunshine hours on the other hand was noted to be 8.28hrs. Solar radiation consists of different light frequencies that can pose a health hazard especially to workers exposed to the sun for long hours with the eyes and the skin bearing the greatest brunt. There will be need therefore for the project implementing agencies to take this into consideration during the construction period. However, for the case of Mokowe fishing landing site proposed works, radiation is anticipated to be of a positive value for the proposed solarised street lights and the solar panels to supplement grid power supply to the facility. The contractor shall be required to provide for the workers clean drinking water to address possible cases of dehydration due to water loss from sweating.

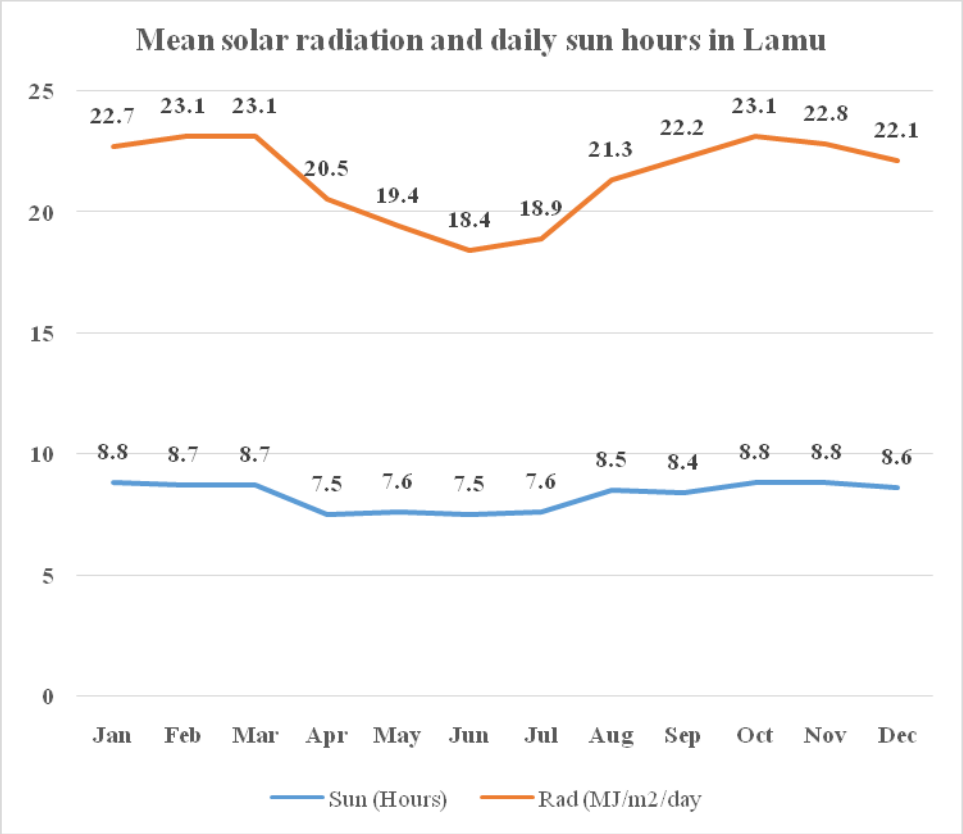



*Figure 4-6: Average daily Radiation and Sunshine hours* source: Lamu weather station (FAO CLIMWAT database March 2022)

### 4.3.2. Waste Generation and Management

#### 4.3.2.1. Municipal waste Management

The main source of litter noted at Mokowe landing site project area during field survey was solid waste from sea debris, boat debris, waste by visitors, waste plastic bottles as highlighted in **Error! Reference source not found.** to **Error! Reference source not found.**4. Lamu Municipality provides municipal services within Mokowe jetty especially provision of waste management services collection using woven baskets before transfer to a dumping site near the hospital. Mokowe jetty currently lacks a skip though the Lamu Municipality is in the process of acquiring the same in the next financial year. Most parts of Mokowe town also lack such similar services and presently Mokowe Mainland CBO has been the main collector of wastes doing it once monthly as a social cleanup exercise together with other stakeholders namely County Department of Environment, NEMA, Kenya Forest Services and other NGO's. In spite of this waste management at household level and at Mokowe fisheries landing site remains inadequately disposed of. During field survey it was observed that there was indiscriminate and crude dumping of solid along the landing site as shown in **Error! Reference source not found.**. Waste management whether liquid, solid or in gaseous form is critical in maintaining environmental integrity of an area. The main type of waste observed was organic and inorganic materials, including plastics, pieces of glass bottles, fish waste, paper, boat fibre glass, sea

debris, boat debris, wood wastes, food remains, soil and plant remains among others. The main waste streams expected to arise out of the operation of the fish landing site upon completion are three namely: human waste generate by people working within the plant, waste water arising out of cutting and washing of fish and solid waste from fish internal organs.

*Plate 4-1: Refuse put near the fish banda*

*Plate 4-2: Beach litter*

*Plate 4-3: Sea debris along the shore*

*Plate 4-4: Solid wastes burnt within the site*

*Plate 4-5: Marine plastic waste*

It was further noted during field survey that some of the operators at the landing site cope with inadequate waste collection through burning at the site as shown in **Error! Reference source not found.** However, waste burning enhances pollutant dispersal to the environment and if not well handled, can be a cause of environmental degradation to the air, biological diversity, water sources and the soils. Waste is anticipated during construction activities, during demolition of existing structures, at the contractor's camp if any, operation phase of the proposed facilities particularly fish waste, waste from the economic activities associated with the mini processing plant as well as debris waste at decommissioning phase of the project. But despite this and

given the size of the proposed works, it is not envisioned to be a menace in the project area. Due to inadequate waste disposal habit within the project site, the contractor shall be required to recycle most of the waste generated on site and where possible adopt safe disposal of any waste.

#### 4.3.2.2. Fish Waste Management

Key informant consultations with Mokowe BMU chairperson indicated that currently there is hardly any fish waste generated at the site. It was revealed that fish gutting is done at sea by the fishers to reduce post harvest loss due to lack of ice to preserve the fish. However, it was reported that for those who land without gutting, most of the waste generated is recycled and is popular among the crab fattening groups around Mokowe area. The intestines and gills for small fish were reported to be collected by the hand line fishers who use the waste as bait during fishing and crab feeds in mangrove areas around Mokowe. In addition to using the intestines for bait, consultation with fishers also revealed that the intestines are fed to domestic animals particularly chicken, dogs and cats and further revelation indicated that intestines are processed to produce fish oil that is used for painting on dugout canoes to protect against wood borer pests. Though fish waste data could have been characterized under this study, there were hardly any fish landings or handling activities on the site that generate waste during the study period as most fish landed was noted to have been gutted at sea. The BMU operating the fish Banda shall be required to partner with waste recycling stakeholders so as to use fish waste for feeds production. However, of significance is the selling of the fish waste to crab farmers currently practicing within Mokowe area, who expressed interest of collecting the waste as feeds to crab fattening activities. Some of the CIGs have expressed interest in crab fattening by submitting proposals and concept notes for grants under component 2 of the project.

### 4.3.3. Ambient Noise and Vibrations

Noise pollution possesses both auditory and non-auditory effects on the exposed population if in excess of allowable limits. Mokowe market centre is predominated by residential tenements which reduce as one move towards the proposed project area to commercial tenements. The main sources of noise within the general project area were noted to be from general conversation, motorcycles, vehicles operating in a nearby Mokowe bus station, boats engines transporting passengers and goods from the jetty, birds, braying of donkeys and noise from public address systems in mosques Plate 4-6. However as one moves away from the market centre and the project site, the noise level reduces as the anthropogenic activities also reduces. There were no major noise receptors other than the visitors and the commercial premises around the proposed fisheries compound. It is anticipated that the works associated with construction of a modern fish Banda, Ablution Block and External works, (*Perimeter wall, drainage, landscaping works, access road works, Jetty, bio-digester and street light)* and movement of project related vehicle will lead to increased noise levels within the proposed project area. However, given the scope of the proposed works and the duration of the activities, the noise impact is anticipated to be low and temporal.

*Plate 4-6: One of the Public Address systems noted in the area*

### 4.3.4. Ambient Air quality

Air pollution at Mokowe area is predominantly dust and haphazard burning of waste at the site and particulates from wind action. The gaseous and particulates pollutants are anticipated to increase with the proposed construction of the infrastructure at Mokowe landing site construction works particularly from construction activities and movement of construction vehicles. In as much as there shall be net improvement of the infrastructure at Mokowe, the movement of transportation vehicle at the site shall generate dust, there are mitigation measures that shall be put in place to regulate the same as indicated in the ESMP in chapter 7 as well as the construction of the 50m or so access road to the site.

## 4.4. Biological Environmental Baseline Conditions

### 4.4.1. Fish Resources and Exploitation

The Kenyan coastline is rich in marine resources and biodiversity. Fishing is among the key economic activities that occur everywhere along the coastline providing income to about 70% of the coastal communities. Fish is also a critical source of protein for the coastal communities. The fisheries sector contributes significantly to blue economy through employment creation, foreign exchange earnings, poverty reduction and food security. Fishing within Lamu county occurs in the inshore and near shore adjacent waters and is mainly small-scale. There is also a marine ornamental fishery which supplies live fish and invertebrates for export to international markets. Fishing along the Kenyan coast is male dominated; however, women dominate in fish processing and trading. Lamu County has over 4,000 fishermen distributed in different landing sites. An average of 6,750 metric tons of fish worth KShs.1.15 billion is landed every year in the county. 535 metric tons was landed in September 2021 (Figure 4-7). Low fish production was realized during Southeast monsoon (Kusi) months from June to September. The lowest catches were in April.

Most of the fish landings from Lamu area traded at Mokowe which is the gateway to and from Lamu Islands. From the (Kenya Integrated Household Budget Survey (KIHBS)) by the Kenya National Bureau of Statistics (KNBS), the per capita fish consumption for Lamu is 20 kgs per person. With a total population of 143,000 people (Census 2019), this translates to a consumption of 8 tons per day. The average landings for Lamu County amount to 21 tons per day. The consumption by Lamu residents is estimated at 8 tons per day and with an estimated 8 more tons leaving for Mombasa and other markets daily. This means that about 5 tons per day will be available for processing at the Mokowe site. Fish production is seasonal peaking during the Northeast monsoon season (Kasikazi) which starts from October to March each year. In 2021, the highest catch of about with 448 metric tons of landings. The dominant landings are from demersal species which are available throughout the year while the pelagics are caught more during the North East monsoon when fishers are able to fish in the open waters. During the SE monsoon, most fishing takes place in the sheltered areas.

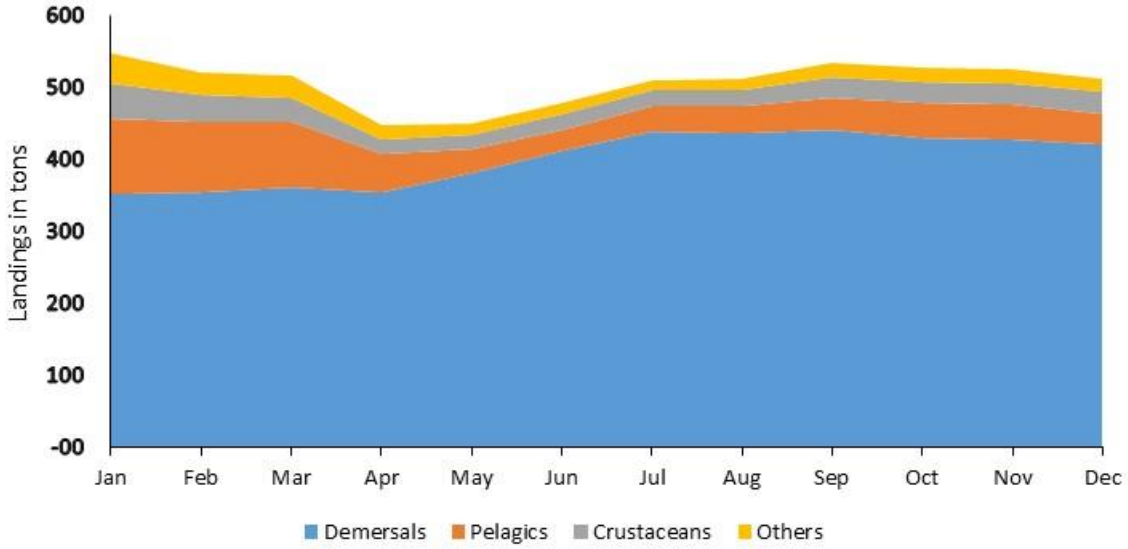



*Figure 4-7: Monthly Estimates of Fisheries Landing in Lamu in the year 2021( Source: Fisheries Buletting 2021)*

#### 4.4.1.1. Vessel types and gear use

According to the 2016 marine frame survey, a total of 1,059 vessels were recorded. The most common craft type was Mashua (48%), Hori (24%) and dugout canoe (15%) (Table 4-1). The most common vessel-gear combinations include mashua-gillnet seines and hori-monofilament (Table 4-2). The main gears used in Lamu are Gillnet, Monofilament and Scoop net. The scoop nets are mainly used for the harvest of lobsters, a major export product from Lamu mainly destined for Europe and Asia. Mean daily catch rates for the commonly used gear types at the Lamu landing site are shown in Table 4-3. On average approximately 50 to 135 kg of fish is landed during each fishing trip. Maximum catch rates can peak to about tons for large vessels. The highest mean catch was recorded from Mashau-Beachseine landing on average 134.8 Kgs,

followed by Mtori-beachseine, Hori-Handline and mashua-Boat seine at 89.3 kgs, 87.6 kgs and 85.5 kgs respectively. These landings from all the boats in Lamu justify the need for the modernization of the fish handling facilities at the site to ensure maximum utilization of landed fish.

*Figure 4-8: Mashua (sail-powered) vessels coutesy of landing catches at Kilifi-central landing site*

*Table 4-1: Number of Vessels (Source: KeFS)*

| Sites | Dau | Dugout | Foot Fishing | Hori | Mashua | Mtori | Others | Grand Total |
|---|---|---|---|---|---|---|---|---|
| Bahari | 2 | | 15 | | 1 | | | 18 |
| Faza | 2 | 19 | 22 | | 34 | 3 | | 80 |
| Hindi/Magogoni | | 4 | 56 | 14 | 9 | | 2 | 85 |
| Kiunga | 2 | 2 | 72 | 24 | 47 | 8 | 4 | 159 |
| Kizingitini | 1 | 1 | 6 | 19 | 67 | 9 | | 103 |
| Langoni | 2 | | 1 | | 42 | 5 | | 50 |
| Mapenya | 1 | 14 | 29 | 2 | | | | 46 |
| Matondoni | | 14 | 21 | 76 | 15 | 2 | 1 | 129 |
| Mbwajumwali | | | 11 | | 11 | 2 | | 24 |
| Mkunumbi | | 26 | 30 | 1 | | 1 | 1 | 59 |
| Mokowe | | 26 | 40 | | 8 | | | 74 |
| Ndambwe | | 22 | 2 | | | | | 24 |
| Ndau | | | 25 | 17 | 32 | 5 | 1 | 80 |
| Pate | 16 | | | | 9 | 1 | | 26 |
| Shella/Manda | 2 | | | | 14 | 4 | | 20 |
| Siyu | 17 | | | | 59 | 6 | | 82 |
| Grand Total | 45 | 109 | 327 | 175 | 348 | 46 | 9 | 1,059 |

*Table 4-2: The boat gear Combination (Source: KeFS)*

| Sites | Dau | Dugout | Foot Fishing | Hori | Mashua | Mtori | Others | Grand Total |
|---|---|---|---|---|---|---|---|---|
| Beach Sein | 0 | 0 | 5 | 10 | 64 | 4 | 0 | 83 |
| Gillnet | 7 | 31 | 2 | 23 | 159 | 11 | 3 | 236 |
| Hand Gathering | | | 62 | | 8 | 1 | 0 | 71 |
| Hand Line | 4 | 11 | 48 | 11 | 30 | | 0 | 104 |
| Hooked Sticks | 2 | 5 | 87 | 5 | 1 | | 0 | 100 |
| Longline | 2 | 5 | 1 | 1 | 9 | 4 | 1 | 23 |
| Monofilament net | 23 | 33 | 31 | 84 | 12 | 2 | 2 | 187 |
| Prawn Seine | | 16 | 15 | 25 | | | 0 | 56 |
| Scoop Net | | 5 | 58 | 13 | 56 | 18 | 2 | 152 |
| Others | 7 | 3 | 18 | 3 | 9 | 6 | 1 | 47 |
| | | | | | | | | |
| Grand Total | 45 | 109 | 327 | 175 | 348 | 46 | 9 | 1059 |

*Table 4-3: Average Daily Catch rates (Kg.vessel$^{-1}$ day$^{-1}$) ± standard Error (SE) for commonly used fishing gears in Lamu*

| **Vessel/gear type** | **Total catch (Kg) Means** | **Total catch (Kg) N** | **Total catch (Kg) Std.Err.** |
|---|---|---|---|
| Mashua-BeachSeine | 134.8 | 539 | 45.3 |
| Mtori-BeachSeine | 89.3 | 460 | 16.2 |
| Hori-Handline | 87.6 | 175 | 21.2 |
| Mashua-BoatSeine | 85.5 | 171 | 20.5 |
| Mtori-HookedStick | 68.2 | 136 | 11.8 |
| Other-Handline | 58.7 | 176 | 15.8 |
| Mashua-Other | 58.2 | 87 | 17.2 |
| Mtori-Monofilament | 56.5 | 139 | 13.5 |
| Other-Gillnet | 55.5 | 111 | 16.4 |
| Hori-BeachSeine | 54.7 | 145 | 18.2 |
| Hori-Gillnet | 50.4 | 148 | 12.7 |

#### 4.4.1.2. Lamu fishing grounds

The fishing grounds of Lamu are spread all the way from Amu to Kiunga which neigbours Somali as indicated in Figure 4-9. Fishing for demersal fish mainly takes place within the reefs. The northern most fishing ground is Jamba la usi near Somalia while the southernmost reported fishing ground is Zinyika neigbouring Tana River County.

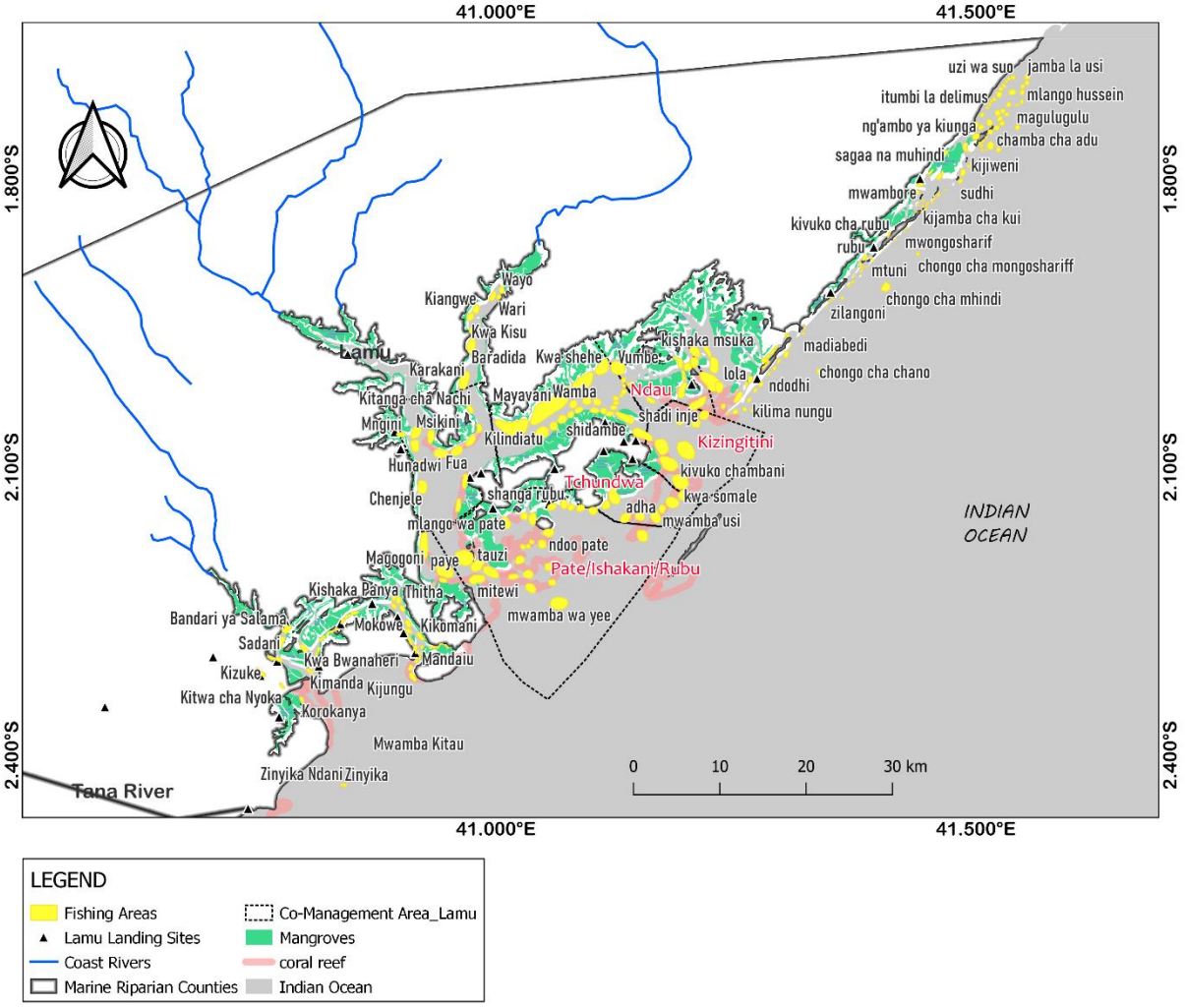



*Figure 4-9: Fishing Grounds in Lamu*

#### 4.4.1.3. Species composition of landings

Pelagic species constitute about 79% of the landings by weight with a high abundance of lethrinids and parrot fish species. This is followed by demersal species which constitute about 11% of the production, Crustaceans and molluscs make up 6% and 4% of the catches respectively (Table 4-4). Although the catches of crustaceans compose 6% of the total catches, the composition in terms of value was 31%. This is because the crustaceans composed of high value species such as lobsters and prawns.

*Table 4-4: The Composition of Landed Catches by Major Groups*

| | Weight (T) | % Weight | Value (Million Kshs) | % Value |
|---|---|---|---|---|
| Pelagics | 4,817 | 79.1 | 555 | 52.9 |
| Demersal fin fish | 668 | 11.0 | 85 | 8.1 |
| Crustaceans | 344 | 5.6 | 326 | 31.1 |
| Molluscs | 260 | 4.3 | 83 | 7.9 |
| Total | 6,089 | 100% | | 100% |

#### 4.4.1.4. Measures to Enhance Fisheries Sustainability and Increased Fish Production

Improving the facilities at Mokowe fish landing site is anticipated to improve fishing efforts by fishers as a means of enhancing household income. Though Lamu County is associated with high fish production over time, near shore fisheries has been facing challenges associated with habitat degradation and increased fishing pressure. However, to contribute towards the project development objective of enhancing fisheries management, there was need to undertake deliberate measures of enhancing sustainability of fish production. The project activities under sub-component 1.2 contribute to increased fish production through identifying area specific management measures and developing a Joint Co-Management Area (JCMA) plan. Under JCMA plans, the communities have identified management measures to be implemented through the BMUs focused on enhancing fish production and habitat management. The management efforts under JCMAs focuses on management of fishing gears, gear exchange to reduce illegal fishing gears, identifying and demarcating no take zones “Tengefu”, seasonal closures and conducting multi-agency patrols for monitoring and surveillance controls.

In addition to the measures undertaken under component 1.2, the project under component 2 is empowering the communities in Lamu county to engage in deep sea fishing by providing modern boats to reduce near shore fishing pressure. Enhancing deep sea fishing skill and tracking the boats to ensure that the fishing activities are in deep waters will enhance fish production in the near shore. The project under component 2 is also providing the communities with complimentary livelihood to reduce overreliance on fishing activities, a move hoped to reduce

pressure on fisheries resources. Mokowe fish landing site which is under Bandari salama BMU is under Lamu Bay JCMA, with a management plan developed. The plan is anticipated to enhance management of near shore fisheries cautioning it from unanticipated negative impacts of increased fishing effort by the locals.

### 4.4.2. Marine Biodiversity and Habitat at Mokowe area

#### 4.4.2.1. Overview

The landing site at Mokowe forms part of the exit point for marine related goods extracted from the Islands. Fisheries and Mangrove associated products are landed from nearby fishing grounds as well as far off Islands of the Lamu Archipelago. Here, the products are either sold locally or transported to other places for trade. This makes this landing site of great significance in terms of how the marine resources from the Islands are extracted. Improving the infrastructure at Mokowe landing site will definitely influence the biodiversity of marine ecosystems close by as well as those of the other Islands of Lamu county. The archipelago is considered to be semi-pristine and contains extensive mangrove stands sheltering lagoons, large areas of seagrass beds on rocky substrates, shallow outer fringing reefs, and a submerged barrier reef c. 3–4 km offshore. Although the area is considered to be semi-pristine, there are a number of infrastructural projects being implemented (such as the LAPSET project from the port development) that have a potential of modifying the biodiversity of this area. Here we provide the baseline information of this area and discuss the implication of infrastructure development at the Mokowe landing site as well as the cumulative impacts from the other development projects in this area.

#### 4.4.2.2. Mangroves

The cover of mangrove forests in Lamu is estimated at 37,350 ha, representing 62% of the mangrove coverage in Kenya (GoK, 2017). All the nine mangroves' species described in Kenya occur in Lamu county. The dominant species are *Rhizophora mucronata* and *Ceriops tagal* that constitutes more than 73% of the forest formation (Kairo et al., 2002b). Other species are *Sonneratia alba*, *Brugueria gymnorrhiza*, *Avicennia marina*, *Xylocarpus granatum*, *Xylocarpus moluccensis*, *Lumnitzera racemosa*, and *Heritiera littoralis*. These species normally occur in single or mixed formation.

Historically, mangroves in Lamu have provided harvestable wood and non-wood products to the people (Hamza et al., 2020; Kairo et al.,2009). This is in addition to the value of mangroves to shoreline protection and biodiversity conservation (Kairo et al., 2008, 2009; Kirui,2013). Commercial harvesting and marketing of mangrove wood products support more than 30,000 families in Lamu (Lamu county spatial plan, 2017). The Kenya Forest Service controls harvesting of mangroves through issuance of harvesting license (GoK., 2017). However, the permit issued are often based on the wood demand rather than the available stocks of the product (Kairo et al., 2002). This procedure has contributed to near depletion of the market sized poles in areas where commercial harvesting is extensive (Kairo et al., 2009; Okello et al.,2022).

The major challenges facing sustainable management of mangroves in Kenya include overexploitation of wood products (GoK, 2017), low community participation in mangrove management efforts, the poverty status of many indigenous coastal communities (Kairo, et al., 2002), limited budget allocation directed to mangrove resources management, and poor governance (Kairo et al., 2018). These challenges persist even with the development of a national mangrove management plan (GoK, 2017). Unpredictable trends in harvesting of mangroves, unclear market trends as well as limited information on multiple actors hinder sustainable utilization of mangrove resources hence leading to numerous economic losses and degradation of the forest. The mangrove species listed below occur in Lamu county and are considered threatened locally due to over-harvesting, but are listed as Least Concern on IUCN's Red List.

Mangrove forest formation in Lamu (source: GoK, 2017).

| Classification | Area (ha) | % Cover |
|---|---|---|
| *Avicennia marina* | 6966 | 18.7 |
| *Avicennia* mixed with *Ceriops* | 1961 | 5.3 |
| *Ceriops tagal* | 5155 | 13.8 |
| *Ceriops* mixed with *Brugueria, Rhizophora and Avicennia* | 1901 | 5.1 |
| *Ceriops-Rhizophora* | 5138 | 13.6 |
| *Rhizophora mucronata* | 5558 | 14.9 |
| *Rhizophora* mixed with *Ceriops, Brugueria, Avicennia* | 8649 | 23.2 |
| *Sonneratia alba* | 1165 | 3.1 |
| *Sonneratia-Rhizophora* | 856 | 2.3 |
| **Total Mangrove cover** | 37,350 | 100 |

#### 4.4.2.3. Coral reefs

Coral reefs in the Lamu Archipelago are located in a transitional ecotone zone. The reefs have been monitored annually from 1998 to the present, documenting a range of ecosystem changes from large and small scale threats. Reefs in the area suffered ˜60% loss of coral cover due to mass bleaching in the 1998 ElNiño event, and 25-40% loss of coral species at individual site levels. Recovery of coral community structure has been variable, with some reefs showing strong recovery, while others have declined further. A harmful algal bloom and coral disease in early 2002 further impacted these reefs, causing mass mortalities of fish and coral, and failure of coral recruitment in that year.

The coral reefs habour the highest fish diversity including Crustaceans with lobsters being the most commercially valuable Crustaceans. Coral reefs in the Kiunga Marine Protected Area (MPA) have the highest fish abundance with the inner reefs having a highest hard coral cover and fish fauna abundance. Two dominant reef fish species are *Acanthurus leucosternon* and

*Plectorhinchus gaterinus*. The fish fauna is dominated by Mullidae and Scaridae and the dominant trophic guilds are herbivores and detritivores. In comparison to a previous study (Obura and Church, 2004), the dominant trophic guilds have changed.

Currently, the coral reef biodiversity is being threatened by overfishing, destructive fishing methods, sedimentation, pollution and climate change. To combat these rising threats, a number of important activities have been established through co-management between different stakeholders. For example, the Pate Marine Community Conservancy (PMCC), Kiunga Community Conservancy (KICOCO) and the Kiunga Marine National Reserve (KMNR) have teamed up with other different stakeholders to co-manage the area including other management actions such as coral reef restoration initiatives and gear exchange program to eliminate destructive fishing gears.

The figure below shows the benthic percentage cover of hard corals in 2020, at 38 study sites spanning from the northern part of Kiunga to the southern part of Lamu. The coral cover in this area is shown to vary significantly from a maximum of over 60 % to a minimum of less than 1 %.

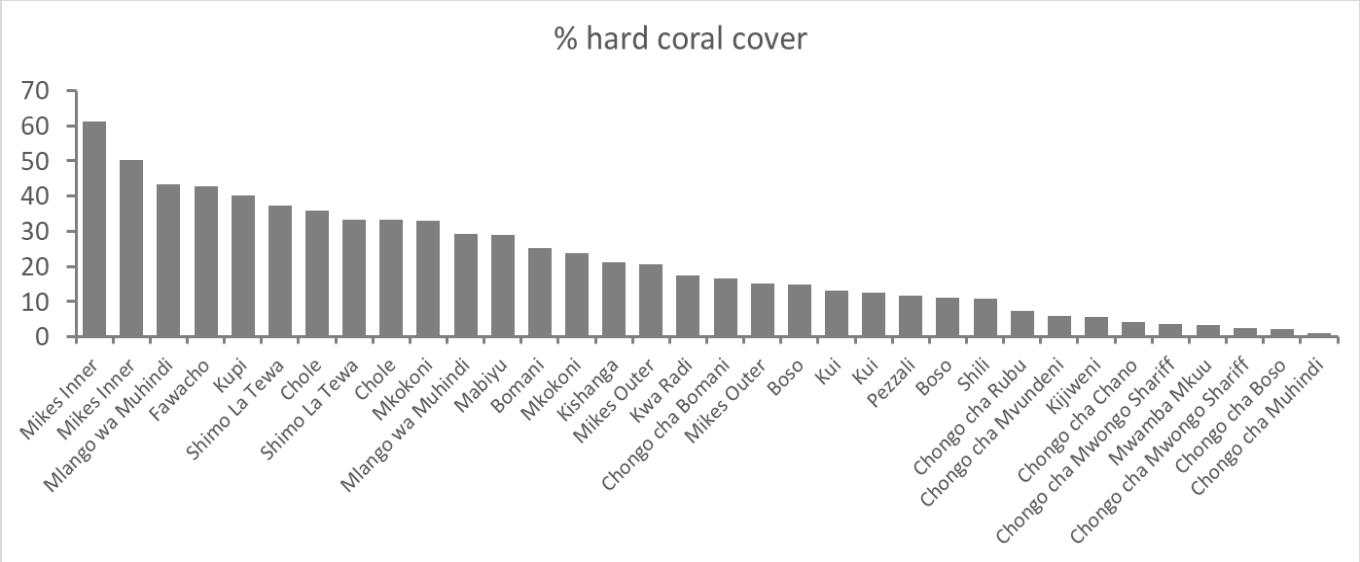


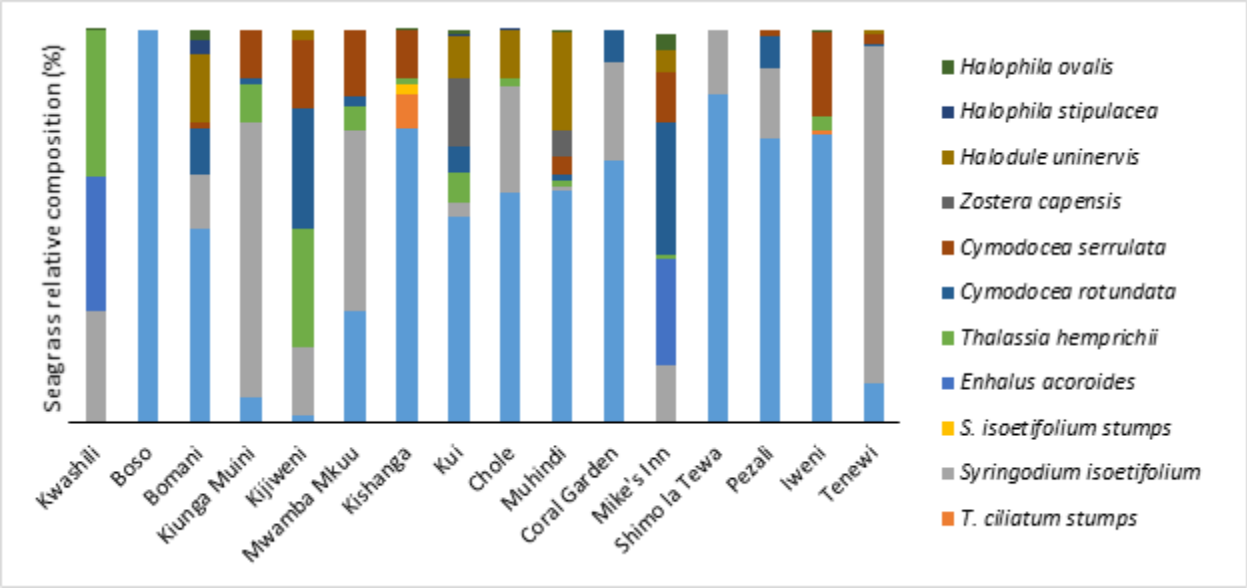

*Figure 4-10: Benthic percentage cover of hard corals*

#### 4.4.2.4. Seagrass

In 2019, extensive surveys on seagrass beds were done in the Lamu Archipelago making the first ever spatially robust seagrass surveys in this area. Results showed that the Lamu- Kiunga seascape has a fairly healthy seagrass cover with an average of 68 % and a maximum of 98 % cover at some sites. Ten species of seagrass were identified with *Thalassodendron ciliatum* (Cymodoceaceae) identified as the dominating species in this area. Further, all the sites had at

least more than one species with *T. ciliatum* dominating, apart from Boso where *T. ciliatum* was the only species encountered at that site. Evidence of seagrass herbivory was observed at Bomani and Kishanga for both *T.ciliatum* and *Syringodium isoetifolium* in a manner that indicated sea turtle grazing. Previous studies along the Kenyan coast have approximated total seagrass coverage at 317 $km^2$ with an estimated 196 $km^2$ coverage for the Lamu-Kiunga seascape representing 60% of the total seagrass coverage in Kenya. Despite this, some meadows appeared to be disturbed such as Mike's Inn which recorded low cover.In addition, areas near the Lamu port such as Iweni experienced colonization by pioneer seagrass species in a place that seemed to be experiencing coral habitat degradation. Most of the seagrass beds appeared to be composed of mixed meadows apart from areas which had monospecific *S. isoetifolium* and *T. ciliatum* meadows. *Thalassodendron ciliatum* was identified as the most dominant monospecific seagrass meadow and has been reported to be dominating in some sites in the southern part as well. Although not much is known about seagrasses along the Lamu-Kiunga seascape, this recent survey provides evidence that there is high diversity and abundance of seagrass species as compared to some sites in the southern part of Kenyawere generally higher than other areas along the coastline. It is important to note that although the majority of species exhibited similar distribution between sites, *Zostera capensis*, which is listed as vulnerable in the IUCN red list, was only found at Kui and Muhindi. The species was confined to intertidal zone which is known to be shallow and often exposed habitats. This species is uncommon and has been reported to be sparsely distributed only in Wasini Island.

This figure below shows the Relative composition of seagrass species at the surveyed sites in Lamu archipelago seascape



#### 4.4.2.5. Fish

Lamu Archipelago is one of most productive fishing grounds along the Kenyan coast. It has the broadest area of continental shelf along the Kenyan coast, and experiences higher productivity relative to neighboring shelf regions. Rich inshore marine fishing grounds are found in and around Lamu Archipelago. Currently, artisanal fishing is the main economic activity, contributing 70% of the household income. The main inshore fishery is located inside the fringing coral reef and extends along the full length of the Kenyan coastline.

Ecological surveys with scientific research vessels have shown that the small pelagic species in include anchovy (*Engraulis sp., Stolephorus sp*.), round herring (*Etrumeus teres*),spotted herring (*Herklotsichthys sp*.), sardinellas (*Sardinella sirm, S. jussieu*), Indianoil sardinella (*Sardinella longiceps*), scad (*Decapturusmacrosoma& D. maruadsi*),bigeye scad (*Selarcrumenophthalmus*), hairtail scad (*Megalaspiscordyla*), and Indianmackerel (*Rastrelligerkanagurta*). Offshore demersal species include snappers (*Lutjanus spp., Etelis spp., Pristipomoides spp.*) groupers (*Epinephelus sp.*),thread fin bream (*Otolithes rubra*), and croakers (*Johnieops sp*.). Highly migratory scombroids (tunas) have also been recorded in the offshore areas and these species are shared with neighbouring countries Somalia and Tanzania. Most of these species, because they have a propensity to aggregate in large schools, lend themselves to capture by the purse-seine method. Improvement in the fishery infrastructure including more accessibility to fishing boats and fishing gears (nets) will increase the exploitation levels of this range of species.

The dominant fish larvae families are Engraulidae (29.5% of total) followed by Sphyraenidae (8.6%), Carangidae (8.2%), Scombridae (6.2%) and Lutjanidae (5.5%), whilst the dominant species within these families are *Encrasicholina sp., Sphyraena sp., Thunnus albacares, T. alalunga and Lutjanus sp.*, respectively. A high prevalence of larvae from migratory species such as *T. albacares, T. alalunga* and *Gempylusserpens*is found across the northern part of the seascape suggesting that the area may be an important nursery area for migratory fish with implications for fisheries across the wider Western Indian Ocean. However, this fishery may be susceptible to predicted future warming in this region with implications for both management of the resource and those fishing communities who benefit from the fisheries. The new emerging offshore fisheries within the blue economy gives this area a great potential to improve the livelihoods of local impoverished fishing communities.

#### 4.4.2.6. Crustaceans

In the archipelago, there is a high diversity and abundance of crustaceans. Ecological surveys have recorded a high abundance of Lobster species which is also contributing significantly to the commercial fisheries of this area. Other crustaceans include crabs, octopus and squids. In Pate Island, there is an Octopus temporary closure where octopus are harvested during specific season in the year.

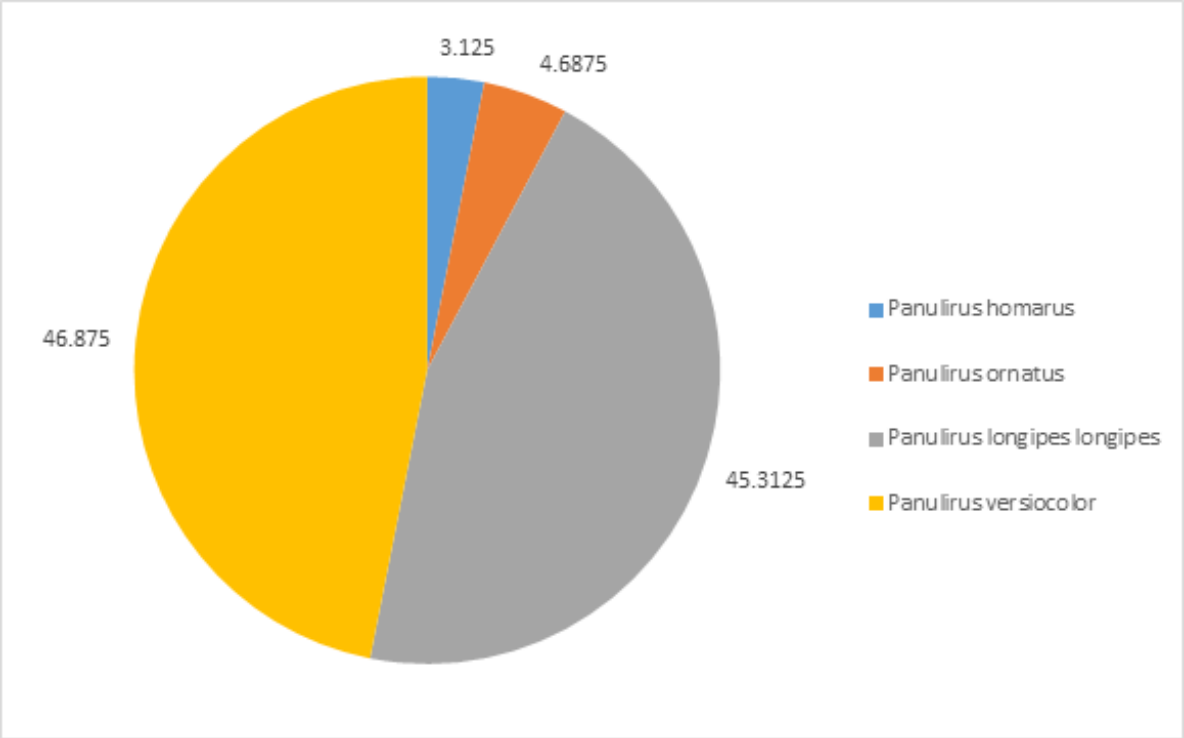



*Figure 4-11: The overall diversity and abundance of Lobster species in the Lamu Archipelago seascape*

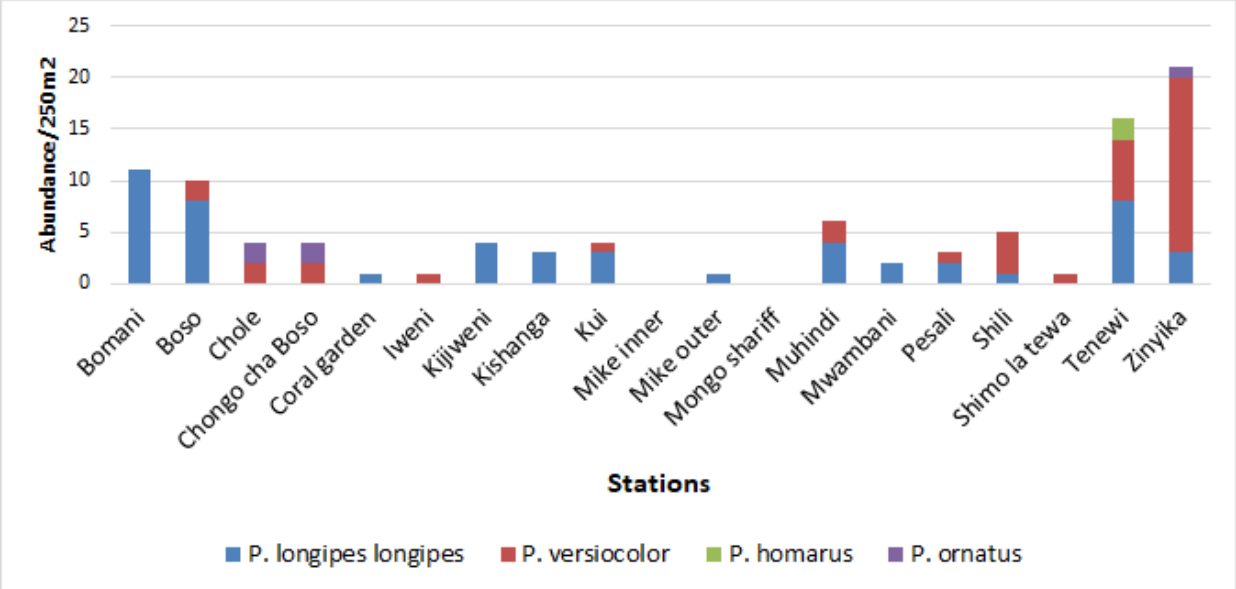



*Figure 4-12: Below shows the diversity and abundance of lobster species at different sites within Lamu archipelago seascape*

#### 4.4.2.7. Species and areas of special concern

### *i. Sea Turtles*

The Lamu archipelago provides the most significant nesting beaches for sea turtles along the Kenyan coast with more than 60% of reported nests found in this area. A total of 2,021 nests have been recorded over a period of 17 years of patrol. Of these, 1,971 (97.5%) were for green turtle (*Chelonia mydas)*, 31 (1.5%) hawksbill (*Eretmochelys imbricata*), 8 (0.4%) olive ridley (*Lepidochelys olivacea)* and 11 (0.5%) unidentified nests. Nesting occurs year-round, increasing during March–July, when 74% of nests were recorded. However, the number of doomed nests relocated and protected was exceptionally high indicating a very vulnerable population of sea turtles.

### *ii. Large marine mammals*

*Table 4-5: Below is a table showing the marine mammals occurring in Lamu archipelago*

| Marine users (MU) | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| Common bottlenose dolphin | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 2 |
| Indian Ocean humpback dolphin | 1 | 3 | 3 | 0 | 0 | 0 | 0 | 0 | 17 | 24 |
| Indo-Pacific bottlenose dolphin | 1 | 76 | 24 | 0 | 0 | 0 | 0 | 7 | 71 | 179 |
| Killer whale | 4 | 1 | 0 | 0 | 0 | 0 | 1 | 2 | 0 | 8 |
| Pantropical spotted dolphin | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| Risso's dolphin | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| Short-finned pilot whale | 0 | 5 | 1 | 1 | 0 | 2 | 1 | 0 | 3 | 13 |
| Spinner dolphin | 2 | 22 | 2 | 0 | 0 | 0 | 0 | 0 | 6 | 32 |
| Total | 8 | 107 | 30 | 1 | 0 | 2 | 2 | 9 | 101 | 260 |
| Dedicated surveys (DS) | | | | | | | | | | |
| Indian Ocean humpback dolphin | 2 | 7 | 11 | 0 | 3 | 5 | 3 | 1 | 2 | 34 |
| Indo-Pacific bottlenose dolphin | 69 | 114 | 94 | 49 | 31 | 40 | 39 | 19 | 16 | 471 |
| Spinner dolphin | 0 | 3 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 10 |
| Total | 71 | 124 | 112 | 49 | 34 | 45 | 42 | 20 | 18 | 515 |
| MMO | | | | | | | | | | |
| False killer whale | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 |
| Indo-Pacific bottlenose dolphin | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 3 |
| Melon-headed whale | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 |
| Risso's dolphin | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 4 |
| Short-finned pilot whale | 0 | 0 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 7 |
| Spinner dolphin | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 |
| Total | 0 | 0 | 0 | 17 | 0 | 0 | 0 | 0 | 0 | 17 |

*Data collection methods: marine users (MU), dedicated surveys (DS) and marine mammal observers (MMOs).*

### *iii. Dugongs*

Globally, IUCN classified the Dugong as rare; Kenya has done the same under the Wildlife Conservation and Management Act 2013, thus making Dugongs a conservation priority. Dugongs are so rare they are in danger of going locally extinct. Generally, there are only two sighting of Dugongs per year, during the month of February and March. In Kenya, there is no reliable historical data on dugong populations (Wamukoya et al., 1997). It is believed that dugongs may now only remain in very small numbers in the Lamu-Kiunga region (Wamukoya et al.1996; Dutton 1998) and in Funzi Bay in the south of the country. Conservation efforts to halt the capture of dugong are a high priority before the population is driven to local extinction.

### *iv. Corals*

Coral species of special interest that are either rare, endemic or have limited ranges include: *Horastrea indica, Siderastrea savignyana, Porites nodifera, P. columnaris,* and an undescribed *Coscinaraea.*

### *v. Fish*

Ecological information on fish biodiversity in this area show that the Napoleon wrasse, *Cheilinus undulatus,*is found in this area. This species is listed as Endangered on IUCN's Red List (IUCN 2010), and is also listed on Appendix 2 of CITES due to serious concerns of the trade in this species to the Asian live reef fish market and crashing populations. The Vulnerable giant grouper *Epinephelus lanceolatus* (IUCN Red List: A2d) and other threatened groupers are likely to occur in this area.

### *vi. Sharks and Rays*

The Critically Endangered sawfish *Anoxypristis cuspidata* (knifetooth sawfish) and *Pristis zijron* (longcomb sawfish) occur in the Lamu archipelago seascape especially in the bays of the ocean in shallow muddy habitat which is ideally suited to these species. All sawfish are listed on Appendix 1 of CITES. Sawfish are the sole living family Pristidae within the order Pristiformes. There is currently very little information available on sharks in Kenya, but there is global concern for the status of sharks due to heavy offshore fishing, little management and regulation, the pressure brought by the valuable trade in shark fin and the destruction of near shore nursery grounds (see IUCN Sharks and Rays Specialist Group). Small (< 2m) coastal sharks that generally have small home ranges (but not milk shark), and high site fidelity make them highly vulnerable and these are likely to be being fished to extirpation. These include: *Carcharhinus wheeleri, C. sealei, C. dussumieri, C. sorrah,* and *Rhizoprionodonacutus*. On the coral reefs the Black tip (*Carcharhinus melanopterus*) and White tip (*Triaenodonobesus*) reef sharks are now extremely rare and have not appeared in any recent Shark studiessuggesting their populations have dropped dramatically.

### *vii. Habitats*

Habitat threats are also of concern but it is believed that approaches to address species concerns would also address habitat concerns. There are several flagship species of high conservation value in this region which should help raise awareness and support for local conservation action. Area-based conservation efforts are popular in this area targeting a multifaceted approach in protecting habitats that are integrated by either ecosystems or by the way they are utilized by the communities, for example the Pate Marine Community Conservancy.

### 4.4.3. The Terrestrial Modified Habitats

The general terrestrial area around the proposed project site was ones a coastal rain forest as part of the larger Boni Forest which extends from around witu area to Somali border, but is a highly modified environment due to anthropogenic activities. The immediate surrounding area is built with hotels, commercial buildings, jetties and yards. The original terrestrial vegetation within the proposed project area has been interfered with and most of the existing is introduced. Most of the natural vegetation which was a tropical coastal forest has been cleared for settlement activities and farming. Hindi area in particular was reported to be one of the settlement schemes in the area. The proposed project shall not have any impact on the surrounding vegetation since the proposed building structures are being introduced to an already build environment.

### 4.4.4. Invasive Species Management

The main invasive plant species observed within the proposed project area of interest was *Prosopis juliflora (*Mathenge Plant*)* as shown in Plate 4-7. The observation made showed that the spread of mathenge plant within proposed project area is influenced by anthropogenic activities particularly road construction activities, livestock movement, construction activities and human settlement as indicated in Plate 4-8. Mokowe was observed to be the main business activity point within the area being influenced by Lamu port operation activities and probably this could be part explanation of the high incidence occurrence of the plant along the main highway accessing Mokowe Jetty, within the project area. There is a potential of exacerbating the spread of the plant during project construction if construction materials will be sourced from infected areas or contamination of the construction vehicles as it moves within the project area. There is need therefore to ensure that equipment to be used during construction works is free from any alien plant materials and soils which may contain seeds of alien species. The materials for construction should also be sourced from areas that are free from the plant species or any other invasive species other than the one noted in the area. Although the risks are moderate based on the observations made in the immediate surroundings of the project site, there is need for vigilance by the contractor and the local community who will work on the project.

*Plate 4-7: : Prosopis Juliflora along the main Mombasa-Lamu road an indication of using contaminated materials*

*Plate 4-8:Livestock herd noted within Mokowe area that could contribute to Prosopis Juniflora dispersal*

## 4.5. Socio-Economic Baseline Conditions

### 4.5.1. Administrative units

The proposed Mokowe landing site project is located in Lamu County, Lamu West Sub- County, Hindi ward, Mokowe location and in Mokowe Sub-location. The Landing site is located at next to Mokowe Jetty connecting to the Island, near Lamu County headquarter offices. The area has an elevation of 3m with GPS coordinate of the project site being Latitude 2°14'31.15"S and Longitude 40°52'15.81"E

### 4.5.2. Demographic Characteristic of the Project site

#### 4.5.2.1. Population Levels

According to housing and population census of 2019, the population for Mokowe location indicated that the male population is slightly higher at 58.52% (4,598) than female population which was 41.48% (3,259)[7] consistent with Mokowe sub-locations with 60.02% (3,470) and 39.98% (2,311) respectively. The population and housing census further indicated that Mokowe sub-location has a total of 1,503 households with an average household size of 3.8 persons per household.

#### 4.5.2.2. Literacy Levels

Literacy levels within the general Lamu West Sub-County is higher compared to the rest of the County followed by Lamu East sub-county. The national average was 82.8% based on the 2019 census, Lamu County was 72.18% and Lamu West Sub-county account for at least 72.38% of the population having attained a form of formal education in the county. It was noted that males in the sub-county had a slightly higher literacy levels than females at 54.63% and 45.36% respectively. About 27.82% of the population does not have any form of formal education in

[7] *Kenya Population and Housing Census 2019: Volume II: Population by County and Sub-County*

Lamu West Sub-county, with majority observed to be women at 50.94% compared to men at 49.06%. The majority of those with formal education have a form of primary education at 57.82%, secondary levels at 22.85%, 4.91% for tertiary, 2.02% university and 3.44% had other form of literacy either adult basic literacy or madras. There was high gender disparity among those who have attained university level of education with males consisting 67.51% compared to 32.49% who were women. The literacy level figures at national, Lamu County and Lamu West Sub-county were as shown on Table 4-6[8].

**Table 4-6: Literacy Level Attained in Lamu West Sub-County**

| | Level of Literacy | Male | Female |
|---|---|---|---|
| National | 82.8% | 50.06% | 49.96% |
| Lamu County | 72.18% | 54.63% | 45.63% |
| Lamu West Sub-County | 72.38% | 54.64 % | 45.36% |
| Pre-Primary level attained in Lamu West Sub-county | 10.98% | 51.30% | 48.7% |
| Primary level attained in Lamu West Sub-county | 57.82% | 51.34% | 48.64% |
| Secondary level attained in Lamu West Sub-county | 22.85% | 62.63% | 37.37% |
| Tertiary College level attained in Lamu West Sub-county | 4.91% | 59.11% | 40.89% |
| University College level attained in Lamu West Sub-county | 2.02% | 67.51% | 32.49% |

The existence of such a relatively high literate population (including females) implies the potential availability of human capital (labour force), for effective participation in the construction activities.

### 4.5.3. Social Amenities and physical infrastructure

#### 4.5.3.1. Project Area Accessibility

There are several options regarding the modes of transport to access the proposed project area. Generally, Mokowe area is connected to other areas through road network, air and sea access. The main roads are the main tarmac road from Mokowe jetty to Witu and onwards to Minjila and Malindi, then branching off at Minjila towards Hola in Tana River County as indicated in Figure 4-13. The area was also noted to be accessed through water (*Indian Ocean*) bordering the landing site. The nearest airport to Mokowe is Manda Island which can only be accessed through water as shown in Figure 4-14 .

[8] *The data shown on the table was extracted from 2019 Kenya population and housing census Volume IV specifically table 2.4*


*Figure 4-13: Access to Mokowe by Malindi-Lamu Road and Sea By boat (courtesy of Google earth image)*

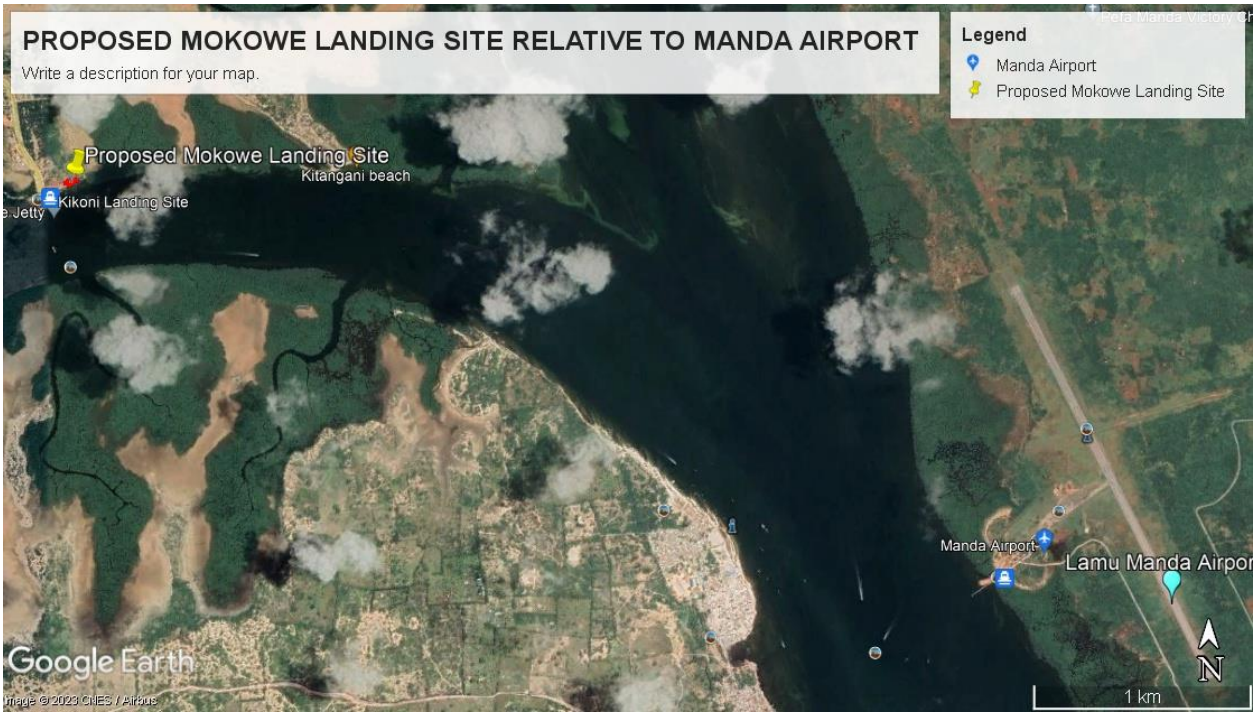



*Figure 4-14: Manda Airport relative to Proposed Mokowe Landig Site*

#### 4.5.3.2. Communication Network

Mokowe area and its immediate environs were generally noted to have adequate communication network. Development in communication network in an area has an influence on the level of awareness among the local population. Findings from observations, key informant interview and stakeholder consultation meeting indicated that wireless communication is the main mode of communication in the proposed project area as highlighted in Plate 4-9. The major mobile network coverage for three communication companies Safaricom, Airtel and telecom were reported to receive signals within the project area, but due to the strong Safaricom signal reception and M-Pesa services, it was reported to be the most popular among the locals. Pay television decoders for zuku, Go-TV, Azam, DSTV and startimes were noted to be the main signal receivers in the area as indicated in Plate 4-11 and Plate 4-12. The audio media reported were radio Lamu,Sifa radio, Kaya FM, baran, rahma, msenangu, salan, Bahari FM in addition to the national radio stations such as KBC, Kiss, Nation, Citizen, Radio maisha and Pwani FM among others. The 2019 population and housing census data indicate that about 46.5% of the population in Lamu West sub-county uses mobile phones, and it appears like more men own phones compared to women at 50.1% to 42.5%. Access to communication services particularly to mobile phones is critical for communication, access to mobile internet and also money transfer during project construction. The findings further show that 20% of the population use internet men accessing at 23.9% and women 15.7% but interesting is that only 6.6% of the population own a computer or a laptop. This indicates that of the 20% who use internet majority could be accessing the internet using cyber cafes or mobile devices which further shows the significance of communication through mobile phones. Internet connectivity within the general Mokowe project area was noted to be high from the number of internet receivers observed in some of the homesteads as shown in Plate 4-10. The available communication channels can be used in the event of need for community awareness and sensitizations is required.

*Plate 4-9: A communication mast noted within the project area*

*Plate 4-10: One of the several Internet Receivers noted in the area*

*Plate 4-11: A receiver dish from star times*

*Plate 4-12: One of the DSTV signal receivers*

#### 4.5.3.3. The Main Water Sources and Reliability

Mokowe landing site is not connected to water neither any nearby premises. The nearest is a public toilet that source its water from Hindi area through a water bowser. Key informant interview indicated that fish is clean with sea water at the existing banda. Ground water is the main source of water within the project area with the local community reporting drawing water from shallow wells as indicated in Plate 4-13. Mokowe area will also be supplied with water by LAWASCO, from a borehole that was put up in Mbele Mbele site in Hindi. The development of boreholes is not included in the sub-project activities. Instead, our primary water source will be the existing facilities operated by LAWASCO at MbeleMbele, which is recognized for its capability to supply clean water. To ensure a robust and reliable water supply system for the site, the site is planning to complement the MbeleMbele source with the installation of a 50m³ storage tank. This strategic addition is designed to provide sufficient storage capacity to meet the site's operational needs without interruption, thereby enhancing the overall efficiency and sustainability of water usage at the fish landing site. The storage is captured in the BOQs. The locals cope with the deficiency through supplementing with shallow wells which are dug by hand and pumped in storage for supply Plate 4-14. However, the shallow wells around Mokowe area were reported to be salty and unfit for human consumption other than for cleaning. Other households cope through buying of water through water bowsers and store in tanks as highlighted in Plate 4-15. The proposed Mokowe landing site design proposes to source water from LAWASCO which supplies the area. Proposals have been put forward to consider storage facilities at the landing site in order to control for the unreliable water supply in the area.

*Plate 4-13: Using Manpower to draw water from one of the shallow wells in the area*

*Plate 4-14: Water storage at one of the roof tops that was reported to be pumped from shallow wells*

*Plate 4-15: Storage tank at the Public Toilet supplied by a water bowser sourcing water from Hindi area*

#### 4.5.3.4. Sanitation Coverage

Human waste management is critical for the landing site users and the workers who shall be working at construction site. Soak pit and septic tank are generally the main means of human waste management noted within the proposed Mokowe project area as shown in Plate 4-16, Plate 4-17 and Plate 4-18. It was apparent on site that fishers do not have a proper toilet but instead rely on a pay toilet near Mokowe site which is privately operated but belong to the County government of Lamu as highlighted in Plate 4-19. The main challenge faced by the operator of the existing sanitation facility is the availability of water. It was reported that water is bought from Hindi area and supplied by a water bowser. The proposed design for Mokowe landing site was informed by the existing information and the site has been designed with a bio-digester connected to the ablution block to assist treat the waste water and recycle for landscaping or cleaning purpose. The proposed design has an ablution block with toilets and a bathroom for

fishers and for all visitors who access the site. A separate toilet for the staff has been provided for in the main proposed fish banda.

*Plate 4-16: Toilet Connected to A soak pit*

*Plate 4-17: One of the Soak Pits constructed adjacent to the Toilet*

*Plate 4-18: Makeshift Toilet connected a soak pit*


*Plate 4-19: County Public Toilet Operated by a private operator at Mokowe Jetty*

#### 4.5.3.5. Main Power supply

Most of the premises and residential households within Mokowe market centre are connected to the national power grid through the Kenya Power and Lighting Company (KPLC) Plate 4-20. However, the proposed Mokowe landing site facilities is not currently connected but will be connected to the same electricity grid system existing in the area Plate 4-21. In addition to electricity, solar power has been provided for in the design of the sub-project and the locals were also noted of using solar at household level as shown in Plate 4-22 and for street lighting Plate

4-23. The measures have been put in place to act as a back-up for regular power failures that could interrupt the operation of the proposed ice plant. The proposed design for the site has considered power saving measures by capitalizing on natural lighting, use of renewable energy-solar and use of energy saving bulbs LED.

*Plate 4-20: Power Suply Sub-station noted at Mokowe Area*

*Plate 4-21: Power Connected to one of the residential Homesteads at Mokowe area*

*Plate 4-22: A solar Panel at one of the Households at Mokowe*

*Plate 4-23: Solarised Street Lights at Mokowe Landing site area*

### 4.5.4. Land Use and Ownership

#### 4.5.4.1. Land use Pattern

According to the Lamu West sub-county physical planning officer, the land use plan for the general project area was prepared in 2020 and is awaiting county Assembly ratification. The land officer observed that most of Mokowe area has been surveyed and the planning takes into consideration future growth of the town. The town is currently the Lamu County headquarters

with most of the access roads and drainage having been constructed already. Lamu port will be a big factor in the development trend of the area. The surveyed areas include Hindi settlement schemes mainly for agricultural purpose and some private plots which have been titled. However most of the plots that have been surveyed in Mokowe have only an allotment letters and are yet to be titled. The proposed land for the fisheries landing site has been surveyed and it's in the process of being titled. An idea about land use information is significant in providing a view of the main economic activities within the proposed project area, and it also provides an indication of whether the proposed project activities are in tandem with the general land use. The proposed landing site shall be located on land set aside for development of fisheries landing site in Mokowe. The immediate land use surrounding the proposed site is commercial premises that are yet to be developed.

#### 4.5.4.2. Land Tenure Status

The proposed improvement works for Mokowe landing site shall be located on public land. The landing site was allotted a land parcel earmarked for Mokowe fish landing site development which was reported to measure about 0.3034 Ha as indicated in annex II. The proposed land for the sub-project has been surveyed and issued with a Part Development Plan (PDP) as indicated in annex II, but the title is yet to be processed. Land will be a major factor in the implementation of the proposed project and resolution of any emerging conflicts related to land will require consultations among various stakeholders. Land in Kenya is generally classified as public, private or community land. Public land is held by the County Government in trust for the people resident in the County but administered by the National Land Commission.

### 4.5.5. Livelihood and Economic Activities

Livelihood comprises of the capabilities, assets and activities required for a means of a living[9]. Through observations, key informant interviews and community stakeholders meeting discussions, it was apparent that households in the proposed project area depend on a diverse range of sources of livelihood. These were basically categorized into; employment, trade and commerce, tourism, livestock production and crop farming. The section below highlights about the general employment status in the area with the other livelihood activities being captured in the livelihood restoration plan prepared together with this ESIA report.

#### 4.5.5.1. Household Employment Levels

There are many sources of either formal or informal employment within the project area where the local people derive their livelihood. Private enterprises, tourism industry and public institutions provide employment opportunities to the local people. The construction of the proposed landing site is anticipated to add to temporal employment of the locals at construction

[9] UNISDR Guidance note on Recovery: Livelihood.
https://www.unisdr.org/files/16771_16771guidancenoteonrecoveryliveliho.pdf

and operation phase of the sub-project. The 2019 population and housing census data for Lamu West population indicated that about 49.58% of the population in Lamu West Sub-County was employed while 5.53% were unemployed and seeking for employment.
The data further shows that of the employed, 52.92% were men whereas 47.08% were women. The findings further showed that about 65.66% of the unemployed in the sub-county were men and 34.34% were women. This is the population that can potentially supply the labour market. The economically inactive population was about 44.86% which was noted to be lower than employed population and of whom men were 46.83% and women were about 53.17%. The economically inactive population indicates that most women in Lamu West sub-county were economically inactive hence dependent on someone in away compared to men. This indicates that most women could be home makers in the area. The proposed project is anticipated to provide employment to various groups of people during implementation and operation phases.

Lamu Island is a source of both skilled and unskilled labor. Skilled labor is sometimes outsourced in cases where such skills are not inherent in the community. Many projects by government and non- state actors have been undertaken through competitive bidding at the County level or national level depending on the threshold and magnitude of work to be undertaken. In most cases locals have been given preference to provide both skilled and unskilled labor. However, it has been observed that most local Bajunis who are the majority are not keen on taking unskilled labor whose wages are too low. Only a paltry 10% of locals present themselves for recruitment as laborers in any construction works. This could be in form of transporting construction materials to the site or undertaking construction works as casual laborers.
Over 90% of casual labor is sourced from other coastal communities who are residents of Lamu in particular the Miji Kenda community from Kilifi County who have either settled permanently or working in the construction sector in Lamu. During the construction phase of this project there will be opportunities for both skilled and semi-skilled labor. The respondent felt that while skilled labor may be imported due to inadequate local capacity, all semi-skilled labor should go to locals especially unemployed youth to build the local capacity and livelihoods improvement. This should be enforced during contract-signing. Child labor is only prevalent in fishing and transport sector and is being addressed through multi-agency approach with the National government taking lead through promotion of policies that can contribute to total elimination of child labor. A case in point is the 100% transition from primary school to secondary school and the free basic education which has significantly contributed to increased school enrolment both in primary and secondary.

### 4.5.6. Cultural heritage and properties within the project area

Lamu Old Town, located on an island known by the same name on the coast of East Africa some 350 Km north of Mombasa, is the oldest and best preserved example of Swahili settlement in East Africa with a core comprising a collection of buildings on 16 hectares of Lamu Old Town

was inscribed as a World heritage site by UNESCO's World Heritage Centre, Lamu has maintained its social and cultural integrity, as well as retaining its authentic building fabric up to the present day. Once the most important trade centre in East Africa, Lamu exercise an important influence in the entire region in religious, cultural as well as in technological expertise. A conservative and close-knit society, Lamu has retained its important status as a significant centre for education in Islamic and Swahili culture as illustrated by the annual *Maulidi* and cultural festivals celebrating the birth of Prophet Mohammed, and the Lamu Cultural Festival, celebrating the rich culture and traditions of the communities inhabiting the coastal region. Unlike other Swahili settlements which have been abandoned along the East African coast, Lamu has continuously been inhabited for over 700 years. The growth and decline of the seaports on the East African coast and interaction between the Bantu, Arabs, Persians, Indians, and Europeans represents a significant cultural and economic phase in the history of the region which finds its most outstanding expression in Lamu Old Town, its architecture and town planning .The town is characterized by narrow streets and magnificent stone buildings with impressive curved doors. This labyrinth street pattern has its origins in Arab traditions of land distribution and urban development. It is also defined by clusters of dwellings divided into a number of small wards (mitaa) each being a group of buildings where a number of closely related lineages live. The buildings on the seafront with their arcades and open verandas provide a unified visual impression of the town when approaching it from the sea. While the vernacular buildings are internally decorated with painted ceilings, large niches (*madaka*), small niches (*zidaka*), and pieces of Chinese porcelain. The buildings are well preserved and carry a long history that represents the development of Swahili building technology, based on coral, lime and mangrove poles. Attributed by eminent Swahili researchers as the cradle of Swahili civilization, Lamu became an important religious centre in East and Central Africa since the 19th century, attracting scholars of Islamic religion and Swahili culture. Today it is a major reservoir of Swahili culture whose inhabitants have managed to sustain their traditional values as depicted by a sense of social unity and cohesion.

Lamu Island has banned cars for general public and the community around relies on donkeys as a means of transport on the land and dhows to travel through the archipelago. The people of Lamu are part of the Swahili people of east of Africa, found in the east coast of Kenya, Tanzania and Mozambique. Lamu island and the mainland is a mixture of many groups Bajunis, Arabs, Somalis and Indians. The community staple food is of Arabic descent, and most of their cooking is rich in spices. Popular Swahili cuisine includes pilau and wali (rice cooked in coconut milk) served with a thick meat stew or fish. The community eats a lot of different grains, vegetables and fruits, including beans, peas, tomatoes, potatoes, okra, kale, spinach, mangoes, coconut and bananas. Goat meat and chicken are traditionally served during special occasions. The traditional attire of the men is a long white (or beige) robe (or kaftans) known in Swahili as a kanzu and a small, white, rounded hat with elaborate embroidery while the women dress in long black dresses called buibui and cover their heads with a black cloth known as a hijabu. The traditional Taarab

rhythm is a slow beat that borrows heavily from Indian and Arabic melody while Chakacha is another authentic music genre with a faster tempo than Taarab.The community uses different kinds of Swahili healing specialist including diviners, traditional healers and even scholars/teachers.Lamu is a major tourist attraction site with Lamu museum, Lamu Fort, Manda Island, the Majlis, lamu game reserve and Kiunga marine national park.

Built in coral stone and mangrove timber, the town is characterized by the simplicity of structural forms enriched by such features as inner courtyards, verandas, and elaborately carved wooden doors.Lamu consists of four main indigenous communities the Bajuni, Sanye, Aweer (Boni), and Orma. The Bajuni, who are the largest in population of the four groups, trace their origins to diverse groups, primarily Bantu and Arab descent.Other indigenous communities include the Korei, Swahili, Arabs, Kikuyu, Mijikenda,Pokomo/Riverine, Somali, Luo, Luhya, Taita and many others. The Swahili/Shirazi and the Arabs constitute 1% and 6% of the population respectively, are mainly in the trading centers. In Mokowe area, Shirazi and Arabs constitute close to 10% of the population.

### 4.5.7. Child Labour Prevalence in the area

Child labor statistics are very low in Lamu. Apart from farm work, there are no other data on child labor prevalence in Lamu. The County is working on the well-being of children in Lamu County.and isguided by the following:

- The Constitution of Kenya (Article 53) on the Rights of Children
- The African Charter on the Rights and Welfare of the Child (ACRWC) (Article 11) on a Child's Right to Education and personal development, and;
- United Nations Convention on the Rights of the Child (UNCRC) (Articles 19, 28 and 42) on Protection from Violence, Abuse and Neglect; the Right to Education; and the State's obligation to inform children and families of their rights.

The County's commitment to the well-being of children in Lamu is commendable. However, a comprehensive and data-driven approach, coupled with community engagement and strengthened enforcement mechanisms, is necessary to effectively combat child labor and ensures the well-being of all children in Lamu.

### 4.5.8. Prevalence of HIV and AIDS

HIV, the virus that causes AIDS, is perhaps the most serious STI. National HIV prevalence among adults 15-64 years is 4.9% with Lamu reporting 3.0%. The workers are at higher risk of contracting HIV/AIDS. Their disconnection from their usual social and familial networks can engender feelings of isolation, prompting some to seek solace in temporary companionships. Unfortunately, these relationships are not always formed under the banner of safe sex practices, heightening the risk of sexually transmitted infections (STIs), including HIV. Culturally, there may be an implicit acceptance of engaging with multiple sexual partners, particularly among men. This social leniency towards promiscuity further escalates the vulnerability to contracting

STIs. Additionally, the consumption of alcohol and drugs in these settings can significantly impair judgment, leading to unprotected sexual encounters and, consequently, an increased risk of infection. The construction industry's workforce is predominantly male, creating a significant gender imbalance at worksites. This scarcity of women can sometimes give rise to situations of transactional sex, where the prevailing power dynamics severely limit women's ability to negotiate the use of protection, such as condoms, effectively elevating their risk of HIV infection. Compounding these challenges is the pervasive stigma and discrimination associated with HIV/AIDS. The fear of being ostracized, rejected, or discriminated against can deter individuals from seeking HIV testing, knowing their status, or accessing necessary treatments. Such apprehensions obstruct effective prevention strategies and facilitate the virus's transmission among populations. Moreover, construction sites, especially those in remote locations, may lack sufficient access to essential healthcare services. This includes HIV testing, counseling, availability of condoms, and treatment options. The absence of these critical healthcare services erects formidable barriers to both the prevention and management of HIV, undermining efforts to curb its spread within these transient communities.

### 4.5.9. Gender Based Violence (GBV) Prevalence

Gender-Based Violence (GBV) occurs across all socio-economic and cultural backgrounds, and in many societies across the Country. GBV is a symptom of underlying gender inequalities and power imbalances that transcend the bounds of geography, race, culture, class, and religion, touching virtually every community.

In Lamu, as in many parts of Kenya and the broader African continent, GBV manifests in various forms, including physical, sexual, psychological, and economic violence. These acts predominantly affect women and girls, stemming from deeply rooted gender inequalities and cultural norms that perpetuate discrimination and violence against women. In Lamu, GBV cases have been reported in both urban and rural areas, affecting women of all ages. These cases range from domestic violence, sexual assault, and harassment, to harmful cultural practices such as early and forced marriages and female genital mutilation (FGM), despite national efforts to eradicate such practices. The patriarchal structure of many communities in Lamu often exacerbates the situation, with women and girls facing significant barriers to reporting abuse and accessing justice and support services. Several challenges hinder effectively tackling Gender-Based Violence (GBV) in Lamu. Stigma and cultural norms discourage victims from reporting incidents, with some viewing family matters as private and justifying male dominance. A lack of awareness and education about GBV, its impacts, and women's rights further contributes to underreporting, leaving many unaware of legal protections or fearing retribution for seeking help. Limited access to support services, especially in remote areas, further complicates the situation as survivors may lack resources to access legal, medical, or psychological support. Finally, while Kenya has legal frameworks protecting women and children, inconsistent implementation creates difficulties for survivors navigating the legal system, from filing reports

to securing prosecution of their abusers. Addressing these multifaceted challenges is crucial to effectively combat GBV in Lamu...

Recognizing the severity of GBV, KEMFSED will put in place initiative aimed at combating this issue at Mokowe construction site. One of the initiative is the raise awareness of GBV. These campaigns also aim to educate communities about the rights of women and girls and the importance of reporting and opposing GBV.

#### 4.5.10. Gender Inequality

i. The management of the Mokowe BMU prioritizes gender sensitivity, with women occupying key positions such as vice secretary and treasurer. However, out of a total of 136 members, only 26 are women, constituting approximately 19% of the membership. This falls short of meeting the constitutional requirement of at least one-third female representation. Despite this, women, or "Mama Karangas," who are members of the BMU, actively participate in various activities and contribute significantly to the community. Some of the activities they are engaged in included: Cleaning and scaling the fish
ii. Improving the sanitation and hygiene at the landing site
iii. Prepare fish ready for market i.e., frying
iv. Trading the fish

Some of the challenges they face include: -

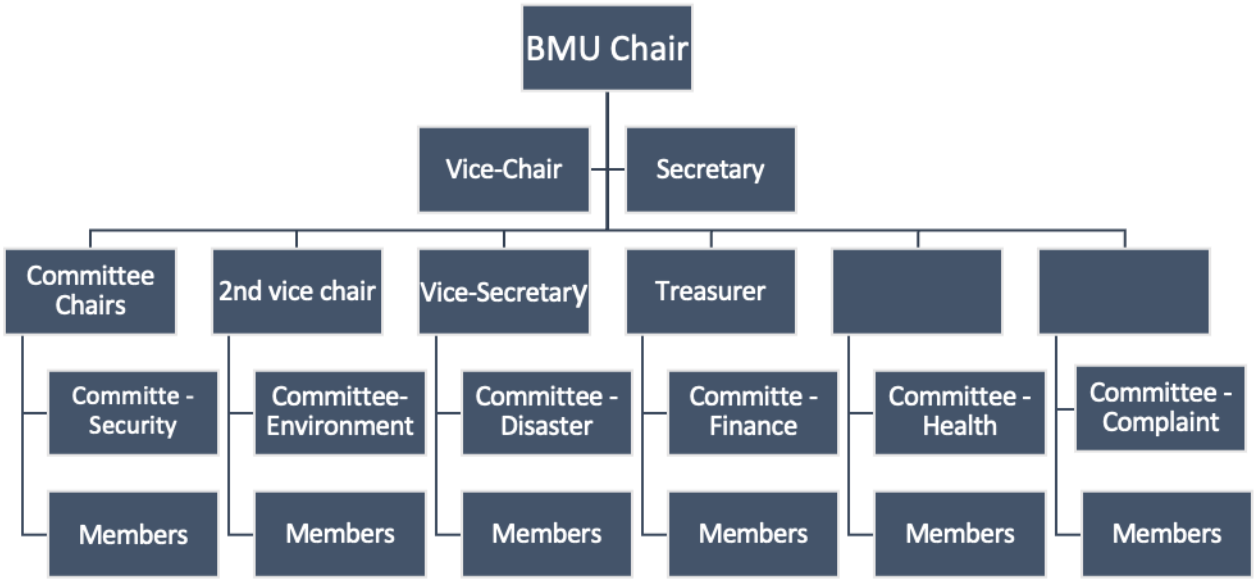
i. Inadequate storage facilities
ii. Lack of working area i.e., fish banda
iii. Stable market
iv. Exposure of the trade
v. Over burden with other responsibilities from home
vi. Not fully engaged in the landing site due to gender

A lot of awareness and capacity is needed across a wide variety of issues such as HIV/AIDS, taking lead in becoming BMU members, financial management including saving and best way to expand the business to large scale trade.

#### 4.5.11. BMU (Organization, leadership, history, activities, sources of income, challenges

Mokowe is a Swahili name which means ‘to rescue’ during the slavery times where slaves were captured and traded to Unguja, Zanzibar. Mokowe landing site in Lamu County constitute of Kitangani landing site, Bandari Salama landing site and Jetty landing site after borrowing from the BMU’s in Kisumu County where they were fishing in freshwater lake. The Mokowe BMU were trained, and they formed their own BMU it is now 10years since its establishment. Elections are conducted after every four years the last election was in 2021. The Mokowe BMU’s are responsible of management of the landing sites, financial management, collection of revenue, enforce the law, supporting welfare of fishermen and resources, security of fishermen,

support in data collection, collaborate with the County Government, enhance sustainability of fishing activities, conserve ocean resources and ecosystem though faced with a numerous challenge such as poor financial base, mismanagement of resources, lack of infrastructure, low technical capacity, low empowerment of the members and poor commitment of the members. The BMU is made up of 136 members, 73 old men, 37 young men, 23 old women and 3young women. For one to qualify as a BMU member you have to be a fisherman, boat owner, mama karanga, fish dealer or boat repairer within a fishing community. The current BMU constitute of the below management members: -



# 5. PUBLIC PARTICIPATION AND CONSULTATIONS

## 5.1. Overview

The chapter highlights the need for stakeholder participation and the consultative process adopted during the study and summary results of the process. According to the Constitution of Kenya 2010, Article10 underlines the need for government, private, donor funded projects and agencies to conduct public participation in public development projects that shall affect communities and the general public. The views and opinions of the community are, therefore equally valued and vital before the project is implemented. As a result, the ESIA survey team conducted several stakeholder engagements and consultations with key informants, BMU members, *Mama Karanga* and the general public, to seek their views and opinions during project design, operations and decommissioning of the project.

## 5.2. The consultative process adopted

The environmental survey team recognized the significance of the assignment findings to intended project users and in this regard, considered the active involvement of all potential project stakeholders. To attain this objective, the ESIA survey team adopted a participatory approach in identifying environmental and social impacts related to the project cycle in Mokowe Fish Landing site. Several methods were used to engage stakeholders in the process of capturing their views, issues and concerns on the proposed project during data collection. The methods included: presentation of the proposed site plan for Mokowe for their opinions and views on the proposed development; question and answer session from the general public and key informant's interview of strategic officers i.e. *Sub-county fisheries officer, Department of Fisheries Chief Officer; County Executive Committee Member for Fisheries and Cooperative Development*. These persons were able to share their insights on the effects of the proposed development project.

## 5.3. Key Informant Interviews

The Lamu CPIU together with NPCU infrastructure development technical team, conducted several technical assessments and key informant consultations with the county government officials, Kenya Marine Fisheries Research Institute staff, County Executive Committee Member for Fisheries and Cooperative Development, Director/Acting Chief Officer fisheries and officers from supporting departments mainly public works, land and physical planning and mama karanga and BMU members in order to adequately get the Mokowe landing site infrastructure priority interventions. The consultations were on several different occasions which were both formal and informal. A public consultative meeting was held on *13th January 2023* at the proposed landing site as indicated in ***Error! Reference source not found.***to*Plate 6*. The discussions during the consultation process were as captured in *Table 5-1 and Table 5-2*. The general views from the consultations highlighted that the Mokowe landing site area has a potential of becoming a key fish landing site for *Lamu County* mainly as a dispatch facility to other markets. The proposed facilities shall open up the area to potential investments in eco-

tourism, hotel industry, and recreational facilities in order for the BMU to increase their revenue streams and enhance their livelihood.

Table 5-1: Summaries of Key observations made by selected key informants

<table>
<tr><th>No.</th><th>KEY INFORMANT INTERVIEWED</th><th>SUMMARY OF REMARKS</th></tr>
<tr><td>1.</td><td>Hon Faiz Fankupi, County Executive Committee Member – Fisheries and Cooperative Development</td><td>The CECM noted that the initial PDP for this landing site dates back to 1971 but was not followed up to get a title deed hence there was grabbing and we are only left with about 0.75 acres for which the designs have been done. He noted that there is a presidential directive to establish the status of all landing sites to see how they can be recovered for community benefit. The PDP for the landing is in process of being gazetted.</td></tr>
<tr><td>2.</td><td>Kamalu Shariff,<br>Director/Acting Chief Officer, Fisheries</td><td>He cited the importance of having a functional fish landing site in Lamu. He noted that fish is food and as such it needs to be isolated from the proposed petrol jetty which was close nearby to avoid contamination. He emphasized that the community has now a chance to contribute to this design to fit their needs.</td></tr>
<tr><td>3.</td><td>Naomi Karanja,<br>Physical Planner</td><td>She explained the size of the current site and also took the team around to show them the beacons. He reported that the Department of Physical Planning had already developed the PDP whose gazzettment process was to commence the week starting 16 January 2023.<br>The GPS coordinates for the existing plot are:
<table>
<tr><td>Stn</td><td>E</td><td>N</td></tr>
<tr><td>Fs1</td><td>707919</td><td>9752381</td></tr>
<tr><td>Fs2</td><td>707930</td><td>9752328</td></tr>
<tr><td>Fs3</td><td>707996</td><td>9752355</td></tr>
<tr><td>Fs4</td><td>708005</td><td>9752366</td></tr>
<tr><td>Fs5</td><td>707999</td><td>9752383</td></tr>
<tr><td>Fs6</td><td>707986</td><td>9752377</td></tr>
<tr><td>Fs7</td><td>707983</td><td>9752380</td></tr>
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| | | |
|---|---|---|
| 4. | **Collins Ndolo**, Component 2 team member | He explained to the community that today's meeting was specifically on infrastructure development, however, the project has other components which can fund other initiatives such as patrol boat, refrigerated truck, BMU hotel and encouraged the community and BMU members to explore those options. |
| 5. | Kipkalis Japhet, Fisheries Officer | The fisheries officer was particular about the documentation for this site ownership to be availed or process finalized. He noted that the proposed landing site is for the Bandari Salama BMU aka Mokowe BMU. The average fish landings are 5 tonnes per week during main fishing seasons from August to January with the fish destined for the local market in Mombasa. The type of fish landed is mostly mixed fish – *Tafi, Tangu, Kiboma, Cheusi, Pweza, Mullet Fish(Mkizi), Tewa, With Tangu* being the main fish species. The season for tuna and tuna-like fish is from September to December. This site has about 20 fish dealers who are also transporters. The fisheries officer is unable to access most landing sites in Hindi ward due to transport logistics. |
| 6. | **James Githui** Chief Engineer. | The facility will fit the space available though it will be squeezed close to the neighboring plot. The plot will not have a perimeter wall for space maximization while there will be space left to allow vehicle loading/offloading at the cargo jetty to maneuver. The design provides for wide open windows to improve on lighting and aeration while a hybrid power system will be installed for help reduce in power costs. The typical Swahili architectural design will be maintained for visual appeal. Sewage will be handled through a 3 step sewer system and a bio-digester. The top floor will be installed with the solar panels. |
| 7. | **Kahindi Yeri,** NEMA Officer | The Survey Act provides that there should be a 60m distance from the high water mark that should be observed before any developments are put up. According to The Wetlands Regulations under EMCA provide for a developer to observe a setback line of 30 m from the high water mark before any developments are put up. However, a fish landing site is a facility put up to help fishers land their fish directly from the boats directly to a processing plant and reduce contamination |

| | | |
|---|---|---|
| | | under HACCP, as such this development is typically put up alongside the ocean and in this case there is a seawall. The nature of this activity is that it has to be at the sea line, the design has put all the necessary safeguard measures to ensure the integrity of the seawall and the sea are not interfered or contaminated. A special presidential exemption was provided by Government. |
| 8. | **Mr Mwangi,**<br>KFS Officer | The Lamu Ecosystem Conservator explained that from records available, there is no evidence previous application by the Fisheries Department for a Special User License for this specific site that is required for use of an area touching the mangrove zone. He recommended that the Fisheries Department or the Bandari Salama BMU since they are the user community needs to apply for a *Special User License* and thereafter pay the requisite annual license fees. The department has no objection as well as the Special User License is obtained. The CPIU is in the process of applying for Special User licence |
| 9. | **Stephen Mwangi,** Infrastructure team member – KEMFSED Mombasa NPCU | He explained to the community that this project is being funded with a view to improve fisheries infrastructure for the Lamu fishers. The project covers the five counties bordering the Indian Ocean. The concern will be in line with the available financial resources. |
| 10. | **Mohamed Burji** – Chief Mokowe | He assured community of government initiative in ensuring security is enhanced as the project is implemented. The Chief also assured of the readiness of the national government in ensuring that as many youths benefit from the KEMFSED project. He was also thankful that the project had a sub-component of education scholarships. All these efforts would ensure the youth are busy, get a source of income that will keep them away from crime, anti-terror activities and radicalization. |
| 11. | OCS – Mokowe | He assured community of government initiative in ensuring security is enhanced in project areas. He noted that most of the youth are just looking for means of earning an income and this landing site has the potential to create income through manual jobs as well as opening up job opportunities for youth entrepreneurs. The BMU should also encourage out-of-school |

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| | youth engage in fishing activities instead of being idle. These initiatives will help in reduction of crime. |

### 5.4. Community Consultations at Mokowe BMU site

The public community stakeholder meeting was held as a compliance measure to the constitution of Kenya-2010 requirement, for all public development projects to be subjected to public views and opinions from the community that shall be affected during the commissioning, operations and de-commissioning phases of the project. The consultation meetings was organized by the area Chief in consultation with CPIU team members particularly the CPC, ESO and SSO, the meeting was held on **13th January 2023**, at the project site as indicated in **Error! Reference source not found.** to Plate 6.The community members were invited for the public consultation include the BMU members, residents of *Mokowe area*, women, youth, business men and people with special needs, as indicated in the attendance list Annex III.

The Lamu CPIU Project Coordinator introduced the purpose and objective of the meeting and the need for the community members to actively participate and contribute to the discussions. The Project Engineer from NPCU presented the objectives, design and the scope of the proposed sub-project. The participants were taken through the proposed projects- *a Social Fish Banda, a Social Conference Hall, and an Ablution Block*. The objective of the meeting was to get the views and opinions of the residents and users of the facilities on areas of improvement on the project design, environmental and social impacts and areas of mitigation that shall be considered in the ESIA project report. From the findings of the discussions in the meeting, it was evident that the project was welcome and supported by the community members.

The County Director/Acting Chief Officer, Fisheries department indicated that the proposed Mokowe landing site infrastructure development would provide local fishermen with economic and social benefits. The center will foster an improvement in the community's economic development by promoting fishing and cold facilities. The County Executive Committee Member thanked all for availing themselves for this noble project. He noted that Lamu produces 80% of lobsters sold in this country with majority coming from *Kizingitini.* He noted that there are many initiatives in the marine industry such as *Crab farming*, which the county government is willing to support and encouraged the community to undertake such initiatives. He said that plans to get title deeds for all landing sites are at advanced stages. He also requested members to ensure they develop any land given to them or ensure that they process those title deeds to discourage grabbing. He assured them that H.E, the Governor was in support of this project and gave his apologies as he had another engagement.

Some of the observations made by the participants were as captured and summarized in the minutes attached in *Annex III*. Some of the highlights of the discussions were as captured below;

- Community members expressed their enthusiasm for the construction of the Landing site.

- The community members perceived the project as beneficial. Some of the outlined benefits as; Job opportunities, transfer of skill sets to the community members during construction, expected local business boom particularly food vending at the site and improved livelihood conditions due to high cash flows in the area, time management since the early risers will be considered while hiring casuals.
- The community *Mama Karanga* termed the proposed project as a timely and beneficial to them as the Dispatch area shall provide ice flakes and storage of fish therefore they do not have to wait for the fishers to come back to get fresh fish for selling.
- The proposed project will provide local labor and job opportunities for the youth, women and men in the BMU and from Mokowe Area.
- Some transporters wanted provision for parking area for loaded trucks.
- Some members wanted provision of refrigerated trucks for transport of fish.
- The perceived negative impacts identified by the participants were from the three waste streams generated namely: *human waste, waste water and solid waste.*
- The community raised concerns on environmental pollution especially on management of fish waste, waste disposal mechanism, type of construction material that shall be used by the contractor and the types of roofing materials during construction phase. They suggested the PMC to be vigilant and strict with the contractor to ensure proper compliance on quality control of the materials.
- Members were worried that the parking lot was too small but were informed that this area will only be accessed for dispatch of fish and no parking will be allowed within the facility.
- There was needed to come up with a proper Labor Plan to ensure the locals are employed before the contractor brings in imported labor.

*Plate 5-1: A BMU member contributing during the public participation meeting*

*Plate 5-2: Lamu County CECMs Fisheries giving closing remarks during the meeting*

*Plate 5-3: Mama Salma Contributing to the proposed design*

*Plate 5-4:Project Engineer Presenting the proposed design to the participants*

*Plate 5-5: One of the youth engaged in Mama Karanga business contributing to the discussions during the meeting*

*Plate 5-6: The OCS Mokowe Assuring participants on security in Mokowe during project implementation*

## 5.4 Summary of Issues Raised during public participation meeting and the responses

There were several issues that were raised by the community during public participation meeting and the team facilitating the community meeting discussions responded to some of the concerns of the community as captured in Table 5-2.

Table 5-2: Summary of stakeholders Issues raised and the response

| ISSUES/CONCERNS | RESPONSES FROM KEMSFED TEAM |
|---|---|
| **Scope of Infrastructures at the site**<br><br>The community proposed the following components to be incorporated in the fish landing site facility:<br><br>e. Inclusion of a BMU Office<br>f. Noted that internal organs from fish are useful as fish | The office will be considered for inclusion in the design.<br><br>The use of internal organs for crab fattening by *Mokowe Mainland CBO* was appreciated as it would enhance their capacity.<br><br>The community was reminded that the freshness of fish during transport was the most critical part of |

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| feed and should not be condemned and destroyed<br>g. Should consider provision of a hotel within the site for the BMU<br>h. The ice plant to be relocated to the old plot<br>Noted that there is no provision for bathrooms and a changing area in the current design | this project.<br><br>The budget set aside will not allow installation of a cold room though the structure is provided for in the design and can be installed later once it becomes essential.<br><br>The funds available may not allow for the inclusion of a hotel facility. |
| **<u>Location of the dispatch area</u>**<br><br>The community noted that the location of the dispatch area was misplaced and will mean that there will be a lot of vendors accessing the facility. They suggested that the facility needs to be moved towards the western side where the current machine room is and be easily accessed by community members without interfering with processing operations,<br><br>Noted dispatch area to be easily accessible and also jetty to directly access the cutting and washing area | The project was to be redesigned to allow for smooth movement of fish from the landing site to the dispatch area. The ice flake machine needs to open out into the processing area and the chilling area nearby for storage of processed fish. The changing room cum toilets should not have access by outsiders. |
| Members wanted to know whether there are similar project in the country and BMU members to be taken for an exposure visit. | Eng. Angwenyi noted that there were similar and even larger projects similar to Mukowe especially in Kisumu where BMU even have cold trucks to transport fish. He said a visit is possible under the project. |
| Waste Management at the site<br><br>The community wanted to know if there will be a drain pipe to evacuate waste water ("vumba") into the sea. | The Project Eng. explained that there will be a waste treatment facility for the 3 waste streams, namely: human waste, fish waste and organs and bloodied waste water. He explained there will be an ablution block for human waste management; a solid waste treatment facility for solid and organic waste; and for bloodied waste water, a bio-digester, |

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| | moving bed bioreactor and Dissolved Air Flotation (DAF) will be used to clean the waste water a 3-step process before water discharge into a soak pit. |
| **Parking zone for the vehicles**<br><br>The community wanted to know if there will be a special parking zone for loaded fish transport vehicles | The Project engineer noted that the parking space was county government's facilities and is not included in the design. He was requested to forward those concerns through the BMU to County government. |
| **Patrol Boat**<br><br>The community requested for a patrol boat | These have not been addressed in the design but can be requested under sub-component 2 of the KEMFSED project. |
| **Concerns on the encroached land**<br><br>Members requested that the encroached land for the fisheries jetty outside the present plot needs to be urgently repossessed as they are public utilities | CECM assured the participants that they are taking up this matter with the national government and the issue of grabbed land will be resolved soon |
| **Water at the site**<br><br>The was a concern about water availability at the site since Mokowe has no piped water supply | It was agreed that CPC Lamu engage a hydro-geologist to come up with a hydro-geological report that can be submitted to KEMSFED NPCU for consideration. |
| **A food plant near a cargo jetty**<br><br>It was noted that there is fuel cargo jetty near the site and its activities may have impacts such as dust, noise and interference due to movement of vehicles offloading materials at the cargo jetty near the site. | Precautions for safety will be included in the design. |
| **GBV:**<br><br>There was a concern as to whether | Fishing is predominantly a male activity and once the fish are landed, women only access the site when looking for fish to buy especially *Mama Karanga*sand the design reduces any cases of |

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| cases of gender-based violence may occur at the landing site. | conflict among the two genders. The BMU members manning the dispatch will be trained on GBV issues and a complaints desk and incident register opened. There will also a GRM committee at the BMU to record and address such issues. The BMU members will also be trained on GBV issues in the conduct of business. The contractor will sign a code of conduct and ensure that it is enforced as there is a potential of sexual exploitation and abuse during recruitment of labor during construction. |
| **Sexual Exploitation and Abuse**<br><br>There were also concern as to whether there will be cases of SEA (sexual exploitation and abuse) during construction and operation of the fish landing site. | The contractor will sign a code of conduct and ensure that it is enforced as there is a potential of sexual exploitation and abuse during recruitment of labor during construction phase. The BMU also will document any cases that may arise. Lamu fishing industry has not experienced cases of "sex for fish" and the setup of this landing site may not expose women to SEA during operation. However, the BMU members will be sensitized on SEA and have a GRM committee to enforce adherence to this code during construction. |
| **HIV/AIDS Awareness** | The construction works have a potential to attract migrant skilled workers. Due to staying for long periods away from their families there is a likelihood of them engaging in unprotected sexual activity with locals with a risk of HIV/AIDS exposure. The contractor will sensitize workers on HIV/AIDS awareness and ensure there are condom dispensers within the work site. Workers will be encouraged to know their HIV status and those interested will be facilitated to access Mokowe sub-district hospital for screening. |
| **Labour Issues:**<br><br>The community members wanted the contractor to give local youth opportunities for non- and semi-skilled workers | The NPCU and the County Government of Lamu will negotiate with the contractor to consider local youths for non-skilled opportunities within the contract. |

The results of the key informant interview and public consultation phase of the fish landing site project Environmental and Social Impact Assessment (ESIA) have demonstrated strong support from BMU, county leadership and the local community. Through engagement meetings with community representatives and open public forums, a clear majority of respondents expressed their support for the construction of the Mokowe fish landing site, citing the potential benefits to the local economy, employment opportunities, and improved fishing operations. In particular, the community welcomed the proposed ice plant, fish depot, Beach Management Unit (BMU) office, and conference facility, recognizing the positive impact these facilities would have on the local fishing industry and the wider community. The community also acknowledged the importance of the access road in facilitating the transportation of goods and people, and ensuring the safe and efficient operation of the fish landing site. Overall, the public consultation results demonstrate that the community recognizes the potential benefits of the fish landing site project and supports its implementation. The project team will continue to engage with the local community throughout the implementation process to ensure that the project is developed in a manner that is environmentally and socially responsible, and in line with the expectations and needs of the local community.

# 6. POTENTIAL ENVIRONMENTAL AND SOCIAL IMPACTS

## 6.1. Overview

This chapter covers the following sections; positive and negative environmental and social impacts of the proposed sub-project and mitigation measures (at implementation/construction, operation and decommissioning phase).

## 6.2. Definition and Classification of Environmental and Social Impacts

Environmental or social impact refers to a change to the existing social or environmental condition caused by proposed project activity or an external influence affecting the project. Impacts could be positive (beneficial) or negative (adverse). The nature of the impact could be direct or indirect, long-term or short-term, permanent or temporal, could be local or over a wide area. The impacts could also be termed as cumulative when they add incrementally to existing impacts or reinforce the effect of each other where such could not be the case if the impacts were in independent of each other in effect. In the case of the project, potential environmental and social effects are anticipated to arise during construction, operations and decommissioning phases of the project and at the stages, positive and negative impacts are anticipated.

## 6.3. Impact Significance

The significance of impacts could be defined based on;

- Being subject to legislative requirements,
- Sensitivity of the project environment,
- Nature of the project activity
- Resiliency of the receiving environment in recovering
- Public concern and importance
- Are determined as such by technically competent specialists;
- Trigger subsequent secondary impacts;
- Elevate the risk to life threatening circumstances; and

## 6.4. Impact Rating

The rating of impacts is important in determining the significance of the same and the need to priorities tracking of the effects. Under this report, the impacts have been rated ranging from A to D for each phase of the project as indicated in table Table 6-1. The rating does not in any way consider the magnitude of the impact but rather focuses on the likelihood of occurrence. The phases considered include:

- Construction Phase (Co);
- Operation/Post Construction Phase (Op); and
- Decommissioning Phase (De).

Table 6-1: Impact Rating

| No. | Impact | Significance |
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| | Rating | |
|---|---|---|
| 1 | A+/- | Significant positive/negative impact is expected |
| 2 | B+/- | Positive/negative impact is expected to some extent |
| 3* | C | Extent of positive/negative light or unknown. (A further examination is needed, impact is not definite and the impact could be clarified as the study progresses) |
| 4 | D | No impact is expected |

*C - rating was only applicable at scoping stage.

**Error! Reference source not found.** show the anticipated impacts from the proposed Mokowe fish landing site sub-project.

## 6.5. The Positive Impacts of the Proposed Project

The improvement of proposed Mokowe fish landing site in Lamu County is anticipated to have an overall positive impact as captured in **Error! Reference source not found.**, particularly in enhancing the county fisheries infrastructure development, socio-economic development of local communities and contribution to the blue economy in the county and improving of fishers working conditions which influence fisheries management.

*Table 6-2: The Positive Impacts of the Project*

| NO. | IMPACT | RATING IN EACH PHASE | | | DESCRIPTION |
|---|---|---|---|---|---|
| | | Co | Op | De | |
| 1. | Contribute to improved management of priority fisheries and enhanced coastal livelihood | D | A+ | B- | **Co:** The construction phase is not anticipated to contribute to the management of priority fisheries and enhanced coastal livelihood<br><br>**Op:** The proposed improvement of Mokowe fish landing site in Lamu County, Lamu West in Mokowe is part of the contributions towards enhancing county fisheries infrastructure development, aimed at improving fisheries management and preservation, which is significant in achieving coordinated community participatory and improved management of priority fisheries and enhanced coastal livelihood.<br><br>**De**: The decommissioning of the proposed project shall imply that proposed Mokowe landing site facilities if implemented shall be removed and this will reduce management of priority fisheries that could further reduce |

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| | | | | | coastal livelihood within Lamu County area. |
| 2. | Enhanced data collection for fisheries management | D | A+ | B- | **Co:** The construction phase is not anticipated to contribute to data collection for fisheries management<br><br>**Op:** Improvement of the landing site is anticipated to motivate more fishers to land their catch at the site an act which provides an opportunity for a centralized data collection for fisheries management within Lamu county<br><br>**De**: The decommissioning of the proposed project shall imply that proposed Mokowe landing site facilities if implemented shall be removed and this will reduce data collection at Mokowe landing site for fisheries management. The fish landings could be taken to areas with facilities. |
| 3. | Enforcement compliance | D | A+ | B- | **Co:** The construction phase is not anticipated to contribute to enhanced enforcement of fisheries management activities<br><br>**Op:** The proposed landing will provide an opportunity for the compliance officers to enforce compliance to the vessels that would have docked hence improving fisheries management.<br><br>**De**: decommissioning shall imply that the proposed facilities are obsolete requiring removal and this may impact negatively on the enforcement. |
| 4. | Enhance general economic development | B+ | A+ | B- | **Co:** Business and employment opportunities at the construction phase of the project may contribute to enhanced general economic growth.<br><br>**Op:** The blue economy is being targeted under government policy to contribute towards the GDP of the country. Improvement of Mokowe landing site shall be a contributing factor towards harnessing the effort of realizing this objective through improved fisheries management for economic development not only for the county but also for the national government. The landing site is strategically positioned as gateway in and out of the greater Lamu County.<br><br>**De**: If decommissioning activities are undertaken, it implies that the contribution of Mokowe landing site will be reduced impact negatively on the general economic development. |
| 5. | Reduction in post-harvest loses | D | A+ | B- | **Co:** The construction phase is not anticipated to contribute to reduction in post-harvest loses |

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| | | | | | **Op:** The proposed design of the project shall include an ice plant that will assist the fishers to have ice for chilling of fish while out in the sea. The proposed fish Banda will also have cold room storage area for fish unlike the current situation where fishers at Mokowe do not have the proposed facilities or anything. The improvement in fish preservation at the sea and at the fish band is anticipated to reduce post-harvest loses.<br><br>**De**: If decommissioning activities are undertaken, it implies that the ice plant, cold room storage and preservation facilities at Mokowe landing site will be removed and the local people may not have an opportunity to conserve harvested fish which may impact negatively to fisheries activities at the site. |
| 6. | Empowering Mokowe BMU institutionally and financially to manage the landing site | B+ | A+ | B- | Co: The BMU members will be part of the JSPC and the participating members may gain skills on the operation of some of the facilities that will be provided at the site eg Ice making plant, operating the cold room, operation of bio-digester among others. The BMu will also be capacity build on the management of the landing site in general.<br><br>**Op:** Mokowe landing site has a functioning BMU at the site which do not have any physical office for the BMUs. And under the proposed project, an office shall be provided with space for fisheries data collection and record keeping. The implementation of the project is anticipated to increase revenue collection for the BMU from either more members joining paying for the landings (ces) or payment for using the social hall by the community and visitors visiting the site. There shall be improved trade of fish from the fish depot which is anticipated to contribute to revenue to the BMU. The BMU will be capacity build with an aim of improving operation and maintenance of the proposed facilities.<br><br>**De**: If decommissioning activities are undertaken, it implies that the facilities at Mokowe landing site will be removed and the local people may not have an opportunity to learn or nowhere to conduct the learning if the social hall is removed. The BMU will not have an office or a source of income if the proposed facilities which are anticipated to add to the income are removed. |
| 7. | Improved fish product | D | A+ | B- | **Co:** The construction phase is not anticipated to contribute to improved fish product quantity and quality traded by fishers |

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| | quantity and quality traded by fishers | | | | **Op:** The use of ice to chill the fish for preservation at the fish band and for fishers out at the sea is anticipated to increase the quality of the fish as well as the quantity by reducing losses. Under KEMFSED project, the fishers are also being empowered to access offshore fishing and this is anticipated to contribute towards the quality and quantity of fish at the landing site. The proposed cold romm storage is also anticipated to improve the quality of fish and reduce post harvest losses during glut<br><br>**De**: If decommissioning activities are undertaken, it implies that the facilities at Mokowe landing site will be removed and quality and quantity of fish traded by fishers may be reduced due to lack of preservations or fishers opting for landing sites with facilities. |
| 8. | Creating employment opportunities | A+ | A+ | B- | There shall be employment opportunities at construction phase of the sub-project with an average of about 25 workers at any given point. The contractor is anticipated to employ several locals during project implementation providing temporal source of income.<br><br>**Op:** Several facilities have also been proposed at Mokowe fisheries landing site which includes the modern fish banda which is anticipated to contribute to hiring of helpers at operation phase of the project. More indirect employment opportunities are anticipated along the fish value chains.<br><br>**De**: If decommissioning activities are undertaken, it implies that the facilities at Mokowe landing site will be removed and most of those employed at the landing site may lose their jobs. |
| 9. | Creating business opportunities | A+ | A+ | B- | **Co:** Business opportunities are anticipated at the site during project construction to suppliers of construction materials, equipment and from food vendors.<br><br>**Op:** Completion of the proposed facilities at the landing site is also anticipated to increase business opportunities from the increased flow of the visitors at the site as well as traders.<br><br>**De**: However, if the site is rendered obsolete, visitor may reduce and hence business on site, The proposed stalls shall also be removed hence reducing the opportunity to conduct any businesses at the site. |

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| 10. | Enhancing the local capacity in fishing, landing, handling and processing among the fishers at Mokowe | D | A+ | B- | **Co:** At construction there is no impact expected on capacity building to enhance fishing, landing, handling and processing among the fishers. An activity that can only occur after implementation of the facilities.<br><br>**Op:** Implementation of the proposed sub-project is anticipated to build capacity among the local fishers in skills to handle and process fish for the high value markets. Due to the rudimentary methods currently being applied, the fishers are not able to attract high value market but instead rely on middlemen and local markets. However, implementation of the proposed facilities is anticipated to change the current situation. The fishers reported being forced to sell all there produce before they go bad at a throw away price whenever theirs is a glut.<br><br>**De**: However if the site is rendered obsolete, modern fish banda and the ice plant may be removed with few activities on site impacting on possibility of proper handling and processing of the fish which may not attract international markets. |
| 11. | Provision of physical workplace for Mokowe BMU | D | A+ | B- | **Co:** Construction phase is not anticipated to have any impacts as far as provision of office space to the BMU is concerned. But as it standards, the BMU do not have an office.<br><br>**Op:** The construction of the landing site will provide opportunity to improve the working conditions of Mokowe BMU who currently operate from the dilapidated fisheries handling structure noted on site. The proposals will provide adequate space for an office. They have no current working space other than borrowed spaces from the dilapidated fisheries office.<br><br>**De**: Removing the structures will mean doing away with the working space which may negatively impact on the availability of workplace. |
| 12. | Enhancing traders and visitors flow in the area | B- | A+ | B- | **Co:** Construction phase may deter fish traders and visitor from accessing the site and opt to visit other beaches along the sea hence impacting negatively<br><br>**Op:** The conditions at Mokowe landing site are not appealing to the visitors as well as to any potential traders who would like to buy the fish from the site. The key challenge is the |

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| | | | | | lack of facilities for handling of fish. The fishers do not have any facilities on site that can attract any visitor or traders. Most of the existing facilities were reported to be for private traders. The improvement of the landing site is anticipated to improve the traffic as well as well the quality and quantity of fish from the site<br><br>**De**: Declaring Mokowe landing site obsolete may negatively impact the flow of traders and visitors on site due to lack of any attractive events or the site being repulsive to visitors and lacking any activities to attract fish traders. |
| 13. | Improved access to the landing site by traders and visitors | B- | A+ | B- | **Co:** There could be negative impact on access by the construction vehicles which may deteriorating it further<br><br>**Op:** The existing access to the landing site is unimproved and the design proposes to pave it using cabros, improving its aesthetics<br><br>**De**: Removal of access during decommissioning may have a negative impact on those accessing the site. |
| 14. | Improved Household income, food security and living standards | A+ | A+ | B- | **Co:** The opportunities from job creation at the construction site, food vendor businesses, construction equipment and materials on site are anticipated to trickle down to household, improving the household income.<br><br>**Op:** There is an anticipated improvement of income for fishers, workers at the site, traders on site and the BMU due to improved quality and quantity of fish as well as improved traffic flow to Mokowe landing site by fishers and buyers. The proposed facilities aim to improve the quality of fish hence fetching a higher price and attract high value markets. The BMU shall also be generating fees from the fish processing activities which will assist in operation and maintenance of the facility.<br><br>**De**: If Mokowe landing site is rendered obsolete, the proposed facilities will be removed if installed and this means there could be loss of income for those working at the fish banda, boat yard, fish net mending, selling at stalls and those providing tourism activities. |
| 15. | The proposed development on the plot shall help | D | B+ | B- | **Co.** at construction, nothing much will change but if the plot is left undeveloped it will be encroached upon. Most parts of the plot have already been encroached upon and whatever that is remaining was not the original size of the plot. |

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| | secure the land | | | | **Op:** Mokowe BMU will have positively utilized the land where the proposed project will be set up as currently it's not properly utilized with no structures on site and vulnerable to encroachment just as it has been the case with other landing sites.<br><br>**De.** Removal of structures on the plot may expose the plot for encroachment unless there is change of use. |

## 6.6. The Negative Environmental and Social Impacts of the Proposed Project

The proposed project will comprise of constructing and operating; a modern fish banda, Ablution block and civil works, (*perimeter wall, drainage, bio-digester,* moving bed bioreactor, Dissolved Air Flotation (DAF), *access road works, Jetty, and street light)*. Construction and operation of the structures is anticipated to have some negative impacts as indicated in Table 6-3 below:

**Table 6-3: Negative Impacts of the sub-project**

| NO. | IMPACT | RATING IN EACH PHASE | | | DESCRIPTION |
|---|---|---|---|---|---|
| | | **Co** | **Op** | **De** | |
| 1. | Occupational Health and Safety (*accidents and Injuries*) | A- | A- | A- | **Co:** Working on a construction site comes with risks and accidents to the workers. The risk could be associated with falling objects, injury due to the nature of occupational activities (ergonomic), operating or movement of machines and equipment, falling off by workers from heights, working above and falling into deep waters. The Jetty construction activities to be conducted during low tides to reduce cases of drowning and sedimentation of the water. The occupation health and safety risks are mainly anticipated at construction and decommissioning phases.<br><br>**Op:** But that does not rule out the same occurring at the operation phase, especially the workers conducting routine maintenance, repair and cleaning on the facilities at site, the bio-digester or the landscape of the compound. There also exposure to cold working conditions for the ice making machine attendants and cold room attendants, biological hazards associated with allergic reactions, physical hazards associated with use of equipment and slippery floor,<br><br>**De**: Decommissioning activities is also anticipated to pose |

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| | | | | | occupational health and safety issues particularly workers who shall participate in decommissioning the sub-project facilities |
| 2. | Public health and safety (*accidents and Injuries*) | A- | B- | B- | **Co:** The public and any persons who have access to the construction site can be at risk of injury from falling objects, accident involving construction vehicles, personal falls, or sharp objects on the ground. The risk is anticipated to be higher during the construction and decommissioning phase of the project.<br><br>**Op:** Though we shall have public safety issues during the operation of the building, it is anticipated to be low due to the size of the proposed structures and the level of public traffic flow accessing the project site. Public health and safety issues are also anticipated during the transportation of materials from the site or to the site. There is likelihood of unhygienic handling of fish at the facility that may pose a risk to public health concerns which will require sensitization of the workers on need to work under hygienic conditions to avert any contaminations, outbreak of diseases and air pollution from odour due to inadequate waste management. .<br><br>**De**: The decommissioning activities may have negative impacts associated with movement of decommissioning vehicles and the public accessing the abandoned site which could have hazards. |
| 3. | Visual/ aesthetic Impacts | A- | B+ | A- | **Co:** The excavation activities and stockpile shall be the main source of visual/aesthetic value impact at the project site.<br><br>**Op:** Landscaping of the compound after completion of the structures on site is anticipated to partly enhance the aesthetic value of the area.<br><br>**De**: Decommissioning of the sub-project facilities may have a negative effect on the Aesthetic value of the site given the anticipated dilapidation of the facilities on site. This shall be so if the site shall be left without rehabilitation. |
| 4. | Leakages and spills | B- | D | B- | **Co:** The main source of leakages and spills anticipated are from vehicles with mechanical issues at project construction, phase. At construction, the leakage shall be from contractor's equipment/vehicles, |

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| | | | | | **Op:** The leakages and spills during operation phase may occur from operation of the power generator and vehicles using the proposed parking on site. However, the design has taken into consideration of such during operation through paving of parking area and mitigation measures for leakage from the generator has been provided for in the ESMP. The likelihood of such spills and leakage is however anticipated to be negligible in spite of the possibility.<br><br>**De**: The main source of leakages and spills during decommissioning maybe from contractor's equipment/vehicles that shall be conducting the decommissioning activities and rehabilitation or restoration of the site. |
| 5. | Noise and vibrations | A- | A- | A- | **Co:** The movement of construction vehicles to and from the site, general construction activities on-site, and noise from conversation on site are anticipated to be the main sources of noise.<br><br>**Op:** Noise in addition is anticipated to be generated during the project operation phase when repairing and maintaining, from operation of the generator, general conversation from the high anticipated traffic at the fish selling area or from activities by users or vehicle movement in and out of the landing site.<br><br>**De**: Noise is also anticipated to be generated during decommissioning activities of the project. Measures have been proposed to mitigate against the amount of noise generated during construction. The main receptors will be the residential areas. |
| 6. | Air pollution | A- | D | A- | Air quality degradation at construction phase is anticipated to be affected by exhaust fumes on site from operating of machines and moving of construction vehicles transporting materials from the site or to the site, from dust particles on-site during demolition of some of the existing structures to create space, foundation excavation activities and during mixing of cement on site.<br><br>**Op:** The operation of the proposed landing site is anticipated to have impacts on air quality level through odour associated with fish processing activities and from |

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| | | | | | particulate matter from operating the proposed power backup generator on site. Delivering of fish by the vessels using using fuel s also anticipated to add to air quality degradation though at low levels. .<br><br>**De**: Decommissioning activities, notably demolition and transportation of the waste, could be sources of particulate matter on site in addition to the movement of the contractor's vehicles and machines undertaking the demolition activities. |
| 7. | Solid Waste generation | A- | A- | A- | **Co:** The main sources of waste shall be debris from construction activities (wood waste, metal, plastic from plumbing, construction debris, polythene bags, cardboards, paper, soil cuttings, plant remains, concrete waste, and debris waste from construction sites among others)<br><br>**Op:** Fish waste from operation of the modified fish Banda and waste generated from general consumption of materials by visitors accessing the site for tourism purpose (plastics, pieces of glass bottles, polythene bags, cardboards, paper, food remains, fish waste (gills, intestines and scales). Waste from boat yard and based on the type of fishing gears at use, by-catch is not anticipated to be an issue at the site.<br><br>**De**: Decommissioning activities, notably demolition is anticipated to generate construction waste on site when the obsolete facilities are removed from site, |
| 8. | Waste water generation | D | A- | D | **Co:** Though waste water is not anticipated to be a menace at construction phase of the project. The workers on site will require sanitation facilities that are anticipated to generate waste water. However while on site the workers will use a pay toilet which the contractor will need to enter into an agreement with the proprietor for workers to use it. The toilets have existing septic tanks and in the event that it will be filled, the proprietor shall seek the services of exhausters for safe disposal of the waste water.<br><br>**Op:** The main source of wastewater shall be during the operation phase of the project, with grey and black water being anticipated from the ablution blocks and cleaning of the fish banda. Although the black water could be used for landscaping purposes on site, it was noted that cultural perception towards black water could be an impediment. |

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| | | | | | However, with proper functioning of the proposed bio-digester through adequate maintenance and operation, the perceptions shall be changed over time. The other expected source shall be waste water from the fish banda which will be used for cleaning purposes. The oil trapped from the waste water shall be used by canoe fishers in maintaining their vessels.<br><br>**De:** Waste water is not anticipated at decommissioning phase of the project. |
| 9. | Fire Hazards | B- | A- | D | **Co:** Fire hazards are anticipated at the project site during construction phase. with the major risks emanating from welding or use and storage of fuel on site by the construction team..<br><br>**Op:** Fire hazard is anticipated mainly at the operation phase of the project, from electrical faults and arson being the main anticipated sources. The design of the proposed structure at the landing site has provided for fire management measures in the design by providing for water hydrants, fire extinguishers and fire assembly point. And additional measures have also been proposed in the ESMP.<br><br>**De:** Fire hazards are anticipated at the site at decommissioning phase from decommissioning of the electrical cables on site. |
| 10. | Increased Water consumption | A- | A- | D | **Co:** The proposed construction activities will require water resources impacting negatively to water resources consumption. The water shall be used for mortar concrete and curing.<br><br>**Op:** The water will be used in washrooms, for landscaping, cleaning and frequent personal cleaning by fishers The design has provided for the treatment of waste water through a bio-digester system that shall be used for landscaping purpose. Despite this, additional measures in the project's design have been proposed to ensure efficient utilization of the resources on site such as push delay taps in washrooms, rain water harvesting and reduced indoor potable water use. This shall reduce pressures on the resources to ensure sustainability.<br><br>**De:** The decommission phase of the project will require use of water resources as means to reduce dust by wetting the |

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| | | | | | structures being demolished |
| 11. | Increased Energy consumption | D | A- | D | **Co:** During the construction phase, energy consumption is likely to be high due to the use of heavy machinery, tools, and equipment. Electricity will be needed to power the construction site, and this may result in increased energy consumption from the national grid or other sources.<br><br>**Op:** Energy shall be critical particularly for the existing ten ton/day ice making plant and for the users of the proposed social hall events at the landing site either to run machines and equipment or for lighting purposes. The demand for energy resources will increase, and several measures have been provided for in the project's design to ensure efficient utilization of the resource including having a solar system, using large windows where applicable for lighting, energy saving bulbs LED, solarised street lights and allowing adequate air circulation. Additional measures have also been proposed in the mitigation measures<br><br>**De:** There shall be no impact at decommissioning as no demand for energy is anticipated |
| 12. | Risk of Spread of HIV/AIDS and other STI | B- | B- | B- | **Co:** During construction, the project will employ some youth to work at the site. This particular category is prone to taking risks and as they engage in cheap liquor or drugs, there could be cases of transactional sex exposing them to the risk of HIV/AIDS as well as other sexually transmitted diseases. The contractor will be expected to sensitize the work force on HIV/AIDS and provide condom dispensers on site. Baseline survey findings indicated that sexual activities are slightly higher at the project area and use of alcohol. Due to availability of the cash sexual activities could increase.<br><br>**Op:** during operation phase, Mokowe site will be open for the traders who will be operating at the site and tourists on transit to Amu island, Therefore, cases of sex tourism may occur<br><br>**De:** In the decommissioning phase, the risk of HIV transmission may be lower compared to the construction |

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| | | | | | phases. However, if the decommissioning process leads to job losses or economic hardships for the local communities, there may be an increased risk of risky sexual behavior or drug use, which can increase the risk of HIV/AIDs. |
| 13. | increase in Grievances | A- | A- | A- | **Co:** The local community members, contractor, contractor workers, client (SDBE&F and the County government) or any other interested parties may be aggrieved due to project activities and need to be aware of the structures of expressing their grievances is critical. Grievances are anticipated to increase due to limited resources against several competing needs. The allocation of limited opportunities during construction could raise grievances unless the allocation is perceived to have been done in a transparent and equitable manner. The available procurement opportunities should be allocated through competitive bidding particularly for the local population. The facilities should be allocated through competitive bidding to private management especially the ablution block and the ice plant. The other anticipated sources of grievances shall be associated with the pace of the project implementation and adherence to the quality of work.<br><br>**Op**: Grievances are anticipated at operation phase of the project and this could be associated with complains on accessibility to facilities particularly the stalls. The locals may feel aggrieved for lack of opportunities to access jobs during repair and maintenance of the proposed landing site facilities at operation. Operation of the facilities is also going to create employment opportunities which may not serve the wants of the community since they are limited and this could be a source of grievances.<br><br>**De:** Decommission activities could raise grievances especially from people whose livelihoods is dependent on the operation of the facilities at the landing site. The landing site may be abandoned without proper rehabilitation of the site which could generate grievances from the hazards posed by neglected facilities which could pose hazards to the residents of the area generating complaints among other sources of grievance. |

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| 14. | Child Labour and Protection | A- | B- | A- | **Co:** During the construction phase, there is a high likelihood of child labor occurring, especially if the project is labor-intensive and involves manual work. Children from the surrounding community may be engaged in carrying materials, digging, or any other task that does not require specialized skills. This is often due to poverty and lack of access to education, which can lead to families relying on their children for income.<br><br>**Op:** During the operational phase, there may be a reduced likelihood of child labor as the work is likely to be more specialized and requires technical skills that children may not possess. However, the risk of child labor may still exist in the form of subcontracting, where contractors may engage children as part of their workforce.<br><br>**De:** During the decommissioning phase, the risk of child labor may be similar to that during the construction phase, as the dismantling and removal of infrastructure may require manual work that can be carried out by children. |
| 15. | Gender Equity, Sexual Harassment and abuse amongst workers in the workplace | A- | A- | B- | **Co:** During the construction phase, there may be a higher risk of gender-based violence and harassment due to the influx of male workers into the area, which may result in an imbalance of power dynamics and increase the vulnerability of women and girls. Additionally, the lack of proper sanitation facilities and accommodations for women may further exacerbate these risks.<br><br>**Op:** During the operational phase, there may be potential risks of sexual harassment and exploitation, particularly for women who work in or around the fish landing site. This may be due to the informal nature of the work and the lack of clear workplace policies and procedures for addressing and preventing such behavior.<br><br>**De:** Finally, during the decommissioning phase, the sudden loss of income and livelihoods may increase the vulnerability of women and girls to sexual exploitation and abuse, as they may turn to risky coping strategies in order to survive. Women participation in fisheries activities remains very low in spite of their critical role in fisheries |

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| | | | | | resources management. There shall be need to have equal access to the facilities and also modalities for women to access fish from the fish banda instead of buying directly from the fishermen during project operation to manage cases of sexual exploitation. |
| 16. | Gender-based violence at community level | A- | A- | B- | **Co:** During the construction phase, there may be an increase in gender-based violence in the community due to the influx of male workers and the disruption of community norms and values. This could result in increased harassment and violence towards women and girls in the community.<br><br>**Op:** During the operational phase, gender-based violence could occur due to the increased economic opportunities that the fish landing site may provide. Women may be vulnerable to exploitation and abuse by those who control access to the landing site and the fish trade.<br><br>**De:** During the decommissioning phase, the loss of economic opportunities may lead to increased stress and tension in the community, which could result in an increase in gender-based violence. |
| 17. | GBV: Sexual Exploitation and Abuse (SEA) | A- | A- | B- | **Co:** During the construction phase, the influx of a predominantly male workforce may result in an increase in GBV incidents against female workers, particularly those working in low-paid and low-skilled positions. The unequal power dynamics between male and female workers can make it difficult for women to report incidents of GBV or seek support.<br><br>**Op:** During the operation phase, the presence of a large workforce and surrounding communities may increase the likelihood of GBV incidents, particularly against women and girls who may be more vulnerable due to poverty and cultural practices. The county's operations may also result in the displacement of communities, which can lead to an increase in GBV incidents as people are forced to leave their homes and livelihoods.<br><br>**De:** The decommissioning process may also have an impact |

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| | | | | | on local communities, leading to an increase in GBV incidents as people become more vulnerable to poverty and cultural practices. |
| 18. | Spread of COVID-19 amongst community members during consultation processes | B- | B- | B- | **Co:** During the construction phase, there is a likelihood of Covid-19 transmission due to increased movement of people, workers, and equipment to the site. This could result in a higher risk of community transmission, especially if proper protocols such as social distancing, regular testing, and personal protective equipment (PPE) are not put in place.<br><br>**Op:** During the operational phase of the infrastructure, there is also a risk of Covid-19 transmission due to the continuous flow of people and goods in and out of the facility. This risk can be mitigated by establishing and enforcing measures such as mandatory mask-wearing, regular testing, and vaccination for workers, visitors, and customers.<br><br>**De:** Finally, during the decommissioning phase, there is a risk of Covid-19 transmission as workers dismantle and remove equipment from the site, resulting in increased movement of people and equipment. Proper protocols must be in place to minimize the risk of transmission, including measures to safely dispose of waste and other materials associated with the project. |
| 19. | Spread of COVID-19. During construction at work sites | B- | B- | B- | **Co:** During the construction phase, the likelihood of Covid-19 at the construction site is high due to the high number of workers involved, the close proximity of workers to each other, and the frequent movement of workers from various locations. The workers may come from different areas with varying levels of Covid-19 prevalence, and there may be inadequate measures in place to enforce Covid-19 prevention guidelines such as social distancing, wearing of masks, and regular hand washing.<br><br>**Op:** During the operational phase, the likelihood of Covid-19 at the fish landing site is also high as workers and visitors may come from different areas and interact with each other. The risk can be increased if there is a high volume of visitors and inadequate measures are in place to |

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| | | enforce Covid-19 prevention guidelines.<br><br>**De:** During the decommissioning phase, the likelihood of Covid-19 may be lower as the number of workers on site is likely to be reduced. However, there may still be some workers involved in decommissioning activities, and there may be a need to implement measures to prevent the spread of Covid-19 among workers and visitors |
| 20. | Impacts on biological environment (terrestrial and marine flora & fauna), including mangroves | During jetty construction, there is potential of damaging seagrasses and other benthic communities.<br>Fish communities depend on clear water for feeding and breeding. There is potential of increased turbidity of the areas adjacent to the proposed jetty during the construction and also usage of the jetty due to increased activity by boats within the jetty area. This will potentially make fish to migrate to adjacent clear waters. |
| 21. | Potential cumulative impacts | Other projects such as KPA activities on the existing jetty that is going on around the Mokowe Landing site area are likely to aggravate the existing potential impact |
| 22. | Impacts on physical cultural resources | Construction activities can disrupt artisanal fishing techniques and cultural ceremonies linked to fishing, leading to cultural heritage loss.<br>Construction may result in losing access to culturally significant areas, impacting spiritual and cultural practices.<br>Infrastructure expansion may encroach upon gathering areas or ceremonial grounds, reducing opportunities for cultural expression and community cohesion.<br>Landscape transformation due to construction may alter cultural identity and sense of place, affecting connection to the land and sea. |
| 23. | Impacts on local vehicular traffic | Traffic congestion due to increased construction activity.<br>Road closures or diversions for safety reasons.<br>Restricted access to certain areas near the construction site.<br>Increased travel time for vehicles.<br>Potential damage to roads from heavy construction vehicle |
| 24. | Disruption of | Disruption of fishing activities due to construction |

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| | existing operations | activities.<br><br>Reduction in available space for fish storage, processing, or market activities.<br><br>Noise and disturbance from construction machinery impacting existing operations.<br><br>Access constraints caused by road closures or limited access points.<br><br>Environmental impacts such as sedimentation or water pollution affecting fish resources and existing fishing operations. |
| 25. | Security risks – terror attacks | ***Co Phase***: During the construction phase, the primary security concern involves the potential for terrorist attacks by Al Shabab, posing significant threats to both the safety of construction personnel and the integrity of project infrastructure. Additionally, the risk of kidnappings targeting external technical staff and the possibility of sabotage to construction infrastructure are prominent. Efforts to mitigate these risks should include enhanced security measures, strict travel and safety protocols for staff, and robust surveillance of the construction site. Furthermore, the potential for local unrest due to employment practices necessitates a strong focus on community engagement and prioritizing local hiring to foster positive relations and mitigate unrest.<br><br>***Op. Phase:*** In the operational phase, the fish landing site continues to face threats from terrorist activities from Al Shabab, with fisheries staff and infrastructure remaining vulnerable targets. The persistent risk of kidnappings of technical personnel and sabotage actions against the site underscores the need for a comprehensive security strategy, including ongoing staff training in security awareness, crisis management preparations, and physical security measures to protect the site. Additionally, sustaining local support through continued community engagement and adherence to local hiring policies is critical to prevent employment-related unrest and ensure the smooth operation of the site.<br><br>***Deco. Phase:*** Throughout the decommissioning phase, the project remains at risk from terrorist attacks, highlighting the need for a specific security plan tailored to this phase, including measures for the safe removal or destruction of materials and structures. The vulnerability of remaining infrastructure to sabotage calls for continued site security until all decommissioning activities are concluded. A |

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| | proactive approach to security planning, in coordination with local and national security forces and ongoing community engagement, is essential to navigate the decommissioning phase safely, ensuring all personnel and resources are protected until project closure. |

# 7. ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP)

## 7.1. Chapter Overview

The chapter highlights the environmental and social management measures for the anticipated negative impacts. The ESMP captures the impacts, receptor, proposed mitigation measures, institution responsible for the mitigation, frequency, and budget.

## 7.2. Proposed Environment and Social Management Measures

The objectives of the proposed environmental and social management plan is to ensure smooth implementation of environmental protection measures, mitigate adverse impacts and ensure environmental protection activities are conducted efficiently at the project site.

The specific objectives include but are not limited to:

- Ensuring environmental health and safety within the the surrounding living environment and *minimizing environmental risk* during the design, construction, and operation phases.
- Incorporating environmental principles into development planning, design, construction, and operation to enhance environmental management and protection as well as promote sustainable development.
- To provide mitigation measures against all identified and potential negative impacts resulting from the activities of the proposed development
- Reduce contamination
- Apply climate change adaptation measures
- Apply green building construction measures
- Apply measures required by Kenya regulations
- Apply measures required by the World Bank Safeguard Policies triggered under the KEMFSED sub- project
- To assign duties to various actors in the management plan for purposes of enhancing accountability in this project.
- To provide a logical framework for environmental and social management and monitoring.
- To provide a baseline for future environmental and social audits of the proposed development.

Various potential adverse environmental and social impacts associated with the proposed sub-project have been identified, and an ESMP developed to guide in mitigating the negative impacts. The project implementing agency *(SDBE&F) & together with the county government through Joint Project Supervising Committee)* and the contractor are required to identify the actions and coordinate the various stakeholders appropriately. Table 7-1 to Table 7-3 below shows the anticipated impacts, proposed mitigation measures, the institutions responsible and the estimated possible cost of the action. Although the cost of ESMP implementation has been provided, future dynamics during project operation and decommissioning were a limiting factor and could not be well envisioned at this point in time. The contractor will be required to update the ESMP for operation of the proposed landing site facilities by providing operation and maintenance guidelines through the as-built documents submitted to the client.

**Table 7-1: Environmental and Social Management Plan During Construction**

| NO. | ASPECT | IMPACT | RECEPTOR | MITIGATION MEASURES | Goal | Responsibility | Cost (KES) |
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| 1. | Occupational Health and Safety (*accidents and Injuries*) | Injuries and accidents | Workers on site | ▪ Contractor to complete hazard identification and risk assessment develop a site occupational health and safety action plan detailing safety measures/procedure, equipment to be used, emergency procedures, restriction on site and personnel responsible for safety inspections and controls. This shall be ready and approved by the joint supervising committee before commencing of the proposed works<br>▪ Contractor shall hire and retain a duly qualified construction environment safety and health officer throughout the construction period, to ensure implementation of the safety plan. The Health and Safety Specialist to prepare an Emergency Preparedness and Response Plan for the contractor<br>▪ Train workers on safety and first aid skills before commencing works<br>▪ Encourage daily tool box talks on potential OSH hazards and mitigation measures.<br>▪ Ensure safety of the construction workers by putting fully equipped first aid facility, and having trained first aiders among the workers and injury reporting mechanism. The ration of first aiders to works shall be in line with the OSHA First Aid Rules.<br>▪ Provide appropriate personal protective equipment (PPE) to workers and training on appropriate use. (Reflective jackets, helmets, face masks, ear plugs gloves, safety boots, fall arrestors, welding masks etc.). The safety plan | To ensure the safety of workers | contractor and sub-Project supervising consultant | 850,000 |

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| | | | | shall identify the mandatory PPEs by the tasks performed.<br>▪ Adequate provision of requisite sanitation facilities for human waste disposal for workers on site<br>▪ Ensure the work place is registered by Directorate of Occupational Health and Safety (DOHS) and maintain the log of all injuries that occur on site in the incident register, corrective actions for their prevention as appropriate.<br>▪ The contractor is required to have WIBA insurance policy to compensate workers in the event of injuries.<br>▪ Provide clean drinking water for the workers to mitigate against dehydration.<br>▪ Have an understanding with a nearby health facility for emergency cases on-site before decisions are made.<br>▪ Adherence to Covid-19 rules/guidelines as provided from time to time by the ministry of health and the bank with provision of easily accessible and adequate covid-19 PPE to all persons on site. The specific action to be captured in the contractor ESMP.<br>▪ Training of workers on covid-19 rules and requirements.<br>▪ As applicable, only qualified personnel shall be allowed to operate construction equipment's on site that may require specialized skills.<br>▪ | | | |
| 2. | OHS risks from working above and falling into | Risk of drowning | workers | ▪ To the extent possible, consider working during low tide periods or use pilling for the foundations<br>▪ The workers to be provided with appropriate footwear to reduce the risk of slipping. | To ensure the safety of workers | contractor and sub-Project supervising consultant | 50,000 |

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| | deep waters | | | ▪ Ensure workers are provided with life jackets and enforce use at all times when exposed to sites or working under deep waters<br>▪ Ensure workers working on such sites are experienced swimmers<br>▪ Train workers in safety measures when working above deep waters<br>▪ Avoid working at night to reduce cases of drowning<br>▪ Having rescue teams on site in the event of an accidents<br>▪ Provide necessary information on rescue during emergencies. | | | |
| 3. | Public health and safety (*accidents and Injuries*) | injuries and accidents such as traffic related | Mokowe landing site visitors, fishermen, and other persons operating at the site | ▪ Ensure the safety of visitors and operators at the landing site by providing safety signs at strategic places around the access roads.<br>▪ Hoarding off working sites to protect the public or unauthorized persons from entry.<br>▪ Use of signs and warnings on sites on areas with high risks.<br>▪ Reduce unnecessary speeding to 30 KPH by the construction vehicles to control for accidents from the movement of pedestrians in the area and particularly Mokowei jetty access road.<br>▪ Prior creation of awareness and sensitization of the public and the operators at the site of any activities that is likely to have an impact in adequate time (*2 weeks)* before commencement.<br>▪ Implement Grievance mechanism and use feedback to improve any management measures as may be necessary.<br>▪ Ensure vendors selling food at the construction site have public health permits to mitigate risks related to food contamination. | To ensure public safety at site area | contractor and sub-Project supervising consultant | 150,000 |

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| 4. | Visual/ aesthetic Impacts | Psychological nuisance | Mokowe landing site visitors, fishermen, and other persons operating at the site | • Cleaning of the site and organized siting different construction materials.<br>• Backfilling of soil cuttings<br>• Landscaping of the project site<br>• hoarding of the construction site using appropriate screening materials | To reduce psychological impacts to persons visiting or operating at the site and workers on site | contractor and sub-Project supervising consultant | part of construction cost |
| 5. | Leakages and spills | contamination and pollution | soil, water, plants, and air | ▪ All areas where fuel and hazardous chemicals are stored must be concretized and bunded<br>▪ In the event of hazardous waste leakage or spills, engage authorized waste handlers to dispose of contaminated soils.<br>▪ Disposing of contaminated soils in cutting pit if volumes are low.<br>▪ Use of NEMA licensed hazardous waste handlers to dispose off in licensed disposal areas.<br>▪ Development of site-specific incident management or response plan.<br>▪ Use of an authorized garage or fuel station in the project area by the contractor.<br>▪ No servicing of construction equipment shall be undertaken on site. For emergency works, fuel and oil trays shall be used. | to avoid any contamination and pollution on-site or at the contactor's camp | contractor and sub-Project supervising consultant | part of construction cost |
| 6. | Excessive Noise | auditory injuries | Site workers, fishermen and | • The contractor to use equipment with low noise levels or fitted with silencers where appropriate.<br>• Regular servicing of the equipment to reduce | to ensure Workers and public safety | contractor and sub-Project supervising consultant | 250,000 |

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| | | | other persons operating at the site | the possibility of noise from worn-out parts.<br>• Informing the public about the possibility of unusual noise levels, particularly to residents and those operating at the site, whenever working on such activities.<br>• Ensure adherence to PPE by workers[10] working on excessive noise and vibration activities<br>• Minimize unnecessary hooting and speeding by construction vehicles.<br>• Restricting noisy activities to be during the day and no noisy activities should be conducted on site at night.<br>• Regular measurement of noise levels and devising control measures. | | | |
| 7. | Air pollution | air pollution | workers, area residents, persons operating at the site and the general public | • Vehicles to be used on-site to meet NEMA emission standards as required under NEMA air quality regulations.<br>• Reduce unnecessary speeding or idling of construction vehicles<br>• Use of non-lead paints during construction.<br>• Adherence to proper uses of PPE by the workers, especially those working on activities requiring mixing of cement.<br>• Inform the public and residents about activities with possibility of unusual air pollutants<br>• Use of silt screens to reduce dust from site.<br>• Consider wetting all the sand or soil materials being transported to or from the construction site. Where appropriate, cover the materials | to ensure workers and public safety | contractor and sub-Project supervising consultant | 250,000 |

[10] The measure should be according to the law (Occupation safety and health Act 2007, National Construction Act

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| | | | | being transported to avoid being blown by the wind during transportation. | | | |
| 8. | Increased Solid Waste generation | increased waste generation at project site and contractors camp if any | The environment in general (public nuisance, soil, water and air) | • Promotion and adoption of the principles of waste avoidance, reduction, reuse and recycle. Through avoiding unnecessary generation of waste, use of debris for backfilling where possible, use of waste materials on-site for other purposes where appropriate, or selling to recycling merchants.<br>• Construction workers should be sensitized on appropriate waste handling and disposal of all construction related waste in designated areas<br>• Designate proper waste transfer stations onsite with adequate waste receptacles that encourage segregation and controlled access.<br>• Seek appropriate approvals from NEMA and County Government on management and Disposal of the waste[11].*(this may include using authorized disposal sites, use of NEMA authorized waste pickers/transporters, acquiring dumping certificates, and keeping proper records or use of authorized vehicles to ferry waste from site)*<br>• Consider formulating a site-specific waste management plan informed by waste characterization[12].<br>• Observing waste management standards proposed under NEMA waste management | to ensure waste is managed properly | contractor and sub-Project supervising consultant | 100,000 |

[11] Waste management and disposal procedures need to be in accordance to waste management standards proposed under NEMA waste management regulations of 2006 (legal notice 121).

[12] Waste characterization should consider waste from construction site and the contractors' camp if any.

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| | | | | regulations 2006. *( with a particular focus on waste separation and management before disposal)*<br>• | | | |
| 9. | Waste water generation | Risk of water borne disease to construction workers | Contractor or staff and community | • Install temporary or permanent on-site wastewater treatment plants to treat all generated wastewater from construction activities.<br>• Ensure that these facilities are designed to handle the volume and type of wastewater produced, adhering to local and national environmental standards.<br>• Use sedimentation tanks to capture and remove sediments and other particulates from wastewater before it is discharged. This helps in reducing the turbidity and improving the quality of the water.<br>• Implement oil and grease separators to treat wastewater from vehicle maintenance and equipment cleaning areas.<br>• These separators ensure that oils and greases do not enter the local water systems, thus preventing pollution.<br>• Promote the recycling and reuse of water within the construction site wherever feasible.<br>• Ensure that wastewater containing hazardous chemicals is treated separately and disposed of according to hazardous waste management protocols. | To manage waste water generation | Contractor | part of construction waste |

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| 10. | Risk of Spread of HIV/AIDS and other STIs | Increased cases of STI and HIV/AIDS in view of worker on site | Surrounding community | • Promote STI and HIV/AIDS Prevention messaging<br>• Access to safe sex (condoms-Male and female)<br>• Provide separate sanitary convenience to male and female workers<br>• Provide HIV testing services at the construction site or an MoU with an existing government health facility in the area.<br>• Support infected workers with access to ARVs from local public health facilities especially those open about their status.<br>• Assist workers access peer counseling services at the nearest health centre to the site | STI and HIV/AIDS free site | contractor and sub-Project supervising consultant | 550,000 |
| 11. | Grievances | conflict between affected parties | All project stakeholders | • Establish grievance redress committees at the site<br>• Ensure that there is a trained focal person to facilitate the receipt and management of the grievance resolution process<br>• Ensure contractor staff grievance structures exist<br>• Sensitization and awareness creation among workers and the public on grievance redress mechanisms in place | Prompt addressing of grievances and issues of concern | contractor and sub-Project supervising consultant | 150,000 |
| 12. | Effects of Immigrant workers | increase in grievance | workers and the local communities | ▪ Contractor should use the local workforce as much as possible (preference to local community members on skills locally available).<br>▪ Effective community engagement and strong grievance redress mechanisms on matters related to labour<br>▪ All workers to sign an employment contract | Maximize benefit to local people and conflict | contractor and sub-Project supervising consultant | Part of construction cost |

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| | | | | including a Code of Conduct governing appropriate behaviour<br>▪ The workforce should be sensitized to local social and cultural practices and be educated on the expected behaviour and conduct<br>▪ Contractor should prepare and enforce a No Sexual Harassment and Non-Discrimination Policy<br>▪ Contractor should prepare and implement a gender action plan<br>▪ The contractor as part of the C-ESMP will Prepare labor Management Plan (LMP ) that included mandatory requirement to procure all unskilled (and as much as possible, semi-skilled) labour as well as locally available materials from the local community while ensuring equal pay for equal work for men, women and people with disability | with immigrant | | |
| 13. | Child Labour and Protection | Abuse and exploitation of children | children | ▪ Ensure no children are employed on site in accordance with national labour laws. This can be done through incorporating prohibitive provisions in the code of conduct and also having the recruitment policies that prohibits child labour.<br>▪ Ensure that any child sexual relations offenses among contractors' workers are promptly reported to the police.<br>▪ Ensure that the CoC and the employment contract has clear measures in dealing with such contraventions | zero tolerance to child labour | contractor and sub-Project supervising consultant | Part of construction cost |
| 14. | Gender Equity, Sexual Harassment | Injury and Psychological | Vulnerable persons at the work | ▪ The contractor will strive to ensure equitable distribution of employment opportunities between men and women.<br>▪ The contractor should prepare and enforce a No Sexual Harassment and Non-Discrimination Policy | Gender equity at work place and free of | contractor and sub-Project supervising consultant | 100,000 |

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| | and abuse amongst workers in the workplace | | place. | ▪ Provision of gender disaggregated bathing, changing, sanitation facilities<br>▪ Whenever harassment are recorded on site, the contractor should ensure prompt and effective remedial action<br>▪ The employees should be trained and sensitized on appropriate behavior<br>▪ All workers should sign a code of conduct<br>▪ Sensitization and awareness creation<br>▪ Measures that will allow for the uptake of complaints without the fear of retaliation (whistle blower policy) | SEA | | |
| 15. | Security Risks at Mokowe | Risks of loss of life of personnel at the site | Contractor personnel, staff | • Installing robust fencing around the entire perimeter of the construction site to control access and prevent unauthorized entry.<br>• Implementing CCTV cameras at strategic locations throughout the site to monitor activities and enhance security, particularly in vulnerable areas.<br>• Establishing controlled access points where security personnel can monitor and manage the entry of personnel, visitors, and vehicles. This includes issuing ID badges and maintaining a visitor log.<br>• Employing trained security guards to patrol the site, monitor access points, and respond to security incidents. This includes both uniformed and plainclothes officers.<br>• Conducting regular safety induction sessions for all new employees and ongoing training for all staff on security practices, emergency procedures, and the proper use of personal | Safety of staff at the site | Contractor | 2,000,000.00 |

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| | | | | protective equipment (PPE).<br>▪ Developing and implementing a comprehensive emergency response plan, including clear procedures for evacuation in case of incidents such as fires or security breaches. Regular drills should be conducted to ensure everyone is familiar with the plan. | | | |
| 16. | Gender-based violence at community level | Injury | Vulnerable persons in the community. | ▪ The contractor will implement provisions that ensure that gender-based violence at the community level is not triggered by the Project, including:<br>▪ Effective and on-going community engagement and consultation, particularly with women and girls;<br>▪ Review of specific project components that are known to heighten GBV risk at the community level,<br>▪ Specific plan for mitigating these known risks, e.g. sensitization around gender-equitable approaches to employment, representation, management, school pupils etc<br>▪ The contractor will ensure adequate referral mechanisms are in place if a case of GBV at the community level is reported related to project implementation. | prevent cases of GBV in the community due to project activities | contractor and sub-Project supervising consultant | 150,000 |
| 17. | Sexual exploitation and abuse (SEA) | Injury | Vulnerable persons in the community. | ▪ Develop and implement a SEA/SH prevention and response Action plan with an Accountability and Response Framework as part of the ESMP. The SEA action plan will follow guidance on the World Bank's Good Practice Note for Addressing Gender-based Violence in Investment Project Financing.<br>▪ The SEA action plan will include how the project will ensure necessary steps are in place for:<br>▪ Prevention of SEA: including CoCs and | zero tolerance to SEA | contractor and sub-Project supervising consultant | 150,000 |

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| | | | | ongoing sensitization of staff on responsibilities related to the CoC and consequences of non-compliance; project-level IEC materials;<br>▪ Response to SEA: including survivor-centred coordinated multi-sectoral referral and assistance to complainants according to standard operating procedures; staff reporting mechanisms; written procedures related to case oversight, investigation and disciplinary procedures at the project level, including confidential data management;<br>▪ Engagement with the community: including development of confidential community-based complaints mechanisms discrete from the standard GRM; mainstreaming of PSEA awareness-raising in all community engagement activities; community-level IEC materials; regular community outreach to women and girls about social risks and their PSEA-related rights;<br>▪ Management and Coordination: including integration of SEA in job descriptions, employments contracts, performance appraisal systems, etc.; development of contract policies related to SEA, including whistle-blower protection and investigation and disciplinary procedures; training for all project management; management of coordination mechanism for case oversight, investigations and disciplinary procedures; supervision of dedicated PSEA focal points in the project and trained community liaison officers. | | | |
| 18. | Gender Inequality | Risk of excluding one gender | Women at construc | • Regularly distribute surveys or feedback forms to gather anonymous information on workers' perceptions of gender equity | Promote gender | contractor and sub-Project supervising | 150,000 |

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| | of opportunities | tion community | within the workplace.<br>• Regularly review the gender composition of the workforce at all levels of the organization to ensure equitable gender representation.<br>• Tracking promotions, pay grades, and hiring practices to detect any form of gender bias.<br>• Establish and maintain confidential reporting mechanisms, such as hotlines, suggestion boxes where workers can report instances of harassment or abuse.<br>• Conduct regular training sessions on sexual harassment policies and prevention strategies for all employees, including management.<br>• Monitor attendance and participant engagement to ensure comprehensive understanding and compliance.<br>• For every reported incident, track the investigation process, follow-up actions, and resolution outcomes to ensure cases are handled promptly and effectively. Regularly review the resolution process to ensure it is in line with the company's policies and legal requirements.<br>• Regularly review and update workplace policies on gender equity and sexual harassment to align with the latest legal requirements and best practices.<br>• Ensure these policies are clearly communicated to all employees.<br>• Initiate regular awareness campaigns to educate workers about their rights and available support regarding gender equity and sexual harassment. | equality | consultant |

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| | | | | • | | | |
| 19. | Traffic disruption | Marine traffic | Boat operators at Mokowe Jetty | • Temporary disruptions in marine traffic.<br>• The movement of construction materials and equipment via waterways may require navigation changes for existing marine traffic, potentially leading to delays or rerouting of marine vessels.<br>• The area around the construction site may experience increased marine congestion due to the presence of construction vessels and barges.<br>• Construction activities might lead to increased sedimentation, which can affect water quality and marine life. | Ensure effective marine traffic at Mokowe, Lamu | contractor and sub-Project supervising consultant | |
| 20. | Spread of COVID-19. During construction at work sites | Infection or loss of life | workers and members of the public accessing the site for some reason | • The Contractors will develop standard operating procedures (SOPs) for managing the spread of Covid-19 during project execution and submit them for the approval of the Joint Supervision committee and the client, before mobilizing to site. The SOPs shall be in line with the World Bank guidance on COVID-19, Ministry of Health Directives and site-specific project conditions;<br>• Mandatory provision and use of appropriate Personal Protective Equipment (PPE) shall be required for all project personnel including workers and visitors;<br>• Install hand washing facilities with adequate running water and soap, or sanitizing facilities at entrance to work sites including consultation venues and meetings and ensure they are used;<br>• Ensure routine sanitization of shared social facilities and other communal places routinely including wiping of workstations, door knobs, hand rails etc.; | avoidance of infection | contractor and sub-Project supervising consultant | 100,000 |

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| 21. | Labour Related disputes | • Prioritize to the extent possible recruitment of local labor<br>• Adherence to labor laws and practices such as the working hours, payment, and no child/forced labor in their workforce<br>• No child labour is allowed on site, children below 18 years shall not be employed in dangerous work.<br>• Ensure the workers have contracts with terms and conditions consistent with national labour laws and policies<br>• The Contractor shall keep complete and accurate records of the employment of labor at the Site to include the names, ages, genders, hours worked, wages paid to all workers | |

The estimated total cost for the implementation of the construction phase ESMP is Kenya Shillings 5.32 Million. However, the actual cost shall be prepared by the contractor and captured in the C-ESMP. The project's Bid Documents will incorporate the Environment, Social Health and Safety Provisions discussed under this ESMP.

**Table 7-2: Environmental and Social Management Plan (ESMP) during Sub-project Operation**

| NO. | ASPECT | IMPACT | RECEPTOR | MITIGATION MEASURES | GOAL | RESPONSIBILITY | COST (KES) |
|---|---|---|---|---|---|---|---|
| 1. | Occupational Health and Safety (*accidents and Injuries*) | Injuries and accidents | workers conducting maintenance and repair, working at the fish banda and those working at the ablution | • Ensure compliance to Occupational Safety and Health Act Cap. 514 and its Subsidiary Legislations standards including: registering all the proposed sites as work place *modern fish Banda, Ablution Block*, constituting a safety committee, providing first aid facilities, conducting emergency drills and annual landing site safety audits.<br>• Provide personal protective equipment (e.g gloves with thermal liners, chaps, safety helmet with thermal liner, thermal hoods, face protectors, insulated safety boots, use of thermal socks etc) to operation and maintenance workers who will be working at the proposed cold room and ice making plant.<br>• Sensitization and aware ness creation among workers on proper use and maintenance of cutting equipments and provision of protective equipment (metallic gloves, leather aprons and rubber soles.<br>• are ness creation among workers on proper use and maintenance of cutting equipments and provision of protective equipment (metallic gloves, leather aprons and rubber soles.<br>• ness creation among workers on proper use and maintenance of cutting equipments and provision of protective equipment (metallic | Ensure the safety of workers at all proposed structures on site. | BMU management , KeFS and the county government fisheries department | To be determined under operation and maintenance costs |

gloves, leather aprons and rubber soles.

- Demarcate the working space for different activities to minimize flow of processes from crossing.
- Employing workers who are physically fit (those who do not have a pre-existing medical condition such as asthma or arthritis)
- Tasks rotation for workers working in cold conditions
- Sensitization and Awareness on cold condition hazards and symptoms to workers.
- Equip cold stores and chill stores with strip curtains to avoid extensive drafts when doors are open
- Conduct regular health monitoring to workers working in the cold room.
- Recording all injuries that occur on-site to workers while doing their daily duties in the incident register, corrective actions for their prevention should be initiated as appropriate.
- Creation of awareness and training of fishers on site on safety and first aid skills by KeFS and coast guards for those who engage in deep sea fishing.
- Hiring employees with proper qualifications for specialized and risky tasks during operation and maintenance of the various utility systems.
- Adherence to Covid-19 rules as provided by the ministry of health and the Bank while conducting daily duties.
- Providing requisite PPE (face mask and gloves

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| | | | | for those handling Covid-19 symptomatic patients) and training of workers on covid-19 rules and requirements.<br>• The workers to be rotated to reduce exposure to allergens<br>• Use of gloves particularly while working with fish species known to create allergic reactions<br>• Avoid aerosol-generating activities and proper ventilation of working space. | | | |
| 2. | Public health and safety (*accidents and Injuries*) | Injury, disease outbreak and accidents | visitors to Mokowe landing site | • Constitute a committee on fish landing site management, public safety, sanitation and hygiene<br>• Cordoning off working sites to protect the public or unauthorized persons during repair and maintenance of the different utility systems on site<br>• Provide concrete rails for the jetty to reduce cases of falling<br>• Having a rescue team on site at all time for quick response in case of falling.<br>• Provide adequate lighting to avoid falling and drowning during dark periods for fishers delivering fish at night or early morning when dark<br>• using signage during cleaning, maintenance, or repair to warn the public<br>• Easily accessible fire risk information to the public visiting the landing site<br>• Employment of workers certified by the public health officers.<br>• Regular inspection of the fish handling and | ensure protection and safety of the public who visit the landing site | BMU and County government fisheries department. | To be determined under operation and maintenance costs |

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| | | | | processing facility by the public health officers.<br>• Sensitization and awareness creation to workers on hygienic handling of the food items at the fish processing facility.<br>• Restriction of non-authorized persons from accessing the fish processing area<br>• Observe disinfection requirement by workers before entry in the fish processing area.<br>• Observe the use of requisite clothing while in the processing facility to avoid contamination.<br>• Regular inspection and repair of the jetty to detect any corroding steel reinforcing the jetty.<br>• Consider protecting the steel using marine paint before concreting the pillars.<br>• Regular monitoring of the conditions of the jetty<br>• Regular maintenance to ensure the structural integrity of the jetty by repainting, replacing worn out or damaged materials. | | | |
| 3. | Security Risks at office | Risks of loss of life of personnel at the site | Staff at the office | • Implement a comprehensive security protocol including round-the-clock surveillance, secure fencing, and controlled access points to protect the construction site and personnel from potential terrorist threats and sabotage activities.<br>• Staff Safety Protocols and Training: Develop and enforce strict travel and safety protocols for all personnel, especially for those coming from outside the region.<br>• Provide regular training on security awareness, emergency response, and hostage survival strategies to prepare staff | Safety of staff at the site | County Government of Lamu | To be determined |

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| | | | | for potential security incidents.<br>• Community Engagement and Local Hiring: Foster goodwill and mitigate the risk of local unrest by actively engaging with the community, understanding their concerns, and prioritizing the hiring of local labor for construction activities.<br>• Establish strong lines of communication and collaboration with National Police Service - law enforcement and national security agencies to benefit from their intelligence, support, and rapid response capabilities in case of a security incident.<br>• Emergency Preparedness and Response Plan: Create a detailed emergency response plan that includes procedures for evacuation, communication, and crisis management in the event of a security incident.<br>• Conduct regular drills to ensure that all construction personnel are familiar with the plan and can act swiftly and efficiently under pressure. | | | |
| 4. | Solid Waste generation | contamination and littering | public nuisance, soil, water and air | • To determine and characterize the amount of fish waste to be generated at the banda<br>• Sensitization and awareness creation among the landing site users, Mokowe BMU and visitors on the significance of waste separation and in addition provide for waste sorting bins at the landing site with clear labeling.<br>• Promote the use of accredited fishing gears to minimize catch of non-target species<br>• Provide for a waste transfer station (through | to ensure waste is managed properly | BMU and county government environment and natural resources and fisheries departments | To be determined under operation and maintenance costs |

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| | | | | waste bins) at the landing site for temporal holding of waste before final disposal.<br>• To engage the county government environment and natural resources department mandated with waste management to collect and properly dispose of the waste.<br>• Conduct regular cleaning of the jetty to remove debris and sediment<br>• Sensitization and awareness creation among fishers on reducing capturing non-targeted species.<br>• s.<br>• Recovering of waste streams by adopting the fish processing operation appropriately<br>• Reprocessing the fish waste to fish meals and oils<br>• Recovering proteins from waste water and using for improving animal feeds | | | |
| 5. | Hazardous waste management | contamination and littering | public, soil, water and air | • Procuring and using of durable equipments requiring less replacement by reducing frequency replacement needs<br>• Adoption of solar equipments that are easily repairable and recycling friendly components to reduce the amount of waste generated and pumped into waste management systems<br>• Adopting solar equipment with less hazardous sub-stances by reviewing the environmental health and safety and going for preferred alternatives with less hazardous substances<br>• Use the solar equipment suppliers and servicing logistics to collect and safe disposal | to ensure waste is managed properly | BMU and county government environment and natural resources and fisheries departments | To be determined under operation and maintenance costs |

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| | | | | of obsolete component after replacement.<br>• Early identification of solar e-waste collection and recycling locally<br>• Consider partnering with NEMA local office for safe collection and disposal of the e-waste. | | | |
| 6. | Noise and Vibration | auditory injuries | Site workers, fishermen and other persons operating at the site | • Consider procuring the power backup generator to ensure that the ones with least noise impacts are procured, and using silencers/muffle<br>• Regular servicing of the power backup generators. | to ensure Workers and public safety | BMU and county government environment and natural resources and fisheries departments | To be determined under operation and maintenance costs |
| 7. | Air Pollution | climate change and air quality degradation | maintenance workers, visitors, and neighbouring businesses | • Keep working and storage areas clean at all times<br>• Empty and clean fat traps on regular basis<br>• Store waste products in cold, closed and well ventilated places and for short periods<br>• The waste transfer systems, waste water canals, and water treatment facilities to be covered as a means of reducing the escape of foul smell<br>• To install catalytic devices on the power backup generator to ensure complete burning of waste gases,<br>• Use of clean petroleum that is low in sulphur, lead or other fuel additives,<br>• Proper servicing of generator and other equipment using fuel,<br>• Plant more vegetation as part of beautification | to ensure Workers and public safety | BMU and county government environment and natural resources and fisheries departments | To be determined under operation and maintenance costs |

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| | | | | and landscaping for carbon sequestration, | | | |
| 8. | Leakage and spillage (generator room and fuel storage areas) | fire incidence and pollution | storm drainage, soils and water sources | • Incorporate secondary containment unit within the generator fuel storage<br>• Cleaning the backup generator regularly and checking for leaking parts which if spotted should be tightened if loose or replaced immediately<br>• Regular servicing of the generator to avoid spillage<br>• Cleaning up fuel spills immediately it occurs and disposing off fuel-soaked absorbent materials. The absorbent materials will be maintained on site for emergency use. | to deter oil and fuel spillage | BMU and county government environment and natural resources and fisheries departments | To be determined under operation and maintenance costs |
| 9. | Waste water generation | increased waste water generation during operation | public nuisance, soil and water | • Ensure adequate and accessible provision of sanitation facilities and ensure they are regularly cleaned,<br>• Regular sensitization and awareness to users to discourage releasing detergents or other chemical solutions in black water system.<br>• Regular cleaning of the wastewater drainage system<br>• Regular and proper maintenance of the drainage system<br>• Prompt response to any reported blockage and leakages<br>• Sensitization and awareness of users from discharging or emptying any oils to the sewer system particularly from the boat yard.<br>• Treating the waste water through a bio-digester and using the water for landscaping.<br>• Fit grids and screens or traps to remove solid | to ensure adequate treatment and management of waste water | BMU and county government fisheries department | To be determined under operation and maintenance costs |

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| | | | | waste from waste water<br>• Application of sludge from waste water treatment as fertilizers by local farmers | | | |
| 10. | Fire Hazards | destruction of the proposed structures at site | Landing site visitors and persons operating at the landing site | • Provide recessed swinging type hose reel complete with 30 meters of 20mm internal diameter rubber fire hose with nylon spray/jet shut off nozzle<br>• Provision of a Fire assembly point in the design<br>• Installation of fire extinguishers in the building<br>• Provide for fire risk and appropriate response equipment as well as signages with short and clear information.<br>• Ensure flammables are stored in fire resistant areas<br>• Train selected staff as fire marshals who can take lead in case of fire emergency in the building<br>• Regular fire drills for the building users<br>• Regular awareness and sensitization on fire safety measures and response to the users of the building.<br>• Clear fire incidents reporting procedures and response. Ensure regular provision of operational emergency reporting contacts.<br>• Regular servicing and maintenance of the fire extinguishers on site.<br>• Ensuring availability of adequate water resources at the landing site at all times for the | to ensure the buildings are protected from fire hazards | BMU, county government Fire and fisheries departments | To be determined under operation and maintenance costs |

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| | | | | hydrants as per the OSHA requirements. | | | |
| 11. | Increased Water consumption | pressure on existing water resources | Fisheries office borehole supplying the landing site | • Sensitization and awareness creation among users of the structures at the site on significance of water conservation measures.<br>• Use of water efficient appliance such as delay taps<br>• Regular maintenance and prompt response to leakage in the water system.<br>• Use of alternative water sources eg rain water harvesting<br>• Prompt reporting of leakages through sensitization of the public members<br>• Storage tanks to have floaters to reduce wastage from spills when the tanks are full<br>• Use of cleaning detergents that do not have adverse impacts | to ensure efficient and sustainable consumption of water resources | BMU and county government fisheries department | To be determined under operation and maintenance costs |
| 12. | Increased Energy consumption | contribution to carbon generation and pressure on energy resources | energy resources and climate change | • Sensitization and awareness creation among building users on the significance of energy conservation measures<br>• Sensitization and awareness creation among the maintenance team to continue observing the use of energy-saving electrical appliances on the building.<br>• Proper and regular maintenance of the green energy appliances and equipment provided for in the design of the building.<br>• Monitor energy consumption and keep records<br>• Adopt the alternative sources of energy such as solar<br>• Maximize the use of natural light and ventilation | to ensure efficient and sustainable consumption of energy resources | BMU and county government fisheries department | To be determined under operation and maintenance costs |

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| | | | | • Adoption of equipment with cooling efficiency for the fish banda.<br>• Increase the use of energy efficient equipment for the fish banda | | | |
| 13. | Spread of COVID-19. During operation at work sites | Infection or loss of life | landing site Users | • The county departments of fisheries to develop Standard Operating Procedures (SOPs) for managing the spread of Covid-19 during landing site operation and submit them for the approval by the county department of public health before use of the building. The SOPs shall be in line with the World Bank guidance on COVID-19, Ministry of Health Directives and site-specific conditions;<br>• Mandatory provision and use of appropriate Personal Protective Equipment (PPE) shall be required for all landing site users including visitors;<br>• Install hand washing facilities with adequate running water and soap, or sanitizing facilities at building entrance including consultation venues and meetings and ensure they are used;<br>• Ensure routine sanitization of shared social facilities and other communal places routinely including wiping of workstations, door knobs, hand rails etc.; | avoidance of infection | BMU, Public Health and fisheries County Government departments | To be determined under operation and maintenance costs |

**Table 7-3: Environmental and Social Management Plan (ESMP) during Decommissioning.**

| NO. | ASPECT | IMPACT | RECEPTOR | MITIGATION MEASURES | Goal | Responsibility | Cost (KES) |
|---|---|---|---|---|---|---|---|
| 1. | Occupational Health and Safety (*accidents and Injuries*) | Injury and accidents | Workers | • Preparation of project decommissioning plan.<br>• Ensure the safety of the decommissioning workers by putting first aid area and injury reporting mechanism<br>• The contractor should consider having a WIBA insurance policy to compensate workers in an event of an accident on site.<br>• Provide personal protective equipment to workers.<br>• Recording all injuries that occur on site in the incident register, corrective actions for their prevention.<br>• Cordoning off demolition sites to protect the public or unauthorized persons<br>• use of signs and warnings on sites with high risks<br>• Creation of awareness and training of workers on-site on safety and first aid skills.<br>• Hiring employees with proper qualifications for specialized and risky tasks.<br>• Ensure compliance to Occupational Safety and Health Act Cap. 514 and it's Subsidiary Legislations. | to ensure workers safety | BMU, County Department of fisheries and decommissioning contractor | To be determined under the decommissioning plan |
| 2. | Occupational health and safety risks | Risks of drowning | Workers | • Decommissioning of the jetty should be done during the low tides to the extent possible<br>• The workers to be provided with | to ensure workers safety | BMU, County Department of fisheries and | To be determined under |

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| | while working in waters | | | appropriate footwear to reduce the risk of slipping.<br>• Ensure workers are provided with life jackets and enforce use at all times when exposed to sites or working under deep waters<br>• Ensure workers working on such sites are experienced swimmers<br>• Train workers in safety measures when working above deep waters<br>• Avoid working at night to reduce cases of drowning<br>• Having rescue teams on site in the event of an accidents<br>• Provide necessary information on rescue during emergencies. | | decommissioning contractor | the decommissioning plan |
| 3. | Leakages and spills | contamination and pollution | soil, water, plants, and air | • In the event of hazardous waste leakage or spills, engage authorized waste handlers to dispose of contaminated soils.<br>• Disposing of contaminated soils in cutting pit if volumes are low.<br>• Use of NEMA licensed waste handlers to dispose of in licensed disposal sites.<br>• Development of site-specific incident management or response plan.<br>• Use of an authorized garage or fuel station in the project area by the contractor or specific concrete and oil traps should be constructed at the contractor's yard. | to reduce contamination on site | contractor | To be determined under the decommissioning plan |
| 4. | Excessive Noise | Auditory injuries and psychological nuisance | workers, operators at the site | • Adequate use of PPE by the workers e.g. earplugs<br>• Working on and restricting noisy activities during the day | to ensure workers and public safety | BMU, County department of fisheries and decommissioni | To be determined under the |

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| | | | neibouring residents and visitors to the site | • Reducing the duration of exposure of workers to high occupational noise levels during demolition.<br>• Acquisition of permits/Licenses for any activity with high noise levels eg drilling of walls or slabs for demolition.<br>• Using models of machines and equipment with low noise levels.<br>• workers using drilling or handheld pneumatic equipment to be provided with specialized anti-vibrating gloves,<br>• Switching off vehicles and machines when not in use,<br>• Avoiding unnecessary hooting,<br>• Warnings to be issued to the locals in case of any unusual noise levels,<br>• Ensure that NEMA noise and Vibration standards are observed in all project activities. | | ng contractor | decommissioning plan |
| 5. | Air pollution | contamination of air | air, Operators at the site, Visitors to the site and workers | • Workers to use masks when working in dusty conditions during the decommissioning process.<br>• Use all means possible to suppress dust if considered to be a menace during demolishing of obsolete walls or structures on-site | to ensure workers and public safety | BMU, County department of fisheries and contractor | To be determined under the decommissioning plan |
| 6. | Solid Waste generation | littering environment and contamination | water, air, soils, environment, | • Proper disposal of any hazards waste from the decommissioned site.<br>• Preparation of waste management plan to guide waste management and disposal activities of all debris from demolition activities. | to ensure waste is managed properly | county department of environment and natural resources, | To be determined under the decommis |

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| | | | and operators or visitors at the site and jetty | • Disposal of debris to NEMA authorized damping sites<br>• Use of certified vehicles or NEMA licensed waste disposal firms for waste management and disposal<br>• Demolition to be done during low tide | | department of fisheries and decommissioning contractor | sioning plan |
| 7. | Spread of COVID-19. During construction at work sites | Infection or loss of life | workers and members of the public accessing the site for some reason | • The Contractors will develop standard operating procedures (SOPs) for managing the spread of Covid-19 during project decommissioning and submit for approval to the county department of public, before mobilizing to site. The SOPs shall be in line with Ministry of Health Directives and site-specific project conditions;<br>• Mandatory provision and use of appropriate Personal Protective Equipment (PPE) shall be required for all project personnel<br>• Install hand washing facilities with adequate running water and soap, or sanitizing facilities at entrance to work sites including consultation venues and meetings and ensure they are used;<br>• Ensure routine sanitization of shared social facilities and other communal places routinely including wiping of workstations, door knobs, hand rails etc.; | avoidance of infection | contractor and sub-Project supervising consultant | To be determined under the decommissioning plan |

# 8. Environmental and Social Monitoring Plan (EMoP)

## 8.1. Chapter Overview

The chapter highlights the environmental and social monitoring indicators for the anticipated negative and positive impacts as captured in

and **Error! Reference source not found.** . The preparation of the plan was informed and guided by the indicators that were anticipated in the KEMFSED project Environmental and Social Management Framework 2019.

The institutional responsibilities for implementation and supervision are presented in Section 3.7 of this report. The progress reports prepared, incorporating ESMP implementation progress status, shall be on a monthly and quarterly basis. The client (SDBE&F) including the project joint supervising committee and the safeguards consultants shall review the reports and submit to the World Bank.

In addition to regular reporting, all ESHS incidents, accidents, dangerous occurrences including occupational diseases shall be promptly reported to the respective regulatory institution in the prescribed manner and template outlined in DOSH ML/DOSH/FORM 1 and further to the World Bank in line with the requirement of the World Bank EHS guidelines, Occupational Health and Safety Act (OSHA) 2007 and EMCA CAP 387. Investigation shall be conducted, and a corrective action plan developed for every reportable incident to prevent recurrence.

**Table 8-1: Environmental and Social Monitoring Plan (EMoP)**

| PARAMETER/ ACTIVITY | LOCATION | MEANS OF MONITORING | INDICATORS | FREQUENCY | RESPONSIBLE AGENCY | |
|---|---|---|---|---|---|---|
| | | | | | IMPLEMENTED BY | SUPERVISED BY |
| **Occupational Health and Safety** | construction site | Visual inspection of first aid area, injury reporting mechanism, WIBA insurance policy, appropriate use and wearing of PPE, training programs for workers, health and safety plan prepared for site, clean drinking watering points, housekeeping on site and at the contractor's camp. safety training certificates, PPE (gloves, earplugs, safety boots, reflector jackets, nose mask, helmet,) overall, sanitation facilities, anti-vibrating gloves | ▪ Availability of site safety action plan<br>▪ No. of trained workers on safety and first aid skills<br>▪ First aid facility and injury reporting mechanism<br>▪ Availability of Emergency Preparedness and Response Plan.<br>▪ Availability and appropriate use of personal protective equipment (PPE) *(Reflective jackets, helmets, face masks, ear plugs gloves, safety boots, etc.)*<br>▪ Percentage of workers trained on appropriate use of PPE.<br>▪ No and adequacy of sanitation facilities on site<br>▪ Incident register<br>▪ Availability of valid Contractor WIBA insurance policy<br>▪ No of watering points for worker on site with clean water<br>▪ MoU with health centre.<br>▪ Covid-19 management rules/guidelines on site<br>▪ Covid-19 PPE and use on site.<br>▪ No of trained workers on covid-19 rules | Daily | Contractor | sub-Project supervising consultant |

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| **COVID-19 spread among workers** | Construction site and operating landing site facilities | Approved SOPs in line with World Bank and Ministry of health guidelines in place, routine fumigation of shared area and shared tools, sanitizing and hand washing area and facilities, isolation area, proper use of covid-19 PPE, visual inspection of social distance and rapid covid-19 screening measures | • Approved SOPs in line with World Bank and ministry of health guidelines in place,<br>• No of routine fumigation of shared area and shared tools,<br>• Sanitizing and hand washing area and facilities put in place<br>• Isolation area,<br>• proper use of covid-19 PPE,<br>• visual inspection of social distance and<br>rapid covid-19 screening measures put in place | weekly | Contractor | sub-Project supervising consultant and County department of public health. |
| **COVID-19 spread among community members during consultations** | at construction site | visual inspection of social distance, electronic channels adopted for engagement of stakeholders, the number of stakeholders per meeting, provision of appropriate PPE during meetings, traditional communication channels in use, feedback and suggestion platforms for participants, size of groups attending meetings and digital platforms in use to disseminate | • electronic channels adopted for engagement of stakeholders<br>• Measures to observe social distance put in place<br>• Covid-19 PPE use on site<br>• Use of Covid-19 PPE during community engagement<br>• Traditional Communication channels adopted<br>• No. of stakeholders per meeting,<br>• No of digital platform adopted<br>• Online services of community engagement put in place<br>• feedback and suggestion platforms for participants,<br>• No of people attending meetings | regularly based on the consultation sessions | Contractor | sub-Project supervising consultant and County department of public health. |

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| | | information to stakeholders | | | | |
| **Public health and safety** | Areas surrounding the construction site. | visual inspection of site for; safety signs at strategic places, cordoned off working sites to protect the public or unauthorized persons, usage of signs and warnings on sites with high risks, low speeding of construction vehicle and consideration of wind action. No. of reported injuries and accidents and No. of grievances reported. | ▪ Safety signs at high risk place.<br>▪ Hording off working site<br>▪ Speed limit<br>▪ No of awareness and sensitization activities<br>▪ No. of sanitation facilities provided<br>▪ Provision of solid waste receptacles<br>▪ Grievance raised and status of resolution. | weekly | Contractor | sub-Project supervising consultant |
| **Leakages and spills of greases, oil or fuel** | contractor yard and construction site | Visual inspection of hazardous waste leakage or spills to soils on site, records of cutting pits for disposed off contaminated soils, Developed site-specific incident management or response plan. | ▪ No of incidents of hazardous waste leakage or spills.<br>▪ No of site-specific incident management and response plan.<br>▪ Oil trap measures at construction site | weekly | Contractor | sub-Project supervising consultant |
| **Noise and vibrations** | construction site | Use equipment with low noise levels or fitted with mufflers. Visual inspection of site for use of PPE, use of sound | • Noise regulation measures on construction equipment.<br>• Availability of Equipment and Machine servicing records<br>• No of public notices on high | weekly | Contractor | sub-Project supervising consultant |

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| | | proof materials, notices to public on noisy construction activities, restricting noisy activities to day time and regular measurement of noise levels through mobile phone gadgets. | noise level activities<br>• use of noise PPE<br>• Guideline on hooting and speed limits.<br>• Records of noise monitoring<br>• No of complaints registered regarding noise nuisance | | | |
| **Air quality** | Construction site and along construction vehicle movement routes | Physical inspection of vehicles records to ensure meets emission requirements, Use of masks while working in dusty conditions, shielding wind impacts during construction, low speed of construction vehicle, catalytic devices on vehicle and suppress dust | • No of sources of air pollution on site<br>• Certificates of inspection on emission for vehicles<br>• No of Workers using air pollution PPEs<br>• Enforcement of Speed limits<br>• No of times sand and soil material are covered in transit. | daily | Contractor | sub-Project supervising consultant |
| **Waste generation** | Construction site | Visual inspection of; sanitation facilities for human waste management, amount of waste correctly disposed, Visual inspection of haphazard littering, practicing of waste avoidance, reduction, reuse and recycle, designated waste transfer station onsite, | • Adequacy of sanitation facilities on site for workers<br>• Site-specific waste management plan<br>• Measures of waste avoidance, reduction, reuse and recycle put in place.<br>• Designated waste transfer station on site.<br>• Records of approvals from NEMA and County Government on waste management and disposal. | Monthly | Contractor | sub-Project supervising consultant |

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|---|---|---|---|---|---|---|
| | | documented approved waste dumping site, presence and compliance to implementations of site-specific waste management plan. | | | | |
| **Grievances among project stakeholders** | construction site | grievance redress committee formed, existence of grievance redress structures put in place, sensitization and awareness creation among workers and other stakeholders on grievance redress structures in place, grievance log forms and | • Grievance redress committees put in place<br>• Contractor staff grievance structures put in place<br>• No. of sensitization and awareness events<br>• No. of grievances reported/no of cases resolved/existence of a grievance log on site | Monthly | contractor and safeguards officer | sub-Project supervising consultant |
| **HIV/AIDS prevalence** | Construction site | HIV/AIDS prevention and awareness campaign; as well as HIV/AIDS testing services at the construction site or an MoU with an existing government health facility in the area, type of support for infected workers for ARVs and peer counseling services at the site. | • No. of HIV/AIDS prevention messaging (workshops/outreaches/etc)<br>• No. of workers having access to safe sex (condoms-Male and female)<br>• HIV testing services or a MoU with an existing government health facility.<br>• No. of supported infected workers with ARVs<br>• No of peer counsellors trained/Peer counseling services put in place | Monthly | contractor | sub-Project supervising consultant |

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|---|---|---|---|---|---|---|
| **Gender Equity, Sexual Harassment and abuse amongst workers in the workplace** | construction site | Training of workers on sexual harassment, signing of code of conduct prohibiting GBV/SEA, equitable distribution of employment opportunities, disaggregated bathing and sanitation facilities on site and records of sexual harassment. | • Availability of Sexual Harassment and Non-Discrimination Policy<br>• No of women employed as a proportion of total numbers employed<br>• No of sanitation facilities per sex<br>• No of reported harassment cases<br>• No of trained and sensitized employees on appropriate behavior<br>• No of signed code of conduct against SH<br>• No. of Gender action plan | Monthly | contractor | sub-Project supervising consultant |
| **GBV at community** | construction site | Community? Referral mechanism put in place for GBV cases, Mitigation plan put in place for project activities with high risk GBV incidences, Mechanisms put in place to deter GBV cases and an engagement mechanism put places for GBV victims. | ▪ No. of community engagement and consultation with women and girls; (Traditional and religious leaders<br>▪ No. of sub-project activities identified to be of high GBV risk at community level.<br>▪ Referral mechanisms put in place in the event of GBV at Community level | Quarterly | safeguards officer | sub-Project supervising consultant |
| **GBV: Sexual exploitation and abuse (SEA)** | Construction site | SEA management plan in place, sensitization and awareness creation among workers and the community, SEA | ▪ SEA management action plan<br>▪ Signed code of conduct (CoC) by all workers and sub-contractors<br>▪ No. of workers trained on CoCs and responsibilities (all data is | Quarterly | safeguards officer | sub-Project supervising consultant |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | response mechanism put in place, Special GRM for SEA cases put in place, SEA awareness in community engagement activities, Integration of SEA management principles in project engagement documents, training of all workers at the construction site and signing of code of conduct prohibiting GBV/SEA | gender disaggregated)<br>▪ Project-level IEC materials put in place<br>▪ Survivor-centred mechanisms put in place<br>▪ Multi-sectoral referral and assistance plan put in place<br>▪ Disciplinary procedures at the project put in place<br>▪ Confidential community-based complaints mechanisms in place<br>▪ PSEA awareness-raising done<br>▪ community-level IEC materials put in place<br>▪ No of community outreach to women and girls about social risks and their PSEA-related rights;<br>▪ Integration of SEA in job descriptions, employments contracts, performance appraisal systems,<br>▪ Whistle-blower protection and investigation and disciplinary procedures put in place<br>▪ No. of training of project staff on SEA conducted | | | |
| **Child Labour and Protection** | construction site | Workers to have national identification card, recruitment policy prohibiting child labour put in place and review of employee records | ▪ Records of employees including copies of identification cards<br>▪ No of cases of child sexual relations offenses reported to the police.<br>▪ Recruitment policy prohibiting child labour put in place<br>▪ No of employee records reviewed (this may not be | Monthly | safeguards officer | sub-Project supervising consultant |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | necessary given the first indicator you have mention in this section.) | | | |
| **Labour and employment-related issues** | Construction site and contractors office | Physical counts and inspection of records on;<br>No. of locals employed on the project from the employment records.<br>No. of Grievance recorded from employees and how they were addressed | ▪ No of local workforce as a proportion of the total numbers employed. (Remember there is a percentage of locals who are expected to be employed. This is the baseline)<br>▪ Community engagement plan<br>▪ Signed Code of Conduct by all workers<br>▪ No of sensitization meeting on local social and cultural practices on acceptable behavior<br>▪ Labour Management Plan (LMP) | Monthly | safeguards officer | sub-Project supervising consultant |
| **Security risks** | Construction site and landing site | No. of security walling barricades put in place.<br>No. of security surveillance system put in place<br>No. of security personnel employed by the project | ▪ No. of attempted attacks prevented by security<br>▪ No. of security personnel employed by the project. | Monthly | Safeguards' Officer | sub-Project supervising consultant |

**Table 8-2: Environmental and Social Monitoring Plan (EMoP)for positive impacts**

| PARAMETER/ ACTIVITY | LOCATION | MEANS OF MONITORING | INDICATORS | FREQUENCY | RESPONSIBLE AGENCY | |
|---|---|---|---|---|---|---|
| | | | | | IMPLEMENTED BY | SUPERVISED BY |
| **Employment** | Construction | temporal Job | ▪ No of local workers employed | Monthly | Contractor | sub-Project |

| | | | | | | |
|---|---|---|---|---|---|---|
| **opportunities** | site | opportunities for construction workers and service providers at construction site eg *(electrical, security)* | at construction site<br>▪ No of local service providers employed on site to provide security or electrical conduits or cables. | | | supervising consultant |
| **Business opportunities** | Construction site | Materials available within the local, Identify local suppliers and identified women food vendor | ▪ Amount of materials Sourced locally<br>▪ No of local suppliers<br>▪ No of local women food vendors supplying the site. | Monthly | Contractor | sub-Project supervising consultant |
| **Acquiring a structures** | operation | modern fish Banda, an ice plant, Ablution Block and External works, (*Perimeter wall, drainage, landscaping works, access road works, Jetty, bio-digester and street light)* | Operational structures | Monthly | Contractor | sub-Project supervising consultant |
| Fish landing data | Construction site | Routine recording of landed catches (weight and species)<br>Scientific monitoring | Catch records of fish landings at the site<br><br>Catch records of fish | Daily<br><br>Quarterly | BMU<br><br>KMFRI | County<br><br>County |

| | | |
|---|---|---|
| | of landed catches | landings |

# 9. GRIEVANCES MANAGEMENT SYSTEM AND PROCEDURE

## 9.1. Chapter Overview

This chapter describes the procedure and mechanism through which community members, the contractor, workers, fish traders, operators at the site, BMU members, visitors visiting the site and any other sub-project aggrieved parties will be able to report, make, place/lodge or express a grievance against impacts from construction activities of the proposed Mokowe landing site infrastructures or the contractor activities as part of the ESIA ESMP implementation. The chapter generally outlines the need for a grievance redress mechanism, grievance redress structure, grievance redress procedure, institutional arrangement and awareness and sensitization on grievance redress mechanism.

## 9.2. Need for Grievance Mechanism

The implementation of the proposed Mokowe landing site construction works are anticipated to generate perceived or actual grievances from sub-project interested parties who could be Mokowe community members, current users of the site (fish traders & fishermen), BMU members, visitor visiting the site, neighbouring residents, workers, individuals, groups or county officers from other departments affected or likely to be affected by environmental and social impacts of the construction activities. In light of this, there is need to anticipate and put in place a grievance redress mechanism to outline approach to accepting, assessing, resolving and monitoring of grievances from aggrieved parties on implementation activities of the proposed construction of Mokowe landing site infrastructures sub-project. A grievance is any dissatisfaction or sense of injustice or unfairness felt by a person – in this respect a project affected person or his/her representative in connection matters related to labour, project impacts, GBV, SEA, the work implementation process, the project developer, the contractor and other scenarios related to project implementation. The grievance is usually brought to the attention of the person(s) in charge, referred to in this ESIA report as the Grievance Officer (GO) designated by the project implementation team, in this case, the contractor safeguards Officer has been assigned as the grievance officer for this sub-project.

### 9.2.1. Scope of the GRM

The scope of GRM system will be to deal with grievances related to construction works – particularly issues related to recruitment of unskilled labour; ensuring fairness of job opportunities to different segments of construction; following up on waste management; dealing with Environment Health & Safety (EHS) aspects to unskilled workers; addressing complaints related to Gender Based Violence (GBV) committed by site workers; Sexual Exploitation and Abuse (SEA) particularly referrals to criminal justice system; addressing aspects of child labour and following on safe waste disposal.

### 9.2.2. Grievance Log

Documentation of complaints and grievances is important, including those that are communicated informally and orally. The log will contain a record of the person responsible for an individual complaint, and record dates for the following events:

i. Date the complaint was reported;
ii. Date the grievance log was uploaded onto the project database;
iii. Date information on proposed corrective action sent to complainant (if appropriate);
iv. The date the complaint was resolved

A sample grievance redress form is included in Annex VIII of this report.

Once parties agree on a path forward – such as an apology, compensation or an adjustment to operations – an action plan should be formalized and implemented. Depending on the issue, responses may vary from a single task to a program of work that involves different parts of the operation. Effective responses will also include engagement with parties involved to ensure that the response continues to be appropriate and understood.

For serious gender-based violence cases, the following procedures will be followed

- Ensure access to service – health, psychosocial, legal/security, safe house/shelter, livelihood
- Ensure a survivor centred approach – give the power back to the survivor – listen, present options of support, ensure informed decision making
- Ensure safety – facilitate the survivor feeling safe at all times
- Ensure confidentiality – (for the survivor and her family) Not disclosing any information at any time to any party without the informed consent of the person concerned.
- Actions are to be guided by respect

Non-discrimination - Survivors of violence should receive equal and fair treatment regardless of their age, race, religion, nationality, ethnicity, sexual orientation or any other characteristics

## 9.3. Grievance Redress Structure

The grievance redress structure for Proposed Mokowe landing site sub-project's construction activities shall be of 2 tier amicable review and settlement of disputes. The tiers shall consist of; Site –Level Grievance Redress Committee (SL-GRC) and Joint Project Supervising Committee which shall feed into the general KEMFSED GRM in the event that any grievance is not addressed at this level. In spite of having the different tiers, an aggrieved party is free to lodge a complaint at any level. However, it's encouraged that the complaint should be made at the lowest level possible for quick and prompt response and only escalated if the issue is complex and cannot be handled at such level.

### 9.3.1. First level: Site –Level Grievance Redress Committee (SL-GRC)

The first level: Site Level (Project site level) Grievance Redress Committees (SL-GRC), this will be formed at sub-project site. Under this ESIA, it's preferred that the first level of grievance or conflict redress on project related issues as a result of this sub-project to be handled by the contractor and SL-GRC. The committee will be drawn from the contractor, the BMU and from

the county government officers participating on project activities. The BMU representative on the SL-GRC will be elected by the members. The committee will handle all forms of grievances in an amicable manner and as an alternative dispute resolution to formal process, which is normally lengthy and costly. Grievances not resolved by the site level committees (SL-GRC) will be taken to the second level.

In the affected sites as described above there will be a **Site –Level Grievance Redress Committee (SL-GRC)** and the membership will include:

- The Area Chief, Chairperson of the committee
- County Environment Safeguards specialist
- CPIU Social Safeguards Officer, secretary of the committee
- Male Community representatives preferably a BMU member
- Female community representative preferably a BMU member
- Representative of persons with disabilities

#### 9.3.2. Second level: Joint Project Supervising Committee

The committee will include NPCU project engineer and CPIU representative engineering team supervising the construction, BMU representative and NPCU Safeguards team and county safeguards officers. It is envisaged that the committee will be meeting on a monthly basis. Part of their role will be to review grievances emanating from Site-Level Grievance Redress committee and address them as urgently as possible.

### 9.4. Grievance Redress Procedure

#### 9.4.1. Step 1: Receipt of Complaint/Grievance

Any aggrieved party shall present a grievance or feedback to the GRM desk at the contractors' office on site. The contractor shall ensure avenues for lodging grievances are accessible to the public for any aggrieved parties. The contractor's safeguards officer shall be designated Grievance officer (GO) to receive and appropriately record in a grievance log form attached in annex VIII. The grievance log form will indicate grievances, date opened/lodged, actions taken to address or reasons why the grievance was not acted upon (e.g. the grievance was not related to the project), information provided to complainant and date on which the grievance was closed. The complaints can be lodged by telephone, email, physically/verbally, suggestion box, through representatives/third party, letters, face book, what's up, twitter or any other digital platform. The grievance officer shall in consultation with the contractor team resolve all the complaints and refers those which cannot be resolved to **Site –Level Grievance Redress Committee (SL-GRC)**. All cases related to GBV/SEA shall be handled by the County safeguards officers through appropriate GBV/SEA service provision channels and the details shall not be recorded in the public logbook.

The GO within an appropriate time period as shall be agreed by the **Site –Level Grievance Redress Committee (SL-GRC)**, shall acknowledge receipt of complain and assure the complaint of the necessary action being taken. The grievances can also be made to the fisheries

office at Amu Island either by the complainant, community leaders, and community representative or by any other third party of choice. The complaints shall be referred to the contractor safeguards officer for appropriate action. Complains will be acknowledged in a day or within any other project agreed time frame to the complainant confirming that the grievance is received and under investigation for appropriate action. The fisheries office shall be an alternative for the complainants who shall not be comfortable to report to the contractor's office directly. However regardless of the source of grievance or complain, the contractor reporting desk will record all grievances on the grievance reporting form or logbook. The complaint could be from members of the public, workers or any other aggrieved party.

### 9.4.2. Enquire or Investigating the Complain

The complaints received shall be screened to determine whether the matter bares any relationship with the sub-project activities, and whether the contractor team can handle the grievance or refer to a more competent or relevant agency. Any grievance matter not related to the sub-project shall be recorded together with the action taken and be referred as appropriate. The complainant shall be appropriately informed and guided on the next steps. The complaints to be referred shall be those whose issues are not related to the sub-project and the issues raised does not fall within the scope of issues to be addressed by the GRM for example cases of GBV/SEA or any other related criminal offences. The verification and screening process may consist of community site visits and meeting to determine the scale, scope and magnitude of the grievance and available options to address the matter appropriately.

### 9.4.3. Responding and Resolving the Conflict

All grievances will be responded to through the chairperson of the SLGRC after completing the investigation or enquiry into the matter. The communication should be done within an agreed timeframe after the completion of the investigations, discussions and identification of potential means of resolving the matter. Where the investigations and resolution of the issue is delayed, the complainant must be informed appropriately together with the cause of the delay and the new timelines provided in advance. The contractor shall endeavor to solve issues directly and promptly on site but if the matter is more complex or beyond the contractor, it should be handled by the SLGRC or JPSC. If the complainant is not satisfied with the decision made at any stage of the GR structure, the aggrieved party will be made aware of their rights to pursue the matter to the next level. The complainant however should be informed of the process and directed to a person that will offer the assistance. A copy of written documentation of the decision should be given to the complainant and another copy shared with the next level of the GR structure to bring to their attention of the complaint. The records of any grievance redress process with all the activities that were involved and decisions should be kept well and will be monitored by the county M&E officer and included in regular KEMFSED project reporting. If an aggrieved party is not satisfied with the decision of **Site –Level Grievance Redress Committee (SL-GRC),** the grievance will be escalated to JPSC for review and final decision making. The JPSC should

resolve all grievances during the monthly site meetings. If the complainant is still dissatisfied, further action will be referred to the **Sub-County - Grievance Redress Committee (SC-GRC)**

If the grievance is solved at any stage and the designated GO and a representative of a GRC will determine a corrective action in consultation with the aggrieved person. A description of the action, the time frame within which the action is to take place, and the party charged with implementing the action will be recorded in the grievance database. Grievances will be resolved and the status reported back to complainants within 7 days. If more time is required, this will be clearly communicated and in advance to the aggrieved person. Cases that are not resolved within the stipulated time, detailed investigations will be undertaken by Joint Project Supervision Committee (JPSC) and results discussed in the monthly meetings with the affected persons. In some instances, it may be appropriate to appoint an independent third party to undertake the investigations.

### 9.4.4. Follow up and Closure

#### 9.4.4.1. Meeting with the Complainant

The proposed corrective action and the time frame in which it is to be implemented will be discussed with the complainant within **7 days** of receipt of the grievance. Written agreement to proceed with the corrective action will be sought from the complainant (e.g. by use of an appropriate consent form).

#### 9.4.4.2. Implementation of Corrective Action

Agreed corrective actions will be undertaken by **Site –Level Grievance Redress Committee (SL-GRC)** or the contractor within the agreed time frame. The date of the completed action will be recorded in the grievance database.

#### 9.4.4.3. Verification of Corrective Action

To verify satisfaction, the aggrieved person will be approached by the GO to verify that the corrective action has been implemented. A signature of the complainant will be obtained and recorded in the log and/or on the consent form. If the complainant is not satisfied with the outcome of the corrective action, additional steps will be undertaken to reach agreement between the parties. If additional corrective action is not possible alternative avenues may be pursued.

## 9.5. Institutional Arrangement at SL-GR

The committee shall consist of 5 members drawn from the community, county government and the contractor, who will be;

- Area Chief
- County Environmental Safeguards specialist who will be the chairperson of the committee,
- County Social Safeguards specialist

- Contractor safeguards specialist who will be the secretary of the committee and
- Male and Female BMU Representatives
- Representative of the disabled persons

### 9.5.1. The role and functions of the committee

The process of lodging a complaint is outlined below:

*a) The designated GO will receive a complaint from the complainant.*

*b) The designated GO will ask the claimant questions in swahili language, write the answers in English and enter them in English onto the grievance form (refer to grievance log form in Annex VIII).*

*c) The local leader (representative of GRC) and the complainant both sign the grievance form after they have both confirmed the accuracy of the grievance.*

*d) The designated GO lodges the complaint in the grievance log.*

### 9.5.2. The Role and Functions of the Committee members

#### 9.5.2.1. County safeguards specialist

- Coordination of the landing site construction GRM
- Documentation of proceedings, recommendations and decisions
- Facilitation and provision of information and services to resource persons required to deal with grievances
- Maintenance of grievance-related documents, reports and attendance
- Coordination of grievance uptake channels and ensuring they are operational
- Liason with JPSC, contractor to ensure the publicizing the GRM channels, structure and other essential GRM related awareness and sensitization
- Providing feedback to affected persons and agencies or institutions that are involved grievances
- Reporting progress to JPMC and NPCU in the required format
- Planning and effecting GRM trainings in consultation with NPC safeguards team. Planning and executing grievance redress evaluation and refining the GRM process for continuous improvements.

#### 9.5.2.2. Contractor safeguards specialist

- Operate and manage uptake point for complains and resolving complaints in consultation with the contractor project manager
- Receive and registration of grievance using appropriate forms provided
- Promptly refer grievances to JPSC that cannot be resolved at project level
- Monitor and provide feedback on environmental and social impacts and effectiveness of mitigation measures at project level.
- Provide monthly and quarterly reports on grievances to JPSC through the county safeguards specialist

- Participate in development and implementation of grievance prevention sub-plans.

#### 9.5.2.3. BMU Representatives

The BMU representatives will be elected to represent the interests of the community and participation in decision making process during resolving of grievances. The role of the representative shall include;

- Liaison between the community and the contractor
- Receive and communicate complaints to the contractor from the community members who for some reason cannot register their complains with the contractor
- Participate in training programs
- Be involved in participatory planning with contractor to prevent grievances
- Assist in disseminating project information
- Coordinate community meetings or any other engagement
- Participate in Grievance Resolution meetings

#### 9.5.2.4. County Monitoring &Evaluation Officer

- Generate performance indicators for the GRM
- Develop reporting and management formats to support the PGRM
- Conduct independent monitoring of GRM operations and provide any corrective measures for the project grievance redress committee PGRC.
- Conduct community and stakeholder satisfaction surveys
- Work with the contractor in developing grievance prevention plans.

### 9.6. Awareness Creation and Disclosure of Grievance

The Grievance Committee members will be oriented with the grievance management system suggested in the ESIA and provided with skills to handle complaints in a just and fair manner. The capacities of the Grievance Redress Committee members will also be enhanced around project mobilization, implementation, Gender Based Violation, Sexual Harassment, Labor issues, child labor and conflict management.

# 10. CONCLUSION AND RECOMMENDATIONS

## 10.1. Conclusion

In spite of the Fisheries sector being critical in Lamu County, it remains under developed with inadequate infrastructural development. The fisheries sub-sector in the County contributes to over 70% of households' income with an estimated annual turnover of about KES 1.5billion. Infrastructure development remains one of the key areas of focus if the fisheries sub-sector is to be transformed for socio-economic development in the County. Mokowe is an exit point to the market for fish from Lamu and as far as to the border with Somali, but due to lack of infrastructure, the site is faced with a myriad of challenges including: fishers experiencing low fish prices to avert a lot of postharvest losses due to lack of fish preservation equipments or ice flakes to preserve fish for the transporters particularly during glut periods, the existing fish banda does not have the capacity to handle the potential amount of fish produced in the area hence fishers being left at the mercy of dealers, the landing site lacks sanitation facilities, lack of water supply to the site, lack of power connection and lack of meeting area for fishers.

The proposed improvement of Mokowe landing site infrastructure will consist of a modern fish Banda, Ablution Block and External works, (*Perimeter wall, drainage, landscaping works, access road works, Jetty, MBBR, DAF, bio-digester and street light)* at Mokowe in Lamu County. Improvement of the landing site shall therefore be an enabler towards sustainable management of the fish stock and private sector interest and investment in fisheries management. The project has generally positive impacts and for the negative impacts, readily implementable mitigation measures have been proposed. The proposed project area was noted to be a highly modified habitat through anthropogenic activities mainly from settlement and commercial activities. The environmental and social assessment findings indicate that the project impacts are of low impacts. The implementation of the project therefore is not anticipated to significantly influence the physical, biological and social environment. It was further noted that the anticipated impacts shall be of low magnitude due to the size of the project and with mitigation measures having been proposed in this report.

## 10.2. Mandatory Requirements

The development of the proposed Mokowe landing site is anticipated to have negative impacts socially and to the physical environment. In spite of the anticipated environmental and social impacts, with proper mitigation measures, the project is environmentally viable. The environmental assessment team proposes the implementations of the sub-project with the following requirement for the sub-project;

- The construction contract shall be between the National Project Coordination Unit of the State Department of Blue Economy and Fisheries, (SDBE&F) and the contractor
- The sub-contractors of the contractor will be accepted and cleared by the supervising consultant in charge of the supervision of the works. The supervising consultant will be responsible to ensure that the sub-contractors enforce and apply all measures included in this

ESIA, including the Environmental Technical clauses attached in the bidding document and contracts.

- The supervising consultant to ensure full implementation by contractors and subcontractors of the ESMPs during construction/implementation stage
- The contractor's project Engineer and the Environmental, Health and Safety Manager in charge of Environmental and Health and Safety, Labor and Social safeguards officer to prepare a Construction ESMP incorporating safety, as well as emergency preparedness and response plan, to be implemented in construction by the contractor and all its subcontractors.
- The supervising consultant in liaison with the contractor's project Engineer and the Environmental, Health and Safety Manager in charge of Environmental and Health and Safety, Labor and Social safeguards officer to prepare an Operation phase ESMP (EMoP) to guide the operation and maintenance of the structures by Mokowe BMU and Lamu County fisheries department to do so during operation and decommissioning stages of the project as required.
- The Contractor will prepare Training Operational Manual on the use of Ice Machine Plant and general site maintenance.
- The supervising consultant and the contractor to ensure that the ministry of health and World Bank covid-19 guidelines are implemented to the latter at the project site during the construction period and that all the workers commit to observing the rules. The Department of Fisheries, Mokowe BMU and the CPIU to ensure the covid-19 rules are adhered to during operation of the facilities. Covid-19 virus remains dynamic and unpredictable
- The project contractor and supervising consultant to ensure that compliance with GRM and sensitization and awareness is created among construction workers, contractor, subcontractors and the general public, on project Grievance Redress Mechanism (GRM) structures in place in the event of a need to address or report any emerging issues or any complains by any aggrieved part in the area, and separate mechanism for reporting any Gender based violence and Sexual Exploitation Abuse on site.

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**ANNEXES**

# I. PROJECT DESIGN AND DRAWINGS

## ANNEX I – MOKOWE LANDING SITE AND DEPOT DESIGN

Republic of Kenya

Kenya Marine Fisheries Socioeconomic
Development Project (KEMFSED)
P.O. Box 58187-00200
NAIROBI

# MINISTRY OF MINING, BLUE ECONOMY AND MARITIME AFFAIRS

## Request for Bids

# CONSTRUCTION OF KILIFI FISH LANDING SITE

**Employer:** State Department for Blue Economy & Fisheries
**Project:** Kenya Marine Fisheries Socio-Economic Development Project (KEMFSED)
**Contract Title:** CONSTRUCTION OF MOKOWE FISH LANDING SITE
**Country:** Republic of Kenya
**Loan No./Credit No/Grant No.:** 6540-KE
**RFBNo.:** KE-MOMBE&MA-LM-2024-010-CW
Issued on: **13-02-2024**

VOLUME 4 OF 4

**DRAWINGS**

**Mukowe Fish** landing Site

# 1 .CONSTRUCTION OF MUKOWE FISH LANDING SITE

DRAWING NO 09-001-001

| NO. | DRAWING/DOCUMENT | DRAWING NO | DRAWING SHEET | DRAWING FORMAT | DOCUMENT STATUS |
|---|---|---|---|---|---|
| | PROJECT 01 ARCHITECTURAL DRAWINGS. | | | | |
| | LIST OF DRAWINGS. | | | | |
| 01 | SITE PLAN | **09-001-001** | A1 | PDF/DWG | PROVIDED |
| | FISH BANDA DRAWINGS | | | | |
| 02 | GROUND FLOOR PLAN | **09-001-002** | A1 | PDF/DWG | PROVIDED |
| 03 | ROOF LEVEL | **09-001-003** | A1 | PDF/DWG | PROVIDED |
| 04 | ROOF SLAB | **09-001-004** | A1 | PDF/DWG | PROVIDED |
| 05 | ELEVATION 01 & 02 | **09-001-005** | A1 | PDF/DWG | PROVIDED |
| 06 | ELEVATION 03 & 04 | **09-001-006** | A1 | PDF/DWG | PROVIDED |
| 07 | SECTION 01 | **09-001-007** | A1 | PDF/DWG | PROVIDED |
| 08 | 3D PERSPECTIVES | **09-001-008** | A1 | PDF/DWG | PROVIDED |
| | ABLUTION BLOCK | | | | |
| 09 | GROUND FLOOR PLAN | **09-001-009** | A1 | PDF/DWG | PROVIDED |
| 10 | ELEVATIONS | **09-001-010** | A1 | PDF/DWG | PROVIDED |
| 11 | 3D PERSPECTIVES | **09-001-011** | A1 | PDF/DWG | PROVIDED |
| | SCHEDULES | | | | |
| 12 | WINDOW SCHEDULES | **09-001-012** | A1 | PDF/DWG | PROVIDED |
| 13 | DOOR SCHEDULES 01 | **09-001-013** | A1 | PDF/DWG | PROVIDED |
| 14 | DOOR SCHEDULES 02 | **09-001-014** | A1 | PDF/DWG | PROVIDED |
| | DETAILS | | | | |
| 15 | GUARD HOUSE | **09-001-015** | A1 | PDF/DWG | PROVIDED |
| 16 | BOUNDARY WALL | **09-001-016** | A1 | PDF/DWG | PROVIDED |
| 17 | PUMP HOUSE | **09-001-017** | A1 | PDF/DWG | PROVIDED |
| 18 | POWER HOUSE 01 | **09-001-018** | A1 | PDF/DWG | PROVIDED |
| 19 | POWER HOUSE 02 | **09-001-019** | A1 | PDF/DWG | PROVIDED |

## NOTES

**GENERAL**
- All dimensions are shown in mm unless otherwise specified.
- Drawings are not to be scaled. Only figured dimensions to be used.
- The contractor must check and verify all dimensions on site before commencement of any work.

**CONSTRUCTION**
- Damp proof course must be provided under all external walls at grade. DPC to be minimum 150mm above ground level.
- All slab at grade to be poured on 1000gauge polytheneon 50mm stone dust blinding on compacted hardcore.
- All soils under slab and around external foundation to be treated for termite control.
- Window sills must be finished before internal plastering.

**CIVIL WORKS**
- All soil under slabs and all around external foundations to be treated with anti- termite pesticide AND should be executed by licensed and duly registered sub contractor.
- Sample for pipe works and other materials for road works specified to be presented to the engineer before works commences.
- All levels for sewer and road works must be approved by the engineer before work commences.

**STRUCTURAL**
- This drawing must be read in conjunction with related architectural drawing, engineers and any other relevant drawings.
- Concrete to be class 20/20 (1:2:4).
- Steel reinforcement bar to be:"Y" = high tensile steel to B.S 4461. "R" = Round mild steel to B.S 449.
- All timber to be sawn cypress G.S grade to KS 02- 771:1989 and seasoned to equilibrium moisture content between 9% and 15%.
- All timber to preservative treated in accordance with KS 02 914:1982.
- Depth of the foundation to be determined on site to S.E's approval.

**MECHANICAL**
- Pipe dimensions are in mm.
- Cold water device pipes steel, with class B to B.S 1387.
- Draining pipe above ground shall upvc grey while those below ground shall be upvc golden brown.
- All underground foul and waste drain pipes shall be upvc to comply.
- All inspection chambers covers and framing shall be cast iron to comply with BS497 TABLE 2 GRADE A.
- The storm water pipe to comply with BS 556.
- Minimum slope in the drain to be 1%.
- All testing of pipes must be completed before plastering.

**ELECTRICAL**
- All conduits must be laid before plastering.
- General conditions of contract for sub contract works.
- Government electrical specification number 1.
- Government electrical specification number 2.
- Electrical act and rules made there under.
- The current edition of regulation for the electrical equipment of buildings issued by the institution of electrical engineers.
- Kenya power and lighting Co. Ltd.

**FIRE**
- Instal water ring main with fire hydrant with 2.5" instantaneous coupling adaptors
- Provide underground water tank with automatic electric booster pump for ring main
- Provide automatic push button fire alarm system
- Provide heat and smoke detectors in each room
- Provide 9kg. dry powder fire extinguishers to ME specifications

| Abbreviations | Meaning |
|---|---|
| **svp** | soil vent pipe |
| **mh** | man hole |
| **ic** | inspection chamber |
| **rcc** | reinforced cement conrete |
| **gt** | gully trap |
| **ss sink** | stain-less steel sink |
| **whb** | wash hand basin |
| **wc** | water closet |
| **shw** | shower |
| **cc** | centre to centre |
| **st. eng/S.E.** | structural engineer |
| **dpc** | damp proof course-under all grd. fl. wallings |
| **dpm** | damp proof membrane |
| **gl** | ground level |
| **pv** | permanent ventilation-on all windows & doors except on internal toilet doors. |

| No | REVISIONS | DATE | SIGNATURE |
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Project : **PROPOSED KENYA MARINE FISHERIES AND SOCIO-ECONOMIC DEVELOPMENT**

Plot L . R. No.:

Location : **MUKOWE,LAMU**

Client : **STATE DEPARTMENT FOR FISHERIES AQUACULTURE AND THE BLUE ECONOMY**

Signature .....

Subject :

**MUKOWE FISH LANDING SITE**

Consultancy :

ARPRIM CONSULTANTS
P.O BOX 12969-0040 NAIROBI
TEL: 020-884312/8
Website :www.arprimconsultants.com

| Drawn by: | Checked by : - | Checked by : - |
|---|---|---|
| **CHRIS NGARE** B. Arch. (Hons), | **F. TUNDULI** B. Arch. (Hons) , M. Arch, (reg. No.A1552 ) | **J. MOMANYI** B. Arch. (Hons) , M. Arch. (reg. No.A1122 ) |

Date:JAN 2024 | Drawing No .

Scale 1:100

# Mukowe Fish landing Site

## Site Plan


## NOTES

**GENERAL**

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**CONSTRUCTION**

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**CIVIL WORKS**

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**MECHANICAL**

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+Kenya power and lighting Co. Ltd.

**FIRE**

+ Instal water ring main with fire hydrant with 2.5" instantaneous coupling adaptors
+ Provide underground water tank with automatic electric booster pump for ring main
+ Provide automatic push button fire alarm system
+ Provide heat and smoke detectors in each room
+ Provide 9kg. dry powder fire extinguishers to ME specifications

| Abbreviations | Meaning |
|---|---|
| svp | soil vent pipe |
| mh | man hole |
| ic | inspection chamber |
| rcc | reinforced cement conrete |
| gt | gully trap |
| ss sink | stain-less steel sink |
| whb | wash hand basin |
| wc | water closet |
| shw | shower |
| cc | centre to centre |
| st. eng/S.E. | structural engineer |
| dpc | damp proof course-under all grd. fl. wallings |
| dpm | damp proof membrane |
| gl | ground level |
| pv | permanent ventilation-on all windows & doors except on internal toilet doors. |

| No | REVISIONS | DATE | SIGNATURE |
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Project : **PROPOSED KENYA MARINE FISHERIES AND SOCIO-ECONOMIC DEVELOPMENT**

Plot L . R. No.:

Location : **MUKOWE,LAMU**

Client : **STATE DEPARTMENT FOR FISHERIES AQUACULTURE AND THE BLUE ECONOMY**

Signature .....

Subject :

**MUKOWE FISH LANDING SITE**

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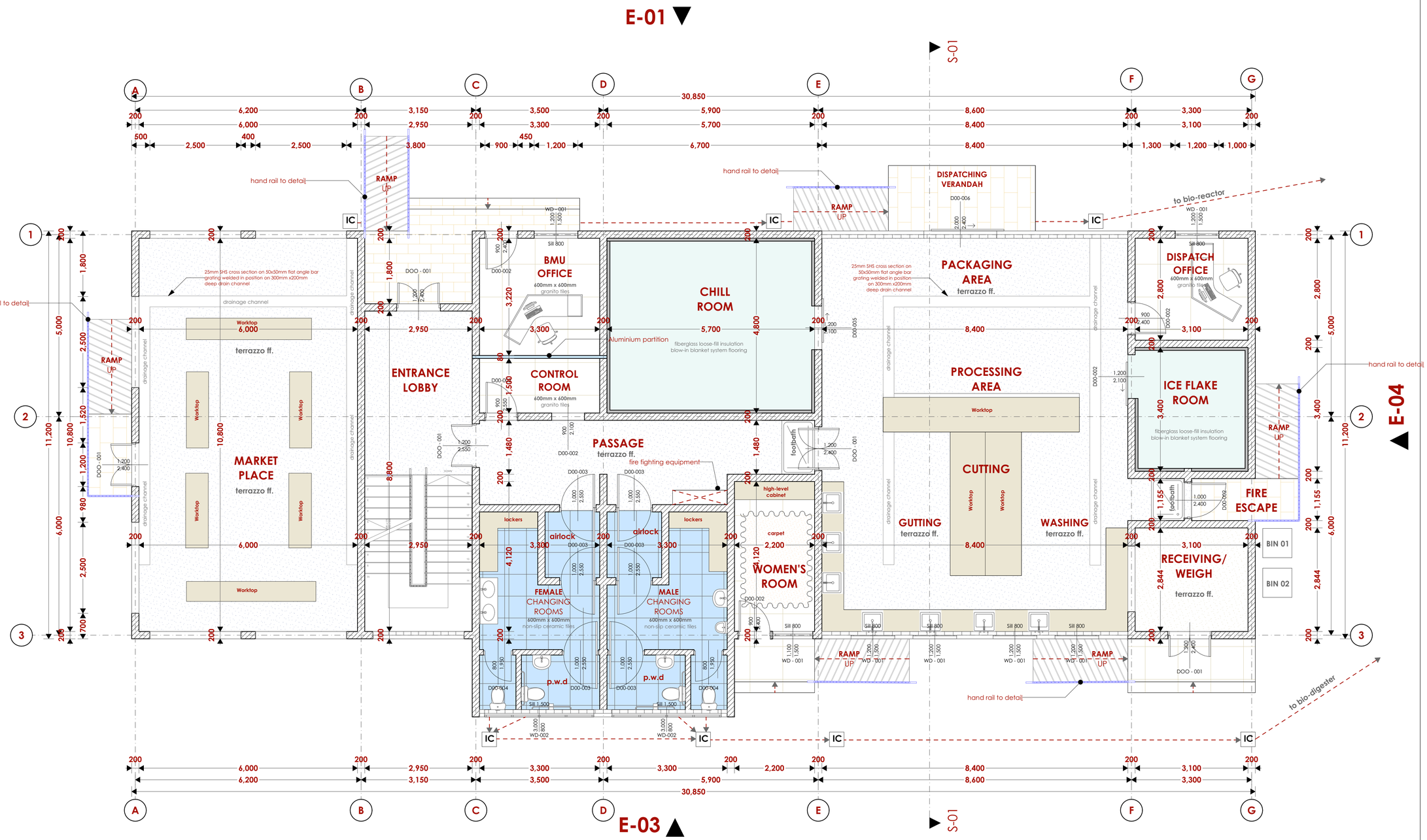
| Date:JAN 2024 | Drawing No . | **09-001-001** |
| Scale 1:100 | | |

# Mukowe Fish landing Site

## Fish Banda-Ground Floor




## NOTES

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- Window sills must be finished before internal plastering.

**CIVIL WORKS**

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- All timber to preservative treated in accordance with KS 02 914:1982.
- Depth of the foundation to be determined on site to S.E's approval.

**MECHANICAL**

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**ELECTRICAL**

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**FIRE**

- Instal water ring main with fire hydrant with 2.5" instantaneous coupling adaptors
- Provide underground water tank with automatic electric booster pump for ring main
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- Provide 9kg. dry powder fire extinguishers to ME specifications

| Abbreviations | Meaning |
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| mh | man hole |
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| No | REVISIONS | DATE | SIGNATURE |
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Project : **PROPOSED KENYA MARINE FISHERIES AND SOCIO-ECONOMIC DEVELOPMENT**

Plot L . R. No.:

Location : **MUKOWE,LAMU**

Client : **STATE DEPARTMENT FOR FISHERIES AQUACULTURE AND THE BLUE ECONOMY**

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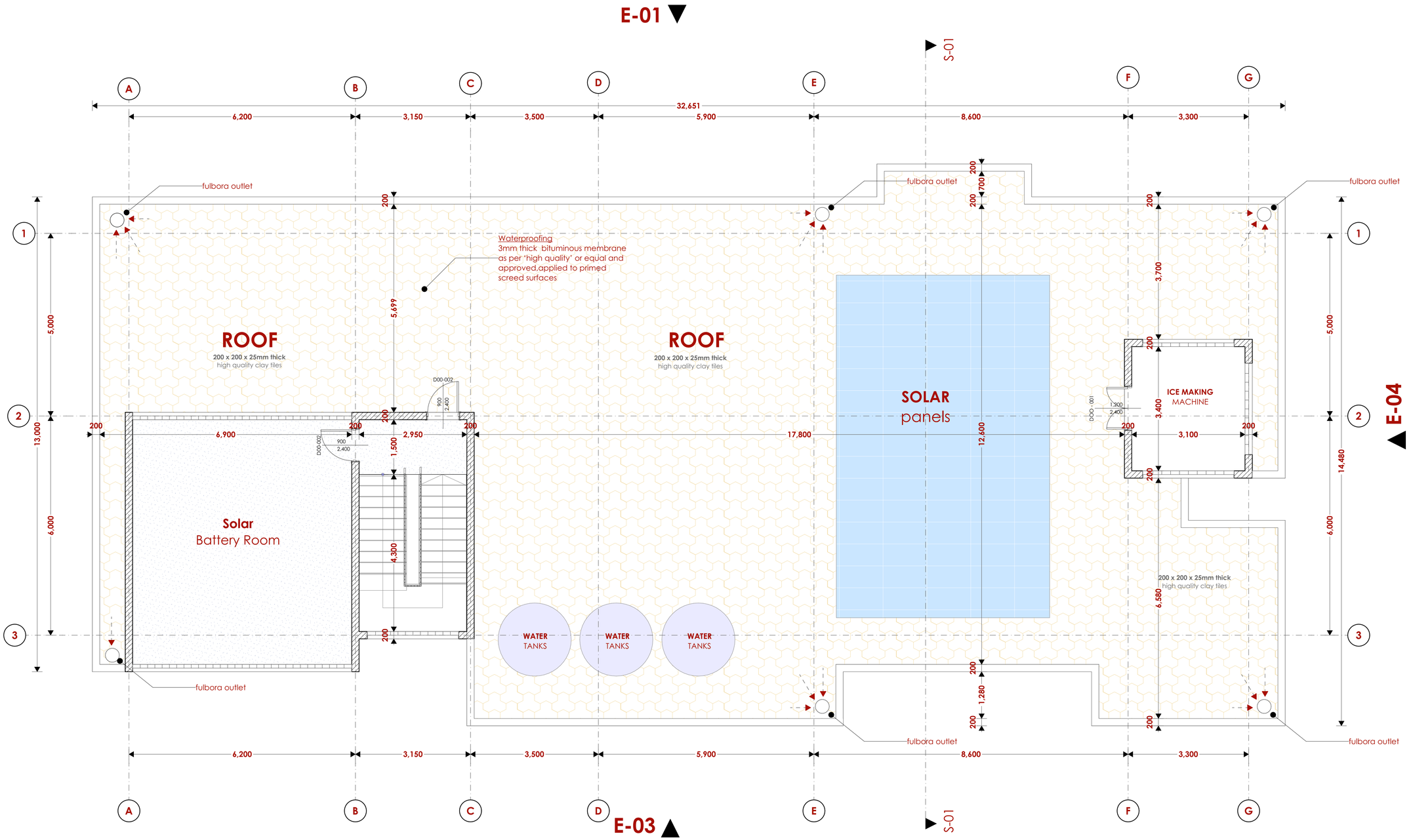
| Date:JAN 2024 | Drawing No . | **09-001-002** |
| Scale 1:100 | | |

# Mukowe Fish landing Site

## Fish Banda - Roof Level

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|---|---|---|---|
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Project : **PROPOSED KENYA MARINE FISHERIES AND SOCIO-ECONOMIC DEVELOPMENT**

Plot L . R. No.:

Location : **MUKOWE,LAMU**

Client : **STATE DEPARTMENT FOR FISHERIES AQUACULTURE AND THE BLUE ECONOMY**

Signature .....

Subject :

**MUKOWE FISH LANDING SITE**

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Consultancy :


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| Drawn by: | Checked by : - | Checked by : - |
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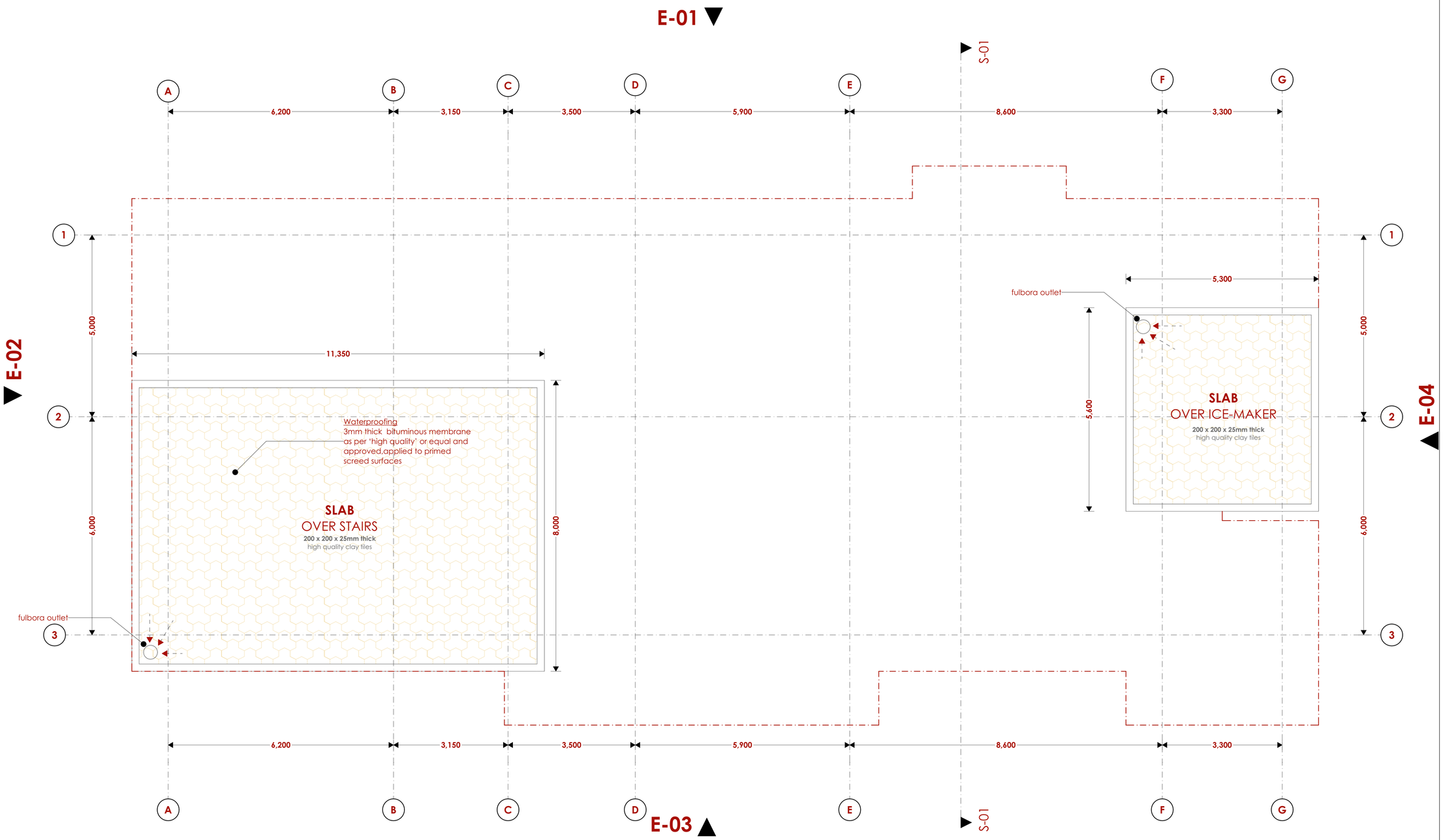
| Date:JAN 2024 | Drawing No . | **09-001-003** |
| Scale 1:100 | | |

# Mukowe Fish landing Site

## Fish Banda-Roof Slab

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+Steel reinforcement bar to be:"Y" = high tensile steel to B.S 4461.
"R" = Round mild steel to B.S 449.
+All timber to be sawn cypress G.S grade to KS 02- 771:1989 and seasoned to equilibrium moisture content between 9% and 15%.
+All timber to preservative treated in accordance with KS 02 914:1982.
+Depth of the foundation to be determined on site to S.E's approval.

**MECHANICAL**

+Pipe dimensions are in mm.
+Cold water device pipes steel, with class B to B.S 1387.
+Draining pipe above ground shall upvc grey while those below ground shall be upvc golden brown.
+All underground foul and waste drain pipes shall be upvc to comply.
+All inspection chambers covers and framing shall be cast iron to comply with BS497 TABLE 2 GRADE A.
+The storm water pipe to comply with BS 556.
+Minimum slope in the drain to be 1%.
+All testing of pipes must be completed before plastering.

**ELECTRICAL**

+All conduits must be laid before plastering.
+General conditions of contract for sub contract works.
+Government electrical specification number 1.
+Government electrical specification number 2.
+Electrical act and rules made there under.
+The current edition of regulation for the electrical equipment of buildings issued by the institution of electrical engineers.
+Kenya power and lighting Co. Ltd.

**FIRE**

+ Instal water ring main with fire hydrant with 2.5" instantaneous coupling adaptors
+ Provide underground water tank with automatic electric booster pump for ring main
+ Provide automatic push button fire alarm system
+ Provide heat and smoke detectors in each room
+ Provide 9kg. dry powder fire extinguishers to ME specifications

| Abbreviations | Meaning |
|---|---|
| **svp** | soil vent pipe |
| **mh** | man hole |
| **ic** | inspection chamber |
| **rcc** | reinforced cement conrete |
| **gt** | gully trap |
| **ss sink** | stain-less steel sink |
| **whb** | wash hand basin |
| **wc** | water closet |
| **shw** | shower |
| **cc** | centre to centre |
| **st. eng/S.E.** | structural engineer |
| **dpc** | damp proof course-under all grd. fl. wallings |
| **dpm** | damp proof membrane |
| **gl** | ground level |
| **pv** | permanent ventilation-on all windows & doors except on internal toilet doors. |

| No | REVISIONS | DATE | SIGNATURE |
|---|---|---|---|
| | | | |
| | | | |
| | | | |

Project : **PROPOSED KENYA MARINE FISHERIES AND SOCIO-ECONOMIC DEVELOPMENT**

Plot L . R. No.:

Location : **MUKOWE,LAMU**

Client : **STATE DEPARTMENT FOR FISHERIES AQUACULTURE AND THE BLUE ECONOMY**

Signature .....

Subject :

**MUKOWE FISH LANDING SITE**

.

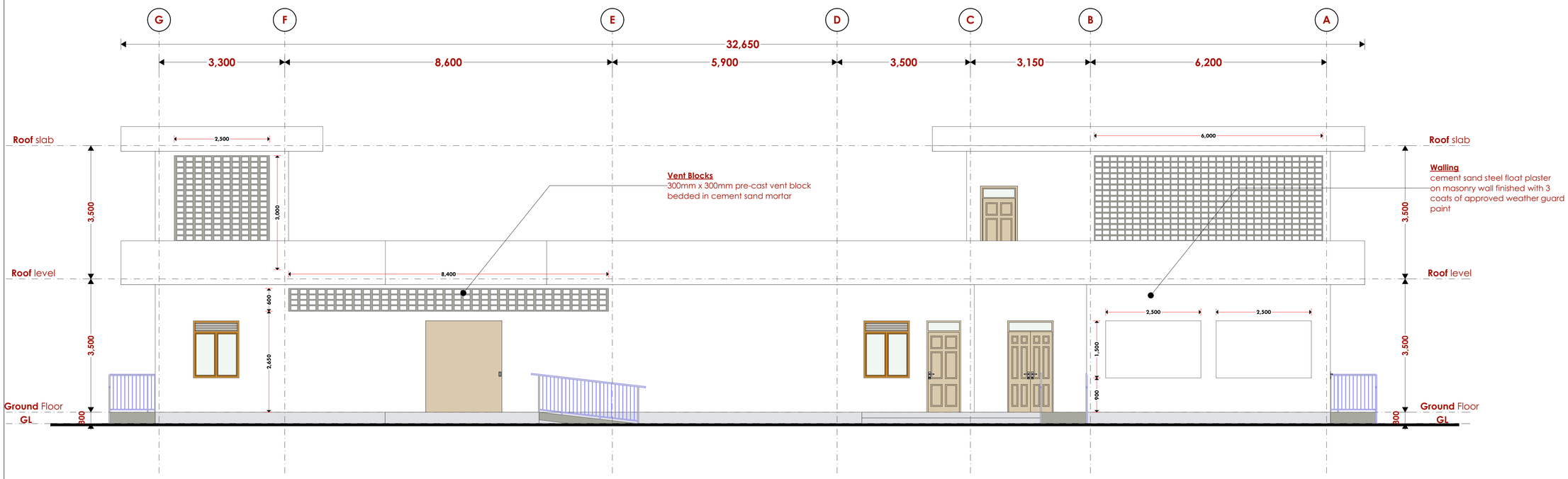
Consultancy :


ARPRIM CONSULTANTS
P.O BOX 12969-0040 NAIROBI
TEL: 020-884312/8
Website :www.arprimconsultants.com

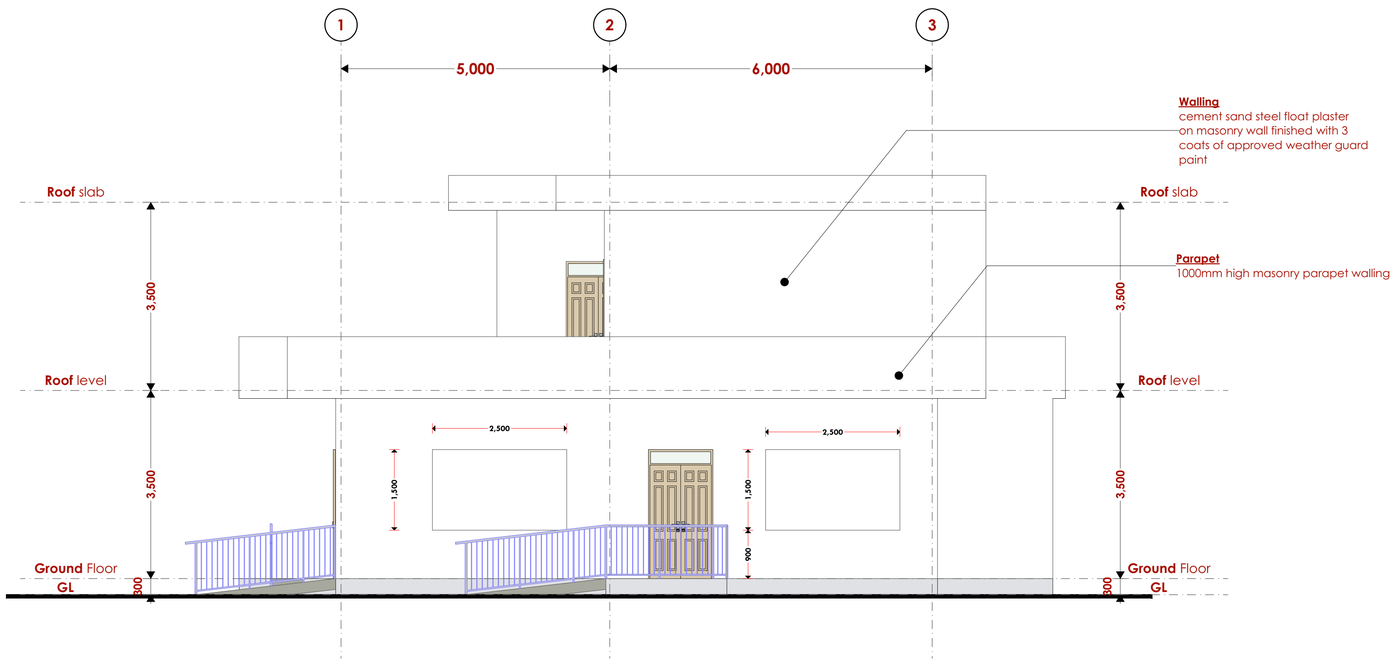

| Drawn by: | Checked by : - | Checked by : - |
|---|---|---|
| **CHRIS NGARE** B. Arch. (Hons), | **F. TUNDULI** B. Arch. (Hons) , M. Arch. (reg. No.A1552 ) | **J. MOMANYI** B. Arch. (Hons) , M. Arch. (reg. No.A1122 ) |
| Date:JAN 2024 | Drawing No . | **09-001-004** |
| Scale 1:100 | | |

# **Mukowe Fish** landing Site

## **Fish Banda-**Elevations




Elevations **01**




Elevations **02**

/

## NOTES

**GENERAL**
- All dimensions are shown in mm unless otherwise specified.
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- The contractor must check and verify all dimensions on site before commencement of any work.

**CONSTRUCTION**
- Damp proof course must be provided under all external walls at grade. DPC to be minimum 150mm above ground level.
- All slab at grade to be poured on 1000gauge polytheneon 50mm stone dust blinding on compacted hardcore.
- All soils under slab and around external foundation to be treated for termite control.
- Window sills must be finished before internal plastering.

**CIVIL WORKS**
- All soil under slabs and all around external foundations to be treated with anti- termite pesticide AND should be executed bylicensed and duly registered sub contractor.
- Sample for pipe works and other materials for road works specified to be presented to the engineer before works commences.
- All levels for sewer and road works must be approved by the engineer before work commences.

**STRUCTURAL**
- This drawing must be read in conjunction with related architectural drawing, engineers and any other relevant drawings.
- Concrete to be class 20/20 (1:2:4).
- Steel reinforcement bar to be:"Y" = high tensile steel to B.S 4461.
  "R" = Round mild steel to B.S 449.
- All timber to be sawn cypress G.S grade to KS 02- 771:1989 and seasoned to equilibrium moisture content between 9% and 15%.
- All timber to preservative treated in accordance with KS 02 914:1982.
- Depth of the foundation to be determined on site to S.E's approval.

**MECHANICAL**
- Pipe dimensions are in mm.
- Cold water device pipes steel, with class B to B.S 1387.
- Draining pipe above ground shall upvc grey while those below ground shall be upvc golden brown.
- All underground foul and waste drain pipes shall be upvc to comply.
- All inspection chambers covers and framing shall be cast iron to comply with BS497 TABLE 2 GRADE A.
- The storm water pipe to comply with BS 556.
- Minimum slope in the drain to be 1%.
- All testing of pipes must be completed before plastering.

**ELECTRICAL**
- All conduits must be laid before plastering.
- General conditions of contract for sub contract works.
- Government electrical specification number 1.
- Government electrical specification number 2.
- Electrical act and rules made there under.
- The current edition of regulation for the electrical equipment of buildings issued by the institution of electrical engineers.
- Kenya power and lighting Co. Ltd.

**FIRE**
- Instal water ring main with fire hydrant with 2.5" instantaneous coupling adaptors
- Provide underground water tank with automatic electric booster pump for ring main
- Provide automatic push button fire alarm system
- Provide heat and smoke detectors in each room
- Provide 9kg. dry powder fire extinguishers to ME specifications

| Abbreviations | Meaning |
|---|---|
| **svp** | soil vent pipe |
| **mh** | man hole |
| **ic** | inspection chamber |
| **rcc** | reinforced cement conrete |
| **gt** | gully trap |
| **ss sink** | stain-less steel sink |
| **whb** | wash hand basin |
| **wc** | water closet |
| **shw** | shower |
| **cc** | centre to centre |
| **st. eng/S.E.** | structural engineer |
| **dpc** | damp proof course-under all grd. fl. wallings |
| **dpm** | damp proof membrane |
| **gl** | ground level |
| **pv** | permanent ventilation-on all windows & doors except on internal toilet doors. |

| No | REVISIONS | DATE | SIGNATURE |
|---|---|---|---|
| | | | |
| | | | |
| | | | |

Project : **PROPOSED KENYA MARINE FISHERIES AND SOCIO-ECONOMIC DEVELOPMENT**

Plot L . R. No.:

Location : **MUKOWE,LAMU**

Client : **STATE DEPARTMENT FOR FISHERIES AQUACULTURE AND THE BLUE ECONOMY**

Signature .....

Subject :

**MUKOWE FISH LANDING SITE**

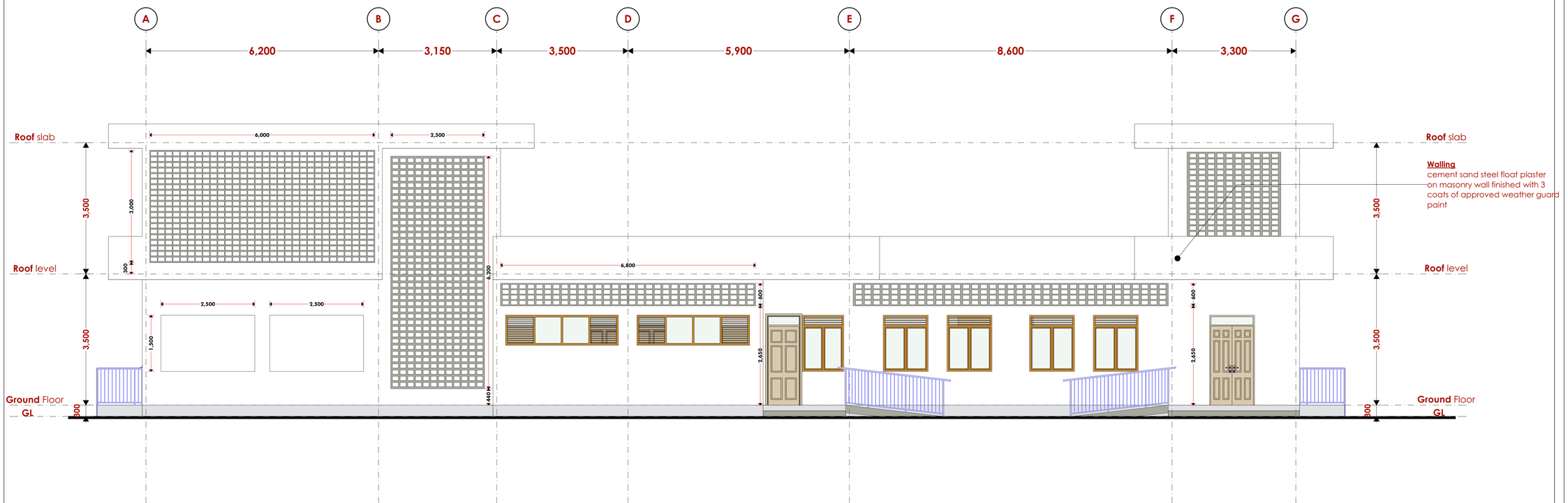
Consultancy :


ARPRIM CONSULTANTS
P.O BOX 12969-0040 NAIROBI
TEL: 020-884312/8
Website :www.arprimconsultants.com

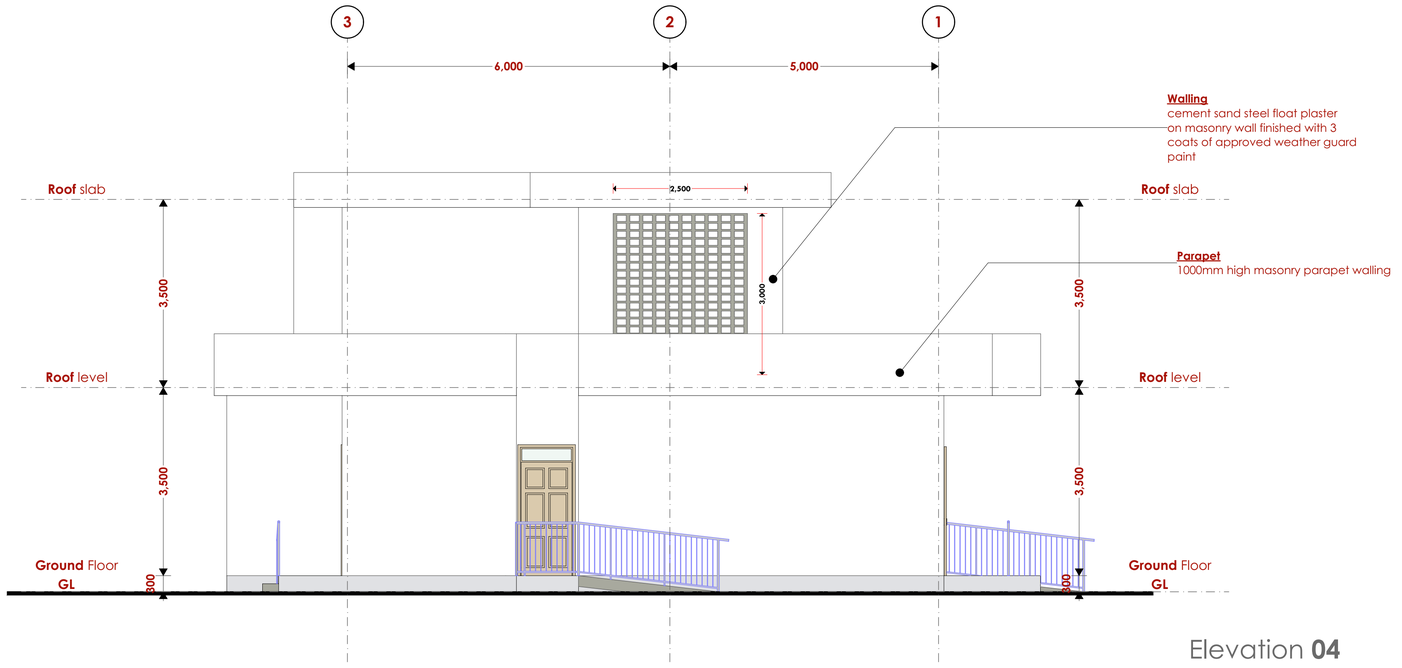

| Drawn by: | Checked by : - | Checked by : - |
|---|---|---|
| **CHRIS NGARE** B. Arch. (Hons), | **F. TUNDULI** B. Arch. (Hons) , M. Arch. (reg. No.A1552 ) | **J. MOMANYI** B. Arch. (Hons) , M. Arch. (reg. No.A1122 ) |
| Date:JAN 2024 | Drawing No . | **09-001-005** |
| Scale 1:100 | | |

# Mukowe Fish landing Site

## Fish Banda- Elevations




Elevation **03**




Elevation **04**

## NOTES

**GENERAL**
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**CONSTRUCTION**
- Damp proof course must be provided under all external walls at grade. DPC to be minimum 150mm above ground level.
- All slab at grade to be poured on 1000gauge polytheneon 50mm stone dust blinding on compacted hardcore.
- All soils under slab and around external foundation to be treated for termite control.
- Window sills must be finished before internal plastering.

**CIVIL WORKS**
- All soil under slabs and all around external foundations to be treated with anti- termite pesticide AND should be executed by licensed and duly registered sub contractor.
- Sample for pipe works and other materials for road works specified to be presented to the engineer before works commences.
- All levels for sewer and road works must be approved by the engineer before work commences.

**STRUCTURAL**
- This drawing must be read in conjunction with related architectural drawing, engineers and any other relevant drawings.
- Concrete to be class 20/20 (1:2:4).
- Steel reinforcement bar to be:"Y" = high tensile steel to B.S 4461.
  "R" = Round mild steel to B.S 449.
- All timber to be sawn cypress G.S grade to KS 02- 771:1989 and seasoned to equilibrium moisture content between 9% and 15%.
- All timber to preservative treated in accordance with KS 02 914:1982.
- Depth of the foundation to be determined on site to S.E's approval.

**MECHANICAL**
- Pipe dimensions are in mm.
- Cold water device pipes steel, with class B to B.S 1387.
- Draining pipe above ground shall upvc grey while those below ground shall be upvc golden brown.
- All underground foul and waste drain pipes shall be upvc to comply.
- All inspection chambers covers and framing shall be cast iron to comply with BS497 TABLE 2 GRADE A.
- The storm water pipe to comply with BS 556.
- Minimum slope in the drain to be 1%.
- All testing of pipes must be completed before plastering.

**ELECTRICAL**
- All conduits must be laid before plastering.
- General conditions of contract for sub contract works.
- Government electrical specification number 1.
- Government electrical specification number 2.
- Electrical act and rules made there under.
- The current edition of regulation for the electrical equipment of buildings issued by the institution of electrical engineers.
- Kenya power and lighting Co. Ltd.

**FIRE**
- Instal water ring main with fire hydrant with 2.5" instantaneous coupling adaptors
- Provide underground water tank with automatic electric booster pump for ring main
- Provide automatic push button fire alarm system
- Provide heat and smoke detectors in each room
- Provide 9kg. dry powder fire extinguishers to ME specifications

| Abbreviations | Meaning |
|---|---|
| **svp** | soil vent pipe |
| **mh** | man hole |
| **ic** | inspection chamber |
| **rcc** | reinforced cement conrete |
| **gt** | gully trap |
| **ss sink** | stain-less steel sink |
| **whb** | wash hand basin |
| **wc** | water closet |
| **shw** | shower |
| **cc** | centre to centre |
| **st. eng/S.E.** | structural engineer |
| **dpc** | damp proof course-under all grd. fl. wallings |
| **dpm** | damp proof membrane |
| **gl** | ground level |
| **pv** | permanent ventilation-on all windows & doors except on internal toilet doors. |

| No | REVISIONS | DATE | SIGNATURE |
|---|---|---|---|
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| | | | |

Project : **PROPOSED KENYA MARINE FISHERIES AND SOCIO-ECONOMIC DEVELOPMENT**

Plot L . R. No.:

Location : **MUKOWE,LAMU**

Client : **STATE DEPARTMENT FOR FISHERIES AQUACULTURE AND THE BLUE ECONOMY**

Signature .....

Subject :

**MUKOWE FISH LANDING SITE**

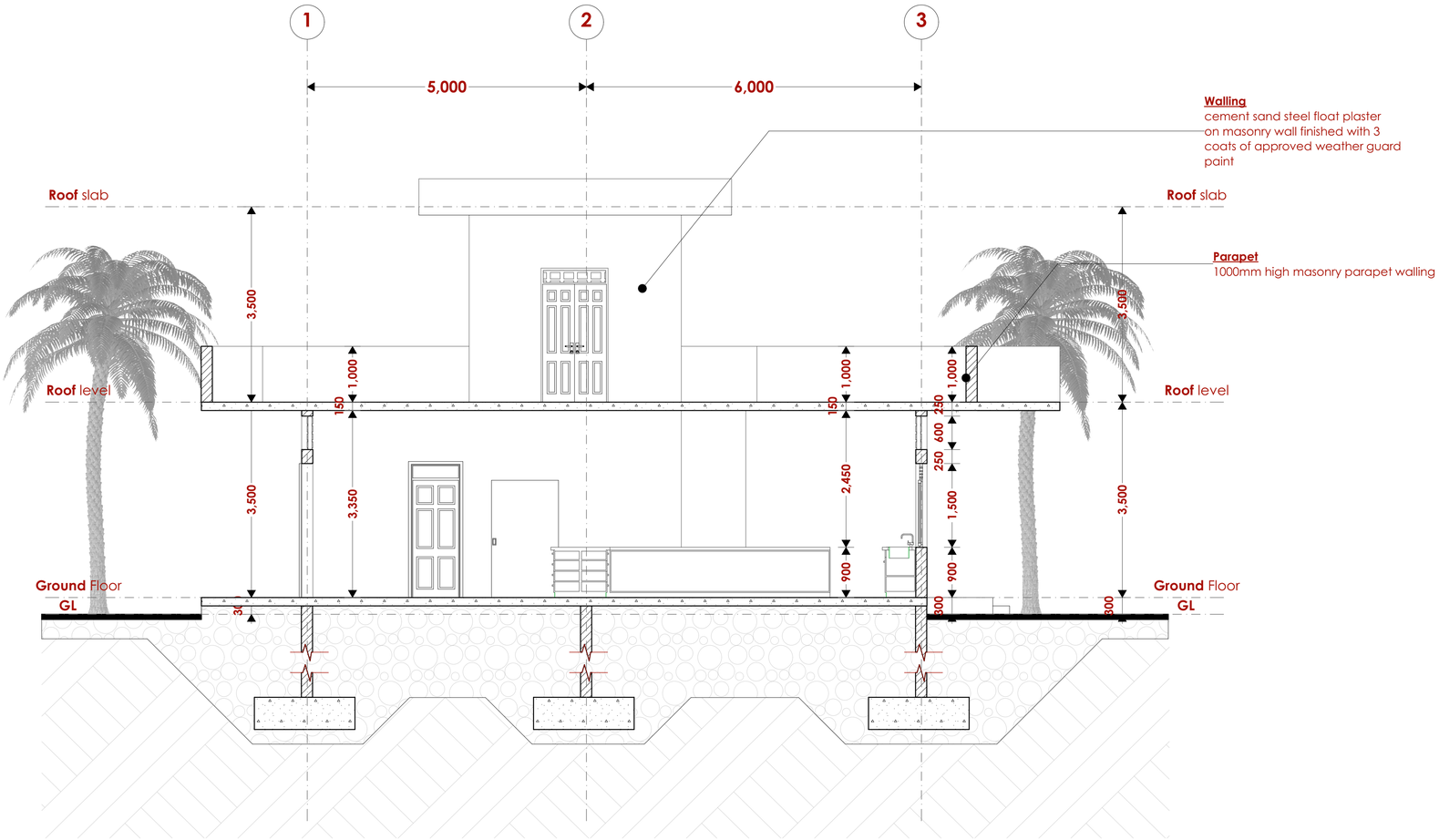
Consultancy :

ARPRIM CONSULTANTS
P.O BOX 12969-0040 NAIROBI
TEL: 020-884312/8
Website :www.arprimconsultants.com

| Drawn by: | Checked by : - | Checked by : - |
|---|---|---|
| **CHRIS NGARE** B. Arch. (Hons), | **F. TUNDULI** B. Arch. (Hons) , M. Arch. (reg. No.A1552 ) | **J. MOMANYI** B. Arch. (Hons) , M. Arch. (reg. No.A1122 ) |
| Date:JAN 2024 | Drawing No . | **09-001-006** |
| Scale 1:100 | | |

# **Mukowe Fish** landing Site

## **Fish Banda-**Section 01




## NOTES

**GENERAL**

+All dimensions are shown in mm unless otherwise specified.
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+The contractor must check and verify all dimensions on site before commencement of any work.

**CONSTRUCTION**

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+ All slab at grade to be poured on 1000gauge polytheneon 50mm stone dust blinding on compacted hardcore.
+ All soils under slab and around external foundation to be treated for termite control.
+ Window sills must be finished before internal plastering.

**CIVIL WORKS**

+All soil under slabs and all around external foundations to be treated with anti- termite pesticide AND should be executed bylicensed and duly registered sub contractor.
+Sample for pipe works and other materials for road works specified to be presented to the engineer before works commences.
+All levels for sewer and road works must be approved by the engineer before work commences.

**STRUCTURAL**

+This drawing must be read in conjunction with related architectural drawing, engineers and any other relevant drawings.
+Concrete to be class 20/20 (1:2:4).
+Steel reinforcement bar to be:"Y" = high tensile steel to B.S 4461.
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+All timber to preservative treated in accordance with KS 02 914:1982.
+Depth of the foundation to be determined on site to S.E's approval.

**MECHANICAL**

+Pipe dimensions are in mm.
+Cold water device pipes steel, with class B to B.S 1387.
+Draining pipe above ground shall upvc grey while those below ground shall be upvc golden brown.
+All underground foul and waste drain pipes shall be upvc to comply.
+All inspection chambers covers and framing shall be cast iron to comply with BS497 TABLE 2 GRADE A.
+The storm water pipe to comply with BS 556.
+Minimum slope in the drain to be 1%.
+All testing of pipes must be completed before plastering.

**ELECTRICAL**

+All conduits must be laid before plastering.
+General conditions of contract for sub contract works.
+Government electrical specification number 1.
+Government electrical specification number 2.
+Electrical act and rules made there under.
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+Kenya power and lighting Co. Ltd.

**FIRE**

+ Instal water ring main with fire hydrant with 2.5" instantaneous coupling adaptors
+ Provide underground water tank with automatic electric booster pump for ring main
+ Provide automatic push button fire alarm system
+ Provide heat and smoke detectors in each room
+ Provide 9kg. dry powder fire extinguishers to ME specifications

| Abbreviations | Meaning |
|---|---|
| **svp** | soil vent pipe |
| **mh** | man hole |
| **ic** | inspection chamber |
| **rcc** | reinforced cement conrete |
| **gt** | gully trap |
| **ss sink** | stain-less steel sink |
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| **dpc** | damp proof course-under all grd. fl. wallings |
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| **gl** | ground level |
| **pv** | permanent ventilation-on all windows & doors except on internal toilet doors. |

| No | REVISIONS | DATE | SIGNATURE |
|---|---|---|---|
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| | | | |

Project : **PROPOSED KENYA MARINE FISHERIES AND SOCIO-ECONOMIC DEVELOPMENT**

Plot L . R. No.:

Location : **MUKOWE,LAMU**

Client : **STATE DEPARTMENT FOR FISHERIES AQUACULTURE AND THE BLUE ECONOMY**

Signature .....

Subject :

**MUKOWE FISH LANDING SITE**

.

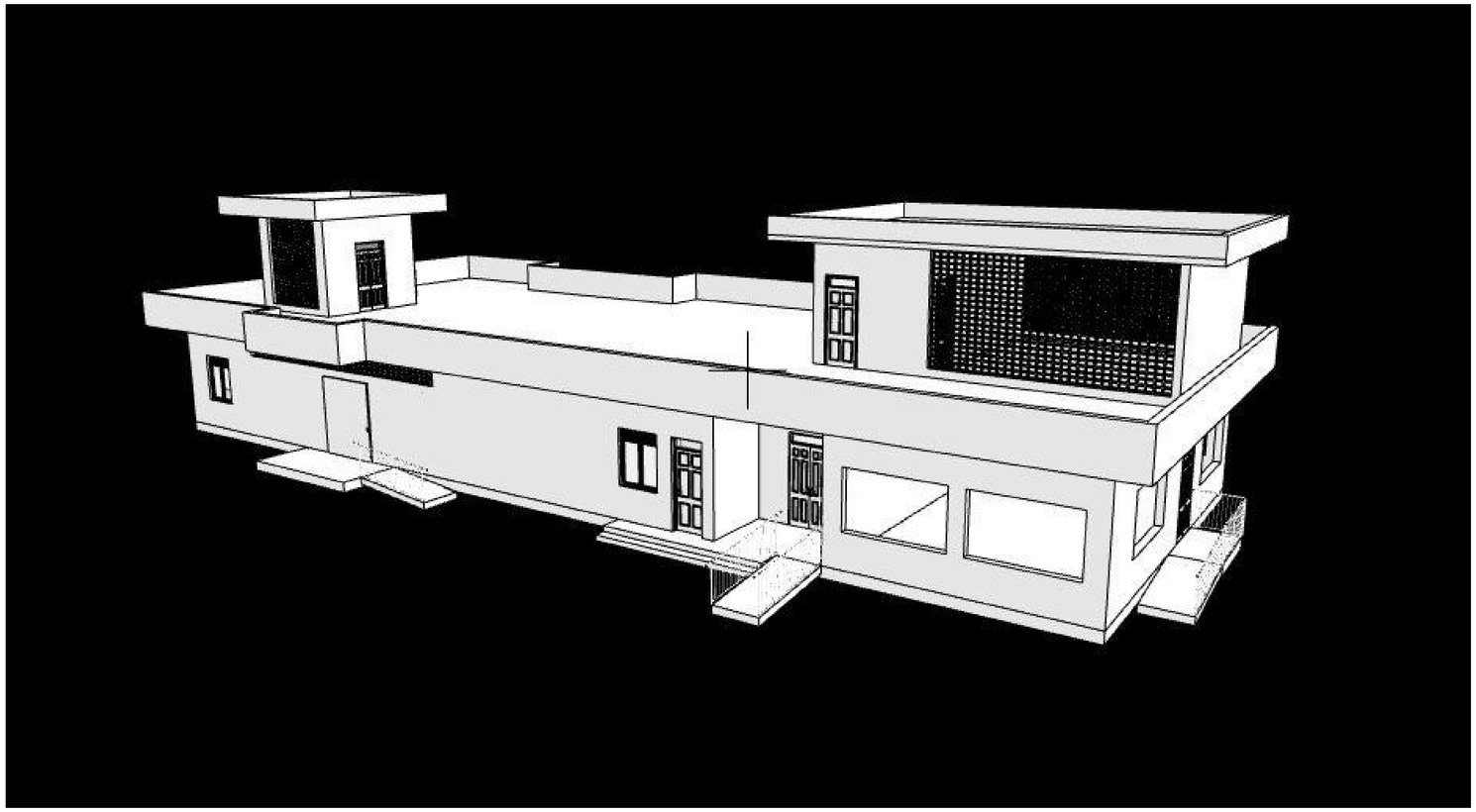
Consultancy :

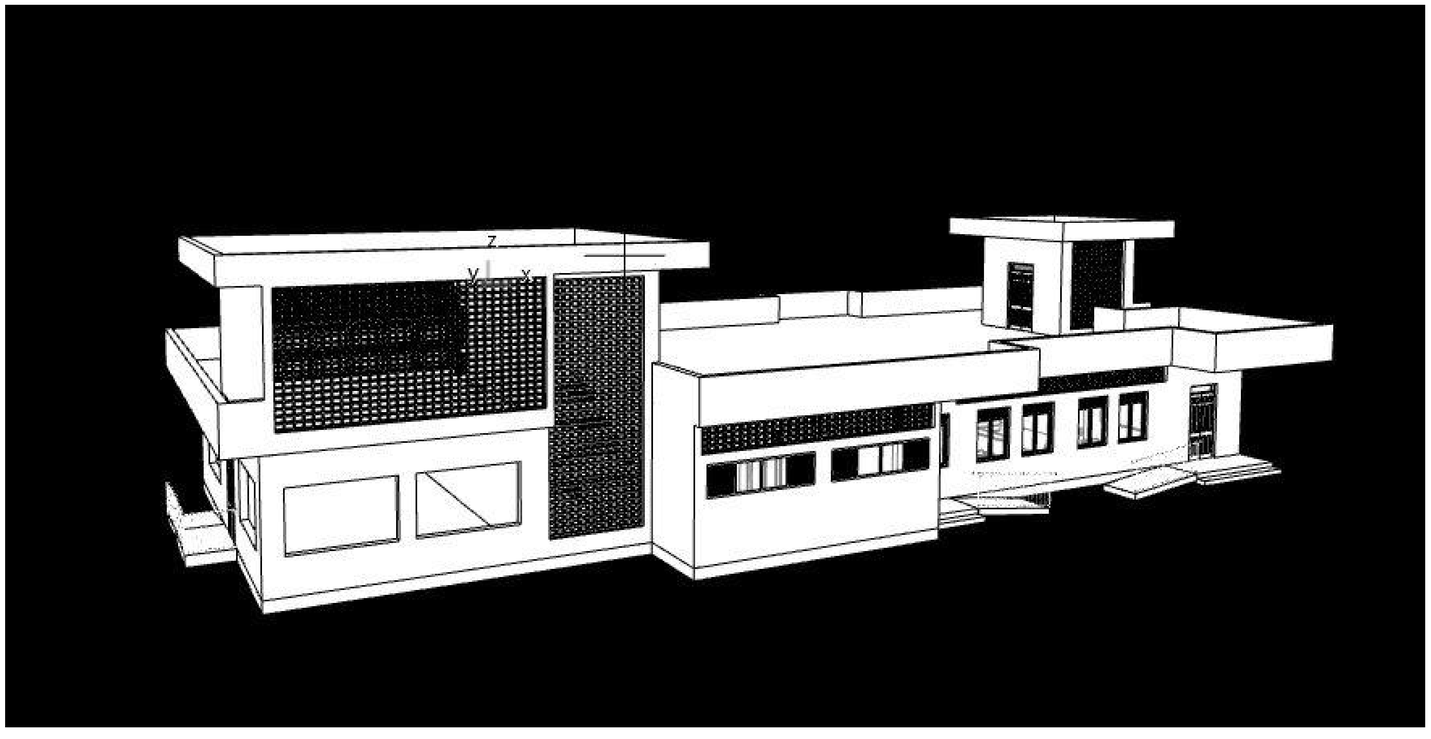
ARPRIM CONSULTANTS
P.O BOX 12969-0040 NAIROBI
TEL: 020-884312/8
Website :www.arprimconsultants.com

| Drawn by: | Checked by : - | Checked by : - |
|---|---|---|
| **CHRIS NGARE** B. Arch. (Hons), | **F. TUNDULI** B. Arch. (Hons) , M. Arch. (reg. No.A1552 ) | **J. MOMANYI** B. Arch. (Hons) , M. Arch. (reg. No.A1122 ) |
| Date:JAN 2024 | Drawing No . | **09-001-007** |
| Scale 1:100 | | |

# **Mukowe Fish** landing Site

## **Fish Banda-**3d Perspectives






## NOTES

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+The contractor must check and verify all dimensions on site before commencement of any work.

**CONSTRUCTION**
+ Dump proof course must be provided under all external walls at grade. DPC to be minimum 150mm above ground level.
+ All slab at grade to be poured on 1000gauge polytheneon 50mm stone dust blinding on compacted hardcore.
+ All soils under slab and around external foundation to be treated for termite control.
+ Window sills must be finished before internal plastering.

**CIVIL WORKS**
+All soil under slabs and all around external foundations to be treated with anti- termite pesticide AND should be executed bylicensed and duly registered sub contractor.
+Sample for pipe works and other materials for road works specified to be presented to the engineer before works commences.
+All levels for sewer and road works must be approved by the engineer before work commences.

**STRUCTURAL**
+This drawing must be read in conjunction with related architectural drawing, engineers and any other relevant drawings.
+Concrete to be class 20/20 (1:2:4).
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"R" = Round mild steel to B.S 449.
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+All timber to preservative treated in accordance with KS 02 914:1982.
+Depth of the foundation to be determined on site to S.E's approval.

**MECHANICAL**
+Pipe dimensions are in mm.
+Cold water device pipes steel, with class B to B.S 1387.
+Draining pipe above ground shall upvc grey while those below ground shall be upvc golden brown.
+All underground foul and waste drain pipes shall be upvc to comply.
+All inspection chambers covers and framing shall be cast iron to comply with BS497 TABLE 2 GRADE A.
+The storm water pipe to comply with BS 556.
+Minimum slope in the drain to be 1%.
+All testing of pipes must be completed before plastering.

**ELECTRICAL**
+All conduits must be laid before plastering.
+General conditions of contract for sub contract works.
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+Government electrical specification number 2.
+Electrical act and rules made there under.
+The current edition of regulation for the electrical equipment of buildings issued by the institution of electrical engineers.
+Kenya power and lighting Co. Ltd.

**FIRE**
+ Instal water ring main with fire hydrant with 2.5" instantaneous coupling adaptors
+ Provide underground water tank with automatic electric booster pump for ring main
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| **dpm** | damp proof membrane |
| **gl** | ground level |
| **pv** | permanent ventilation-on all windows & doors except on internal toilet doors. |

| No | REVISIONS | DATE | SIGNATURE |
|---|---|---|---|
| | | | |
| | | | |
| | | | |

Project : **PROPOSED KENYA MARINE FISHERIES AND SOCIO-ECONOMIC DEVELOPMENT**

Plot L . R. No.:

Location : **MUKOWE,LAMU**

Client : **STATE DEPARTMENT FOR FISHERIES AQUACULTURE AND THE BLUE ECONOMY**

Signature .....

Subject :

**MUKOWE FISH LANDING SITE**

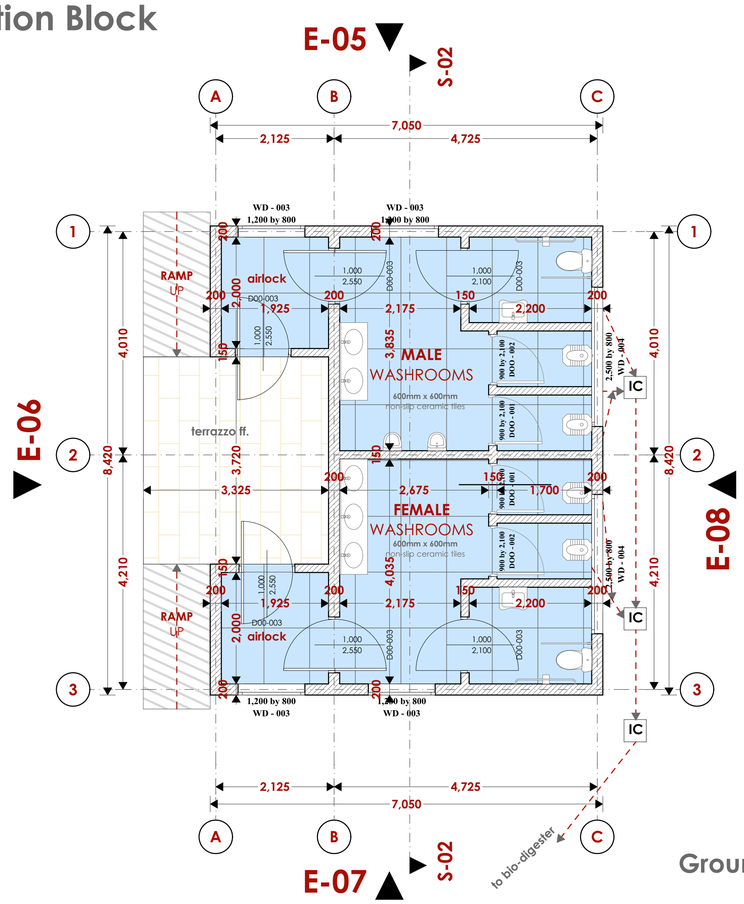
Consultancy :

ARPRIM CONSULTANTS
P.O BOX 12969-0040 NAIROBI
TEL: 020-884312/8
Website :www.arprimconsultants.com

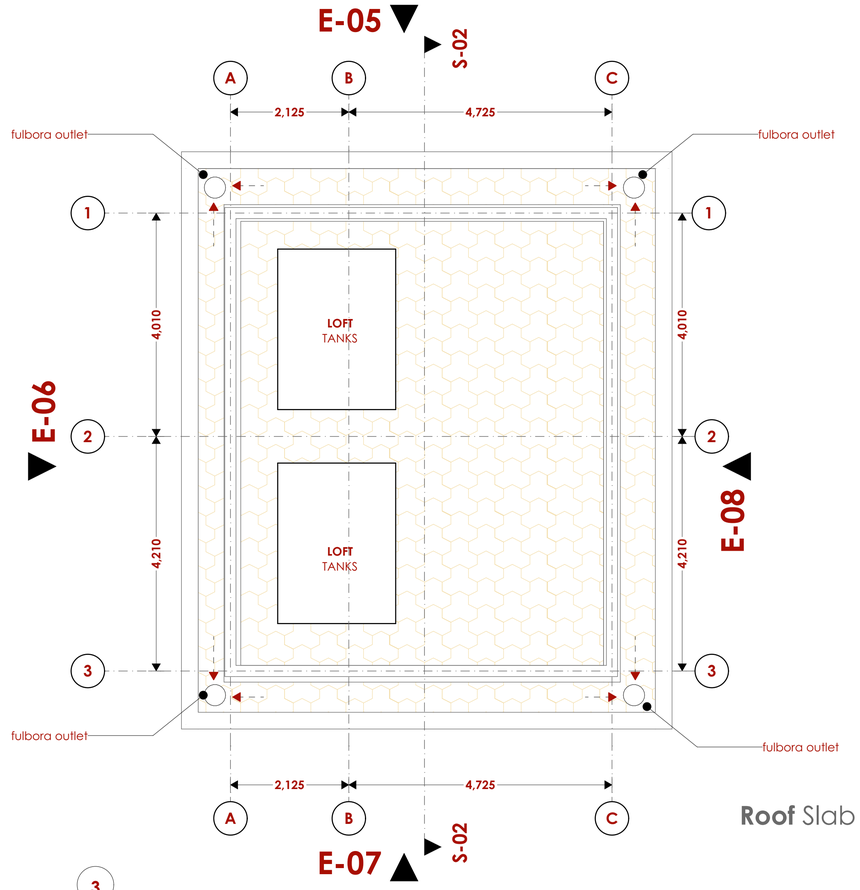
| Drawn by: | Checked by : - | Checked by : - |
|---|---|---|
| **CHRIS NGARE** B. Arch. (Hons), | **F. TUNDULI** B. Arch. (Hons) , M. Arch. (reg. No.A1552 ) | **J. MOMANYI** B. Arch. (Hons) , M. Arch. (reg. No.A1122 ) |
| Date:JAN 2024 | Drawing No . | **09-001-008** |
| Scale 1:100 | | |

# Mukowe Fish landing Site

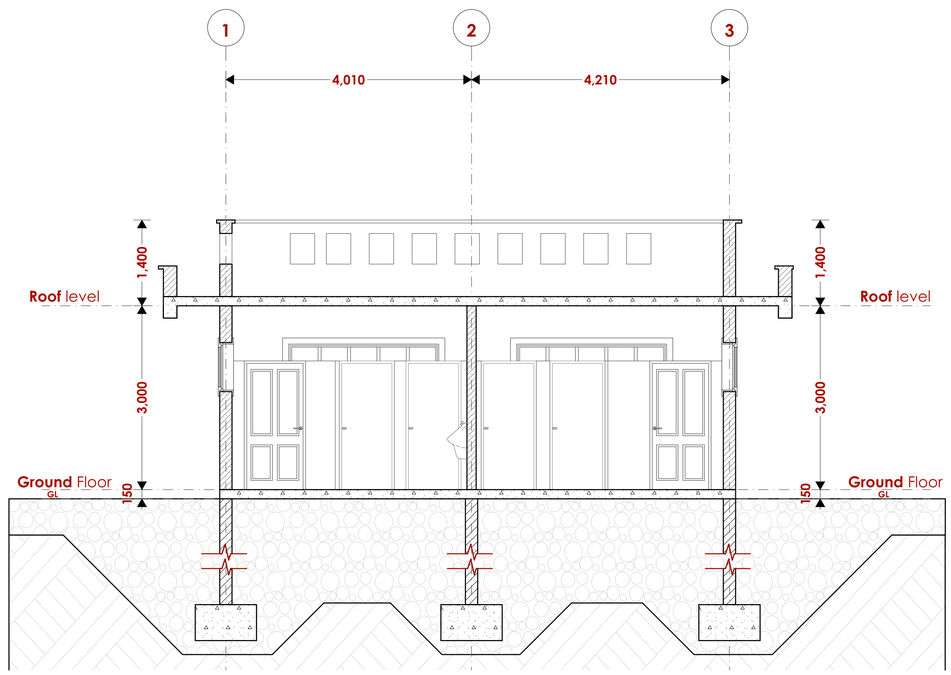
## Ablution Block




Ground Floor




Roof Slab




Section 02 ,

## NOTES

**GENERAL**

+All dimensions are shown in mm unless otherwise specified.
+Drawings are not to be scaled. Only figured dimensions to be used.
+The contractor must check and verify all dimensions on site before commencement of any work.

**CONSTRUCTION**

+ Damp proof course must be provided under all external walls at grade. DPC to be minimum 150mm above ground level.
+ All slab at grade to be poured on 1000gauge polytheneon 50mm stone dust blinding on compacted hardcore.
+ All soils under slab and around external foundation to be treated for termite control.
+ Window sills must be finished before internal plastering.

**CIVIL WORKS**

+All soil under slabs and all around external foundations to be treated with anti- termite pesticide AND should be executed bylicensed and duly registered sub contractor.
+Sample for pipe works and other materials for road works specified to be presented to the engineer before works commences.
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+This drawing must be read in conjunction with related architectural drawing, engineers and any other relevant drawings.
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+All timber to preservative treated in accordance with KS 02 914:1982.
+Depth of the foundation to be determined on site to S.E's approval.

**MECHANICAL**

+Pipe dimensions are in mm.
+Cold water device pipes steel, with class B to B.S 1387.
+Draining pipe above ground shall upvc grey while those below ground shall be upvc golden brown.
+All underground foul and waste drain pipes shall be upvc to comply.
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+Kenya power and lighting Co. Ltd.

**FIRE**

+ Instal water ring main with fire hydrant with 2.5" instantaneous coupling adaptors
+ Provide underground water tank with automatic electric booster pump for ring main
+ Provide automatic push button fire alarm system
+ Provide heat and smoke detectors in each room
+ Provide 9kg. dry powder fire extinguishers to ME specifications

| Abbreviations | Meaning |
|---|---|
| **svp** | soil vent pipe |
| **mh** | man hole |
| **ic** | inspection chamber |
| **rcc** | reinforced cement conrete |
| **gt** | gully trap |
| **ss sink** | stain-less steel sink |
| **whb** | wash hand basin |
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| **cc** | centre to centre |
| **st. eng/S.E.** | structural engineer |
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| **dpm** | damp proof membrane |
| **gl** | ground level |
| **pv** | permanent ventilation-on all windows & doors except on internal toilet doors. |

| No | REVISIONS | DATE | SIGNATURE |
|---|---|---|---|
| | | | |
| | | | |
| | | | |

Project : **PROPOSED KENYA MARINE FISHERIES AND SOCIO-ECONOMIC DEVELOPMENT**

Plot L . R. No.:

Location : **MUKOWE,LAMU**

Client : **STATE DEPARTMENT FOR FISHERIES AQUACULTURE AND THE BLUE ECONOMY**

Signature .....

Subject :

**MUKOWE FISH LANDING SITE**

.

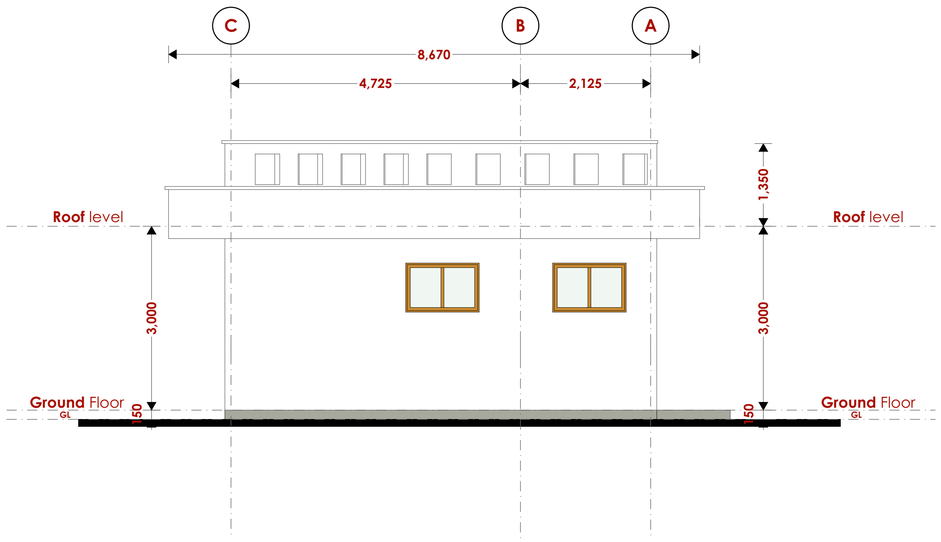
Consultancy :


ARPRIM CONSULTANTS
P.O BOX 12969-0040 NAIROBI
TEL: 020-884312/8
Website :www.arprimconsultants.com

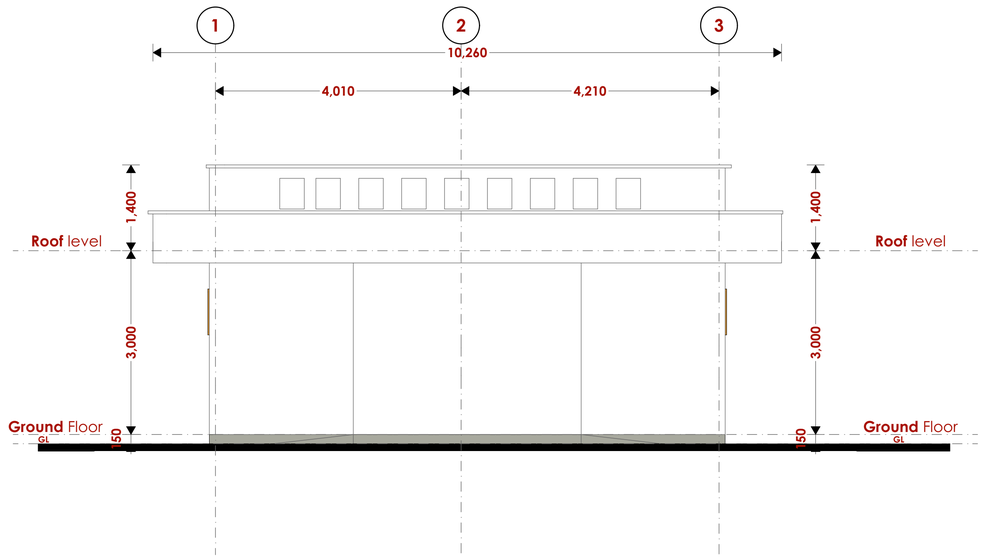

| Drawn by: | Checked by : - | Checked by : - |
|---|---|---|
| **CHRIS NGARE** B. Arch. (Hons) | **F. TUNDULI** B. Arch. (Hons) , M. Arch, (reg. No.A1552 ) | **J. MOMANYI** B. Arch. (Hons) , M. Arch, (reg. No.A1122 ) |
| Date:JAN 2024 | Drawing No . | **09-001-009** |
| Scale 1:100 | | |

# Mukowe Fish landing Site

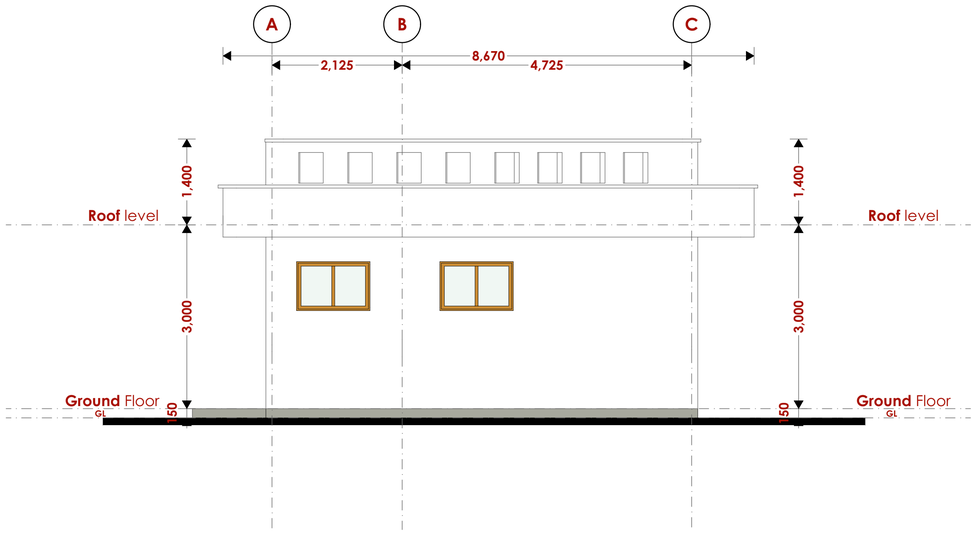
## Ablution Block



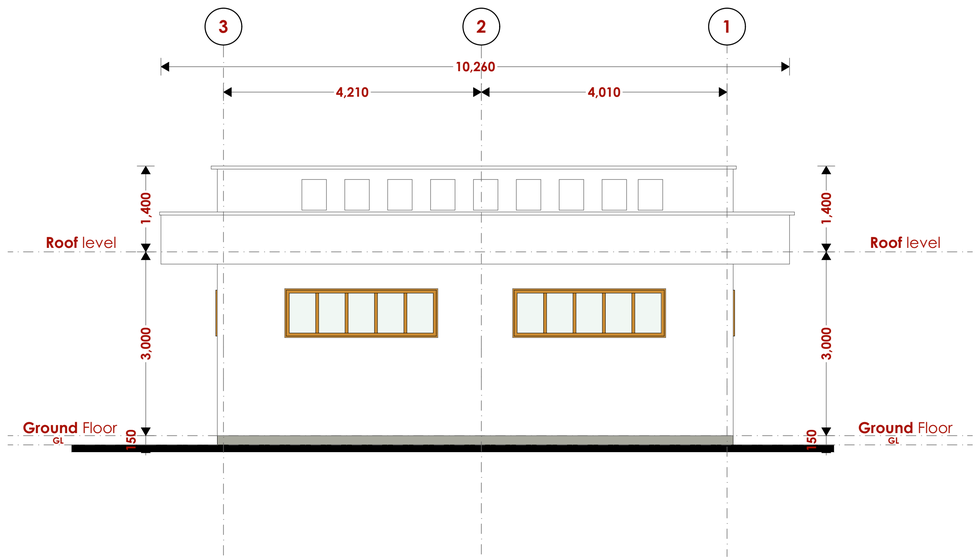

**Elevation** 05




**Elevation** 06




**Elevation** 07




**Elevation** 08

## NOTES

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**CONSTRUCTION**
- Dump proof course must be provided under all external walls at grade. DPC to be minimum 150mm above ground level.
- All slab at grade to be poured on 1000gauge polytheneon 50mm stone dust blinding on compacted hardcore.
- All soils under slab and around external foundation to be treated for termite control.
- Window sills must be finished before internal plastering.

**CIVIL WORKS**
- All soil under slabs and all around external foundations to be treated with anti- termite pesticide AND should be executed bylicensed and duly registered sub contractor.
- Sample for pipe works and other materials for road works specified to be presented to the engineer before works commences.
- All levels for sewer and road works must be approved by the engineer before work commences.

**STRUCTURAL**
- This drawing must be read in conjunction with related architectural drawing, engineers and any other relevant drawings.
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- Steel reinforcement bar to be:"Y" = high tensile steel to B.S 4461. "R" = Round mild steel to B.S 449.
- All timber to be sawn cypress G.S grade to KS 02- 771:1989 and seasoned to equilibrium moisture content between 9% and 15%.
- All timber to preservative treated in accordance with KS 02 914:1982.
- Depth of the foundation to be determined on site to S.E's approval.

**MECHANICAL**
- Pipe dimensions are in mm.
- Cold water device pipes steel, with class B to B.S 1387.
- Draining pipe above ground shall upvc grey while those below ground shall be upvc golden brown.
- All underground foul and waste drain pipes shall be upvc to comply.
- All inspection chambers covers and framing shall be cast iron to comply with BS497 TABLE 2 GRADE A.
- The storm water pipe to comply with BS 556.
- Minimum slope in the drain to be 1%.
- All testing of pipes must be completed before plastering.

**ELECTRICAL**
- All conduits must be laid before plastering.
- General conditions of contract for sub contract works.
- Government electrical specification number 1.
- Government electrical specification number 2.
- Electrical act and rules made there under.
- The current edition of regulation for the electrical equipment of buildings issued by the institution of electrical engineers.
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**FIRE**
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- Provide 9kg. dry powder fire extinguishers to ME specifications

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Project : **PROPOSED KENYA MARINE FISHERIES AND SOCIO-ECONOMIC DEVELOPMENT**

Plot L . R. No.:

Location : **MUKOWE,LAMU**

Client : **STATE DEPARTMENT FOR FISHERIES AQUACULTURE AND THE BLUE ECONOMY**

Signature .....

Subject :

**MUKOWE FISH LANDING SITE**

Consultancy :


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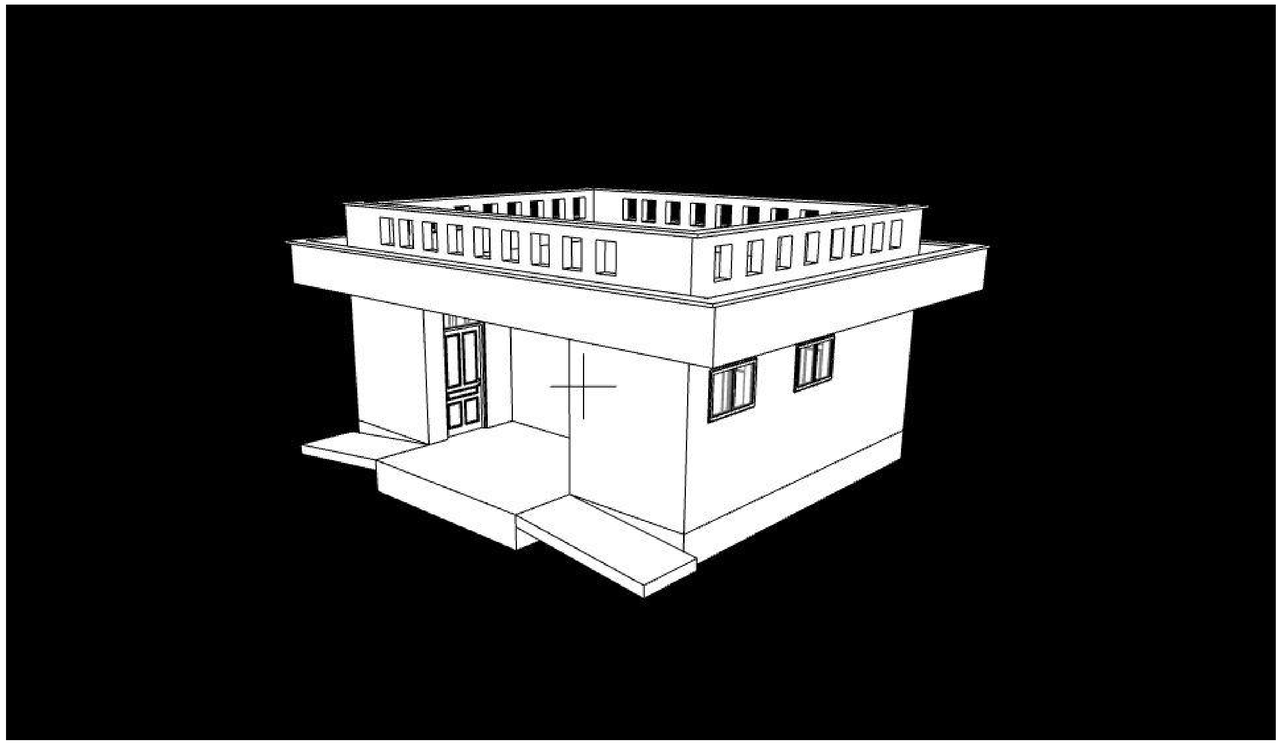
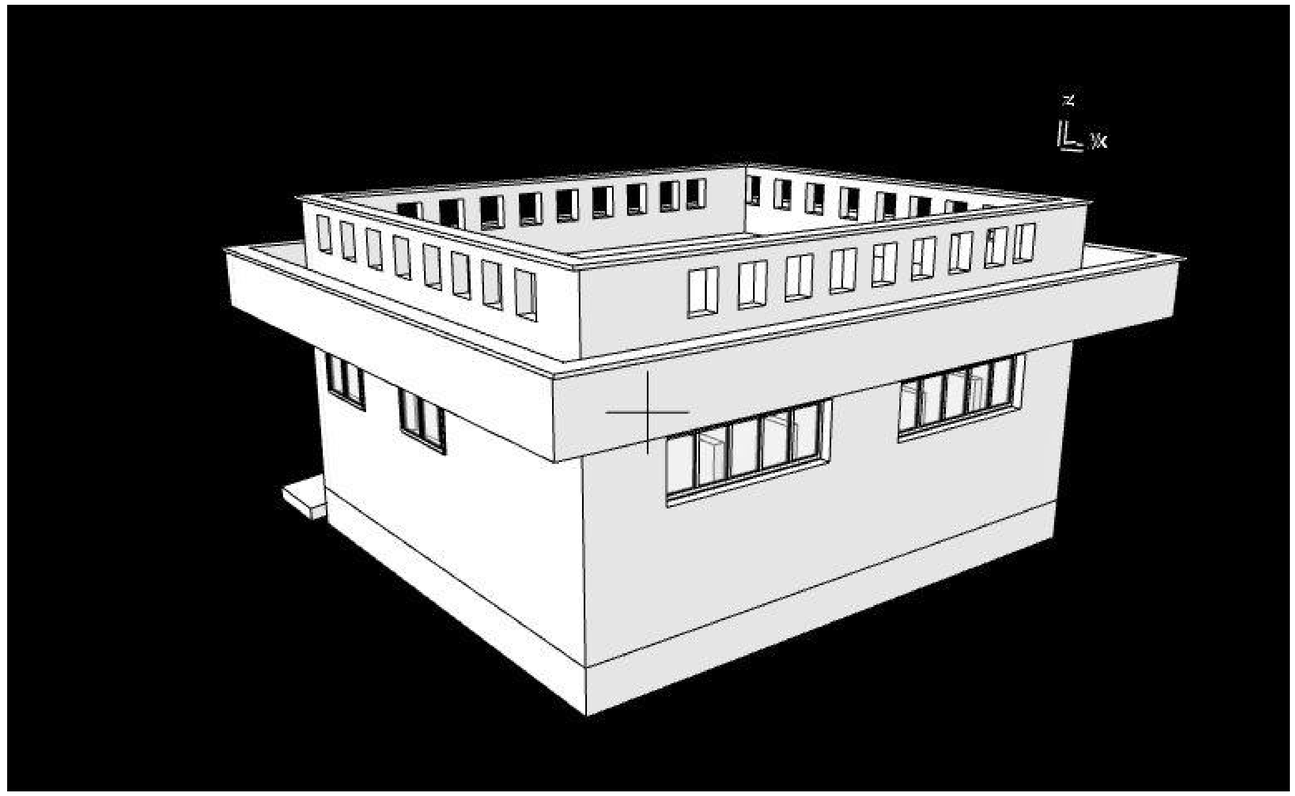
TEL: 020-884312/8
Website :www.arprimconsultants.com


| Drawn by: | Checked by : - | Checked by : - |
|---|---|---|
| **CHRIS NGARE** B. Arch. (Hons), | **F. TUNDULI** B. Arch. (Hons) , M. Arch. (reg. No.A1552 ) | **J. MOMANYI** B. Arch. (Hons) , M. Arch. (reg. No.A1122 ) |
| Date:JAN 2024 | Drawing No . | **09-001-010** |
| Scale 1:100 | | |

# **Mukowe Fish** landing Site

## **Ablution Block -** 3D Perspectives





## NOTES

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|---|---|---|---|
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Project : **PROPOSED KENYA MARINE FISHERIES AND SOCIO-ECONOMIC DEVELOPMENT**

Plot L . R. No.:

Location : **MUKOWE,LAMU**

Client : **STATE DEPARTMENT FOR FISHERIES AQUACULTURE AND THE BLUE ECONOMY**

Signature .....

Subject :

**MUKOWE FISH LANDING SITE**

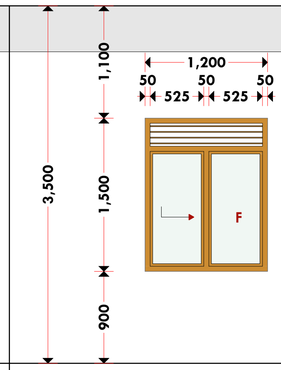
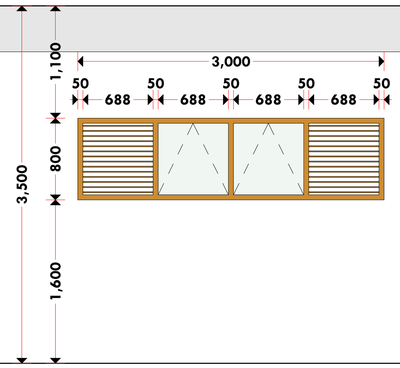
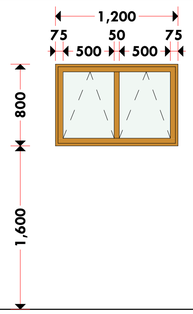
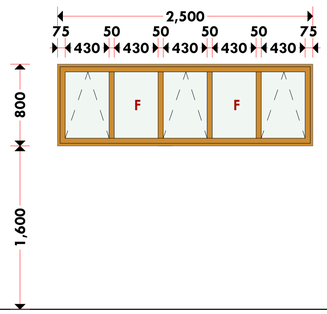
Consultancy :

ARPRIM CONSULTANTS
P.O BOX 12969-0040 NAIROBI
TEL: 020-884312/8
Website :www.arprimconsultants.com

| Drawn by: | Checked by : - | Checked by : - |
|---|---|---|
| **CHRIS NGARE** B. Arch. (Hons), | **F. TUNDULI** B. Arch. (Hons) , M. Arch. (reg. No.A1552 ) | **J. MOMANYI** B. Arch. (Hons) , M. Arch. (reg. No.A1122 ) |
| Date:JAN 2024 | Drawing No . | **09-001-011** |
| Scale 1:100 | | |

# Mukowe Fish landing Site

## Window Schedule

| | | | | |
|---|---|---|---|---|
| WINDOW DESIGN |  |  |  |  |
| NAME | WD -001 | WD -002 | WD -003 | WD -004 |
| QUANTITY | 06 | 2 | 4 | 2 |
| LOCATION | | | | |
| SPECIFICATIONS | powder coated aluminium framed sliding windows complete with ironmongery, mullions, transomes, railing and necessary intermediate reinforcement elements including all weather strips, rubber glazing strips,couplings, sliding rails bars, window cills and window boards, quadrant & painted externally and internally; panes fixed with 6mm thick one way glass fixed with beadings. | powder coated aluminium framed top-hung windows complete with ironmongery, mullions, transomes, railing and necessary intermediate reinforcement elements including all weather strips, rubber glazing strips,couplings, sliding rails bars, window cills and window boards, quadrant & painted externally and internally; panes fixed with 6mm thick one way glass fixed with beadings. | powder coated aluminium framed top-hung windows complete with ironmongery, mullions, transomes, railing and necessary intermediate reinforcement elements including all weather strips, rubber glazing strips,couplings, sliding rails bars, window cills and window boards, quadrant & painted externally and internally; panes fixed with 6mm thick one way glass fixed with beadings. | powder coated aluminium framed top-hung windows complete with ironmongery, mullions, transomes, railing and necessary intermediate reinforcement elements including all weather strips, rubber glazing strips,couplings, sliding rails bars, window cills and window boards, quadrant & painted externally and internally; panes fixed with 6mm thick one way glass fixed with beadings. |

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| No | REVISIONS | DATE | SIGNATURE |
|---|---|---|---|
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| | | | |

Project : **PROPOSED KENYA MARINE FISHERIES AND SOCIO-ECONOMIC DEVELOPMENT**

Plot L. R. No.:

Location : **MUKOWE,LAMU**

Client : **STATE DEPARTMENT FOR FISHERIES AQUACULTURE AND THE BLUE ECONOMY**

Signature .......................

Subject :

**MUKOWE FISH LANDING SITE**

Consultancy :

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P.O BOX 12969-0040 NAIROBI
TEL: 020-884312/8
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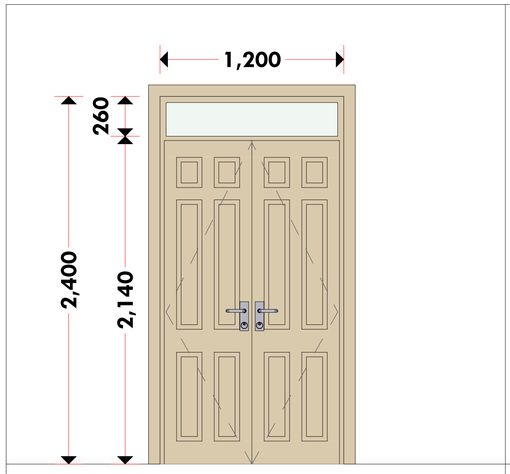
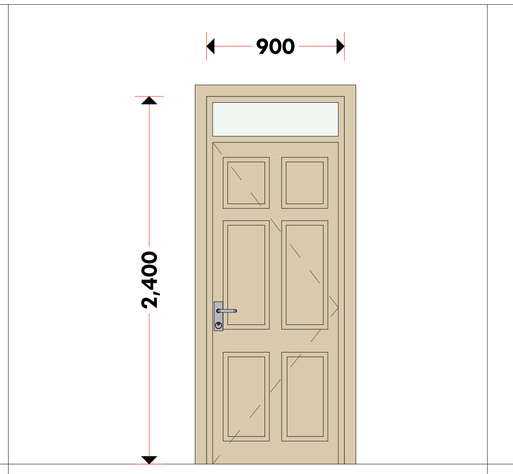
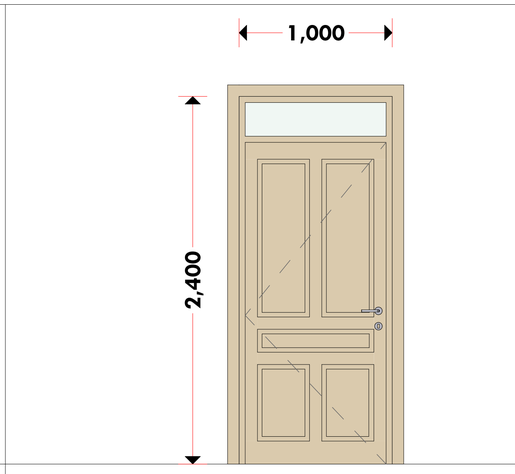
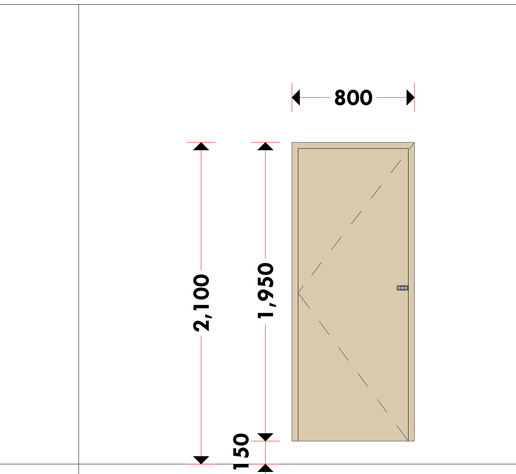
| Drawn by: | Checked by : - | Checked by : - |
|---|---|---|
| **CHRIS NGARE**<br>B. Arch. (Hons), | **F. TUNDULI**<br>B. Arch. (Hons) , M. Arch. (reg. No.A1552 ) | **J. MOMANYI**<br>B. Arch. (Hons) , M. Arch. (reg. No.A1122 ) |
| Date:JAN 2024 | Drawing No . **09-001-012** | |
| Scale 1:100 | | |

# Mukowe Fish landing Site

## Door Schedule

| | | | |
|---|---|---|---|
|  |  |  |  |
| **D O O - 0 0 1** | **D O O - 0 0 2** | **D O O - 0 0 3** | **D O O - 0 0 4** |
| 1200*2400MM<br>HARDWOOD MVULE<br>PANELLED<br>DOUBLE LEAF DOOR<br>IRON MONGERY DETAILS<br>AS PER BoQ<br>SPECIFICATIONS | 900*2400MM<br>HARDWOOD MVULE<br>PANELLED<br>SINGLE LEAF DOOR<br>IRON MONGERY DETAILS<br>AS PER BoQ<br>SPECIFICATIONS | 1000*2400MM<br>HARDWOOD MVULE<br>PANELLED<br>SINGLE LEAF DOOR-<br>DOUBLE ACTING<br>IRON MONGERY DETAILS<br>AS PER BoQ<br>SPECIFICATIONS | 800*1950MM<br>HARDWOOD MVULE<br>PANELLED<br>SINGLE LEAF DOOR<br>IRON MONGERY DETAILS<br>AS PER BoQ<br>SPECIFICATIONS |
| **6 NO.** | **6 NO.** | **6NO.** | **2 NO.** |

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Project : **PROPOSED KENYA MARINE FISHERIES AND SOCIO-ECONOMIC DEVELOPMENT**

Plot L . R. No.:

Location : **MUKOWE,LAMU**

Client : **STATE DEPARTMENT FOR FISHERIES AQUACULTURE AND THE BLUE ECONOMY**

Signature .....

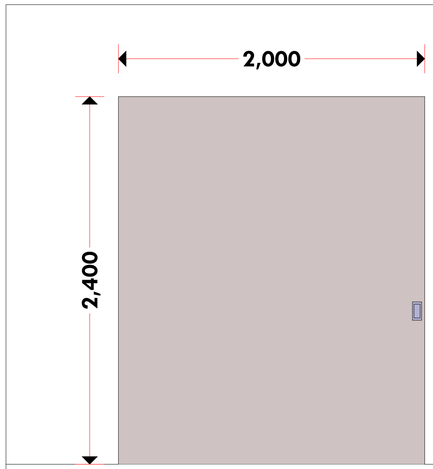
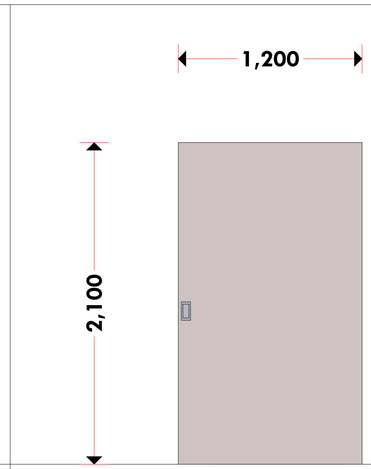
Subject :
**MUKOWE FISH LANDING SITE**
.

Consultancy :
ARPRIM CONSULTANTS
P.O BOX 12969-0040 NAIROBI
TEL: 020-884312/8
Website :www.arprimconsultants.com

| Drawn by: | Checked by : - | Checked by : - |
|---|---|---|
| **CHRIS NGARE** B. Arch. (Hons), | **F. TUNDULI** B. Arch. (Hons) , M. Arch. (reg. No.A1552 ) | **J. MOMANYI** B. Arch. (Hons) , M. Arch. (reg. No.A1122 ) |
| Date:JAN 2024 | Drawing No . | **09-001-013** |
| Scale 1:100 | | |

# **Mukowe Fish** landing Site

## **Door** Schedule

| | |
|---|---|
|  |  |
| **D O O - 0 0 6** | **D O O - 0 0 5** |
| 2000*2400MM<br>STEEL SLIDING DOOR<br>IRON MONGERY DETAILS<br>AS PER BoQ<br>SPECIFICATIONS | 2000*2400MM<br>STEEL SLIDING DOOR<br>IRON MONGERY DETAILS<br>AS PER BoQ<br>SPECIFICATIONS |
| **1 N O .** | **1 N O .** |

## NOTES

**GENERAL**
+All dimensions are shown in mm unless otherwise specified.
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+The contractor must check and verify all dimensions on site before commencement of any work.

**CONSTRUCTION**
+ Damp proof course must be provided under all external walls at grade. DPC to be minimum 150mm above ground level.
+ All slab at grade to be poured on 1000gauge polytheneon 50mm stone dust blinding on compacted hardcore.
+ All soils under slab and around external foundation to be treated for termite control.
+ Window sills must be finished before internal plastering.

**CIVIL WORKS**
+All soil under slabs and all around external foundations to be treated with anti- termite pesticide AND should be executed bylicensed and duly registered sub contractor.
+Sample for pipe works and other materials for road works specified to be presented to the engineer before works commences.
+All levels for sewer and road works must be approved by the engineer before work commences.

**STRUCTURAL**
+This drawing must be read in conjunction with related architectural drawing, engineers and any other relevant drawings.
+Concrete to be class 20/20 (1:2:4).
+Steel reinforcement bar to be:"Y" = high tensile steel to B.S 4461.
"R" = Round mild steel to B.S 449.
+All timber to be sawn cypress G.S grade to KS 02- 771:1989 and seasoned to equilibrium moisture content between 9% and 15%.
+All timber to preservative treated in accordance with KS 02 914:1982.
+Depth of the foundation to be determined on site to S.E's approval.

**MECHANICAL**
+Pipe dimensions are in mm.
+Cold water device pipes steel, with class B to B.S 1387.
+Draining pipe above ground shall upvc grey while those below ground shall be upvc golden brown.
+All underground foul and waste drain pipes shall be upvc to comply.
+All inspection chambers covers and framing shall be cast iron to comply with BS497 TABLE 2 GRADE A.
+The storm water pipe to comply with BS 556.
+Minimum slope in the drain to be 1%.
+All testing of pipes must be completed before plastering.

**ELECTRICAL**
+All conduits must be laid before plastering.
+General conditions of contract for sub contract works.
+Government electrical specification number 1.
+Government electrical specification number 2.
+Electrical act and rules made there under.
+The current edition of regulation for the electrical equipment of buildings issued by the institution of electrical engineers.
+Kenya power and lighting Co. Ltd.

**FIRE**
+ Instal water ring main with fire hydrant with 2.5" instantaneous coupling adaptors
+ Provide underground water tank with automatic electric booster pump for ring main
+ Provide automatic push button fire alarm system
+ Provide heat and smoke detectors in each room
+ Provide 9kg. dry powder fire extinguishers to ME specifications

| Abbreviations | Meaning |
|---|---|
| **svp** | soil vent pipe |
| **mh** | man hole |
| **ic** | inspection chamber |
| **rcc** | reinforced cement conrete |
| **gt** | gully trap |
| **ss sink** | stain-less steel sink |
| **whb** | wash hand basin |
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| **shw** | shower |
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| **st. eng/S.E.** | structural engineer |
| **dpc** | damp proof course-under all grd. fl. wallings |
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| No | REVISIONS | DATE | SIGNATURE |
|---|---|---|---|
| | | | |
| | | | |
| | | | |

Project : **PROPOSED KENYA MARINE FISHERIES AND SOCIO-ECONOMIC DEVELOPMENT**

Plot L . R. No.:

Location : **MUKOWE,LAMU**

Client : **STATE DEPARTMENT FOR FISHERIES AQUACULTURE AND THE BLUE ECONOMY**

Signature .....

Subject :

**MUKOWE FISH LANDING SITE**

Consultancy :

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Website :www.arprimconsultants.com

| Drawn by: | Checked by : - | Checked by : - |
|---|---|---|
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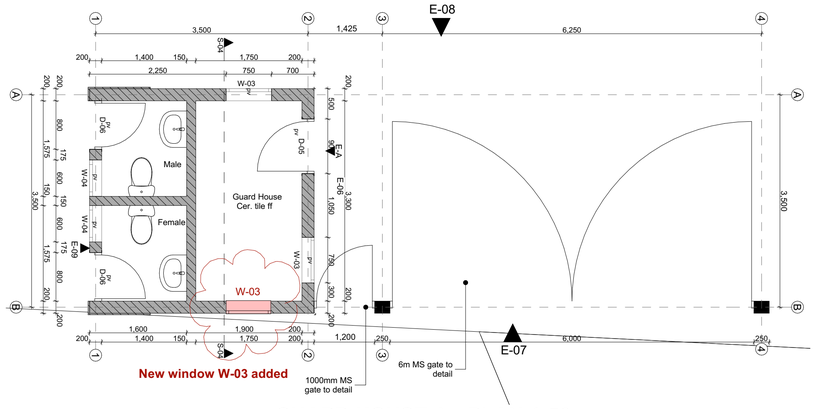
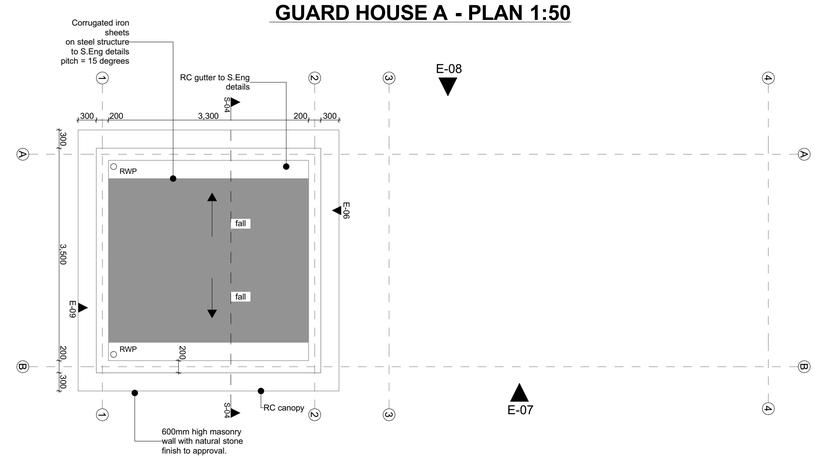
| Date:JAN 2024 | Drawing No . **09-001-014** | |
| Scale 1:100 | | |

# **Mukowe Fish** landing Site

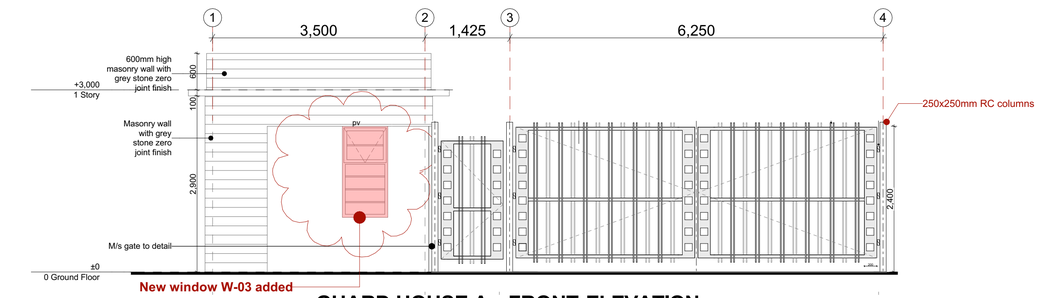
## **Gate** House



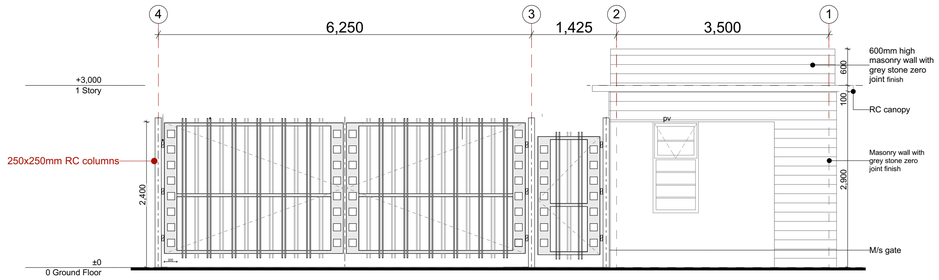

### GUARD HOUSE A - PLAN 1:50



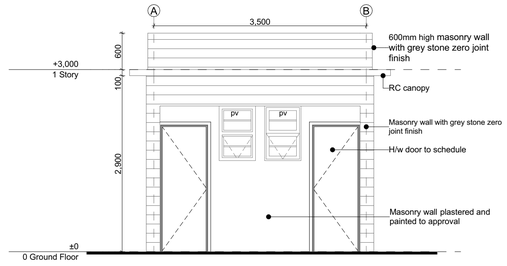

### GUARD HOUSE A - ROOF PLAN 1:50



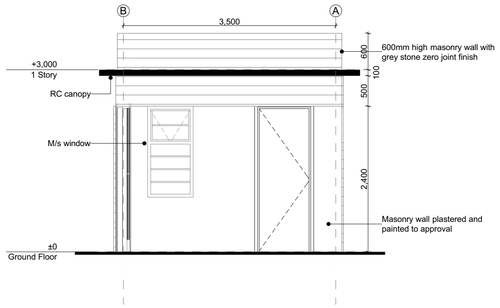

### GUARD HOUSE A - FRONT ELEVATION 07 1:50



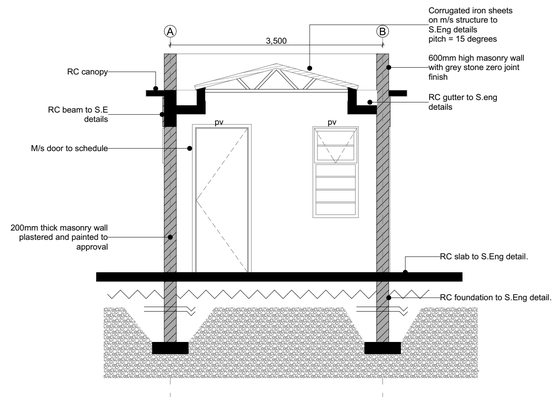

### GUARD HOUSE A - REAR ELEVATION 08 1:50




### GUARD HOUSE A - SIDE ELEVATION 09 1:50




### GUARD HOUSE A - SIDE ELEVATION 06 1:50




### GUARD HOUSE A - SECTION 04 1:50

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| No | REVISIONS | DATE | SIGNATURE |
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Project : **PROPOSED KENYA MARINE FISHERIES AND SOCIO-ECONOMIC DEVELOPMENT**

Plot L . R. No.:

Location : **MUKOWE,LAMU**

Client : **STATE DEPARTMENT FOR FISHERIES AQUACULTURE AND THE BLUE ECONOMY**

Signature .....

Subject :

**MUKOWE FISH LANDING SITE**

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Consultancy :

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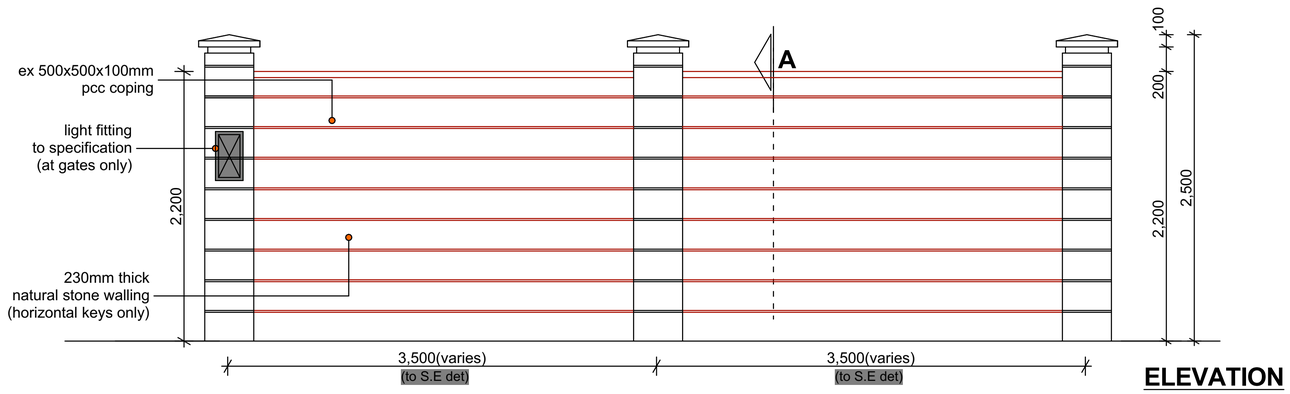
Date:JAN 2024 | Drawing No . **09-001-015**

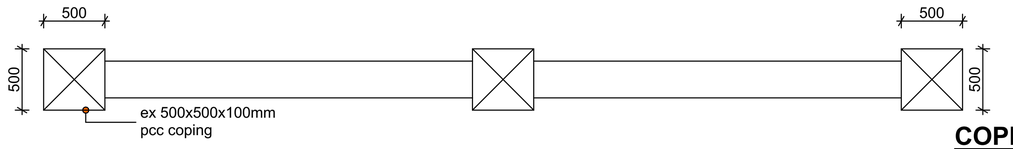
Scale 1:100

# Mukowe Fish landing Site

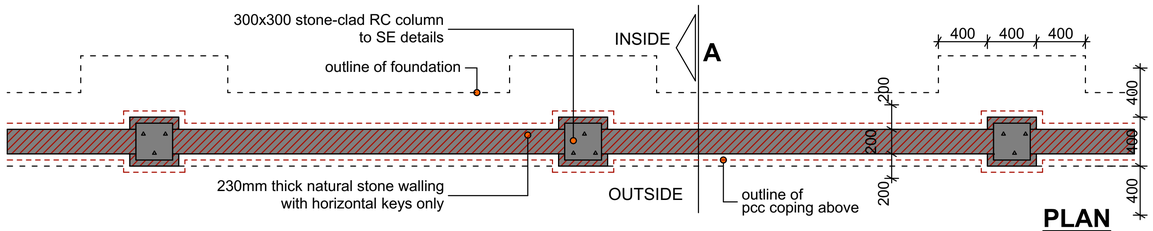
## Boundary Wall



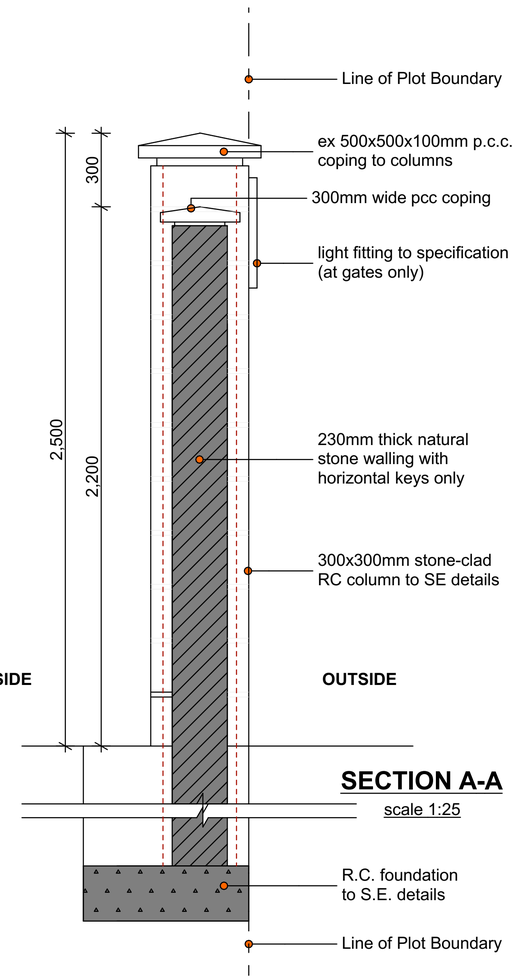

**ELEVATION**
scale 1:50




**COPING PLAN**
scale 1:50




**PLAN**
scale 1:50




**SECTION A-A**
scale 1:25

## EXTERNAL BOUNDARY WALL

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| No | REVISIONS | DATE | SIGNATURE |
|---|---|---|---|
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Project : **PROPOSED KENYA MARINE FISHERIES AND SOCIO-ECONOMIC DEVELOPMENT**

Plot L . R. No.:

Location : **MUKOWE,LAMU**

Client : **STATE DEPARTMENT FOR FISHERIES AQUACULTURE AND THE BLUE ECONOMY**

Signature .....

Subject :

**MUKOWE FISH LANDING SITE**

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Consultancy :


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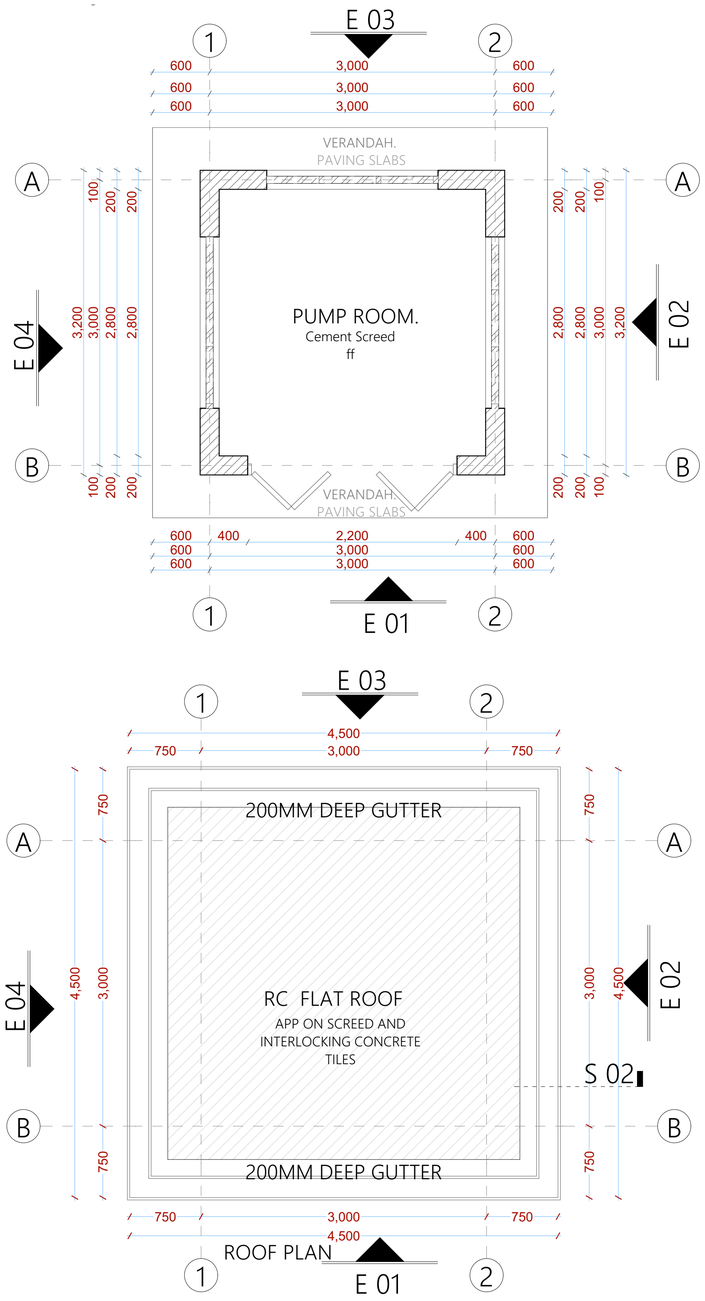
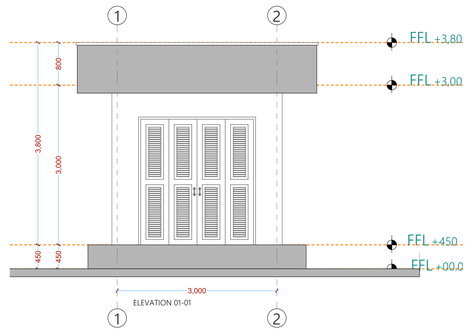
Date:JAN 2024 | Drawing No . **09-001-016**

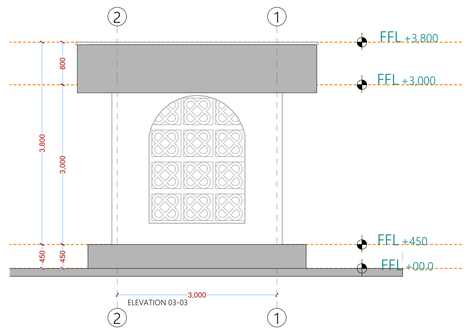
Scale 1:100

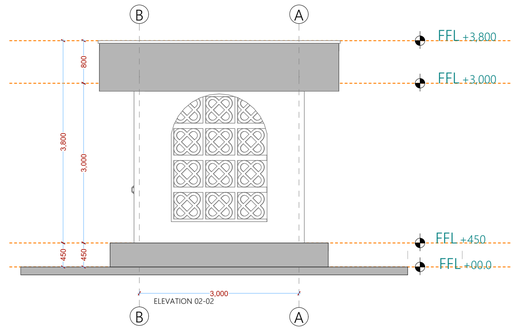
# Mukowe Fish landing Site

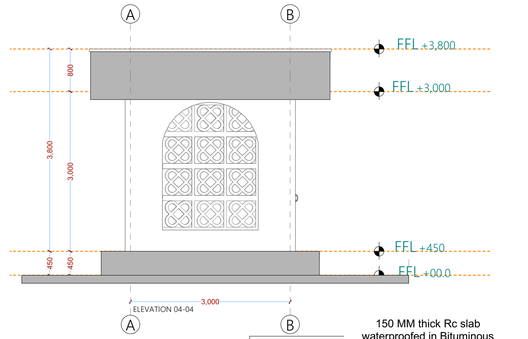
## Pump House

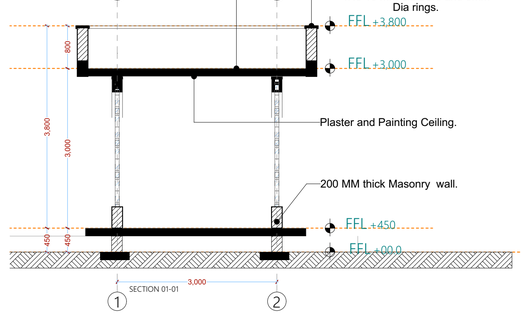


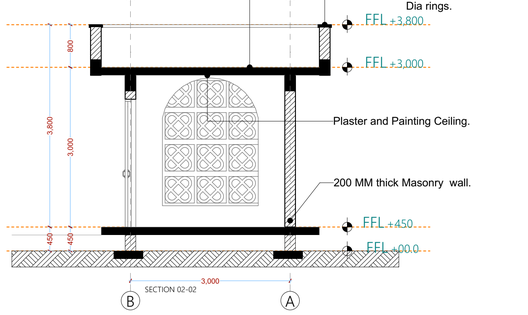



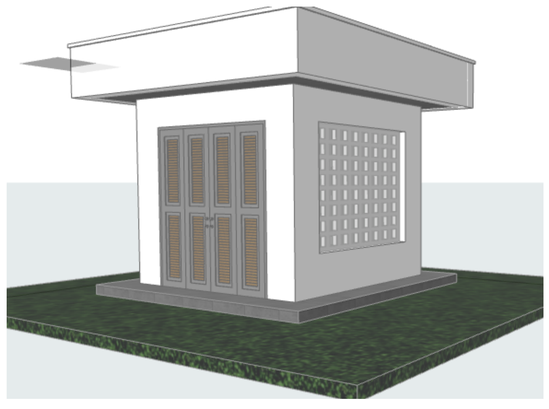



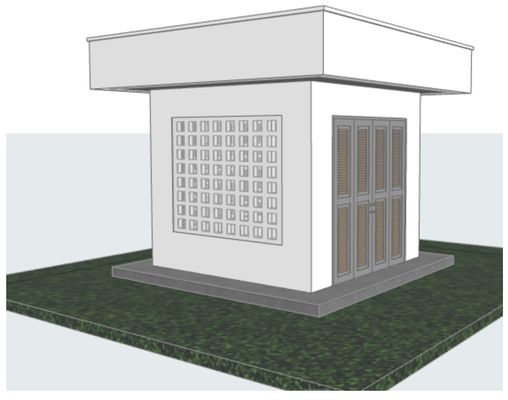





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**MUKOWE FISH LANDING SITE**

.

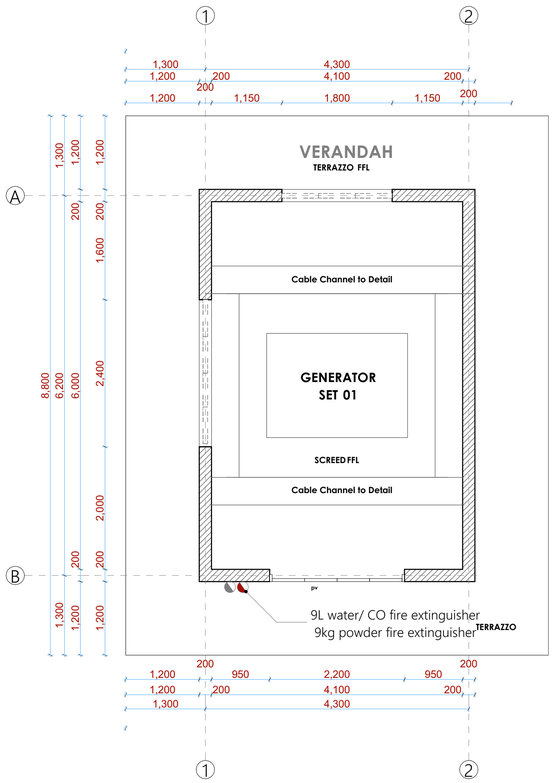

Consultancy :

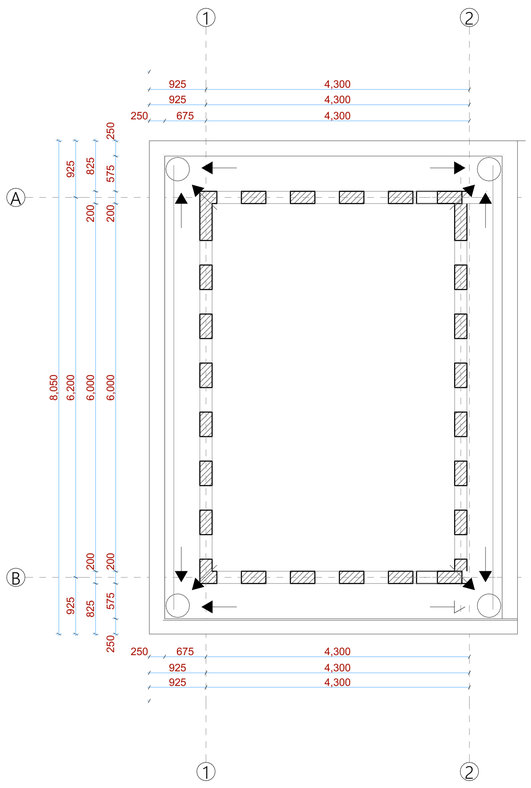
ARPRIM CONSULTANTS
P.O BOX 12969-0040 NAIROBI
TEL: 020-884312/8
Website :www.arprimconsultants.com


| Drawn by: | Checked by : - | Checked by : - |
|---|---|---|
| **CHRIS NGARE** B. Arch. (Hons). | **F. TUNDULI** B. Arch. (Hons) , M. Arch, (reg. No.A1552 ) | **J. MOMANYI** B. Arch. (Hons) , M. Arch. (reg. No.A1122 ) |
| Date:JAN 2024 | Drawing No . | **09-001-017** |
| Scale 1:100 | | |

# **Mukowe Fish** landing Site

## **Power** House




## NOTES

**GENERAL**

- All dimensions are shown in mm unless otherwise specified.
- Drawings are not to be scaled. Only figured dimensions to be used.
- The contractor must check and verify all dimensions on site before commencement of any work.

**CONSTRUCTION**

- Dump proof course must be provided under all external walls at grade. DPC to be minimum 150mm above ground level.
- All slab at grade to be poured on 1000gauge polytheneon 50mm stone dust blinding on compacted hardcore.
- All soils under slab and around external foundation to be treated for termite control.
- Window sills must be finished before internal plastering.

**CIVIL WORKS**

- All soil under slabs and all around external foundations to be treated with anti- termite pesticide AND should be executed bylicensed and duly registered sub contractor.
- Sample for pipe works and other materials for road works specified to be presented to the engineer before works commences.
- All levels for sewer and road works must be approved by the engineer before work commences.

**STRUCTURAL**

- This drawing must be read in conjunction with related architectural drawing, engineers and any other relevant drawings.
- Concrete to be class 20/20 (1:2:4).
- Steel reinforcement bar to be:"Y" = high tensile steel to B.S 4461. "R" = Round mild steel to B.S 449.
- All timber to be sawn cypress G.S grade to KS 02- 771:1989 and seasoned to equilibrium moisture content between 9% and 15%.
- All timber to preservative treated in accordance with KS 02 914:1982.
- Depth of the foundation to be determined on site to S.E's approval.

**MECHANICAL**

- Pipe dimensions are in mm.
- Cold water device pipes steel, with class B to B.S 1387.
- Draining pipe above ground shall upvc grey while those below ground shall be upvc golden brown.
- All underground foul and waste drain pipes shall be upvc to comply.
- All inspection chambers covers and framing shall be cast iron to comply with BS497 TABLE 2 GRADE A.
- The storm water pipe to comply with BS 556.
- Minimum slope in the drain to be 1%.
- All testing of pipes must be completed before plastering.

**ELECTRICAL**

- All conduits must be laid before plastering.
- General conditions of contract for sub contract works.
- Government electrical specification number 1.
- Government electrical specification number 2.
- Electrical act and rules made there under.
- The current edition of regulation for the electrical equipment of buildings issued by the institution of electrical engineers.
- Kenya power and lighting Co. Ltd.

**FIRE**

- Instal water ring main with fire hydrant with 2.5" instantaneous coupling adaptors
- Provide underground water tank with automatic electric booster pump for ring main
- Provide automatic push button fire alarm system
- Provide heat and smoke detectors in each room
- Provide 9kg. dry powder fire extinguishers to ME specifications

| Abbreviations | Meaning |
|---|---|
| **svp** | soil vent pipe |
| **mh** | man hole |
| **ic** | inspection chamber |
| **rcc** | reinforced cement conrete |
| **gt** | gully trap |
| **ss sink** | stain-less steel sink |
| **whb** | wash hand basin |
| **wc** | water closet |
| **shw** | shower |
| **cc** | centre to centre |
| **st. eng/S.E.** | structural engineer |
| **dpc** | damp proof course-under all grd. fl. wallings |
| **dpm** | damp proof membrane |
| **gl** | ground level |
| **pv** | permanent ventilation-on all windows & doors except on internal toilet doors. |

| No | REVISIONS | DATE | SIGNATURE |
|---|---|---|---|
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| | | | |

Project : **PROPOSED KENYA MARINE FISHERIES AND SOCIO-ECONOMIC DEVELOPMENT**

Plot L . R. No.:

Location : **MUKOWE,LAMU**

Client : **STATE DEPARTMENT FOR FISHERIES AQUACULTURE AND THE BLUE ECONOMY**

Signature .....

Subject :

**MUKOWE FISH LANDING SITE**

Consultancy :

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| Drawn by: | Checked by : - | Checked by : - |
|---|---|---|
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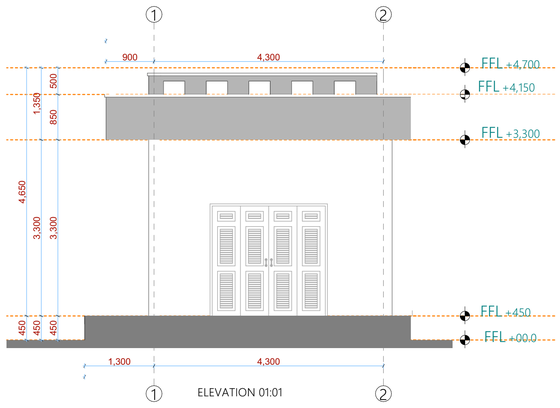
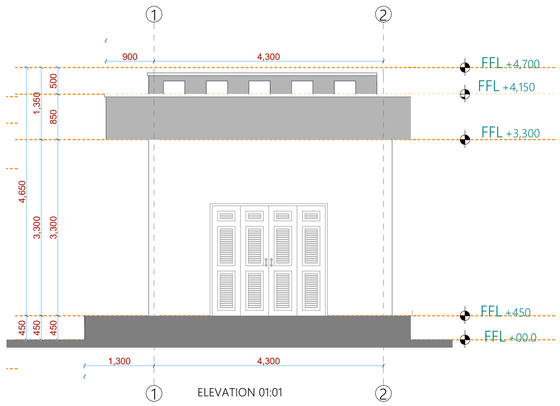
| Date:JAN 2024 | Drawing No . | **09-001-018** |
| Scale 1:100 | | |

# Mukowe Fish landing Site

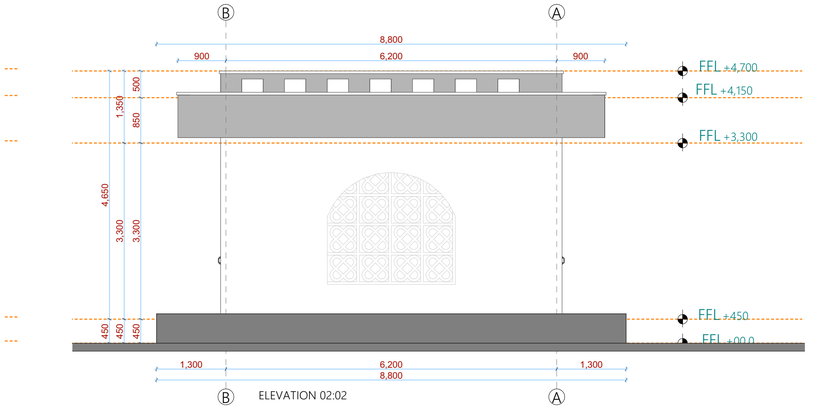
## Power House



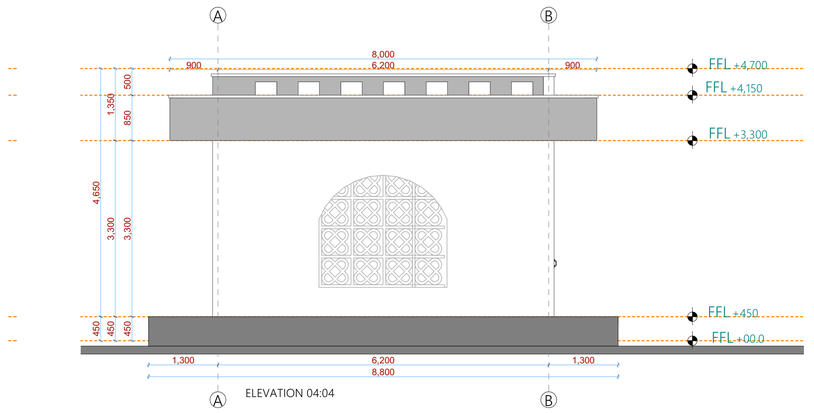

ELEVATION 01:01



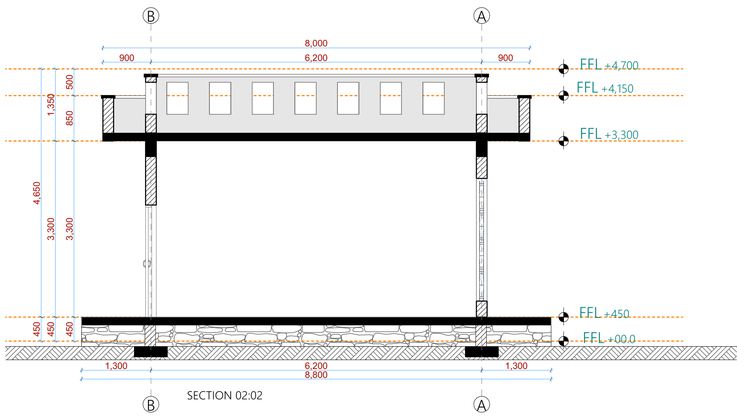

ELEVATION 01:01




ELEVATION 02:02




ELEVATION 04:04




SECTION 02:02

## NOTES

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**CONSTRUCTION**

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+Kenya power and lighting Co. Ltd.

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+ Provide heat and smoke detectors in each room
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| **whb** | wash hand basin |
| **wc** | water closet |
| **shw** | shower |
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| **dpc** | damp proof course-under all grd. fl. wallings |
| **dpm** | damp proof membrane |
| **gl** | ground level |
| **pv** | permanent ventilation-on all windows & doors except on internal toilet doors. |

| No | REVISIONS | DATE | SIGNATURE |
|---|---|---|---|
| | | | |
| | | | |
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Project : **PROPOSED KENYA MARINE FISHERIES AND SOCIO-ECONOMIC DEVELOPMENT**

Plot L . R. No.:

Location : **MUKOWE,LAMU**

Client : **STATE DEPARTMENT FOR FISHERIES AQUACULTURE AND THE BLUE ECONOMY**

Signature .....

Subject :

**MUKOWE FISH LANDING SITE**

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Consultancy :

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| Date:JAN 2024 | Drawing No . | **09-001-018** |
| Scale 1:100 | | |

| PROPOSED MUKOWE FISH LANDING SITE, LAMU COUNTY. | | |
|---|---|---|
| PAGE | DRAWING NUMBER | DRAWING TITLE |
| 1 | 09-002-01 | DRAWING LIST |
| 2 | 09-002-02 | SITE PLAN |
| 3 | 09-002-03 | MODERN FISH BANDA - FOUNDATION LAYOUT AND DETAIL |
| 4 | 09-002-04 | MODERN FISH BANDA - ROOF AND COLUMN DETAIL |
| 5 | 09-002-05 | MODERN FISH BANDA - ROOF SLAB RC DETAIL |
| 6 | 09-002-06 | MODERN FISH BANDA - BEAM AND STAIRCASE DETAIL |
| 7 | 09-002-07 | ABLUTION BLOCK - STRUCTURAL DETAIL |
| 8 | 09-002-08 | GATE HOUSE - STRUCTURAL DETAIL |
| 9 | 09-002-09 | UNDERGROUND WATER TANK |
| 10 | 09-002-10 | CIVIL WORKS 1 |
| 11 | 09-002-11 | BOUNDARY WALL DETAIL |
| 12 | 09-002-12 | CIVIL WORKS 2 |
| 13 | 09-002-13 | CIVIL WORKS 3 |
| 14 | 09-002-14 | BIO-DIGESTER AND SOAK-PIT DETAIL |
| 15 | 09-002-15 | BIO-REACTOR AND INTERCEPTOR DETAIL |
| 16 | 09-002-16 | JETTY LAYOUT, SLAB AND BEAM DETAIL |
| 17 | 09-002-17 | JETTY SECTION AND PILE DETAIL |
| 18 | 09-002-18 | PUMP ROOM DETAIL |
| 19 | 09-002-19 | TYPICAL RECLAMATION SECTION |
| 20 | 09-002-20 | GENERATOR ROOM |

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CLIENT:-
**STATE DEPARTMENT FOR FISHERIES, AQUACULTURE AND THE BLUE ECONOMY.**

PROJECT:-
**PROPOSED KENYA MARINE FISHERIES AND SOCIO-ECONOMIC DEVELOPMENT (KEMFSED) NATIONAL AND COUNTY FISHERIES INFRASTRUCTURE.**

PROJECT TITLE:-
**PROPOSED MUKOWE FISH LANDING SITE, LAMU COUNTY.**

DRAWING TITLE:-
**DRAWING LIST**

NOTES
1. Read this drawing in conjunction with relevant G.A., Services and Architectural drawings. Any descrepancy to be reported to the Engineer.
2. All dimensions are in millimetres unless specified otherwise.
3. All levels are indicated in m unless specified otherwise.
4. Minimum cover to all reinforcement to be:
   - Stairs, Slabs & Walls = 35mm
   - Beams (main bars) = 35mm
   - Post-tensioned beams = 40mm
   - Columns (main bars) = 40mm
   - Foundations = 75mm
5. Maximum tolerance on concrete cover is +/- 5mm.
6. All high tensile (T) and mild steel (R) bars to be in accordance with BS 4449 and fabric mesh to be made from cold worked steel bars in accordance with BS 4483.
7. Minimum laps to all bars to be 50Ø unless stated otherwise.
8. Safe Bearing Pressure taken to be 250 KN/m².
9. Nominal aggregate size to be 20mm.
10. Structural concrete to be Class 25 unless stated otherwise.
11. Concrete blinding to be Class 15 unless stated otherwise.
12. Masonry Strength to be 7.0 N/mm².

| | |
|---|---|
| Designed by | DAN |
| Drawn by | DAN |
| Checked by | HOH |
| Scale | AS SHOWN |

| Rev | Description | By | Date |
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| D | | | |
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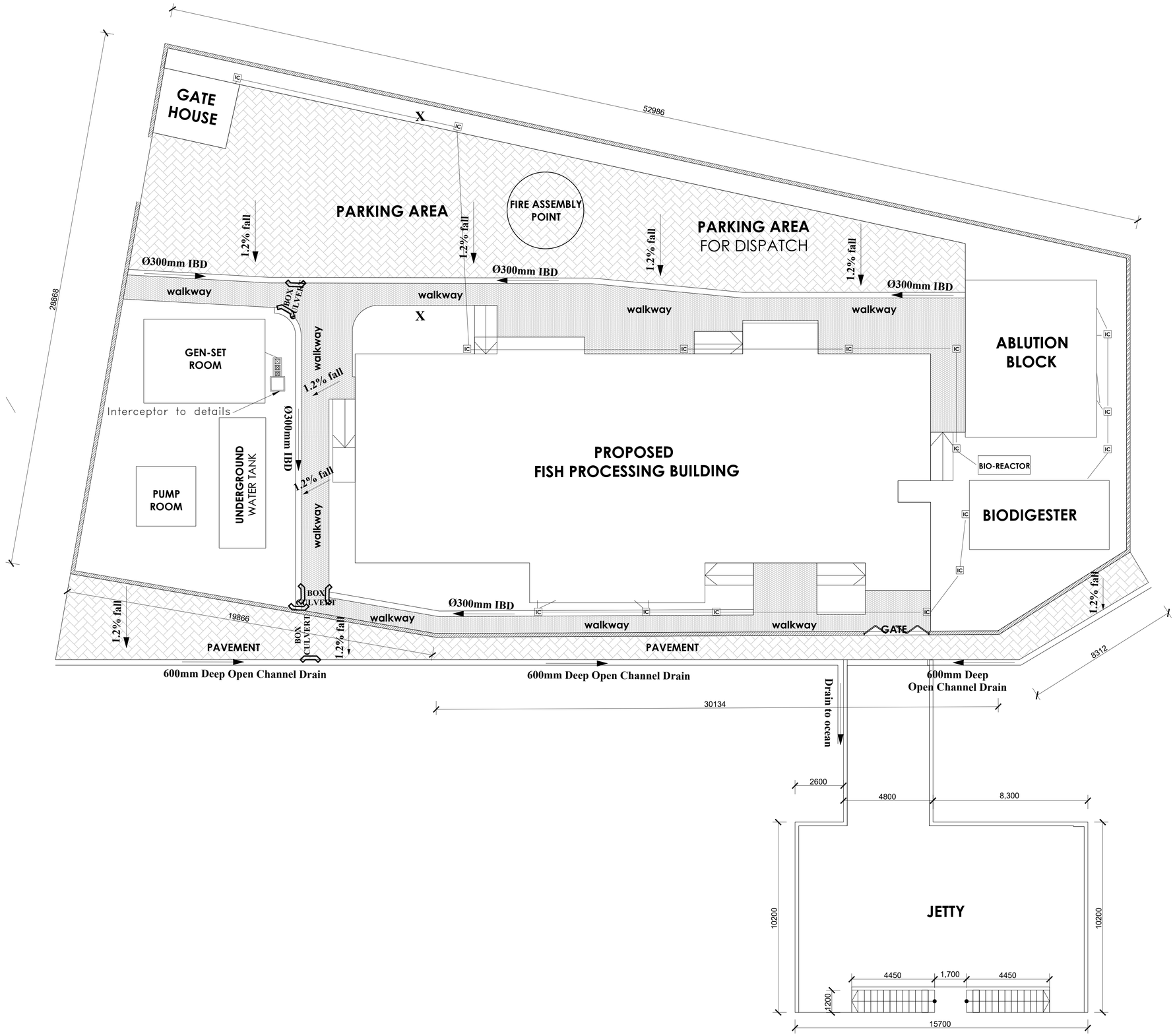
**DRAWING NO. 09-002-01**




Consultant:-

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*Nairobi, KENYA.*
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*Fax: 02 608 907*
*E-mail: info@arprimconsultants.com*

CLIENT:-
**STATE DEPARTMENT FOR FISHERIES, AQUACULTURE AND THE BLUE ECONOMY.**

PROJECT:-
**PROPOSED KENYA MARINE FISHERIES AND SOCIO-ECONOMIC DEVELOPMENT (KEMFSED) NATIONAL AND COUNTY FISHERIES INFRASTRUCTURE.**

PROJECT TITLE:-
**PROPOSED MUKOWE FISH LANDING SITE, LAMU COUNTY.**

DRAWING TITLE:-
**SITE PLAN**

NOTES

1. Read this drawing in conjunction with relevant G.A., Services and Architectural drawings. Any descrepancy to be reported to the Engineer.
2. All dimensions are in millimetres unless specified otherwise.
3. All levels are indicated in m unless specified otherwise.
4. Minimum cover to all reinforcement to be:

| | |
|---|---|
| Stairs, Slabs & Walls | = 35mm |
| Beams (main bars) | = 35mm |
| Post-tensioned beams | = 40mm |
| Columns (main bars) | = 40mm |
| Foundations | = 75mm |

5. Maximum tolerance on concrete cover is +/- 5mm.
6. All high tensile (T) and mild steel (R) bars to be in accordance with BS 4449 and fabric mesh to be made from cold worked steel bars in accordance with BS 4483.
7. Minimum laps to all bars to be 50Ø unless stated otherwise.
8. Safe Bearing Pressure taken to be 250 KN/m².
9. Nominal aggregate size to be 20mm.
10. Structural concrete to be Class 25 unless stated otherwise.
11. Concrete blinding to be Class 15 unless stated otherwise.
12. Masonry Strength to be 7.0 N/mm².

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| Designed by | DAN |
| Drawn by | DAN |
| Checked by | HOH |
| Scale | AS SHOWN |

| Rev | Description | By | Date |
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| D | | | |
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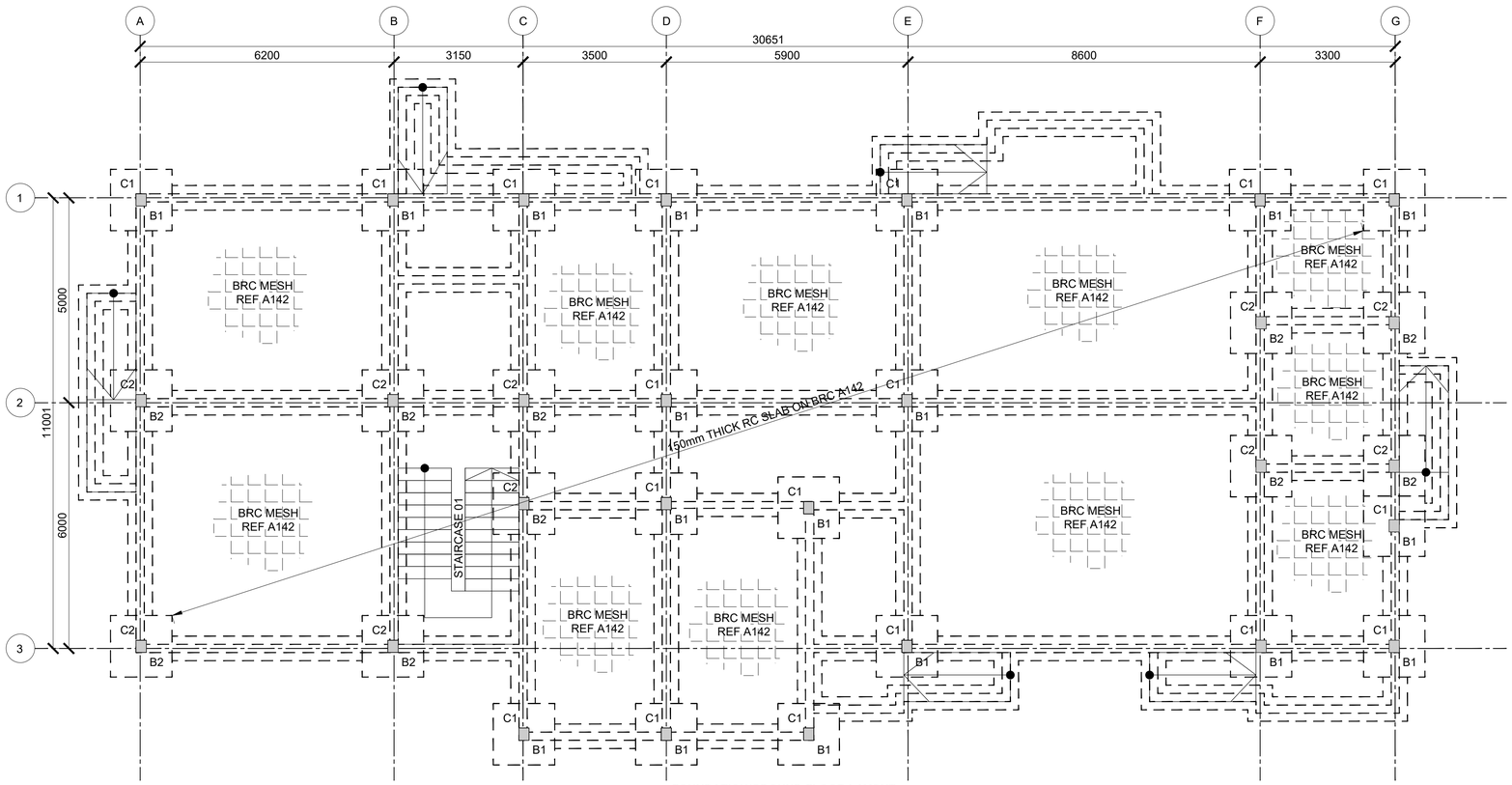
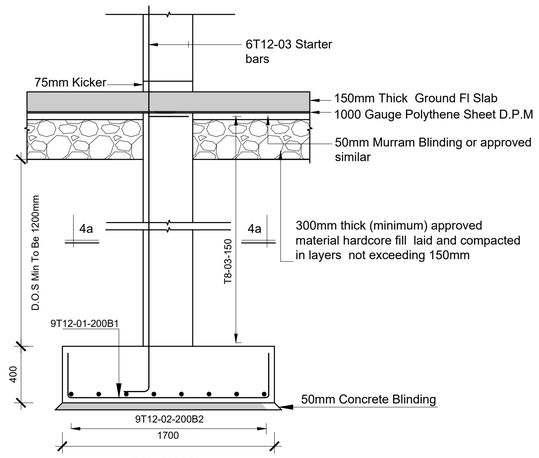
**DRAWING NO. 09-002-02**




**FOUNDATION/GROUND FLOOR LAYOUT**
(SCALE 1:100)

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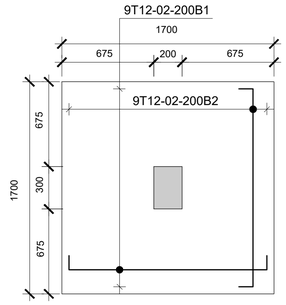
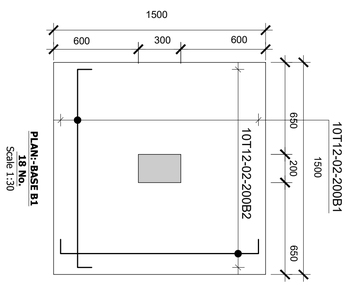
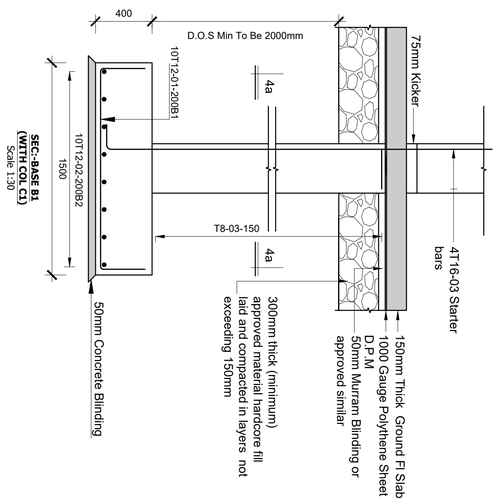
**(WITH COL C2)**
Scale 1:30



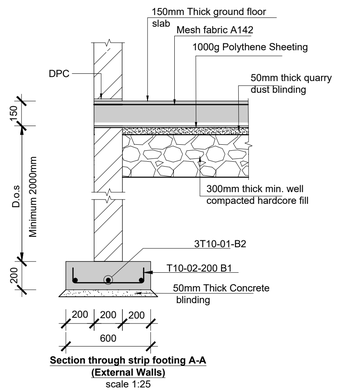

**PLAN:-BASE B2**
**10 No.**
Scale 1:30



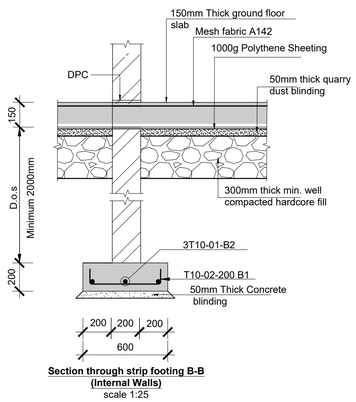

**PLAN:-BASE B1**
**18 No.**
Scale 1:30



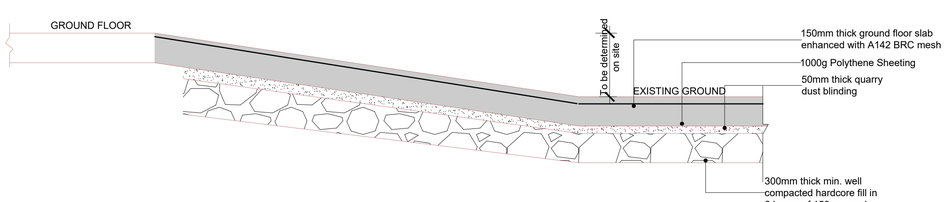

**SEC:-BASE B1**
**(WITH COL C1)**
Scale 1:30




**Section through strip footing A-A**
**(External Walls)**
scale 1:25




**Section through strip footing B-B**
**(Internal Walls)**
scale 1:25




SECTION THROUGH RAMP (1 IN 12)
(SCALE 1 : 25)


Consultant:-

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CLIENT:-
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PROJECT:-
**PROPOSED KENYA MARINE FISHERIES AND SOCIO-ECONOMIC DEVELOPMENT (KEMFSED) NATIONAL AND COUNTY FISHERIES INFRASTRUCTURE.**

PROJECT TITLE:-
**PROPOSED MUKOWE FISH LANDING SITE, LAMU COUNTY.**

DRAWING TITLE:-
**MODERN FISH BANDA - FOUNDATION LAYOUT AND DETAIL**

NOTES

1. Read this drawing in conjunction with relevant G.A., Services and Architectural drawings. Any descrepancy to be reported to the Engineer.
2. All dimensions are in millimetres unless specified otherwise.
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4. Minimum cover to all reinforcement to be:

| | |
|---|---|
| Stairs, Slabs & Walls | = 35mm |
| Beams (main bars) | = 35mm |
| Post-tensioned beams | = 40mm |
| Columns (main bars) | = 40mm |
| Foundations | = 75mm |

5. Maximum tolerance on concrete cover is +/- 5mm.
6. All high tensile (T) and mild steel (R) bars to be in accordance with BS 4449 and fabric mesh to be made from cold worked steel bars in accordance with BS 4483.
7. Minimum laps to all bars to be 50Ø unless stated otherwise.
8. Safe Bearing Pressure taken to be 250 KN/m².
9. Nominal aggregate size to be 20mm.
10. Structural concrete to be Class 25 unless stated otherwise.
11. Concrete blinding to be Class 15 unless stated otherwise.
12. Masonry Strength to be 7.0 N/mm².

| | |
|---|---|
| Designed by | DAN |
| Drawn by | DAN |
| Checked by | HOH |
| Scale | AS SHOWN |

| Rev | Description | By | Date |
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| D | | | |
| C | | | |
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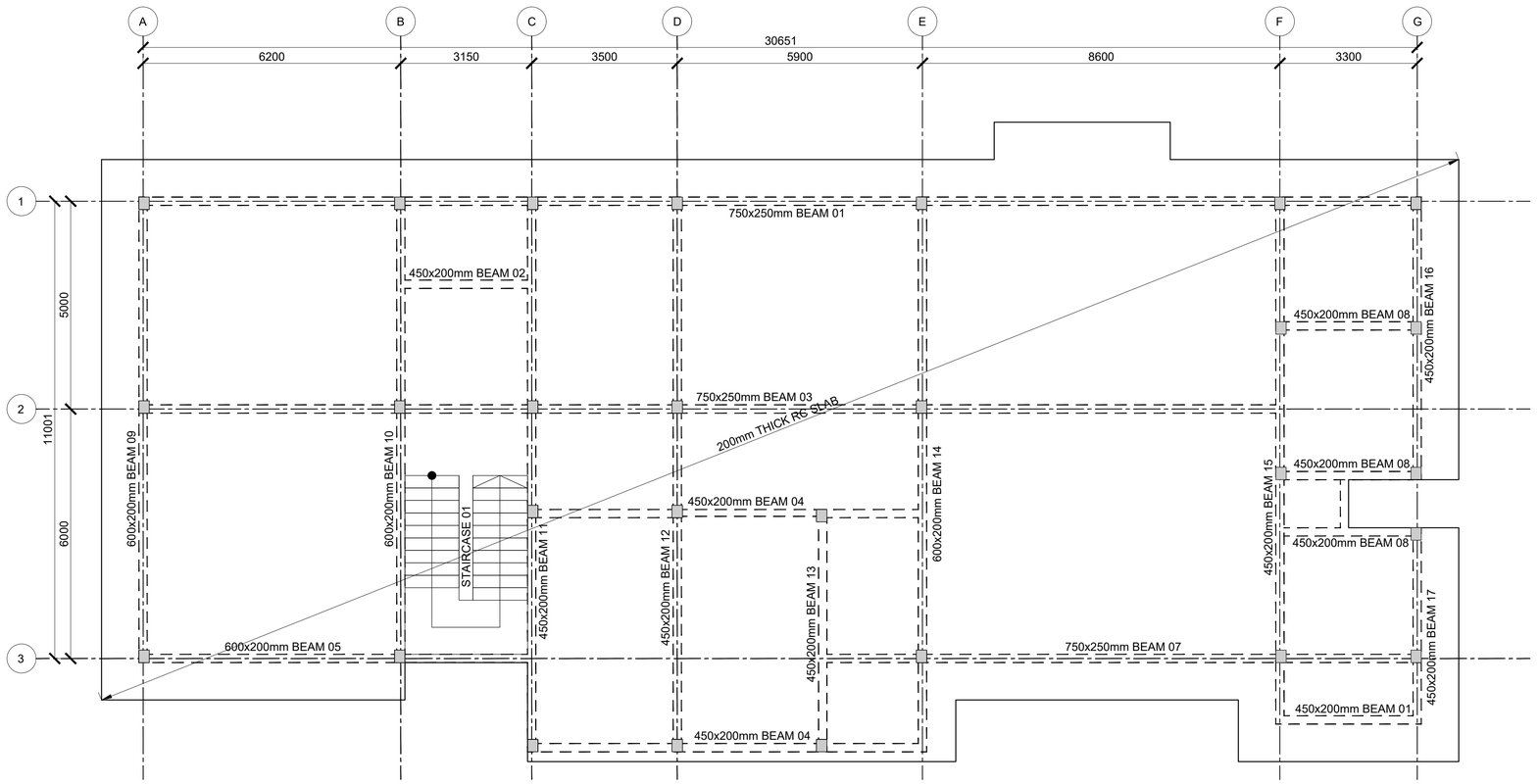
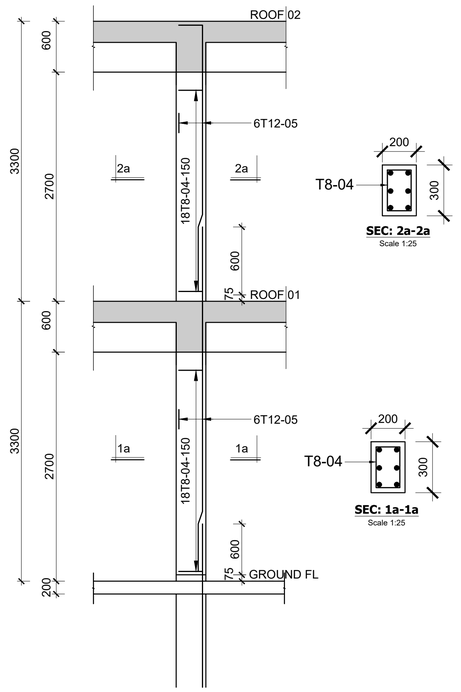
| A | | | |

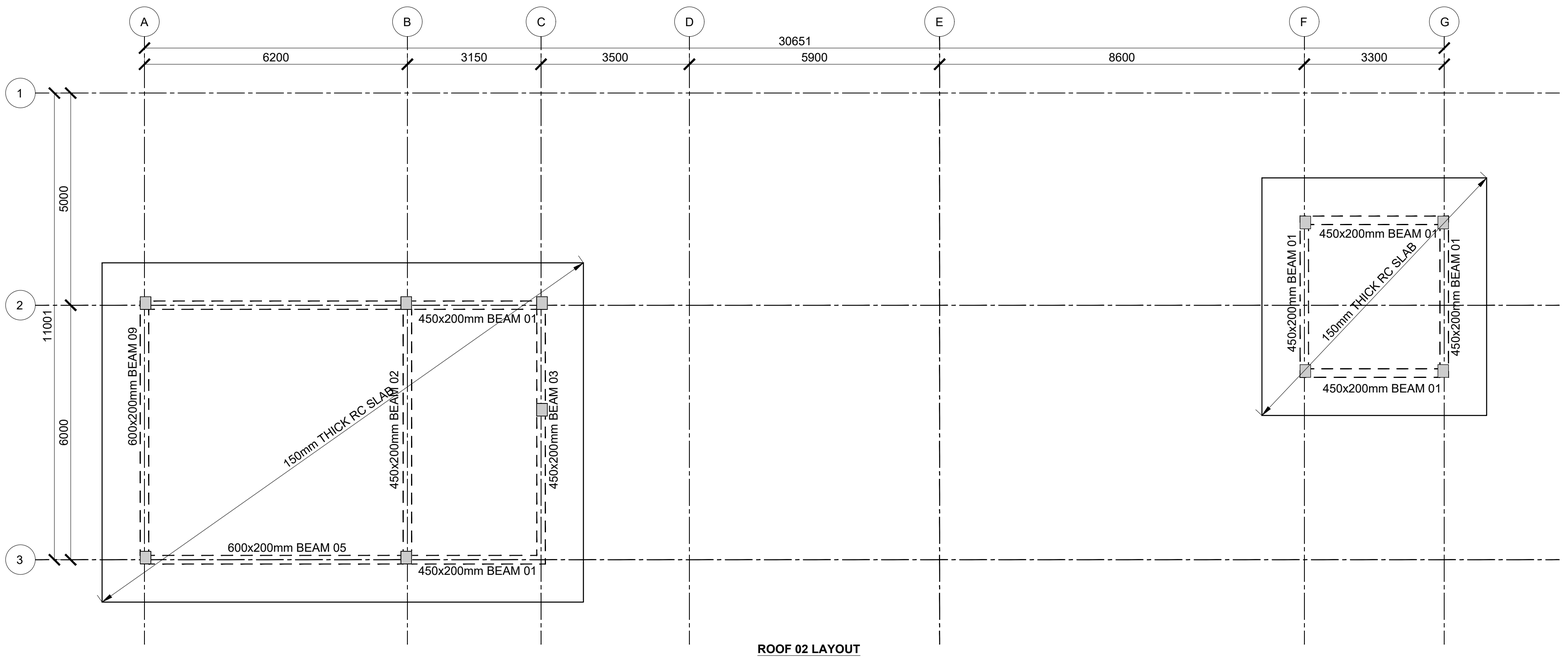
**DRAWING NO. 09-002-03**



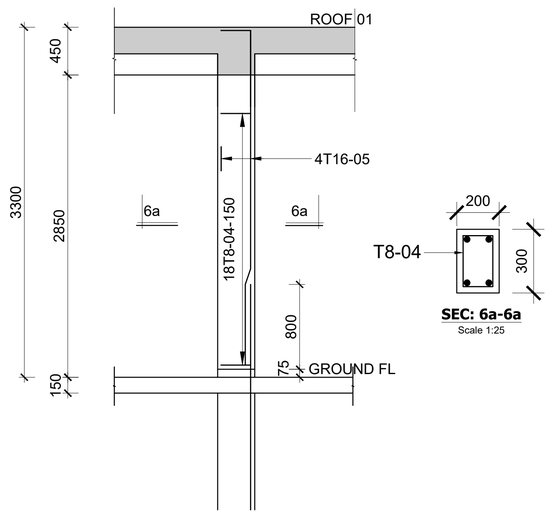

**ROOF 01 LAYOUT**
(SCALE 1:100)




**COLUMN C2**
**10 NO.THUS**
**300X200**
Scale 1:50




**ROOF 02 LAYOUT**
(SCALE 1:100)




**COLUMN C1**
**18 NO.THUS**
**300X200**
Scale 1:50


Consultant:-
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**PROPOSED MUKOWE FISH LANDING SITE, LAMU COUNTY.**

DRAWING TITLE:-
**MODERN FISH BANDA - ROOF AND COLUMN DETAIL**

NOTES
1. Read this drawing in conjunction with relevant G.A., Services and Architectural drawings. Any descrepancy to be reported to the Engineer.
2. All dimensions are in millimetres unless specified otherwise.
3. All levels are indicated in m unless specified otherwise.
4. Minimum cover to all reinforcement to be:

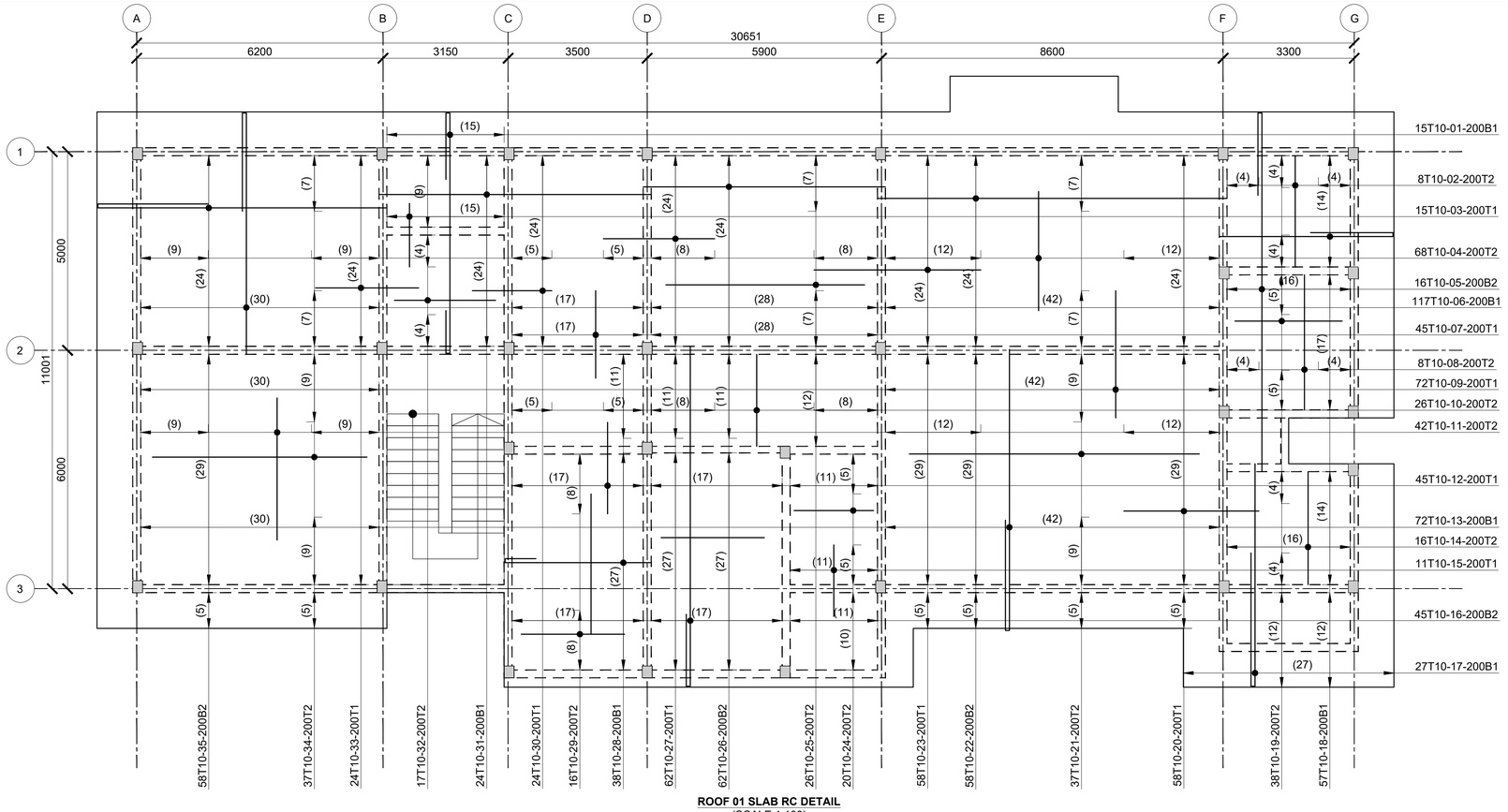
| | |
|---|---|
| Stairs, Slabs & Walls | = 35mm |
| Beams (main bars) | = 35mm |
| Post-tensioned beams | = 40mm |
| Columns (main bars) | = 40mm |
| Foundations | = 75mm |

5. Maximum tolerance on concrete cover is +/- 5mm.
6. All high tensile (T) and mild steel (R) bars to be in accordance with BS 4449 and fabric mesh to be made from cold worked steel bars in accordance with BS 4483.
7. Minimum laps to all bars to be 50Ø unless stated otherwise.
8. Safe Bearing Pressure taken to be 250 KN/m².
9. Nominal aggregate size to be 20mm.
10. Structural concrete to be Class 25 unless stated otherwise.
11. Concrete blinding to be Class 15 unless stated otherwise.
12. Masonry Strength to be 7.0 N/mm².

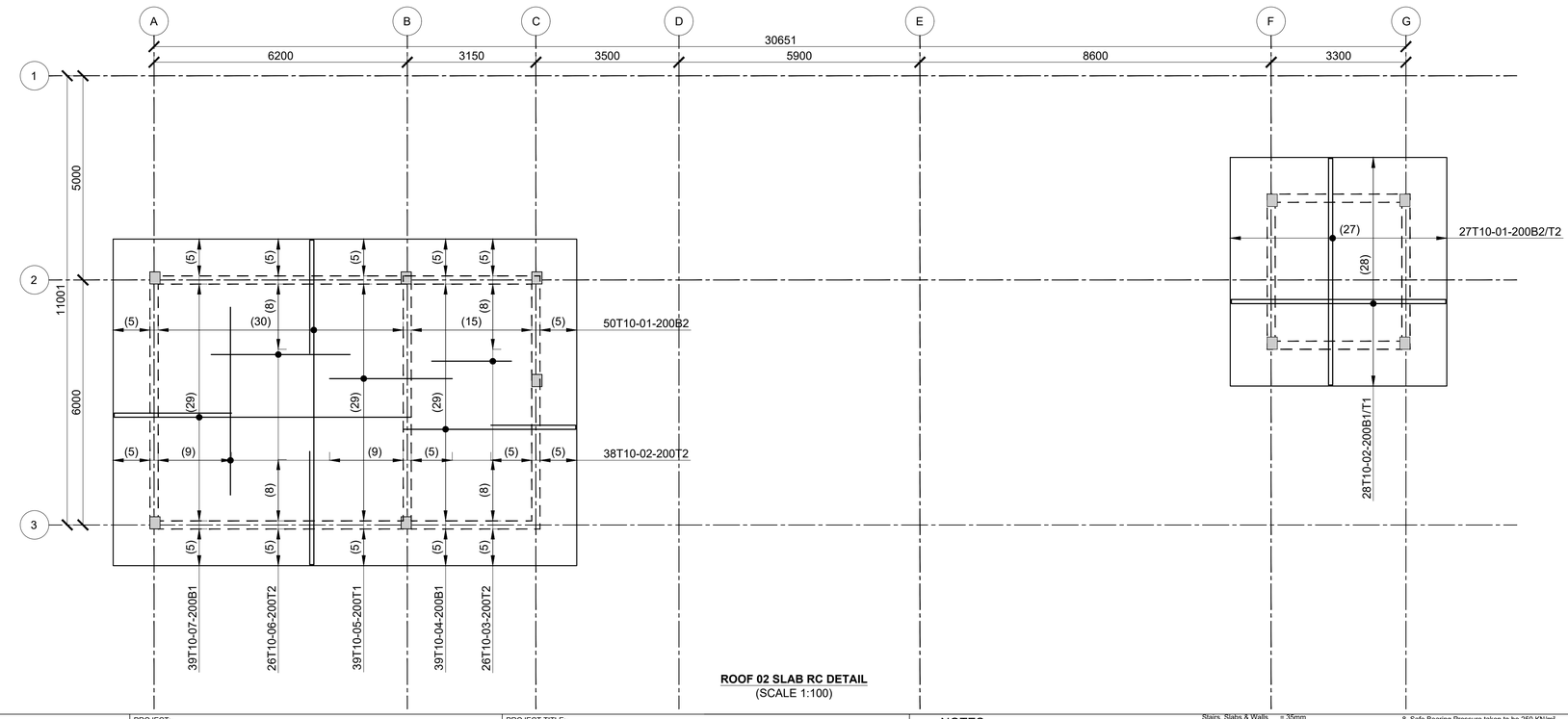
| | |
|---|---|
| Designed by | DAN |
| Drawn by | DAN |
| Checked by | HOH |
| Scale | AS SHOWN |

| Rev | Description | By | Date |
|---|---|---|---|
| D | | | |
| C | | | |
| B | | | |
| A | | | |

**DRAWING NO. 09-002-04**




**ROOF 01 SLAB RC DETAIL**
(SCALE 1:100)




**ROOF 02 SLAB RC DETAIL**
(SCALE 1:100)

Consultant:-

**ARPRIM CONSORTIUM**
*P.O. Box 12969-00100,*
*Nairobi, KENYA.*
*Tel: 02 608 906*
*Fax: 02 608 907*
*E-mail: info@arprimconsultants.com*

CLIENT:-
**STATE DEPARTMENT FOR FISHERIES, AQUACULTURE AND THE BLUE ECONOMY.**

PROJECT:-
**PROPOSED KENYA MARINE FISHERIES AND SOCIO-ECONOMIC DEVELOPMENT (KEMFSED) NATIONAL AND COUNTY FISHERIES INFRASTRUCTURE.**

PROJECT TITLE:-
**PROPOSED MUKOWE FISH LANDING SITE, LAMU COUNTY.**

DRAWING TITLE:-
**MODERN FISH BANDA - ROOF SLAB RC DETAIL**

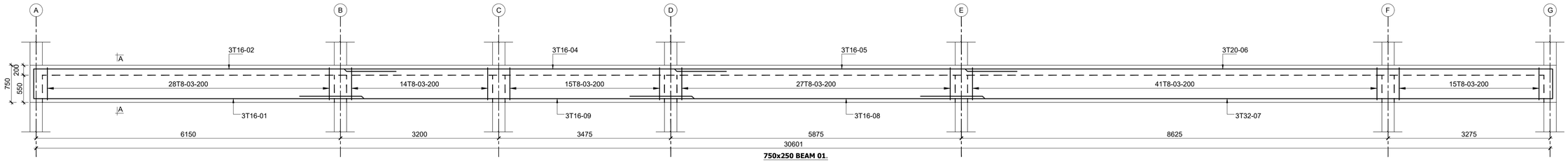
NOTES

1. Read this drawing in conjunction with relevant G.A., Services and Architectural drawings. Any descrepancy to be reported to the Engineer.
2. All dimensions are in millimetres unless specified otherwise.
3. All levels are indicated in m unless specified otherwise.
4. Minimum cover to all reinforcement to be:
   - Stairs, Slabs & Walls = 35mm
   - Beams (main bars) = 35mm
   - Post-tensioned beams = 40mm
   - Columns (main bars) = 40mm
   - Foundations = 75mm
5. Maximum tolerance on concrete cover is +/- 5mm.
6. All high tensile (T) and mild steel (R) bars to be in accordance with BS 4449 and fabric mesh to be made from cold worked steel bars in accordance with BS 4483.
7. Minimum laps to all bars to be 50Ø unless stated otherwise.
8. Safe Bearing Pressure taken to be 250 KN/m².
9. Nominal aggregate size to be 20mm.
10. Structural concrete to be Class 25 unless stated otherwise.
11. Concrete blinding to be Class 15 unless stated otherwise.
12. Masonry Strength to be 7.0 N/mm².

| | |
|---|---|
| Designed by | DAN |
| Drawn by | DAN |
| Checked by | HOH |
| Scale | AS SHOWN |

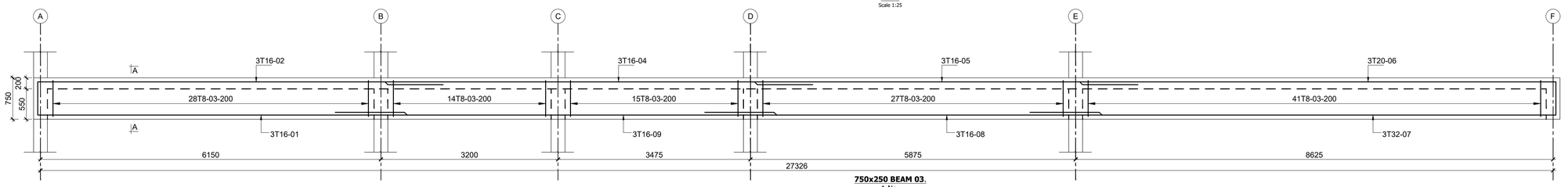
| Rev | Description | By | Date |
|---|---|---|---|
| D | | | |
| C | | | |
| B | | | |
| A | | | |

**DRAWING NO. 09-002-05**

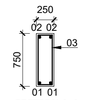



**750x250 BEAM 01.**
1 No.
Scale 1:25

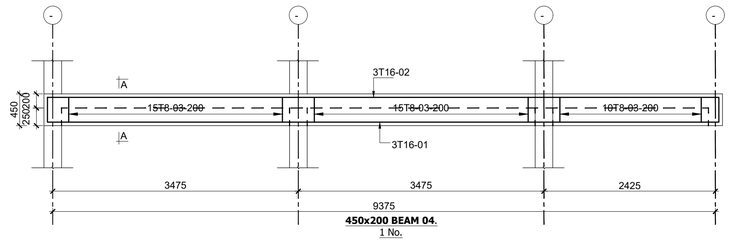

**SECTION A-A**
Scale 1:25



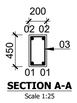

**750x250 BEAM 03.**
1 No.
Scale 1:25



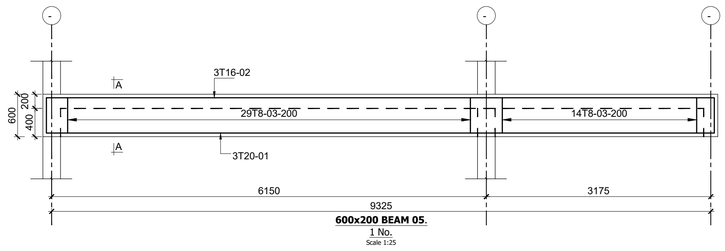

**SECTION A-A**
Scale 1:25



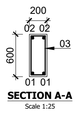

**450x200 BEAM 04.**
1 No.
Scale 1:25



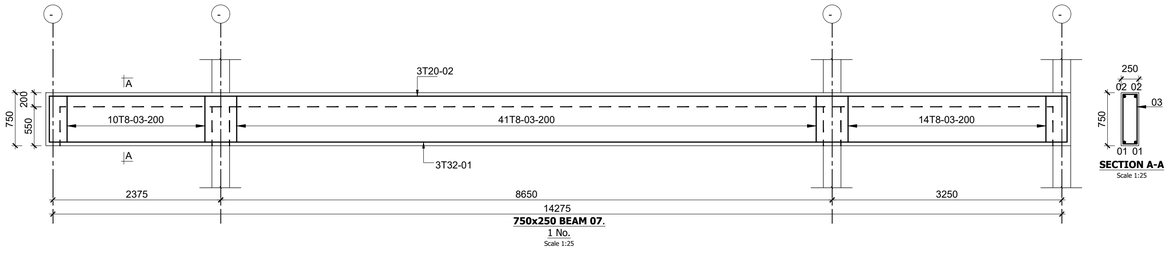

**SECTION A-A**
Scale 1:25




**600x200 BEAM 05.**
1 No.
Scale 1:25



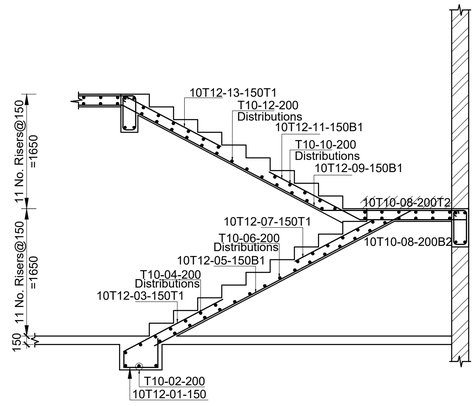

**SECTION A-A**
Scale 1:25




**750x250 BEAM 07.**
1 No.
Scale 1:25



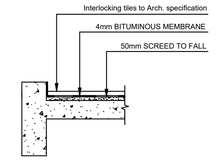

**SECTION A-A**
Scale 1:25




## SECTION THROUGH STAIRCASE 01

Waist=175mm Riser=150mm Tread=300mm

Scale 1:50




TYPICAL ROOF SLAB
W/POOFING DETAIL


Consultant:-

**ARPRIM CONSORTIUM**
*P.O. Box 12969-00100,*
*Nairobi, KENYA.*
*Tel: 02 608 906*
*Fax: 02 608 907*
*E-mail: info@arprimconsultants.com*


CLIENT:-
**STATE DEPARTMENT FOR FISHERIES, AQUACULTURE AND THE BLUE ECONOMY.**

PROJECT:-
**PROPOSED KENYA MARINE FISHERIES AND SOCIO-ECONOMIC DEVELOPMENT (KEMFSED) NATIONAL AND COUNTY FISHERIES INFRASTRUCTURE.**

PROJECT TITLE:-
**PROPOSED MUKOWE FISH LANDING SITE, LAMU COUNTY.**

DRAWING TITLE:-
**MODERN FISH BANDA - BEAM AND STAIRCASE DETAIL**

NOTES

1. Read this drawing in conjunction with relevant G.A., Services and Architectural drawings. Any descrepancy to be reported to the Engineer.
2. All dimensions are in millimetres unless specified otherwise.
3. All levels are indicated in m unless specified otherwise.
4. Minimum cover to all reinforcement to be:

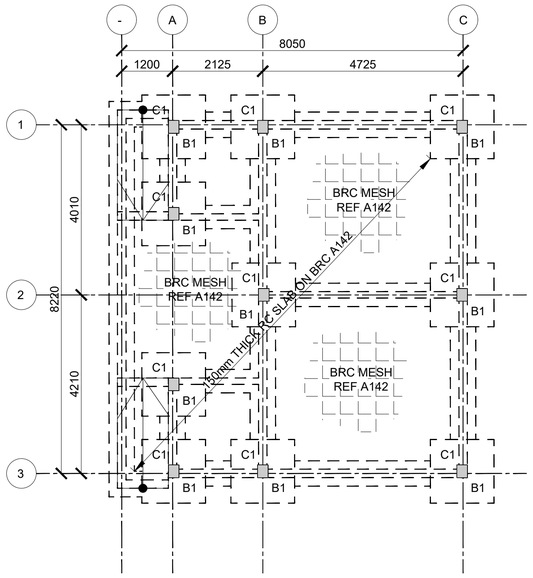
| | |
|---|---|
| Stairs, Slabs & Walls | = 35mm |
| Beams (main bars) | = 35mm |
| Post-tensioned beams | = 40mm |
| Columns (main bars) | = 40mm |
| Foundations | = 75mm |

5. Maximum tolerance on concrete cover is +/- 5mm.
6. All high tensile (T) and mild steel (R) bars to be in accordance with BS 4449 and fabric mesh to be made from cold worked steel bars in accordance with BS 4483.
7. Minimum laps to all bars to be 50Ø unless stated otherwise.
8. Safe Bearing Pressure taken to be 250 KN/m².
9. Nominal aggregate size to be 20mm.
10. Structural concrete to be Class 25 unless stated otherwise.
11. Concrete blinding to be Class 15 unless stated otherwise.
12. Masonry Strength to be 7.0 N/mm².

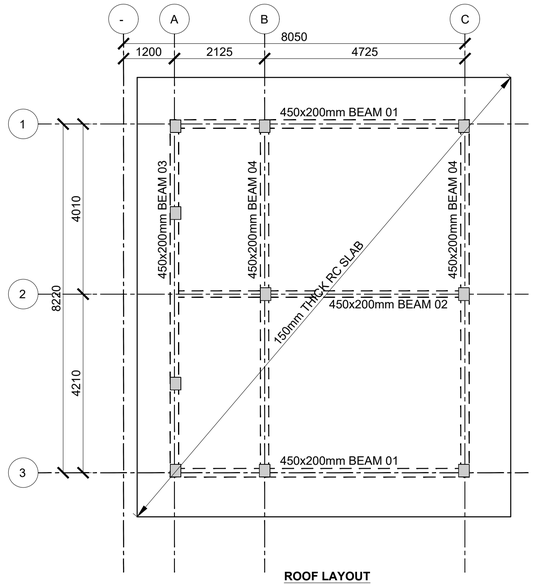
| | |
|---|---|
| Designed by | DAN |
| Drawn by | DAN |
| Checked by | HOH |
| Scale | AS SHOWN |

| Rev | Description | By | Date |
|---|---|---|---|
| D | | | |
| C | | | |
| B | | | |
| A | | | |

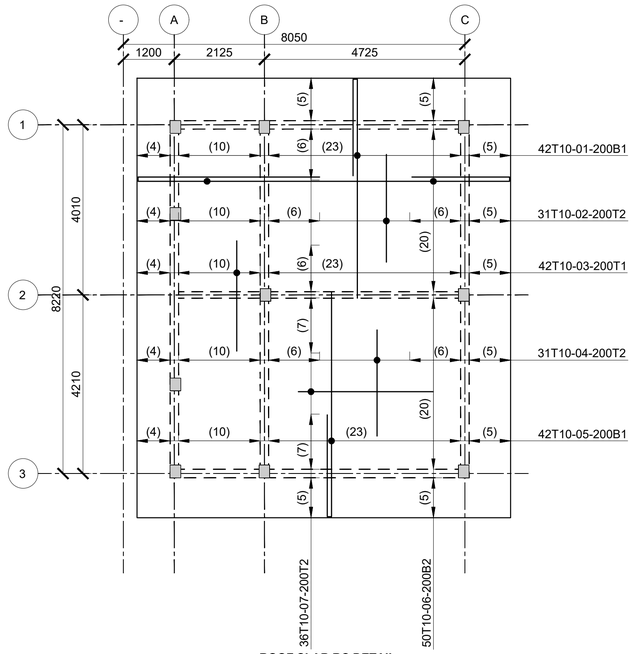
**DRAWING NO. 09-002-06**



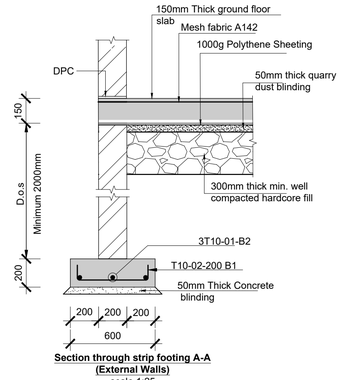

**FOUNDATION/GROUND FLOOR LAYOUT**
(SCALE 1:100)



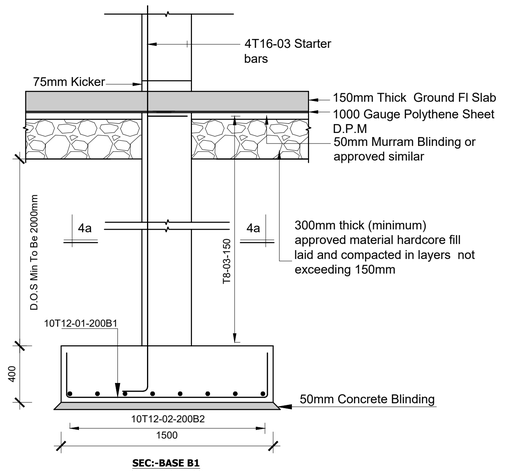

**ROOF LAYOUT**
(SCALE 1:100)



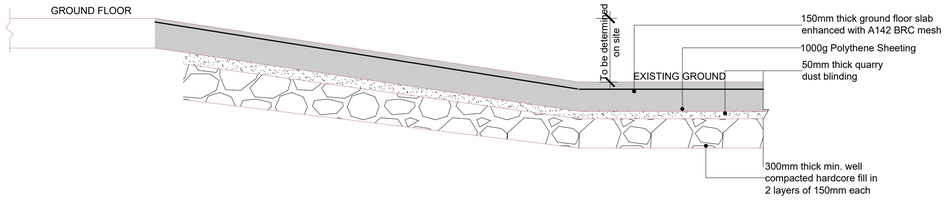

**ROOF SLAB RC DETAIL**
(SCALE 1:100)



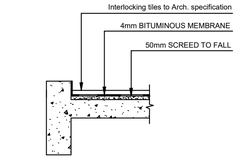

**Section through strip footing A-A**
**(External Walls)**
scale 1:25



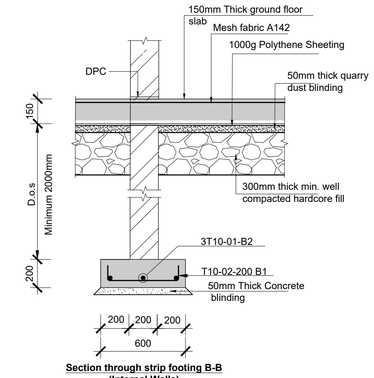

**SEC:-BASE B1**
**(WITH COL C1)**
Scale 1:30



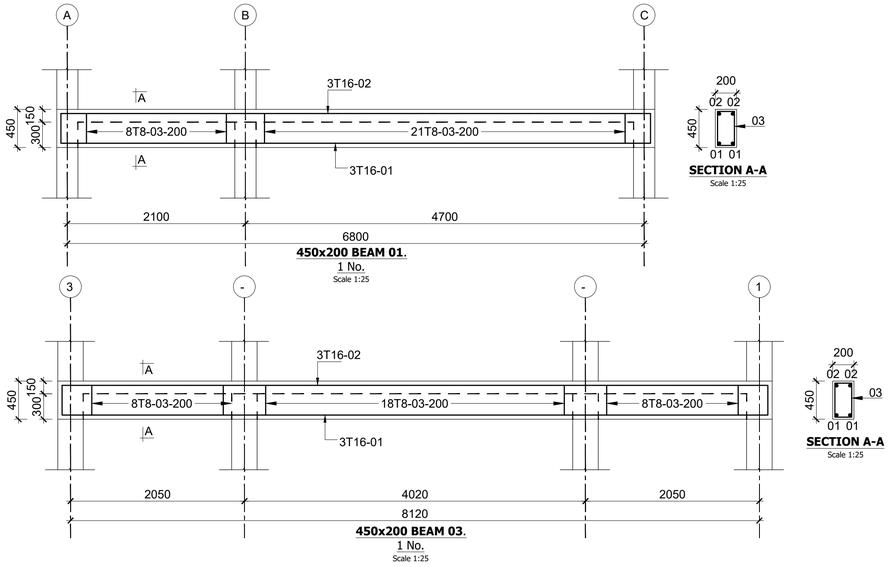

SECTION THROUGH RAMP (1 IN 12)
(SCALE 1 : 25)




TYPICAL ROOF SLAB
W/POOFING DETAIL




**Section through strip footing B-B**
**(Internal Walls)**
scale 1:25

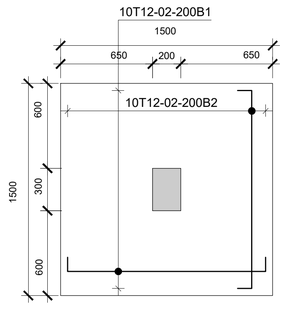



**450x200 BEAM 01.**
1 No.
Scale 1:25

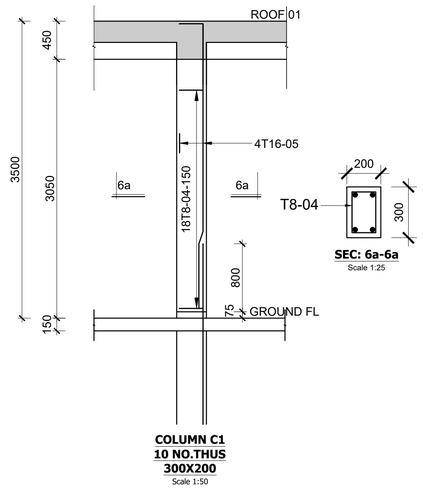
**SECTION A-A**
Scale 1:25

**450x200 BEAM 03.**
1 No.
Scale 1:25

**SECTION A-A**
Scale 1:25




**PLAN:-BASE B1**
**10 No.**
Scale 1:30




**COLUMN C1**
**10 NO.THUS**
**300X200**
Scale 1:50

Consultant:-

**ARPRIM CONSORTIUM**
*P.O. Box 12969-00100,*
*Nairobi, KENYA.*
*Tel: 02 608 906*
*Fax: 02 608 907*
*E-mail: info@arprimconsultants.com*

CLIENT:-
**STATE DEPARTMENT FOR FISHERIES, AQUACULTURE AND THE BLUE ECONOMY.**

PROJECT:-
**PROPOSED KENYA MARINE FISHERIES AND SOCIO-ECONOMIC DEVELOPMENT (KEMFSED) NATIONAL AND COUNTY FISHERIES INFRASTRUCTURE.**

PROJECT TITLE:-
**PROPOSED MUKOWE FISH LANDING SITE, LAMU COUNTY.**

DRAWING TITLE:-
**ABLUTION BLOCK - STRUCTURAL DETAIL**

NOTES

1. Read this drawing in conjunction with relevant G.A., Services and Architectural drawings. Any descrepancy to be reported to the Engineer.
2. All dimensions are in millimetres unless specified otherwise.
3. All levels are indicated in m unless specified otherwise.
4. Minimum cover to all reinforcement to be:

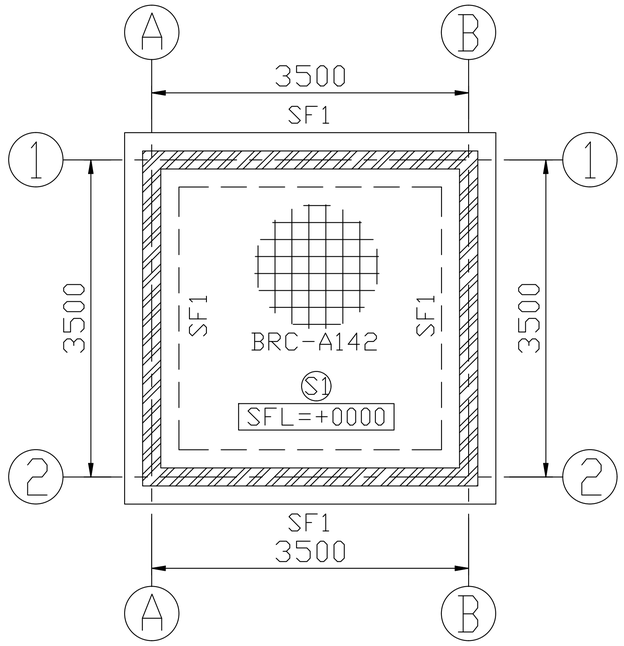
| | |
|---|---|
| Stairs, Slabs & Walls | = 35mm |
| Beams (main bars) | = 35mm |
| Post-tensioned beams | = 40mm |
| Columns (main bars) | = 40mm |
| Foundations | = 75mm |

5. Maximum tolerance on concrete cover is +/- 5mm.
6. All high tensile (T) and mild steel (R) bars to be in accordance with BS 4449 and fabric mesh to be made from cold worked steel bars in accordance with BS 4483.
7. Minimum laps to all bars to be 50Ø unless stated otherwise.
8. Safe Bearing Pressure taken to be 250 KN/m².
9. Nominal aggregate size to be 20mm.
10. Structural concrete to be Class 25 unless stated otherwise.
11. Concrete blinding to be Class 15 unless stated otherwise.
12. Masonry Strength to be 7.0 N/mm².

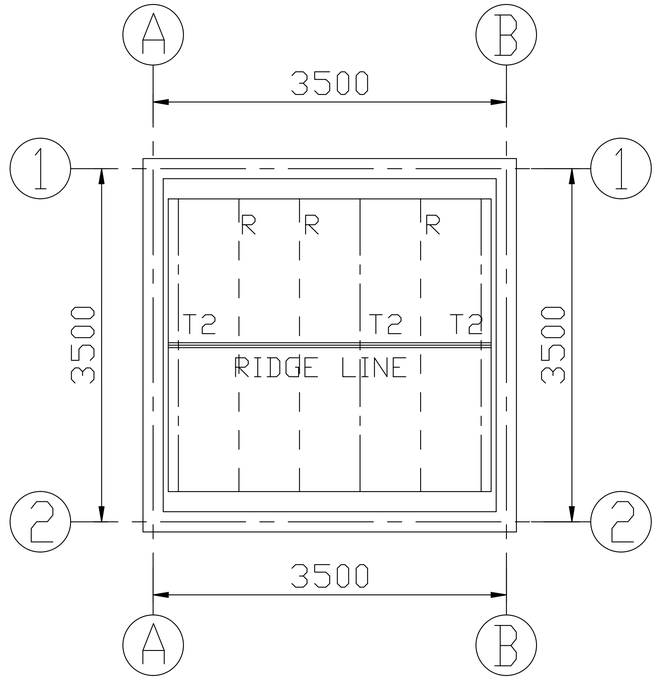
| | |
|---|---|
| Designed by | DAN |
| Drawn by | DAN |
| Checked by | HOH |
| Scale | AS SHOWN |

| Rev | Description | By | Date |
|---|---|---|---|
| D | | | |
| C | | | |
| B | | | |
| A | | | |

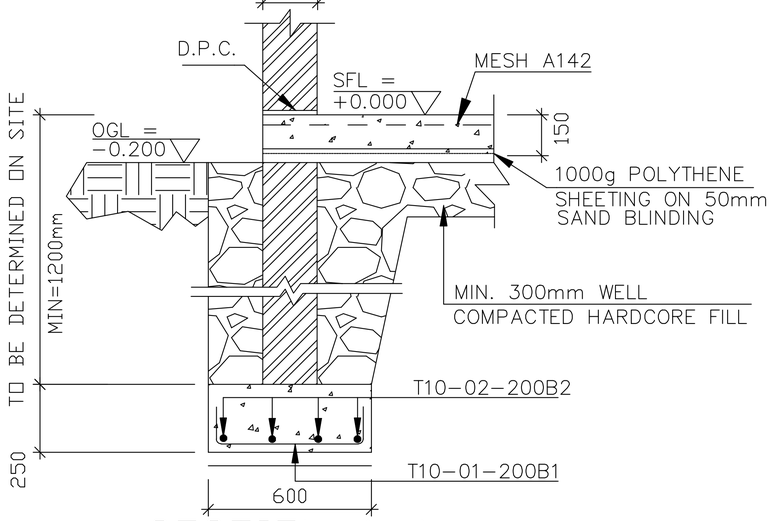
**DRAWING NO. 09-002-07**



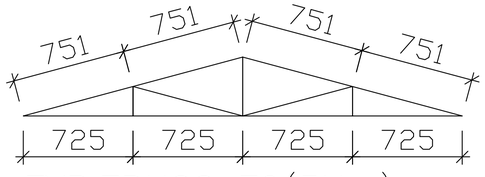

FOUNDATION G.A LAYOUT
MAIN GUARD HOUSE
SCALE 1:75



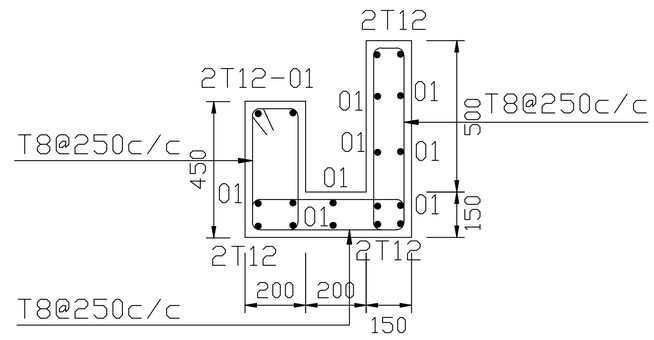

ROOF TRUSS LAYOUT
MAIN GUARD HOUSE
SCALE 1:75




SECTION A-A
SECTION THRO' SF1
EXTERNAL STRIP FOOTING
SCALE 1:25




TYP.TRUSS T2(3No.)
SCALE 1:50




TYP. GUTTER & BEAM DETAILS
SCALE 1:25


Consultant:-

**ARPRIM CONSORTIUM**
*P.O. Box 12969-00100,*
*Nairobi, KENYA.*
*Tel: 02 608 906*
*Fax: 02 608 907*
*E-mail: info@arprimconsultants.com*


CLIENT:-
**STATE DEPARTMENT FOR FISHERIES, AQUACULTURE AND THE BLUE ECONOMY.**

PROJECT:-
**PROPOSED KENYA MARINE FISHERIES AND SOCIO-ECONOMIC DEVELOPMENT (KEMFSED) NATIONAL AND COUNTY FISHERIES INFRASTRUCTURE.**

PROJECT TITLE:-
**PROPOSED MUKOWE FISH LANDING SITE, LAMU COUNTY.**

DRAWING TITLE:-
**GATE HOUSE - STRUCTURAL DETAIL**

NOTES

1. Read this drawing in conjunction with relevant G.A., Services and Architectural drawings. Any descrepancy to be reported to the Engineer.
2. All dimensions are in millimetres unless specified otherwise.
3. All levels are indicated in m unless specified otherwise.
4. Minimum cover to all reinforcement to be:

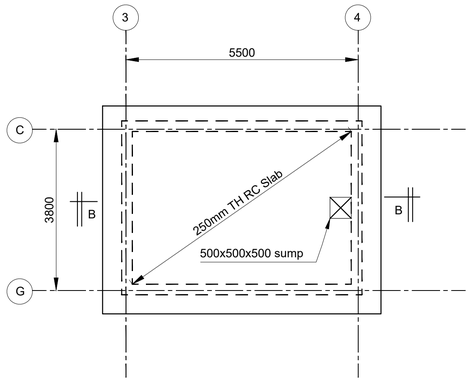
| | |
|---|---|
| Stairs, Slabs & Walls | = 35mm |
| Beams (main bars) | = 35mm |
| Post-tensioned beams | = 40mm |
| Columns (main bars) | = 40mm |
| Foundations | = 75mm |

5. Maximum tolerance on concrete cover is +/- 5mm.
6. All high tensile (T) and mild steel (R) bars to be in accordance with BS 4449 and fabric mesh to be made from cold worked steel bars in accordance with BS 4483.
7. Minimum laps to all bars to be 50Ø unless stated otherwise.
8. Safe Bearing Pressure taken to be 250 KN/m².
9. Nominal aggregate size to be 20mm.
10. Structural concrete to be Class 25 unless stated otherwise.
11. Concrete blinding to be Class 15 unless stated otherwise.
12. Masonry Strength to be 7.0 N/mm².

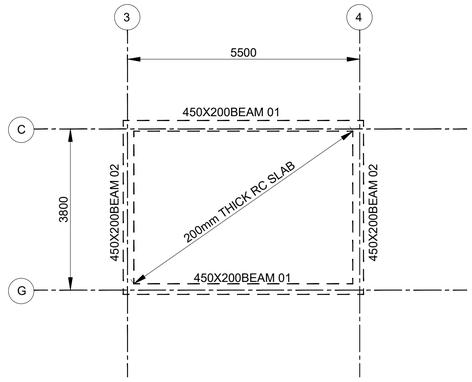
| | |
|---|---|
| Designed by | DAN |
| Drawn by | DAN |
| Checked by | HOH |
| Scale | AS SHOWN |

| Rev | Description | By | Date |
|---|---|---|---|
| D | | | |
| C | | | |
| B | | | |
| A | | | |

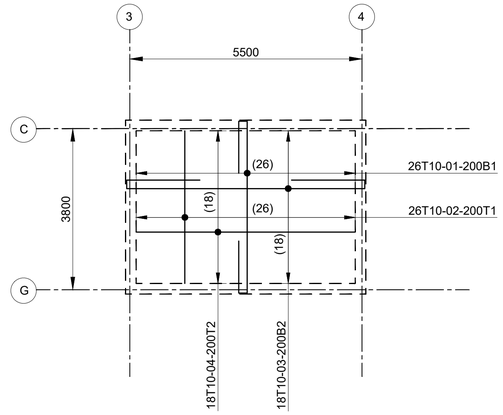
**DRAWING NO. 09-002-08**



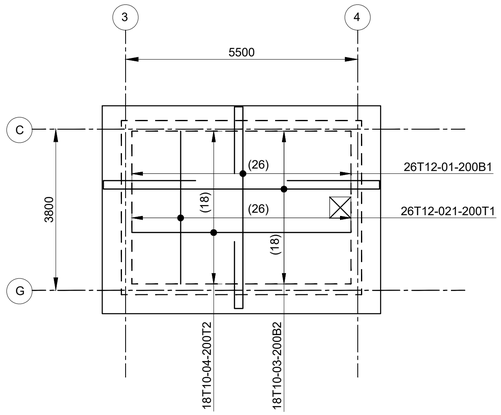

TANK FOUNDATION LAYOUT
SCALE 1:100



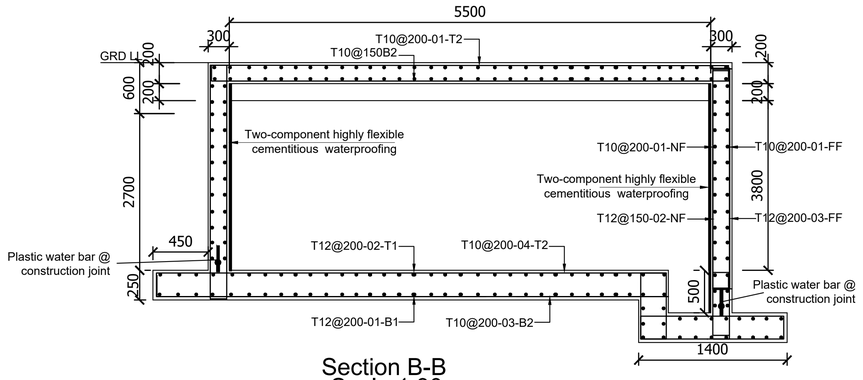

200mm SLAB BEAM LAYOUT
SCALE 1:100



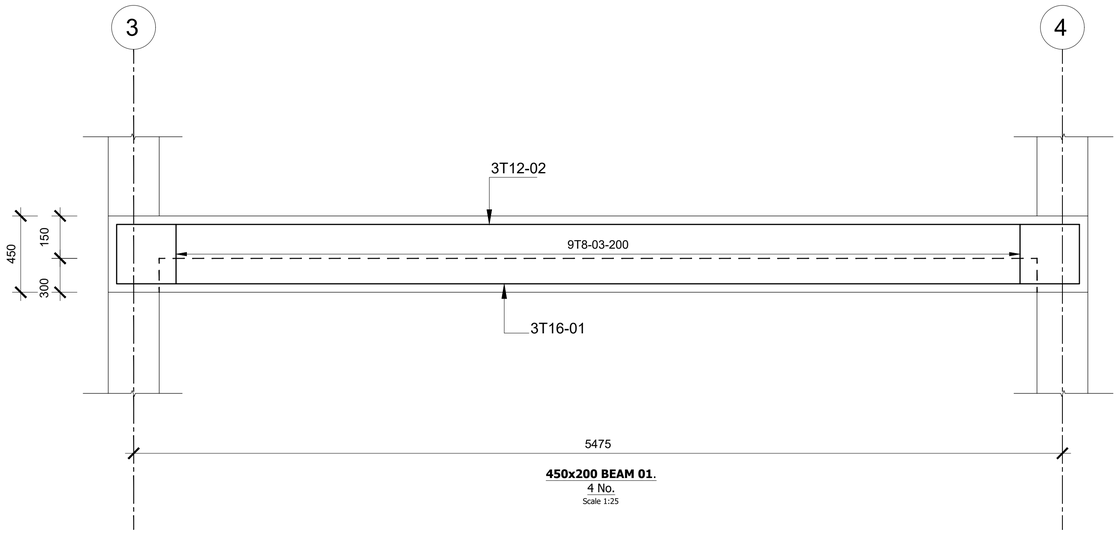

175mm SLAB BEAM LAYOUT
SCALE 1:100



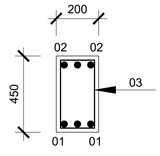

TANK FOUNDATION LAYOUT
SCALE 1:100




Section B-B
Scale 1:30




**450x200 BEAM 01.**
4 No.
Scale 1:25




**SECTION A-A**
Scale 1:25

Consultant:-

**ARPRIM CONSORTIUM**
*P.O. Box 12969-00100,*
*Nairobi, KENYA.*
*Tel: 02 608 906*
*Fax: 02 608 907*
*E-mail: info@arprimconsultants.com*

CLIENT:-
**STATE DEPARTMENT FOR FISHERIES, AQUACULTURE AND THE BLUE ECONOMY.**

PROJECT:-
**PROPOSED KENYA MARINE FISHERIES AND SOCIO-ECONOMIC DEVELOPMENT (KEMFSED) NATIONAL AND COUNTY FISHERIES INFRASTRUCTURE.**

PROJECT TITLE:-
**PROPOSED MUKOWE FISH LANDING SITE, LAMU COUNTY.**

DRAWING TITLE:-
**UNDERGROUND WATER TANK**

NOTES
1. Read this drawing in conjunction with relevant G.A., Services and Architectural drawings. Any descrepancy to be reported to the Engineer.
2. All dimensions are in millimetres unless specified otherwise.
3. All levels are indicated in m unless specified otherwise.
4. Minimum cover to all reinforcement to be:
   Stairs, Slabs & Walls = 35mm
   Beams (main bars) = 35mm
   Post-tensioned beams = 40mm
   Columns (main bars) = 40mm
   Foundations = 75mm
5. Maximum tolerance on concrete cover is +/- 5mm.
6. All high tensile (T) and mild steel (R) bars to be in accordance with BS 4449 and fabric mesh to be made from cold worked steel bars in accordance with BS 4483.
7. Minimum laps to all bars to be 50Ø unless stated otherwise.
8. Safe Bearing Pressure taken to be 250 KN/m².
9. Nominal aggregate size to be 20mm.
10. Structural concrete to be Class 25 unless stated otherwise.
11. Concrete blinding to be Class 15 unless stated otherwise.
12. Masonry Strength to be 7.0 N/mm².

| | |
|---|---|
| Designed by | DAN |
| Drawn by | DAN |
| Checked by | HOH |
| Scale | AS SHOWN |

| Rev | Description | By | Date |
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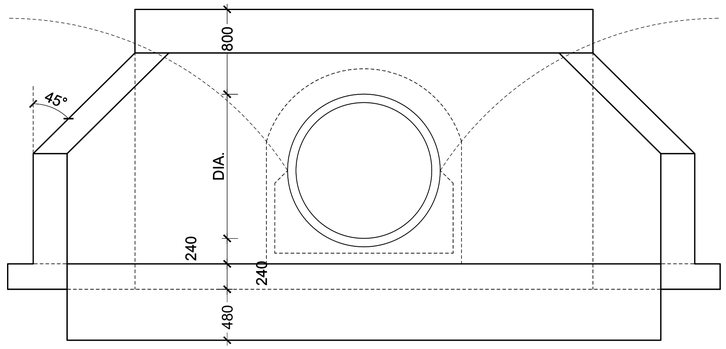
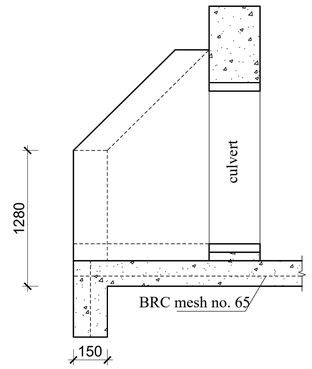
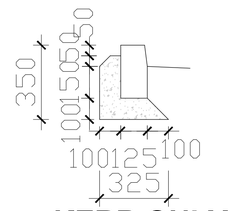
**DRAWING NO. 09-002-09**




ELEVATION

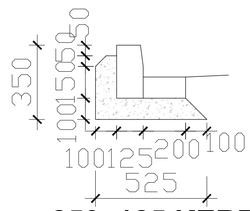



SECTION



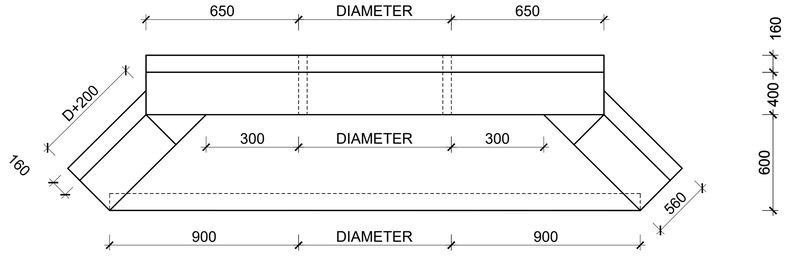

**KERB ONLY**

Scale 1:25

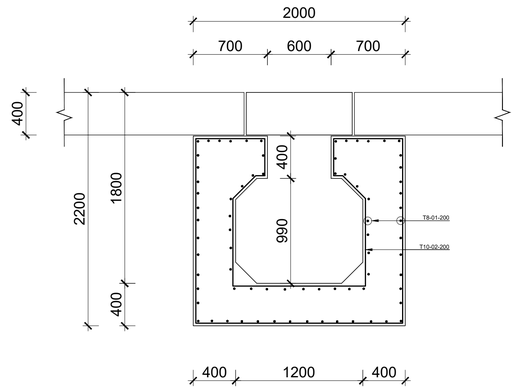



**250x125 KERB AND 200x100 CHANNEL**

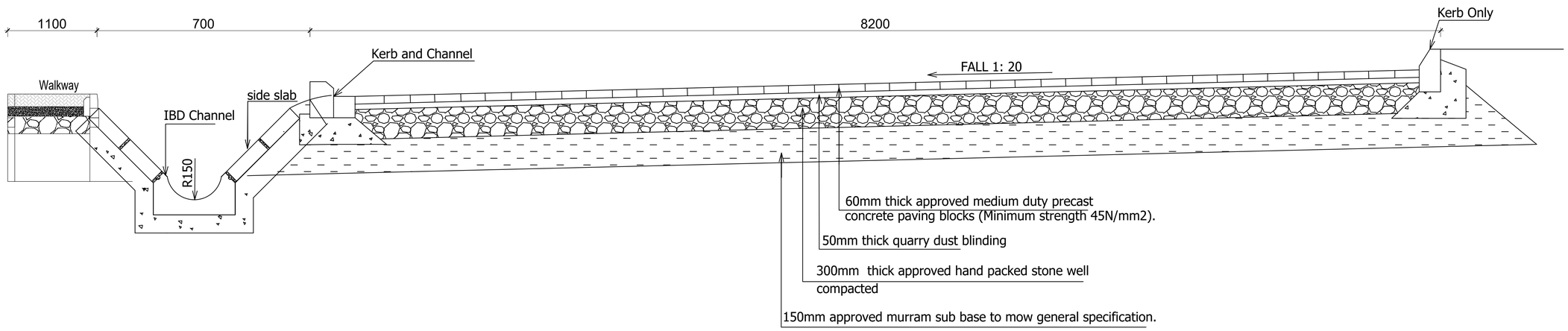
Scale 1:25




PLAN




DRAIN TYPE A: R.C COVERED OPEN DRAIN




## ROAD SECTION X-X (ONE WAY FALL)

SCALE 1:50


Consultant:-

**ARPRIM CONSORTIUM**

*P.O. Box 12969-00100,*
*Nairobi, KENYA.*
*Tel: 02 608 906*
*Fax: 02 608 907*
*E-mail: info@arprimconsultants.com*


CLIENT:-

**STATE DEPARTMENT FOR FISHERIES, AQUACULTURE AND THE BLUE ECONOMY.**

PROJECT:-

**PROPOSED KENYA MARINE FISHERIES AND SOCIO-ECONOMIC DEVELOPMENT (KEMFSED) NATIONAL AND COUNTY FISHERIES INFRASTRUCTURE.**

PROJECT TITLE:-

**PROPOSED MUKOWE FISH LANDING SITE, LAMU COUNTY.**

DRAWING TITLE:-

**CIVIL WORKS 1**

NOTES

1. Read this drawing in conjunction with relevant G.A., Services and Architectural drawings. Any descrepancy to be reported to the Engineer.
2. All dimensions are in millimetres unless specified otherwise.
3. All levels are indicated in m unless specified otherwise.
4. Minimum cover to all reinforcement to be:

| | |
|---|---|
| Stairs, Slabs & Walls | = 35mm |
| Beams (main bars) | = 35mm |
| Post-tensioned beams | = 40mm |
| Columns (main bars) | = 40mm |
| Foundations | = 75mm |

5. Maximum tolerance on concrete cover is +/- 5mm.
6. All high tensile (T) and mild steel (R) bars to be in accordance with BS 4449 and fabric mesh to be made from cold worked steel bars in accordance with BS 4483.
7. Minimum laps to all bars to be 50Ø unless stated otherwise.
8. Safe Bearing Pressure taken to be 250 KN/m².
9. Nominal aggregate size to be 20mm.
10. Structural concrete to be Class 25 unless stated otherwise.
11. Concrete blinding to be Class 15 unless stated otherwise.
12. Masonry Strength to be 7.0 N/mm².

| | |
|---|---|
| Designed by | DAN |
| Drawn by | DAN |
| Checked by | HOH |
| Scale | AS SHOWN |

| Rev | Description | By | Date |
|---|---|---|---|
| D | | | |
| C | | | |
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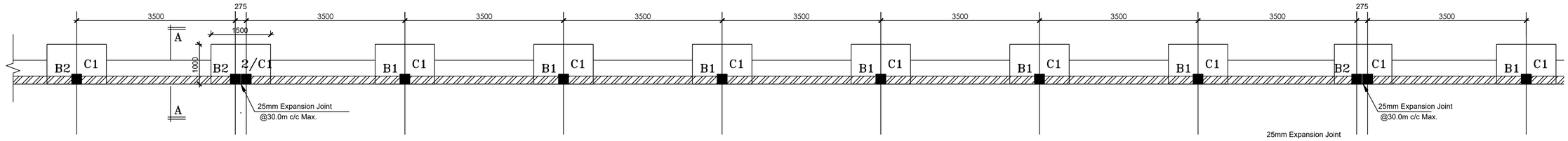
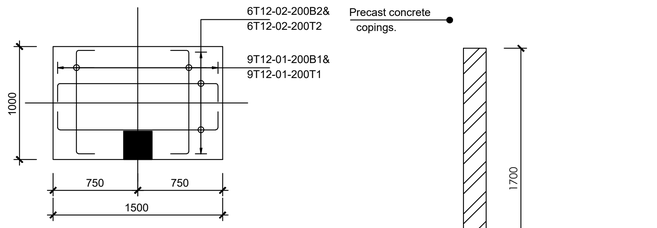
**DRAWING NO. 09-002-10**



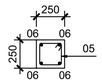

## PART BOUNDARY WALL 2: FOUNDATION LAYOUT.

SCALE 1:50

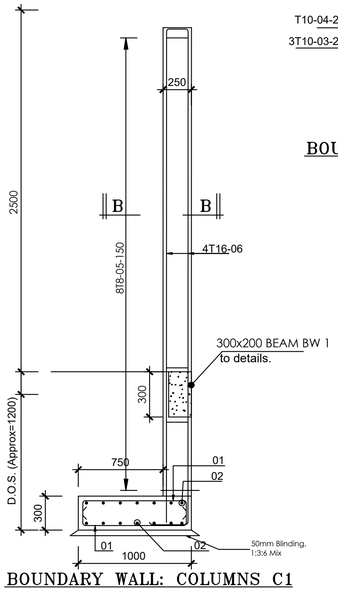



### 1000x1500x300 BASE B1

SCALE 1:25




### SECTION B–B



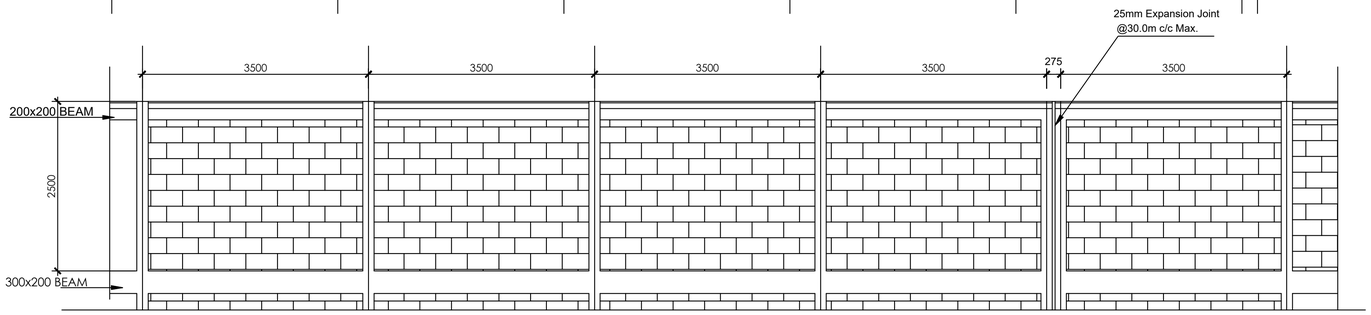

### BOUNDARY WALL: COLUMNS C1

SCALE 1:25

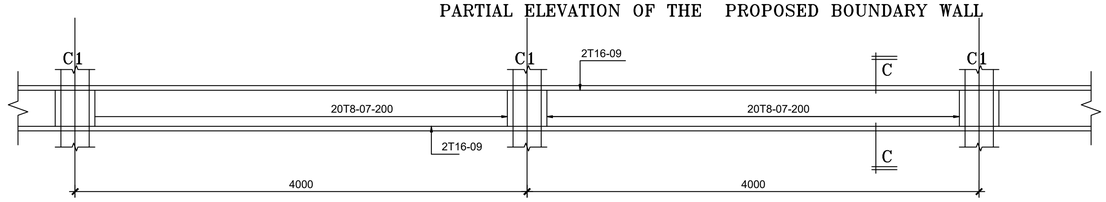


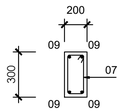

### BOUNDARY WALL: SECTION A–A.

SCALE 1:25

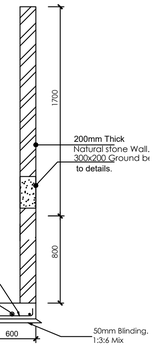



### PARTIAL ELEVATION OF THE PROPOSED BOUNDARY WALL



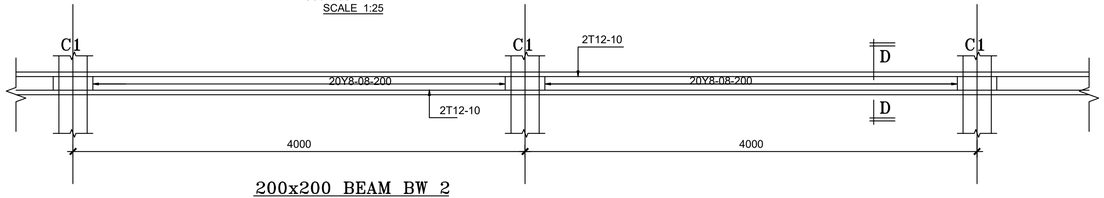

### SECTION C–C




### BOUNDARY WALL: SECTION A–A.

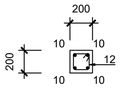
SCALE 1:25

300x200 BEAM BW 1
SCALE 1:25




### 200x200 BEAM BW 2

SCALE 1:25




### SECTION D–D

Consultant:-

**ARPRIM CONSORTIUM**
*P.O. Box 12969-00100,*
*Nairobi, KENYA.*
*Tel: 02 608 906*
*Fax: 02 608 907*
*E-mail: info@arprimconsultants.com*

CLIENT:-
**STATE DEPARTMENT FOR FISHERIES, AQUACULTURE AND THE BLUE ECONOMY.**

PROJECT:-
**PROPOSED KENYA MARINE FISHERIES AND SOCIO-ECONOMIC DEVELOPMENT (KEMFSED) NATIONAL AND COUNTY FISHERIES INFRASTRUCTURE.**

PROJECT TITLE:-
**PROPOSED MUKOWE FISH LANDING SITE, LAMU COUNTY.**

DRAWING TITLE:-
**BOUNDARY WALL DETAIL**

NOTES

1. Read this drawing in conjunction with relevant G.A., Services and Architectural drawings. Any descrepancy to be reported to the Engineer.
2. All dimensions are in millimetres unless specified otherwise.
3. All levels are indicated in m unless specified otherwise.
4. Minimum cover to all reinforcement to be:

| | |
|---|---|
| Stairs, Slabs & Walls | = 35mm |
| Beams (main bars) | = 35mm |
| Post-tensioned beams | = 40mm |
| Columns (main bars) | = 40mm |
| Foundations | = 75mm |

5. Maximum tolerance on concrete cover is +/- 5mm.
6. All high tensile (T) and mild steel (R) bars to be in accordance with BS 4449 and fabric mesh to be made from cold worked steel bars in accordance with BS 4483.
7. Minimum laps to all bars to be 50Ø unless stated otherwise.
8. Safe Bearing Pressure taken to be 250 KN/m².
9. Nominal aggregate size to be 20mm.
10. Structural concrete to be Class 25 unless stated otherwise.
11. Concrete blinding to be Class 15 unless stated otherwise.
12. Masonry Strength to be 7.0 N/mm².

| | |
|---|---|
| Designed by | DAN |
| Drawn by | DAN |
| Checked by | HOH |
| Scale | AS SHOWN |

| Rev | Description | By | Date |
|---|---|---|---|
| D | | | |
| C | | | |
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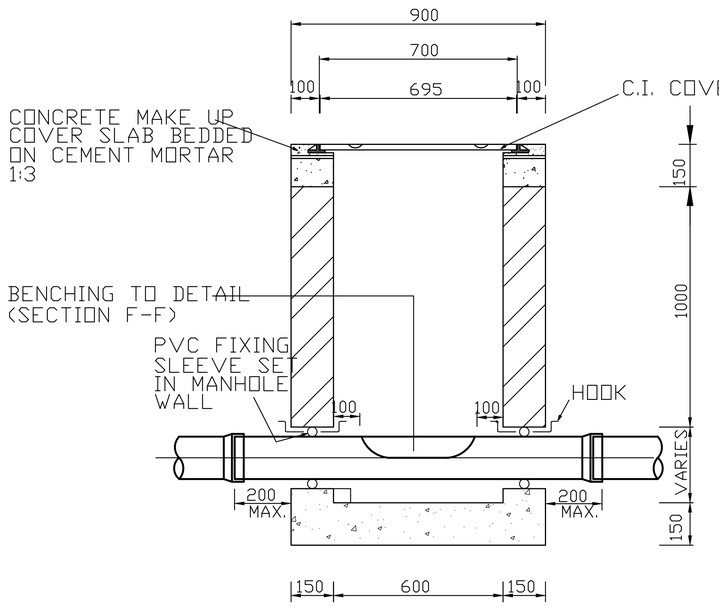
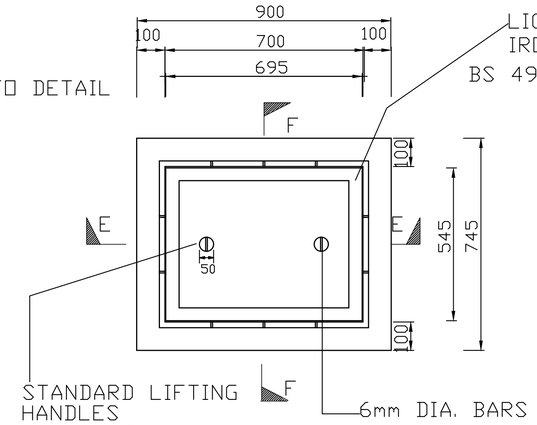
**DRAWING NO. 09-002-11**



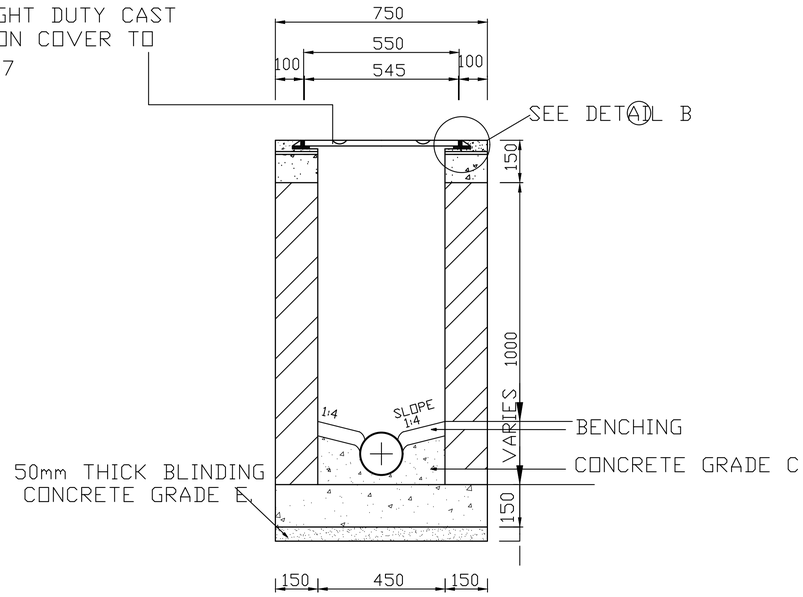

## SECTION E-E

SCALE A1- 1:15
A3- 1:30




## PLAN

SCALE A1- 1:15
A3- 1:30



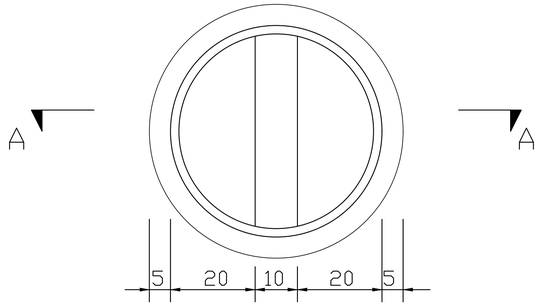

## SECTION F-F

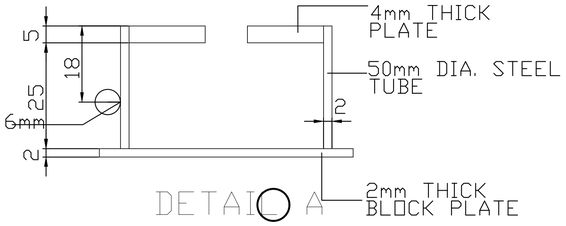
SCALE A1- 1:15
A3- 1:30

# INSPECTION CHAMBER DETAILS

## NOTES:

1. INSPECTION CHAMBER SHOULD BE SIZE 600x450mm UPTO DEPTH OF 1000mm
2. FOR INSPECTION CHAMBER EXCEEDING DEPTH 1000mm SIZE SHOULD BE 850x1200mm
3. WALLS OF INSPECTION CHAMBER TO BE OF MASONRY



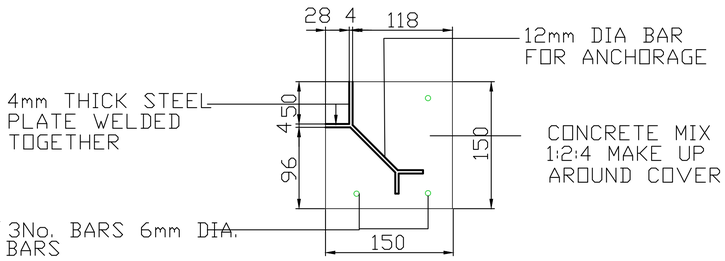




## DETAIL A

## SECTION A-A

## DETAIL OF LIFTING KEY HOLE

SCALE 1 : 1




## DETAIL B

## SECTION SHOWING DETAIL OF FRAME FOR P.C.C - I.C COVER

SCALE 1 : 5


Consultant:-

**ARPRIM CONSORTIUM**
*P.O. Box 12969-00100,*
*Nairobi, KENYA.*
*Tel: 02 608 906*
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*E-mail: info@arprimconsultants.com*


CLIENT:-
**STATE DEPARTMENT FOR FISHERIES, AQUACULTURE AND THE BLUE ECONOMY.**

PROJECT:-
**PROPOSED KENYA MARINE FISHERIES AND SOCIO-ECONOMIC DEVELOPMENT (KEMFSED) NATIONAL AND COUNTY FISHERIES INFRASTRUCTURE.**

PROJECT TITLE:-
**PROPOSED MUKOWE FISH LANDING SITE, LAMU COUNTY.**

DRAWING TITLE:-
**CIVIL WORKS 2**

NOTES
1. Read this drawing in conjunction with relevant G.A., Services and Architectural drawings. Any descrepancy to be reported to the Engineer.
2. All dimensions are in millimetres unless specified otherwise.
3. All levels are indicated in m unless specified otherwise.
4. Minimum cover to all reinforcement to be:

| | |
|---|---|
| Stairs, Slabs & Walls | = 35mm |
| Beams (main bars) | = 35mm |
| Post-tensioned beams | = 40mm |
| Columns (main bars) | = 40mm |
| Foundations | = 75mm |

5. Maximum tolerance on concrete cover is +/- 5mm.
6. All high tensile (T) and mild steel (R) bars to be in accordance with BS 4449 and fabric mesh to be made from cold worked steel bars in accordance with BS 4483.
7. Minimum laps to all bars to be 50Ø unless stated otherwise.
8. Safe Bearing Pressure taken to be 250 KN/m².
9. Nominal aggregate size to be 20mm.
10. Structural concrete to be Class 25 unless stated otherwise.
11. Concrete blinding to be Class 15 unless stated otherwise.
12. Masonry Strength to be 7.0 N/mm².

| | |
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| Designed by | DAN |
| Drawn by | DAN |
| Checked by | HOH |
| Scale | AS SHOWN |

| Rev | Description | By | Date |
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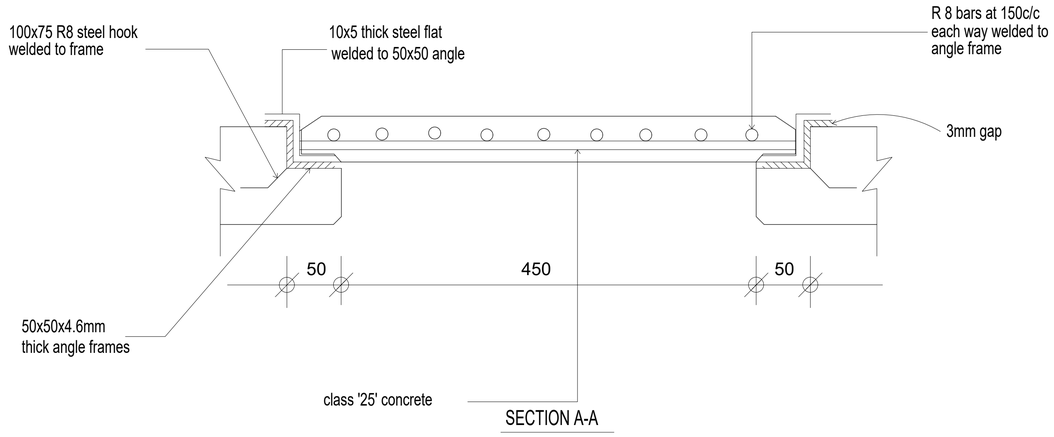
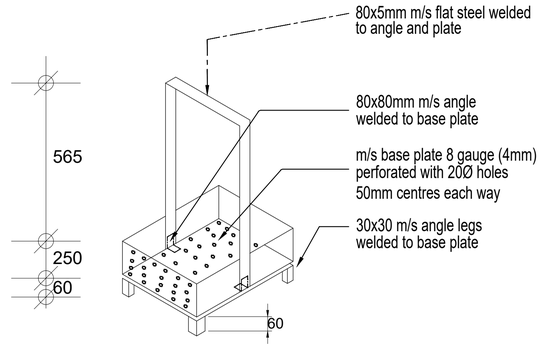
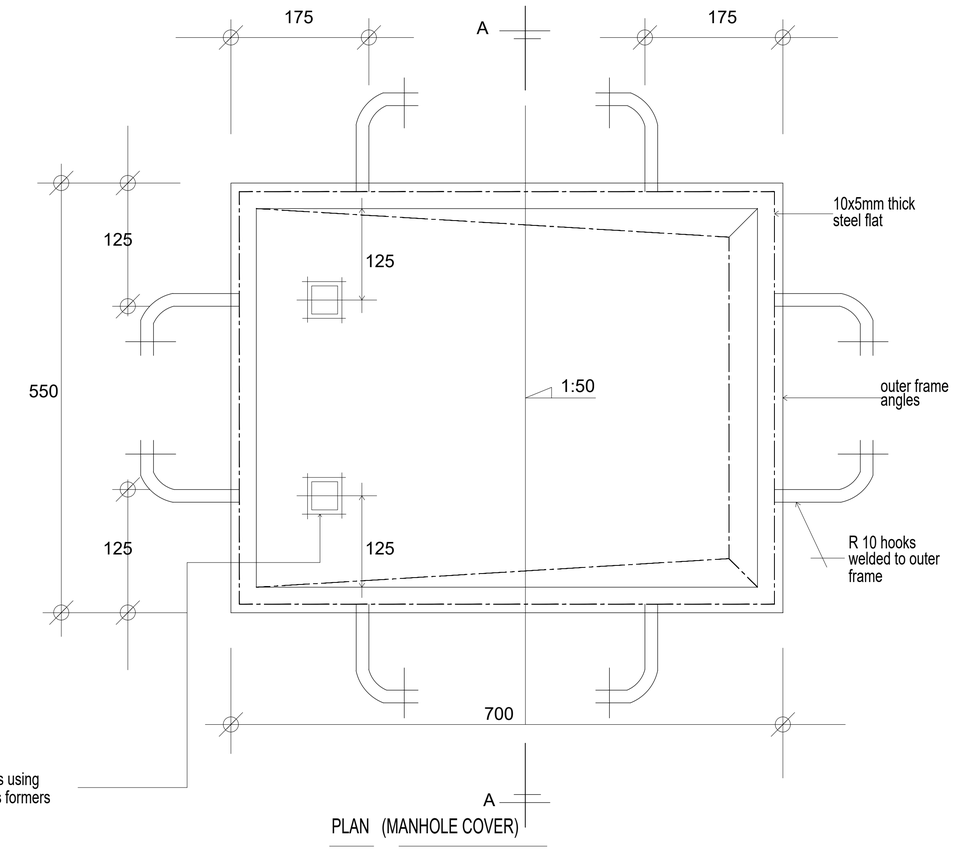
**DRAWING NO. 09-002-12**



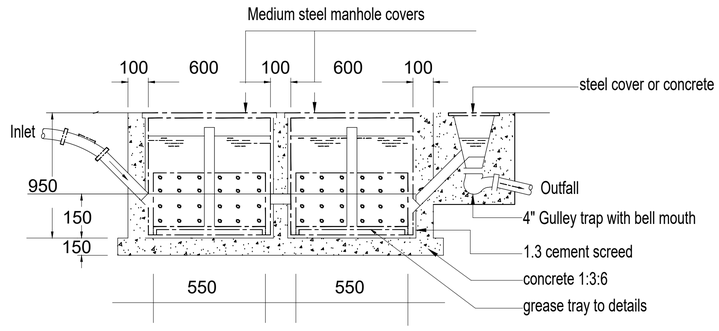

SECTION A-A



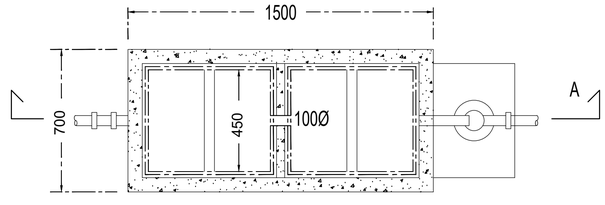

GREASE TRAY
(NTS)




PLAN (MANHOLE COVER)




SECTION A-A
(NTS)




GREASE TRAP PLAN - DETAILS
(NTS)

Consultant:-

**ARPRIM CONSORTIUM**
*P.O. Box 12969-00100,*
*Nairobi, KENYA.*
*Tel: 02 608 906*
*Fax: 02 608 907*
*E-mail: info@arprimconsultants.com*

CLIENT:-
**STATE DEPARTMENT FOR FISHERIES, AQUACULTURE AND THE BLUE ECONOMY.**

PROJECT:-
**PROPOSED KENYA MARINE FISHERIES AND SOCIO-ECONOMIC DEVELOPMENT (KEMFSED) NATIONAL AND COUNTY FISHERIES INFRASTRUCTURE.**

PROJECT TITLE:-
**PROPOSED MUKOWE FISH LANDING SITE, LAMU COUNTY.**

DRAWING TITLE:-
**CIVIL WORKS 3**

NOTES

1. Read this drawing in conjunction with relevant G.A., Services and Architectural drawings. Any descrepancy to be reported to the Engineer.
2. All dimensions are in millimetres unless specified otherwise.
3. All levels are indicated in m unless specified otherwise.
4. Minimum cover to all reinforcement to be:

| | |
|---|---|
| Stairs, Slabs & Walls | = 35mm |
| Beams (main bars) | = 35mm |
| Post-tensioned beams | = 40mm |
| Columns (main bars) | = 40mm |
| Foundations | = 75mm |

5. Maximum tolerance on concrete cover is +/- 5mm.
6. All high tensile (T) and mild steel (R) bars to be in accordance with BS 4449 and fabric mesh to be made from cold worked steel bars in accordance with BS 4483.
7. Minimum laps to all bars to be 50Ø unless stated otherwise.
8. Safe Bearing Pressure taken to be 250 KN/m².
9. Nominal aggregate size to be 20mm.
10. Structural concrete to be Class 25 unless stated otherwise.
11. Concrete blinding to be Class 15 unless stated otherwise.
12. Masonry Strength to be 7.0 N/mm².

| | |
|---|---|
| Designed by | DAN |
| Drawn by | DAN |
| Checked by | HOH |
| Scale | AS SHOWN |

| Rev | Description | By | Date |
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| D | | | |
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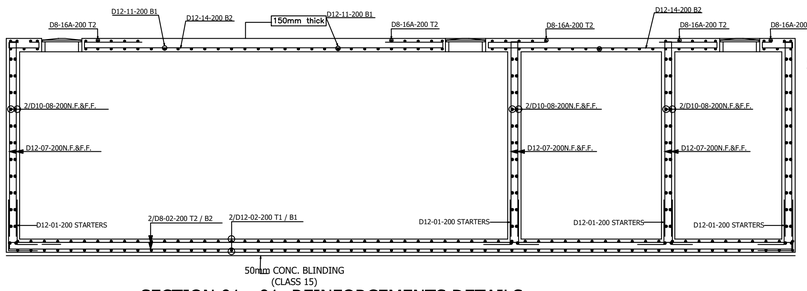
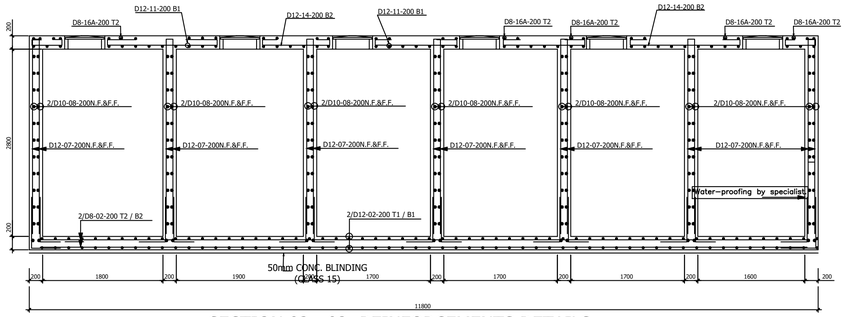
**DRAWING NO. 09-002-13**



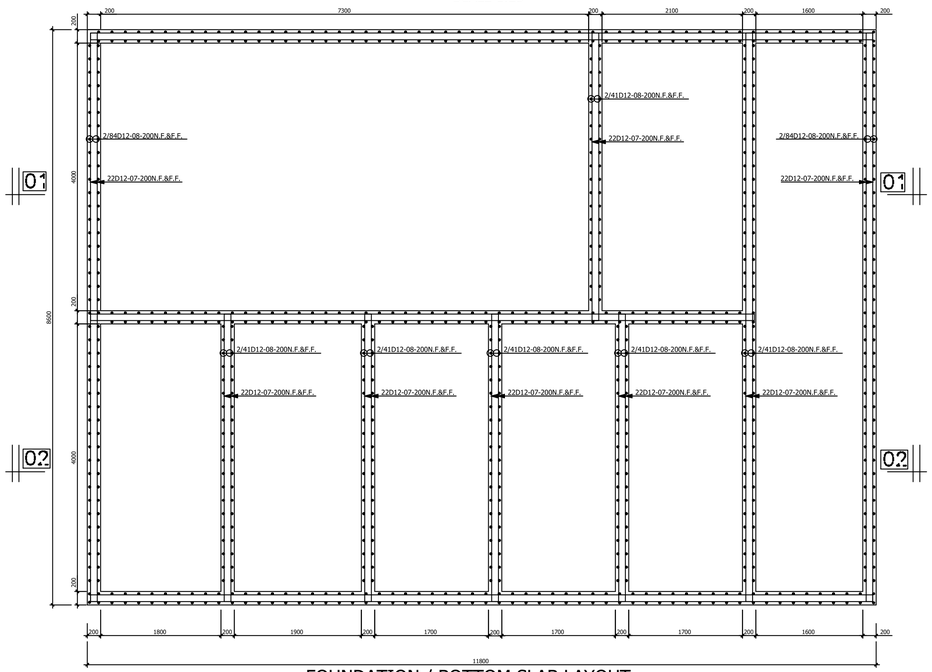

## SECTION 01 - 01: REINFORCEMENTS DETAILS.

SCALE 1:25



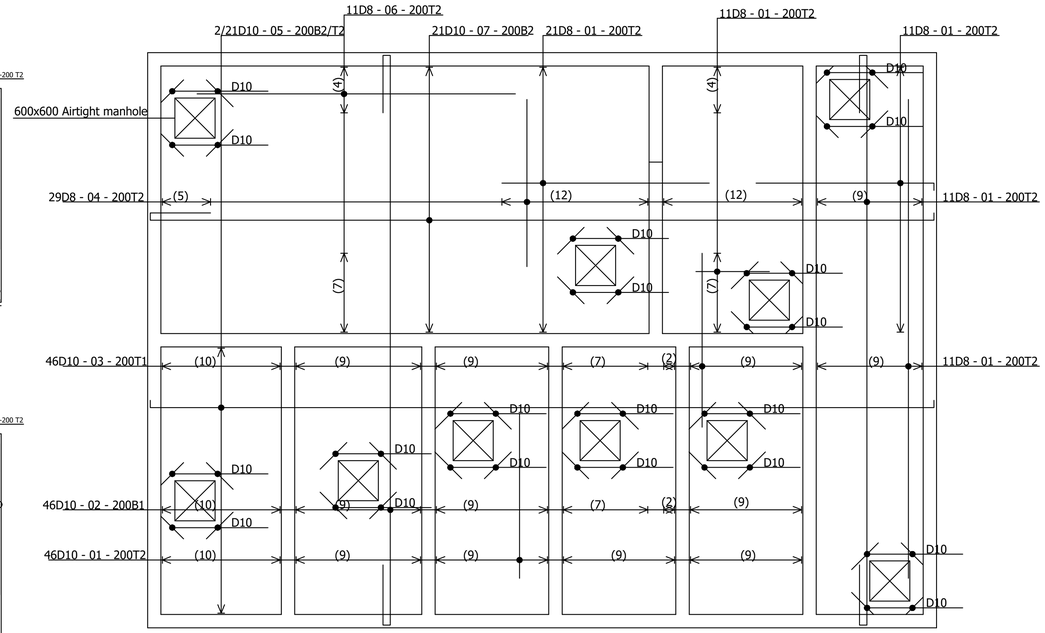

## SECTION 02 - 02: REINFORCEMENTS DETAILS.

SCALE 1:25




## FOUNDATION / BOTTOM SLAB LAYOUT

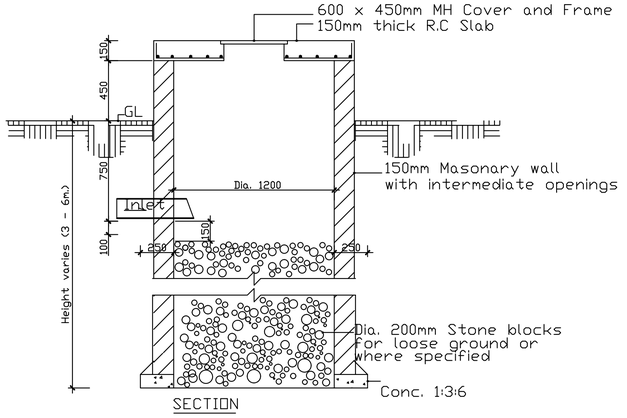
SCALE 1:25



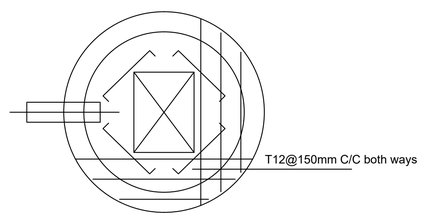

## TOP SLAB LAYOUT

150mm THICK SOLID SLAB

SCALE 1:25




SECTION




Plan

(Depth of Soak pit to be determined on site)

## SOAK PIT DETAILS

Consultant:-

**ARPRIM CONSORTIUM**

*P.O. Box 12969-00100,*
*Nairobi, KENYA.*
*Tel: 02 608 906*
*Fax: 02 608 907*
*E-mail: info@arprimconsultants.com*

CLIENT:-

**STATE DEPARTMENT FOR FISHERIES, AQUACULTURE AND THE BLUE ECONOMY.**

PROJECT:-

**PROPOSED KENYA MARINE FISHERIES AND SOCIO-ECONOMIC DEVELOPMENT (KEMFSED) NATIONAL AND COUNTY FISHERIES INFRASTRUCTURE.**

PROJECT TITLE:-

**PROPOSED MUKOWE FISH LANDING SITE, LAMU COUNTY.**

DRAWING TITLE:-

**BIODIGESTER AND SOAK-PIT DETAIL**

NOTES

1. Read this drawing in conjunction with relevant G.A., Services and Architectural drawings. Any descrepancy to be reported to the Engineer.
2. All dimensions are in millimetres unless specified otherwise.
3. All levels are indicated in m unless specified otherwise.
4. Minimum cover to all reinforcement to be:

| | |
|---|---|
| Stairs, Slabs & Walls | = 35mm |
| Beams (main bars) | = 35mm |
| Post-tensioned beams | = 40mm |
| Columns (main bars) | = 40mm |
| Foundations | = 75mm |

5. Maximum tolerance on concrete cover is +/- 5mm.
6. All high tensile (T) and mild steel (R) bars to be in accordance with BS 4449 and fabric mesh to be made from cold worked steel bars in accordance with BS 4483.
7. Minimum laps to all bars to be 50Ø unless stated otherwise.
8. Safe Bearing Pressure taken to be 250 KN/m².
9. Nominal aggregate size to be 20mm.
10. Structural concrete to be Class 25 unless stated otherwise.
11. Concrete blinding to be Class 15 unless stated otherwise.
12. Masonry Strength to be 7.0 N/mm².

| | |
|---|---|
| Designed by | DAN |
| Drawn by | DAN |
| Checked by | HOH |
| Scale | AS SHOWN |

| Rev | Description | By | Date |
|---|---|---|---|
| D | | | |
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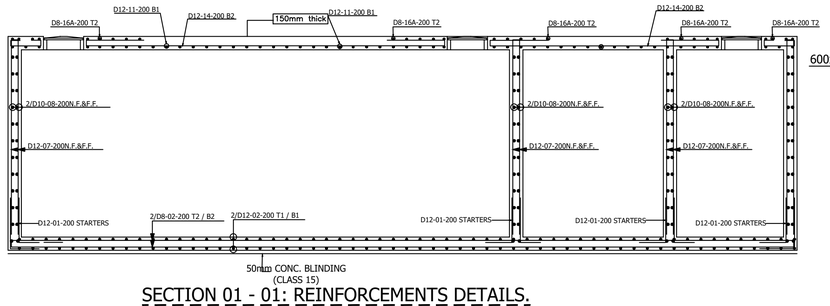
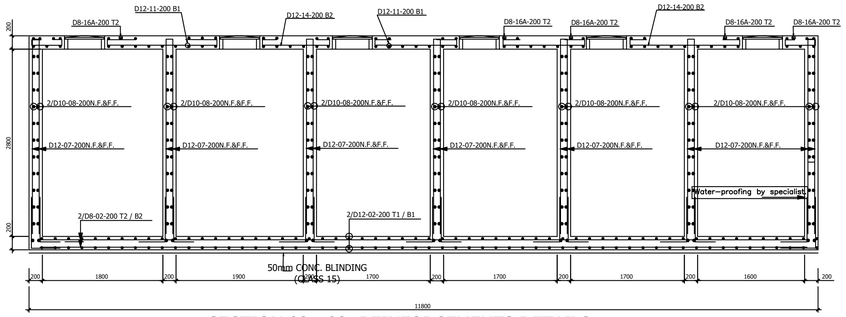
**DRAWING NO. 09-002-14**



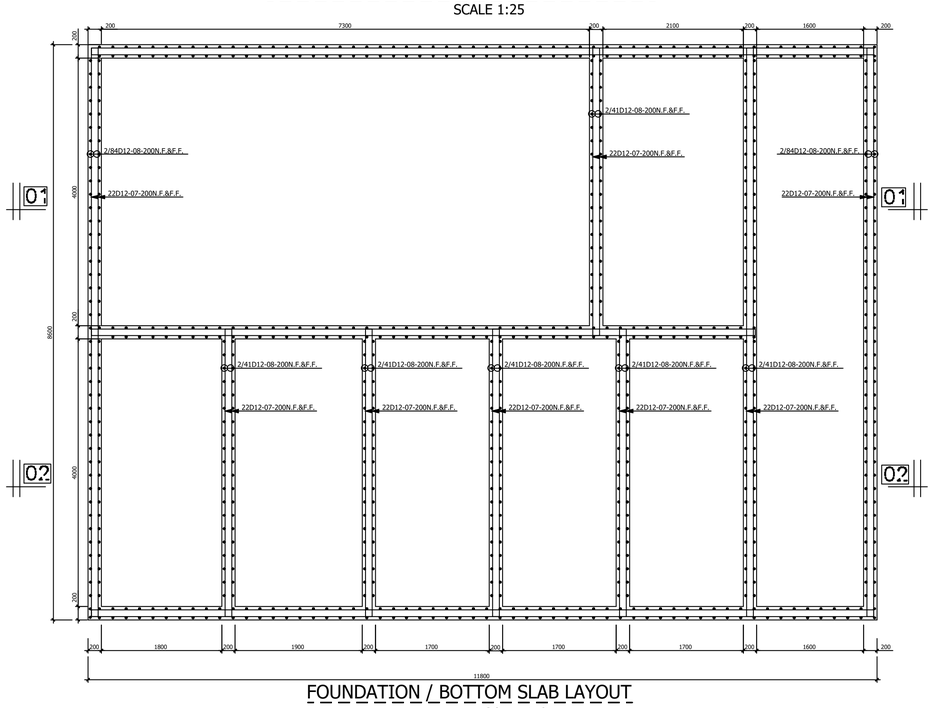

## SECTION 01 - 01: REINFORCEMENTS DETAILS.

SCALE 1:25



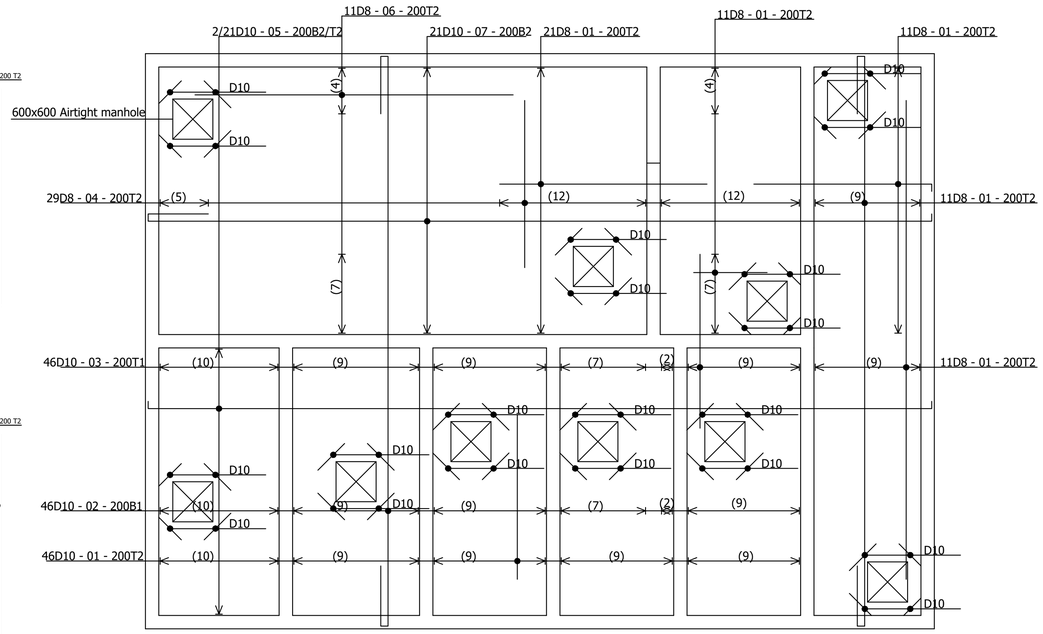

## SECTION 02 - 02: REINFORCEMENTS DETAILS.

SCALE 1:25




## FOUNDATION / BOTTOM SLAB LAYOUT

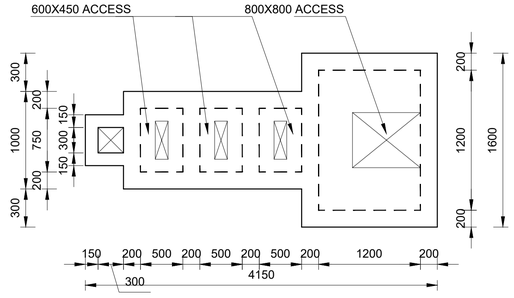
SCALE 1:25




## TOP SLAB LAYOUT

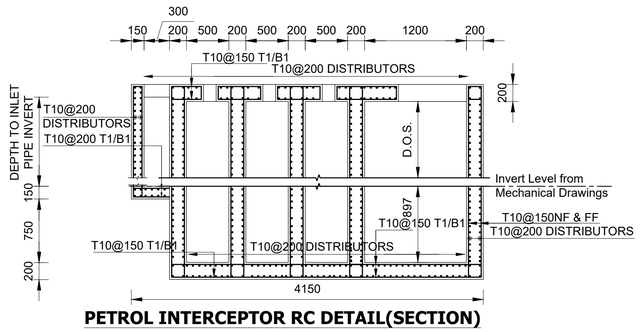
150mm THICK SOLID SLAB

SCALE 1:25




## PETROL INTERCEPTOR (PLAN)

Scale 1:50




## PETROL INTERCEPTOR RC DETAIL(SECTION)

Scale 1:50


Consultant:-

**ARPRIM CONSORTIUM**

***P.O. Box 12969-00100,***
***Nairobi, KENYA.***
***Tel: 02 608 906***
***Fax: 02 608 907***
***E-mail: info@arprimconsultants.com***


CLIENT:-

**STATE DEPARTMENT FOR FISHERIES, AQUACULTURE AND THE BLUE ECONOMY.**

PROJECT:-

**PROPOSED KENYA MARINE FISHERIES AND SOCIO-ECONOMIC DEVELOPMENT (KEMFSED) NATIONAL AND COUNTY FISHERIES INFRASTRUCTURE.**

PROJECT TITLE:-

**PROPOSED MUKOWE FISH LANDING SITE, LAMU COUNTY.**

DRAWING TITLE:-

**BIO-REACTOR AND INTERCEPTOR DETAIL**

NOTES

1. Read this drawing in conjunction with relevant G.A., Services and Architectural drawings. Any descrepancy to be reported to the Engineer.
2. All dimensions are in millimetres unless specified otherwise.
3. All levels are indicated in m unless specified otherwise.
4. Minimum cover to all reinforcement to be:

| | |
|---|---|
| Stairs, Slabs & Walls | = 35mm |
| Beams (main bars) | = 35mm |
| Post-tensioned beams | = 40mm |
| Columns (main bars) | = 40mm |
| Foundations | = 75mm |

5. Maximum tolerance on concrete cover is +/- 5mm.
6. All high tensile (T) and mild steel (R) bars to be in accordance with BS 4449 and fabric mesh to be made from cold worked steel bars in accordance with BS 4483.
7. Minimum laps to all bars to be 50Ø unless stated otherwise.
8. Safe Bearing Pressure taken to be 250 KN/m².
9. Nominal aggregate size to be 20mm.
10. Structural concrete to be Class 25 unless stated otherwise.
11. Concrete blinding to be Class 15 unless stated otherwise.
12. Masonry Strength to be 7.0 N/mm².

| | |
|---|---|
| Designed by | DAN |
| Drawn by | DAN |
| Checked by | HOH |
| Scale | AS SHOWN |

| Rev | Description | By | Date |
|---|---|---|---|
| D | | | |
| C | | | |
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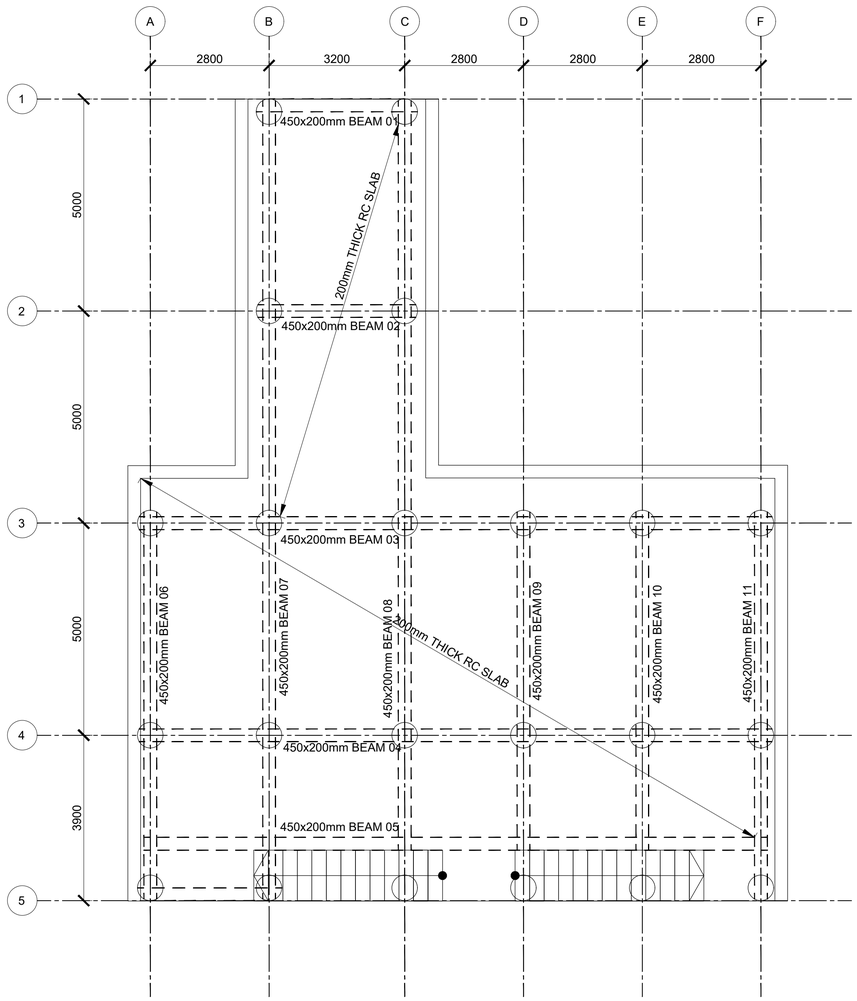
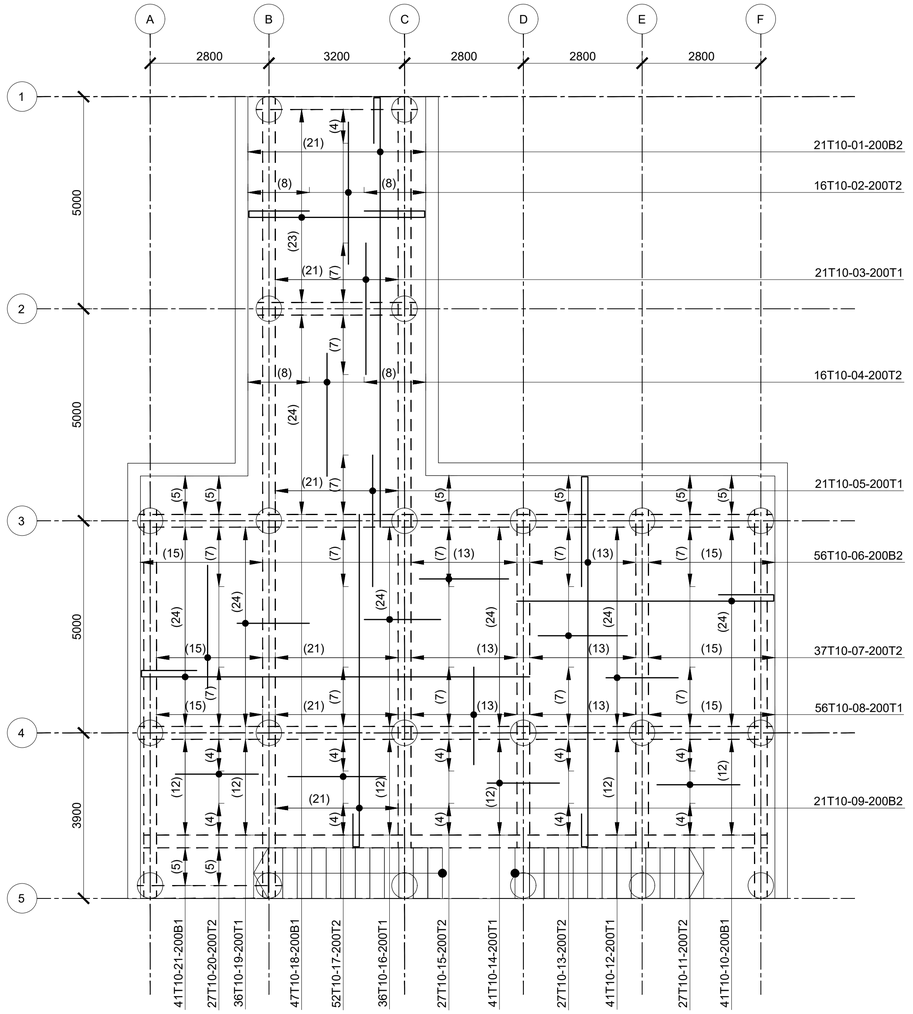
| A | | | |

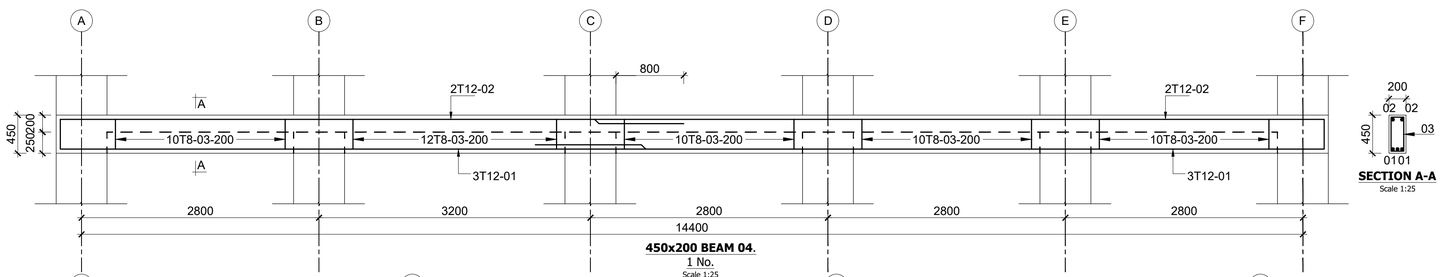
**DRAWING NO. 09-002-15**




## JETTY LAYOUT



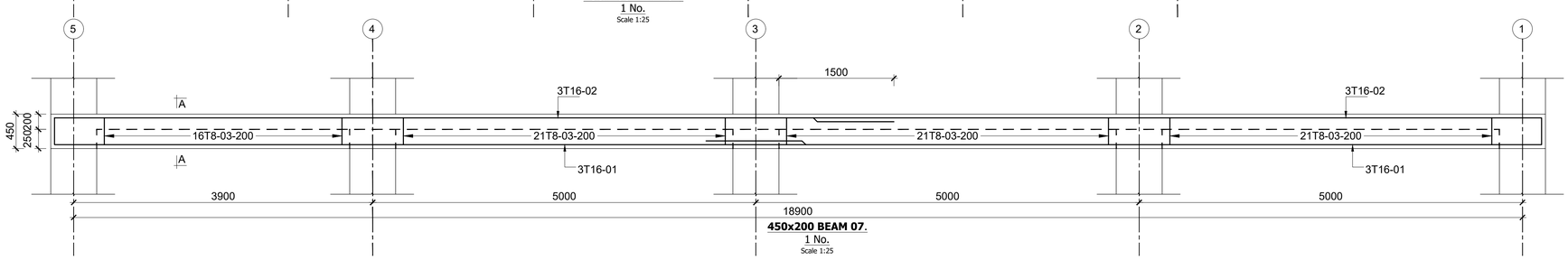

## JETTY SLAB RC DETAIL



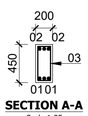

**450x200 BEAM 04.**
1 No.
Scale 1:25




**SECTION A-A**
Scale 1:25




**450x200 BEAM 07.**
1 No.
Scale 1:25




**SECTION A-A**
Scale 1:25

Consultant:-
**ARPRIM CONSORTIUM**
*P.O. Box 12969-00100,*
*Nairobi, KENYA.*
*Tel: 02 608 906*
*Fax: 02 608 907*
*E-mail: info@arprimconsultants.com*

CLIENT:-
**STATE DEPARTMENT FOR FISHERIES, AQUACULTURE AND THE BLUE ECONOMY.**

PROJECT:-
**PROPOSED KENYA MARINE FISHERIES AND SOCIO-ECONOMIC DEVELOPMENT (KEMFSED) NATIONAL AND COUNTY FISHERIES INFRASTRUCTURE.**

PROJECT TITLE:-
**PROPOSED MUKOWE FISH LANDING SITE, LAMU COUNTY.**

DRAWING TITLE:-
**JETTY LAYOUT, SLAB AND BEAM DETAIL**

## NOTES

1. Read this drawing in conjunction with relevant G.A., Services and Architectural drawings. Any descrepancy to be reported to the Engineer.
2. All dimensions are in millimetres unless specified otherwise.
3. All levels are indicated in m unless specified otherwise.
4. Minimum cover to all reinforcement to be:
   - Stairs, Slabs & Walls = 35mm
   - Beams (main bars) = 35mm
   - Post-tensioned beams = 40mm
   - Columns (main bars) = 40mm
   - Foundations = 75mm
5. Maximum tolerance on concrete cover is +/- 5mm.
6. All high tensile (T) and mild steel (R) bars to be in accordance with BS 4449 and fabric mesh to be made from cold worked steel bars in accordance with BS 4483.
7. Minimum laps to all bars to be 50Ø unless stated otherwise.
8. Safe Bearing Pressure taken to be 250 KN/m².
9. Nominal aggregate size to be 20mm.
10. Structural concrete to be Class 35 unless stated otherwise.
11. Concrete blinding to be Class 15 unless stated otherwise.
12. Masonry Strength to be 7.0 N/mm².

| | |
|---|---|
| Designed by | DAN |
| Drawn by | DAN |
| Checked by | HOH |
| Scale | AS SHOWN |

| Rev. | Description | By | Date |
|---|---|---|---|
| D | | | |
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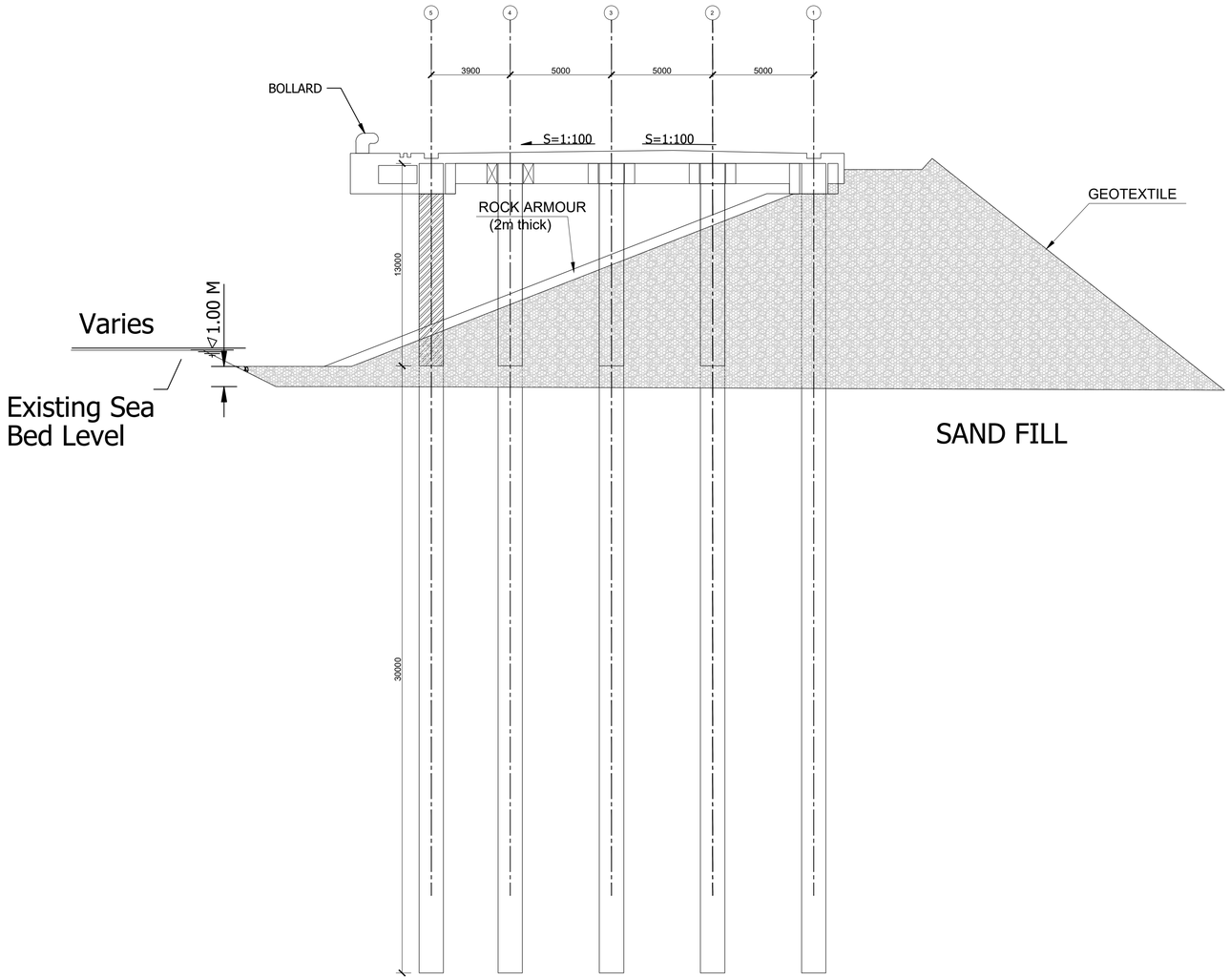
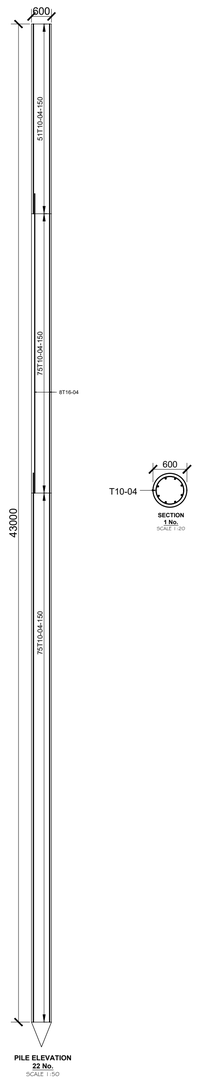
| A | | | |

**DRAWING NO. 09-002-16**




**TYPICAL JETTY SECTION**

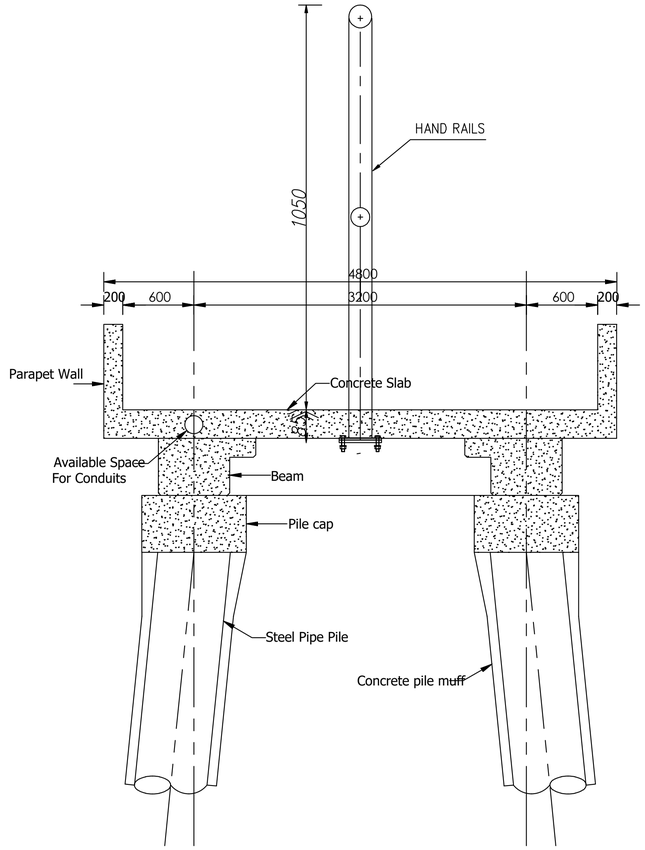
Scale 1:50



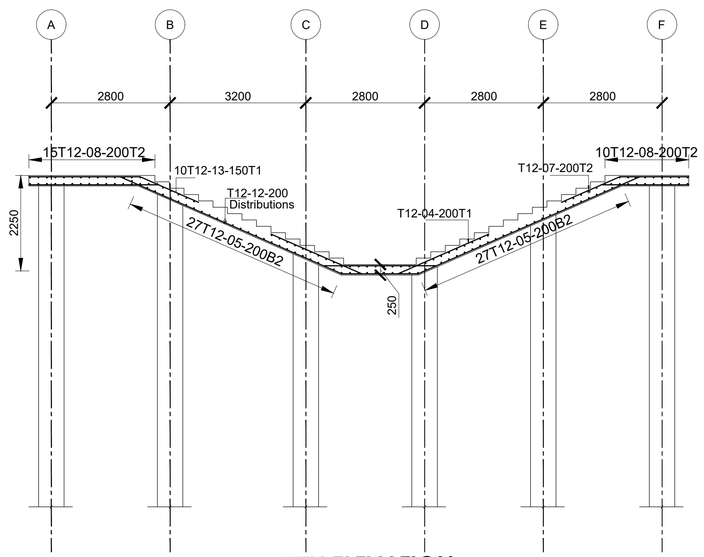

PILE ELEVATION
22 No.
SCALE 1:50




SECTION
1 No.
SCALE 1:20




**JETTY WALKWAY SECTION**
**SCALE 1:30**




**JETTY ELEVATION**
**SCALE 1:30**


Consultant:-

**ARPRIM CONSORTIUM**
*P.O. Box 12969-00100,*
*Nairobi, KENYA.*
*Tel: 02 608 906*
*Fax: 02 608 907*
*E-mail: info@arprimconsultants.com*


CLIENT:-
**STATE DEPARTMENT FOR FISHERIES, AQUACULTURE AND THE BLUE ECONOMY.**

PROJECT:-
**PROPOSED KENYA MARINE FISHERIES AND SOCIO-ECONOMIC DEVELOPMENT (KEMFSED) NATIONAL AND COUNTY FISHERIES INFRASTRUCTURE.**

PROJECT TITLE:-
**PROPOSED MUKOWE FISH LANDING SITE, LAMU COUNTY.**

DRAWING TITLE:-
**JETTY SECTION AND PILE DETAIL**

NOTES

1. Read this drawing in conjunction with relevant G.A., Services and Architectural drawings. Any descrepancy to be reported to the Engineer.
2. All dimensions are in millimetres unless specified otherwise.
3. All levels are indicated in m unless specified otherwise.
4. Minimum cover to all reinforcement to be:

| | |
|---|---|
| Stairs, Slabs & Walls | = 35mm |
| Beams (main bars) | = 35mm |
| Post-tensioned beams | = 40mm |
| Columns (main bars) | = 40mm |
| Foundations | = 75mm |

5. Maximum tolerance on concrete cover is +/- 5mm.
6. All high tensile (T) and mild steel (R) bars to be in accordance with BS 4449 and fabric mesh to be made from cold worked steel bars in accordance with BS 4483.
7. Minimum laps to all bars to be 50Ø unless stated otherwise.
8. Safe Bearing Pressure taken to be 250 KN/m².
9. Nominal aggregate size to be 20mm.
10. Structural concrete to be Class 35 unless stated otherwise.
11. Concrete blinding to be Class 15 unless stated otherwise.
12. Masonry Strength to be 7.0 N/mm².

| | |
|---|---|
| Designed by | DAN |
| Drawn by | DAN |
| Checked by | HOH |
| Scale | AS SHOWN |

| Rev | Description | By | Date |
|---|---|---|---|
| D | | | |
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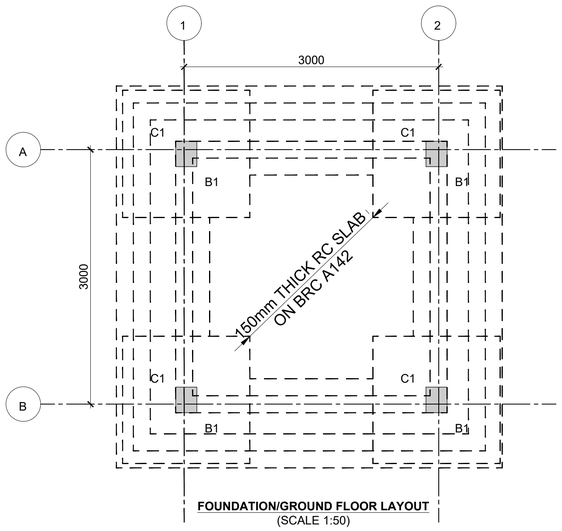
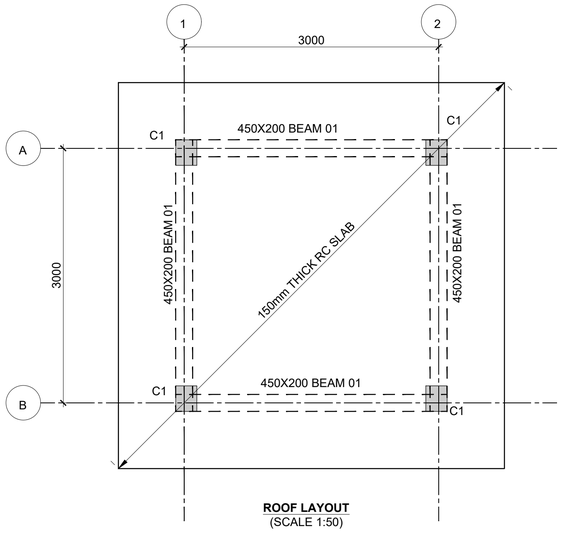
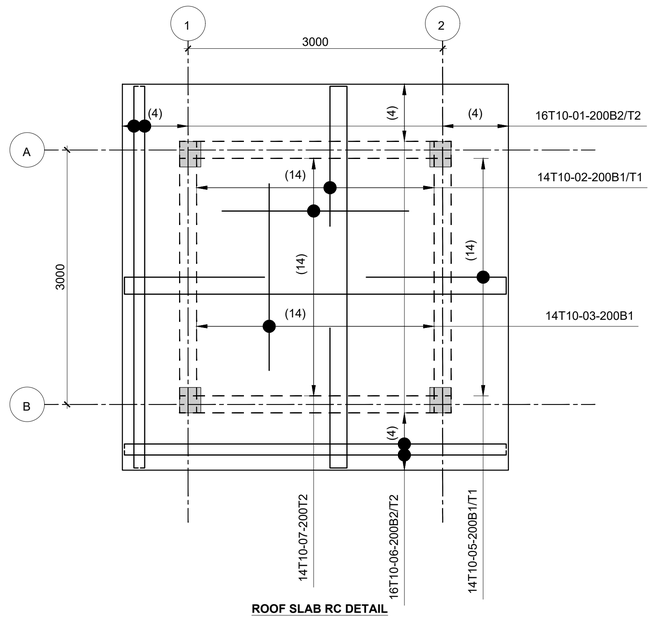
**DRAWING NO. 09-002-17**



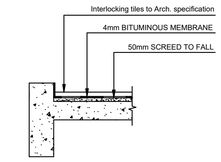

**FOUNDATION/GROUND FLOOR LAYOUT**
(SCALE 1:50)



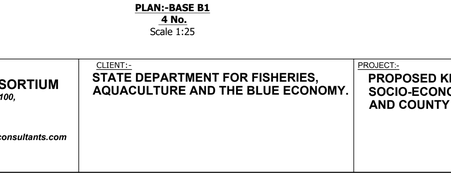

**ROOF LAYOUT**
(SCALE 1:50)



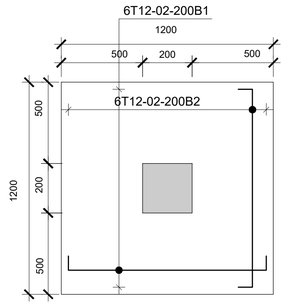

**ROOF SLAB RC DETAIL**
(SCALE 1:50)



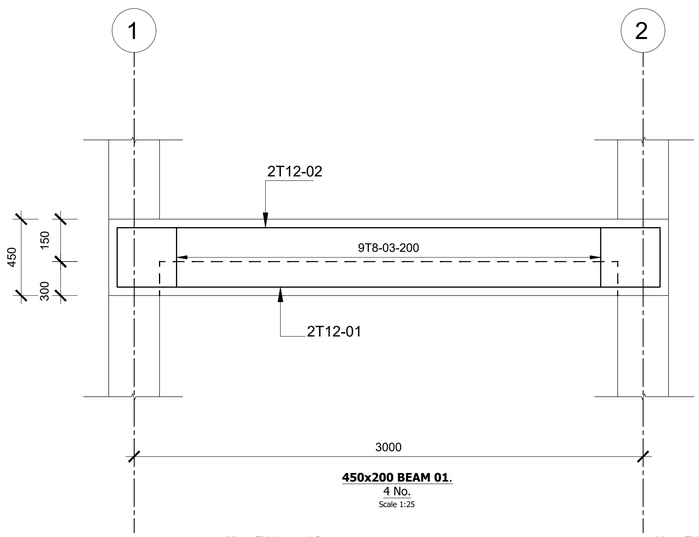

TYPICAL ROOF SLAB
W/POOFING DETAIL



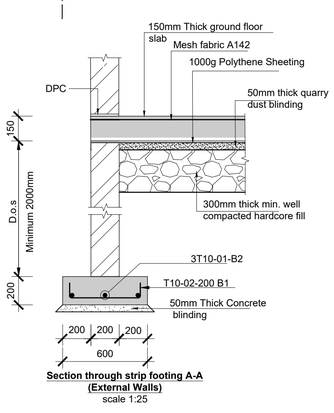

**SEC:-BASE B1**
**(WITH COL C1)**
Scale 1:25



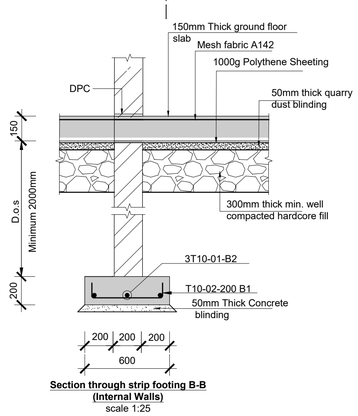

**PLAN:-BASE B1**
**4 No.**
Scale 1:25



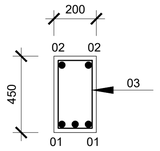

**450x200 BEAM 01.**
4 No.
Scale 1:25



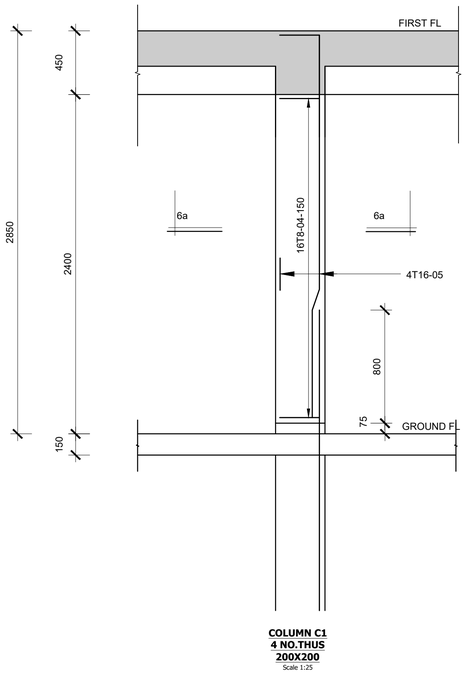

**Section through strip footing A-A**
**(External Walls)**
scale 1:25



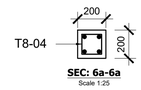

**Section through strip footing B-B**
**(Internal Walls)**
scale 1:25




**SECTION A-A**
Scale 1:25




**COLUMN C1**
**4 NO.THUS**
**200X200**
Scale 1:25




**SEC: 6a-6a**
Scale 1:25

Consultant:-

**ARPRIM CONSORTIUM**
*P.O. Box 12969-00100,*
*Nairobi, KENYA.*
*Tel: 02 608 906*
*Fax: 02 608 907*
*E-mail: info@arprimconsultants.com*

CLIENT:-
**STATE DEPARTMENT FOR FISHERIES, AQUACULTURE AND THE BLUE ECONOMY.**

PROJECT:-
**PROPOSED KENYA MARINE FISHERIES AND SOCIO-ECONOMIC DEVELOPMENT (KEMFSED) NATIONAL AND COUNTY FISHERIES INFRASTRUCTURE.**

PROJECT TITLE:-
**PROPOSED MUKOWE FISH LANDING SITE, LAMU COUNTY.**

DRAWING TITLE:-
**PUMP HOUSE - STRUCTURAL DETAIL**

NOTES
1. Read this drawing in conjunction with relevant G.A., Services and Architectural drawings. Any descrepancy to be reported to the Engineer.
2. All dimensions are in millimetres unless specified otherwise.
3. All levels are indicated in m unless specified otherwise.
4. Minimum cover to all reinforcement to be:

| | |
|---|---|
| Stairs, Slabs & Walls | = 35mm |
| Beams (main bars) | = 35mm |
| Post-tensioned beams | = 40mm |
| Columns (main bars) | = 40mm |
| Foundations | = 75mm |

5. Maximum tolerance on concrete cover is +/- 5mm.
6. All high tensile (T) and mild steel (R) bars to be in accordance with BS 4449 and fabric mesh to be made from cold worked steel bars in accordance with BS 4483.
7. Minimum laps to all bars to be 50Ø unless stated otherwise.
8. Safe Bearing Pressure taken to be 250 KN/m².
9. Nominal aggregate size to be 20mm.
10. Structural concrete to be Class 25 unless stated otherwise.
11. Concrete blinding to be Class 15 unless stated otherwise.
12. Masonry Strength to be 7.0 N/mm².

| | |
|---|---|
| Designed by | DAN |
| Drawn by | DAN |
| Checked by | HOH |
| Scale | AS SHOWN |

| Rev | Description | By | Date |
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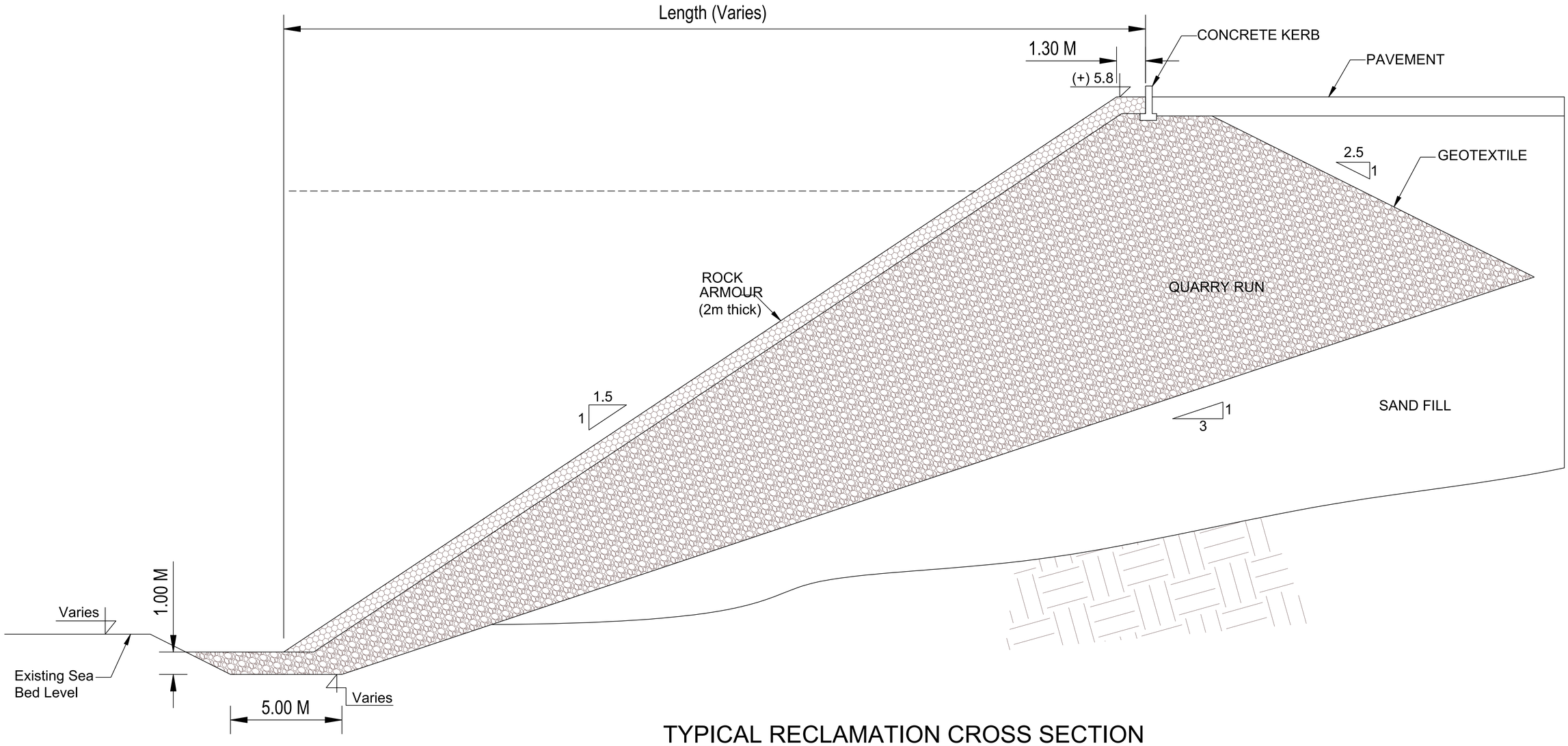
**DRAWING NO. 09-002-18**




# TYPICAL RECLAMATION CROSS SECTION


Consultant:-

**ARPRIM CONSORTIUM**
*P.O. Box 12969-00100,*
*Nairobi, KENYA.*
*Tel: 02 608 906*
*Fax: 02 608 907*
*E-mail: info@arprimconsultants.com*


CLIENT:-
**STATE DEPARTMENT FOR FISHERIES, AQUACULTURE AND THE BLUE ECONOMY.**

PROJECT:-
**PROPOSED KENYA MARINE FISHERIES AND SOCIO-ECONOMIC DEVELOPMENT (KEMFSED) NATIONAL AND COUNTY FISHERIES INFRASTRUCTURE.**

PROJECT TITLE:-
**PROPOSED MUKOWE FISH LANDING SITE, LAMU COUNTY.**

DRAWING TITLE:-
**RECLAMATION TYPICAL CROSS-SECTION AND RETAINING WALL DETAIL**

NOTES

1. Read this drawing in conjunction with relevant G.A., Services and Architectural drawings. Any descrepancy to be reported to the Engineer.
2. All dimensions are in millimetres unless specified otherwise.
3. All levels are indicated in m unless specified otherwise.
4. Minimum cover to all reinforcement to be:

| | |
|---|---|
| Stairs, Slabs & Walls | = 35mm |
| Beams (main bars) | = 35mm |
| Post-tensioned beams | = 40mm |
| Columns (main bars) | = 40mm |
| Foundations | = 75mm |

5. Maximum tolerance on concrete cover is +/- 5mm.
6. All high tensile (T) and mild steel (R) bars to be in accordance with BS 4449 and fabric mesh to be made from cold worked steel bars in accordance with BS 4483.
7. Minimum laps to all bars to be 50Ø unless stated otherwise.
8. Safe Bearing Pressure taken to be 250 KN/m².
9. Nominal aggregate size to be 20mm.
10. Structural concrete to be Class 30 unless stated otherwise.
11. Concrete blinding to be Class 15 unless stated otherwise.
12. Masonry Strength to be 7.0 N/mm².

| | |
|---|---|
| Designed by | DAN |
| Drawn by | DAN |
| Checked by | HOH |
| Scale | AS SHOWN |

| Rev | Description | By | Date |
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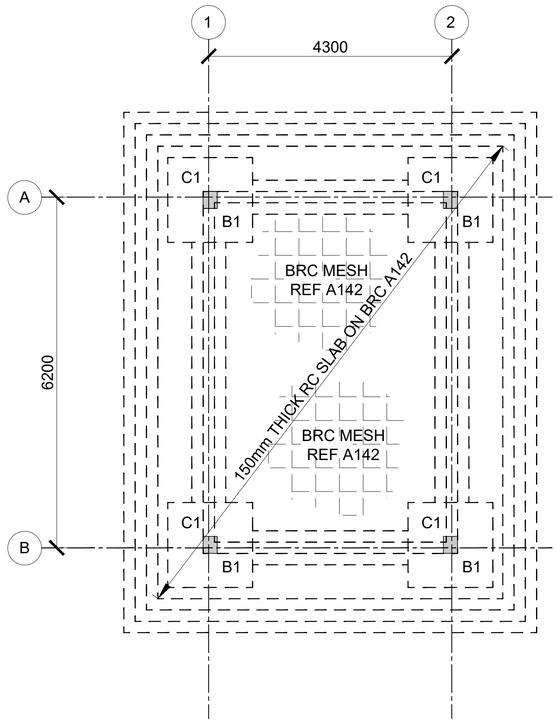
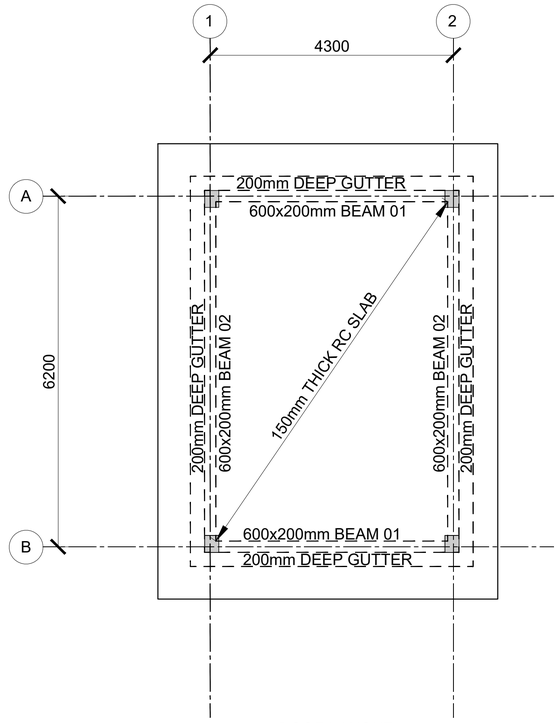
| D | | | |
| C | | | |
| B | | | |
| A | | | |

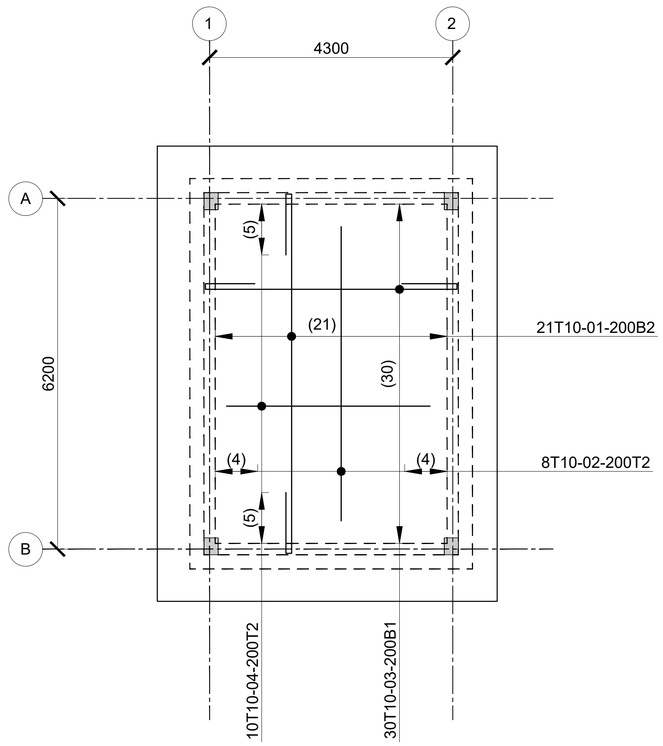
**DRAWING NO. 09-002-19**



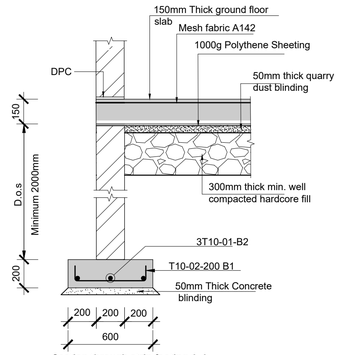

**FOUNDATION/GROUND FLOOR LAYOUT**
(SCALE 1:100)



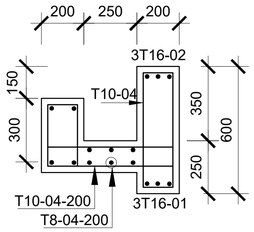

**ROOF LAYOUT**
(SCALE 1:100)



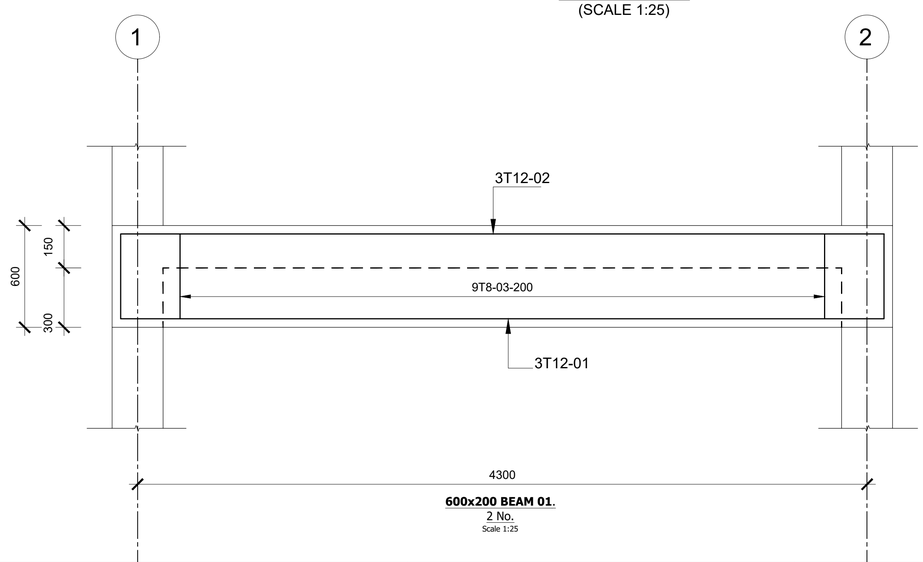

**ROOF SLAB RC DETAIL**
(SCALE 1:100)



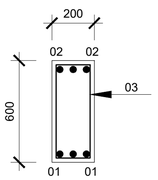

**Section through strip footing A-A**
**(External Walls)**
scale 1:25



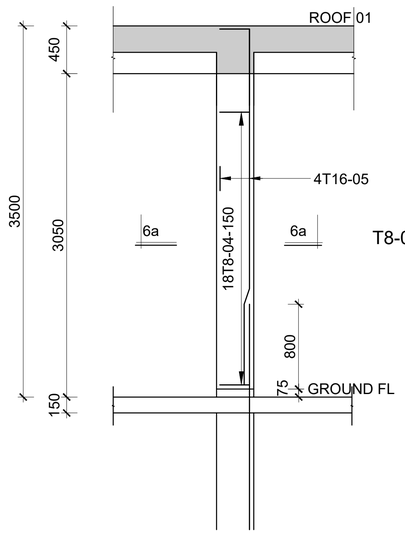

**GUTTER SECTION**
(SCALE 1:25)



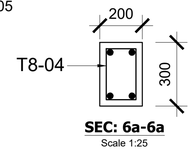

**600x200 BEAM 01.**
2 No.
Scale 1:25



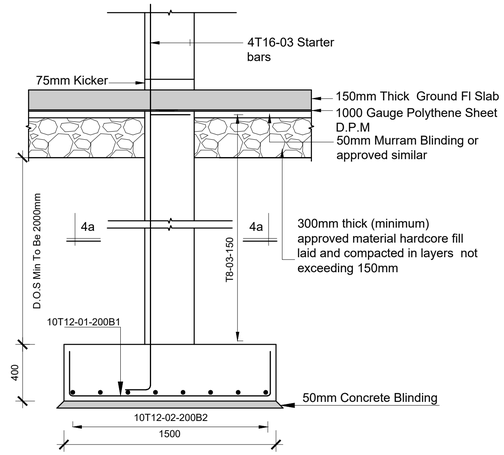

**SECTION A-A**
Scale 1:25



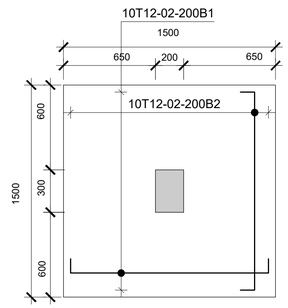

**COLUMN C1**
**4 NO.THUS**
**300X200**
Scale 1:50




**SEC: 6a-6a**
Scale 1:25




**SEC:-BASE B1**
**(WITH COL C1)**
Scale 1:30




**PLAN:-BASE B1**
**4 No.**
Scale 1:30

Consultant:-

**ARPRIM CONSORTIUM**
*P.O. Box 12969-00100,*
*Nairobi, KENYA.*
*Tel: 02 608 906*
*Fax: 02 608 907*
*E-mail: info@arprimconsultants.com*

CLIENT:-
**STATE DEPARTMENT FOR FISHERIES, AQUACULTURE AND THE BLUE ECONOMY.**

PROJECT:-
**PROPOSED KENYA MARINE FISHERIES AND SOCIO-ECONOMIC DEVELOPMENT (KEMFSED) NATIONAL AND COUNTY FISHERIES INFRASTRUCTURE.**

PROJECT TITLE:-
**PROPOSED MUKOWE FISH LANDING SITE, LAMU COUNTY.**

DRAWING TITLE:-
**GENERATOR ROOM - STRUCTURAL DETAIL**

NOTES

1. Read this drawing in conjunction with relevant G.A., Services and Architectural drawings. Any descrepancy to be reported to the Engineer.
2. All dimensions are in millimetres unless specified otherwise.
3. All levels are indicated in m unless specified otherwise.
4. Minimum cover to all reinforcement to be:
   - Stairs, Slabs & Walls = 35mm
   - Beams (main bars) = 35mm
   - Post-tensioned beams = 40mm
   - Columns (main bars) = 40mm
   - Foundations = 75mm
5. Maximum tolerance on concrete cover is +/- 5mm.
6. All high tensile (T) and mild steel (R) bars to be in accordance with BS 4449 and fabric mesh to be made from cold worked steel bars in accordance with BS 4483.
7. Minimum laps to all bars to be 50Ø unless stated otherwise.
8. Safe Bearing Pressure taken to be 250 KN/m².
9. Nominal aggregate size to be 20mm.
10. Structural concrete to be Class 25 unless stated otherwise.
11. Concrete blinding to be Class 15 unless stated otherwise.
12. Masonry Strength to be 7.0 N/mm².

| | |
|---|---|
| Designed by | DAN |
| Drawn by | DAN |
| Checked by | HOH |
| Scale | AS SHOWN |

| Rev | Description | By | Date |
|---|---|---|---|
| D | | | |
| C | | | |
| B | | | |
| A | | | |

**DRAWING NO. 09-002-20**

## DRAWING TITLE: PROPOSED FISH LANDING SITES/MARKETS FISHERIES OFFICES - MUKOWE

**DRAWING NUMBER: 09-003E- 001**

| No. | DRAWING/ DOCUMENT TITLE | DRAWING NUMBER | DRAWING SHEET | DRAWING FORMAT | DOCUMENT STATUS |
|---|---|---|---|---|---|
| D | ELECTRICAL ENGINEERING DRAWINGS | | | | |
| 1 | LIST OF DRAWINGS | 09- 003E- 001 | A3 | PDF/ EXCEL | Provided |
| 2 | LIGHTING & POWER SYSTEM GENERAL NOTES | 09- 003E- 002 | A3 | PDF/ DWG | Provided |
| 3 | ELECTRICAL SCHEDULE OF SYMBOLS | 09- 003E- 003 | A3 | PDF/ DWG | Provided |
| 4 | ABLUTION BLOCK LIGHTING LAYOUT | 09- 003E- 004 | A2 | PDF/ DWG | Provided |
| 5 | ABLUTION BLOCK POWER LAYOUT | 09- 003E- 005 | A2 | PDF/ DWG | Provided |
| 6 | FISH BANDA GROUND FLOOR LIGHTING LAYOUT | 09- 003E- 006 | A2 | PDF/ DWG | Provided |
| 7 | FISH BANDA GROUND FLOOR POWER LAYOUT | 09- 003E- 007 | A2 | PDF/ DWG | Provided |
| 8 | FISH BANDA GROUND FLOOR FIRE ALARM | 09- 003E- 008 | A2 | PDF/ DWG | Provided |
| 9 | FISH BANDA GROUND FLOOR CCTV LAYOUT | 09- 003E- 009 | A2 | PDF/ DWG | Provided |
| 10 | FISH BANDA GROUND FLOOR FANS LAYOUT | 09- 003E- 010 | A2 | PDF/ DWG | Provided |
| 11 | FISH BANDA SCHEMATIC | 09- 003E- 011 | A2 | PDF/ DWG | Provided |
| 12 | FISH BANDA FIRST FLOOR ELECTRICAL LAYOUT | 09- 003E- 012 | A2 | PDF/ DWG | Provided |
| 13 | FISH BANDA LIGHTNING ARRESTOR LAYOUT | 09- 003E- 013 | A2 | PDF/ DWG | Provided |
| 14 | GUARD HOUSE ELECTRICAL LAYOUT | 09- 003E- 014 | A2 | PDF/ DWG | Provided |
| 15 | GUARD HOUSE SCHEMATIC LAYOUT | 09- 003E- 015 | A2 | PDF/ DWG | Provided |
| 16 | PUMP HOUSE LIGHTING LAYOUT | 09- 003E- 016 | A2 | PDF/ DWG | Provided |
| 17 | PUMP HOUSE POWER LAYOUT | 09- 003E- 017 | A2 | PDF/ DWG | Provided |
| 18 | PUMP HOUSE FIRE ALARM LAYOUT | 09- 003E- 018 | A2 | PDF/ DWG | Provided |
| 19 | PUMP HOUSE SCHEMATIC | 09- 003E- 019 | A2 | PDF/ DWG | Provided |
| 20 | SOLAR SCHEMATIC | 09- 003E- 020 | A2 | PDF/ DWG | Provided |
| 21 | POWER HOUSE ELECTRICAL LAYOUT | 09- 003E- 021 | A2 | PDF/ DWG | Provided |
| 22 | POWER HOUSE SCHEMATIC | 09- 003E- 022 | A2 | PDF/ DWG | Provided |
| 23 | SITE POWER LAYOUT | 09- 003E- 021 | A2 | PDF/ DWG | Provided |
| 24 | STREET LIGHT DETAIL | 09- 003E- 022 | A2 | PDF/ DWG | Provided |

## GENERAL NOTES

1. ALL ELECTRICAL WORKS CARRIED OUT SHALL COMPLY WITH THE LATEST EDITION OF IEEE WIRING REGULATIONS, BS 7671 AND RELEVANT LOCAL AUTHORITY REQUIREMENTS.
2. EARTHING INSTALLATION SYSTEM SHALL COMPLY WITH SECTION 5 OF WIRING REGULATION. SECTION 6 & 7 SHALL BE REFERENCED FOR ALL WIRING SYSTEMS. WIRING SHALL BE IN CONCEALED CONDUIT/TRUNKING UNLESS OTHERWISE SPECIFIED BY THE EE.
3. THE MOUNTING HEIGHT OF ALL SWITCH SOCKET OUTLET SHALL BE AT 300mm FROM FINISHED FLOOR LEVEL EXCEPT IN WET AREAS WHERE IT SHALL BE 1500mm FROM FINISHED FLOOR LEVEL OR UNLESS OTHERWISE STATED.
4. THE POSITIONING OF ALL LIGHTING LUMINAIRES, SWITCH SOCKET OUTLETS, DISTRIBUTION BOARDS ETC. AS SHOWN IN THE DRAWINGS ARE APPROXIMATE ONLY. THE EXACT POSITIONS SHALL BE DETERMINED AT SITE.
5. THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR THE ELECTRICAL LOAD BALANCING, AND LABELING OF ALL EQUIPMENT AND SWITCHBOARDS THROUGHOUT THE INSTALLATION.
6. THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE TO LIAISE WITH KPLC AND THE LOCAL AUTHORITIES FOR ALL CLEARANCES, CABLE JOINTING, TESTING AND ELECTRICITY METERING FOR THE INSTALLATION.
7. THE OVERALL RESISTANCE FOR THE EARTHING SYSTEM (ELECTRICAL) SHALL BE LESS THAN 1 OHM AND IN ANY CASE SHALL COMPLY WITH KPLC REQUIREMENTS.
8. ALL DISCHARGE LIGHTING LUMINAIRES, IF ANY, SHALL BE COMPLETE WITH BUILT-IN CONTROL GEAR, LAMP, LOW-LOSS BALLAST, AND AUXILIARY QUARTZ LAMP FOR DISCHARGE LAMP RE-STRIKING.
9. THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR SEALING OF ALL CABLE PENETRATION OPENINGS BETWEEN FLOOR SLAB AND WALLS ETC. WITH APPROVED FIRE RATING MATERIAL/SEALANT TO CONSULTANTS' APPROVAL.
10. ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR SEALING OF ALL CABLE PENETRATION OPENINGS THROUGH ROOF FLOOR SLABS, WALLS WITH APPROVED WATERPROOF MATERIALS AFTER THE INSTALLATION OF CABLES.
11. ALL FLUORESCENT LIGHTING LUMINAIRES SHALL BE COMPLETE WITH LOW LOSS BALLAST, TUBE LAMPS, ETC. COLOR OF LIGHT OUTPUT SHALL BE AS SPECIFIED BY THE CONSULTANT OR INTERIOR DECORATOR.
12. THE ELECTRICAL SUB-CONTRACTOR SHALL BACKFILL WITH SANDBAG THE MANHOLES AND DRAW PITS TO COMPLY TO TECHNICAL SPECIFICATIONS.
13. ALL CABLES TO BE LAID IN HD UPVC PIPES SHALL BE ENCASED IN CONCRETE WHEN LAID ACROSS THE DRIVEWAY.
14. ALL UNDERGROUND WIRING SHALL BE OF XLPE/SWA/PVC CABLE (IN HD UPVC PIPE FOR HARD GROUND / PAVEMENT).
15. IT IS THE ELECTRICAL SUB-CONTRACTOR'S RESPONSIBILITY TO PROVIDE EARTH FAULT AND OVERCURRENT TRIPPING DISCRIMINATION BETWEEN THE SWITCHBOARD AND THE INCOMING FEEDER TO COMPLY WITH THE LOCAL POWER UTILITY COMPANY AND THE CONSULTANT'S REQUIREMENTS.
16. THE ELECTRICAL SUB-CONTRACTOR SHALL BE RESPONSIBLE FOR THE EQUIPOTENTIAL EARTHING BONDING TO ALL METAL PARTS COMPLETED BY THE OTHER TRADES TO THE NEAREST ELECTRICAL PANEL / EARTH BAR.
17. ALL WIRING TO LIGHTING LUMINAIRES SHALL COMPRISE OF APPROVED CEILING ROSE FOR INDOOR INSTALLATION AND WEATHERPROOF JUNCTION BOX FOR OUTDOOR INSTALLATION. CONNECTION TO LIGHT FIXTURE SHALL BE BY MEANS OF PVC SHEATHED FLEXIBLE CABLE FOR NORMAL SUPPLY, FR CABLE FOR EMERGENCY SUPPLY AND ARMOURED CABLE FOR OUTDOOR INSTALLATION.
18. ALL LIGHTING POLE SPECIFIED SHALL COMPRISE OF RAIL MOUNTED 10A MCB IN THE COMPARTMENT. ALL POLE SHALL HAVE ITS OWN LIGHTNING ELECTRODES. OUTDOOR INSTALLATION SHALL BE IN HEAVY DUTY UPVC PIPES OF 100mm DIAMETER (MINIMUM).
19. MCB's RATED < 100A PROTECTING CABLES SUPPLYING LOADS WITH HIGH SWITCH-ON CURRENT (E.G. MOTORS, HID LAMPS, ETC.) SHALL HAVE TYPE 'C' MAGNETIC CURVE RATING UNLESS OTHERWISE INDICATED IN THE PLANS. UNLESS OTHERWISE STATED, ALL BUSBAR ARE OF HD COPPER AND SHALL BE RATED AT A CURRENT DENSITY OF NO MORE THAN 1.55A/sq. mm.
20. THE ELECTRICAL CONTRACTOR SHALL FURNISH ALL NECESSARY LABOUR, MATERIALS AND EQUIPMENT FOR SATISFACTORY COMPLETION OF THE ENTIRE ELECTRICAL INSTALLATION AS GENERALLY DESCRIBED IN THE SPECIFICATION AND/OR SHOWN ON DRAWINGS.
21. ALL LOCATIONS OF EQUIPMENT AND CABLE ROUTES SHOWN ON THE DRAWING ARE APPROXIMATE. THE EXACT LOCATIONS MUST BE CO-ORDINATED ON SITE BEFORE INSTALLATION. FULLY CO-ORDINATED SHOP DRAWINGS MUST BE SUBMITTED TO THE CONSULTANT FOR APPROVAL BEFORE COMMENCEMENT OF WORK.
22. ALL SWITCHBOARDS AND DISTRIBUTION BOARDS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE LATEST DEWA REGULATIONS AND THE APPROVAL OF POWER UTILITY COMPANY. THEY SHALL BE PAINTED WITH A COAT OF ANTI-RUST PAINT AND TWO COATS OF SEMI-GLOSS TEAK PAINT OF BEST QUALITY TO THE APPROVAL OF THE CONSULTANT.
23. ALL POWER CONDUITS AND TRUNKING WHICH ARE EXPOSED SHALL BE PAINTED WITH A COAT OF RUST-RESISTING PRIMER AND TWO COATS OF ELECTRIC ORANGE.
24. ALL CONDUITS SHALL BE G.I., G.I. CONDUITS SHALL COMPLY WITH THE LATEST DEWA REGULATIONS ON ELECTRICAL INSTALLATIONS. MINIMUM SIZE SHALL NOT BE LESS THAN 20mm (INSIDE DIAMETER). ALL THREADS IN CONDUITS SHALL BE TREATED WITH ALUMINUM PAINT OR SIMILAR ANTITRUST PAINT TO PREVENT CORROSION AT JOINTS AND TERMINATION, CONNECTIONS SHALL BE BY MEANS OF COUPLER, SHALL BE USED FOR DIFFERENT CIRCUITS.
25. PHASE SEGREGATION SHALL COMPLY WITH THE LATEST REQUIREMENTS OF THE IEE WIRING REGULATIONS. SEPARATE CONDUITS SHALL BE USED FOR CABLES OF DIFFERENT CIRCUIT CATEGORIES. FOR 3 PHASE FINAL CIRCUITS, SEPARATE CONDUITS SHALL BE USED FOR DIFFERENT CIRCUITS.
26. ALL LIGHTING POINTS SHALL BE PROVIDED WITH CIRCUIT PROTECTIVE CONDUCTORS AND ALL METAL PARTS SHALL BE CONTINUOUSLY EARTHED THROUGHOUT.
27. THE ELECTRICAL CONTRACTOR SHALL SUPPLY AND INSTALL ALL LIGHT LUMINAIRES AS SHOWN ON THE DRAWINGS. EACH FITTING SHALL HAVE ITS OWN INDEPENDENT SUPPORT REGARDLESS OF SURFACE, RECESSED OR SUSPENDED MOUNTING.
28. EACH CIRCUIT SHALL BE TESTED FOR GROUNDS AND SHORTS BY MEANS OF A MEGGER INSULATION RESISTANCE TESTING INSTRUMENT APPLYING A VOLTAGE OF NOT LESS THAN 500V D.C. UPON CIRCUIT UNDER TEST.
29. CABLES FOR ESSENTIAL CIRCUITS SUCH AS EMERGENCY LIGHTING CIRCUITS AND FIRE FIGHTING EQUIPMENT CIRCUITS ETC SHALL NOT BE DRAWN INTO THE SAME CONDUIT, DUCT OR TRUNKING INTENDED FOR NORMAL CIRCUITS AS PER IEE 364 WIRING REGULATION. ALL CABLES AND WIRES FOR LIFE SAFETY AND ESSENTIAL CIRCUIT SHALL BE OF 2HRS FIRE RATED.
30. FOR SINGLE PHASE SUPPLY, CIRCUITS OF DIFFERENT PHASES SHALL NOT SHARE THE SAME CONDUIT.
31. ALL SHUNT TRIP RELEASES OF ACB'S IN THE MAIN ELECTRICAL SWITCHBOARD SHALL BE RATED AT 30V DC. A BATTERY SUPPLY OF SUFFICIENT CAPACITY SHALL BE PROVIDED FOR THE TRIPPING OF ACBs, CAPACITY OF BATTERY SHALL BE SUBMITTED FOR THE CONSULTANT'S APPROVAL PRIOR TO INSTALLATION.
32. ALL EARTH TESTS SHALL BE CARRIED OUT WITH A 1000V MEGGER TEST INSTRUMENT AND IN ACCORDANCE WITH THE LATEST REQUIREMENTS OF DEWA WIRING REGULATIONS.
33. THE LIGHTNING PROTECTION SYSTEM SHALL COMPLY WITH THE REQUIREMENTS OF THE LATEST DEWA REGULATIONS PRACTICE AND BS-EN 62305 AND INSTALLED TO THE SATISFACTION OF THE CONSULTANT.
34. THE ELECTRICAL CONTRACTOR SHALL LIASE WITH ELV SYSTEMS CONTRACTOR VIA THE MAIN CONTRACTOR TO ENSURE THAT POWER SUPPLIES FOR ALL EQUIPMENT ARE ADEQUATELY PROVIDED TO SUIT THE SYSTEM REQUIREMENTS.
35. EQUIPOTENTIAL BONDING SHALL BE PROVIDED FOR ALL TOILETS.
36. ALL POWER OUTLET, LIGHTING, ETC., LOCATIONS SHOWN ARE APPROXIMATE ONLY AND THE ELECTRICAL SUB-CONTRACTOR MUST CO-ORDINATE WITH LINX AND OR THE INTERIOR DESIGNER, AS WELL AS EQUIPMENT SUPPLIERS.
37. THE DISTRIBUTION AND SIZE OF THE TRUNKING/CABLE TRAY SHOWN ON THE DRAWINGS ARE MEANT TO FACILIATE THE CONTRACTOR THE PROPOSED ROUTING OF THE MAIN AND SUB-MAIN. THE CONTRACTOR SHALL SIZE THE TRUNKING/CABLE TRAY BASED ON THE EXACT CABLE SPACE AND CODE REQUIREMENTS. THE CONTRACTOR SHALL ALLOW 20% SPARE SPACE FOR FUTURE CABLE LAYING.
38. ALL ISOLATORS INSIDE MECHANICAL PLANTROOMS AND OTHER POTENTIALLY WET LOCATIONS SHALL BE PROVIDED WITH WEATHERPROOF ENCLOSURE (IP65).
39. CONTRACTOR TO CROSS REFER TO FIRE ALARM CAUSE AND EFFECT MATRIX. ALL DEVICES, INTERFACE, TERMINAL BLOCKS, WIRING, ETC. NECESSARY FOR SATISFACTORY OPERATION OF FIRE ALARM AND FIRE STRATEGY SHALL BE DEEM INCLUDED IN THIS CONTRACT.

## ELECTRICAL BOARD AND COMPONENTS

1. ALL MCCB's INSTALLED SHALL COMPLETE WITH ADJUSTABLE THERMAL AND MAGNETIC SETTING OF APPROPRIATE RANGE.
2. ALL MCBs USED FOR PROTECTION OF LIGHTING AND SMALL POWER SHALL OF TYPE C CHARACTERISTIC. ALL MCCBs/MPCBs USED FOR PROTECTION OF MOTOR LOADS SHALL BE OF TYPE D CHARACTERISTIC. HOWEVER, MOTOR PROTECTION COORDINATION STUDY SHALL BE SUBMITTED BY THE CONTRACTOR FOR ENGINEER'S/CONSULTANT'S REVIEW AND APPROVAL.
3. MCCBs/MCBs IN THE MAIN SWITCHBOARDS, SUB-SWITCHBOARDS, DISTRIBUTION BOARDS SHOWN HEREIN AND OTHER DRAWINGS PROTECTING MOTOR CIRCUITS FOR PUMPS, FANS, AHU's, ETC. SHALL BE OF THE TYPE SUITABLE FOR MOTOR PROTECTION INCORPORATING OVERLOAD AND SHORT CIRCUIT PROTECTIVE DEVICES (ALSO EARTH FAULT PROTECTION WHERE SHOWN IN THE DRAWINGS) AND THEY SHALL BE SO SELECTED THAT THEY ARE ABLE TO COORDINATE WITH BOTH THE UPSTREAM AND DOWNSTREAM PROTECTION DEVICES.
4. ALL PROTECTION CTs SHALL BE OF CLASS COMPLYING TO DEWA REQUIRENT OR BETTER.
5. ALL METERING CTs SHALL BE OF CLASS COMPLYING TO DEWA REQUIREMENT OR BETTER.
6. BUSBAR MARKINGS, ARRANGEMENTS, CONNECTIONS AND GRADE OF COPPER SHALL COMPLY AS APPROPRIATE WITH BS.159, 1433 AND 1977.
7. ALL ELECTRICAL BOARDS BUSBARS SHALL BE OF HARD DRAWN TINNED COPPER AND SHALL HAVE A CURRENT DENSITY OF NOT LESS THAN 1.55A/SQ.MM. WHEN MORE THAN ONE SET OF BUSBARS ARE USED PER PHASE, APPROPRIATE DERATING FACTOR SHALL APPLY.
8. ALL NON-CURRENT CARRYING METALLIC PARTS OF THE DISTRIBUTION BOARDS SHALL BE BONDED TO SYSTEM EARTH.
9. THERE SHALL BE A COMMON EARTH BAR IN EACH ELECTRICAL BOARD.
10. THE NEUTRAL LINKS AND EARTH BARS IN THE ELECTRICAL BOARDS SHALL BE LOCATED AT AN EASILY ACCESSIBLE POSITION AND SHALL BE KEPT CLEAR OF ANY OBSTRUCTIONS.
11. NEUTRAL AND EARTH BARS SHALL HAVE SUFFICIENT NUMBER OF WAYS TO MATCH THE NUMBER OF SUB-CIRCUITS WITH SPARES.
12. THE MINIMUM CLEARANCE AROUND THE NEUTRAL LINKS SHALL BE 50mm.
13. THE ELECTRICAL SUB-CONTRACTOR IS REQUIRED TO CARRY OUT HIS OWN FAULT LEVEL CALCULATIONS BASING ON THE CHARACTERISTICS OF THE EQUIPMENT OFFERED AND THE ACTUAL/AGREED ROUTING (SUBJECT TO THE SUPERVISING CONSULTANT APPROVAL) OF THE ACTUAL/AGREED ROUTING (SUBJECT TO THE SUPERVISING CONSULTANT APPROVAL) OF THE CABLES AND THEREAFTER SELECT THE MOST APPROPRIATE RUPTURING CAPACITY OF SUB-SWITCHBOARDS, BUSBAR TRUNKING AND DISTRIBUTION BOARDS TO MEET THE PROSPECTIVE FAULT LEVELS. ALL COSTS IN CONNECTION THEREWITH SHALL BE DEEMED TO BE INCLUDED IN THE SUB-CONTRACT SUM. THE ELECTRICAL SUB-CONTRACTOR SHALL SUBMIT DETAILED CALCULATION & SELECTION FOR ELECTRICAL CONSULTANT'S APPROVAL.
14. ALL ELECTRICAL EQUIPMENT AND ACCESSORIES THAT ARE EXPOSED TO WEATHER SHALL BE OF WEATHERPROOF TYPE TO IP65, UNLESS OTHERWISE STATED.
15. IDMTL OVERCURRENT AND EARTH FAULT RELAYS SPECIFIED SHALL BE COMPLETE WITH HIGH SET ELEMENT.
16. ALL OVERCURRENT, EARTH FAULT RELAYS AND EARTH LEAKAGE RELAYS SHALL BE TESTED ON SITE BY ELECTRICAL LICENSED TESTER AND ALL COSTS CONNECTED THEREWITH SHALL BE DEEM TO BE INCLUDED IN THE SUB-CONTRACT SUM.
17. THE ELECTRICAL SUB-CONTRACTOR IS REQUIRED TO SUBMIT DETAILS OF FINAL ARRANGEMENT AND DIMENSIONAL LAYOUT OF ALL THE ITEMS OF EQUIPMENT IN RESPECTIVE ROOMS TO SUIT SITE CONDITIONS, ETC FOR REVIEW BY THE CONSULTANT BEFORE COMMENCEMENT OF INSTALLATION.
18. ALL MOTOR SHALL BE PROVIDED WITH EMERGENCY STOP BUTTON RIGHT NEXT TO THE EQUIPMENT.
19. UNLESS OTHERWISE INDICATED, THE MCCBs/MCBs INSTALLED FOR ANY MAIN SWITCHBOARDS, SUB-BOARDS AND DISTRIBUTION BOARDS SHALL HAVE THE FOLLOWING MINIMUM BREAKING CAPACITY :

| | |
|---|---|
| MAIN SWITCHBOARD | : 50KA RMS. 1 SEC. |
| SUB BOARDS | : 35KA RMS. 1 SEC. |
| DISTRIBUTION BOARDS | : 10KA RMS. 1 SEC. |

## CO-ORDINATION AND INSTALLATION

1. THE ELECTRICAL CONTRACTOR SHALL OBTAIN APPROVAL FROM STRUCTURAL ENGINEERS FOR PENETRATION THROUGH R.C. BEAMS AND FLOOR SLABS PRIOR TO CONSTRUCTION.
2. ALL CONDUITS LAYOUT AND INSTALLATION METHODS SHALL BE IDENTICAL IN ALL ROOMS AS MUCH AS POSSIBLE.
3. ALL MATERIALS/ CABLES TO BE USED AND INSTALLATION METHOD SHALL COMPLY WITH THE TECHNICAL SPECIFICATION, STANDARDS, CODE OF PRACTICE AND AUTHORITY REQUIREMENT.
4. THE ELECTRICAL CONTRACTOR IS REQUIRED TO SUBMIT DETAILS OF FINAL ARRANGEMENT AND DIMENSIONAL LAYOUT OF ALL ITEMS OF EQUIPMENT IN RESPECTIVE ROOMS TO SUIT SITE CONDITIONS, ETC. FOR REVIEW BY THE SUPERVISING CONSULTANT BEFORE COMMENCEMENT OF INSTALLATION.
5. ALL ELECTRICAL AND ELV DRAWINGS SHALL BE READ IN CONJUCTION WITH THE LATEST ARCHITECTURAL DRAWINGS, INTERIOR DEISGN DRAWINGS, OTHER SERVICES DRAWINGS AND SPECIFICATIONS.

## LIGHTNING PROTECTION SYSTEM

1. LIGHTNING PROTECTION SYSTEM SHALL COMPLY WITH IEC CODE OF BS EN 62305.
2. THE POSITIONS OF THE ELECTRODES FOR LIGHTNING PROTECTION SYSTEM ARE APPROXIMATE ONLY. THE EXACT LOCATIONS ON SITE SHALL BE DETERMINED SUCH THAT THE SPECIFIED REQUIREMENTS OF EARTHING SYSTEM ARE COMPLIED.
3. ELECTRICAL CONTRACTOR SHALL LIAISE WITH MAIN CONTRACTOR FOR INSTALLATION OF EARTH ELECTRODE PITS. WATER PROOFING FOR ELECTRODES THROUGH R.C SLAB SHALL BE PROVIDED UNDER THIS CONTRACT.
4. ALL PENETRATIONS THROUGH ROOF TO BE MADE WATER TIGHT AFTER INSTALLATION OF DOWN CONDUCTOR CABLES, ETC.

**TENDER ISSUE**

## EARTHING SYSTEM

1. EARTH RESISTANCE WILL BE TESTED UPON COMPLETION OF EACH EARTHING POINT INSTALLATION BEFORE INTERCONNECTION OF THE EARTH POINT.
2. EARTH RESISTIVITY TEST SHALL BE CARRIED AT EACH EARTHING POINT.
3. ALL TAPE/CABLES/CLAMP CONTACT SURFACE SHALL BE HEAVILY TINNED PRIOR TO CONNECTION.
4. PRECAUTIONARY MEASURES SHALL BE TAKEN SO AS NOT TO OVER EXCAVATE THE EARTHING PIT.
5. PROPERTIATARY CAD WELD CONNECTION SHALL BE EMPLOYED FOR CONNECTING EARTH CABLE TO EARTHING POINT STRICTLY IN ACCORDANCE TO THE INSTRUCTION OF THE SUPPLIER.
6. IMMEDIATELY UPON COMPLETION OF EACH GROUP OF EARTH POINT INSTALLATION, TEST SHALL BE CARRIED OUT TO ESTABLISH THE EARTH RESISTANCE. THE TEST RESULTS SHALL BE SUBMITTED TO CONSULTANT FOR APPROVAL.
7. AFTER COMPLETION OF THE EARTHING INSTALLATION AND SATISFACTORY TESTING, EACH OF THE EARTHING PIT SHALL BE SUITABLY GROUTED TO SUPERVISING CONSULTANT REQUIREMENT TO PREVENT INGRESS OF GROUND WATER. GROUTING MATERIALS USED SHALL BE SUBJECT TO CONSULTANT'S APPROVAL.

## CABLES AND ANCILLARY PRODUCTS

1. ALL CABLES / WIRES FOR FINAL SUB-CIRCUIT WIRINGS SHALL BE PVC, MULTI-STRAND COPPER CONDUCTORS.
2. NO PVC CONDUIT/TRUNKING SHALL BE ALLOWED FOR THE WHOLE ELECTRICAL INSTALLATION UNLESS OTHERWISE STATED. IN GENERAL, ALL WIRING SHALL BE DONE WITHIN CONDUIT EMBEDDED IN SLAB FOR ALL SEVICES. EXPOSE CONDUIT/ WIRE SHALL NOT BE ACCEPTED.
3. SEPARATE CONDUIT/MULTI-GANG SWITCH BOX SHALL BE PROVIDED FOR FINAL SUB-CIRCUIT OF DIFFERENT PHASES. ALSO A SIGN SHALL BE PROVIDED TO INDICATE THE VOLTAGE BETWEEN THEM IN ACCORDANCE WITH DEWA REGULATION FOR THE INSTALLATIONS.
4. ALL EXTERNAL/LANDSCAPE LIGHTING POINTS SHALL BE PROVIDED WITH CABLES WITH ADDITIONAL LENGTH OF 5m.
5. SPACE FACTOR OF CONDUIT & TRUNKING SHALL COMPLY WITH DEWA REGULATION OF PRACTICE FOR WIRING OF ELECTRICAL EQUIPMENT OF BUILDINGS.
6. ALL SUB-MAINS CIRCUITS TO BE COMPLETE WITH CIRCUIT PROTECTIVE CONDUCTOR (CPC) COMPLYING TO DEWA REGULATION FOR THE INSTALLATIONS.
7. NEUTRAL & EARTH CABLES FOR EACH DIFFERENT CIRCUIT SHALL BE BROUGHT BACK TO THE SOURCE PANEL AND SHALL NOT BE LOOPED TOGETHER OUTSIDE THE PANEL.
8. ALL ELECTRICAL CONDUITS AND CONDUIT BOXES TO CAST WITHIN R.C. SLAB AT WET AREAS MUST HAVE TIGHTLY SEALED AND WATERPROOF JOINTS.
9. ALL UNDERGROUND JUNCTION BOXES SHALL BE OF G.I., TYPE. KNOCK OUT BOXES SHALL NOT BE USED AS UNDERFLOOR JUNCTION BOXES.
10. THE SIZES OF CABLE TRAY/TRUNKING/CONDUIT AS SHOWN IN DRAWINGS ARE APPROXIMATE ONLY. ELECTRICAL SUB-CONTRACTOR IS DEEMED TO HAVE ALLOWED IN HIS TENDER PRICE FOR ALL NECESSARY ADJUSTMENT TO ACCOMMODATE THE CABLES AND SHALL SUBMIT ALL DETAILED CO-ORDINATED CABLE CONDUIT/TRUNKING/TRAY/ LADDER ROUTE PLANS AND SECTION DRAWINGS TO THE SUPERVISON CONSULTANT FOR CLEARANCE PRIOR TO STARTING WORK ON SITE.
11. ALL UNDERGROUND CABLES CROSSING DRIVEWAYS OR HARDCORE AREAS ARE TO BE PROVIDED WITH HEAVY DUTY PVC PIPES, ENCASED IN CONCRETE WITH FULL HAUNCHING.
12. ALL STRAIGHT CONDUIT RUNS EXEEDING 8 METERS SHALL BE PROVIDED WITH JUNCTION BOX TO FACILITATE EASY WIRE / CABLE PULLING.
14. ALL FEEDER CABLES SHALL BE XLPE / SWA / LSOH FOR NORMAL CRCUIT AND XLPE / SWA / FR FOR EMERGENCY CIRCUITS.

## LUMINAIRES

1. ALL LIGHTING SWITCHES SHALL COMPLY WITH CIBSE STANDARD, KENYA GREEN BUILDING REGULATION AND SHALL BE OF THE APPROVED TYPE.
2. FLUORESCENT LAMP TUBES USED AT PUBLIC AREAS SHALL BE OF COLOUR 83 WARM WHITE AND INSTANT START UNLESS OTHERWISE STATED AND OF LOW LOSS ENERGY SAVING TYPE.
3. ELECTRICAL CONTRACTOR SHALL REFER TO LIGHTING CONSULTANT – FOR FURTHER NOTES AND LEGENDS.
4. ALL EXIT LIGHTINGS SHALL BE POSITIONED NOT MORE THAN 2.4m ABOVE FFL. TO CENTRE OF FITTING.

## POWER OUTLETS

1. SWITCH SOCKET OUTLETS AND SWITCHES MOUNTED SURFACE AT PLANTROOMS, STORES AND SIMILAR AREAS SHALL BE OF WEATHER PROOF TYPE UNLESS OTHERWISE STATED.
2. ALL ELECTRICAL EQUIPMENT & ACCESSORIES THAT ARE EXPOSED OR LESS THAN 2.0M AWAY FROM WET AREA SHALL BE OF WATERPROOF TYPE.
3. COLOUR FOR ALL SWITCHES, SWITCH SOCKET OUTLETS SHALL BE AS PER SUPERVISING CONSULTANT'S / ARCHITECT'S / INTERIOR DESIGNER'S SELECTION.
4. UNLESS OTHERWISE INDICATED, THE MOUNTING HEIGHTS FROM FINISHED FLOOR LEVELS FOR VARIOUS ITEMS OF ELECTRICAL WIRING ACCESSORIES/ EQUIPMENT SHALL BE AS FOLLOWS:

| | | |
|---|---|---|
| LIGHTING SWITCHES | – | 1400mm TO CENTRELINE |
| SWITCH SOCKET OUTLETS | – | 300mm TO CENTRELINE |
| DISTRIBUTION BOARDS | – | GENERALLY 1800mm TO TOP OF BOARD |
| WALL/COLUMN LIGHTS | – | 2500mm TO CENTRELINE |

5. THE ELECTRICAL CONTRACTOR SHALL NOTE THAT THE POSITIONS OF ELECTRICAL POINTS, LUMINAIRES, LIGHTING SWITCHES, SWITCH SOCKET OUTLETS ETC. ARE INDICATIVE AND APPROXIMATE AS SHOWN ON DRAWINGS. THE ACTUAL POSITIONS SHALL BE BASED ON THE CONSULTANT'S OR INTERIOR DESIGNER'S DRAWING. THE ELECTRICAL SUB-CONTRACTOR IS DEEMED TO HAVE ALLOWED IN HIS TENDER PRICE FOR ALL NECESSARY SITE ADJUSTMENT TO SUIT THE FINAL POSITIONS.
6. LOCATIONS FOR ELECTRICAL DISTRIBUTION BOARDS SHOWN IN THE PLANS ARE INDICATIVE ONLY. ELECTRICAL SUB-CONTRACTOR SHALL VERIFY ON SITE AND PROPOSE THEIR ACTUAL LOCATIONS ON THE SHOP DRAWING FOR CLEARANCE.
7. ELECTRICAL DISTRIBUTION BOARD SHALL NOT BE MOUNTED MORE THAN 1800mm ABOVE FFL. (MEASURED FROM FFL TO TOP OF DISTRIBUTION BOARD).
8. ALL ISOLATOR SHALL BE IP-65, IN METAL CABINET AND PAD-LOCKABLE.
9. FINAL LOCATION AND MOUNTING HEIGHT OF WIRING DEVICES SHALL BE COORDINATED WITH ARCHITECT AND ID CONSULTANT.
10. MOTORIZED DAMPER AND MOTORIZED VALVE WHERE REQUIRED BY MECHANICAL SHALL BE BE PROVIDED WITH RESPECTIVE FUSE CONNECTION UNIT TO BE CONNECTED TO RELATED EQUIPMENT LMCP OR AS OTHERWISE SHOWN ON PLAN.



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**PROJECT TITLE:**

PROPOSED CONSTRUCTION OF FISH LANDING SITE- MUKOWE

**CLIENT:**

STATE DEPARTMENT FOR FISHERIES, AQUACULTURE & THE BLUE ECONOMY

**CLIENT'S SIGNATURE:**

Sign:

**DRAWING TITLE:**

ELECTRICAL DRAWINGS NOTES

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| Dwg. No. | 09- 003E- 002 |
| Scale: | NTS |
| Drawn by | Chek'd By |
| Project no.: | Date: |
| 09 | 24.11.2023 |

TENDER ISSUE

# SCHEDULE OF SYMBOLS AND LIGHTING LUMINAIRES

10A 1 GANG 1 WAY white moulded switch plates

10 2 GANG 1 WAY white moulded switch plates

10A 3 GANG 1 WAY white moulded switch plates

10A 3 GANG 1 WAY white moulded switch plates

10A 1 GANG 2 WAY white moulded switch plates

10A 2 GANG 2 WAY white moulded switch plates

Outlet for 13A twin switched socket outlet complete with concealed conduit, box wiring in 3 x 2.5 mm² SC-PVC-CU cables and 13A twin switched socket outlet plate for raw power

Outlet for 13A twin switched socket outlet complete with concealed conduit, box wiring in 3 x 2.5 mm² SC-PVC-CU cables and 13A twin switched socket outlet plate for clean power

TPN Distribution Board
Complete with 100A TP integral isolator and all accessories including lockable cover with the the required MCB's and Blanking plates

SPN Consumer Unit
complete with 100A SPN integral isolator and all accessories including lockable cover with the the required MCB's and Blanking plates

Outlet for RJ45 face plate, complete with concealed HG PVC conduit, square PVC box, draw wire and blanking plate

Outlet for Television coaxial cable outlet point, complete with concealed HG PVC conduit, square PVC box, draw wire and TV outlet point

Outlet for cooker control unit comprising wiring in 3x6.0mm2 SC-PVC CU cables, twin box Dia. 25mm

socket with neon lamp

Outlet for 15A round pin socket outlet complete with concealed conduit, box wiring in 3 x 4 mm² SC-PVC-CU cables and all accessories including 15A round pin socket outlet plate

TMH Extra Low Voltage manhole

HG PVC conduit link, and all accessories including 45A DP cooker control unit with neon lamp, and 13A integral

PMH Power manhole

Outlet point for instant water heaters, AC, Fans and under- sink water heater comprising 20mm diameter conduit, wiring in 3 x 4.0 mm² SC-PVC-CU cables and all accessories including 20A DP switch with neon light

400mm Wide Cable Ladder

400mm Wide Cable Tray for Power

400mm Wide Cable Tray for Data

H **Addressable Heat Detector**

FACP **Addressable Fire Alarm Control Panel**

S **Addressable Smoke Detector**

**Addressable Push Button, Electric Sounder & Beacon**

2D **1200mm 12W LED Mirror Front Light, surface mounted, 4000K Bathroom Mirror Light**

2 **High Quality Ultra Thin 12W Led Panel 300X300Mm Square Panel Light Indoor Lighting For Bathroom Type 2**

N **Type 'N' 12W LED 2D fixture for installation in stairwells and corridors**

E **Type Maintained LED fixture for Emergency installation with 3 - hour autonomy**

4C **Type '4C' 34W 1200mm High performance LED IP65, dust and moisture resistant luminaire**

4 **Type '4' 40W 1200mmX300mm High performance dust and moisture resistant luminarie**

C **Type 'C' 12W super efficient LED downlighter**

M **Type 'M' 50W Solar Floodlight for security lighting, mounted on building's walls**

**600x600mm, 36W, super efficient Surface LED modular luminaries with curved diffuser**

X **Type 'X' Bulkhead wall mounted light for the lift shaft**

EXIT **8W maintained LED Exit Emergency Light. Minimum 3-hour autonomy.**

IR **PIR Motion Sensor**

25mm x 3mm tinned annealed copper tape for both roof & down conductors

15mm multiple point copper air terminal complete with base

F2 **Type 'F2' 1500W High Volume Low Speed (HVLS) 5 blade ceiling fan for auditorium.**
**Blade size: 12 feet; Fan Speed: 50RPM; Noise Level: 50DB**

F1 **Type 'F1' 49W 3 Blade Basic Ceiling Sweep Fan .**
**Sweep: 1200mm; Fan Speed: 350RPM**

**IP 67- Water & Dust Resistant, 4MP, Excellent low- light performance, 24/7 colourful imaging, Efficient Compression Technology Bullet CCTV Camera**

**IP 67- Water & Dust Resistant, 4MP, Excellent low- light performance, 24/7 colourful imaging, Efficient Compression Technology DOME CCTV Camera**

4U **Type '4U' 34W 1200mm High performance LED UV IP65, dust and moisture resistant luminaire**



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**CLIENT:**

STATE DEPARTMENT FOR FISHERIES, AQUACULTURE & THE BLUE ECONOMY

**CLIENT'S SIGNATURE:**

Sign:

**DRAWING TITLE:**

SCHEDULE OF SYMBOLS AND LIGHTING LUMINIARES

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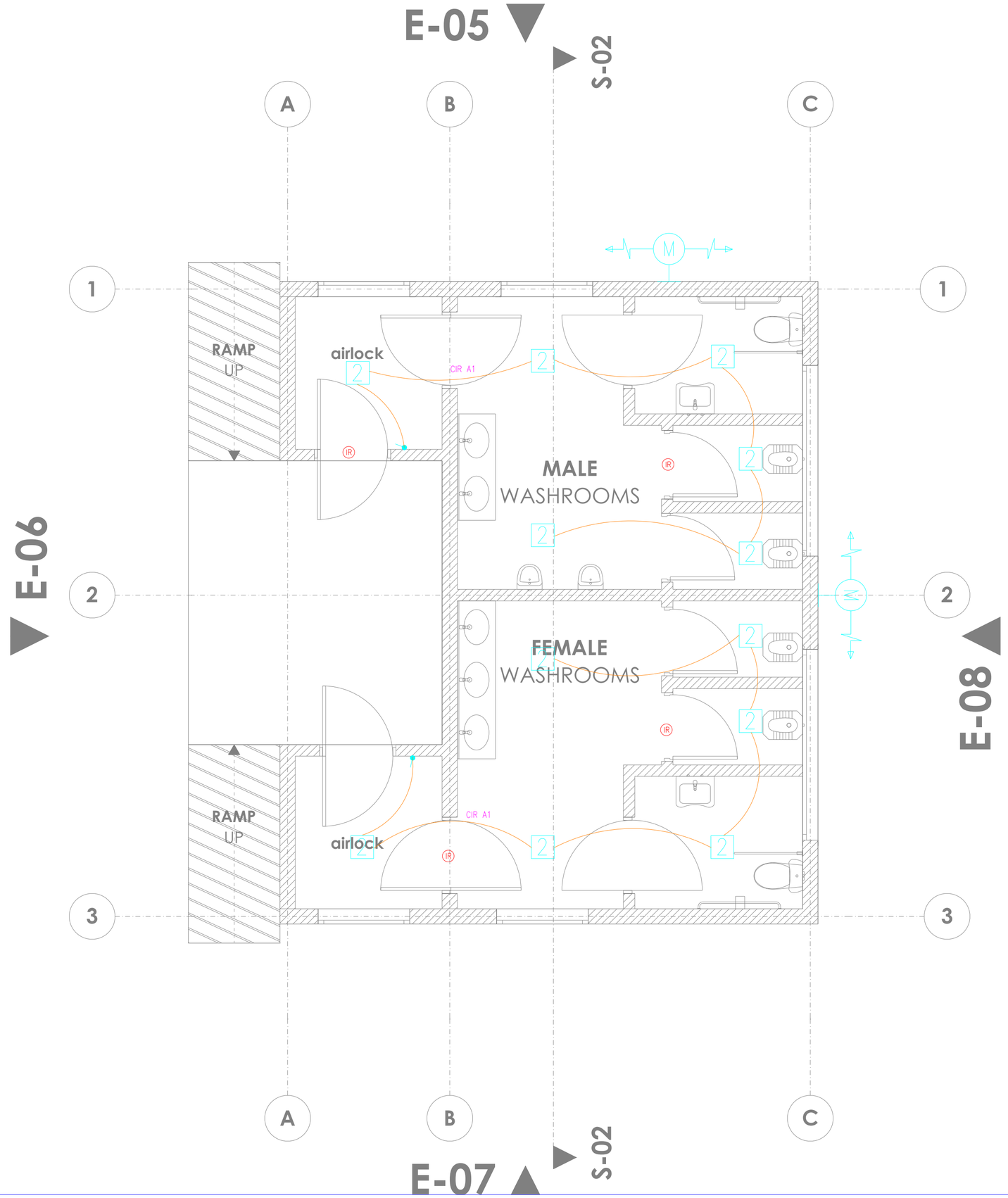
| Dwg. No. | 09- 003E- 003 |
| Scale: | NTS |
| Drawn by | Chek'd By |
| Project no.: | Date: |
| 09 | 24.11.2023 |

**TENDER ISSUE**

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**DRAWING TITLE:**

ABLUTION BLOCK
LIGHTING LAYOUT

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| Dwg. No. | 09- 003E- 004 |
| Scale: | NTS |
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| Chek'd By | |
| Project no.: | 09 |
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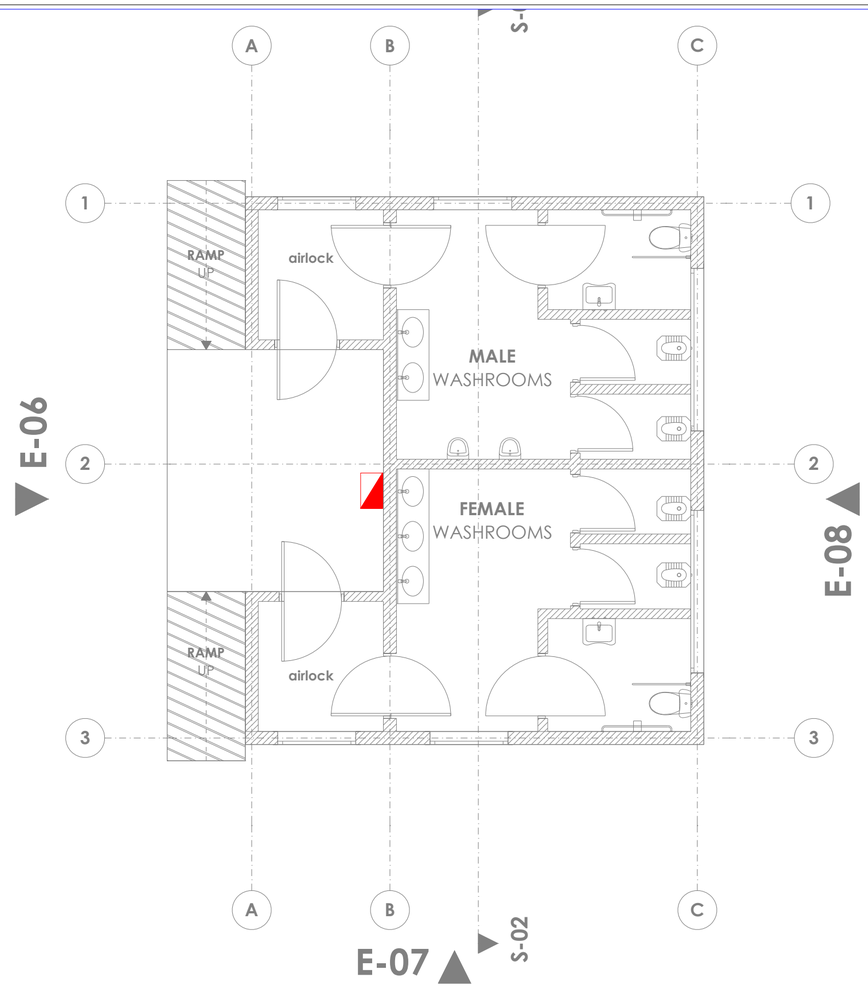


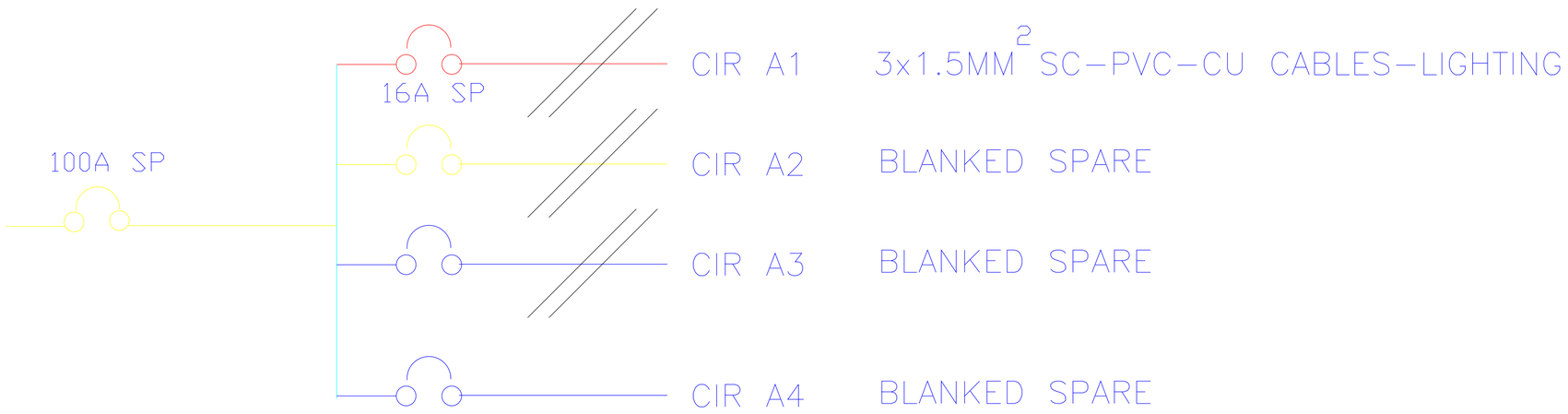


# 4- WAY 100A CONSUMER UNIT FOR ABOLITION BLOCK

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PROPOSED CONSTRUCTION OF MUKOWE FISH LANDING SITE

**CLIENT:**

STATE DEPARTMENT FOR FISHERIES, AQUACULTURE & THE BLUE ECONOMY

**CLIENT'S SIGNATURE:**

Sign:

**DRAWING TITLE:**

ABOLITION BLOCK POWER LAYOUT

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| Dwg. No. | 09- 003E- 005 |
| Scale: | NTS |
| Drawn by | Chek'd By |
| Project no.: | Date: |
| 09 | 10.01.2024 |

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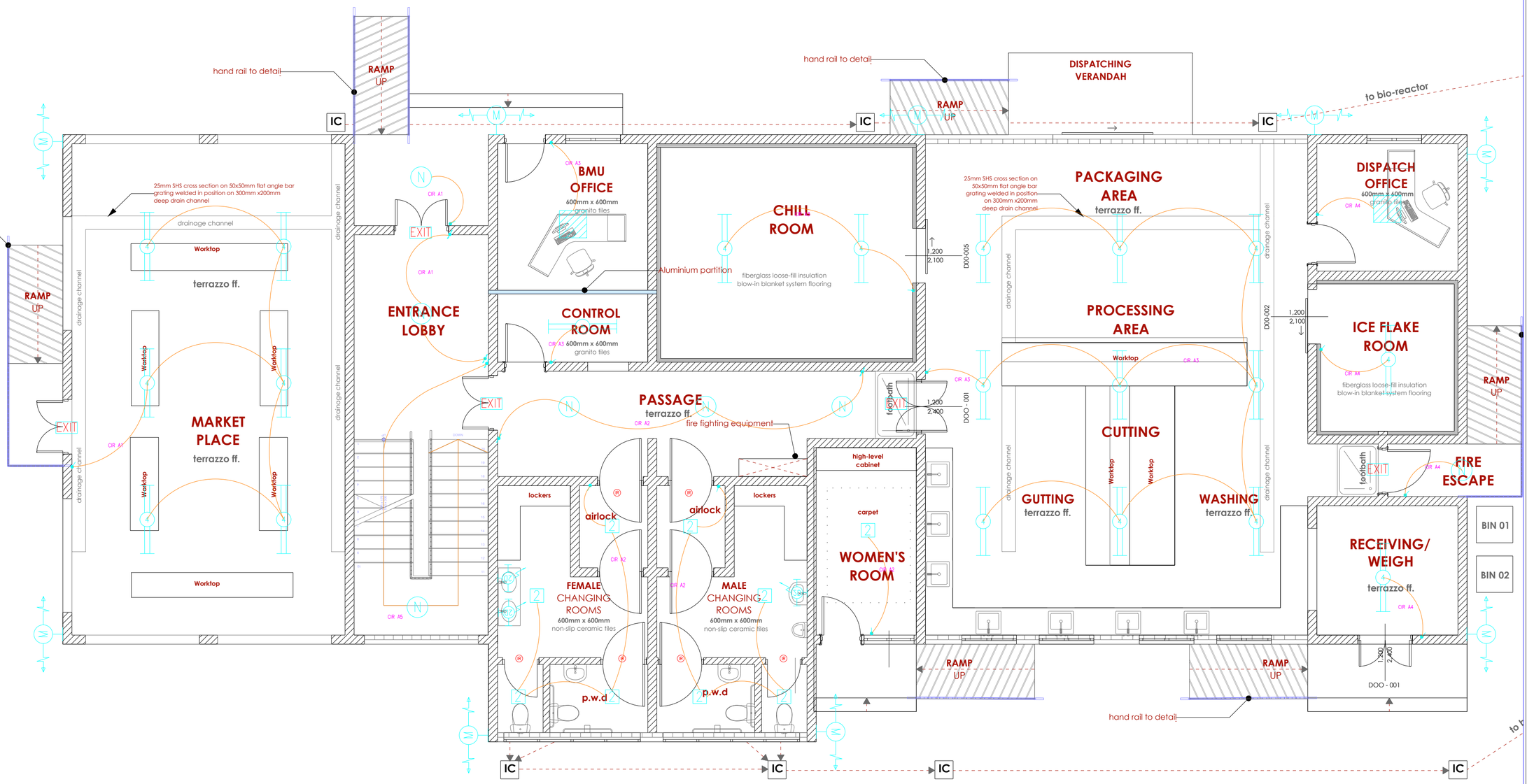


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## DRAWING TITLE:

GROUND FLOOR LIGHTING LAYOUT

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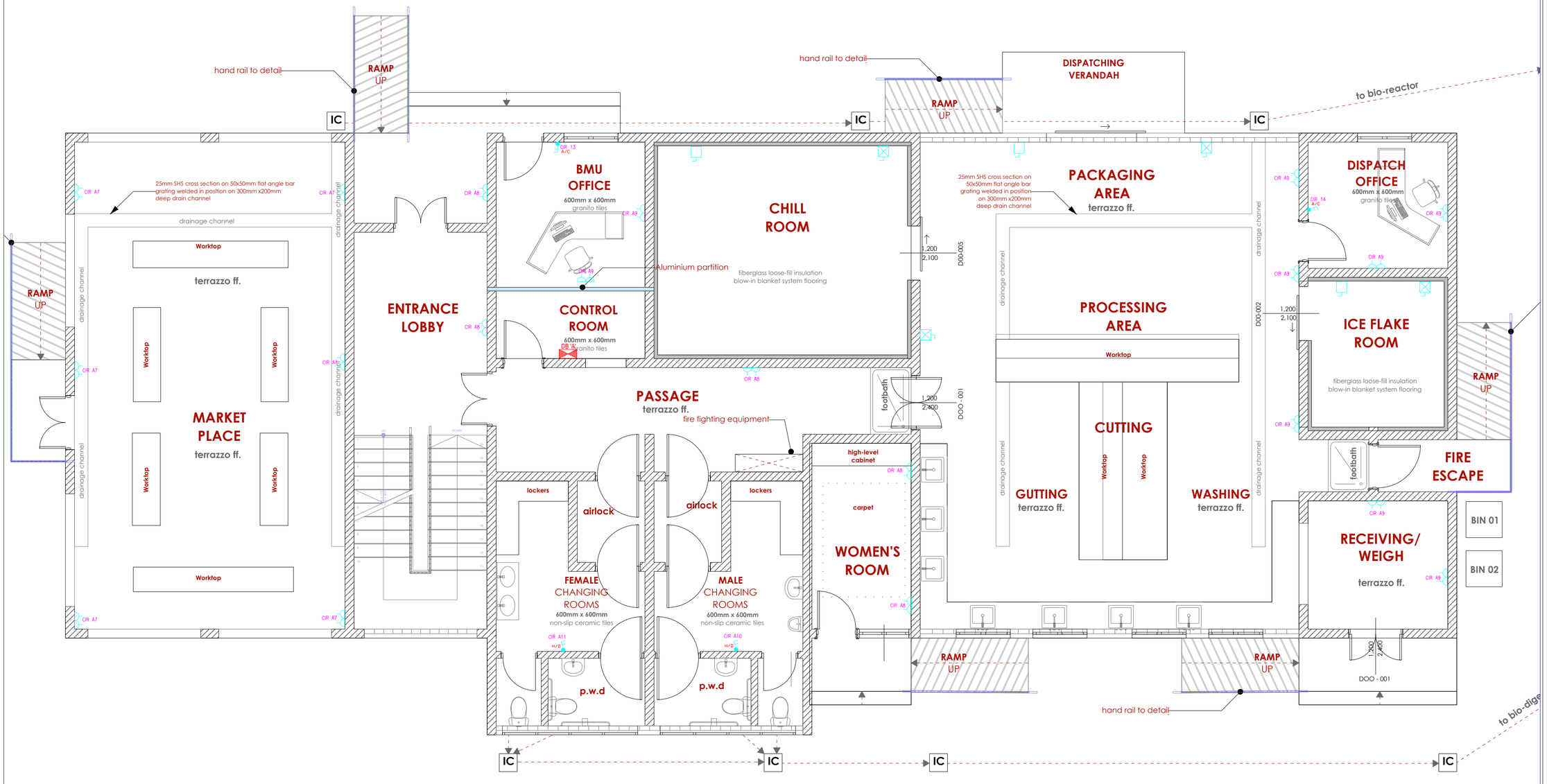


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**DRAWING TITLE:**

GROUND FLOOR POWER LAYOUT

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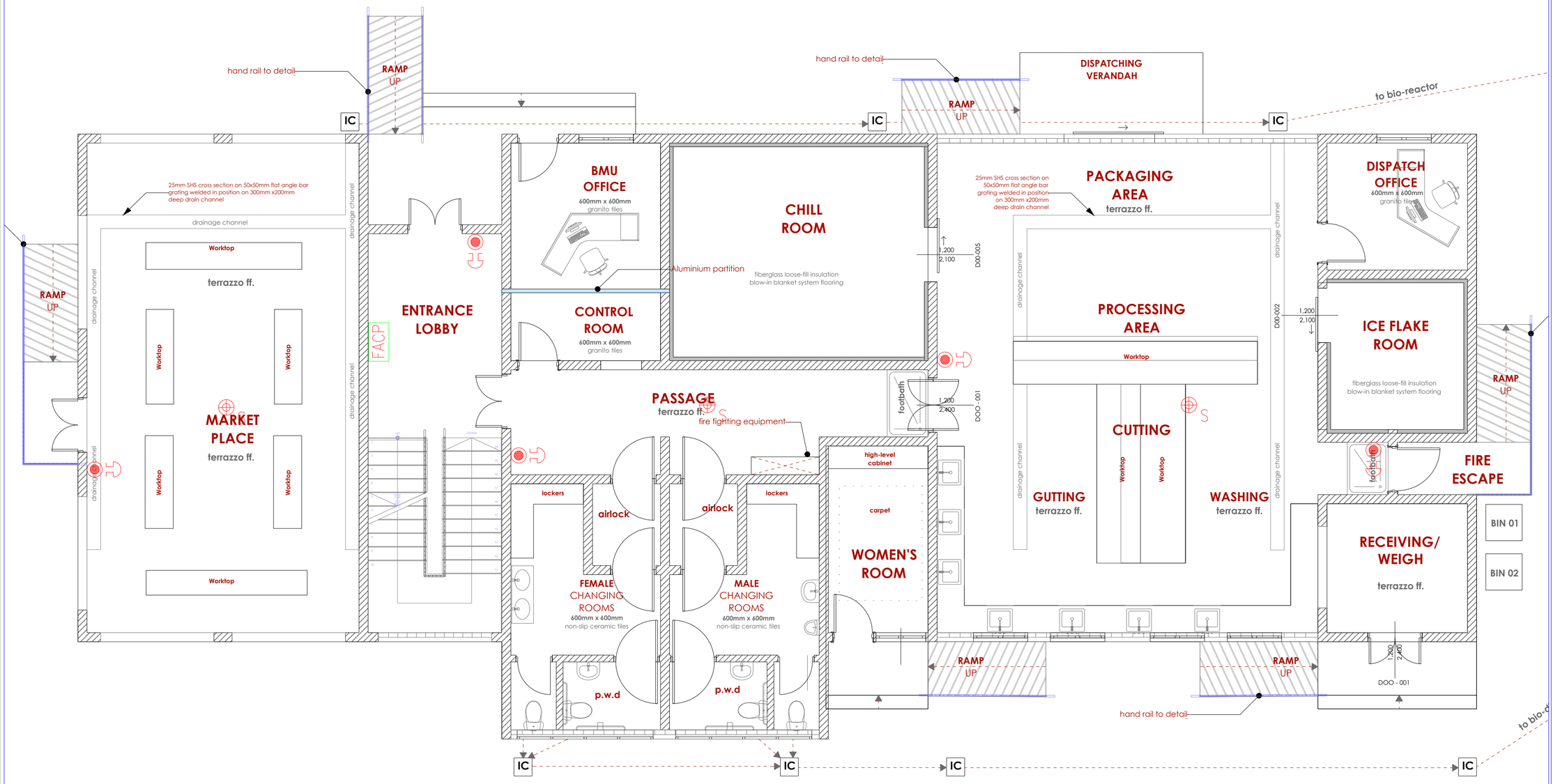




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Sign:

**DRAWING TITLE:**

GROUND FLOOR FIRE ALARM LAYOUT

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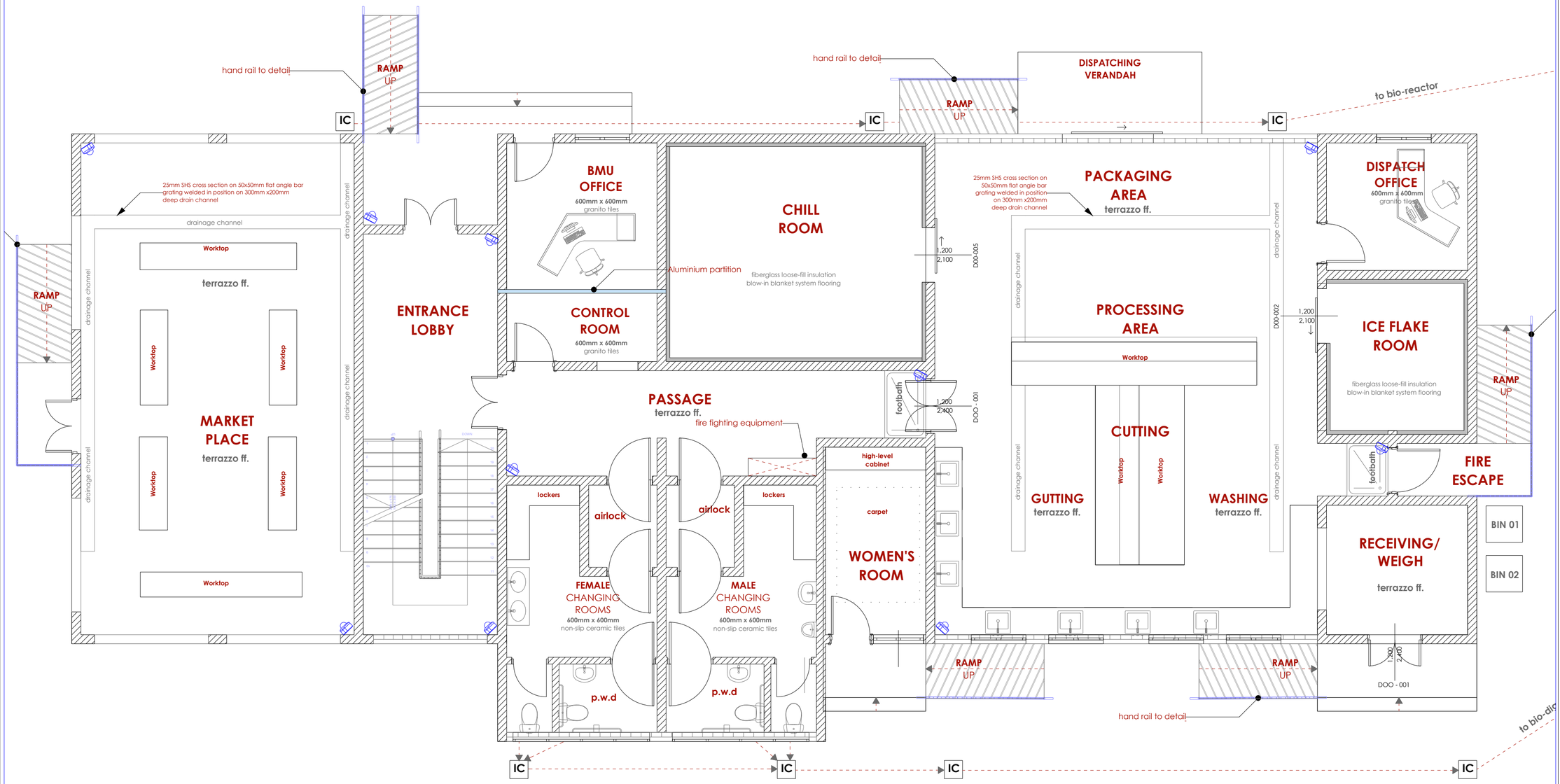
| Dwg. No. | 09- 003E- 008 |
| Scale: | NTS |
| Drawn by | |
| Chek'd By | |
| Project no.: | 09 |
| Date: | 10.01.2024 |

**TENDER ISSUE**

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## REVISIONS:

| REV. No. | Details of Revision |
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## PROJECT TITLE:

PROPOSED CONSTRUCTION OF MUKOWE FISH LANDING SITE

## CLIENT:

STATE DEPARTMENT FOR FISHERIES, AQUACULTURE & THE BLUE ECONOMY

## CLIENT'S SIGNATURE:

Sign:

## DRAWING TITLE:

GROUND FLOOR CCTV LAYOUT

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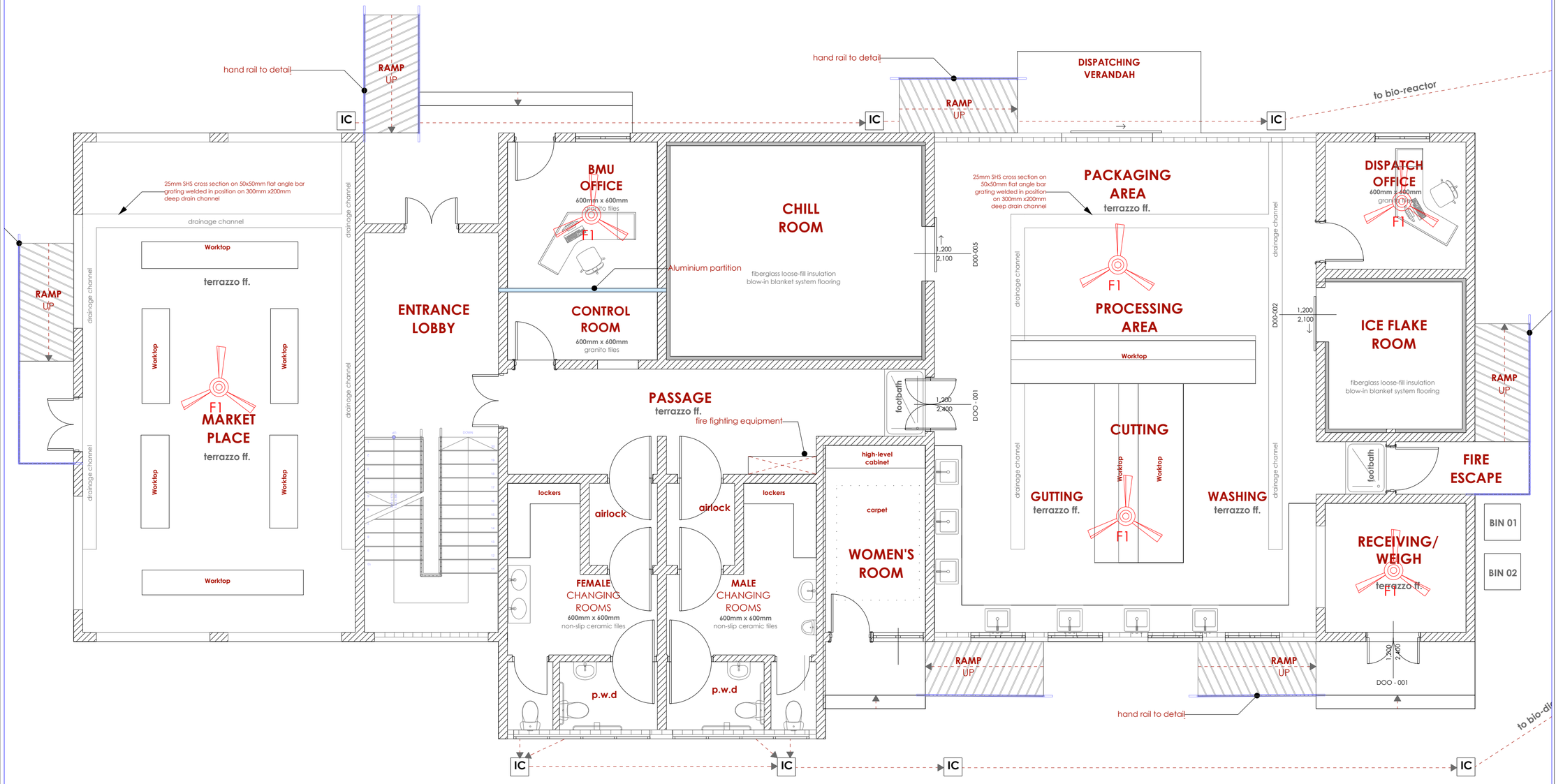
| Dwg. No. | 09- 003E- 009 |
| Scale: | NTS |
| Drawn by | Chek'd By |
| Project no.: | Date: |
| 09 | 10.01.2024 |

**TENDER ISSUE**



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**REVISIONS:**

| REV. No. | Details of Revision |
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**PROJECT TITLE:**

PROPOSED CONSTRUCTION OF MUKOWE FISH LANDING SITE

**CLIENT:**

STATE DEPARTMENT FOR FISHERIES, AQUACULTURE & THE BLUE ECONOMY

**CLIENT'S SIGNATURE:**

Sign:

**DRAWING TITLE:**

GROUND FLOOR FANS LAYOUT

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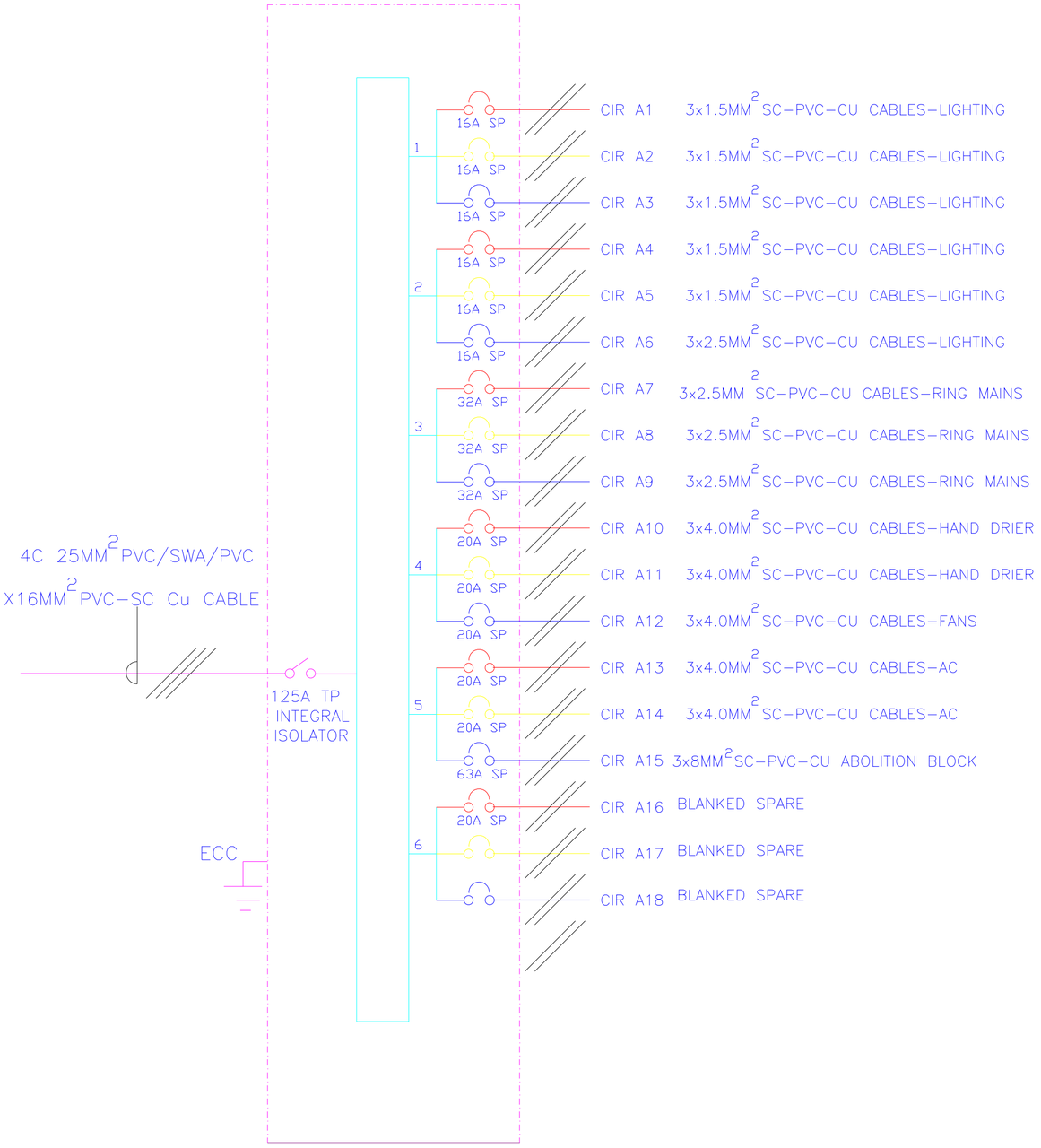
| Dwg. No. | 09- 003E- 010 |
| Scale: | NTS |
| Drawn by | Chek'd By |
| Project no.: | Date: |
| 09 | 10.01.2024 |

**TENDER ISSUE**




6- WAY 125A TPN DISTRIBUTION BOARD 'A' FOR RAW POWER DISTRIBUTION ON GROUND FLOOR



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**PROJECT TITLE:**

PROPOSED CONSTRUCTION OF MUKOWE FISH LANDING SITE

**CLIENT:**

STATE DEPARTMENT FOR FISHERIES, AQUACULTURE & THE BLUE ECONOMY

**CLIENT'S SIGNATURE:**

Sign:

**DRAWING TITLE:**

GROUND FLOOR SCHEMATIC

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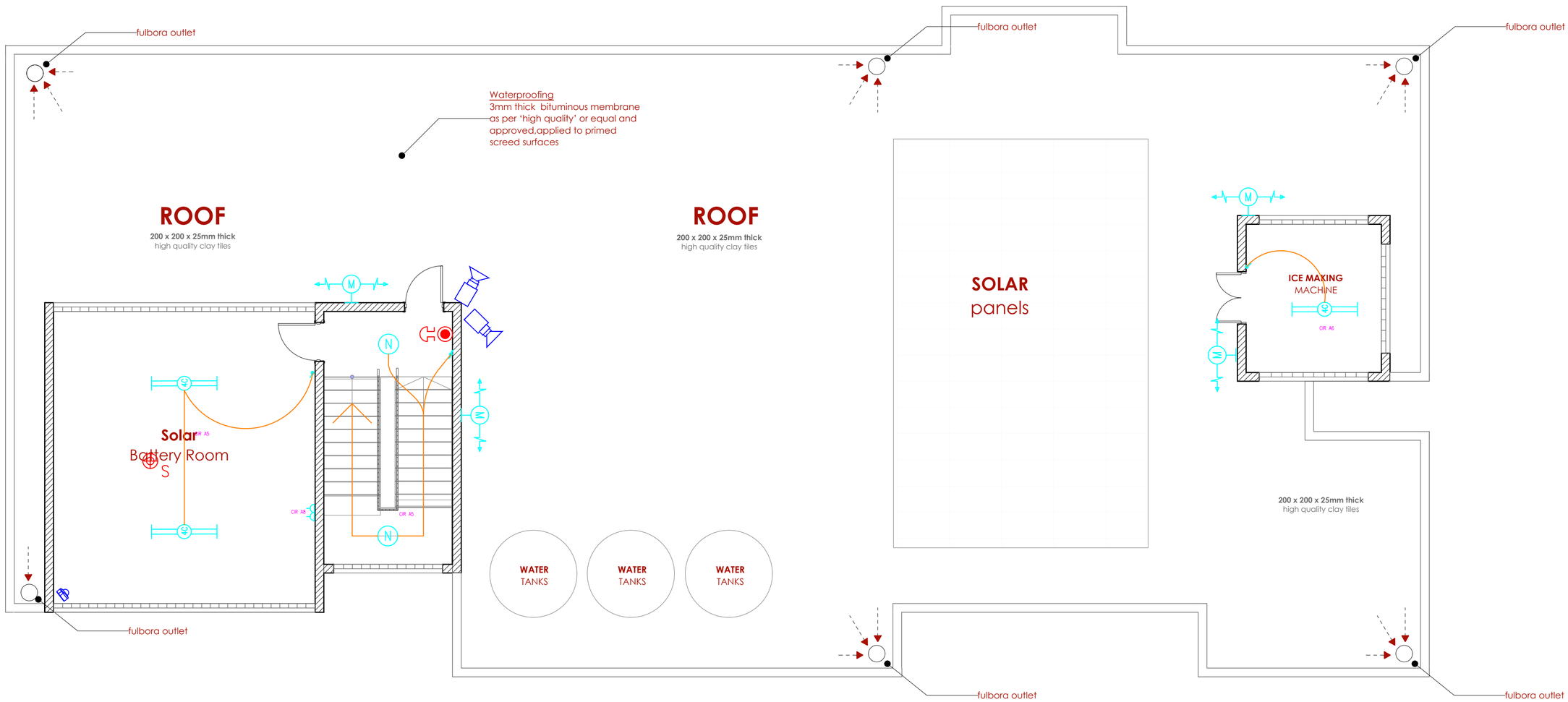
| Dwg. No. | 09- 003E- 011 |
| Scale: | NTS |
| Drawn by | |
| Chek'd By | |
| Project no.: | Date: |
| 09 | 10.01.2024 |

**TENDER ISSUE**



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**PROJECT TITLE:**

PROPOSED CONSTRUCTION OF MUKOWE FISH LANDING SITE

**CLIENT:**

STATE DEPARTMENT FOR FISHERIES, AQUACULTURE & THE BLUE ECONOMY

**CLIENT'S SIGNATURE:**

Sign:

**DRAWING TITLE:**

FISH BANDA FIRST FLOOR ELECTRICAL LAYOUT

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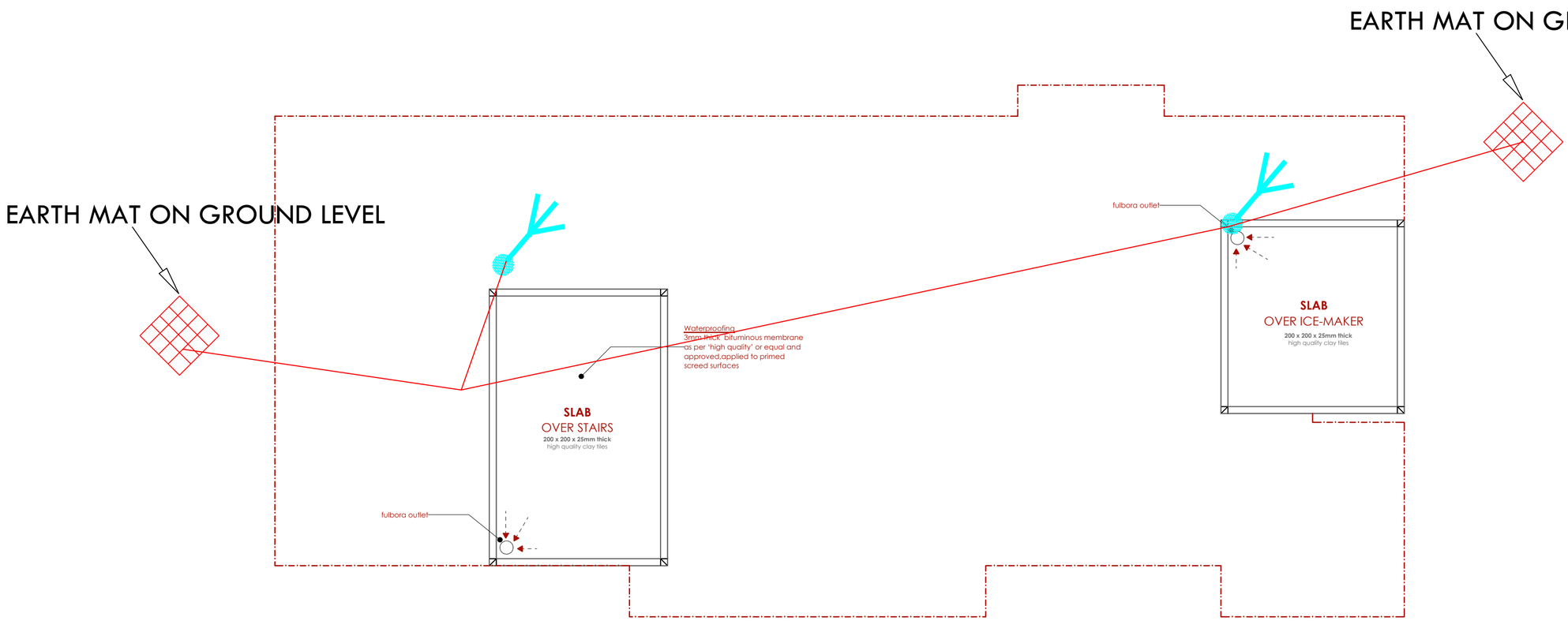
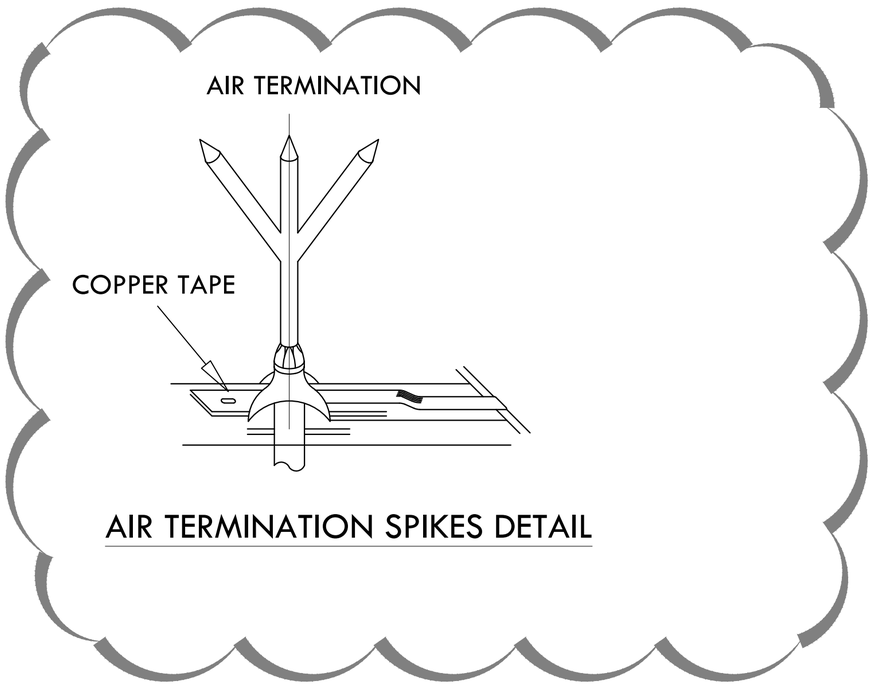
| Dwg. No. | 09- 003E- 012 |
| Scale: | NTS |
| Drawn by | |
| Chek'd By | |
| Project no.: | Date: |
| 09 | 10.01.2024 |

**TENDER ISSUE**




AIR TERMINATION SPIKES DETAIL



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**PROJECT TITLE:**

PROPOSED CONSTRUCTION OF MUKOWE FISH LANDING SITE

**CLIENT:**

STATE DEPARTMENT FOR FISHERIES, AQUACULTURE & THE BLUE ECONOMY

**CLIENT'S SIGNATURE:**

Sign:

**DRAWING TITLE:**

FISH BANDA LIGHTNING ARRESTORS

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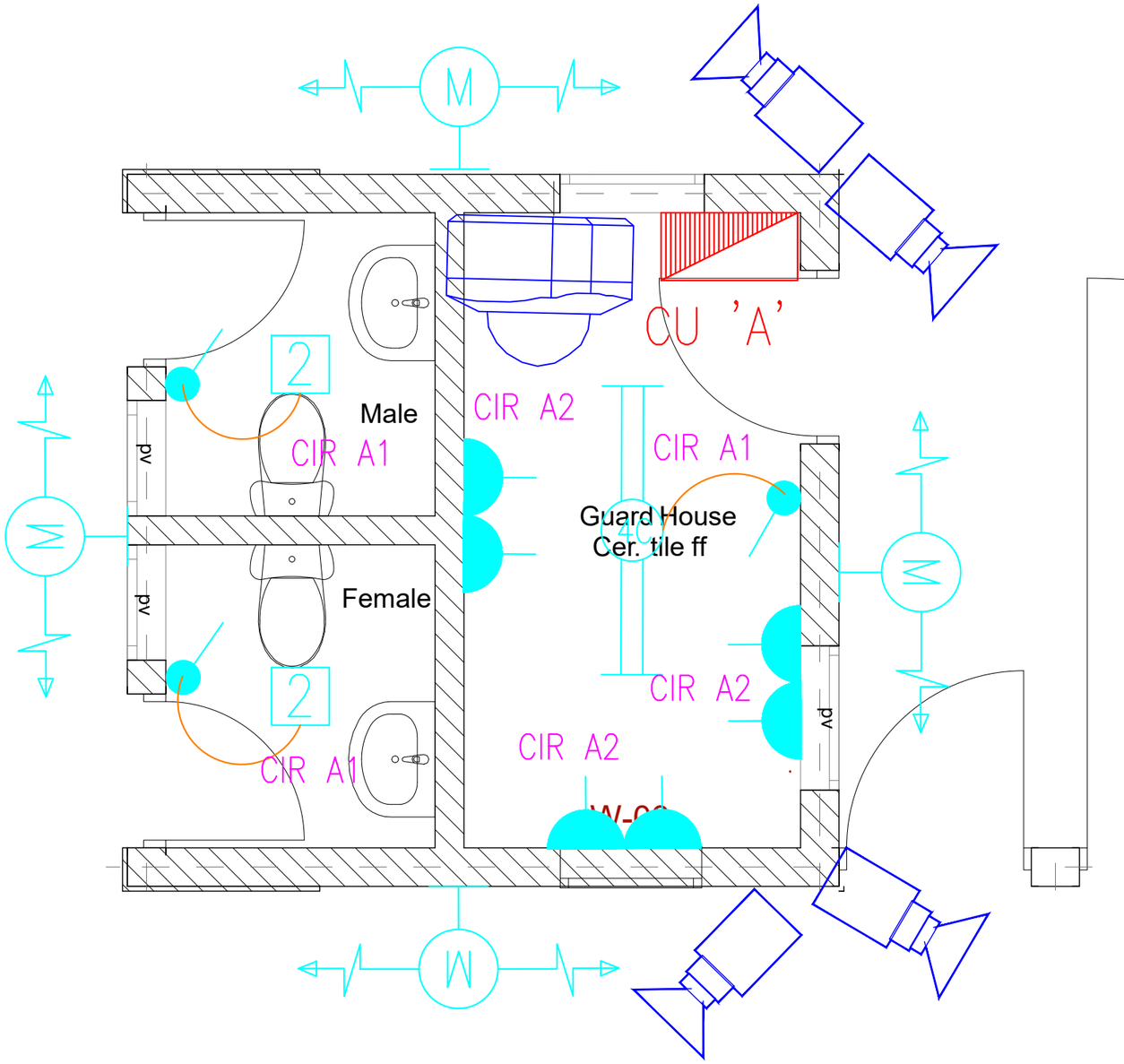
| Dwg. No. | 09- 003E- 013 |
| Scale: | NTS |
| Drawn by | Chek'd By |
| Project no.: | Date: |
| 09 | 10.01.2024 |

**TENDER ISSUE**




# GATE HOUSE PLAN ELECTRICAL LAYOUT



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**REVISIONS:**

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**PROJECT TITLE:**

PROPOSED CONSTRUCTION OF FISH LANDING- MUKOWE

**CLIENT:**

STATE DEPARTMENT FOR FISHERIES, AQUACULTURE & THE BLUE ECONOMY

**CLIENT'S SIGNATURE:**

Sign:

**DRAWING TITLE:**

GATE HOUSE ELECTRICAL LAYOUT

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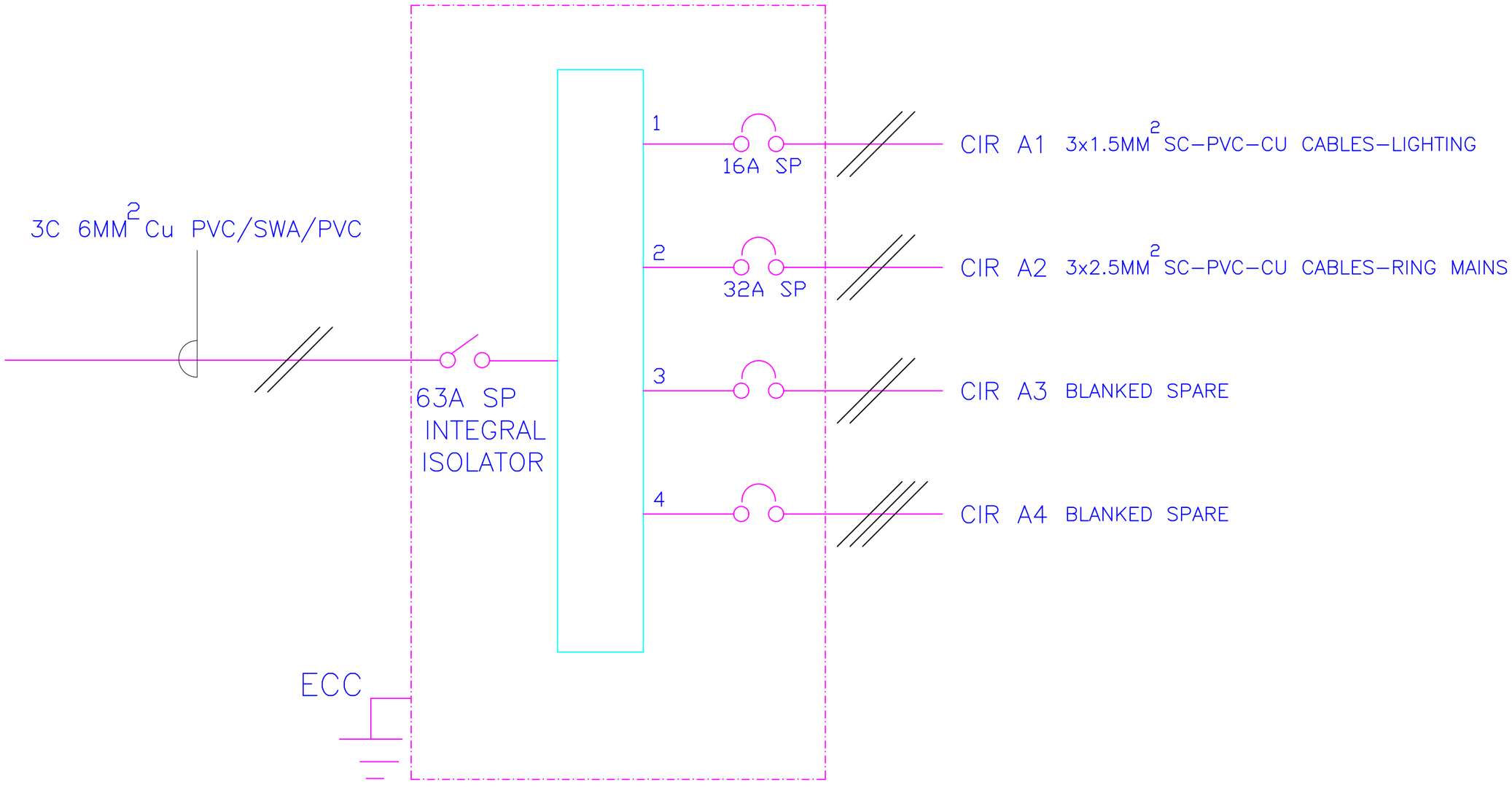
| Dwg. No. | 09- 003E- 14 |
| Scale: | NTS |
| Drawn by | Chek'd By |
| Project no.: | Date: |
| 09 | 29.12.2023 |

**TENDER ISSUE**

# 4– WAY 100A SPN CONSUMER UNIT 'A' FOR RAW POWER DISTRIBUTION– GUARD HOUSE



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**PROJECT TITLE:**

PROPOSED CONSTRUCTION OF FISH LANDING- MUKOWE

**CLIENT:**

STATE DEPARTMENT FOR FISHERIES, AQUACULTURE & THE BLUE ECONOMY

**CLIENT'S SIGNATURE:**

Sign:

**DRAWING TITLE:**

GATE HOUSE SCHEMATIC

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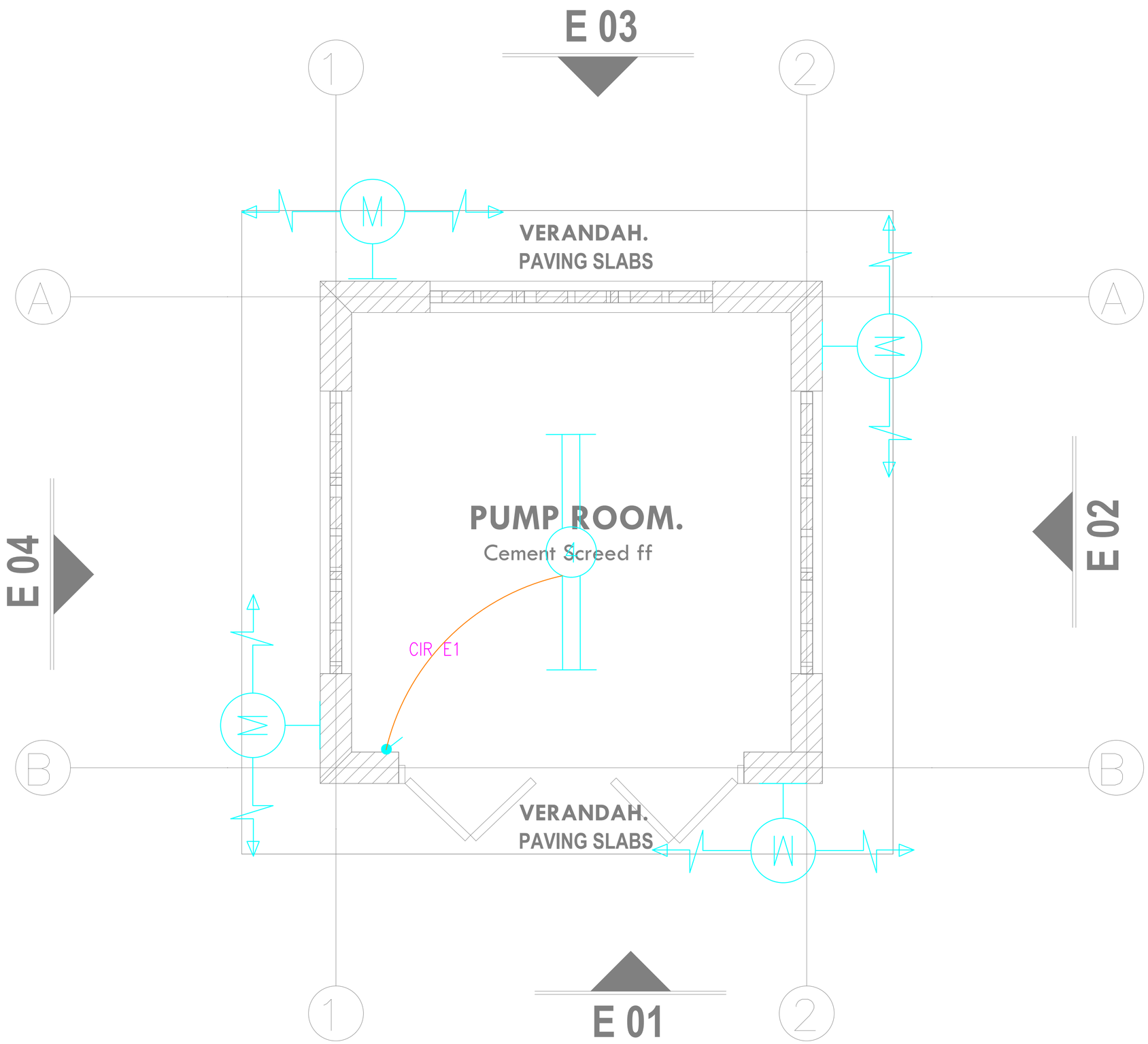
| Dwg. No. | 09- 003E- 15 |
| Scale: | NTS |
| Drawn by | Chek'd By |
| Project no.: | Date: |
| 09 | 29.12.2023 |

TENDER ISSUE



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**PROJECT TITLE:**

PROPOSED CONSTRUCTION OF FISH LANDING- MUKOWE

**CLIENT:**

STATE DEPARTMENT FOR FISHERIES, AQUACULTURE & THE BLUE ECONOMY

**CLIENT'S SIGNATURE:**

Sign:

**DRAWING TITLE:**

PUMP ROOM BLOCK LIGHTING LAYOUT

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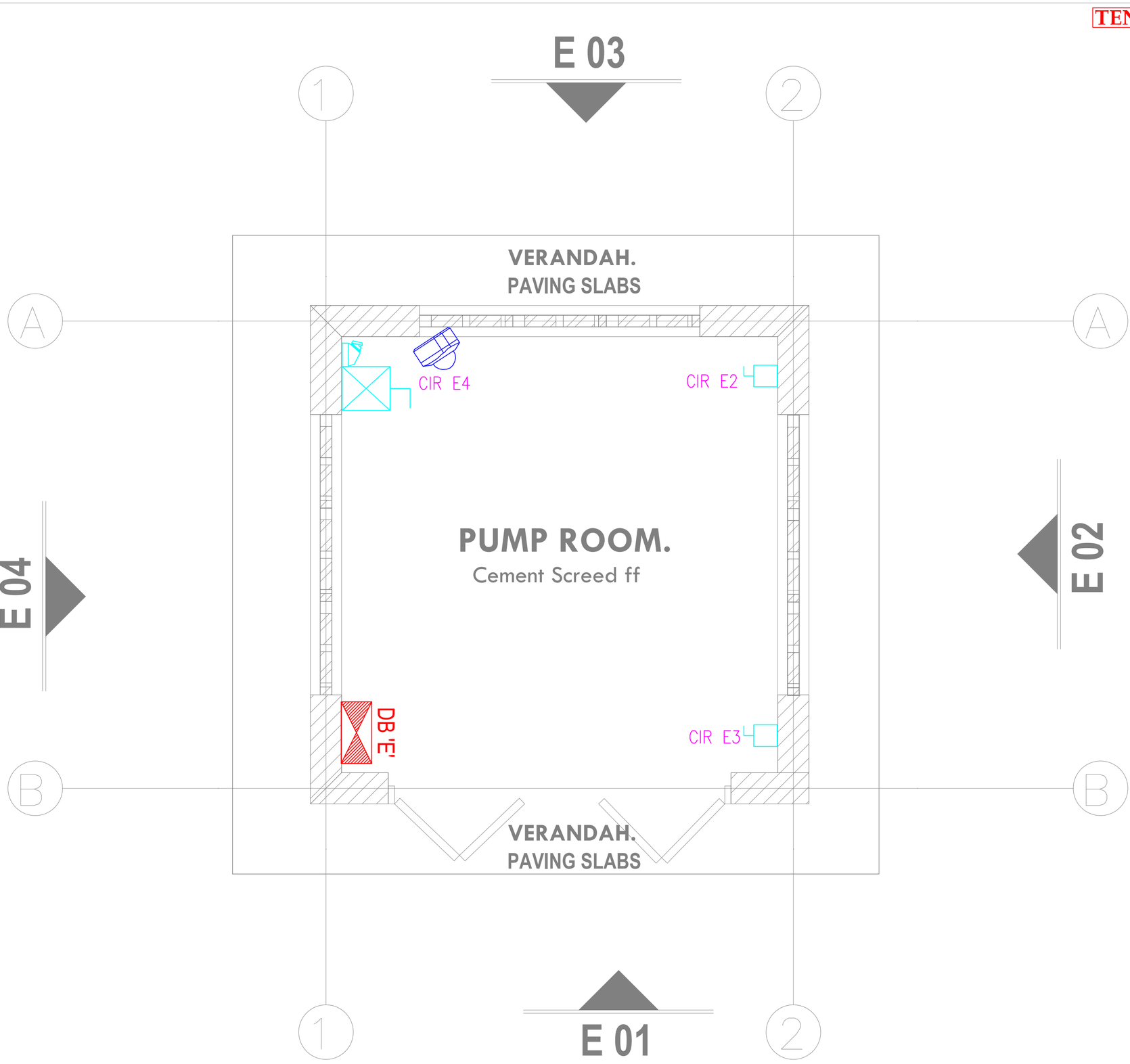
| Dwg. No. | 09- 003E- 016 |
| Scale: | NTS |
| Drawn by | |
| Chek'd By | |
| Project no.: | 09 |
| Date: | 31.01.2024 |

TENDER ISSUE



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**PROJECT TITLE:**

PROPOSED CONSTRUCTION OF FISH LANDING- MUKOWE

**CLIENT:**

STATE DEPARTMENT FOR FISHERIES, AQUACULTURE & THE BLUE ECONOMY

**CLIENT'S SIGNATURE:**

Sign:

**DRAWING TITLE:**

PUMP ROOM BLOCK
POWER LAYOUT

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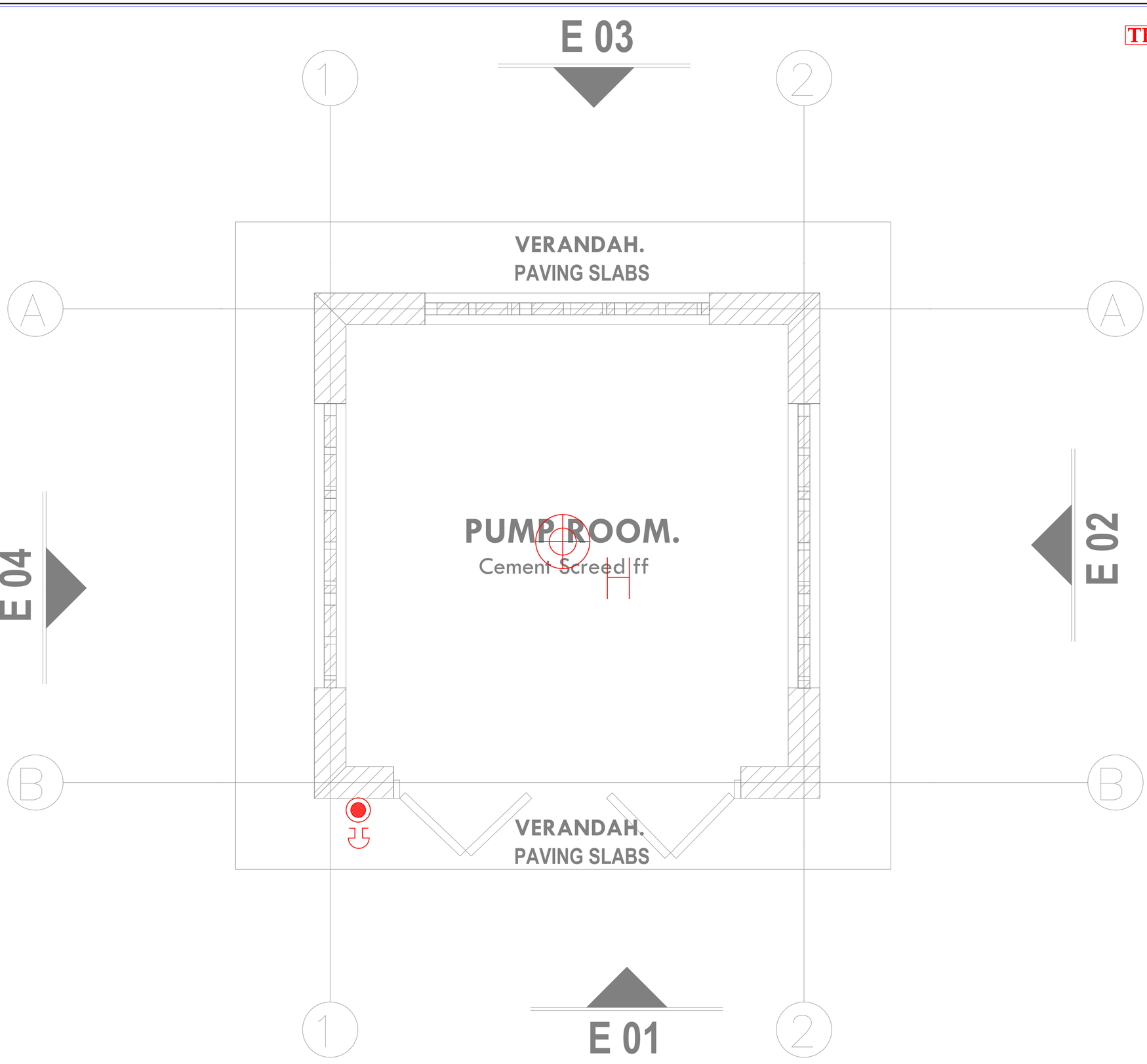
| Dwg. No. | 09- 003E- 017 |
| Scale: | NTS |
| Drawn by | |
| Chek'd By | |
| Project no.: | 09 |
| Date: | 31.01.2024 |

**TENDER ISSUE**

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**PROJECT TITLE:**

PROPOSED CONSTRUCTION OF FISH LANDING- MUKOWE

**CLIENT:**

STATE DEPARTMENT FOR FISHERIES, AQUACULTURE & THE BLUE ECONOMY

**CLIENT'S SIGNATURE:**

Sign:

**DRAWING TITLE:**

PUMP ROOM BLOCK FIRE ALARM LAYOUT

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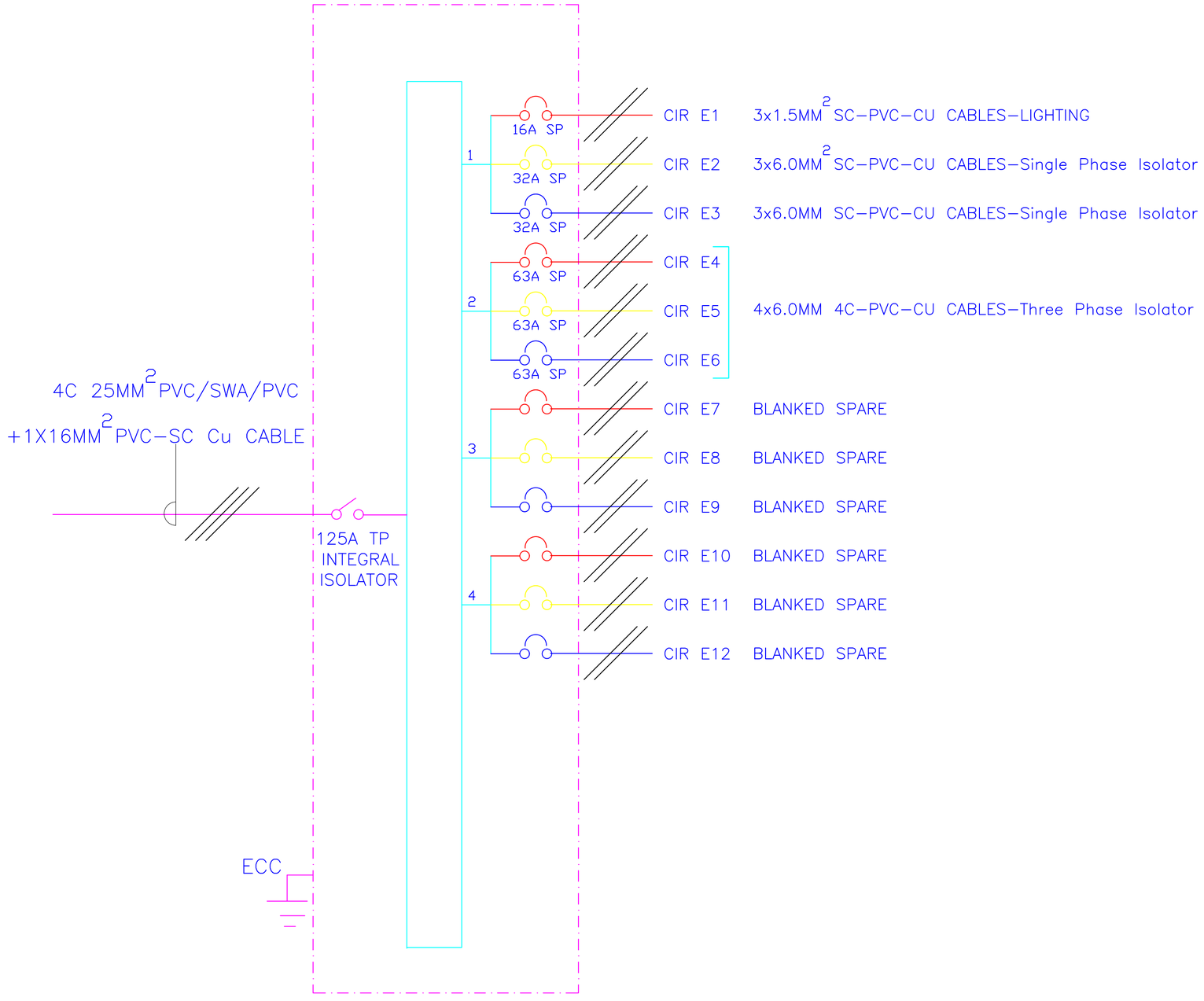
|---|---|
| Dwg. No. | 09- 003E- 018 |
| Scale: | NTS |
| Drawn by | Chek'd By |
| Project no.: | Date: |
| 09 | 31.01.2024 |

**TENDER ISSUE**




# 4– WAY 125A TPN DISTRIBUTION BOARD 'E' FOR RAW POWER DISTRIBUTION ON GROUND FLOOR



ARPRIM

**ARPRIM CONSORTIUM,**
**PO. BOX 12969-0040,**
**NAIROBI. KENYA.**

N O T E S

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10. THE PROJECT NOTES ARE TO BE READ IN CONJUNCTION WITH ALL RELEVANT TECHNICAL SPECIFICATIONS.

**REVISIONS:**

| REV. No. | Details of Revision |
|---|---|
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**PROJECT TITLE:**

PROPOSED CONSTRUCTION OF FISH LANDING- MUKOWE

**CLIENT:**

STATE DEPARTMENT FOR FISHERIES, AQUACULTURE & THE BLUE ECONOMY

**CLIENT'S SIGNATURE:**

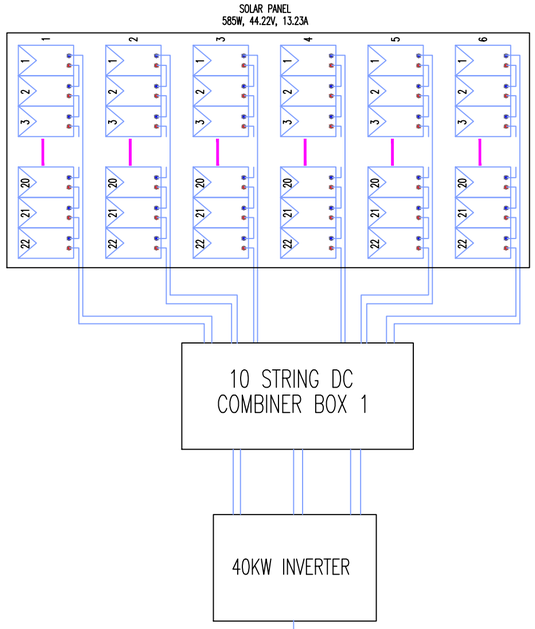
Sign:

**DRAWING TITLE:**

**PUMP ROOM BLOCK SCHEMATIC LAYOUT**

| | |
|---|---|
| Dwg. No. | 09- 003E- 019 |
| Scale: | NTS |
| Drawn by | |
| Chek'd By | |
| Project no.: | Date: |
| 09 | 31.01.2024 |

TENDER ISSUE




25kWh Battery Pack

SOLAR PV POWER TO GRID SYNCHRONIZATION PANEL

MAIN POWER BOARD

# POWER SYSTEM SOLAR SCHEMATIC



ARPRIM

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PO. BOX 12969-0040,
NAIROBI. KENYA.

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**REVISIONS:**

| REV. No. | Details of Revision |
|---|---|
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**PROJECT TITLE:**

PROPOSED CONSTRUCTION OF FISH LANDING- MUKOWE

**CLIENT:**

STATE DEPARTMENT FOR FISHERIES, AQUACULTURE & THE BLUE ECONOMY

**CLIENT'S SIGNATURE:**

Sign:

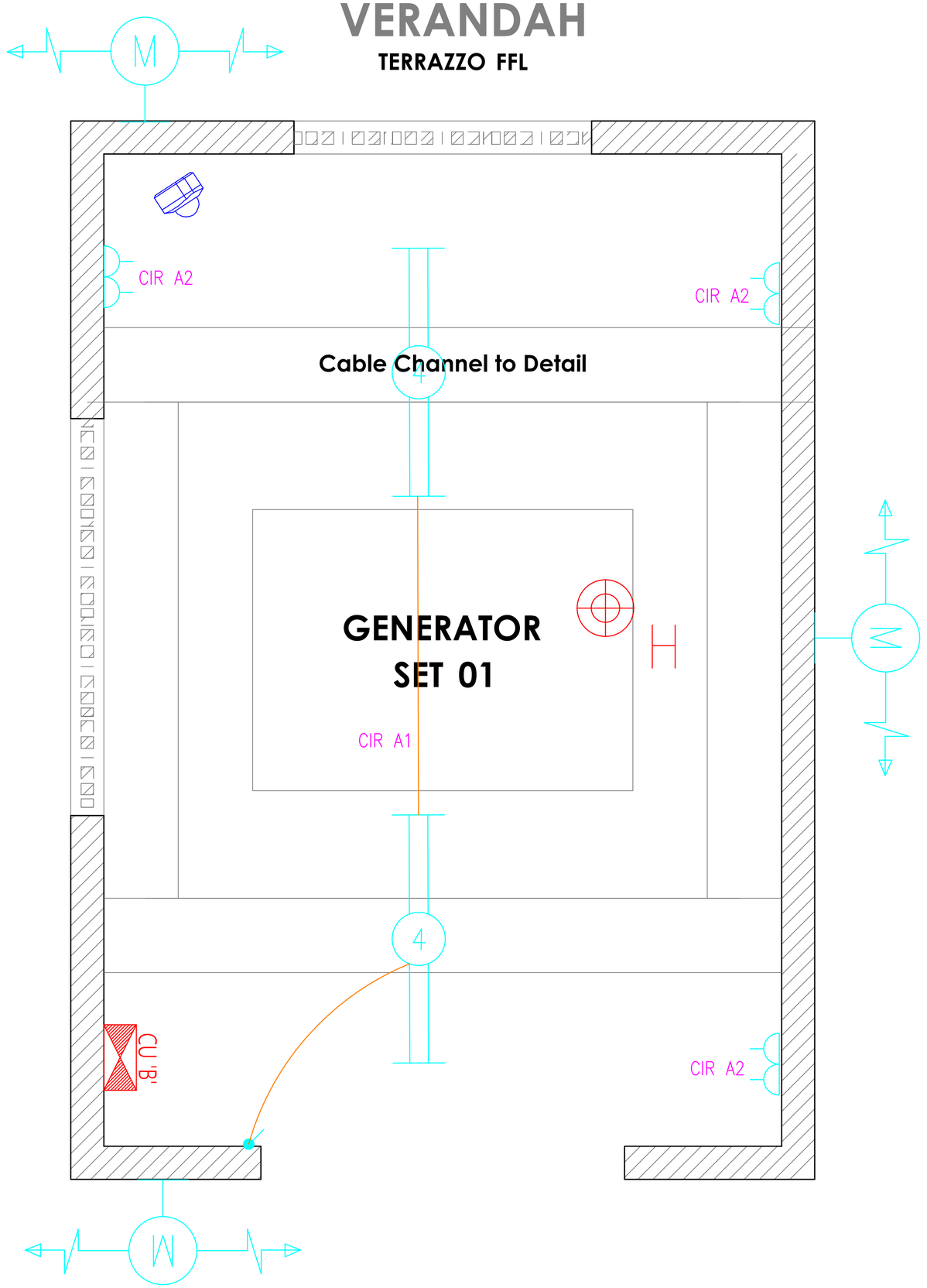
**DRAWING TITLE:**

POWER SYSTEM SOLAR SCHEMATIC

| | |
|---|---|
| Dwg. No. | 09- 003E- 020 |
| Scale: | NTS |
| Drawn by | Chek'd By |
| Project no.: | Date: |
| 09 | 24.11.2023 |

# VERANDAH

**TERRAZZO FFL**

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**REVISIONS:**

| REV. No. | Details of Revision |
|---|---|
| 01 | FIRE HYDRANT ADDED |
| | |
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**PROJECT TITLE:**

PROPOSED CONSTRUCTION OF MUKOWE FISH LANDING SITE

**CLIENT:**

STATE DEPARTMENT FOR FISHERIES, AQUACULTURE & THE BLUE ECONOMY

**CLIENT'S SIGNATURE:**

Sign:

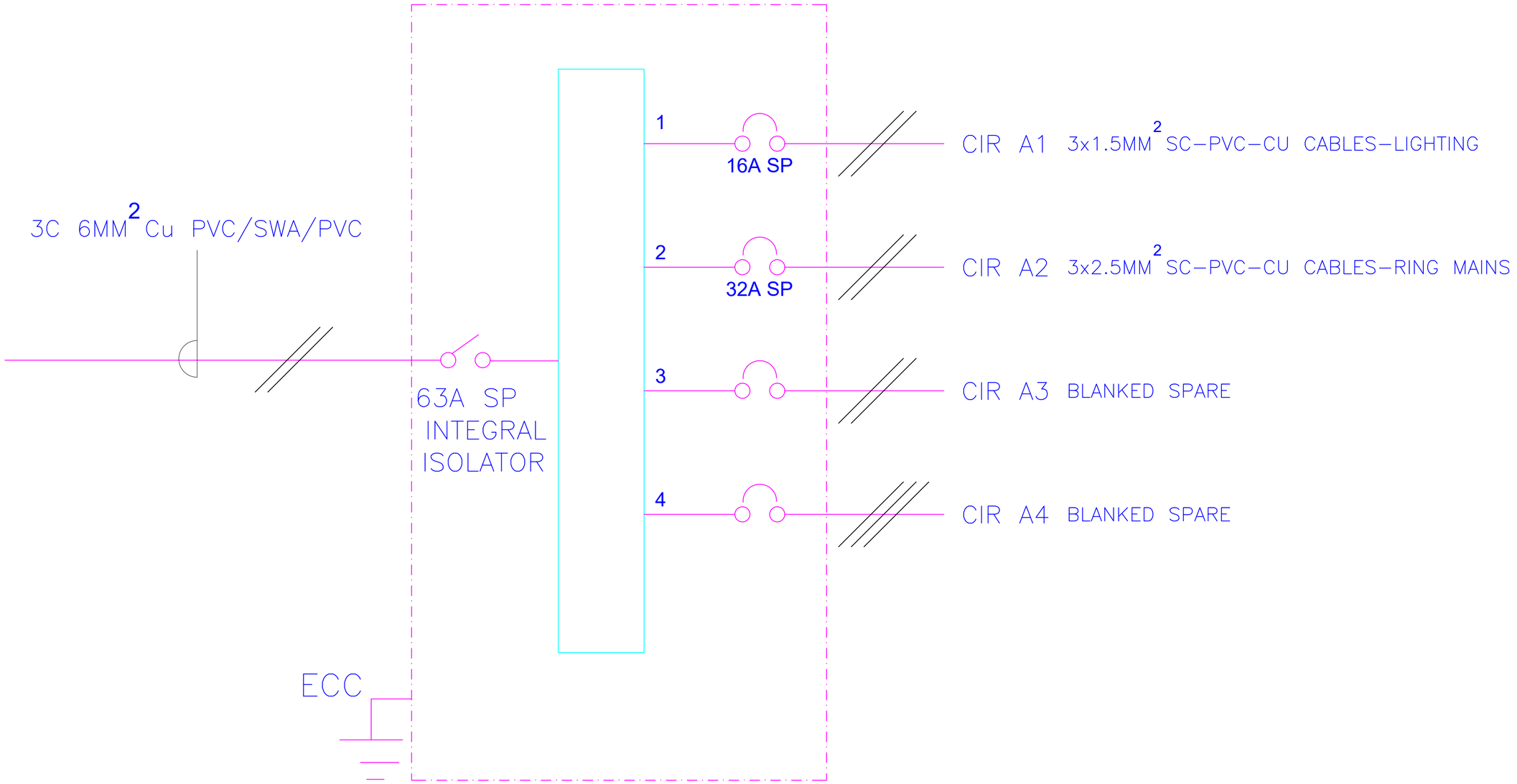
**DRAWING TITLE:**

STREET LIGHT DETAIL

| | |
|---|---|
| Dwg. No. | 09- 003E- 021 |
| Scale: | NTS |
| Drawn by | Chek'd By |
| Project no.: | Date: |
| 09 | 31/01/2024 |

**TENDER ISSUE**

# 4– WAY 100A SPN CONSUMER UNIT 'A' FOR RAW POWER DISTRIBUTION



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NAIROBI. KENYA.

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**REVISIONS:**

| REV. No. | Details of Revision |
|---|---|
| 01 | FIRE HYDRANT ADDED |
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**PROJECT TITLE:**

PROPOSED CONSTRUCTION OF MUKOWE FISH LANDING SITE

**CLIENT:**

STATE DEPARTMENT FOR FISHERIES, AQUACULTURE & THE BLUE ECONOMY

**CLIENT'S SIGNATURE:**

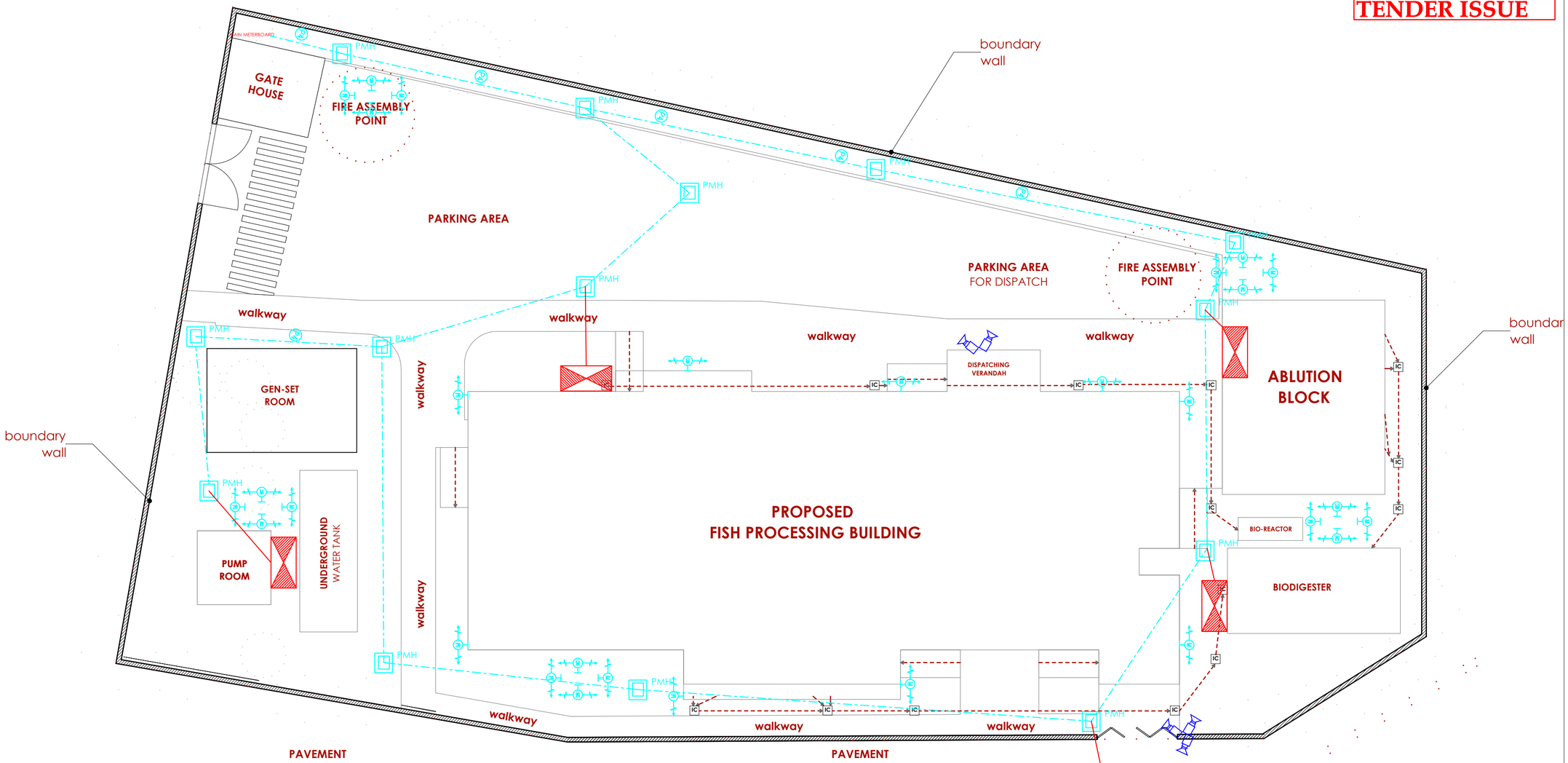
Sign:

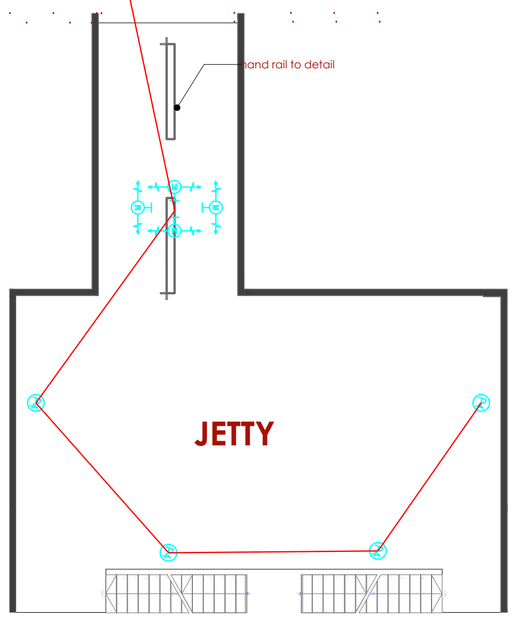
**DRAWING TITLE:**

POWER HOUSE SCHEMATIC

| | |
|---|---|
| Dwg. No. | 09- 003E- 022 |
| Scale: | NTS |
| Drawn by | |
| Chek'd By | |
| Project no.: | 09 |
| Date: | 31/01/2024 |

**TENDER ISSUE**




## LEGEND

1 No. 150mm dia
HGPVC ducts in slab/ belowground

1 No. 50mm dia
HGPVC ducts in slab/ belowground

600X600X700mm Deep
Manhole

SITE PLAN
ELECTRICAL LAYOUT



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**REVISIONS:**

| REV. No. | Details of Revision |
|---|---|
| 01 | FIRE HYDRANT ADDED |
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**PROJECT TITLE:**

PROPOSED CONSTRUCTION OF MUKOWE FISH LANDING SITE

**CLIENT:**

STATE DEPARTMENT FOR FISHERIES, AQUACULTURE & THE BLUE ECONOMY

**CLIENT'S SIGNATURE:**

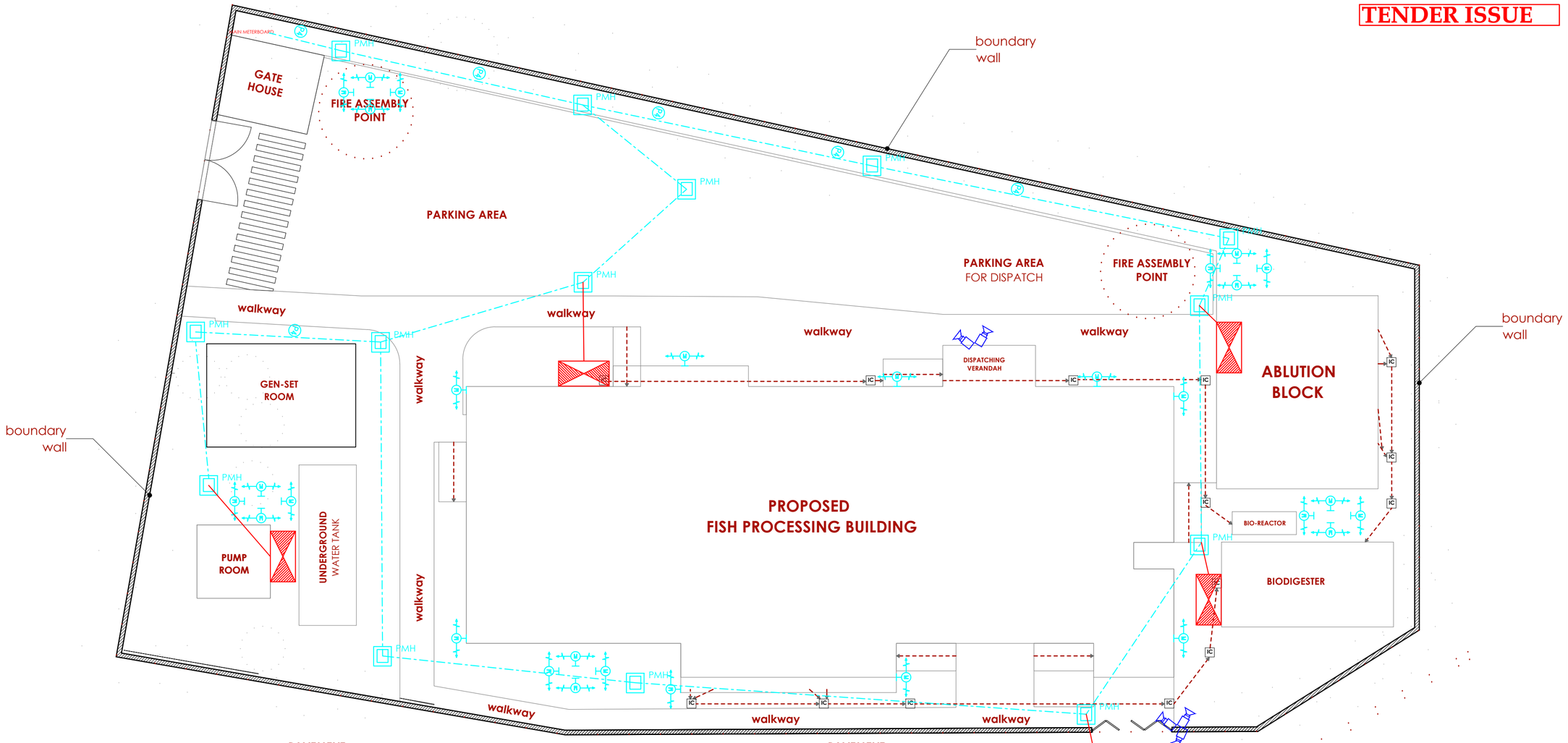
Sign:

**DRAWING TITLE:**

SITE PLAN ELECTRICAL LAYOUT

| | |
|---|---|
| Dwg. No. | 09- 003E- 023 |
| Scale: | NTS |
| Drawn by | Chek'd By |
| Project no.: | Date: |
| 09 | 31/01/2024 |

**TENDER ISSUE**



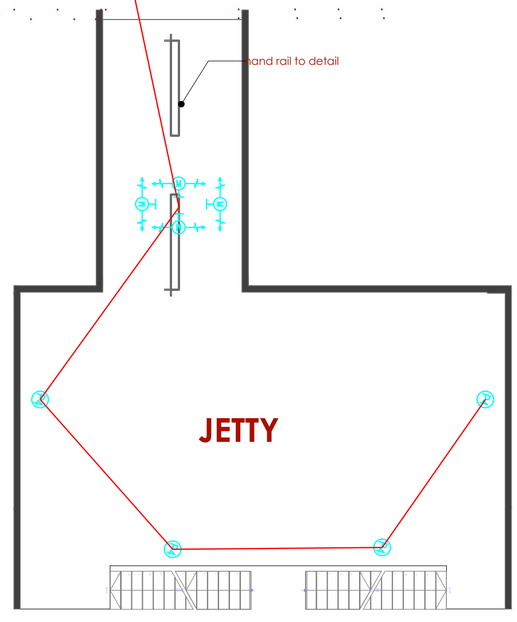

## LEGEND

1 No. 150mm dia
HGPVC ducts in slab/ belowground

1 No. 50mm dia
HGPVC ducts in slab/ belowground

600X600X700mm Deep
Manhole

SITE PLAN
ELECTRICAL LAYOUT



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### REVISIONS:

| REV. No. | Details of Revision |
|---|---|
| 01 | FIRE HYDRANT ADDED |
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**PROJECT TITLE:**

PROPOSED CONSTRUCTION OF MUKOWE FISH LANDING SITE

**CLIENT:**

STATE DEPARTMENT FOR FISHERIES, AQUACULTURE & THE BLUE ECONOMY

**CLIENT'S SIGNATURE:**

Sign:

**DRAWING TITLE:**

STREET LIGHT DETAIL

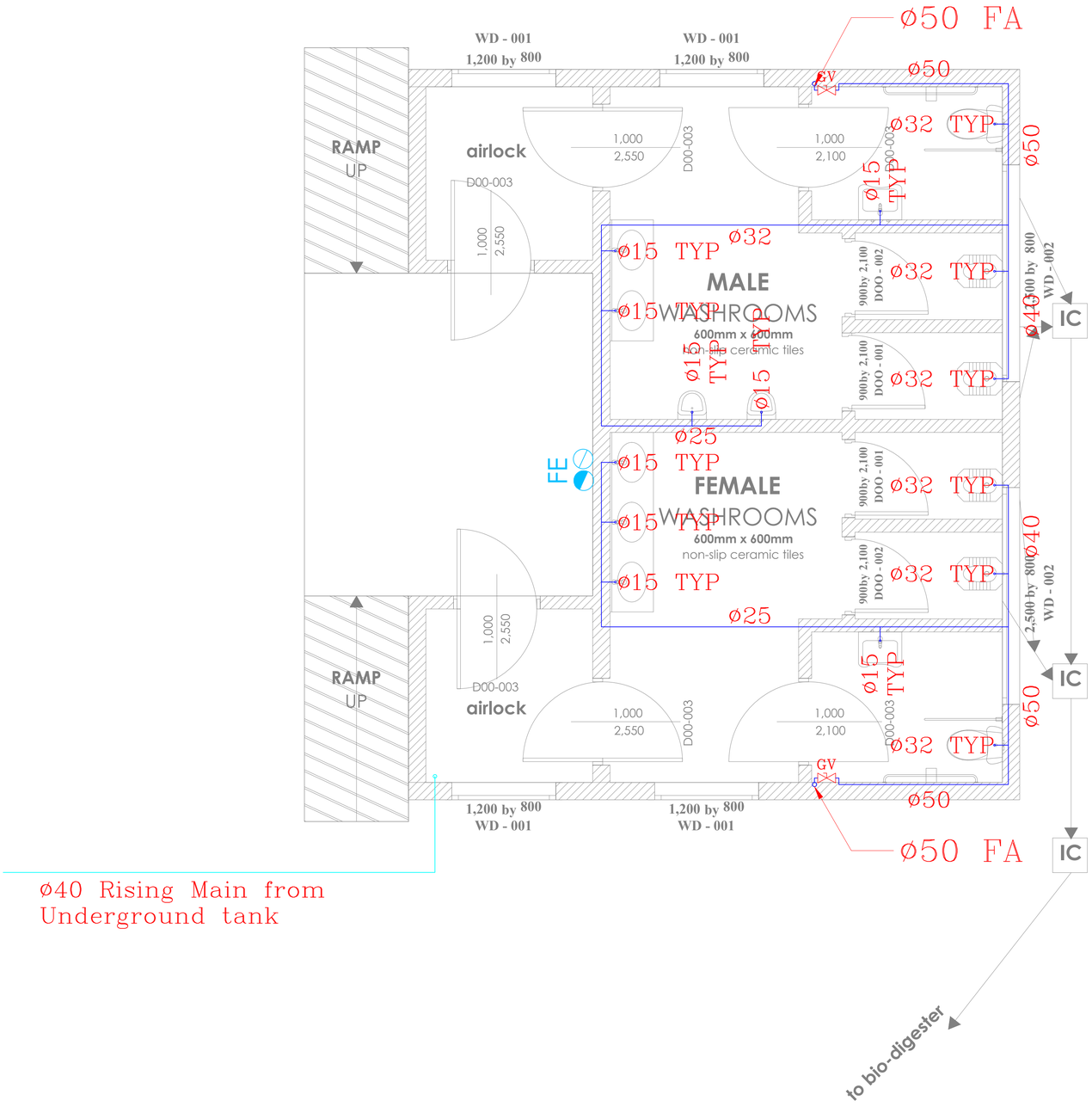
| | |
|---|---|
| Dwg. No. | 09- 003E- 024 |
| Scale: | NTS |
| Drawn by | Chek'd By |
| Project no.: | Date: |
| 09 | 31/01/2024 |

**DRAWING TITLE: PROPOSED CONSTRUCTION OF MUKOWE FISH LANDING SITE**

**DRAWING NUMBER: 09-003M- 001**

| No. | DRAWING/ DOCUMENT TITLE | DRAWING NUMBER | DRAWING SHEET | DRAWING FORMAT | DOCUMENT STATUS |
|---|---|---|---|---|---|
| **D** | **ELECTRICAL ENGINEERING DRAWINGS** | | | | |
| 1 | LIST OF DRAWINGS | 09- 003M- 001 | A3 | PDF/ EXCEL | Provided |
| 2 | ABLUTION BLOCK GROUND FLOOR WATER SUPPLY | 09- 003M- 002 | A3 | PDF/ DWG | Provided |
| 3 | ABLUTION BLOCK FIRST FLOOR WATER SUPPLY | 09- 003M- 003 | A3 | PDF/ DWG | Provided |
| 4 | FISH BANDA GROUND FLOOR WATER SUPPLY | 09- 003M- 004 | A3 | PDF/ DWG | Provided |
| 5 | FISH BANDA FIRST FLOOR WATER SUPPLY | 09- 003M- 005 | A3 | PDF/ DWG | Provided |
| 6 | SITE PLAN WATER RETICULATION LAYOUT | 09- 003M- 006 | A3 | PDF/ DWG | Provided |
| 7 | ABLUTION BLOCK GROUND FLOOR DRAINAGE | 09- 003M- 007 | A3 | PDF/ DWG | Provided |
| 8 | FISH BANDA GROUND FLOOR DRAINAGE | 09- 003M- 008 | A3 | PDF/ DWG | Provided |
| 9 | ABLUTION BLOCK GROUND FLOOR STORM WATER DRAINAGE | 09- 003M- 009 | A3 | PDF/ DWG | Provided |
| 10 | ABLUTION BLOCK FRIST FLOOR STORM WATER DRAINAGE | 09- 003M- 010 | A3 | PDF/ DWG | Provided |
| 11 | FISH BANDA GROUND FLOOR STORM WATER DRAINAGE | 09- 003M- 011 | A3 | PDF/ DWG | Provided |
| 12 | FISH BANDA FIRST FLOOR STORM WATER DRAINAGE | 09- 003M- 012 | A3 | PDF/ DWG | Provided |
| 13 | GATE HOUSE DRAINAGE | 09- 003M- 013 | A3 | PDF/ DWG | Provided |
| 14 | GATE HOUSE PLUMBING | 09- 003M- 014 | A3 | PDF/ DWG | Provided |
| 15 | POWER HOUSE & PUMP ROOM DRAINAGE | 09- 003M- 015 | A3 | PDF/ DWG | Provided |

DETAILED DESIGN




## LEGEND

| | | |
|---|---|---|
| CWS | —— | COLD WATER SUPPY |
| TB | —— | TO BELOW |
| FA | —— | FROM ABOVE |
| TA | —— | TO ABOVE |
| FE | —— | 9L CO2 FIRE EXTINGUISHER |
| FE | —— | 9KG DRY POWDER FIRE EXTINGUISHER |
| HR | —— | 30m HOSEREEL |
| | —— | LANDING VALVE |
| PPR | —— | POLY PROPELEYNE RANDOM |
| GMS | —— | GALVANIZED MILD STEEL PIPE |
| | —— | PLUMBING SERVICES (PPR MATERIAL) |
| | —— | HOSEREEL SERVICES (GMS CLASS 'B') |



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PO. BOX 12969-0040,
NAIROBI. KENYA.

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**REVISIONS:**

| REV. No. | Details of Revision |
|---|---|
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**PROJECT TITLE:**

PROPOSED CONSTRUCTION OF RESOURCE CENTER & RELATED INFRASTRUCTURE- MUKOWE

**CLIENT:**

STATE DEPARTMENT FOR FISHERIES, AQUACULTURE & THE BLUE ECONOMY

**CLIENT'S SIGNATURE:**

Sign:

**DRAWING TITLE:**

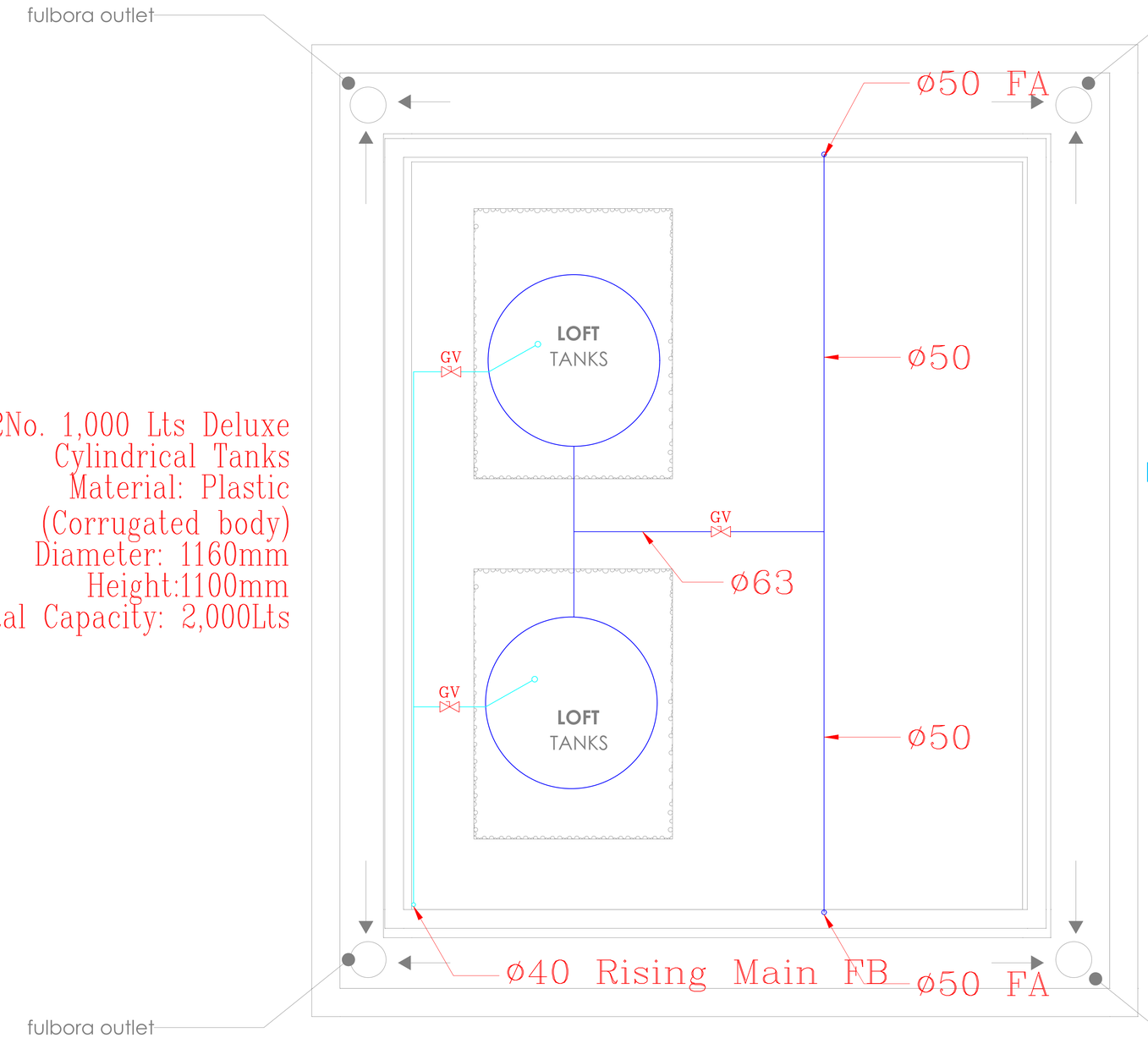
ABLUTION BLOCK GROUND FLOOR WATER SUPPLY

| | | | |
|---|---|---|---|
| Dwg. No. | 09-003M-002 | | |
| Scale: | NTS | | |
| Drawn by | E.M. | Chek'd By | G.O. |
| Project no.: | | Date: | |
| 09 | | 14.01.2024 | |

DETAILED DESIGN



2No. 1,000 Lts Deluxe Cylindrical Tanks
Material: Plastic (Corrugated body)
Diameter: 1160mm
Height:1100mm
Total Capacity: 2,000Lts




## LEGEND

| | | |
|---|---|---|
| CWS | —— | COLD WATER SUPPY |
| TB | —— | TO BELOW |
| FA | —— | FROM ABOVE |
| TA | —— | TO ABOVE |
| FE | —— | 9L CO2 FIRE EXTINGUISHER |
| FE | —— | 9KG DRY POWDER FIRE EXTINGUISHER |
| HR | —— | 30m HOSEREEL |
| | —— | LANDING VALVE |
| PPR | —— | POLY PROPELEYNE RANDOM |
| GMS | —— | GALVANIZED MILD STEEL PIPE |
| | —— | PLUMBING SERVICES (PPR MATERIAL) |
| | —— | HOSEREEL SERVICES (GMS CLASS 'B') |

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PO. BOX 12969-0040,
NAIROBI. KENYA.

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| REV. No. | Details of Revision |
|---|---|
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**PROJECT TITLE:**

PROPOSED CONSTRUCTION OF RESOURCE CENTER & RELATED INFRASTRUCTURE- MUKOWE

**CLIENT:**

STATE DEPARTMENT FOR FISHERIES, AQUACULTURE & THE BLUE ECONOMY

**CLIENT'S SIGNATURE:**

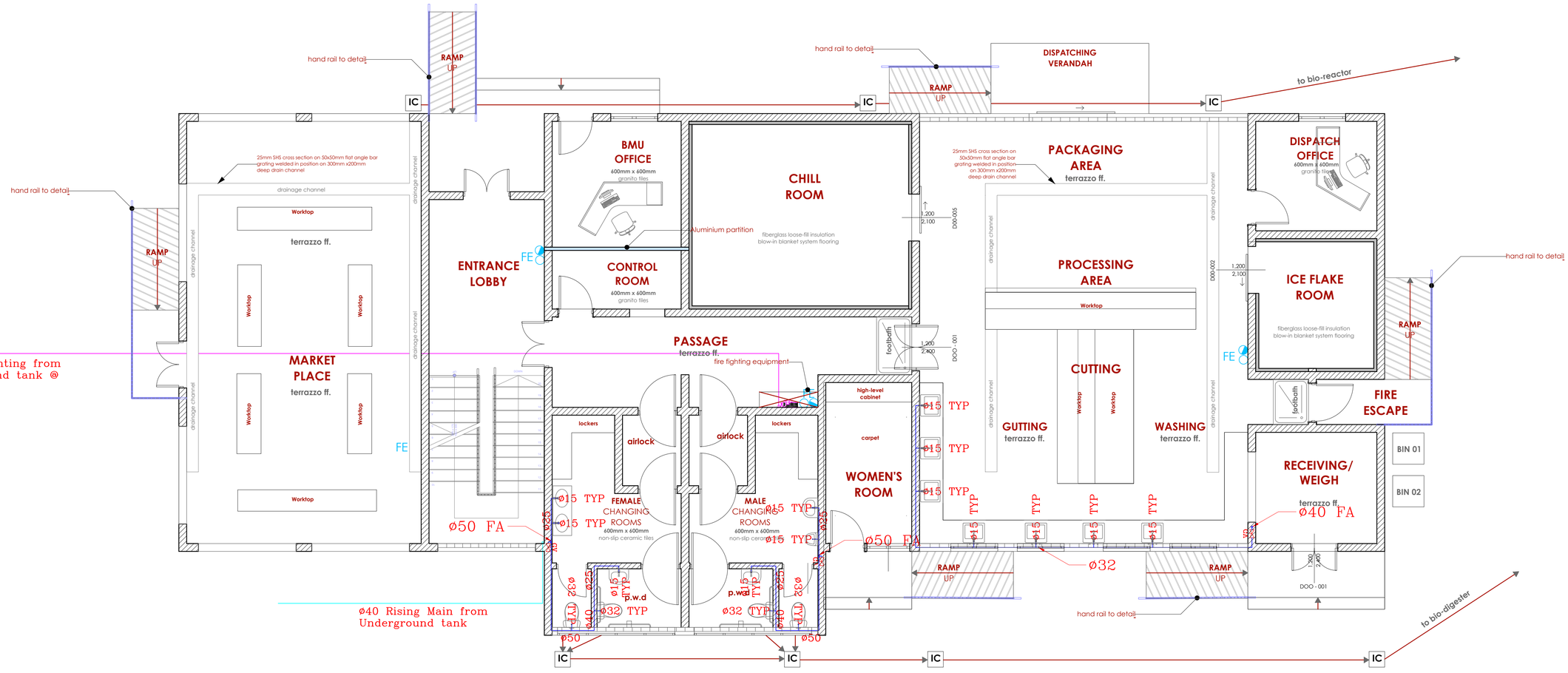
Sign:

**DRAWING TITLE:**

ABLUTION BLOCK FIRST FLOOR WATER SUPPLY

| | | | |
|---|---|---|---|
| Dwg. No. | 09-003M-003 | | |
| Scale: | NTS | | |
| Drawn by | E.M. | Chek'd By | G.O. |
| Project no.: | | Date: | |
| 09 | | 14.01.2024 | |

DETAILED DESIGN




## LEGEND

| | |
|---|---|
| CWS | COLD WATER SUPPY |
| TB | TO BELOW |
| FA | FROM ABOVE |
| TA | TO ABOVE |
| FE | 9L CO2 FIRE EXTINGUISHER |
| FE | 9KG DRY POWDER FIRE EXTINGUISHER |
| HR | 30m HOSEREEL |
| | LANDING VALVE |
| PPR | POLY PROPELEYNE RANDOM |
| GMS | GALVANIZED MILD STEEL PIPE |
| | PLUMBING SERVICES (PPR MATERIAL) |
| | HOSEREEL SERVICES (GMS CLASS 'B') |



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**REVISIONS:**

| REV. No. | Details of Revision |
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**PROJECT TITLE:**

PROPOSED CONSTRUCTION OF RESOURCE CENTER & RELATED INFRASTRUCTURE- MUKOWE

**CLIENT:**

STATE DEPARTMENT FOR FISHERIES, AQUACULTURE & THE BLUE ECONOMY

**CLIENT'S SIGNATURE:**

Sign:

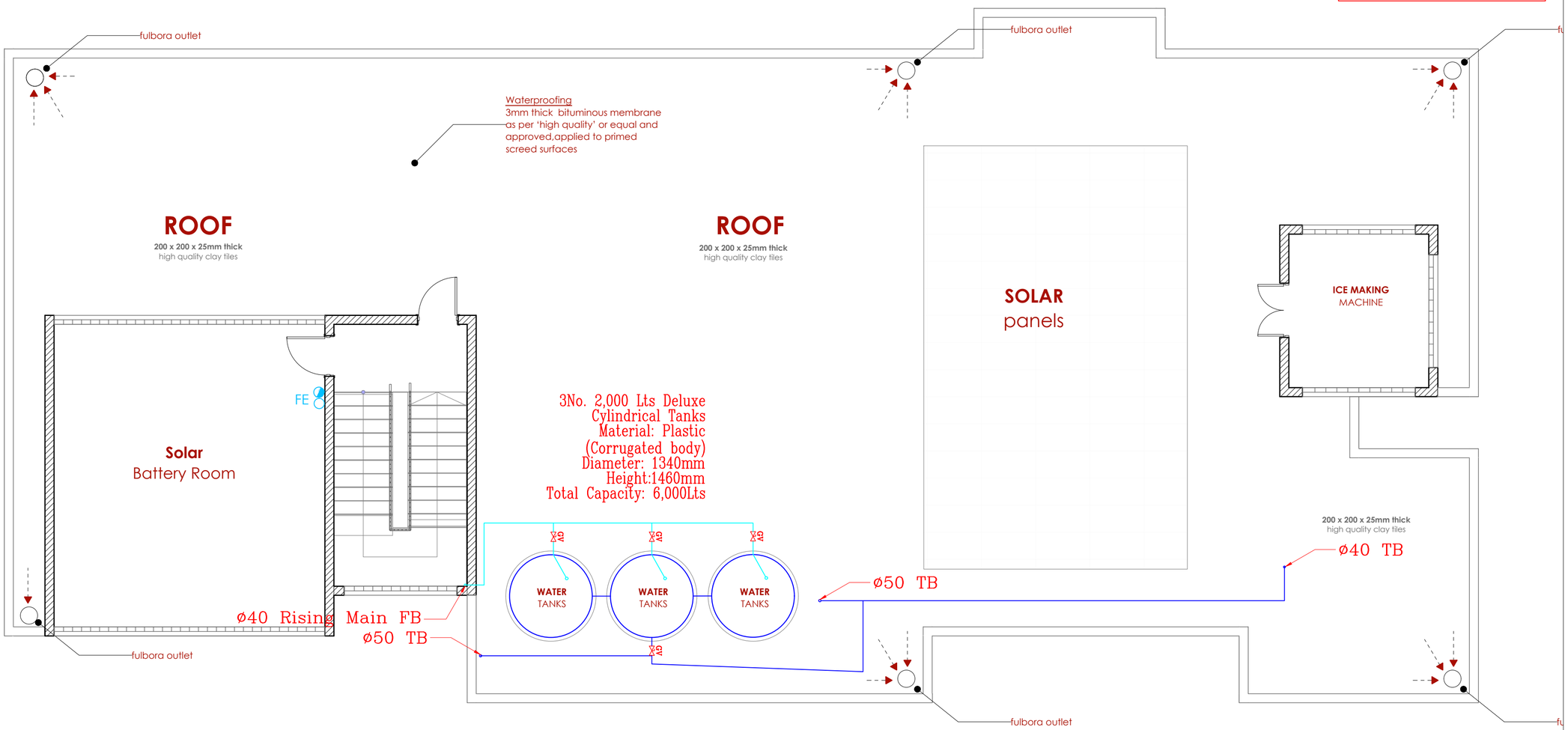
**DRAWING TITLE:**

FISH BANDA GROUND FLOOR WATER SUPPLY

| | |
|---|---|
| Dwg. No. | 09-003M-004 |
| Scale: | NTS |
| Drawn by | E.M. |
| Chek'd By | G.O. |
| Project no.: | 09 |
| Date: | 14.01.2024 |

**TENDER ISSUE**






## LEGEND

| | |
|---|---|
| CWS | COLD WATER SUPPY |
| TB | TO BELOW |
| FA | FROM ABOVE |
| TA | TO ABOVE |
| FE | 9L CO2 FIRE EXTINGUISHER |
| FE | 9KG DRY POWDER FIRE EXTINGUISHER |
| HR | 30m HOSEREEL |
| | LANDING VALVE |
| PPR | POLY PROPELEYNE RANDOM |
| GMS | GALVANIZED MILD STEEL PIPE |
| | PLUMBING SERVICES (PPR MATERIAL) |
| | HOSEREEL SERVICES (GMS CLASS 'B') |

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**REVISIONS:**

| REV. No. | Details of Revision |
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**PROJECT TITLE:**

PROPOSED CONSTRUCTION OF MUKOWE FISH LANDING SITE

**CLIENT:**

STATE DEPARTMENT FOR FISHERIES, AQUACULTURE & THE BLUE ECONOMY

**CLIENT'S SIGNATURE:**

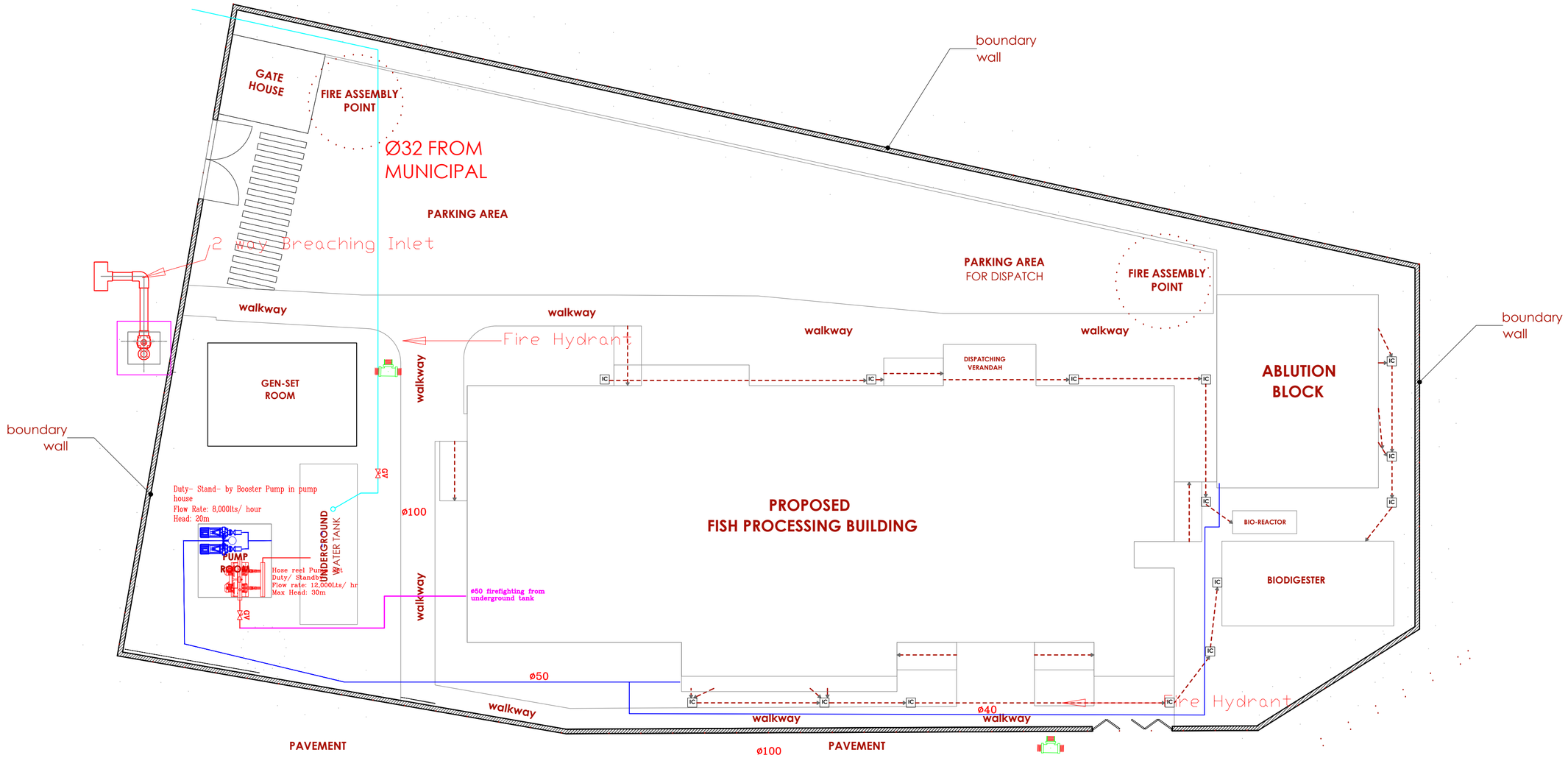
Sign:

**DRAWING TITLE:**

FISH BANDA FIRST FLOOR WATER SUPPLY

| | |
|---|---|
| Dwg. No. | 09- 003M- 005 |
| Scale: | NTS |
| Drawn by | |
| Chek'd By | |
| Project no.: | 09 |
| Date: | 10.01.2024 |

**TENDER ISSUE**




LEGEND

| | |
|---|---|
| CWS | COLD WATER SUPPY |
| TB | TO BELOW |
| FA | FROM ABOVE |
| TA | TO ABOVE |
| FE | 9L CO2 FIRE EXTINGUISHER |
| FE | 9KG DRY POWDER FIRE EXTINGUISHER |
| HR | 30m HOSEREEL |
| | LANDING VALVE |
| PPR | POLY PROPELEYNE RANDOM |
| GMS | GALVANIZED MILD STEEL PIPE |
| | PLUMBING SERVICES (PPR MATERIAL) |
| | HOSEREEL SERVICES (GMS CLASS 'B') |
| | FIRE HYDRANT SERVICES (HDPE PIPE) |

# SITE PLAN
# WATER RETICULATION LAYOUT



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**REVISIONS:**

| REV. No. | Details of Revision |
|---|---|
| 01 | FIRE HYDRANT ADDED |
| | |
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**PROJECT TITLE:**

PROPOSED CONSTRUCTION OF MUKOWE FISH LANDING SITE

**CLIENT:**

STATE DEPARTMENT FOR FISHERIES, AQUACULTURE & THE BLUE ECONOMY

**CLIENT'S SIGNATURE:**

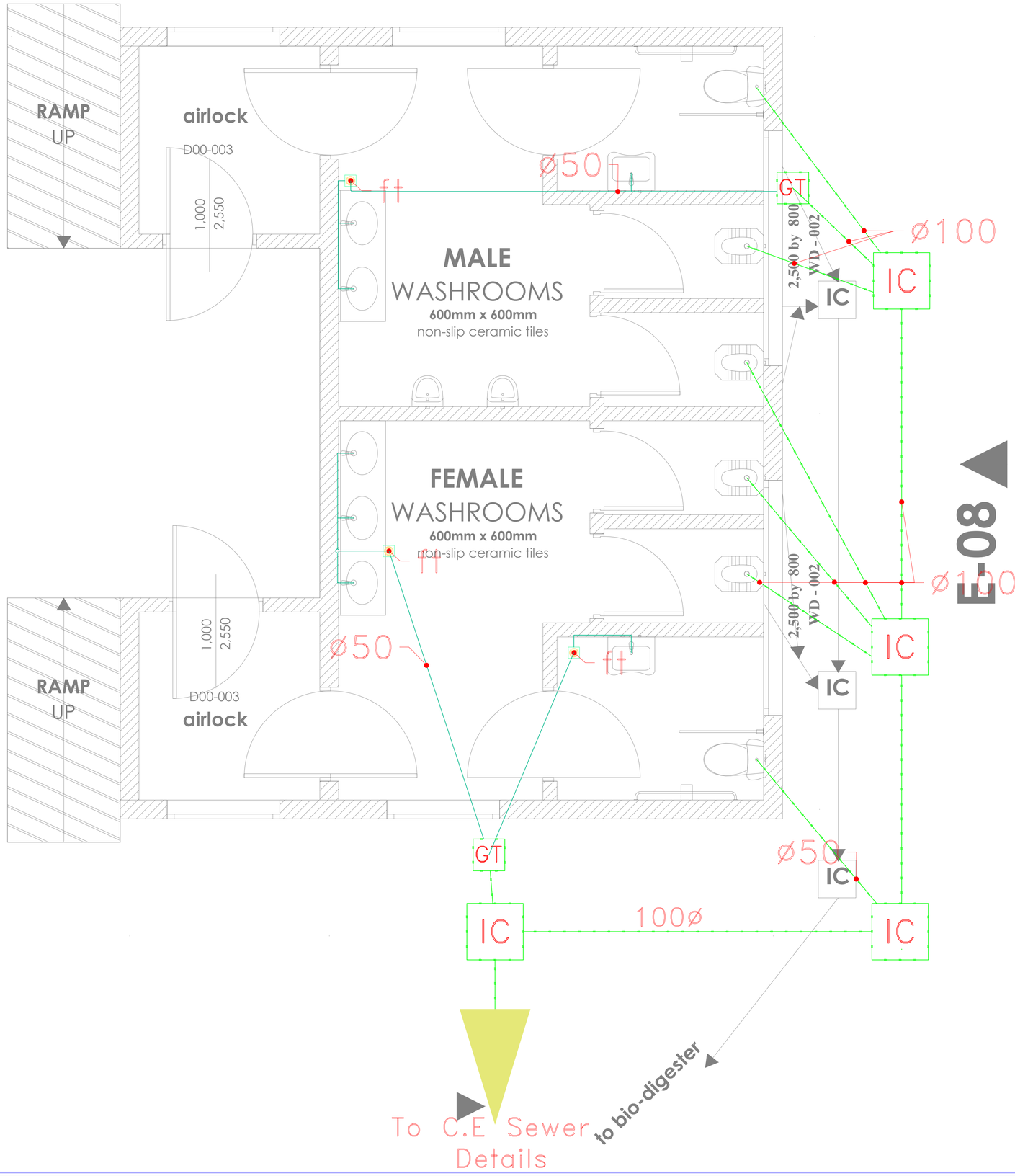
Sign:

**DRAWING TITLE:**
SITE PLAN WATER RETICULATION LAYOUT

| | |
|---|---|
| Dwg. No. | 09- 003M- 006 |
| Scale: | NTS |
| Drawn by | |
| Chek'd By | |
| Project no.: | 09 |
| Date: | 05/02/2024 |

DETAILED DESIGN






E-08

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**REVISIONS:**

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**PROJECT TITLE:**

PROPOSED CONSTRUCTION OF RESOURCE CENTER & RELATED INFRASTRUCTURE- MUKOWE

**CLIENT:**

STATE DEPARTMENT FOR FISHERIES, AQUACULTURE & THE BLUE ECONOMY

**CLIENT'S SIGNATURE:**

Sign:

**DRAWING TITLE:**

ABLUTION BLOCK GROUND FLOOR DRAIAGE

| | |
|---|---|
| Dwg. No. | 09-003M-007 |
| Scale: | NTS |
| Drawn by | E.M. |
| Chek'd By | G.O. |
| Project no.: | 09 |
| Date: | 14.01.2024 |

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**PROJECT TITLE:**

PROPOSED CONSTRUCTION OF RESOURCE CENTER & RELATED INFRASTRUCTURE- MUKOWE

**CLIENT:**

STATE DEPARTMENT FOR FISHERIES, AQUACULTURE & THE BLUE ECONOMY

**CLIENT'S SIGNATURE:**

Sign:

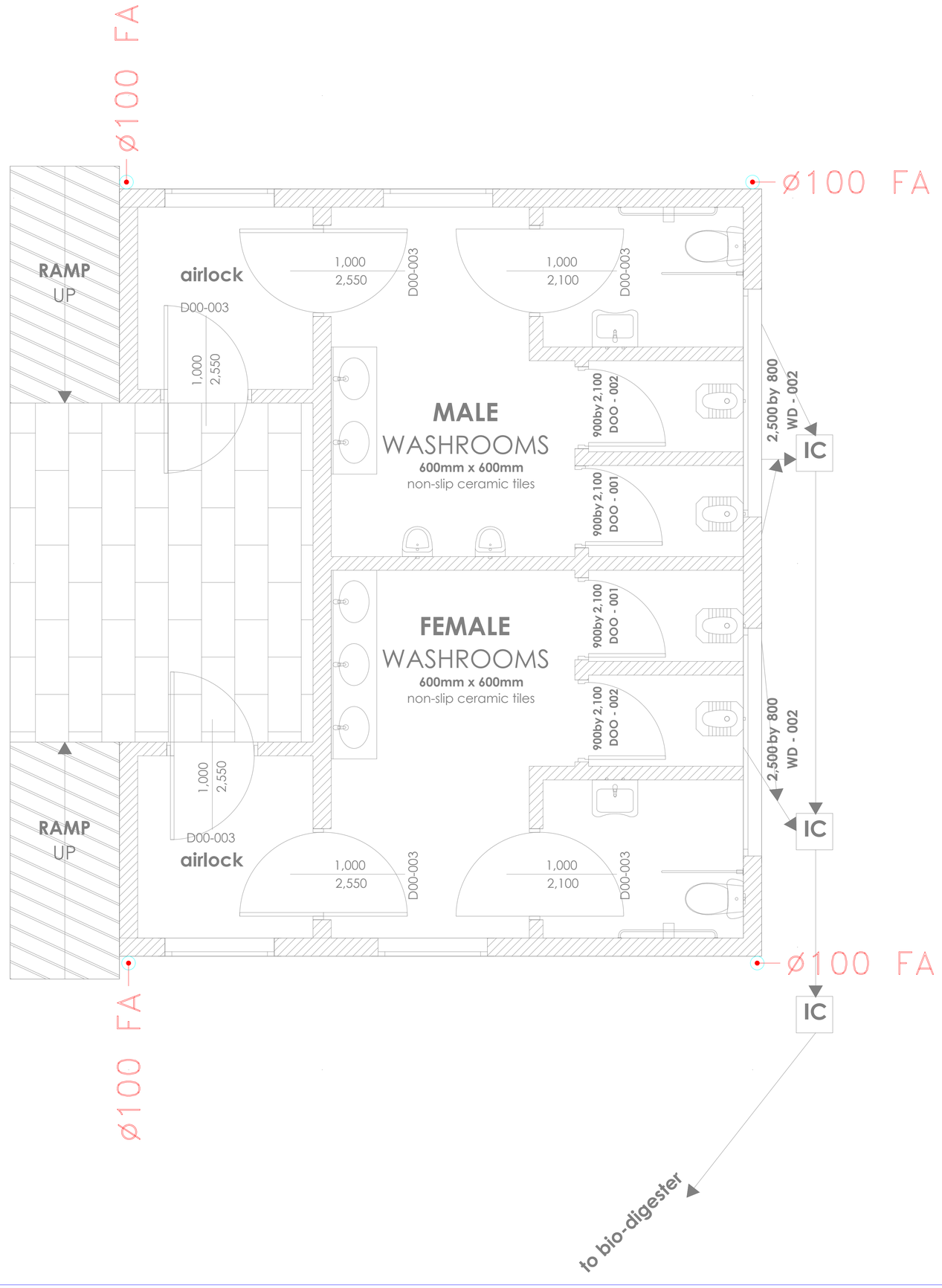
**DRAWING TITLE:**

FISH BANDA GROUND FLOOR DRAINAGE

| | |
|---|---|
| Dwg. No. | 09-003M-008 |
| Scale: | NTS |
| Drawn by | E.M. |
| Chek'd By | G.O. |
| Project no.: | 09 |
| Date: | 14.01.2024 |

DETAILED DESIGN



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**PROJECT TITLE:**

PROPOSED CONSTRUCTION OF RESOURCE CENTER & RELATED INFRASTRUCTURE- MUKOWE

**CLIENT:**

STATE DEPARTMENT FOR FISHERIES, AQUACULTURE & THE BLUE ECONOMY

**CLIENT'S SIGNATURE:**

Sign:

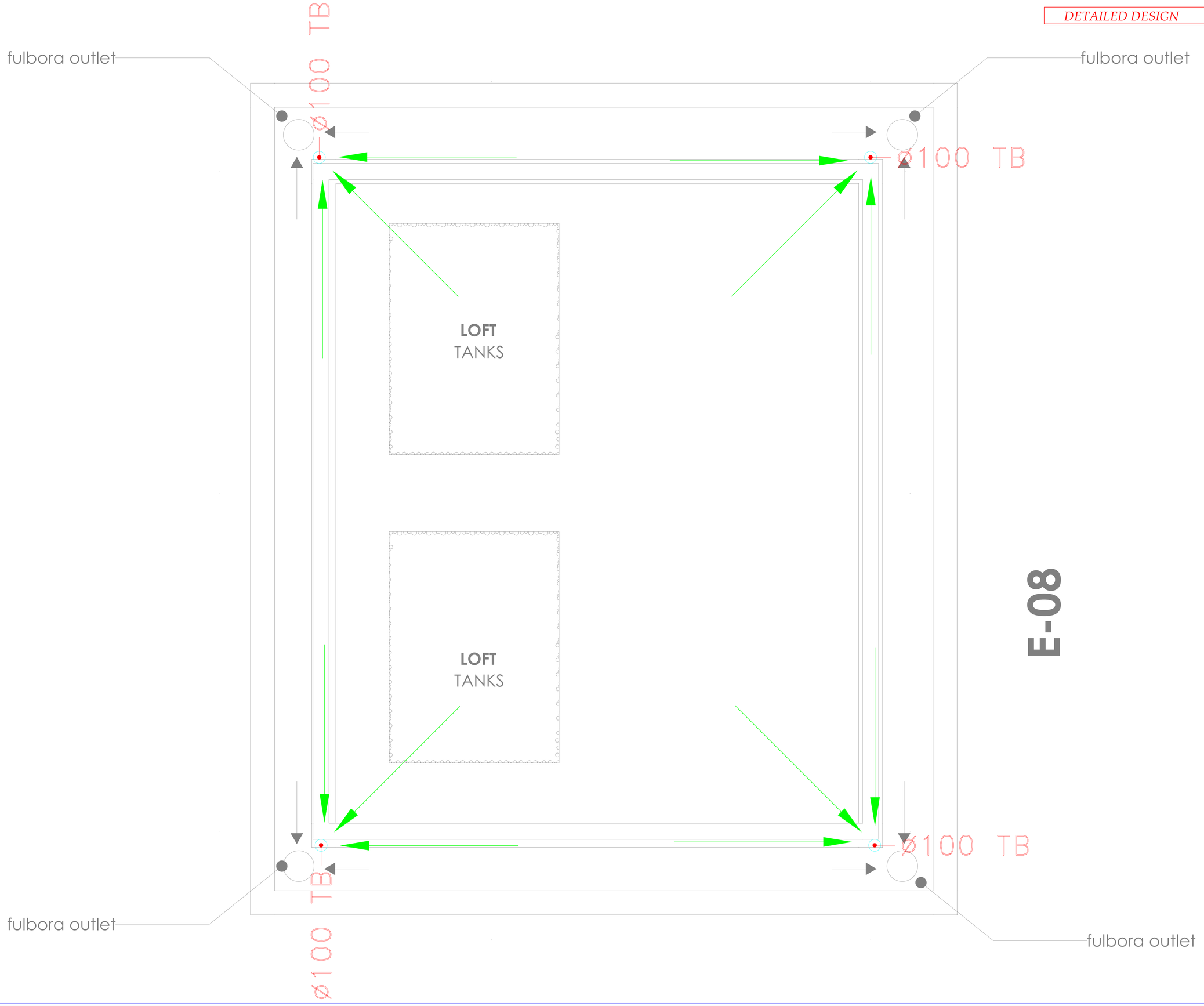
**DRAWING TITLE:**

ABLUTION BLOCK GROUND FLOOR STORM WATER DRAINAGE

| | |
|---|---|
| Dwg. No. | 09-003M-009 |
| Scale: | NTS |
| Drawn by | E.M. |
| Chek'd By | G.O. |
| Project no.: | 09 |
| Date: | 14.01.2024 |

DETAILED DESIGN



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**PROJECT TITLE:**

PROPOSED CONSTRUCTION OF RESOURCE CENTER & RELATED INFRASTRUCTURE- MUKOWE

**CLIENT:**

STATE DEPARTMENT FOR FISHERIES, AQUACULTURE & THE BLUE ECONOMY

**CLIENT'S SIGNATURE:**

Sign:

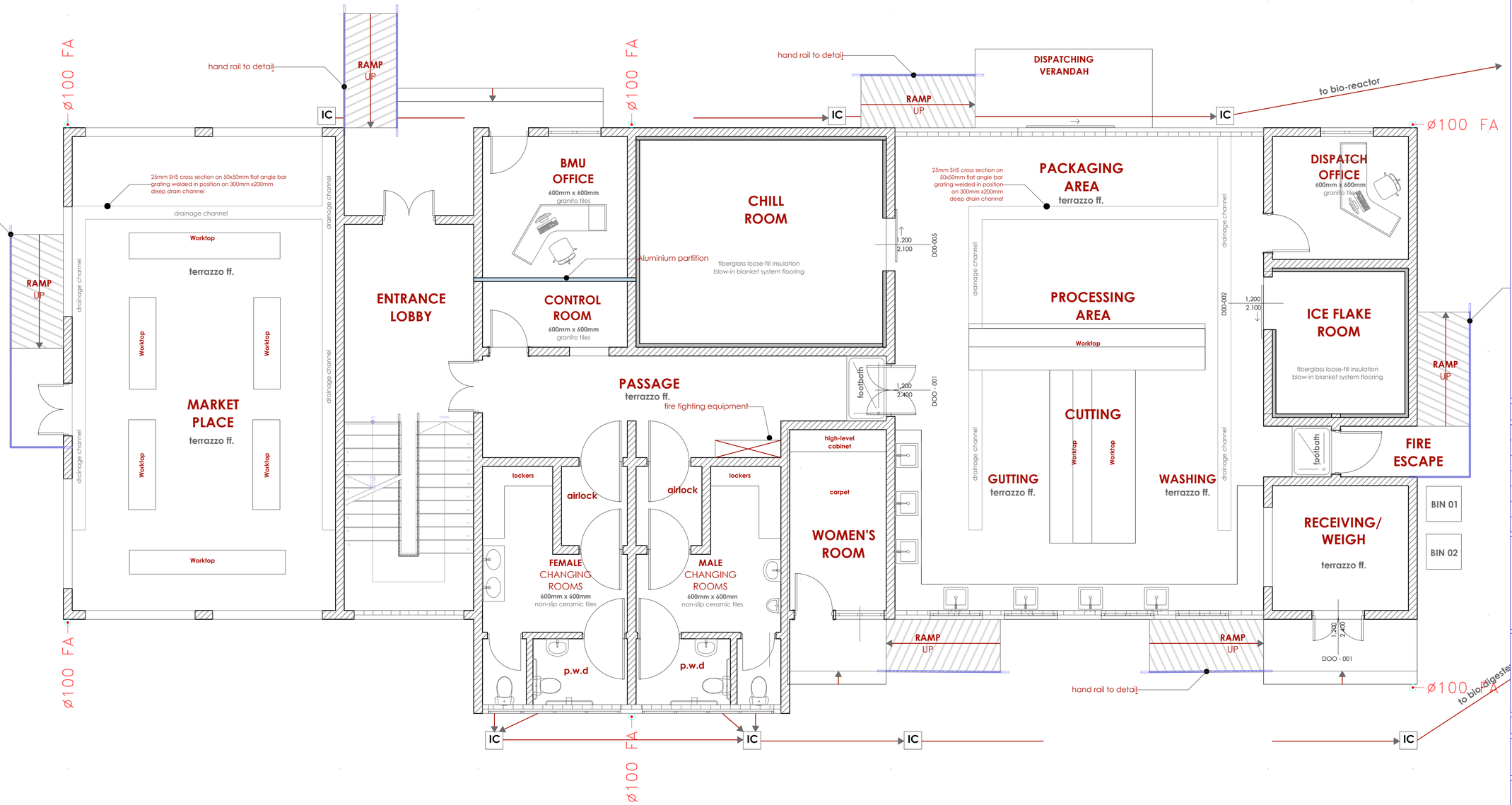
**DRAWING TITLE:**

ABLUTION BLOCK FIRST FLOOR STORM WATER DRAINAGE

| | |
|---|---|
| Dwg. No. | 09-003M-010 |
| Scale: | NTS |
| Drawn by | E.M. |
| Chek'd By | G.O. |
| Project no.: | 09 |
| Date: | 14.01.2024 |

DETAILED DESIGN



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## REVISIONS:

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## PROJECT TITLE:

PROPOSED CONSTRUCTION OF RESOURCE CENTER & RELATED INFRASTRUCTURE- MUKOWE

## CLIENT:

STATE DEPARTMENT FOR FISHERIES, AQUACULTURE & THE BLUE ECONOMY

## CLIENT'S SIGNATURE:

Sign:

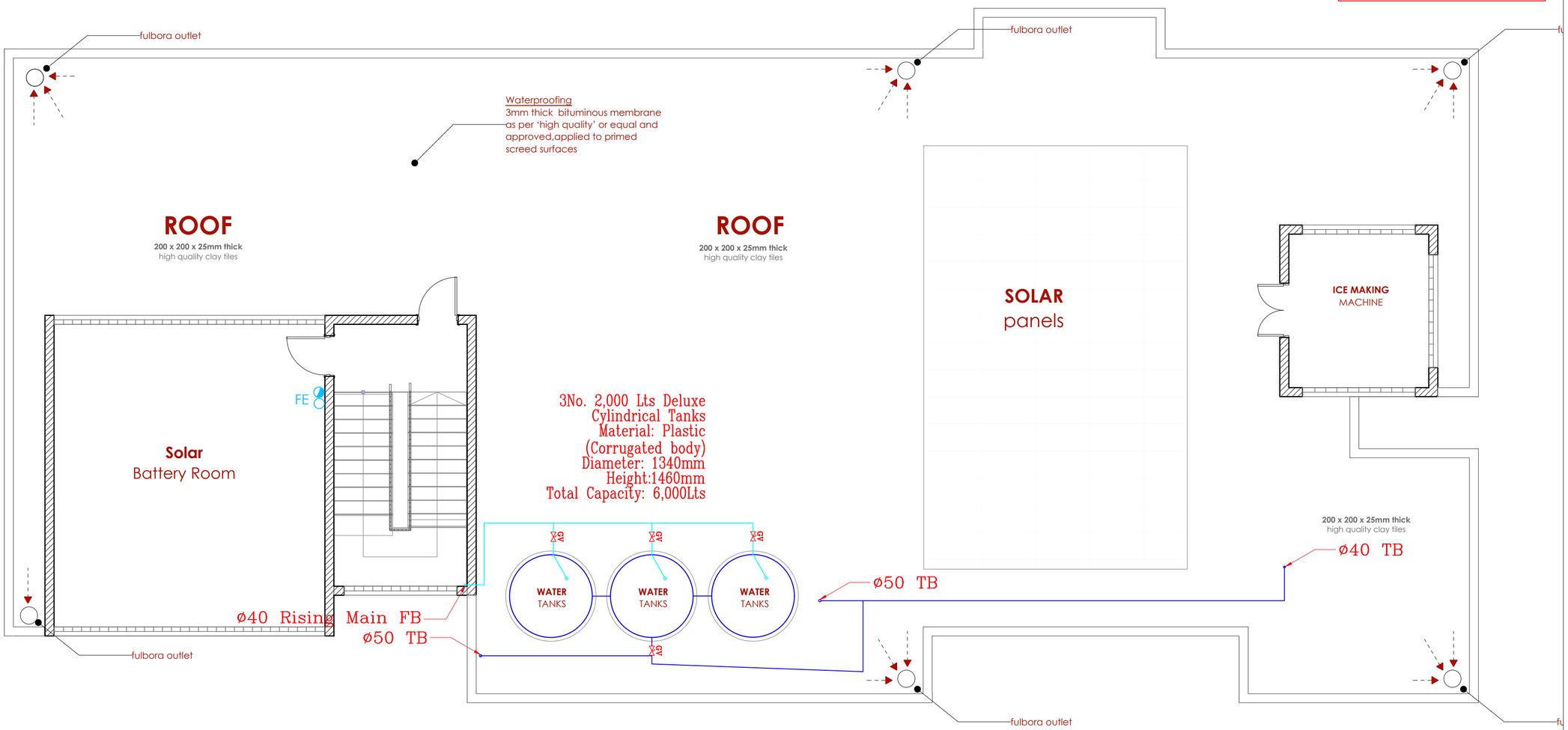
## DRAWING TITLE:

FISH BANDA GROUND FLOOR STORM WATER DRAINAGE

| | | | |
|---|---|---|---|
| Dwg. No. | 09-003M-011 | | |
| Scale: | NTS | | |
| Drawn by | E.M. | Chek'd By | G.O. |
| Project no.: | | Date: | |
| 09 | | 14.01.2024 | |

**TENDER ISSUE**






## LEGEND

| | |
|---|---|
| CWS | COLD WATER SUPPY |
| TB | TO BELOW |
| FA | FROM ABOVE |
| TA | TO ABOVE |
| FE | 9L CO2 FIRE EXTINGUISHER |
| FE | 9KG DRY POWDER FIRE EXTINGUISHER |
| HR | 30m HOSEREEL |
| | LANDING VALVE |
| PPR | POLY PROPELEYNE RANDOM |
| GMS | GALVANIZED MILD STEEL PIPE |
| | PLUMBING SERVICES (PPR MATERIAL) |
| | HOSEREEL SERVICES (GMS CLASS 'B') |

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PO. BOX 12969-0040,
NAIROBI. KENYA.

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**REVISIONS:**

| REV. No. | Details of Revision |
|---|---|
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**PROJECT TITLE:**

PROPOSED CONSTRUCTION OF MUKOWE FISH LANDING SITE

**CLIENT:**

STATE DEPARTMENT FOR FISHERIES, AQUACULTURE & THE BLUE ECONOMY

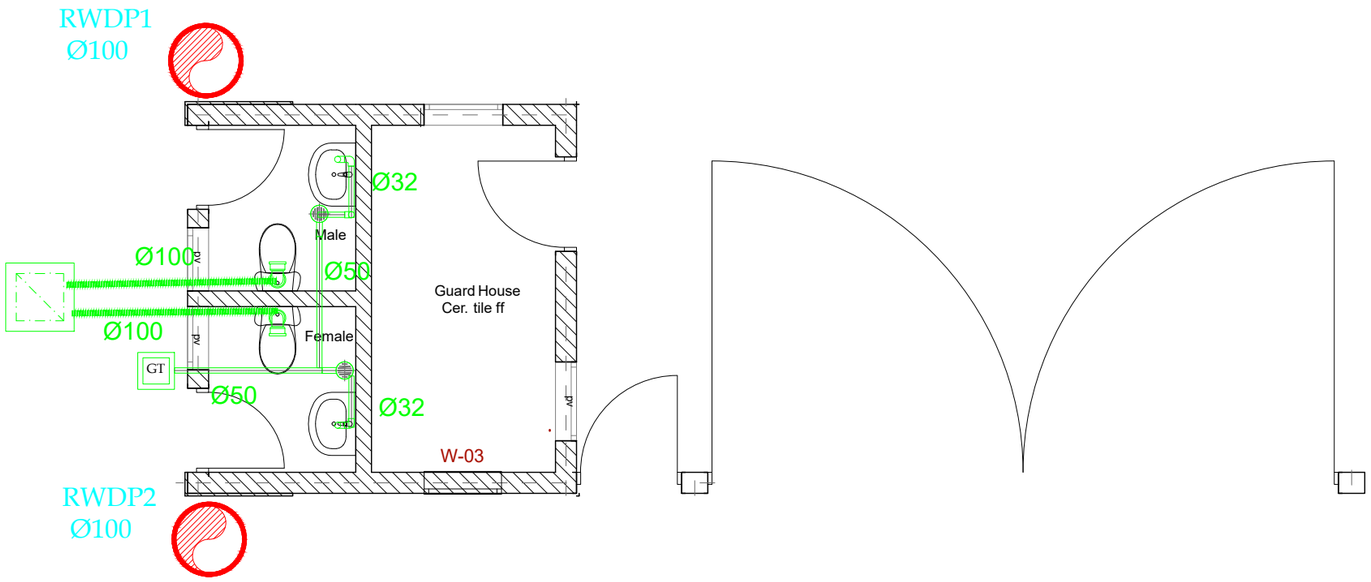
**CLIENT'S SIGNATURE:**

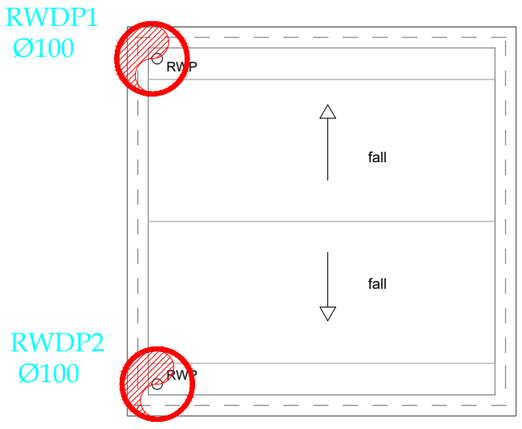
Sign:

**DRAWING TITLE:**

FISH BANDA FIRST FLOOR STORM WATER DRAINAGE

| | |
|---|---|
| Dwg. No. | 09- 003M- 012 |
| Scale: | NTS |
| Drawn by | |
| Chek'd By | |
| Project no.: | 09 |
| Date: | 10.01.2024 |




# DRAINAGE

## LEGEND

WVP —— WASTE VENT PIPE

SVP —— SOIL VENT PIPE

I.S —— INSIDE SLAB PIPING

S —— SURFACE PIPING

TB —— TO BELOW

FA —— FROM ABOVE

RWDP X Ø100 —— RAIN WATER DOWN PIPE

—— DRAINAGE SERVISES (uPVC GREY PIPE)

GT —— 4" GULLY TRAP

**TENDER ISSUE**



ARPRIM

**ARPRIM CONSORTIUM,**
**PO. BOX 12969-0040,**
**NAIROBI. KENYA.**

**N O T E S**

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10. THE PROJECT NOTES ARE TO BE READ IN CONJUNCTION WITH ALL RELEVANT TECHNICAL SPECIFICATIONS.

**REVISIONS:**

| REV. No. | Details of Revision |
|---|---|
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| | |

**PROJECT TITLE:**

PROPOSED CONSTRUCTION OF MUKOWE FISH LANDING SITE

**CLIENT:**

STATE DEPARTMENT FOR FISHERIES, AQUACULTURE & THE BLUE ECONOMY

**CLIENT'S SIGNATURE:**

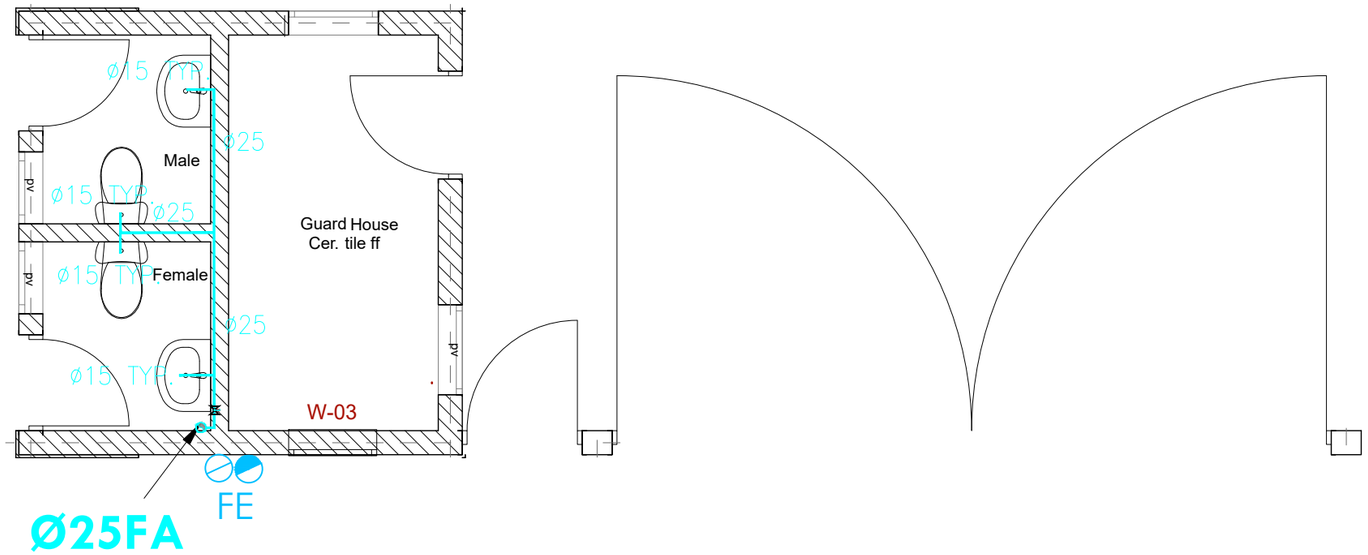
Sign:

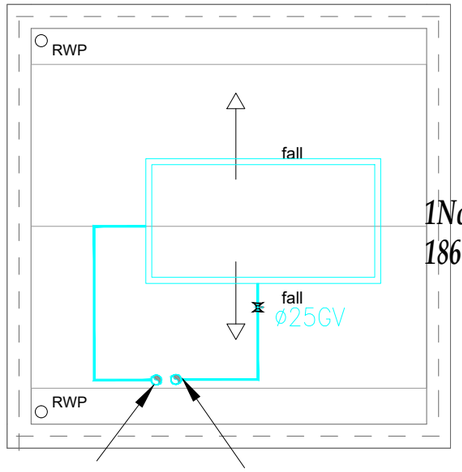
**DRAWING TITLE:**

GATE HOUSE DRAINAGE LAYOUT

| | |
|---|---|
| Dwg. No. | 09- 003M- 13 |
| Scale: | NTS |
| Drawn by | Chek'd By |
| Project no.: | Date: |
| 09 | 29.12.2023 |

**TENDER ISSUE**




*1No. 1,000 Lts Rectangular Loft Tank*
*1860mmX940mmX650mm*

# PLUMBING

## LEGEND

| | | |
|---|---|---|
| CWS | —— | COLD WATER SUPPY |
| TB | —— | TO BELOW |
| FA | —— | FROM ABOVE |
| TA | —— | TO ABOVE |
| FE | —— | 9L WATER CO FIRE EXTINGUISHER |
| FE | —— | 9KG DRY POWDER FIRE EXTINGUISHER |
| HR | —— | 30m HOSEREEL |
| | —— | LANDING VALVE |
| PPR | —— | POLY PROPELEYNE RANDOM |
| GMS | —— | GALVANIZED STEEL PIPE (CLASS B) |
| | —— | PLUMBING SERVICES (PPR PN 20 MATERIAL) |
| | —— | HOSEREEL SERVICES (GMS CLASS 'B') |



ARPRIM

**ARPRIM CONSORTIUM,**
**PO. BOX 12969-0040,**
**NAIROBI. KENYA.**

**N O T E S**

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**REVISIONS:**

| REV. No. | Details of Revision |
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**PROJECT TITLE:**

PROPOSED CONSTRUCTION OF MUKOWE FISH LANDING SITE

**CLIENT:**

STATE DEPARTMENT FOR FISHERIES, AQUACULTURE & THE BLUE ECONOMY

**CLIENT'S SIGNATURE:**

Sign:

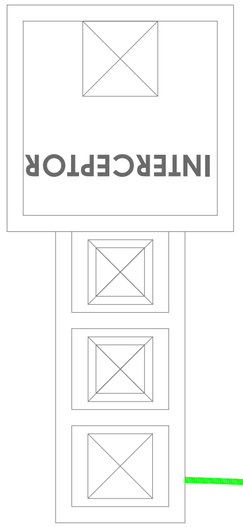
**DRAWING TITLE:**

GATE HOUSE PLUMBING

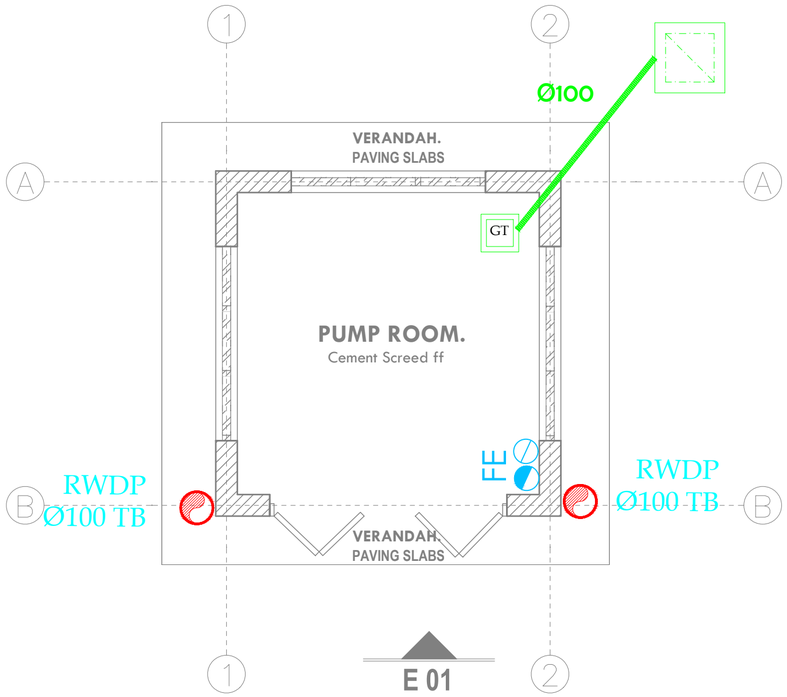
| | |
|---|---|
| Dwg. No. | 09- 003M- 14 |
| Scale: | NTS |
| Drawn by | Chek'd By |
| Project no.: | Date: |
| 09 | 18.01.2024 |

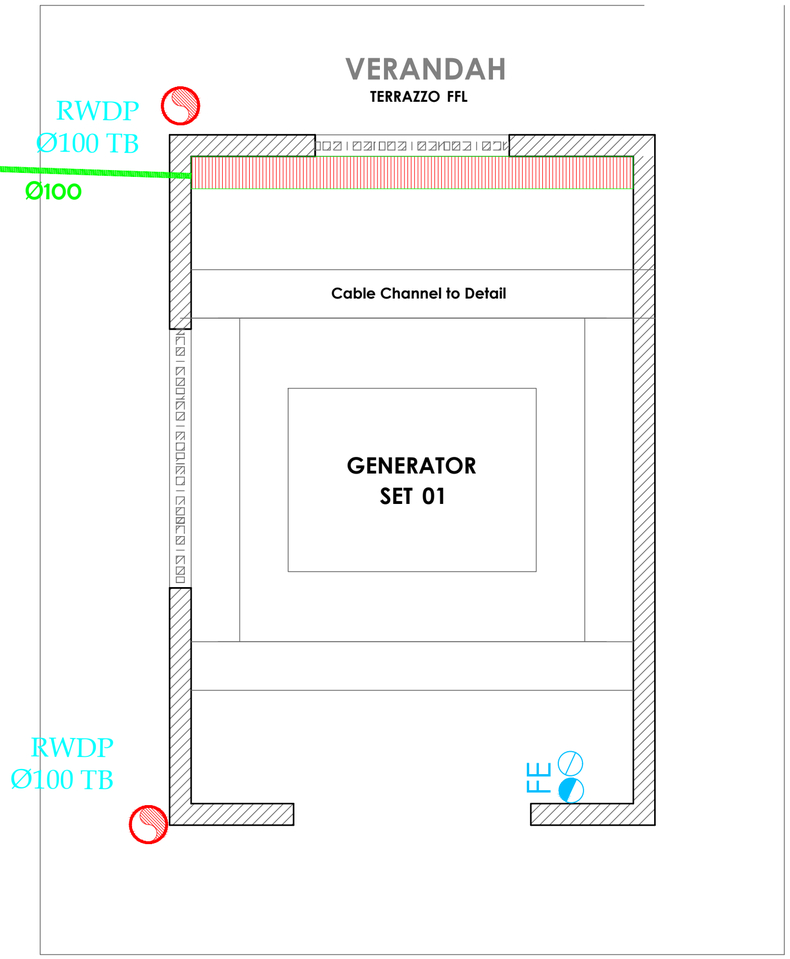
TENDER ISSUE






# Petrol interceptor to C.E. Detail




# PUMP ROOM & POWER HOUSE MECHANICAL LAYOUTS

ARPRIM

ARPRIM CONSORTIUM,
PO. BOX 12969-0040,
NAIROBI. KENYA.

NOTES

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**REVISIONS:**

| REV. No. | Details of Revision |
|---|---|
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| | |

**PROJECT TITLE:**

PROPOSED CONSTRUCTION OF MUKOWE FISH LANDING SITE

**CLIENT:**

STATE DEPARTMENT FOR FISHERIES, AQUACULTURE & THE BLUE ECONOMY

**CLIENT'S SIGNATURE:**

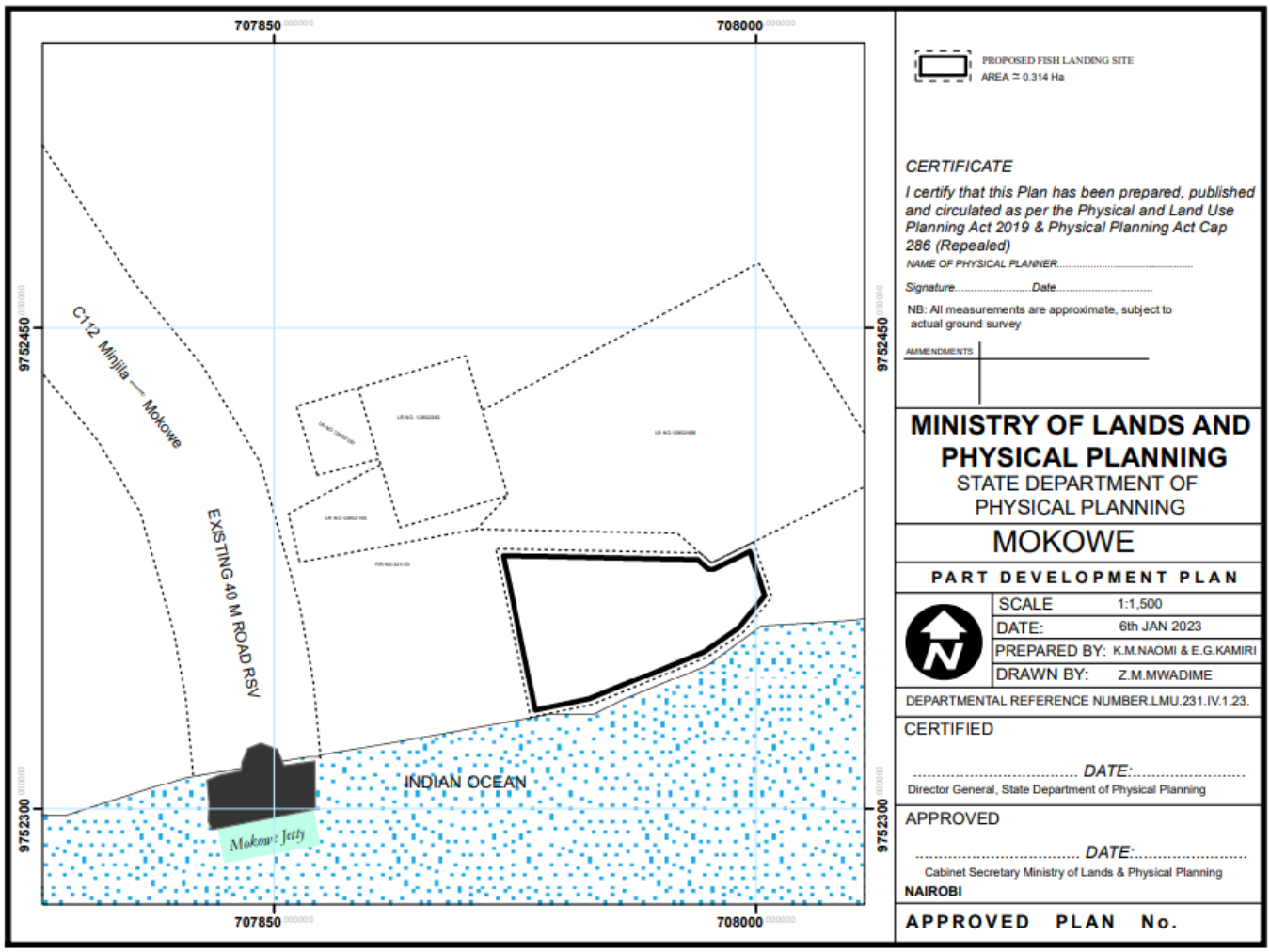
Sign:

**DRAWING TITLE:**

POWER HOUSE & PUMP ROOMS MECHANICAL LAYOUT

| | |
|---|---|
| Dwg. No. | 09- 003M- 015 |
| Scale: | NTS |
| Drawn by | Chek'd By |
| Project no.: | Date: |
| 09 | 29.01.2024 |

# II. Land Ownership Documentations



MR/4257870 *Director-General.*

GAZETTE NOTICE NO. 792

THE PHYSICAL AND LAND USE PLANNING ACT

(*No.* 13 *of* 2019)

THE PHYSICAL PLANNING ACT

(*Cap.* 286) (*Repealed*)

COMPLETION OF PART DEVELOPMENT PLAN

*Part Development Plan: PDP. No. Lmu. 231.IV.1.23—Proposed Fish Landing Site, Mokowe*

NOTICE is given that the preparation of the above plan was on the 10th January, 2023, completed.

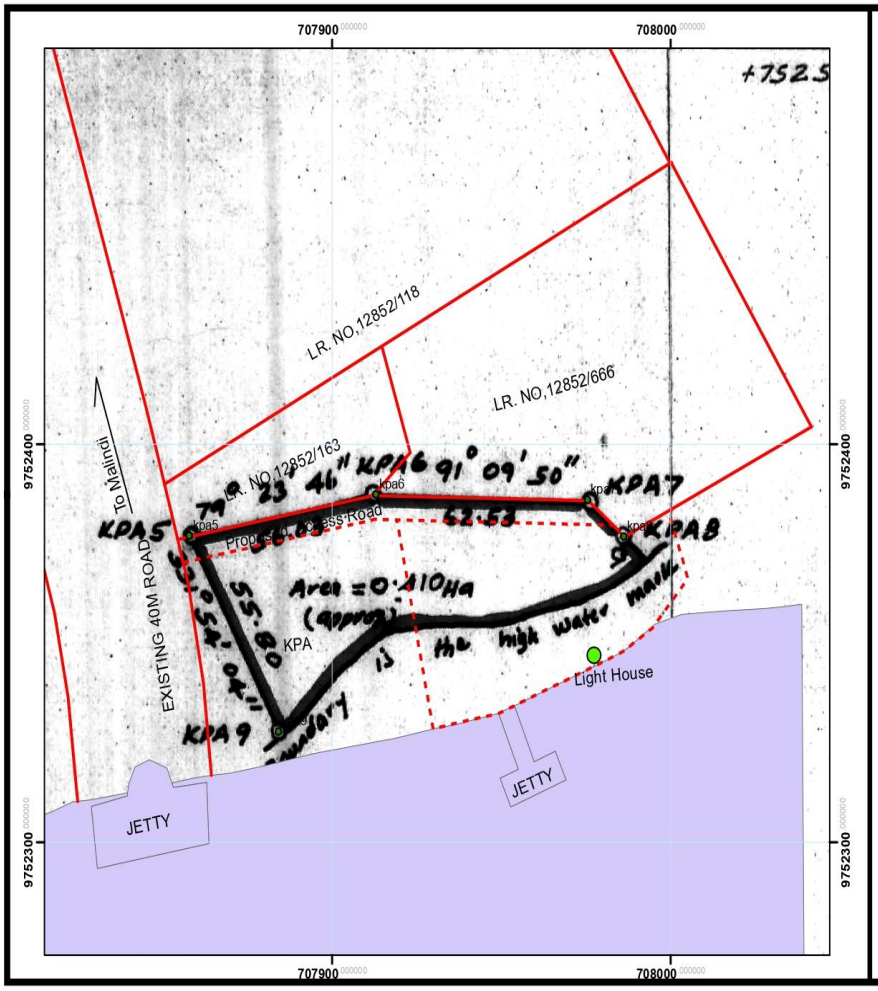
A copy of the plan as prepared has been deposited for public inspection free of charge at the offices of the County Executive Committee Member (CECM) for Lands, Physical Planning, Urban Development, Energy, Water and Natural Resources, Infrastructure & Public Works and County Physical Planning Offices in Mokowe Town-Lamu County between the office hours of 8.00 a.m.–5.00 p.m., Monday to Friday.

Any interested person who wishes to make any representation in connection with or objection to the above plan may within sixty (60) days (60) send the same to the in-charge CECM/County Physical Planning office, P.O. Box 74–80500, Lamu. Such representations or comments shall state the grounds upon which they are made.

Dated the 27th January, 2023.

PATRICE LUMUMBA,

MR/4245565 *County Director for Physical Planning.*




scenario of Proposed Fish Landing Site and Fr. No.321_53 for KPA

Fr. Coordinate List

| e | n | stn |
|---|---|---|
| 708903.3 | 9752644 | kpa1 |
| 708939.9 | 9752692 | kpa2 |
| 709262.5 | 9752443 | kpa3 |
| 709191.1 | 9752423 | kpa4 |
| 707857.9 | 9752377 | kpa5 |
| 707913 | 9752387 | kpa6 |
| 707975.5 | 9752386 | kpa7 |
| 707986.2 | 9752377 | kpa8 |
| 707884.2 | 9752328 | kpa9 |

| | |
|---|---|
| SCALE | 1:1,250 |
| DATE: | 6th JAN 2023 |
| PREPARED BY: | P.S LUMUMBA |
| DRAWN BY: | Z.M.MWADIME |

CERTIFIED BY:

Office of the Managing Director

MMN/I/I/02

3rd November 2023

H.E. Hon. Issa A. Timamy, EGH, OGW
Governor, Lamu County
P.O Box 74- 80500
**LAMU**

Dear Your Excellency

**RE: PROPOSED FISH LANDING SITE INFRASTRUCTURE DEVELOPMENT -MOKOWE LAMU**

This has reference to your letter ref. CGL/O.G/4/6Vol.I/7 of 28th April 2023.

We applaud the county's initiative on development of Mokowe seafront Jetty and a facility for value addition in the fishing industry.

The Authority has no objection to the proposed project. However, its development should not hinder our full access to Authority's aids to navigation installations which are critical for safety of navigation and other marine users.

To this end, I have directed my technical officers in Lamu to urgently organize a meeting with your team for the purposes of developing an engagement framework and to file a brief for our necessary internal approvals that will be communicated to you in due course.

In the interim period, you can proceed to seek necessary approvals from relevant Government agencies and support partners.

Kindly be assured of my support.

Yours Sincerely

Capt. William K. Ruto, AFNI
**MANAGING DIRECTOR**

Kenya Ports Authority P.O. Box 95009 - 80104 Mombasa, Kenya
Tel: +254 41 2113497/ 2113838
Mobile: +254 709 093497/ 709 093838 / 730 653497
Email: kpamd@kpa.co.ke

ISDN (041) 2112999 / 2113999 KEBS ISO 9001 Certified Org. No. 087 | KPA: 5023801017

# III. Minutes for public Consultation and Participation Meeting

**KENYA MARINE FISHERIES SOCIOECONOMIC DEVELOPMENT (KEMFSED) PROJECT**

**COMMUNITY CONSULTATION FOR THE PROPOSED MOKOWE LANDING SITE AND INFRUTRUCTURE FACILITIES COINDUCTED AT THE MOKOWE BMU SITE ON THE 13TH OF JANUARY 2023, HINDI WARD, LAMU WEST SUB-COUNTY.**

| | |
|---|---|
| **Type of Meeting:** | Community Consultations Meeting |
| **Date of Meeting:** | ***13th January 2023.*** |
| **Time of Meeting:** | 9:30AM – 1:00PM |
| **Venue:** | Mokowe landing site |
| **Attendance:** | Mokowe residents members, Youth, Women, |
| **Agenda:** | *i. Introduction;*<br>*ii. Project coordinator remarks*<br>*iii. Community Ideas about the Project*<br>*iv. Challenges faced;*<br>*v. ESIA consultation;*<br>*vi. Concerns and Response*<br>vii. *Closing Remarks* |

**13/01/2023/01: INTRODUCTION**

The meeting was brought to order by the area KEMSFED CPIU Coordinator. He tasked a volunteer to pray for the gathering. He requested the BMU Chair *Masuo Mohamed* to lead the members in introductions. He then led in the introduction of the National Government administration, MCA Hindi, KEMSFED NPCU members, County Government design team and the CPIU memberspresent in the meeting. He later on explained the purpose of the public stakeholder consultations and the need for the fisher-folk community to actively participate in order to share their views and opinions. He introduced the *Chief Mokowe* and the *OCS – Mokowe* who asked to be allowed to make an address and leave as they had another meeting. The Chief gave his opening remarks by appreciating the KEMSFED team for organizing such an important forum as it will enhance community ownership of the project and assured the community of his support and enforcement of security. The area chief introduced OCS- Mokowe

who assured the community of the government's enhancement of security. He requested investors and the community to take advantage of this project, exploit the marine resources, and create jobs for the youth who, if they are gainfully employed, will shun crime. The Chief and the OCS requested to be allowed to leave for the other function.

**13/1/2023/02: PROJECT CORDINATOR REMARKS.**

The Lamu CPIU coordinator introduced the KEMSFED project to the participants. He gave an overview of component 1. He explained the objective of the component is to improve fisheries infrastructure and the Mokowelanding site is one of the ear-marked projects. He introduced the Lamu County Officers, design, and technical team from NPCU. He explained the need for public stakeholder consultations for the Mokowe landing site as a constitutional right for the community and community members to actively participate and contribute to the proposals.

He invited the *MCA Hindi* to make his comments. He then invited Mr. Lazarus Kubasu – KEMFSED NPCU Social Safeguards Specialist who informed the community of the importance of public participation in project design as this is a constitutional provision. He encouraged the members present to freely critique the design as this is their project. He then invited Mr. StephenMwangi, the KEMFRI infrastructure specialist who explained the Component 1 - infrastructure project outlook for improvement of fisheries infrastructure in the five coastal counties. He invited *Mr. Kamalu – Acting Chief Officer – Fisheries,* who highlighted the importance of the fish landing site and its perceived impact in modernizing fisheries in Lamu County as this is the gateway to the local and international market. He then invited the CECM Fisheries Hon. FaizFankupi to make his opening remarks. Hon. Faiz welcomed all and asked them to give their views to improve the existing design. He said the county government fully supports this project and is working on ensuring that all land ownership documents for all fisheries landing sites and infrastructure are underway to secure them.

The CPC then handed over the program to the project engineer- *Eng. Angwenyi*.

**13/1/2023/03: COMMUNITY IDEAS ABOUT THE PROJECT.**

Eng. Angwenyi from NPCU, reminded the community of the previous engagements they had had with Lamu fisheries team, and through those engagements, as the technical and design team, they had gathered essential data such as the fish catch volume, that has greatly informed the designing of the infrastructure projects. He explained that the designs proposed are ideas for the community engagements such as the fish market. He noted that the designs are not the final draft and that the community should be confident enough that their views and opinions will be captured and incorporated in the final designs. He went ahead to inform the community about the proposed infrastructure proposals, which includes:

a) A FishLanding jetty
b) Mini Fish Processing Plant – within the fish processing plan there would be
    - *Power House*
    - *Flake Ice Plant*
    - *Cold room*
    - *Machine Room*
    - *Dispatch area*

- Fish Market
- An Ablution Block
- Court Yard and a
- Storm Drain

He, later on, invited the community to share their views and challenges about the facility proposed

**13/1/2023/04: COMMUNITY CONCERNS/ CHALLENGES AND RESPONSE**

The participants raised the following issues:

| | Names | Issues/concerns | Responses from KEMSFED Team |
|---|---|---|---|
| | Mr. Masuo Ahmed – Mokowe BMU Chair | He proposed the following components to be incorporated in the fish landing site facility:<br>i. Introduction of a BMU Office<br>j. Noted that internal organs from fish are useful as fish food and should not be condemned and destroyed<br>k. Should consider provision of a hotel within the site for the BMU<br>l. The ice plant to be relocated to the old plot | Project Eng. said that the office will be considered.<br>The use of internal organs for crab fattening by Mokowe Mainland CBO was appreciated as it would enhance their capacity.<br>The Project Eng. reminded the community of thegoal of this project is to ensure that fish quality is preserved during transport so that it reaches its destination while still fresh.<br>The budget will not allow installation of a cold room though the structure is provided forin the design and can be installed later once it becomes essential.<br>The funds available may not allow for the inclusion of a hotel facility. |
| | Pastor John Kumala – Faith Leader | He reiterated the importance of the hotel to be located upstairs to take advantage of the sea view as a way of raising more revenue for the BMU and noted it can be rented out to youths who need a source of income and can be paying rent while operating the facility and help in crime reduction | Eng. Angwenyi noted that this welcome idea however, the project was limited by space and availability of funds. |
| | Millicent Atieno – Youth BMU member | She noted that the location of the fish market was misplaced and it would mean that there will be a lot of vendors accessing the facility. She suggested that the facility needs to be moved towards the western side where the current machine room is and be easily accessed by community | The Eng. noted that this will be revised by the design team. He also reiterated that there will be no cold room only but also an ice flake making machine to ensure that the fish preserves its quality of fresh on ice. |

| | | | |
|---|---|---|---|
| | | members without interfering with processing operations. | |
| | Shali Mohamed Babu – BMU member | He wanted to know whether there are similar project in the country and BMU members to be taken for an exposure visit. | Eng.Angwenyi noted that there were similar and even larger projects especially in Kisumu where BMUs own cold trucks to transport fish. He said a visit is possible under the project. |
| | Ali Shekue – BMU member | He appreciated the efforts the project is doing in Mokowe particularly the installation of an ice plant in the fish banda. | Eng. Angwenyi noted the importance of an ice plant. Reporting that they were essential for enhancing the quality of fish caught by Beach Management Units as they help maintain the freshness of the fish. Properly functioning ice plants provide a controlled environment for storing fish, which helps prevent spoilage and reduces the growth of bacteria, ensuring that the fish remains in a safe condition for human consumption. This is particularly important at landing sites, where fish are typically unloaded from boats and sorted for sale or storage. The use of ice helps extend the shelf life of the fish, making it more valuable and increasing the potential for increased profits for the Beach Management Unit. |
| | Shariff Kamalu – Director/ Acting Chief Officer, Fisheries Department | He was apprehensive that the community may not have understood the design and went over it with the community to see if they had understood it. He requested the members to give their input instead of criticizing it later once completed | It became clear that the community had understood it and discussions continued. |
| | Mohmed Shee – Community member | He wanted to know if there will be a drain pipe to evacuate waste water ("vumba") into the sea. | The Project Engineer explained that there will be a waste treatment facility for the 3 waste streams, namely: human waste, fish waste and organs and bloodied waste water. He explained there will be an ablution block for human waste management; a solid waste treatment facility for solid and organic waste; and for bloodied waste water, a 3-step process septic tank before water discharge into a soak pit. |
| | Adam Mohamed – fish transporter | He wanted to know if there will be a special parking zone for loaded fish transport vehicles | The Project Eng. noted those are county government facilities and are not included in the design one because of limited construction space of the facility. He was requested to forward those concerns |

| | | | |
|---|---|---|---|
| | | | through the BMU to County government. |
| | Ilali Suleiman Ali – BMU member | Mechanism needed to open up the local market and a refrigerated truck for fish transport. | These have not been addressed in the design but can be requested under sub-component 2 of the KEMFSED project. |
| | Mohamed Baruti – BMU member | He requested a patrol boat for the BMU | The project has different component. The component that funds the infrastructure is 1.3 while the one that supports the monitoring control and surveillance is sub-component 1.2. Patrol boats can be requested under sub-component 1.2 of the KEMFSED project, which deals with Co-Management activities and Monitoring Control and Surveillance |
| | Pastor John Kumala – Faith Leader | He requested that the grabbed land for the fisheries jetty needs to be urgently repossessed | CECM said that they are taking up this matter with the national government and will be resolved soon. The CECM noted that the President of the Republic had an interest in ensuring the all previous fish landing sites were recovered. |
| | Salma Masuo – Mama Karanga | Emphasized on revocation of the title for the grabbed land | CECM said that they are taking up this matter with the national government and may be resolved soon |
| | Jaffer Ali – County Electrical Engineer | Noted that there is no provision for bathrooms and a changing area in the current design | To be considered during re-design especially in the fish banda |
| | Naomi Karanja – County Physical Planner | Noted fish market to be easily accessible and also jetty to directly access the gutting and washing area. | Eng. Angwenyi noted that these proposals would be considered and revised in the designs. |
| | Hon FaizFankupi – CECM Fisheries | Wanted to know if there has been consideration for any water source since Mokowe has no water supply | Project Eng. noted that CPC KEMSFED to engage a hydro-geologist to come up with a hydro-geological report that can be submitted to KEMSFED NPCU for consideration. |
| | Mohamed SheeMwalimu – BMU Member | A food plant being near a petrol jetty is risky because of danger of fire | Precautions for safety have been included in the design |

**13/1/2023/05: MCA – HINDI AND CECM – FISHERIES REMARKS**

Mr. Lazarus Kubasu the NPCU Social Safeguards Specialist invited the MCA – Hindi to make his closing remarks.

*Mr. Njaaga, MCA Hindi* ward, began by thanking the County Government of Lamu staff KEMFSED project staff forinitiating this noble project that will improve fisheries in Lamu County. He took issue with grabbing of public land and said he will be working with county government to recover all public land including burial sites as has happened in Mokowe New Town. He thanked the county government for their support to Mokowe mainland CBPO on crab farming and said he is ready to support such community initiatives.

Mr. Faiz Fankupi, the CECM Fisheries thanked all for availing themselves for this noble project. He noted that Lamu produces 80% of lobsters sold in this country with majority coming from Kizingitini. He noted that there are many initiatives in the marine industry such as Crab farming which the county government is willing to support and encouraged the community to undertake such initiatives. He said that plans to get title deeds for all landing sites are at advanced stages with the support of National Government. He also requested members to ensure they develop any land given to them or guarantee that they process those title deeds to discourage grabbing. He assured them that H.E The Governor was in support of this project andoffered his apologies as he had another engagement.

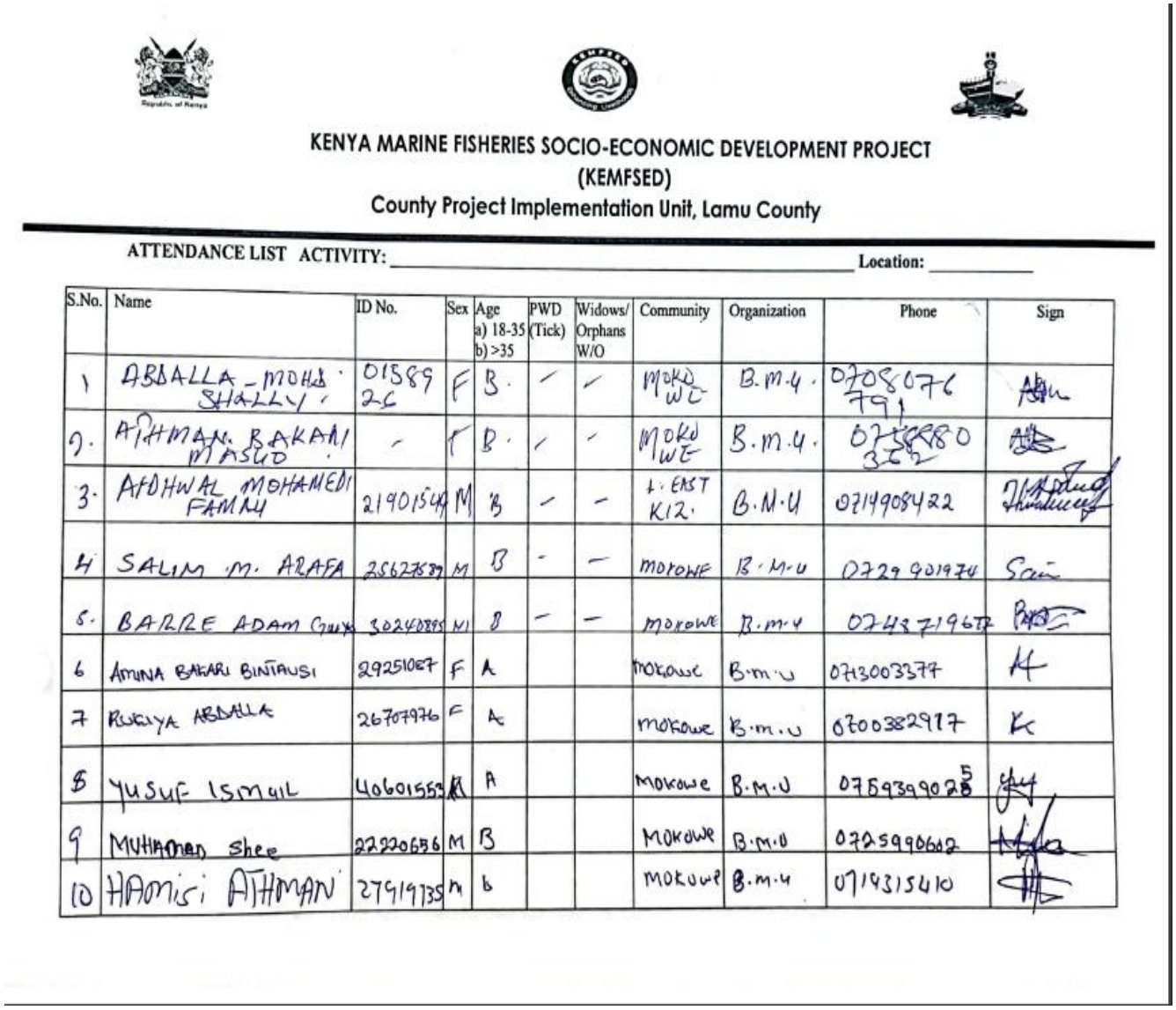
**13/1/2023/06: CLOSURE**

There was no other business, the area CPC thanked the community members for participating. The meeting ended at 11.23 am with a word of prayer from Pastor Kumala – faith leader.

Thanks.

| | |
|---|---|
| **Minutes prepared:** | **Minutes Approved:** |
| **Secretary:** | **Chairman of the Community** |
| --- | --- |

# IV. Public Participation and Consultation Attendance List



KENYA MARINE FISHERIES SOCIO-ECONOMIC DEVELOPMENT PROJECT
(KEMFSED)
County Project Implementation Unit, Lamu County

ATTENDANCE LIST ACTIVITY: _____ Location: _____

| S.No. | Name | ID No. | Sex | Age a) 18-35 b) >35 | PWD (Tick) | Widows/ Orphans W/O | Community | Organization | Phone | Sign |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | ABDALLA - MOHD SHALLY | 01589 26 | F | B | ✓ | ✓ | MOKOWE | B.M.U. | 0708076 791 | |
| 2. | AIHMAN BAKARI MASUD | - | F | B | ✓ | ✓ | MOKOWE | B.M.U. | 07[illegible]80 352 | |
| 3. | AFDHWAL MOHAMEDI FAMAU | 21901544 | M | B | ✓ | - | E. EAST KIZ. | B.N.U | 0714908422 | |
| 4 | SALIM M. ARAFA | 25627837 | M | B | - | - | MOKOWE | B.M.U | 0729 901974 | |
| 5. | BARRE ADAM GURA | 30240895 | M | B | - | - | MOKOWE | B.M.U | 0743 719677 | |
| 6 | AMINA BAKARI BINTAUSI | 29251087 | F | A | | | MOKOWE | B.M.U | 0713003377 | |
| 7 | RUKIYA ABDALLA | 26707976 | F | A | | | MOKOWE | B.M.U | 0700382917 | |
| 8 | YUSUF ISMAIL | 40601553 | M | A | | | MOKOWE | B.M.U | 0759399028 | |
| 9 | MUHAMMAD Shee | 22220696 | M | B | | | MOKOWE | B.M.U | 0725990602 | |
| 10 | HAMISI ATHMAN | 27919735 | M | B | | | MOKOWE | B.M.U | 0719315410 | |

KENYA MARINE FISHERIES SOCIO-ECONOMIC DEVELOPMENT PROJECT

(KEMFSED)

County Project Implementation Unit, Lamu County

ATTENDANCE LIST ACTIVITY: _____ Location: _____

| S.No. | Name | ID No. | Sex | Age a) 18-35 b) >35 | PWD (Tick) | Widows/ Orphans W/O | Community | Organization | Phone | Sign |
|---|---|---|---|---|---|---|---|---|---|---|
| 11 | HONESTO EKALE | 26169 | m | 35 | | | MOKOWE | B.M.U | 0740276241 | |
| 12 | HARUN Suleiman | 24501733 | M | | | | MOKOWE | B.M.U | 0714795913 | |
| 13 | KUSO HUSSEIN | 22021983 | m | 43 | | | MOKOWE | B.M.U | 0705617967 | |
| 14 | RICHARD MKUU [illegible] | 29451143 | m | 28 | | | MOKOWE | B.M.U | 0701658194 | |
| 15 | ABDULRAHMAN TILA | 11111033 | m | 49 | | | MOKOWE | B.M.U | 0742146929 | |
| 16 | Collins Kipkoo | 35139781 | m | 28 | | | MOKOWE | B.M.U | 0725530035 | |
| 17 | HASSAN LOHOS | 11893493 | M | 45 | | | MOKOWE | B.M.U | 0721726999 24 | |
| 18 | ATHMAN HAMDI | 10390381 | M | 47 | | | MOKOWE | B.M.U | 0799843518 | |
| 19 | AMANI SILAS | 27746267 | m | 35 | | | MOKOWE | B.M.U | 0797269417 | |
| 20 | SAID JADO | 12709044 | M | | | | MOKOWE | | 0700701490 | |

KENYA MARINE FISHERIES SOCIO-ECONOMIC DEVELOPMENT PROJECT
(KEMFSED)
County Project Implementation Unit, Lamu County

ATTENDANCE LIST ACTIVITY: _____ Location: _____

| S.No. | Name | ID No. | Sex | Age a) 18-35 b) >35 | PWD (Tick) | Widowe/ Orphans W/O | Community | Organization | Phone | Sign |
|---|---|---|---|---|---|---|---|---|---|---|
| 1. | ~~AMINA BAKARI J.~~ | 2919174 | | | | | | | | |
| 21. | AMINA BAKARI J. | 2919174 | F | B | N/A | – | MOKOWE | BANDARI SALAMA BMU | 0725373959 | |
| 22. | MOHAMED BWANAMKUU | 10390535 | M | B | — | – | MOKOWE | C.I.P.K | 0725585477 | |
| 23 | SALIM ALI ADAM | 2233865 | M | B | – | – | " | BMU | 0713001817 | |
| 24 | OMAR MOHD BAHEDO | 8525888 | M | | – | – | " | BMU | 0115206723 | |
| 25 | AIHMAN. BWANAHEH AIHMAH. | 9355960 | M. | B. | – | – | MOKOWE | B.M.U. | 0714845517 | |
| 26 | BAKARI. BIN TAUSI | 0650189 | M. | B. | – | – | MOKOWE | B.M.U. | 0703299040 | |
| 27 | AHMED MOH'D | 2239677 | M | B. | ✓ | – | MOKOWE | DILLER | 0798-303230 | |
| 28 | SUAREH YUSUF | 2380447 | | B | ✓ | – | MOKOWE | FISHMONGER | 0719766180 | |
| 29 | ALI-OMAR ALI | 2769 7756 | | B | ✓ | ✓ | MOKOWE | B.M.U. | ✓ | |
| 30 | HASHIM. MOHAMED MACHO. | 1114068 9 | | B. | ✓ | ✓ | MOKOWE | BMU. | | |

KENYA MARINE FISHERIES SOCIO-ECONOMIC DEVELOPMENT PROJECT
(KEMFSED)
County Project Implementation Unit, Lamu County

ATTENDANCE LIST ACTIVITY: _____ Location: _____

| S.No. | Name | ID No. | Sex | Age a) 18-35 b) >35 | PWD (Tick) | Widows/ Orphans W/O | Community | Organization | Phone | Sign |
|---|---|---|---|---|---|---|---|---|---|---|
| 31 | Ali Mohd Sala | 20310946 | M | B | | — | Mokowe | BMU | 0704526736 | |
| 32 | Hussein Mohsin | 35445688 | M | b | | | Mokowe | Leader | 0113812486 | |
| 33 | Musa Bwana | 3[illegible]3857 | M | a | | | Mokowe | BMU | 0113054720 | |
| 34 | Evaline Rizuki | 32234611 | F | A | | | Mokowe | Trader | 0757795822 | |
| 35 | Mohamed Bahu | 01581182 | M | b | | | Mokowe | BMU | 0721[illegible]17 0713217417 | |
| 36 | Masud Ahmed | 22409620 | M | B | | | Mokowe | BMU | 0705911713 | |
| 37 | Millicent Mwigai | 35811422 | F | A | | | Mokowe | B.M.U | 0790720873 | |
| 38 | Gure Boni Sobat | 38234583 | M | B | | | Mokowe | B.MU | 0793485858 | |
| 39 | Yusuf Othman | 29676516 | | A | | | Mokowe | B.M.U | 0792681744 | |
| 40 | Frances Mugethe | 36293978 | | A | | | Mokowe | B.M.U | 0725479325 | |

KENYA MARINE FISHERIES SOCIO-ECONOMIC DEVELOPMENT PROJECT
(KEMFSED)
County Project Implementation Unit, Lamu County

ATTENDANCE LIST ACTIVITY: _____ Location: _____

| S.No. | Name | ID No. | Sex | Age a) 18-35 b) >35 | PWD (Tick) | Widows/ Orphans W/O | Community | Organization | Phone | Sign |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | JOSEPH ONYANGO | 11215137 | M | b | | | | KEMFSED | 0713758107 | |
| 2 | Sheh B.K Rutah | 28140433 | M | A | | | | SDAN-HQ | 0726744881 | |
| 3 | Abubakar Maulana | 28581114 | M | a | | | | KEMFSED | 0719315180 | |
| 4. | Lali Fuad | 28551197 | M | a | | | | LCG | 0720110931 | |
| 5 | Eng. George otula | 25811534 | M | a | | | | LCG | 0729779349 | |
| 6 | JAFFAR ALI YUSUF | 30200786 | M | a | | | | LCG | 0743667472 | |
| 7 | Simon M Komu | 39300483 | M | b | | | | LCG | 0706590614 | |
| 8 | NAOMI M KARANJA | 32648161 | F | a | | | | LCG | 0705746739 | |
| 9 | John Mugo | 13211070 | M | B | | | | KEMFSED | 0722398631 | |
| 10 | Charles NDORO | 10850852 | M | B | | | | KEMFSED | 0722403292 | |

KENYA MARINE FISHERIES SOCIO-ECONOMIC DEVELOPMENT PROJECT
(KEMFSED)
County Project Implementation Unit, Lamu County

ATTENDANCE LIST ACTIVITY: _____ Location: _____

| | S.No. | Name | ID No. | Sex | Age a) 18-35 b) >35 | PWD (Tick) | Widows/ Orphans W/O | Community | Organization | Phone | Sign |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 11 | 11 | Juliet kanisa | 21857912 | F | B | | | | KMFRI | 0722977652 | |
| 12 | 12 | Janet Mambua | 23882504 | F | B | | | | KEMFSED | 0723837157 | |
| 13 | 13 | Mohamed Athuman | 23668854 | M | B | | | | KEMFSED | 0721500621 | |
| 14 | 14 | Adam Musa | 10341023 | M | B | | | | KEMFSED | 0721662872 | |
| 15 | 15 | Japheth Kupkales | 28397466 | M | A | | | | fisheries | 0790743727 | |
| 16 | 16 | HAZARUS KUBAU | 2190860 | | B | N/A | N/A | | KEMFSED | 0704887350 | |
| 17 | 17 | HON. FAIZ FANKEPI | 25232540 | | B | N/A | N/A | | LCG. | 0719519022 | |
| 18 | 18 | JAMES KARUKI | 9253519 | M | B | | | | MCA HINDI | 0729310480 | |
| 19 | 19 | ABDULMANAN ALI | 30351276 | | A | | | | COUNTY | 0716 080883 | |
| 20 | 20 | George Obonga | 2011774 | | B | | | | MOH | 0716134113 | |

**KENYA MARINE FISHERIES SOCIO-ECONOMIC DEVELOPMENT PROJECT**
**(KEMFSED)**
**County Project Implementation Unit, Lamu County**

**ATTENDANCE LIST ACTIVITY:** _____ **Location:** _____

| S.No. | Name | ID No. | Sex | Age a) 18-35 b) >35 | PWD (Tick) | Widows/ Orphans W/O | Community | Organization | Phone | Sign |
|---|---|---|---|---|---|---|---|---|---|---|
| 21 | ARAFAT SAID AROT | 23449256 | M | 38 | | | | COUNTY PUBLIC WORKS | 0112-526131 | |
| 22 | Abdulfatah Kassim | 27223073 | M | a | | | | LCG | 0742476462 | |
| 23 | Eng. S. ANGWENYI | 25/19470 | M | B | | | | PE/KEMFSD | 0722858869 | |
| 24 | KAHINDI YERI | 7657816 | M | B | | | | NEMA | 0722329452 | |
| 25 | Anthony Mgoima's | 9050058 | M | B | | | | Kemfsed | 0721460196 | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |

# V. Code of Conduct

**IMPLEMENTATION OF ESHS AND OHS STANDARDS, PREVENTING GENDER BASED VIOLENCE AND VIOLENCE AGAINST CHILDREN**

I …… acknowledge that I will adhere to the Environmental Social Health and Safety (ESHS) requirements; Occupational Health and Safety (OHS) requirements and statutes preventing Gender-Based Violence (GBV) and Violence Against Children (VAC).

I agree that while working on the project I will: -

a) Attend and actively partake in training courses related to **ESHS, OHS, HIV/AIDS GBV, and VAC** as requested by the employer
b) I will wear **Personal Protective Equipment (PPE)**at all times when at work site or engaged in project related activities
c) Implement Occupational Health Safety management plan
d) Take all practical steps to implement the contractors Environmental and Social Management Plan (C-ESMP)
e) Adhere to zero alcohol policy during work activities and refrain from the use of narcotics or other substances which impair faculties at all times
f) Consent to police background checks.
g) Treat women, children (persons under the age of 18yrs) and men with respect regardless of race, colour, language, religion, political or other opinion, Nation, ethnic or social origin property, disability birth or other status
h) Not use language or behaviour towards women, children, or men that is inappropriate, harassing, abusive, sexually provocative demeaning or culturally inappropriate;
*i)* Not engage in sexual harassment for instance making unwelcome sexual advances, requests, for sexual favours and other verbal or physical conduct of sexual nature, including subtle acts of such behaviour e.g. *(Looking at somebody up and down, kissing, howling or smacking sounds, hanging around somebody, whistling and catcalls, giving personal gifts, making comments about somebody's sexual life);*
*j)* Not engage in sexual favours for instance making promises or favourable treatments depending on sexual acts or other forms of humiliating, degrading or exploitive behaviour;
*k)* Not participate in sexual conduct or activities with children including grooming or contact through digital media. Mistaken belief regarding the age of the child or consent from a child is not a defense or an excuse.
*l)* Unless there is full consent by all parties involved, I will not have interactions with members of the surrounding communities, this includes relationships involving the withholding or promises of actual provision of benefits (e.g., monetary or non-monetary) to community members in exchange for sex. Such sexual activity is considered "non-consensual" within the scope of this code of conduct

*m)* Consider reporting through the Project Site Agent, ESH officer or to my supervisors any suspected or actual GBV, and VAC by a fellow worker, whether employed this company or not, or any breaches of this code of conduct

**With regard to children under 18 years**

i. Whenever possible ensure that another adult is present when working in the proximity of children
ii. I will not invite unaccompanied children not related to my family into my house unless they are at immediate risk of danger or physical danger
iii. I will not use any computers, mobiles phone, videos or digital cameras or any other medium to exploit or harass children or to access children phonography or use of children images for work related purposes
iv. Refrain from physical punishment or discipline of children
v. Refrain from hiring children for domestic or other labour related work
vi. Comply with all relevant local legislations including labour laws in relation to child labour and world Bank Safeguards Policies on child labour

**Use of children images for work related purposes**

a) When photographing or filming a child, assess and endeavour to comply with local tradition or restriction for reproducing personal images
b) Before photographing or filming a child, must obtain informed consent from the child, parent or guardian of the child. As part of this, I must explain the use of the photograph or the film.
c) Ensure photographs films videos and DVDs present children in a dignified and respectful manner and not in the vulnerable and submissive manner. Children should be adequately clothed and not in poses that could be seen as sexually suggestive.
d) Ensure file labels do not reveal identifying information about a child when sending images electronically

**NON-RETALIATION ON REPORTING CODE VIOLATIONS**

- No one will be victimized for reporting the violation of this code of conduct.
- A reward will be offered for genuine reporting of this code violations as deemed fit by the Management.

**Sanctions**

I understand that if I breach this individual code of conduct, my employer will take disciplinary action which could include: -

- Informal warning
- Formal warning
- Additional training
- Loss of one week's salary

- Suspension from employment (without payment of salary) for a period of one month
- Termination of employment (without benefits)
- Report to the police if warranted

*I……ID No …….. do hereby acknowledge that I have read the forgoing individual code of conduct, do agree to comply with the standards contained therein and understand my roles and responsibilities to prevent and respond to ESHS OHS GBV and VAC issues, I understand that any action inconsistent with this individual code of conduct or failure to act as mandated by this individual code of conduct may result in disciplinary action and my on-going emolument*

Signature……

Name……..

# VI. Technical Clauses for Contractor Implementation

**CLAUSES TO BE IMPLEMENTED BY THE CONTRACTOR AND ALL SUB-CONTRACTORS AS A REQUIREMENT UNDER THE CONTRACT.**

1. The Contractor shall not commence any works or mobilization unless a notice of no-objection by the Joint Project Supervision Committee (JPSC) as guided by the World Bank to the Contractor, on measures the Contractor proposes to manage environmental and social risks and impacts and Code of Conduct for Contractor's Personnel is submitted and approved as part of the Contract.
2. The Contractor shall also ensure that the Code of Conduct is visibly displayed in multiple locations on the site and any other place where the works will be carried out, as well as in areas outside the site accessible to the local community and project affected people. The posted Code of Conduct shall be provided in languages comprehensible to Contractor's Personnel, Employer's Personnel and the local community.
3. The County safeguards officer (ESSO) will be responsible for organizing environmental training of all the Engineer's and Contractor's staff. It is required that this training is coupled with the safety training that the Contractor should include in his own site management plan. The Contractor shall ensure that the KEMFSED Project Engineer is informed of all staff that will work on the site and their general responsibilities and shall make sure that they are available to attend briefing sessions arranged by the ESSO on the environmental mitigation measures that are to be in place on the site. The Contractor shall facilitate the ESSO as shall be requested.
4. The wages paid to staff employed by the contractor shall be fair and reasonable having regard to those commonly paid in the trade or industry in which such staff are employed and undertake to comply with such requirements relating to hours of work and conditions of labour as are or may from time to time be laid down in the legislation of Kenya.
5. Without prejudice to their obligations under Kenyan Employment Act, the Contractor shall keep proper wages books and time sheets showing the wages paid and the time worked by the staff under their employment in and about the carrying out of this Contract and such wages books and time sheets shall be produced whenever required for inspection by any officer authorized by the Contracting authority.
6. The Contractor shall recognize the freedom of his employees to associate. The Contractor shall at all times during the continuance of the contract display a copy of this Article in full on his site office notice boards for the information of his employees.
7. Due precautions shall be taken by the contractor, and at his own cost, to ensure the safety of his staff and labor and in collaboration with and to the requirements of the local health authorities, to ensure that medical staff, first aid equipment and stores, sick bay and suitable ambulance service are available when required throughout the period of the contract and that suitable arrangements are made for the prevention of epidemics and for all necessary welfare and hygiene requirements.
8. Burning of waste materials will not be permitted on site but instead the waste disposed of in authorized dumpimg sites as per the requirements of NEMA within the county. Hazardous materials such as tires, plastic rubber products, used oil products, or other hazardous materials shall be disposed of by contractors' licensed to handle such waste.

9. The Contractor shall comply with applicable National laws, orders and regulations concerning the prevention, control and abatement of excessive noise. Any activity producing high-intensity impact noise will not be performed during the night
10. The Contractor's construction activities shall be performed by methods that will prevent entrance or accidental spillage, of solid matter, contaminants, debris, and other pollutants and wastes into streams, flowing or dry watercourses, sea, and underground water sources. Other pollutants may include: concrete, oil and other petroleum products. Excavated materials or other construction materials shall not be stockpiled or deposited near or on stream banks, sea shorelines or other watercourse perimeters where they can be washed away by high water tide or storm runoff or can in any way encroach upon watercourse itself.
11. The Contractor shall comply with applicable laws and regulations concerning the prevention and control of air pollution. Notwithstanding the above in conduct of construction activities and operation of equipment, the contractor shall utilize such practicable methods and devices as are reasonably available to control prevent and otherwise minimize atmospheric emissions or discharges of air contaminants. The emission of dust into the atmosphere shall be strictly controlled during the preparation, handling and storage of concrete and aggregates, and the contractor shall use such methods and equipment as are necessary for the collection and disposal or prevention of dust during these operations.
12. The Contractor's methods of storing and handling cement and lime shall also include means of eliminating atmospheric discharges of dust. Equipment and vehicles that show excessive emissions of exhaust gases due to poor engine adjustments or other inefficient operating conditions shall not be operated until corrective repairs or adjustments are made.
13. The contractor to take all measures necessary including sensitization and awareness among workers and the public to avoid or minimize the spread of communicable diseases such HIV/AIDS, TB, STIs and non-communicable diseases associated with the execution of the works, taking into consideration differentiated exposure to and higher sensitivity of vulnerable groups. This includes taking measures to avoid or minimize their transmission. The Contractor shall ensure that condoms are provided as part of the HIV/AIDS control program to all staff.
14. The contractor shall prepare procedures for prevention, preparedness and response activities to be implemented in the case of an emergency. The procedures to establish and maintain a safe working environment without risk to health at all workplaces, machinery, equipment and processes under the control of the Contractor.
15. The contractor to conduct training for workers on first aid, safety and health, appropriate use of PPE and on grievance redress mechanism with details of the training to be provided, records to be kept.
16. The Contractor shall require that its sub-contractors execute the Works in accordance with the Contract, including complying with the relevant environmental and social safeguards requirements as captured in the ESIA report, ESMP and the SEA/SH Prevention and Response Obligations or as shall be guided from time to time depending in changes in circumstances or updating C-ESMP.
17. The contractor shall be required to give fair and reasonable opportunity to sub-contractors from the county where such opportunities arise.

18. The Contractor where applicable to source staff and labor with appropriate qualifications and experience from within the county or sub-county. Where applicable from the general project implementation area (from Coastal Counties).
19. The contractor and all the associated sub-contractors to put in place a policy prohibiting any form of child labor and where such cases arise the contractor to meet appropriate sanctions or legal action as per the national laws and World Bank policies prohibiting such cases.
20. The contractors to put in place measures to avoid, prevent, control and manage covid-19 infection among workers and the community during engagement. The contractor to prepare the guidelines cognizance of Ministry of health and World Bank Covid-19 guidelines as well as appropriate PPE use on site.
21. The contractor to take all necessary measures to ensure that in the process of sourcing of material or executing the works does not perpetuate the spread of invasive plant or animal species. And that all measures shall be taken including measures to avoid, prevent, minimize or manage such incidences.
22. The contractor shall commit to adhere to implementation of all safeguards requirements as per KEMFSED project documents, ESIA report, C-ESMP or as shall be reviewed and issued from time to time in the cause of implementing the proposed sub-project activities and should anticipate for the associated cost.

# VII. List of Indicators for Monitoring

| NO. | ASPECT | LIST OF POTENTIAL INDICATORS TO BE MONITORED |
|---|---|---|
| 1. | Occupational Health and Safety (*accidents and Injuries*) | ▪ Site safety action plan<br>▪ Trained workers on safety and first aid skills<br>▪ First aid facility and injury reporting mechanism put in place<br>▪ Appropriate use of personal protective equipment (PPE) *(Reflective jackets, helmets, face masks, ear plugs gloves, safety boots, etc.)*<br>▪ Trained workers on appropriate use of PPE.<br>▪ Sanitation facilities provided on site for human waste disposal<br>▪ Incident register and training of how to use it<br>▪ Updated contractor WIBA insurance policy<br>▪ Watering points for worker on site with clean water<br>▪ Memorandum of Understanding with nearby health centre.<br>▪ Covid-19 management rules/guidelines on site<br>▪ Adequate covid-19 PPE and use by all persons on site.<br>▪ Trained workers on covid-19 rules and requirements. |
| 2. | Public health and safety (*accidents and Injuries*) | ▪ Use of safety signs at strategic places with high risks to public.<br>▪ Hording off working sites<br>▪ Speed limit measures in place<br>▪ Awareness creation and sensitization activities for the public |
| 3. | Visual/ aesthetic Impacts | • Backfilling of soil cuttings<br>• Landscaping of the project site |
| 4. | Leakages and spills | ▪ Recorded incidents of hazardous waste leakage or spills.<br>▪ Site-specific incident management or response plan.<br>▪ Oil trap measures at contractors yard |
| 5. | Excessive Noise | • Noise regulation measures on construction equipments.<br>• Construction equipment and Machine servicing records<br>• Records of public notices for high noise level activities<br>• Appropriate use of noise PPE by workers<br>• Measures in place to reduce unnecessary hooting and speeding.<br>• Records of regular measurement of noise levels |
| 6. | Air pollution | • Identified potential sources of air pollution on site<br>• Measures put in place to control effect of wind on material being transported |
| 7. | Solid Waste generation | • Site-specific waste management plan<br>• Measures of waste avoidance, reduction, reuse and recycle put in place.<br>• Designated waste transfer station on site.<br>• Records of approvals from NEMA and County Government on waste management and disposal |
| 8. | Increased Water consumption for | • No. of sensitization and awareness creation among construction workers |

| NO. | ASPECT | LIST OF POTENTIAL INDICATORS TO BE MONITORED |
|---|---|---|
| | construction | • Measures to conserve water during structure curing.<br>• Records of response to leakage in the water system.<br>• Alternative water sources |
| 9. | Risk of Spread of HIV/AIDS | • Adequate HIV/AIDS prevention messaging through outreach, road shows and local media discusions<br>• No. of workers having access to safe sex (condoms-Male and female)<br>• Proportion of workers reporting safe sex practices with partners within reporting year<br>•<br>• Installed HIV testing services or an MoU with an existing government health facility in the area.<br>• No. of HIV infected workers supported with ARVs<br>• No of peer counsellors trained/Peer counseling services put in place |
| 10. | Grievances | • Grievance redress committees put in place<br>• Contractor staff grievance structures put in place<br>• Sensitization and awareness creation<br>• No. of grievances reported/no of resolved grievances/Grievance log on site |
| 11. | Effects of Immigrant workers | ▪ No of local workforce (against what? How does this measure effects of immigrant workers?<br>▪ Community engagement plan in place<br>▪ Signed Code of Conduct by all workers<br>▪ Sensitization meeting on local social and cultural practices on acceptable behavior<br>▪ Sexual Harassment and Non-Discrimination Policy<br>▪ Labour Management Plan (LMP ) |
| 12. | Child Labour and Protection | ▪ Records of employees including copies identification cards<br>▪ Records of child sexual relations offenses reported to the police.<br>▪ Recruitment policy prohibiting child labour put in place<br>▪ Review of employee records |
| 13. | Gender Equity, Sexual Harassment and abuse amongst workers in the workplace | ▪ Sexual Harassment and Non-Discrimination Policy<br>▪ No of women as a proportion of total employed<br>▪ Availability of sanitation facilities per sex<br>▪ No of reported sexual harassment cases reported<br>▪ Trained and sensitized employees on appropriate behavior<br>▪ Signed code of conduct against SH<br>▪ Gender action plan |
| 14. | Gender-based violence at community level | ▪ Implemented measures to prevent GBV at community level -how is this measured?<br>▪ No. of community engagement and consultation with women and girls;<br>▪ No. of sub-project activities identified to be of high GBV risk at |

| NO. | ASPECT | LIST OF POTENTIAL INDICATORS TO BE MONITORED |
|---|---|---|
| | | community level.<br>▪ Referral mechanisms are in place in the event of GBV at Community level |
| 15. | Sexual exploitation and abuse (SEA) | ▪ SEA management action plan<br>▪ Signed code of conduct (CoC) by all workers and sub-contractors<br>▪ Workers trained on CoCs and responsibilities<br>▪ Project-level IEC materials put in place<br>▪ Survivor-centred mechanisms put in place<br>▪ Multi-sectoral referral and assistance plan put in place<br>▪ Disciplinary procedures at the project put in place<br>▪ Confidential community-based complaints resolution mechanisms in place<br>▪ PSEA awareness-raising done<br>▪ community-level IEC materials put in place<br>▪ No of community outreach to women and girls about social risks and their PSEA-related rights;<br>▪ Integration of SEA in job descriptions, employments contracts, performance appraisal systems,<br>▪ Whistle-blower protection and investigation and disciplinary procedures put in place<br>▪ No. of training of project staff on SEA conducted |
| 16. | Spread of COVID-19 amongst community members during consultation processes | • electronic channels adopted for engagement of stakeholders<br>• Measures to observe social distance put in place<br>• Covid-19 PPE use on site<br>• Use of Covid-19 PPE during community engagement<br>• Traditional Communication channels adopted<br>• No. of stakeholders per meeting, disaggregated along gender),<br>•<br>• No of digital platform adopted explain<br>• Online services of community engagement put in place<br>• feedback and suggestion platforms for participants,<br>• size of groups attending meetings |
| 17. | Spread of COVID-19. During construction at work sites | • Approved SOPs in line with World Bank and ministry of health guidelines in place,<br>• No of routine fumigation of shared area and shared tools,<br>• Sanitizing and hand washing area and facilities put in place<br>• Isolation area,<br>• proper use of covid-19 PPE,<br>• visual inspection of social distance and<br>• rapid covid-19 screening measures put in place |
| 18. | Spread of invasive species | • Ensuring cleanliness of the project construction vehicles accessing or leaving the site to reduce spread of *Prosopis Juliflora* currently on site.<br>• Create awareness among the workers |

# VIII. GRIEVANCE LOG FORMS

**GRIEVANCE LOG FORM:** **GRIEVANCE NO:**.....

| | | | | |
|---|---|---|---|---|
| **Name of Complainant** | **Gender:** | | **Age:** | |
| | **Male** | | **18 – 35**<br>**36 – 65**<br>**65 - Above** | |
| | **Female** | | **18-35**<br>**36 -65**<br>**65 - Above** | |
| | | | | |
| **Contact Information** | **Phone No:** | | **E-mail:** | |
| | | | | |
| Location of the Complainant<br>County | County | Sub-County | Ward | Village |
| | | | | |
| Signature of the Complainant | Or if he chooses to be anonymous | | Reason for staying anonymous | |
| | | | | |
| Description of the Complaint (s) | | | | |
| | | | | |
| Resolution of the Complaint | **Yes** | | **No:** | |
| Referral | **Yes** | | **No:** | |
| **If referred:**<br>**Who was it referred and what is position or title of the referral** | **Contact of the referrals** | | **E-mail of the referral** | |
| **Resolution Communicated to the Complainant** | **Yes** | | **No** | |

# ANNEX IX: CHANCE FIND PROCEDURE MANAGEMENT PLAN

## 1. Purposes of the chance find procedure

The chance find procedure is a project-specific procedure that outlines actions required if previously unknown heritage resources, particularly archaeological resources, are encountered during project construction or operation.

## 2. Scopes of the chance find procedure

This procedure is applicable to all activities conducted by the contractor personnel, who are likely to carry out excavation and uncover a heritage item/site. The procedure details the actions to be taken if a previously unidentified and potential heritage item/site is found during construction activities. The Procedure outlines the roles and responsibilities and the response times required from both project staff, and any relevant heritage authority.

## 3. Induction/Training

All personnel, especially those working on earth movements and excavations, are to be inducted on the identification of potential heritage items/sites and the relevant actions for them with regards to this procedure during the Project induction and regular toolbox talks. Chance find procedure If any person discovers a physical cultural resource, such as (but not limited to) archaeological sites, historical sites, remains and objects, or a cemetery and/or individual graves during excavation or construction, the following steps shall be taken:

I. *Stop all works in the vicinity of the find, until a solution is found for the preservation of these artifacts or advice from the relevant authorities through the Resident Engineer is obtained;*
II. *Immediately notify a foreman. The foreman will then notify the Contractor Project Manager and the Environment Officer*
III. *Record details in Incident Report and take photos of the find;*
IV. *Delineate the discovered site or area; secure the site to prevent any damage or loss of removable objects. In cases of removable antiquities or sensitive remains, a night guard shall be arranged until the responsible local authorities take over;*
V. *The Contractor Project Manager and the Environment Officer will inform the Resident Engineer who will contact and engage archaeologist. Preliminary evaluation of the findings by archaeologists will be done and a rapid assessment of the site sought to find out or to determine its importance. Based on this assessment the appropriate strategy can be implemented. The significance and importance of the findings should be assessed*

*according to the various criteria relevant to cultural heritage such as aesthetic, historic, scientific or research, social and economic values of the find;*

VI. *Sites of minor significance (such as isolated or unclear features, and isolated finds) should be recorded immediately by the archaeologist, thus causing a minimum disruption to the work schedule of the Contractor. The results of all archaeological work must be reported to the Resident Engineer who will forward the same to the Ministry/Agency, concern once completed.*

VII. *In case of significant find the Agency/Ministry (National Museum) should be informed immediately and in writing within 7 days from the find*

VIII. *The onsite archaeologist provides the Heritage team with photos, other information as relevant for identification and assessment of the significance of heritage items.*

IX. *The National Museum must investigate the fact within 2 weeks from the date of notification and provide response in writing.*

X. *Decisions on how to handle the finding shall be taken by the responsible authorities. This could include changes in the layout (such as when finding an irremovable remain of cultural or archaeological importance) conservation, preservation, restoration and salvage*

XI. *Construction works could resume only after permission is granted from the responsible authorities through the Resident Engineer.*

XII. *In case no response received within the 2 weeks period mentioned above, this is considered as authorization to proceed with suspended construction works. One of the main requirements of the procedure is record keeping.*

All finds must be registered. Photo log, copies of communication with decision making authorities, conclusions and recommendations/guidance, implementation reports kept. Additional information Management options for archaeological site e.g. Site avoidance. If the boundaries of the site have been delineated attempt must be made to redesign the proposed development to avoid the site. The fastest and most cost-effective management option is Mitigation. If it is not feasible to avoid the site through redesign, it will be necessary to sample it using data collection program prior to its loss. This could include surface collection and/or excavation. The most expensive and time-consuming management option is Site Protection. It may be possible to protect the site through the installation of barriers during the time of the development and/or possibly for a longer term. This could include the erection of high visibility fencing around the site or covering the site area with a geotextile and then capping it with fill.

## 4. The mitigation hierarchy

**Avoidance;**

a. *Minimization of adverse impacts and implementation of restoration measures, in situ;*
b. *Restoration of the functionality of the cultural heritage, in a different location;*

Most cultural heritage is best protected by in situ preservation, since removal is likely to result in irreparable damage or even destruction of the cultural heritage. Nonreplicable cultural heritage must not be removed unless all of the following conditions are met:

*a) There are no technically or financially feasible alternatives to removal;*

*b) The overall benefits of the project conclusively outweigh the anticipated cultural heritage loss from removal;*

Any removal of cultural heritage must be conducted using the best available technique advised by relevant authority and supervised by archaeologist

Human Remains Management Options the handling of human remains believed to be archaeological in nature requires communication according to the same procedure described above. There are two possible courses of action:

**i) Avoid.**

The development project is redesigned to completely avoid the found remains. An assessment should be made as to whether the remains may be affected by residual or accumulative impacts associated with the development, and properly addressed by a comprehensive management plan.

**ii) Exhume.**

Exhumation of the remains in a manner considered appropriate by decision makers. This will involve the predetermination of a site suitable for the reburial of the remains. Certain ceremonies or procedures may need to be followed

# ANNEX X: MBELE MBELE HYDROGEOLOGICAL REPORT

Click here to access the Hydrogeological report

## ANNEX XI: SECURITY MANAGEMENT PROTOCOLS FOR MOKOWE FISH LANDING SITE CONSTRUCTION

1. **Physical Security Measures:**
   - *Perimeter Security:* Install robust fencing around the entire construction site to create a secure boundary. Include gated access points manned by security personnel.
   - *Surveillance Systems:* Deploy surveillance cameras at strategic locations across the site to monitor activities and deter unauthorized access.
   - *Guard Posts:* Establish manned guard posts at all entry and exit points, ensuring that all personnel and visitors are checked upon entering or leaving the site.

**2. Access Control Procedures:**
   - *Identification Badges:* Issue ID badges to all project personnel and authorized visitors. Badges must be displayed visibly at all times within the project area.
   - *Visitor Access:* Implement a strict visitor management system that includes prior authorization, scheduled visits, and accompaniment by project personnel at all times. Visitors must register and receive a temporary badge at the security office.
   - *Vehicle Access:* Conduct thorough inspections of all vehicles entering the site for prohibited items. Vehicles must be registered and receive a pass before entry.

**3. Security Personnel and Training:**
   - *Security Staffing:* Employ trained and certified security personnel to enforce site rules and manage access control. Both uniformed and plainclothes security officers should be included.
   - *Training Programs:* Regularly conduct security induction and awareness training for all new hires and existing staff to familiarize them with security procedures and emergency response protocols.

**4. Emergency and Incident Response:**
   - *Incident Reporting:* Establish clear procedures for reporting security incidents. Include hotline numbers and emails for immediate communication.
   - *Sub-County Security Intelligence Committee:* Escalate any issues to the Sub-County Security Intelligence Committee.
   - *Emergency Response Plan:* Develop and maintain an emergency response plan, including evacuation routes and assembly points. Conduct regular drills to ensure all staff are familiar with the plan.

**5. Construction Material and Equipment Security:**
   - *Storage Security:* Secure all storage areas with locking mechanisms and restrict access to authorized personnel only. Regularly audit inventory to prevent and detect any discrepancies.

- *Equipment Handling:* Implement tracking for all major equipment pieces, using logs for check-out and return. Perform routine inspections to ensure equipment is accounted for.
- *Inform Sub-County Security Intelligence Committee:* For logistics and carrying of construction materials from Minjila to Mokowe, ensure the security personnel are informed of the same.

**6. Information Security:**

- *Sensitive Information Handling:* Classify and manage sensitive project information carefully. Implement protocols for the secure handling, storage, and disposal of sensitive documents.
- *Communication Security:* Use secure communication channels for transmitting sensitive information. Ensure all communications are encrypted where necessary.

**7. Community Engagement and Grievance Management:**

- *Community Liaison:* Appoint a community liaison officer to handle interactions with the local community and address any concerns related to the construction activities.
- *Grievance Mechanism:* Set up a grievance redress mechanism to handle complaints and concerns from the community promptly and fairly.

**8. Compliance and Continuous Improvement:**

- *Regulatory Compliance:* Ensure all security measures comply with local laws and regulations as well as international best practices, including those recommended by the World Bank Group.
- *Review and Audit:* Regularly review and audit security measures to identify areas for improvement and ensure effectiveness.

These protocols are designed to ensure the safety and security of all personnel, assets, and operations at the Mokowe Fish Landing Site during the construction period, aligning with the best practices and regulatory requirements.

Drawn from KEMFSED Security Management Plan (SMP)