Defence Infrastructure Organisation

Civil Works Contract

DIO RD OS Trg (Kenya)

BATUK

Required Works: KEN/GE/1903

Booklet 3 Performance Specification Design pack

Reference: KEN/GE/1903 (version 3.0)
Dated:13 Aug 19

PERFORMANCE SPECIFICATION - REQUIRED WORKS KEN/GE/1903

Project considerations

1. **Introduction**. There is a requirement to construct, over a period of two years, two permanent ablution blocks and provide mechanical and electrical (M&E) systems to support them within Nyati Barracks, Nanyuki, Kenya to support daily British Army operations. This specification only applies to the first ablution block. The proposed location for this block and the nearest M&E service connections can be found on Drawing (Dwg) No. KEN/NYA/M/001; the exact building location, orientation and proposed utility connections will be explained to the Contractor on acceptance of Invitation to Tender (ITT).

2. **Supporting documents**. This Performance Specification (PSpec) outlines the required works at Nyati Barracks, Nanyuki, Kenya. Information on the Scope of Works, Specifications, 'Inspection, Supervision, Testing and Commissioning' regime, Construction Materiel List and also Pre-Construction Information (PCI) are at Annexes A – I of this document. This PSpec is to be read in conjunction with the following project documents, and is to be utilised by the contractor in order to produce a cost and time quotation for the required works:

   a. Project drawings.

   b. ITT.

3. **Constraints**. The Contractor **must** adhere to the following constraints:

   a. **Occupation**. The existing site will be partially occupied by permanent staff and Battle group personnel during all phases of construction. Each phase of construction must de-conflict with the daily activities of personnel within the site. The contractor's team is not permitted to live within the Barracks due to security reasons.

   b. **Power and Utilities**. The Contractor is to ensure that construction activities do not disrupt utility services to all occupied areas of the site at all times during construction.

   c. **Security**. The Contractor will receive a security brief in English from the Authority[1] prior to the commencement of works. The Contractor is to ensure a linguist is available to relay the brief to local workers. Actions on emergency events will be explained, the Contractor is to ensure that all workers abide by the stipulated directions. All Contractor workers will be issued with security passes by the Authority. These passes are to be held on the person at all times when on-site. Contractors will be subject to security searches by the Authority on a daily basis when entering the Barracks which shall need to be factored into his project timelines.

   d. **Battle-group**. It is highly likely that the Battle-group (Exercising) troops will be on site at the same time as the Contractor, de-confliction of works is to be co-ordinated via the Authority. No items such as food, clothing or equipment construed as ''Gifts'' shall be accepted by the Contractor or his team from any member in the Battle-group as it is seen as theft by the Authority.

Outline requirement of this project

4. **Works**. The following provides an overview of the required works. The works are to be phased as follows:

[1] The Authority is designated as 'Maj Plackett DIO Garrison Engineer. A delegated Superintending Officer will be on site daily, this individual will make decisions and advise the contractor on behalf of the Authority accordingly.

a. **Enabling Works**. The following enabling works are to be carried out by the contractor prior to the construction of a standalone ablution facility:

(1). Identify the unknown location of any existing services that may affect the site.

(2). Excavation and disposal of the existing concrete footprint area, this is to include making safe all utility services in close vicinity to the site.

b. **FMA Ablution block**. The construction of the new male and female toilet facilities is to be designed to match existing buildings in terms of architecture and colour with a pitched roof. It is to be scaled in accordance with JSP 315[2] and designed to meet the following requirements:

(1). 3 No. Male Water Closets (WC).

(2). 3 No. Urinals.

(3). 4 No. Male Wash Hand Basins (WHB).

(4). 1 No. Female WC.

(5). 1 No. Female WHB.

(6). 1 No. Cleaners sink and cabinet enclosed in a masonry wall cubicle with lockable door.

(7). Foul water drainage is to connect to the existing Manhole (MH) 32, 33 or 34 depending to the design levels.

(8). Surface water is to be collected from the roof and discharged into the existing surface water drainage system via purpose built channel or drain.

(9). Electricity supply is to be taken from the Feeder Pillar (FP) 12 or 13.

(10). Water supply to be taken from the Inspection Chamber (IC) 24 or 25.

Documents to be provided by the Contractor

5. **Requirement**. On acceptance of contract award, and no later than 7 days prior to commencement of works, the Contractor is required to submit the following documents to the Authority:

a. **Supporting drawings**. The drawings attached to this document, are to be read in conjunction with this PSpec. It should be noted that these drawings are **'**Concept only' and the Contractor is to produce a full set of design documentation. It is the Contractor's responsibility to confirm quantities and distances.

b. **Construction design**. The Contractor is to advise the Project Manager (PM) of all design consultants / Sub-Contractors who will be employed on this contract and the areas of their design responsibility. Any works undertaken without the prior issue of full information for the necessary approvals will be entirely at the Contractor's own risk. The Contractor shall not commence any work in accordance with any design document until the Authority has agreed on the relevant design document. The Contractor shall keep one copy of each design document on the Site, to which the Work Contract Officer (WCO) or his representatives may have access at all reasonable times.

[2] MOD Building Performance Standards.

c. **Construction Phase Plan (CPP)**. The CPP is to be developed from the PCI provided at Annex G. The Contractor shall submit a CPP to the Authority for approval, including but not limited to all risk assessments, method statements and hazardous material procedures.

d. **Works plan (Programme)**. To identify the following:

(1). Mobilisation date.

(2). Constructions start date.

(3). Anticipated project completion date.

e. **Health & Safety File (HSF)**. The Contractor shall provide the Authority with a copy of the HSF (including As-Built drawings) which must be submitted no later than 2 weeks before completion of the works. The HSF is to be submitted on CD in PDF format and on a hardcopy.

Design responsibilities

6. **Contractor design responsibilities**. The Contractor is responsible for the design of all elements contained within the schedule of works. Where required, all designs are to be submitted to the Authority[3] for concurrence and authorisation prior to the implementation of Works. Where the nature of works does not warrant full design, a descriptive proposal complete with proposal sketch must be submitted for concurrence. The Contractor shall ensure all designs are in accordance with, and include the applicable requirements as per British Standards and all other design documents specified within this PSpec. It shall be noted that these references are provided as guidance and minimum requirement only; the responsibility remains with the Contractor to ensure that all design and construction works comply with the latest methods, requirements and guides, and generally accepted practice as relates to the works, geography, climate, environment and theatre of operations. Where there are conflicts between the Contractor's design drawings and the PSpec (Booklet 3), the PSpec will take precedence in all cases. Any queries shall always be addressed to the Authority in the first instance. The references and specified British Standards (BS) / Euro Norms (EN), within this PSpec are to be used (or similar Authority approved standards) as a minimum standard, throughout the Works.

7. **UK Building Regulations**. All works shall comply with the latest UK Building Regulations. Shall any variation be required; approval from the Authority shall be obtained in writing prior to the commencement of any works.

8. **Health and Safety (H&S)**. All works shall be carried out in accordance with the Health and Safety at Work Act 1974 (HASAWA).

9. **Construction drawings**. All works shall be constructed in accordance with the final approved Contractor finished construction drawings (or written proposal in this case). Where a conflict in design is found, authorisation shall be obtained in writing to the Authority prior to any changes in design. No construction shall commence prior to obtaining written approval of the final construction drawings/proposal by the Authority. All project changes will be conducted in accordance with Booklet 2 para 61, change control procedures.

10. **Design life**. The design life of all new electrical and structural components and assemblies to first major overhaul, repair or replacement shall be 25 years. The Contractor shall supply and install all components, elements and systems/structures to satisfy this requirement, and any additional contractual requirements that may apply.

[3] DIO RD OS Trg (K) is the Authority for this Contract.

11. **Existing services**. The Contractor is responsible for ensuring all services on or adjacent to the site that will be affected by the works are identified, located and appropriate action taken to prevent damage before work commences. The Contractor shall ensure that any existing services and concrete slabs are reinstated to the standard of the existing, with the minimum of disruption to existing facilities and services during construction. All works that could possibly influence existing services may only commence with written approval from the Authority. The Authority must be informed immediately if any unknown services are discovered that will have an impact on the works.

12. **Approval and instruction**. The Contractor shall ensure that any existing services and affecting works including all connections and services tied into are of an acceptable standard to ensure the required performance over the life of the facility. Should it be found that one or more of the services (including but not limited to existing water, sewerage, drainage and electrical reticulation) is not considered acceptable to the requirements, the Contractor shall inform the Authority and obtain written approval and instruction prior to taking any actions to rectify or make good the pertinent unacceptable situation.

Construction preliminaries

13. **Health and Safety (H&S)**. The Authority regards the provision of adequate H&S measures as being of prime importance. A guidance document to assist in the development of H&S practices is included in this PSpec at Annex G.

14. **Construction pre-start meeting**. The Authority will arrange for a construction pre-start meeting after awarding of the contract. All Stakeholders will be engaged and invited to attend. Items detailed in this document and associated tendering documentation will be discussed. An agenda will be issued by the Authority no less than 5 days prior to the meeting.

15. **Existing ground condition**. The Contractor is responsible for confirming the existing ground conditions, which are to be taken into account whilst designing and compiling the CPP.

16. **Obstructions**. As the proposed works are to be carried out around existing infrastructure and surrounding areas, there are obstructions in the form of fences and buildings etc, the Contractor is to review the site before commencing works.

17. **H&S restrictions, precautions and monitoring**. The Contractor shall implement the requirements described in the HASAWA 74 to protect members of the public and persons visiting the site from risks arising from the use of equipment, materials or substances defined therein.

18. **Control of noise and vibration**. The Contractor shall comply with the recommendations for practical measures to reduce noise set out in BS 5228[4].

19. **Equipment movement and storage**. It is expected that the Contractor will not require a forward resources area other than the site. Should one be required, a location shall be made available, as agreed by the WCO. Packaging shall be to a good standard capable of withstanding transportation and handling loads. The Contractor shall be solely responsible for storage and movement of all equipment to the site. The Contractor shall remain at all times responsible for the security of equipment including prevention of theft.

General conditions

20. **Site diary**. The Contractor shall keep an in date, daily site diary written in the English language. This document is to be used to record all decisions made on the site both verbal and written. The document is also to be used to record visits to the site and note anything, which has a direct effect on the project in terms of cost and extensions to time, or any other occurrence that

[4] Code of practice for noise and vibration control on construction.

affects the project programme. The Contractor shall on request make the site diary available for the Authority to inspect. This document will be used as the audit trail in light of any disputes, concerning the project.

21. **Design standards**. The Contractor should produce designs in accordance with British Standards (BS) and is to ensure all designs and take-offs are correct.

22. **Change protocol**. All changes must be agreed and authorised by the Authority in writing. The site diary shall list in writing all issued variation orders (VO) and site instructions (SI), including amended drawings, and verbal decisions made on site. All verbal decisions must be recorded in writing no less than 24hrs after they have been made and entered in the site diary.

23. **Access**. The Contractor shall provide at all times, access to the works to the Authority. The Contractor shall supply the Authority with copies of any documentation and drawings, which may reasonably be required for the purposes of monitoring the work performed under this or any Sub-Contractor.

24. **Signage**. The Contractor shall supply and erect all applicable and appropriate signage to the site. This shall include as a minimum all H&S signage, directions and location of the site office and emergency contact details of the Contractor's representative on site. Temporary warning signs and careful demarcation of works areas must be undertaken with care to ensure compliance with any and all requirements; all the signs must be written both in English and the local language of the Contractors workforce.

25. **Workmanship**. Notwithstanding any clauses in the contract or elsewhere in the specifications or scope of works, the Contractor shall be responsible for ensuring that all work-related activities are to be carried out in a neat and workmanlike manner, in accordance with accepted good practice. The Contractor shall pay full attention to Quality Control (QC) and adherence to the specifications. Particular care shall be taken in respect to H&S matters. All working areas are to be kept clean and tidy on a daily basis.

26. **Communications**. The Contractor shall provide his workforce with adequate means of communications throughout the life of the contract in order to carry out the work specified.

27. **Temporary services**. The Contractor shall provide temporary service for any required mechanical and electrical systems.

28. **Security at completion of daily work**. The Contractor is to leave the works secure with all accesses locked and keys to be handed to the main guardroom on each completion of daily works.

29. **Contractor welfare**. The Contractor is to provide and maintain the following temporary worker welfare facilities under CDM 2015 at an Authority approved location[5].

a. Drinking water.

b. Rest area.

c. Toilet.

d. Changing area.

30. **Accidents**. The Contractor is to inform the Authority of all on-site accidents & near misses. These occurrences are to be recorded in the accident log book. The Contractor is to ensure adequate first aid and emergency evacuation measures to medical facilities are in place prior to commencement of works. The Contractor is also required to provide the Authority with planned

[5] The contractor is to liaise with the Authority to determine which areas within the site is suitable for locating welfare facilities.

actions to be taken in the event of an accident. This information is to be provided during the return of tender.

ORIGINAL SIGNED

A Plackett RE
Maj
Garrison Engineer
DIO RD OS Trg (Kenya)

Annexes:

A. Scope of Works.
B. Civil Specification.
C. Mechanical Specification.
D. Electrical Specification.
E. Supervision, Inspection, Testing and Commissioning regime.
F. Generic Points Pre-Contract.
G. Generic Points Pre-Construction Information.
H. Generic Points During Construction.
I. Generic Points Post Construction.

Drawings

KEN/NYA/M/001 - Location Plan of Services around FMA.
KEN/NYA/C/001 - FMA Ablution Concept Floor Plan and Elevations.

Annex A to
KEN/GE/1903
Dated 13 Aug 19

Scope of works

1. The scope of works for the project is to construct a new FMA Ablution facility. The task is divided into the following phases:

a. Enabling works.

b. Site clearance and security fencing.

c. Excavations of foundations.

d. Sub-structure to include but not limited to:

(1). Groundworks.

(2). Drainage below ground.

(3). Mains power supply.

(4). Coldwater connection.

(5). Foundations and concrete works.

e. Superstructure to include but not limited to:

(1). Construction of a suitable structure similar to local buildings.

(2). Construction of suitable roof similar to local buildings.

(3). Installation of doors and windows.

(4). Coldwater supply.

(5). Hot water supply.

(6). Drainage above or below ground.

(7). Installation of fixed furniture and fittings.

(8). Floor and wall finishes.

f. Electrical and mechanical fix to include but not limited to:

(1). Power and Lighting first and second fix.

(2). Lightning protection.

g. Testing and commissioning of power, lighting and sanitation as per BS 7671 2018[6] & BS EN 858-2[7].

[6] Requirement for electrical installations, IET wiring regulations 18th Edition Amendment 1.
[7] Separators systems for light liquids part 2: selection of nominal size, installation, operation and maintenance.

h. Handover and production of the Health and Safety file.

Performance specifications

2. In conjunction with concept Dwg No. KEN/NYA/C/001 FMA Ablutions Floor Plans & Elevations, the following data is required to be factored into the Contractor designs.

b. **Ground level**. The Contractor is to level the existing site, if required, in order to provide a suitable surface to enable construction. All materials arising from works must be removed from the site and deposited in an approved location in accordance with the National Environment Management Authority (NEMA) Licence and Environmental Impact Assessment.

c. **Landscaping**. The whole area will be finished to suit the existing construction. The ground will be made good and levelled, any concrete slabs or roads affected by the construction must be made good with appropriate joints and seals.

d. **Drainage below ground**. The wastewater system is to conform to BS EN12056-5: 2000[8], and must be suitable for foul waste from the WCs, urinals, WHBs and sinks. A combined gravity drainage system must be installed; this is to be separate to surface drainage. Falls are to be designed for self-cleansing and anti-scour in accordance with BS EN 752:2017[9].

e. **Mains power supply**. The Contractor is to liaise with the Authority to ensure external power sources have sufficient capacity to provide a power supply to the building.

f. **Cold-water connection**. All water connections are to be carried out in accordance with Water Supply (water fittings) Regulations in accordance with BS EN 806[10].

g. **Foundations and concrete works**. The Contractor is to design a foundation to suit the structural design loadings of the building and geology of the site. All foundations and reinforced concrete works should be carried out in accordance with BS EN 1992-1-1:2004[11], BS 8004:2015[12] and BS EN 206:2013[13].

h. **Floors**. Surface regularity of concrete structural floors; sudden irregularities not permitted. Variations should be measured with a slip gauge to BS 8204-1:2003[14] or BS 8204-2:2011. Appropriate falls are to be created to provide natural drainage towards provided floor traps connected to the main drainage below ground. Wall aprons should slope away from the wall gently to keep walls dry.

i. **External walls**. External walls and internal load-bearing walls will be of 190mm thick solid block wall construction. Walls must be constructed in accordance with Approved Documentation Part A – Structure. All masonry work is to be designed and constructed to BS EN 1996-1-1:2005, part 2: 2006 and part 3:2006 Euro codes 6[15].

j. **Internal walls**. None load-bearing internal walls will be of 100mm thick solid construction wall and will be smooth finished. Walls must be constructed in accordance with Approved Documentation Part A – Structure. All masonry work is to be designed and constructed to BS EN 1996-1-1:2005, part 2: 2006 and part 3:2006 Euro codes 6. All internal walls should be finished smooth with steel trowelled plaster and painted with vinyl

[8] Gravity drainage systems inside buildings.
[9] Drain and sewer systems outside buildings.
[10] Part 2 – Design, Part 3 – Pipe sizing, Part 4 – Installation and Part 5 – O&M consideration
[11] Euro code 2: Design of concrete structures.
[12] Code of practice for foundations.
[13] Concrete - specification, performance, production and conformity.
[14] Screeds, bases and in situ floorings.
[15] Design of masonry structures.

matt paint (magnolia).

k. **Roof**. The roof structure must be designed with sufficient redundancy to support its own self-weight, roof coverings and any imposed / dynamic loads arising from Kenyan climatic conditions. The roof structure is to be secured to the superstructure in accordance with Approved Document Part A Structure. Roof structure should be made of treated well-seasoned timber cladding with 28 gauge prepainted box profiled iron sheets

l. **Rainwater guttering and downpipes**. Rainwater guttering and downpipes are to be fitted and connected to a surface water drainage system. Guttering and downpipes are to be sized to meet the climatic conditions in accordance with Approved Document Part H Drainage and waste disposal. The finish is to be conducive with the environment to ensure minimal maintenance requirement. Gutter and downpipes should be heavy gauge plastic fitted as per manufacturers instruction.

m. **External doors**. External doors are to be solid core timber with a 500mm x 500mm obscure Georgian wired double glazed vision panel fitted or similar and lockable, supplied with 3 keys. Doors are to be self-closing and complete with the doorframe, locking mechanism and door handle fitted. Male and female signage should be of an appropriate size to ensure that users can easily read it. Adequate contrast between the symbol and its background is essential and the symbol should be given a sufficiently large surrounding area to ensure readability.

n. **Windows**. UPVC high-level external windows are to be fitted and sufficiently sized to allow the required levels of daylight and natural ventilation (minimum ventilation rate 6 (Air change rate/hr.)) in accordance with CIBSE Guide B – Heating, ventilating and refrigeration. Other specifications that apply are as follows:

(1). **Glazing**. All glazing is to have a translucent with one way light finish.

(2). **Insect mesh**. All windows are to come with robust fly screens capable of being easily removed and refitted for cleaning purposes.

o. **Cold Water Supply (CWS)**. All pipework and fittings are to be suitably pressure rated to 1.5 times the maximum working pressure of the respective system. CWS must be designed and installed to BS EN 806-5:2012[16] and the Water Supply (water fittings) Regulations.

p. **Hot water supply (HWS)**. The Contractor shall ensure HWS systems provide sufficient hot water to cope with peak demand. All hot water services shall be designed in accordance with BS 6700:2006 A1:2009[17].

q. **Point of use (POU) water heater**. POU water heaters may be installed for the provision of hot water. The cold-water system for the POU water heater is to be directly fed from the mains at a regulated pressure specified by the Contractor. All fittings should be installed as per the manufacturer's specification.

r. **Drainage above ground**. The Contractor shall be responsible for ensuring that wastewater systems (WC, urinals and WHBs) are compliant with BS EN 12056-5:2000[18] and Approved Document Part G Sanitation, hot water safely and water efficiency.

(1). **WCs**. WC cubicles and other partitions are to be fair faced blockwork, 100mm, plastered and painted on either side. Toilet cubicles are to be at least 2.1m high with inward opening semi-solid flush doors as detailed in BS 6465-

[16] Specifications for installations inside buildings conveying water.
[17] Design, installation, testing and maintenance of water supply for domestic use.
[18] Gravity drainage systems inside buildings.

2:2017[19]. The walls behind the WCs are to be finished with a ceramic tile splashback to a minimum height of 1m from Finished Floor Level (FFL) and extend to either side of the appliance a minimum of 0.3m.

(2). **Urinals**. Urinals should be mounted 0.6m from FFL to the rim. The wall on which the urinals are mounted is to be finished with a ceramic tile to a minimum height of 0.3m above the urinal. Splashback to a minimum height of 1m from FFL and extend to either side of the appliance a minimum of 0.3m. Urinals are to be located in accordance with BS 6465-2:2017.

(3). **WHBs**. WHBs should be fixed 0.75m from FFL to the top of the basin. The walls on which the WHBs are mounted are to be finished with ceramic tile splashback to a minimum height of 0.3m above the WHB. Mirrors should be positioned above the splashback, 0.6m above sink level. WHBs are to be located in accordance with BS 6465-2:2017.

(4). **Cleaners sink**. Cleaners sink should be stainless steel and should be mounted 0.7m from FFL to the rim. It should be supported from the floor with stainless steel stands. The wall on which the sink is mounted is to be finished with ceramic tiles splashback at a minimum height of 0.3m above the sink. Sink to have a minimum capacity of 10 litres. Tap to be high enough to create clearance for bucket space.

(5). **Storage cupboard**. Storage cupboard to be constructed of blockboards with double lockable door and two vertical partitions. One partition to have 2No shelves, and the other to be open without shelves. Storage cupboard to be 0.8m wide and 1.8m high. It should be fixed to the wall and painted white.

s. **Fixed-furniture**. Other fixed furniture and fittings are to include but are not limited to:

(1). A Soap Dispenser and mirror for each WHB.

(2). A Toilet Roll Holder for each WC.

(3). Locks and coat hooks for each WC cubicle.

(4). Paper towel dispenser.

t. **Wall finish**. All walls are to be painted magnolia in keeping with the rest of the site in accordance with BS 6150:2006 A1:2014[20].

u. **Floor finish**. The floor is to suit the structural design with an anti-slip floor finish to meet the following:

(1). **Slip resistance**. Have a slip resistance of not less than a Pendulum Test Value (PTV) of 50 when wet; refer to BS 6431[21] for further information.

(2). **Grout**. Grouts shall conform to BS EN 13888[22]; adhesives shall conform to BS EN 12004[23].

[19] Sanitary installations. Space recommendations - code of practice.

[20] Painting of buildings – Code of practice.
[21] Ceramics floor and wall tiles.
[22] Grouts for tiles.
[23] Requirements for cement tiles adhesive.

v. **Power**. The Contractor is to provide an internal distribution box to supply power for the selected hot water system, installed in accordance with BS 7671:2018[24]. Cable from FP to distribution box had to be armoured three-phase cables buried at a depth of 500 – 800mm.

w. **Lighting**. The lighting level is to achieve an even distribution of 125 Lux throughout the building. The design shall be carried out in accordance with CIBSE recommendations and the Society for Light and Lighting Handbook. Lighting circuits are to be installed in accordance with BS 7671:2018 and must contain the following:

(1). **Emergency lighting**. Emergency lighting must be installed in each building complete with test sockets in accordance with BS 5266-1:2016[25]. Test keys are to be provided to the Authority on completion by the Contractor.

(2). **Controls**. Suitable lighting controls must be installed with appropriate Ingress Protection (IP) for the environment as detailed in BS 7671:2018.

x. **Lightning protection**. A Lightning Protection System (LPS) risk assessment is to be undertaken in accordance with BS EN 62305-1:2011 to determine the LPS classification required. An LPS is to be installed that satisfies the risk assessment in accordance with BS EN 62305-1:2011[26].

Contractor Assurance

3. The Specification for this project is a concept only and the Contractor is to provide detailed designs and detailed specifications supported with any applicable design calculations for the Authority. Request for isolation of any existing services which may interfere with the task will need to be factored into the Contractor timelines.

[24] Requirement for electrical installations, IET wiring regulations 18th Edition Amendment 1.
[25] Emergency lighting guide.
[26] Protection against lightning.

Annex B to
KEN/GE/1903
Dated 13 Aug 19

Civil Specification

Groundworks

1. **Preparatory works**. Site investigation is to be conducted by the Contractor. A Statement of Known Hazards (SoKH)[27] is to be obtained prior to any groundworks being undertaken. The area is to be clear from rubbish, rubble or debris prior to any works being carried out. All local services are to be identified and adequate precautions are taken to protect such services from damage for the duration of the works. Before starting work the Authority will verify which existing fences, gates, roads, paved areas and other site features are to be removed, and which assets are to be relocated. Open excavation shall be protected, suitable signage erected, and a banks man employed when vehicles are manoeuvring. Backfilling shall be completed utilising suitable materials and compacted in 75mm layers to achieve the bearing strength enough to safely carry the imposed loads without settling.

2. **Permits**. The Contractor will obtain a Permit to Dig and all drawings relating to existing services that may be affected by the proposed works. A copy of the Permit to Dig must be given to the Authority prior to any works commencing.

a. **Identification**. All local services are to be identified using a Cable avoidance tool and signal generator (Cat and Genny) or otherwise approved cable detector tool and hand digging as required, in order to protect such services from damage during and after the construction.

b. **Notification**. The Contractor will inform the Authority immediately if any unknown services are discovered that will impact on the works.

c. **Accidental damage**. The Contractor is responsible for making good, at his expense, any services damaged by excavation and any additional works required as a result of the damage caused.

3. **Unrecorded features**. If any unrecorded legacy construction is unearthed, it is to be left undisturbed while further Authority instruction is obtained.

4. **Unstable ground**. The Contractor is to inform the Authority without delay if any newly excavated face will not remain unsupported sufficiently long enough to allow the necessary earthwork support to be inserted.

5. **Hazardous, aggressive or unstable materials**. The Contractor shall not import or use fill materials which would, either by themselves or in combination with other materials or groundwater, give rise to a health hazard, damage to the facility structures or instability in the filling. Construction materials should not include any finishes that may lead to the shedding of particles.

6. **Groundwater level**. The groundwater level has not been established but it is not expected to impact on the works. It is the Contractor's responsibility to take into account the groundwater levels when submitting technical and commercial proposals.

7. **Ground level**. The Contractor is to prepare the ground to enable construction. All materials arising from the works that are not suitable for general filling, are to be removed from the site and disposed of in an approved location.

[27] The application for Statement of Known Hazards and Permit to Dig from the Authority requires seven (7) days for the approval process and remains valid for thirty (30) days from the date of approval. The Contractor is expected to apply for Permit to Dig in advance of any intended ground works.

8. **Sinkholes**. Any sinkholes or soft spots are to be excavated and filled with a suitable fill material. The imported fill material is to be thoroughly compacted in layers not exceeding the capability of the compaction equipment. Any areas requiring extra or unforeseen works are to be reported to the Authority for approval on the remedial works prior to any rectification action.

9. **Placing fill**. The Contractor shall ensure that excavations and areas to be filled are free from loose soil, organics, rubbish and standing water. All fill is to be placed and compacted against structures, membranes or buried services in a sequence and manner which will ensure stability and avoid damage. The plant employed for transporting, laying and compacting must be suited to the type of fill material being used and the size of the site. All compaction works are to be carried out correctly; any imported fill is to be wetted and compacted a total of three times using suitable mechanical vibration means to provide a minimum Californian Bearing Ratio (CBR) of 10%.

10. **Compacted fill**. The following is to be adhered to:

a. **General**. Compacted general fill includes any materials that have been excavated or imported. Suitable and unsuitable materials that have been excavated, are to be kept separate to prevent cross-contamination. If there is insufficient suitable excavated material, the Contractor is to provide the Authority with details (and quantities) of proposed imported material. The Contractor is to spread and level all materials in layers and as soon as possible thereafter compact each layer using plant and methods suitable for the type of material.

11. **Disposal of materials**. All materials requiring disposal are to be kept to a minimum on-site and the following rules are to be applied:

a. Spoil heaps are not to be not more than 2.5m high..

b. Do not place any other material on top of spoil heaps.

c. Do not allow construction plant to pass over spoil heaps.

d. Prevent compaction and contamination.

e. Remove surplus subsoil from the site.

f. Separate different materials so as not to cross contaminate.

12. **Grading**. Crushed aggregate is to be used as Type 1 and is to conform to the grading requirement illustrated in Table 1. The optimum moisture content of the Type 1 aggregate is to be maintained within a range of 8 - 12%, to aid the compaction process:

BS EN Sieve Size	Percentage by Mass Passing	
	Minimum	Maximum
63 mm	100	100
31.5 mm	75	100
16 mm	43	81
8 mm	23	66
4 mm	12	53
2 mm	6	42
1 mm	3	32
63 micron	0	9
The particle size shall be determined by washing and sieving method as stated in BS 933.		

Table 1: Type 1 Aggregate grading requirements.

Formwork

13. **Design and construction**. Formwork is the responsibility of the Contractor but must comply with the following:

a. Formwork is to be rigid and durable, suitable for re-use during construction and of sufficient strength to support the loads and lateral pressures of the wet concrete and the placing and finishing operations.

b. Formwork is to be constructed to produce finished concrete to the required dimensions. Formed surfaces must be free from twist and bow, all intersections, lines and angles being square and straight. Formwork is to be adequately braced during placing operations to withstand, without springing or settlement, the impact and vibration of the spreading, compacting and finishing operations.

c. Formwork is to be constructed, including joints between forms and completed work, to prevent loss of grout, using seals when necessary. The formworks are to be secured tightly against adjacent concrete to prevent formation of steps.

d. The depth of forms shall be adequate to fully support the nominal thickness of the slab. The thickness of packing below the forms shall not exceed the irregularity of the surface permitted by this specification, specifically +/- 3mm over a 3m straight edge.

e. Forms are to be coated in mould release agent to aid in striking and the interior of all forms shall be completely free of debris to enable the formwork to be readily removable without impact, shock or damage to the concrete surfaces. The release agent shall not bind with, stain, nor adversely affect concrete surfaces, and will not impair subsequent treatment of concrete surfaces requiring bond or adhesion, nor impede wetting of surfaces to be cured with water or curing compounds.

f. Formwork materials shall be protected before, during and after erection to ensure acceptably finished concrete work. In the event of damage to erected forms, the necessary repairs or replacement prior to concrete pours shall be performed at no expense to the Authority.

Concrete

14. **FMA facility foundation**. The foundation required for the FMA ablution will be a C25 reinforced concrete foundation that is to accommodate the FMA Ablution facility, the building dimensions is 7.6m (L) x 4.0m (W). The sub-base is to be compacted in accordance with the specifications within this document.

15. **Concrete materials and mix designs**. The Contractor shall submit to the Authority the proposed concrete mix designs for all concrete works. The size of the aggregate used is not to exceed the nominal 20mm and will comply with BS EN 13139:2013[28]. The Contractor is to notify the Authority 48 hours prior to pouring of concrete. Cubes are to be taken from structural concrete with 7 & 28-day crushing results passed to the Authority by the Contractor QC representative. PQC is to be used for all concrete works and the required strength of the PQC will be a minimum of 25N/mm^2 (C25 concrete).

16. **Reinforcement**. Mild steel reinforcing mesh is to be A252 or 8mm deformed bars cut, bend and fixed at intervals of 200mm c/c in all direction, reinforcement must be free from oil, dirt, loose-rust and scale when placed. Reinforcement fabric mesh shall be placed and fixed on supports or preformed spacers not exceeding 500mm centres. Cool water shall be sprinkled on steel and

[28] Specification for aggregates for mortar / concrete.

forms prior to placing concrete. There must always be a minimum of 50mm cover over steel reinforcement in all directions. Concrete works in accordance with BS 4482:2005[29].

17. **Concrete workability**. Workability shall be constant and if necessary plasticizing or retarding admixtures may be used to suit local or weather conditions. The slump of concrete will be tested prior to pouring in accordance with BS EN 12350-2:2009[30] to ensure that the mix is not too stiff. Workability is not to be increased by adding water.

18. **Water**. Any water used in the mixing of the concrete shall be clean and non-saline. The Contractor is required to check any water sources used for salinity. The Authority reserves the right to check water salinity on site. Concrete made using saline water will be rejected and replaced by the Contractor.

19. **Concrete practice**. The Contractor shall ensure that suitable consideration is given to the placing of concrete in inclement weather and that appropriate precautionary / avoidance measures are taken to minimise shrinkage and cracking.

20. **Placing and compacting concrete**. At the time of placing concrete, the Contractor shall ensure that all surfaces on which concrete is to be placed are clean and free from debris, organic material and free water. The concrete shall be placed in 150 mm layers; to avoid trapping air, their thickness should be regulated. Do not add water or re-temper mixes. Fully compact to full depth (until bubbles cease to appear on the top surface) especially around cast-in accessories, into corners of formwork and at joints. The vibration of the concrete shall be by means of mechanical vibration only, with care taken in the mix design and compaction to minimise segregation. A spare mechanical vibration unit should be at hand in the event of breaking down during the concrete pour.

21. **Curing of concrete**. The Contractor shall prevent surface evaporation during the curing process. It is the Contractor's responsibility to ensure the concrete is cured correctly. The fresh concrete shall not be subjected to the weight of any traffic or equipment for a period of 14 days after the pour[31]. Where further pours are required on to the concrete, a period of 2 days curing is to pass before further formwork and pouring are introduced.

22. **Concrete finish**. The contractor is to carry out all finishing operations at optimum times in relation to the setting and hardening of the concrete. Wetting of surfaces of concrete to assist surface working or sprinkling cement on to the surface is to be avoided. The surface of the concrete shall receive no special treatment other than finishing operations required to produce the specified degree of accuracy of the surface level. Any exposed concrete edges are to have a 25 x 25mm chamfered finish applied to prevent damage when striking formwork. The surface of the slab after final regulation shall be brush textured in a direction away from the tank sump. The surface texture must be applied evenly across the slab with a stiff brush with the minimum texture depth of the less than 1mm.

23. **Joints**. Expansion joints allow expansion and contraction of a concrete slab without generating potentially damaging forces within the slab itself or the surrounding structures. There shall be a definite break in the concrete and any reinforcing steel that may be present. Where adjacent bays are 'tied' together by means of dowel bars, these dowels shall be sleeved in one of the bays to allow expansion to take place without generating stresses within the slab. Joints are to be constructed after every individual slab to allow for expansion and extraction. The dowels shall be 600mm long and manufactured from mild steel (Grade 250). In expansion joints, the dowels are 25mm diameter at 300mm centres. Expansion joints shall consist of a flexible piece of compressible board, topped with a waterproof sealant. The sealant is to be petroleum resistant and sandwiched between adjacent bays or between the concrete slab and another fixed object.

[29] Steel wire for the reinforcements of concrete products.
[30] Testing fresh concrete, slump test.
[31] The minimum period of fourteen (14) days for curing concrete must be factored into the Contractor's Works Programme.

24. **Surface drainage**. The Contractor is to design and install an adequate surface water drainage system for the area within the contract parameters. The system may tie into the existing drainage system as shown on Dwg No. KEN/NYA/M/001 Location Plan of Services around FMA.

25. **Service entries**. Service entries below ground must be adequately protected from the effects of weather, settlement and displacement, ground-borne loads and vermin ingress.

26. **Ablution Unit**. A concrete block wall construction of 7.6m (l) x 4.0m (w) x 3.0m (h) is required to form a western-style Ablution Unit. The Ablution Unit will be located as shown in Dwg No. KEN/NYA/G/001 Nyati Barracks FMA Site Plan and is to be partitioned from floor to ceiling as shown on Dwg No. KEN/NYA/C/001 FMA Ablution Concept Floor Plan and Elevations for separate male and female ablutions. The Ablution Unit will contain serial 4.c(1) FMA and 4.c(2)SAAB ablution requirements.

27. **Cold Water Supply (CWS)**. CWS is to be provided via connecting to the existing main water supply pipework however to be complete with a booster pump if required pressurising the water throughout the ablution WCs, WHBs and urinal.

28. **Wastewater**. Wastewater should be connected to the existing manhole 32, 33 or 34 depending on the design level.

29. **Doors**. The external doors are to be a 0.90m (W) x 2.1m (H). Each door is to have a minimum of 0.5m x 0.5m obscure Georgian wired double glazed vision panel. They will be of external quality and be hung using 3 No. 0.1m steel butt hinges to open externally. Unless stated otherwise, all doors shall be fitted with a 5 lever mortice lock mechanism in accordance with BS EN 3621. All locks shall have a stainless steel locking mechanism and plate handle arrangement. There are to be a minimum of 3 sets of keys provided for each door lock. All doors are to receive a suitable door closing mechanism, with the closing mechanism to be internally mounted.

30. **Flooring**. The internal concrete floor surface shall be overlaid with 10mm thick non-slip ceramic floor tiles with spacers grouting of not more than 3mm covering throughout and shall be fully water-resistant with grouted joints of similar colour as the tiles. All vertical walls should have a 100mm tile skirting of similar colour as the floor grouted and jointed similar to the floor tiles.

31. **Blockwall**. The load-bearing walls are to use 190mm thick solid blocks. It is laid on the foundation and proceeds to eaves level incorporating the doors and windows opening. On the gable end, the wall is built straight up to the underside of the roofing profile. The external skin is to be weather resistant and waterproof with all joints sealed to prevent damage from rainwater or humidity. The internal wall (non load bearing wall) is to use 100mm thick solid blocks and should be smooth finished. Reinforced concrete tie beam should be placed over all load-bearing walls above the window and door opening, the thickness of the ring beam should flush the block wall on both sides.

32. **Roof**. The roof structure must be designed with sufficient redundancy to support its own self-weight, roof coverings and any imposed / dynamic loads arising from Kenyan climatic conditions. The roof structure is to be secured to the superstructure in accordance with Approved Document Part A Structure. Roof structure should be made of treated well-seasoned timber cladding with 28g pre-painted box profiled iron sheets

33. **Windows**. Each unit will have windows installed as shown on Dwg No. KEN/NYA/C/001 FMA Ablution Concept Floor Plan and Elevations. Windows will be white in colour, single glazed uPVC. There are to be high-level windows fitted at each WC cubicles in order to allow the required level of daylight and natural ventilation.

34. **Inspection and testing**. The following elements have a requirement for inspection and testing:

a. **Materials**. All materials should be checked prior to inclusion in the project to ensure that they meet the required standards of quality and workmanship. Particular attention should be paid to locally sourced materials, blocks and timber. All long-lead materials that have been transported to the site are to be inspected for damage on receipt.

b. **Walls**. Prior to the commencement of blockwork walls a hold point is to be enforced to allow for checking of the setting out, alignment and ensure that all door locations are to be confirmed in accordance with the specification and drawings. In addition, the 2nd course should be checked for alignment and plumb during construction. An additional hold point is to be enforced to allow checking of the window and opening locations once the blockwork reaches the correct course.

c. **Doors**. Once installed all doors are to be checked for the required number of fixings, correct operation and the function of thumb locking mechanisms. Door cills are to be installed in position and the frame is to be sealed correctly to the blockwork. Windows are to be checked to ensure correct operation and security where required, in addition, insect mesh should be checked for integrity. Frames are to have the correct number of fixings and are to be sealed correctly to block work.

d. **CWS and Drainage**. All water fittings should be capable of withstanding an internal water pressure of not less than 1.5 times the maximum operating pressure. Both underground and above ground systems of pipework should be subjected to a final test after completion of the installation and after all works have been carried out. The final test is crucial but it is advantageous if buried pipework, is tested on an interim basis before being backfilled. In all cases, defects revealed as the result of a test should be rectified and retesting carried out until the result is satisfactory. Flushing of installations should be in accordance with Clause 3.1.10.1 of BS 6700: 1997. It is essential that each length of pipe within the system is flushed to remove any debris, including excess flux that may have collected in the pipework.

Annex C to
KEN/GE/1903
Dated 13 Aug 19

Mechanical Specification

Ablution Units

1. **General**. All Ablution units will be installed at the location shown on Dwg KEN/NYA/M/001 Location Plan of Services around FMA. These facilities are to be partitioned into two parts from floor to ceiling as shown on Dwg No. KEN/NYA/C/001 FMA Ablution Concept Floor Plan and Elevations. It is to meet the requirements stated in serial 4.c(1) FMA ablution and 4.c(2) SAAB ablution requirements.

2. **Cold Water Supply**. The main water supply to the facility to be connected to the existing mains water pipework on IC 24 or 25 as illustrated in the Dwg No. KEN/NYA/M/001 Location Plan of Services around FMA. Medium Density Polyethylene (MDPE) pipe and couplings to BS EN 1519 rated at a minimum of 12.5 Bar are to be used throughout the installation, sized in accordance with BS 6700**:** 2007. The supply pipe is to be sleeved and sealed using uPVC pipe for protection upon entry into the building through the floor slab and wall.

a. **Transition fittings**. A transition fitting is to be installed where the internal Polypropylene Random (PPR) pipe connects to the MDPE pipe. The following components shall be installed prior to the transition:

(1). **Check valve**. MDPE compression fitting double check valve is to be installed, preventing siphoning of the system.

(2). **Pressure Reducing Valve (PRV)**. A PRV is to be installed to reduce the pressure coming into the building.

(3). **Pressure gauge**. A pressure gauge is to be fitted after the PRV, but prior to the change from MDPE to PPR pipe.

(4). **External isolation valves**. All external CWS isolation valves are to be MDPE ball valves with male connections to a female coupler compression fitting. All external service isolation valves are to be pressure rated to a minimum of 8 bars, buried at a minimum depth of 750mm.

(5). **Valve pit**. The service isolation valve pit will be (GRP) with a sealed push fit cover. An extension bar for operation is to be provided, terminating in the valve pit. The valve pit is too stabilised adequately with concrete. Details of the stabilisation, location, depth and size shall be in accordance with the Authority's methods and standards.

b. **Internal pipework**. All internal pipework and fittings are to be PPR pipe, with butt fusion welded fittings. PPR pipe should have the following characteristics.

(1). **Pressure**. All internal pipework and fittings are to be pressure rated at a minimum of 5 bars, which has been stipulated to account for the design pressure of the CWS distribution pipe.

(2). **Support**. Pipe runs are to be surface mounted and supported at 600mm centres; with saddle clips secured using eight 50mm R/H Philips screws into the walls.

(3). **Joints**. All joints are to be supported 300mm from the centre of the joint, to reduce deformation of the pipe**.**

(4). **Outlets**. Outlets should be fed from below and joined using flexible couplings with ½ BSP connections. Pipework shall be installed with a fall towards drain valves, minimising 'dead leg' lengths.

(5). **Internal pipework fixings**. Distance between fixings to be in accordance with BS EN 1452-2 to allow for standoff distances in order to aid inspection, maintenance, support outlets/terminations and to provide mechanical protection. Pipework is to be fitted horizontally and vertically only.

(6). **Elbows & tees**. All internal elbows and tees are to be PPR pipe and pressure rated to 5 bars minimum, as stipulated to account for the design pressure of the future CWS distribution pipe of the South site, installed to allow for expansion, contraction and to prevent bowing.

(7). **Internal stop cock**. To be located and clearly marked as soon as is practicable within the confines of the building to aid in isolation in the event of catastrophic failure.

(8). **Internal service valves**. All internal service valves are to be brass bodied ball type isolation valves with PPR pipe outlet and inlet. All valves are to be pressure rated to a minimum of 5 bars. These are to be fitted prior to every outlet in order to aid in maintenance. All toilet and urinal cisterns are to be fitted with double check valves and isolation valves.

(9). **Internal drain valves**. All internal drain valves are to be brass bodied with PPR pipe transition inlets. All valves are to be pressure rated to a minimum of 5 bars and fitted at end of pipe runs in order to aid maintenance. There is to be a minimum distance of 200mm from FFL to drain valve outlet in order to aide drain down.

(10). **Soil and waste pipework**. The design of a suitable discharge waste pipework manifold system is required within the building incorporating the correct falls from WCs, urinals, WHBs, and sinks for self-cleaning properties. All pipework is to be sleeved through the building fabric and sealed.

(11). **Sanitary pipework**. All sanitary drainage pipework is to be tested for water tightness. The pipes, fittings and joints should be capable of withstanding an air test of positive pressure, of at least 38mm water gauge for at least 3 minutes. Every trap should maintain a water seal of at least 25mm.

(12). **Vent pipe**. Vent pipes or air admittance valves are to be installed at suitable locations along the pipework to prevent any negative pressures within the system. External fittings are to be UV resistant with a 25 year life span minimum.

(13). **Inspection chambers and termination**. Inspection chambers are to be installed at changes of direction, changes of height, junctions and maximum runs (in accordance with Building Regulations) along the waste distribution pipework.

(14). **Rodding eyes**. Rodding eyes are to be installed where maintenance is required along the waste distribution pipework in accordance with Approved Document H. These will serve drainage pipework which exits a respective building and are to be fitted at 45˚ maximum from the horizontal in order to allow easy access of the rods.

3. **Buried services**. All drainage pipework shall be buried, where practically possible, to a minimum depth of 750mm. Where this is not possible bedding materials are to be in accordance with approved document H and authorised by the Authority. All buried pipework must be suitably identified by utilising a buried marker tape. The marker tape is to be buried 0.3m above the pipework.

4. **Water distribution**. Medium Density Polyethylene (MDPE) pipe and couplings to BS EN 1519 rated at a minimum of 12.5 Bar are to be used throughout the installation, sized in accordance with BS 6700**:** 2007. Pressure reducing valve is to be used to reduce the pipe and fittings pressures to acceptable levels. All outflows (faucets etc.) are to conform to the relevant BS or approved local equivalent. Pipework connections are to be made using electro-fusion jointing, preference is for coils to be utilised where space allows minimising the number of couplings. Where screwed joints are used for final connections, the male component shall be taper threaded and the jointing between them shall be sealed with PTFE tape. All fittings and materials used throughout the water system are to be WRAS[32] approved. External and internal pipework is to be insulated against freezing.

5. **Sanitary-ware**. All sanitary-ware is to be robust and suitable for repeated operation. WCs are to be white vitreous china pan and cistern. Each WC cubicle is to have a robust, metal toilet roll holder and clothes hook, along with a plastic sanitary disposal bin unit.

6. **Wash Hand Basins**. WHB is to be of a minimum 0.5m x 0.4m. They are to be white vitreous china; pedestal mounted and fitted with 2 No. WHB inclined pillar taps (self-closing, push-button non concussive, water-saving, anti-vandal nozzle regulated to 6 litres per minute maximum. The WHB are to be fitted with a flip-top basin waste plugs. A sign should be displayed indicating 'Do not drink' at each WHB. Each WHB is to include a splashback, 0.6m x 0.4m mirror, shelf and clothes hook. 4 No. paper towel dispensers should be provided, one for each cubicle. The Authority is to approve towel dispensers prior to fitting to ensure replacement towels are available.

7. **Hot water provision**. Hot water is to be provided through 4 No. under-sink instantaneous hot water systems. The point of use instantaneous under sink water heaters, are to be unvented, internal fitted for ablutions WHB, 12kW electrical load maximum, 0.1l/s minimum hot water output. Operating pressure is to be between 1.5 to 6 bars. The produced hot water should not exceed 45 degrees and should not drop below 38 degrees.

8. **Legionnaires' Disease Prevention**. The cold water distribution pipeline outside and inside the male and female ablutions is to be lagged to prevent Legionella bacteria from proliferating within the system in accordance with the HSE ACOP L8.

9. **Foul drainage**. The main foul water drainage is to connect to the existing MH 32, 33 or 34 depending on the design levels. The system for the WHB will use branch pipes to a common soil vent pipe. WCs will each have a common waste pipe feeding to the soil vent pipe. The soil vent pipe will allow a drop to invert level for collection in the existing MH. The pressure relief valve outlets for the instantaneous water heaters are to be connected to the common soil vent pipe. Vent pipes are to be fitted at the end of the branch to prevent trap seal loss. Traps and floor gullies are to be provided. Pipes shall be push-fit or solvent weld and be cut square, clean and debarred. The soil vent pipe is to be capped to prevent animal entry and rainwater ingress. All drainage pipework is to be push-fit, smooth bore uPVC or MDPE pipework with neoprene seals. The pipework is to with as few joints as possible to prevent leakage and reduce resistance to flow. This must have a fall at a minimum 1:40 gradient throughout. The main foul drainage from the facility to be connected to the existing main foul drainage system as illustrated in the Dwg No. KEN/NYA/M/001 Location Plan of Services around FMA. uPVC pipe and couplings to BS EN 1519 are to be used throughout the installation, sized in accordance with BS 6700**:** 2007. The installed waste pipes should have sufficient fall to ensure self-cleaning.

[32] Water Regulatory Advisory Service (WRAS).

10. **Labels and safety signs**. The whole cold and hot water system should have the flow direction signs, names of the main components, valves numbering tags and all other related safety signs as per the as-built drawings.

Annex D to
KEN/GE/1903
Dated 13 Aug 19

Electrical Specification

Mains electrical power supply and distribution requirement

1. **Main distribution board**. The main distribution board shall be of metal enclosure IP2X rated, lockable, mounted on the building wall at the height of 1800mm above finish floor level (FFL). It shall have a minimum of 25% spare capacity for future expansion. Spare ways are to be fitted with blanking plates. Where cables enter the main distribution enclosure, they are to be correctly terminated, using proprietary glands. The main electricity supply is to be taken from FP 12 or 14 as shown on Dwg No. KEN/NYA/M/001 Location Plan of Services around FMA. The contractor shall supply and install the correct rating MCCB at existing FP to protect the main supply cable to the facility.

2. **Trenching**. All trenches for the ducting shall be 800mm deep and 300mm wide. A warning tape shall be placed above ductworks. Warning tape shall be laid at a depth of 300mm below the finished surface level. Warning tapes shall be traceable and be not less than 150mm wide and 0.1mm thick. They shall be yellow in colour and bear the continuously repeated legend “CAUTION ELECTRIC CABLE BELOW”, or similar, in black letters not less than 30mm high. On the completion of trenching, all surfaces shall be re-concreted back with a C25 concrete class.

3. **Distribution cables**. Contractor shall carry out cable calculation and size the cables accordingly (including earth cable). All underground cables shall be XLPE armoured cables and the earthing system shall be TN-S system i.e separate earth cable. All necessary precautions shall be taken to prevent damage and ingress of moisture and impurities. Cable ends shall be free from moisture before jointing commences. All cable types shall be BSEN certified or equivalent and complies with new colour coding:

   a. L1 – Brown.

   b. L2 – Black.

   c. L3 – Grey.

   d. Neutral – Blue

   e. Earth - Yellow/green

4. **Lighting switch**. All lighting switch shall be PVC IP65 rated and mount 1200mm above FFL and 150mm away from the door.

5. **Luminaries**. Contractor shall carry out lighting design and identify the number of luminaries required inside the building. All luminaries inside the ablution shall be an IP65 fluorescent to achieve 125 lux level at the height of 800mm above FFL. Each exit door shall have 1 No. 60W, IP65 bulkhead luminaire installed above the doorways on the outside of the buildings.

6. **Conduit in general**. Conduit is to be surface mounted on to the wall. Conduits shall have screw threads for jointing length to length and for the attachment of accessories. Conduits and fittings shall be screwed classification unless otherwise indicated or approved by the Authority. All conduits shall be heavy gauge white PVC conduit.

7. **Supports**. Junction boxes and back boxes installed in conduit runs need be separately fixed to the underlying surface and not rely on the efficient saddling of conduits for their support. A spacer bar saddle shall be fixed 150mm adjacent to any junction or backbox. Fixing saddles shall be positioned at a maximum of 1200mm apart or 300mm from conduit outlet boxes or changes in direction.

8. **Bends**. All PVC conduit shall be bent on-site to the required shape to allow the conduit to run around obstacles and corners. All conduit bends shall be achieved without distorting the diameter of the conduit. Conduit bending shall be by means of good quality conduit bending machine in good condition and poor or damaged conduit bends shall be rejected.

9. **Couplers, bushes and glands**. Bushes and glands used in conjunction with conduits and conduit accessories shall be appropriate to the type used. Conduit connected, back boxes and fluorescent fittings shall utilise a coupler and male bush. The male bush is to be fitted from within the fitting, securing the coupler outside the equipment.

10. **Saddles**. Spacer bar saddles shall be used for fixing conduits to surface walls, ceilings, and roof trusses. In all cases, the conduit is to be run parallel to the building lines and shall be fixed in position at intervals of not more than 1200 mm by means of spacer bar saddles.

11. **Cable routes**. Cables installed on the surface shall be parallel with the lines of the building construction and properly aligned. Cables buried below ground shall, as far as practicable, follow the features of the site such as roadways and building lines. Ducts at roads shall normally be at right angles to the line of the road. Cables that are directly fixed to surfaces should be neatly run and securely fixed at suitable intervals, in accordance with the recommendations of the cable manufacturer.

Lightning Protection System (LPS)

12. **General**. The contractor shall carry out the LPS risk assessment. Based on the risk assessment, the contractor shall carry out LPS designed and installed in accordance with BSEN 62305 and JSP 482.

13. **Ablution Unit**. 1 No. Ablution unit will be installed at the location shown on Dwg KEN/NYA/M/001 Location Plan of Services around FMA. This facility is to be partitioned into two parts from floor to ceiling as shown on Dwg No. KEN/NYA/C/001 FMA Ablution Concept Floor Plan and Elevations. In total, it will incorporate cubicles with 4No. Western-style WCs, 5 No. WHB, 3No Urinal and 4 No. under-sink instantaneous water heaters. The contractor shall carry out cable calculation, lighting design and sized the protective device accordingly. Final circuits will include the following:

a. 1 No. internal Three-phase, 4-way distribution board rated to IP2X, this will accommodate the incoming supply cable from the feeder pillar.

b. 2 No. emergency exit luminaire, complete with a running man pictogram, installed internally above the doorway to the cabin in order to achieve 10 Lux illumination for emergency lighting at ground level. 1 No luminaire within each compartment.

c. 2 No. 60W, IP65 bulkhead luminaire installed externally and above the doorways to the cabin.

d. 4 No. fuse control unit (FCU) for under-sink instantaneous water heaters.

e. 1 No. localised axial flow extraction fans per WC cubicle, supplied through the internal lighting circuit and installed, complete with a pre-set time delay on/off function.

Annex E to
KEN/GE/1903
Dated 13 Aug 19

Supervision, Inspection, Testing and Commissioning Regime

General

1. **Requirement**. In order to establish whether the requirement has been fully met by the Contractor, the Authority will require proof of testing of the materials used, equipment's installed and the practices employed. The Authority is to be invited to all testing and commissioning. Additionally, the Authority has the right to conduct its own inspection and tests on materials used and equipment installed for this task. Any discrepancy will require additional testing at the expense of the Contractor.

2. **Documentation**. On completion of the project, the following information is to be provided to the Authority for approval and inclusion to the project H&SF:

a. The manufacturers' operating and maintenance manuals and instructions for all equipment and controls, including all available information relating to installed electrical equipment and switchgear.

b. All inspection, test and commissioning results.

c. All associated calibration certificates as it relates to the testing instruments used during the testing procedure.

d. All As built/installed drawings and schematic drawings.

Management of the works

3. **Survey and setting out**. The Contractor will be responsible for all setting out and leveling during construction

4. **Supervision**. The Contractor shall accept responsibility for relevant design amendments, co-ordination, supervision and administration of the works, including all subcontracts. They shall arrange and monitor a programme with each sub-Contractor, supplier, local employer and any worker, and obtain and supply information as necessary for coordination of the work. In addition to constant management and supervision of the works, all significant types of work must be under the close control of competent trade supervisors to ensure the maintenance of satisfactory progress and quality.

5. **Liaison with the Authority**. The Contractor shall designate one person from within his organisation who will be responsible for liaising with the Authority on a day to day basis and as the need arises. The person so designated shall be responsible for communicating with the Authority in English both written and verbally. This is to include notification of intended work and explaining the effect that the works will or may have on the operation or systems within the site. The liaison will be responsible for responding to the Authority's enquiries and dealing with any issues or complaints. It is a requirement that the Contractor liaison makes daily contact with the Authority such that an active rather than a responsive attitude to liaison is maintained. The Contractor's liaison is a key person in achieving the successful execution of this contract.

6. **Co-ordination of engineering services**. The site organisation staff must include one or more persons with appropriate knowledge and experience of mechanical and electrical engineering services, as required to ensure compatibility between mechanical and electrical engineering

services. The Contractor is to provide CVs on the tender return of suitably qualified, competent and experienced personnel. The Authority retains the right to request further evidence of competency.

7. **Site clearance**. On completion of project works all Contractor related equipment, material, ancillaries and temporary works are to be removed from the site. Where applicable all waste is to be disposed of outside of Nyati Barracks and at an approved disposal site.

Quality Control

8. **Procedures**. The Contractor is to produce a QC Schedule for approval by the Authority. The Contractor is responsible for ensuring that the works, including the work of all sub-Contractors, comply with specified requirements. This is to include all testing of materials that are to be incorporated into the project (e.g. concrete). The Contractor is to maintain full records, keep copies on-site for inspection by the Authority, and submit copies of particular parts of the records on request. The Contractor is to take daily progress photos and these are to be sent to the Authority on request. The records must include the following:

a. Identification of the element, item, batch or lot including the location in the works.

b. The nature and dates of inspections by the Contractor, tests and approvals.

c. The nature and extent of any non-conforming work found.

d. Details of any approved corrective action.

9. **General quality of products**. All products shall conform to the following:

a. Products to be new unless otherwise specified by the Authority.

b. Where a choice of manufacturer or source is allowed for any particular product, the whole quantity required must be of the same type, manufacture and/or source unless otherwise approved. Produce written evidence of sources of supply when requested by Authority.

c. Ensure that the whole quantity of each product required to complete the work is of a consistent kind, size, quality and overall appearance.

d. Where consistency of appearance is desirable to ensure consistency of supply from the same source. Do not use different colour batches where they can be seen together.

e. If products are prone to deterioration or have a limited shelf life, order in suitable quantities to a programme and use in an appropriate sequence. Do not use if there are any signs of deterioration, setting or other unsatisfactory condition.

10. **Checking compliance of products**. The Contractor shall check all delivery tickets, labels, identification marks and where appropriate the products themselves to ensure that all products comply with the project documents. In particular, check that the products comply with the following:

a. The sources, types, qualities, finishes and colours are correct and match any approved samples.

b. All accessories and fixings that should be supplied with the products have been supplied.

c. Sizes are correct. Where tolerances are critical, measure a sufficient quantity to ensure compliance.

d. The delivered quantities are correct, to ensure that shortages do not cause delays in the work.

e. The products are clean, undamaged and otherwise in good condition.

f. Any products with a limited shelf life are not out of date.

11. **Protection of products**. All products shall be protected to ensure that they remain in the condition they are required to be in. In particular, the Contractor is to ensure that products are prevented from overstressing, kept clean, protected from the elements and kept in original wrappings until required for the project.

12. **Prohibited products**. The Contractor shall not employ on or incorporate in the works any of the following products and shall impose a like obligation upon all sub-Contractors:

a. Asbestos materials as described in the Control of Asbestos Regulations 2012.

b. Materials which are generally composed of mineral fibres either manmade or naturally occurring which have a diameter of 3 microns or less and a length of 200 microns or less or which contain any fibres not scaled or otherwise stabilised to ensure that fibre migration is prevented.

c. Other products or substances generally known to be deleterious to H&S at the time of use or to the durability of the property in the particular circumstances in which they are being used.

d. Galvanized iron (GI) pipes and hem materials will not be used because of legionella control in accordance with ACOP L8 4th edition.

e. Only the Blue triangle and Bamburi cement are to be used.

f. River dredged aggregates are not to be used.

13. **Authority Quality Assurance (QA) checks**. The Authority may conduct QA checks at any stage throughout the construction phase. These in no way absolve the Contractor from his responsibilities under the contract for QC.

Civils

14. **Levels**. All levels will be checked by the Authority. Any areas which are not as specified will be rectified by the Contractor before the works are allowed to continue.

15. **Compaction**. The compaction of aggregates will be conducted using the correct equipment and are not to exceed the recommended depths of material for each layer. The Authority has the right to check all layers of the construction to determine the density of compacted material. Potable water will be added to aggregates during compaction to aid the process and to lubricate the material. Any areas of concern (loose material or voids) will be rectified by the Contractor at no extra cost.

16. **Aggregates**. The aggregates used for construction layers must conform to the performance specification for grading and in accordance with BS EN 13285, BS EN 13242 and BS EN 933-1. Testing for particle distribution and flakiness will be tested by the Contractor and the results passed to the Authority. Aggregate for concrete will conform to BS EN 12620 and be no greater in size than 20mm.

17. **Formwork**. The formwork will be checked for rigidity and shape by the Contractor prior to any concrete being placed. Levels will be checked and any adjustment made to ensure that the finished concrete is as per the design.

18. **Concrete**. The Contractor shall submit to the Authority the proposed concrete mix designs for the concrete works, including in-situ and pre-cast concrete. The size of the aggregate used is not to exceed the nominal 20mm and will comply with BS EN 12620[33]. The Contractor is to notify the Authority 48 hours prior to pouring of concrete. The Contractor is to adhere to the following:

a. **Concrete test**. The concrete will be subjected to the following tests on arrival at the site and every batch will be tested by the Contractor. The Authority may test alongside for QA.

(1). **Slump**. The slump of concrete[34] will be tested prior to pouring to ensure that the mix is not too stiff. Workability is not to be increased by adding water.

(2). **Compressive strength**. This will be carried out by crushing 0.1m cubes at the 7 and 28 day point[35]. Samples will be taken at the point of laying the concrete and each batch will be tested. Any concrete not forecasted to meet the requirement of the 28 days strength at the 7 day cube test will be replaced at the expense to the Contractor.

Mechanical

19. **Pipework**. All pipework and fittings constructed by the Contractor are to be hydrostatically pressure tested to 1.5 times the working pressure for 1hr. This is to be conducted under a controlled Safe System of Work. The Authority is to be given written notice at least 24 hours before pressure testing is to be undertaken. The Contractor is to produce a commissioning certificate of this testing to prove that this work has being completed.

Electrical

20. The Contractor[36] will provide electrical inspection, testing and commissioning certificates for the new works. The electrical inspection, testing and commissioning regime will include, but is not be limited to, the following:

a. Power supply, distribution and all final circuits in accordance with BS 7671:2018.

b. Earth electrodes systems in accordance with BS 7430.

c. Lightning protection system in accordance with BS EN 62305.

d. Emergency lighting in accordance with BS 5266.

~~e. Fire detection and alarm system in accordance with BS 5839, these details acceptable alarm decibel level.~~

21. **Tradesmen**. Electrical tradesmen responsible for conducting technical assurance of installed electrical works, making final connections to fittings and enclosures and for the electrical installation inspection, testing and commissioning of the installation in its entirety are to be suitably trained, qualified and competent to the following standards:

[33] BS EN 12620 - Specification for aggregates from natural sources for concrete.
[34] Slump test to conform to BS EN 12350-2:2009.
[35] BS EN 12390-3:2009 Testing hardened concrete.
[36] The Authority may supervise aspects of this process to ensure all electrical installations are T&I to BS 7671 2018 Requirement for electrical installations, IET wiring regulations 18th Edition Amendment 1.

a. BS 7671: 2018 - Requirements for Electrical Installations.

b. City & Guilds 2391: Electrical Installations or City & Guilds 2394 initial verification and certification of installation and City & Guilds 2395 or equivalent qualifications: Principles, practices and legislation for the periodic inspection, testing and condition reporting of electrical installations.

Annex F to
KEN/GE/1903
Dated 13 Aug 19

Generic Points Pre-Contract

Designers

1. **General**. This project is a Design and Build contract, meaning the Contractor must fulfil the role of both the Designer, and the Principle Contractor in terms of CDM 2015 Regulations. The design work must be carried out by a suitably qualified, experienced and competent person. The Contractor shall ensure that all designs are in accordance with, and all applicable requirements contained within references and all other design documents specified within this Performance Specification. If the Contractor is not competent to carry out some aspects of the design work, a qualified person or consultancy firm shall be sub-contracted to carry out that portion of the work. The Contractor is to inform the PM of all design consultants/sub-Contractors who will be employed in this project and the areas of their responsibility.

2. **Competency**. Where design work is required to be carried out by a professionally qualified person, details of their qualifications and experience, registration with the Engineers Board of Kenya and copy of their professional liability insurance needs to be submitted to the Authority.

3. **Pre-Construction Information Pack (PCIP)**. All pre-construction information is contained within this Booklet 3. If any additional information is required, the Contractor is to request a copy in sufficient time to allow any changes prior to tender submission.

Contractors design

4. **Design parameters**. The Contractor is to ensure that their design meets the parameters outlined within this PSpec.

5. **Site visit**. The Contractor shall acquaint himself completely with the exact conditions relating to access and site environment, along with the layout, conditions and positions of the existing services, the full extent of the works required, and the supply and conditions affecting labour, carriage, carting, unloading, storage, tools, scaffolding etc. as well as any security and access constraints.

6. **Existing ground levels**. The Contractor shall confirm or identify all existing site levels required prior to any construction works.

7. **Groundwater level**. The groundwater level has not been established but it is not expected to impact on any of the works. However, it remains the Contractor's responsibility to consider the groundwater levels when submitting technical and commercial proposals.

8. **Existing record drawings**. The Contractor will upon request, be supplied with copies of all available and relevant as-built Drawings. The Contractor during tender stages shall fully acquaint himself with the nature and extent of all existing services within the area of the contract works.

9. **Compliance**. The responsibility remains with the Contractor to ensure that all design and construction works comply with the latest methods, requirements and guides, and generally accepted the practice as related to the works, geography, climate, and environment. Where there are conflicts between the design Drawings and detailed specification the detailed specification will take precedence in all cases. Any queries shall always be addressed to the Authority in the first instance.

Use of design codes and specifications

10. **Conformity**. All designs must conform to the most current editions of British Standards (BS) or Euro Norms (EN). Other design codes may, on occasion, be used provided that they meet the minimum requirements and the Contractor shall submit proof of equivalency to the Authority for approval of use. The Authority can be approached for clarification of the relevant BS if required. On no account is the Contractor to use any design information other than that stated or approved by the Authority. All Contractors will be required to certify their designs for conformity to the specification and to the relevant BS/EN. Only appropriately qualified and experienced engineers are to certify the designs.

a. **Letter of conformation**. The design engineer is to produce a letter to state that the design conforms to all applicable legislation, most current editions of BS or EN, and best practices. The letter is to have the company header (of the design agency if sub-contracted) and to be signed by the lead designer with his name, contact details and qualifications detailed in the signature block.

b. **Construction Inspections**. Prior to the start of construction, the Contractor, designer and Authority shall agree on key stages at which the works are to be inspected by the designer for compliance with the design.

c. **Build Conformity**. At the end of the project, the lead designer is to confirm in writing that the works have been built correctly, in accordance with his design.

11. **Design Life**. The design life of all new works and structural components and assemblies to first major overhaul, repair or replacement will be 25 years. The Contractor shall supply and install all components, elements and systems and structures to satisfy this requirement and provide documentary evidence.

Annex G to
KEN/GE/1903
Dated 13 Aug 19

Generic Points Pre-Construction Information

Detailed design and planning

1. **Additional design information**. The Contractor is to submit any additional design information to the Authority prior to the commencement of the construction phase. The PM will examine design documentation and shall be entitled to reject a design as unsatisfactory where it is not in accordance with the specification, statutory regulations or if it would be unfit for purpose.

2. **Construction drawings**. A copy of all construction Drawings is to be provided by the Contractor to the PM prior to commencing Works. Amended or updated Drawings are to be provided as necessary. The minimum design information to be provided by the Contractor shall include the following:

a. Any additional design calculations for the works.

b. Any additional general layout plans for the site and the structures.

c. Any additional detailed structural design, calculations and drawings.

d. Any additional foundation plans shall (as a minimum) indicate all footing locations and dimensions, screeds and/or ground slabs or plinths, as applicable.

e. Any additional services layouts and calculations.

f. Any additional detailed Electrical, Mechanical Drawings and calculations.

g. Manufacturer's product details including safety data sheets.

h. Designer's risk register.

i. The project programme is to be regularly updated and, upon request by the Authority, provided electronically on Microsoft Project or equivalent.

Design Responsibilities under CDM 2015

3. The designer has the following responsibilities under CDM (2015).

a. **Eliminate hazards and risks during design**. Designers are to analyse the risks posed during the construction, daily use, maintenance and ultimate demolition of the facility. Once identified, these risks shall, where practicable, be designed out however the Contractor shall be aware of the following site-specific hazards:

(1). Working with moving vehicles and plant equipment.

(2). Working in and around excavations.

(3). Manual handling general to all task activities.

(4). Traffic control around the site.

(5). Working with and around existing electrical sources and services.

(6). Working with concrete.

(7). Working at height.

b. **Provide information on remaining risks**. Remaining risks after the design process are to be compiled onto a designer's risk register and submitted with the final design.

Provision of information

4. Unless otherwise specified the following is to be provided:

a. **Documentation**. Three copies of all information, including valid certification, with respect to work, goods and materials proposed by the Contractor, shall be supplied to the Authority. Where the original document is written in a language other than English, it shall be accompanied by an English translation.

b. **Time**. Information and certificates shall be provided at least 2 days prior to the work commencing or supply of goods or materials.

c. **Drawing and Calculations**. Three copies of detailed working and fabrication drawings and calculations shall be submitted to the Authority for reference purposes. Such submittal shall in no way relieve the Contractor of his responsibilities for the work under the contract.

5. The Authority reserves the right to request copies of all calculations and drawings for analysis prior to the commencement of any construction on site. The Contractor will provide copies of all calculations and 'As-Built Drawings' for the Health and Safety File.

6. The signed and approved drawings shall be used as the construction drawings on-site for all work purposes and to satisfy the requirements as specified by the CDM (2015) and appropriate Approved Code of Practice (ACoP).

Construction phase plan

7. Under the requirements of HASAWA, the Contractor is to prepare a construction phase plan detailing how they will safely conduct the works. Risk assessments are to be included for all elements of work and method statements are required for any works that are out of the ordinary or high risk. The Construction Phase Plan must cover the following area's (where applicable):

a. **Safety Risks**

(1). **Protecting the public**. The public is any persons not involved in the works. Particular attention shall be paid to areas where children are likely to have access to the site outside of working hours.

(2). **Traffic routes**. Traffic routes for delivery of stores and equipment shall be clearly highlighted and controlled. Movement of plant and machinery on site shall be organised in a way that minimises risks to the workforce and any visitors to the site. Care must also be taken to minimise risk from existing traffic routes.

(3). **Existing buried and overhead services**. Some of these may be identified in the permit to dig process, however, care must be taken to identify and avoid any damages on existing services.

(4). **Adjacent land use**. The use of adjacent land and properties will affect the level of protection for noise and dust suppression etc.

(5). **Stability of nearby structures**. Care must be taken that works do not affect the stability of nearby structures.

(6). **Demolition works**. Demolition work is a particularly dangerous task and careful planning must be conducted. Method statements for all aspects of demolition will be required by the Authority.

(7). **Work equipment**. Work equipment must be inspected and in a suitable condition not to cause a hazard on site.

(8). **Electrical safety**. Electrical works will be conducted in accordance with the JSP and CDM recommendations.

(9). **Preventing falls**. Falling from height is one of the biggest causes of accidents in the construction industry. Even when not working under a permit, it is expected that the correct equipment and management methods are utilised to prevent falls.

(10). **Working with or near fragile materials**. Fragile materials shall be identified prior to work commencing and appropriate action must be taken.

(11). **Control of lifting operations**. Lifting operations are to be carefully planned and controlled on-site.

(12). **Excavations / confined spaces**. All excavations inside buildings where work is to be conducted are to have the appropriate level of shoring/protection. Where an area is deemed a confined space, a permit may need to be issued to control the works. If a permit is not issued, the Contractor is to have a suitable system in place with appropriate risk assessment and method statement documents associated with the work being carried out.

(13). **Working on or near water**. If working on or near water the Contractor is to plan the works to minimise the risk drowning.

b. **Health risks**

(1). **Temperature and weather**. Protection from the weather conditions for the workforce.

(2). **Substance misuse**. Assurance mechanism to prevent the workforce from working under the influence of drugs or alcohol.

(3). **Manual handling**. Assurance mechanism for correct lifting techniques, lifting equipment etc.

(4). **Dust**. Provision of dust suppression and removal.

(5). **Noise**. Reduction and suppression of noise. Management of timings for noisy activities etc.

(6). **Control of Substances Hazardous to Health (COSHH) Regulations 2002**. The correct storage and use of hazardous substances. Appropriate protective equipment must be worn when handling COSHH materials. Safety data sheets must be available on-site at all time.

(7). **Asbestos**. Identification and appropriate management of Asbestos in accordance with Asbestos Prohibitions Regulations 1985 and Asbestos Products (Safety) Regulations.

c. **Provision of**

(1). **Welfare facilities**. Water, food, shade, toilet facilities etc.

(2). **First aid**. There shall be at least one qualified first aider with appropriate medical equipment on-site at all times.

(3). **Emergency procedures**. Procedures for response to incidents such as Fire, major and minor injuries, security incident etc.

(4). **Reporting of accidents, incidents or near misses**. Procedure for reporting and follow-on actions to prevent re-occurrence.

(5). **Waste management**. Management, storage and disposal of waste and arising from the site.

(6). **Fire prevention, detection and fire fighting**. Methods to prevent the start and spread of fire, and to identify any fire that does start. There must also be appropriate fire fighting equipment available and access to the site for fire fighting services.

Pre-start meeting

8. Prior to the commencement of any works, a Pre-Start meeting is to be held with the Contractor, lead designer and chaired by a representative from the Authority. The following topics are to be discussed as a minimum:

a. Mobilisation plan.

b. Site setup.

c. Health and safety.

d. Required permits.

e. Access and security.

f. Programme.

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Dated 13 Aug 19

Generic Points During Construction

Facilities / temporary works/services

1. **Locations**. The Contractor is to agree with the PM of the intended siting of all spoil heaps, temporary works and services in advance. The Authority shall verify with the Contractor which site features are to be removed and protected during construction works.

2. **Survey and setting out**. The Contractor will be responsible for all setting out and levelling during construction. The Contractor shall keep updated schedules and Drawings of all benchmarks used in setting out of the site; these must be made available to the Authority when required. A minimum of 2 survey control stations are to be constructed, one visible from the site at a distance of 50 m and the other 200 m away from the first but in line of sight.

3. **Record drawings**. The Contractor shall record details of all grid lines, setting outstations, bench-marks and profiles on the site setting out Drawing. Retain on-site throughout the contract and hand to PM on Completion.

4. **Signage**. The Contractor shall supply and erect all applicable and appropriate signage to the site. This shall include as a minimum all H&S signage, directions and location of the site office and emergency contact details of the Contractor's representative on site. Temporary warning signs and careful demarcation of works areas must be undertaken with care to ensure compliance with any and all requirements.

5. **Lighting and power**. The Contractor shall provide all lighting and power for this work. No facility will exist on-site from the general base infrastructure.

6. **Communications**. The Contractor shall provide his workforce with adequate means of communications throughout the duration of the Contract period in order to carry out the work specified.

7. **Temporary services**. The Contractor shall provide temporary service connections to both mechanical and electrical systems. All temporary service connections are to be in accordance with current UK regulations.

8. **Use of the site**. The Site shall not be used for any purpose other than undertaking the specified works. The Contractor may erect the site office and storage compound in a location agreed with the Authority. No storage of materials, parking of vehicles, temporary accommodation or any other use of areas beyond the boundaries shall be permitted. Under no circumstances shall it be permissible for the Contractor to cause an obstruction to normal pedestrian or vehicular movements within the vicinity of the site.

9. **Restrictions to the works**. The Works are to be undertaken without interfering with every day running of the Authority's operations within the area. The demarcation of the Site boundary is to be obvious and clearly marked to restrict access to the Site whilst the Works are being undertaken.

Project management

10. **The Authority**. The Project Manager (PM) has overall Authority on this project. For the purpose of this specification, the Project Support Officer (PSO) is the only person from within the Authority acting on behalf of the PM, or Superintending Officer (SO) in most cases. The Contractor

shall not commence any work in accordance with any Design Document until the PM has agreed to the relevant Design Document.

11. **Buried Services**. Prior to carrying out any excavation work, the Contractor must:

a. Obtain a Permit to Dig (Statement of Known Services) and all Drawings relating to existing services that may interfere with the proposed works. A copy of the Permit to Dig must be given to the Authority prior to any works commencing.

b. Identify all local services and take adequate precautions to protect such services from damage for the duration of the works.

c. Inform the Authority immediately if any unknown services are discovered that will impact on the works.

12. **Supervision**. The Contractor shall accept responsibility for delivery, co-ordination, supervision and administration of the works, including all subcontracts. They shall arrange and monitor a programme with each Sub-Contractor, supplier, local Employer and any statutory undertaker, and obtain and supply information as necessary for coordination of the work.

13. **Site diary**. The Contractor shall keep an up to date daily site diary. This document is to be used to record all decisions made on site both verbally and written. The document is also to be used to record visits to the site and note anything, which has a direct effect on the project in terms of cost and extensions to time, or any other occurrence that affects the project programme. This document will be used as the audit trail in light of any disputes, concerning the project.

14. **Contractor's site meetings**. The Contractor is to hold meetings with appropriate sub-Contractors and suppliers shortly before site meetings with the Authority to facilitate accurate reporting of progress.

15. **Site meetings**. The PM or his representative will hold regular site meetings to review progress and other matters arising from the administration of the Contract. It will be the Contractors responsibility to ensure the availability of accommodation and attend all such meetings.

16. **Liaison with the Authority**. The Contractor shall designate a site manager from within his organisation who will be responsible for liaising with the PM, PSO or his representative (SO) on a day to day basis and as the need arises. At all times the Contractor shall ensure that the Site Manager presents on site that has the capability of reading, writing, speaking and receiving instructions in the English Language, including being able to understand and interpret technical drawings and specifications. The Site Manager must be able to explain the work operations to the person performing the work in a language that those performing the work are capable of understanding. The PM shall have the right to determine, whether the proposed representative has sufficient technical and linguistic capabilities.

17. **Approvals**. Where products or works are specified to be approved or the PM instructs or requires that they are to be approved, the same must be supplied and executed to comply with all requirements.

18. **Access**. The Contractor shall provide at all reasonable times, access to the Works. The Contractor shall supply the PM or his representative with copies of any documentation and drawings, which may reasonably be required for the purposes of monitoring the work performed under this or any sub-contract.

19. **Regulations**. It is the Contractor's responsibility to be fully conversant with all local/MOD regulations and requirements in respect of fire, safety, security and occupational health, etc. These are to be fully complied with throughout the contract period.

Health and Safety

20. **Health and Safety (H&S)**. All works shall be carried out in accordance with Ref C.

21. **JSP 375**. The Contractor shall comply with the Client's permit to work system and the JSP 375, Volume 3, (details of which are obtainable from the Authority SO), including the provision of method statements, risk assessments, switching/isolating safety programmes, permit to dig, etc.

Permit to work

22. **Permit to dig**. If any excavation or breaking of the ground is to be carried out, the Contractor must request a permit to dig at the Pre-Start meeting. Shall any excavation be conducted without a permit; the Contractor may be removed from the site.

23. **Hot works permit**. The Contractor is to establish at the Pre-Start meeting if hot work permits will be required for his location of work.

24. **Authorised Persons (AP)**. The following table shows details of APs in their respective discipline.

Discipline	CAP	Contact No
Electrical	Mr Ezekiel / SSgt Ringjali	0719197643/0704405046
Mechanical	WO2 Hattingh	0702659971
Petroleum	Mr Ezekiel	0719197643
Confined Spaces	Mr Mbilo/Mr Julius	0720015852/0719197599
Working at Height	Mr Mbilo	0720015852

25. **Skilled persons & Persons in Charge (PIC)**. Any works required to be completed under a JSP 375 permit must have a dedicated PIC and the work carried out by registered skilled persons. At the Pre-Start meeting the Contractor must establish if any of his works require a permit, and if so arrange for currently registered personnel to conduct the works, or registration of the Contractor's personnel.

26. **CDM 2015**. The Contractor shall submit a pre-construction H&S file to the Authority for approval, including all risk assessments, method statements, hazardous material procedures etc to comply fully with CDM (2015) & appropriate ACOP.

Quality of work

27. **Quality standards and control**. The Contractor will provide evidence to the PM of his quality standards and controls and will produce a plan detailing Quality Control (QC) activities in order for the PM to plan for witnessing of critical activities.

a. **General quality of products**. All products shall conform to the following subparagraphs:

(1). Products to be new unless otherwise specified by the Authority.

(2). For products specified to a BS or EN obtain certificates of compliance from manufacturers when requested.

(3). Where a choice of manufacturer or source is allowed for any particular product, the whole quantity required must be of the same type, manufacture and/or source unless otherwise approved. Produce written evidence of sources of supply when requested by PM.

(4). Ensure that the whole quantity of each product required to complete the work is of a consistent kind, size, quality and overall appearance.

(5). Where consistency of appearance is desirable, the Contractor shall ensure consistency of supply from the same source. Do not use different colour batches where they can be seen together.

(6). If products are prone to deterioration or have a limited shelf life, order in suitable quantities to a programme and use in an appropriate sequence. Do not use if there are any signs of deterioration, setting or other unsatisfactory condition.

b. **Proprietary products**. All products shall conform to the followings:

(1). Handle, store, prepare and use or fix each product in accordance with its manufacturer's current printed or written recommendations/instructions. Inform PM if these recommendations/instructions conflict with any other specified requirement. Submit copies to PM when requested.

(2). The tender will be deemed to be based on the products specified and recommendations on their use given in the manufacturer's literature current at the date of tender.

c. **Product Quality**. Obtain confirmation from manufacturers that the products specified and recommendations on their use have not been changed since that time. Where such change has occurred inform PM and do not place orders for or use the affected products without further instructions.

d. **Checking compliance of products**. The Contractor shall check all delivery tickets, labels, identification marks and where appropriate the products themselves to ensure that all products comply with the project documents. In particular, check that the products comply with the following sub-paragraphs.

(1). The sources, types, qualities, finishes and colours are correct and match any approved samples.

(2). All accessories and fixings that shall be supplied with the products have been supplied.

(3). Sizes are correct. Where tolerances are critical, measure a sufficient quantity to ensure compliance.

(4). The delivered quantities are correct, to ensure that shortages do not cause delays in the work.

(5). The products are clean, undamaged and otherwise in good condition.

(6). Any products with a limited shelf life are not out of date.

e. **Protection of products**. All products shall be protected to ensure that they remain in the condition they are required. In particular, the Contractor is to ensure that products are to be prevented from overstressing, kept clean, protected from the elements and kept in original wrappings until required for the project.

28. **Prohibited products**. The Contractor shall not employ on or incorporate in the Works any of the following products and shall impose a like obligation upon all Sub-Contractors.

a. Asbestos materials as described in the Asbestos Prohibitions Regulations 1985 and the Asbestos Products (Safety) Regulations 1985.

b. Lead or any products containing lead for use in connection with drinking water.

c. Materials that are generally composed of mineral fibres either manmade or naturally occurring which have a diameter of 3 microns or less and a length of 200 microns or less or which contain any fibres not scaled or otherwise stabilised to ensure that fibre migration is prevented.

d. Other products or substances generally known to be deleterious to health and safety at the time of use or to the durability of the property in the particular circumstances in which they are being used.

29. **Hazardous, aggressive or unstable materials**. The Contractor is not to import or use fill materials that either would in themselves or in combination with other material or groundwater, give rise to health hazards, damage buildings or structures. The construction materials shall not include any finishes that may lead to the shedding of particles.

30. **Defects in existing construction/services**. This shall be reported to the PM without delay. Obtain instructions before proceeding with work which may be covered up or otherwise hinder access to the defective construction or be rendered abortive by the carrying out of remedial work. This is particularly relevant in relation to the expansion of the existing service runs.

31. **Proposals for rectification of defective work/products**. As soon as possible after any part(s) of the work or any products are known to be not in accordance with the Contract, or appear that they may not be in accordance, the Contractor is to submit proposals to the PM for opening up, inspection, testing, making good, or removal and re-execution. Such proposals may be unacceptable to the PM and he may issue contrary instructions.

32. **Quality control**. The Contractor is to establish and maintain procedures to ensure that the works, including the work of all Sub-Contractors, comply with specified requirements. This is to include all testing of materials that are to be incorporated into the project (e.g. concrete). The Contractor is to maintain full records, keep copies on-site for inspection by the PM, and submit copies of particular parts of the records on request. The records must include the following:

a. Identification of the element, item, batch or lot including the location in the works.

b. The nature and dates of inspections by the Contractor or PM, tests and approvals.

c. The nature and extent of any non-conforming work found.

d. Details of any corrective action.

33. **Materials testing**. It is the Contractor's responsibility to carry out all materials testing and present all test results to the Authority on request and within the HSF. The Authority will carry out concurrence quality control material tests at regular intervals.

34. **Notification**. The Authority requires to be informed in writing at least 10 days in advance of any tests and commissioning being carried out. Access must be available to the Authority to carry out testing as deemed necessary by the Authority.

Annex I to
KEN/GE/1903
Dated 13 Aug 19

Generic Points Post Construction

Completion / handover

1. **Commissioning period**. Within the tender submission, the Contractor shall submit a Works Commissioning Plan, setting out his commissioning proposals including the preparation of handover documentation.

2. **Notice of completion**. The Contractor is to provide the PM at least five days' notice of the anticipated date of Practical Completion of the whole or parts of the works.

3. **Mechanical and electrical services**. Mechanical and Electrical Services must have final testing and commissioning carried out by the Contractor so that they are in full working order at Practical Completion. This includes buried but not connected cables and pipelines.

4. **Timing of tests and inspections**. The Contractor is to agree dates and times of tests and inspections with PM 10 days in advance, to enable the PM and other affected parties to be present. On the previous working day to each such test or inspection, the Contractor is to confirm to the PM that the work or sample in question will be ready or, if not ready, agree a new date and time.

5. **Test certificates**. The Contractor is to submit a copy of each certificate to PM as soon as practicable and keep copies of all certificates on-site. Copies shall be included in the Health and Safety File on handover of the works.

6. **Work at or after completion**. The Contractor is required to undertake the following works prior to handover.

    a. Make good all damage consequent upon the work.

    b. Remove all temporary markings, coverings and protective wrappings unless otherwise instructed.

    c. Clean the works thoroughly inside and out including all accessible ducts and voids; remove all splashes, deposits, efflorescence, rubbish and surplus materials consequent upon the execution of the work.

    d. Cleaning materials and methods to be as recommended by manufacturers of products being cleaned, and to be such that there is no damage or disfigurement to other materials.

7. **Security at completion**. The Contractor is to leave the Works secure with all accesses locked. Account for and adequately label all keys and hand over to PM with itemised schedule, retaining duplicate schedule signed by PM as a receipt.

8. **Making good defects**. The Contractor is to make arrangements with the PM and give reasonable notice of the precise dates for access to the various parts of the Works for purposes of making good defects. The PM is to be informed by the Contractor when remedial works to the various parts of the Works are completed and ready for approval.

9. **Inspection, testing and commissioning**. The installations shall be tested and inspected in accordance with but not limited to the current CIBSE Codes, BS 7671 2018[37], amendment where appropriate, etc. Advance notice of tests shall be given (minimum of 10 days prior to notification).

10. **Test and inspection certificates**. Test and inspection certificates are to be approved by the Authority, preferred document templates will be provided by the Authority on request. Test certificates shall serve as a record that the item referred to has been shown under test to meet the requirements of the specifications and of British Standards as applicable and shall be dated, numbered and clearly referenced to the item tested by means of serial, chassis or other manufactures reference number permanently marked in a conspicuous position.

11. **Equipment calibration**. The calibration certificates for the testing of the equipment are to be available on request to be shown to the Authority for scrutiny. The Contractor shall ensure all calibrations are in date. The Authority reserves the right to have an independent electrician available during the test and inspection phase.

12. **Defects**. Any defects of workmanship, materials or non-compliance with the specifications or other irregularities that become apparent during the tests shall be rectified by the Contractor, at his own expense, until the whole work is free from defects and in full working order to the complete satisfaction of the Supervising Officer.

13. **Material datasheets**. All materials used for the construction of permanent works shall have suppliers' specifications and/or testing certificates available. Where materials are used as part of a whole or in conjunction with other materials, and in any case where site testing is required by best practice, verification of quality and specifications shall be allowed for the parts/items/ products (suppliers' specification) as well as the whole (site testing).

14. **Defects Liability Period (DLP)**. A defects liability period shall apply for the works as detailed above. The Contractor will be responsible for making good at his own expense any defects in the works arising within that period. The Contractor is to ensure that a defects inspection is conducted 2-4 weeks prior to the end of the liability period in order to release the contract retention.

15. **Operations and maintenance documentation**. Upon completion of the works, the Contractor shall forward all manufacturers' details relating to equipment/materials used to the Authority for inclusion into the O&M Manual/HSF. Refer also to Construction, (Design and Management) Regulations 2015 (CDM 2015) & appropriate ACOP, this documentation less 'As-Built Drawings' is to be made available at the Pre-Board of Officers not less than 10 days before the due project handover date. A full list of snagging items shall be produced and presented to the Authority with a rectification programme at this very same board.

Health and Safety File

16. **Presentation of health and safety file**. Upon project completion, the HSF shall be presented to the Authority before the Board of Officers is convened and in compliance with CDM (2015) & appropriate ACOP. The Contractor is to provide the PM with an electronic and hard copy of the HSF. The Manual is to be contained in a series of A4 size, plastic covered, loose-leaf, four ring binders with hardcovers, each indexed, divided and appropriately cover titled. Selected Drawings needed to illustrate or locate items mentioned in the Manual, where larger than A4, is to be folded and accommodated in the binders so that they may be unfolded without being detached from the rings. The main set(s) of as-built Drawings will form Annex (es) to the Manual.

17. **Health and safety file**. The Contractor is required to complete the Project Health and Safety File on completion of the works, a copy will be provided to the Authority at handover. Advice can be sought from the Authority if required. The HSF provides the information required for future

[37] Requirement for electrical installations, IET wiring regulations 18th Edition Amendment 1.

construction work, which includes cleaning, maintenance, alterations, refurbishment and demolition. The Manual is to consist of the following parts, sub-sectioned as appropriate.

a. **Section 1: H&S**. The Contractor is to provide a description of the site and the buildings thereon. This is to include details of construction methods and materials, which may present significant residual hazards in the future.

b. **Section 2: Certificates**. The Contractor is to provide a copy of all Test Certificates (including but not limited to electrical circuit tests, start and commissioning tests) for the installations and plant, equipment, valves, etc, used in the installations. Warranty Certificates and guarantees are also to be included in this section.

c. **Section 3: As-built Drawings**. The Contractor is to provide as-built Drawings recording details of all construction, electrical and mechanical work. A fire strategy for the site shall also be included with Drawings showing emergency escape routes, location of emergency and fire fighting systems, services shut-off valves, switches, etc.

d. **Section 4: Operation & Maintenance (O&M) schedules**. The Contractor is to provide recommendations as to the preventative maintenance, frequency and procedures to be adopted to ensure the most efficient operation of the systems. Manufacturer's O&M schedules are to be included. Diagrammatic Drawings of each system indicating principal items of plant, equipment, and valves are also to be included.

e. **Section 5: O&M manuals**. The Contractor is to provide copies of manufacturers' current literature for all products for which the particular proprietary brand has been chosen by the Contractor, including COSHH data sheets, catalogue list numbers and manufacturers recommendations for cleaning and maintenance. The mechanical and electrical systems section shall contain a full description of each of the systems installed, written to ensure that the client fully understands the scope and facilities provided. All manufacturers technical literature for items of plant and equipment, assembled specifically for the project, including detailed Drawings, electrical circuit details and operating and maintenance instructions are to be included.

18. **Draft health and safety file**. A complete draft of the Manual must be submitted by the Contractor, not less than 2 weeks before the date for submission of the final copy of the Manual. This is to be amended in the light of any comments and resubmitted to the Authority. Do not proceed with production of the final copy of the Manual until authorised to do so by the Authority.