

VOLUME 3

TECHNICAL SPECIFICATIONS

REF NO 22/CUAMM/ETH/2023/AID012590/06/09

SPECIFICATIONS AND BILL OF QUANTITIES WITH ENGINEERING ESTIMATE

PROJECT:

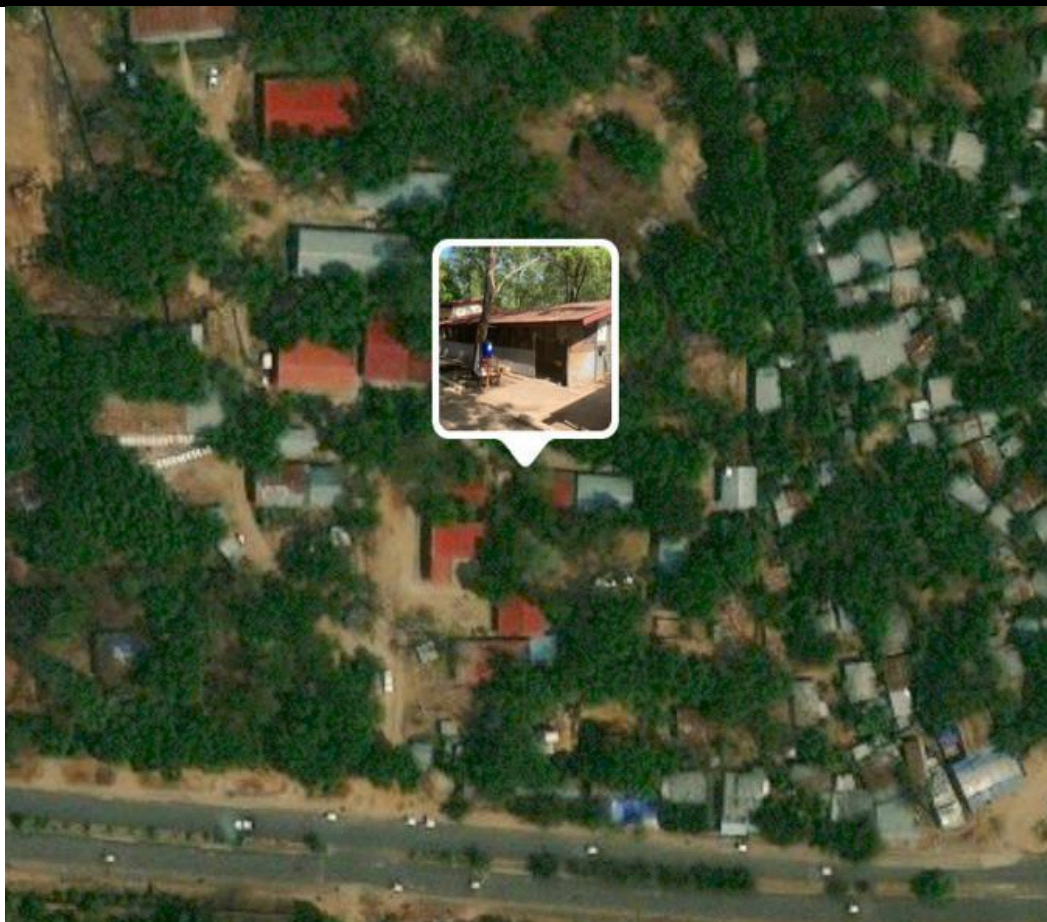
GAMBELA PRIMARY HOSPITAL

LOCATION:

GAMBELA, ETHIOPIA

OWNER:

DOCTORS WITH AFRICA- CUAMM



Prepared by:- Solomon Tesfay
ago-23

Preamble to the Bill of Quantities

1. The Bill of Quantities shall be read in conjunction with the Drawings and Technical Specifications.
2. The Bill of Quantities contains the following part Bills and Schedules:
 - a. Bill No. 1 – Ataye Damaged Block
3. The Quantities given in the Bill of Quantities are estimated and provisional, and are given to provide a common basis for bidding. The estimated contract quantity of each item of works will be set at the time of contract signing. In addition to this the basis of payment will be the actual quantities of work ordered and carried out, as measured by the Contractor and verified by the Engineer and valued at the rates and prices bid in the priced Bill of Quantities, where applicable, and otherwise at such rates and prices as the Engineer may fix within the terms of the Contract
4. The rates and prices bid in the priced Bill of Quantities shall, except insofar as it is otherwise provided under the Contract, include all Constructional Plant, Labor, supervision, materials, erection, maintenance, insurance, profit, taxes, and duties, together with all general risks, liabilities, and obligations set out or implied in the Contract
5. A rate or price shall be entered against each item in the priced Bill of Quantities, whether quantities are stated or not. The cost of Items against which the Contractor has failed to enter a rate or price shall be deemed to be covered by other rates and prices entered in the Bill of Quantities.
6. The rates in this Bill of quantities shall consider all incidental works required to protect existing structures.
7. Items associated with a priced item necessary for its satisfactory fixing shall be considered as included in
8. The rates given for Provisional Quantities (PQ) will be binding if the client decides to incorporate these
9. The whole cost of complying with the provisions of the Contract shall be included in the Items provided in the priced Bill of Quantities, and where no Items are provided, the cost shall be deemed to be distributed among the rates and prices entered for the related Items of Work.
10. The Overhead & risk and the gross profit for variation orders will be 35% .
11. General directions and descriptions of work and materials are not necessarily repeated nor summarized in
12. The method of measurement of completed work for payment shall be in accordance with Standard
13. The Bill of Quantities contains items
 - a. Supplied and installed by the Prime contractor
 - b. Provisional Quantities Supplied and installed by the Prime contractor
 - c. Provisional Sum Items supplied by the Client and installed by the Prime Contractor
 - d. Provisional Sum Items Supplied and installed by Nominated Sub-contractor
14. Provisional Sums included and so designated in the Bill of Quantities shall be expended in whole or in part at the direction and discretion of the Engineer.
15. The duties and responsibilities of the Prime Contractor for items 13(b), 13(c) and 13 (d) above are deemed to be covered by the Contractor's charge indicated in here. The duties and responsibilities of the Prime Contractor in addition to those indicated in the Bill of Quantities are:-
 - a. Handle and store materials at site both for prime contractor, the Client and nominated sub-contractor
 - b. Provide utilities like power, water and other necessary utilities for use by the Client and nominated sub-
 - c. Provide within the site transport and lifting equipment for all loading and unloading purposes and all
 - d. Provide scaffolding, ladder, etc as needed
 - e. Execute any incidental works, like concrete work, earthwork, finishing, patching, and chiseling as required by the Client and nominated sub- contractors.
 - f. Removal of debris and clean the site at completion

16. Errors will be corrected by the Employer for any arithmetic errors in computation or summation as
(a) where there is discrepancy between amounts in figures and in words, the amount in words will govern
(b) where there is a discrepancy between the unit rate and the total amount derived from the multiplication of the unit price and the quantity, the unit rate as quoted will govern.

17. Rock is defined as all materials which, in the opinion of the Engineer, require blasting, or the use of metal wedges and sledgehammers, or the use of compressed air drilling for their removal, and which cannot be extracted by ripping with a tractor of at least 150 brake hp with a single, rear-mounted, heavy-duty ripper.

18. A type of bonding agent used for bonding old concrete to newly fresh one should get approval before application and the cost in connection with the bonding old concrete to newly fresh one shall be born by the

19. All provision for sanitary pipe passage, Electrical and Sanitary ducts and provision of sleeves will have to be done during concrete works as per the Electrical and Sanitary drawings and they are deemed to be

20. The Contractor is responsible for the detail assessment of the Site conditions and any measure to be

21. The removal of Surplus excavated material shall be to an appropriate place away from the construction site. The contractor shall also make arrangement to dump this surplus excavated material to the owner place

22. The Contractor shall submit catalogues with full description for Items under all Divisions which include, but are not limited to: Finishing Materials, Electrical, Sanitary fittings & Equipments and shall get approval

23. All Electrical and Sanitary works /installation/ shall be done by experienced staff or specialized sub-contractor or personnel who have a minimum of eight years experience with similar works & this has to be approved by the Engineer based on their CVs & educational background and certification and recommendation and/or supervision by suppliers

24. All Electrical and Sanitary works shall be tested & commissioned prior to filling chiseled cavities, installing ceilings, covering vertical & horizontal ducts & back filling trenches. The Contractor shall be fully responsible for all systems

25. The Prime contractor shall submit samples of all finishing materials installed by himself and by nominated sub-contractors for approval by the Engineer and the Employer.

SUMMARY OF PRICES

01. EXCAVATION AND EARTH WORK	Birr	-
02. CONCRETE WORK	Birr	-
03. MASONRY WORKS	Birr	-
04. ROOFING	Birr	-
06. METAL WORKS	Birr	-
07. STEEL WORK	Birr	-
08. WALL AND FLOOR FINISHING	Birr	-
09. PAINTING	Birr	-
10. SANITARY WORK	Birr	-
11. ELECTRICAL WORK	Birr	-
SERVICE SUM	Birr	-
15% VAT	Birr	-
GRAND TOTAL	Birr	-

Consultant's estimation for the realization of the civil works is 6 months

BILL OF QUANTITY - Gambela Primary Hospital

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE	QUANTITY
01	EXCAVATION AND EARTH WORK				
	EXCAVATION WORKS				
	* The contractor is responsible for covering any costs incurred due to damage of utility lines and care shall be taken for all existing utilities that could be covered or exposed to view throughout the project execution period.				
1.1	EXCAVATION				
1.1.1	REMOVAL OF TOP SOIL				
	Removal of Top Soil: The top soil shall be removed to the specified depth (200-300mm as directed by the Engineer) leaving area clear off any vegetable soil. The removal of top soil shall be measured by the area occupied by the work to be placed on the cleared area. Removal of top soil shall be understood as including the disposal of surplus material or stock piling and wheel spreading of top soil at later stages as directed by the Engineer.	m ²	219,64		-
1.1.2	EXCAVATION IN ORDINARY SOIL				
	* Excavation shall mean the excavation and get out of the soil. Excavation in ordinary soil shall be measured by volume as the net void created by the excavation with deduction made for existing voids. * "Ordinary Soil" shall mean material yielding to ordinary excavation machinery or pick axes. * "Boulder" shall mean isolated volume of hard rock in ordinary soil and soft rock or above ground less than 1/2 cubic meter in volume.				
1.1.2.1	Bulk Excavation in Ordinary Soil: Bulk excavation to reduce the Natural ground Level to a depth not exceeding 100cm from reduced level.	m ³	109,82		-
1.1.2.2	Pit Excavation in ordinary soil: Pit excavation for isolated footing to a depth not exceeding 2000mm from reduced level.	m ³	37,50		-
1.2	BACK FILL				
	* Fill to excavations or to make up level shall be made in suitable material approved by the Engineer and capable of being compacted. p Fill shall be placed in successive stages of not exceeding 200mm and watered and compacted to approval by the Engineer. * The compaction achieved in filling shall be measured in accordance with the standard practice. The In situ moisture content and density shall be compared with laboratory test results of modified AASHO T147 performed on samples of the selected material. * The minimum relative compaction to be achieved in the compacted area shall be 95% maximum dry density and the moisture content shall be within the range of 95% dry density. The moisture content of the fill material shall be adjusted as necessary to achieve the required compaction. Any material which after repeated compaction, does not fulfill the requirements, shall be removed and replaced. * The final levels of fill shall be adjusted, graded and prepared to receive bedding to be laid on fill. Fill shall be measured as equal to the net volume of void to be filled and shall be understood as including the stockpiling and haulage of material from location of fill.				
1.2.1	Selected borrowed fill - Suitable non-expansive well graded soil or granular material with no rock lumps imported from outside and approved by the Engineer. Fill works Is under floor slab and around footing pad as well a around foundation column.	m ³	93,95		-
1.3	DISPOSAL				

	<p>* All unsuitable and surplus suitable material arising from excavations shall be disposed off when instructed by the Engineer.</p> <p>* Disposal shall be made to tips directed by the Engineer or indicated in the document. In the absence of direction from the Engineer or indication in the documents, it is the contractor's responsibility to identify the appropriate tip and dispose the material.</p> <p>* Disposal shall be understood to include stock piling, loading, transporting, dumping and wheel spreading at tip. Disposal shall be measured as the net volume arising from the void created by the excavation, less excavated material backfill, filled and wheel spread within site or left stockpiled.</p>				
1.3.1	Cartaway surplus excavated material to a place where the administration has allotted for disposal. The contractor is responsible for permission from relevant authorities.	m ³	191,25		-
1.4	SUNDRY ITEMS				
1.4.1	HARDCORE AND STONE FILLERS				
	* Hard core shall be sound approved stone of specified finishing thickness and placed as directed by the Engineer and finished blinded with 20mm crushed aggregate.				
1.4.1.1	Hardcore under Ground floor slab to a thickness of 25cm and blinded with 20mm crushed aggregate.	m ²	190,65		-
01	SUB TOTAL EXCAVATION & EARTH WORK ETH BIRR				-
02	CONCRETE WORKS				
2.1	Cast in Place Concrete				
	Cast in place concrete is concrete premixed at a batching plant and transported to the work site or concrete whose ingredients are transported to the site and mixed just before casting in place.				
2.1.1	50mm thick C-5 lean concrete with minimum cement content of 150kg/m³ of concrete under				
2.1.1.1	Under Isolated footing	m ²	25,00		-
2.1.1.2	Under Stone Masonry	m ²	25,25		-
2.1.1.3	Under Grade beam	m ²	18,94		-
2.1.2	REINFORCED CONCRETE				
2.1.2.1	REINFORCED CONCRETE GRADE C-25 (25 MPa) cast into formworks and vibrated around rod reinforcement bars.				
2.1.2.1.1	In Isolated footing	m ³	10,00		-
2.1.2.1.2	In foundation Column	m ³	2,03		-
2.1.2.1.3	In Ground Column	m ³	5,32		-
2.1.2.1.4	In ground floor slab	m ²	190,65		-
2.1.2.1.5	In grade beam	m ³	7,58		-
2.1.2.1.6	In Top tie Beams	m ³	9,46		-
2.1.2.2	FORMWORK FOR CONCRETE				
	Formwork shall mean temporary support construction for in-situ concrete, designed and constructed in timber or metal whichever is appropriate and capable of withstanding the live and dead loads imposed on it and fully preventing leakage of concrete. The work includes: Construction and removal of formwork Making good of concrete honeycombs. Making good of concrete surfaces to attain the standard of finish desired by the specified type of formwork.				
2.1.2.2.1	For Isolated Footing Pad	m ²	40,00		-
2.1.2.2.2	For Foundation column	m ²	32,50		-
2.1.2.2.3	Formwork to Grade Beam	m ²	68,79		-
2.1.2.2.4	For Ground column	m ²	85,10		-

2.1.2.2.5	For Top Tie Beam	m ²	78,47		-
2.1.2.3	REINFORCEMENT BARS				
	Reinforcement work shall be understood as the supply and fixing of reinforcement bars, including ties and chairs. The steel bars shall be high tensile (Grade S-420) hot rolled deformed Reinforcement Steel bar				
2.1.2.3.1	Rebar Diameter 6mm	kg	-		-
2.1.2.3.2	Rebar Diameter 8mm	kg	1.588,26		-
2.1.2.3.3	Rebar Diameter 10mm	kg	-		-
2.1.2.3.4	Rebar Diameter 12mm	kg	466,20		-
2.1.2.3.5	Rebar Diameter 14mm	kg	2.272,25		-
2.2	CONCRETE ANCILLARIES				
2.2.1	EXPANSION JOINTS				
	Expansion joints shall be formed between the concrete faces, or between concrete, by means of incorporating in the formwork an approved impregnated Chipwood/fiberboard or other filler to the thickness of 20mm. The Exposed edges of expansion joints shall be sealed. Filler boards shall be adequately wound into adjoining concrete to prevent their falling out when the joint opens. In-situ ground slabs laid on ground floor shall be cast in bays 6m x 6m (36m ² in area). The layout of construction joints in the slab shall be approved in advance				
2.2.1.1	Supply and fix 8mm thick and 100mm deep Chipwood/styrophom expansion joint filler b/n grade beam & ground floor slab. Price shall include all the necessary sealants and wear protection coats with all incidental works.	ml	160,00		-
02	SUB TOTAL CONCRETE WORK ETH BIRR				-
03	MASONRY				
3.1	STONE FOR MASONRY				
	Stone obtained from quarries approved by the Engineer shall be hard & sound, free from vents, cracks, fissures, discoloration, or other defects that will adversely affect strength or appearance. Stone chips out of which shaped stone are to be produced shall not be less than 450mm average and 380mm individual length.				
3.1.1	Stone masonry Concealed from View: 50cm thick stone masonry bedded in cement mortar (1:3) mix. price shall include cement mortar.	m ³	37,88		-
3.1.2	Stone masonry Exposed to View for Retaining Wall: 50cm thick stone masonry bedded in cement mortar (1:3) mix. price shall include cement mortar.	m ³	14,18		-
3.2	HOLLOW & SOLID CONCRETE BLOCKS				
3.2.1	strength of Individual Block 32kg/cm²				
3.2.1.1	200mm thick class 'B' H.C.B wall bedded and jointed in cement mortar (1:3) both side left for appropriate finishing.	m ²	188,48		-
3.2.1.2	150mm thick class 'B' H.C.B wall bedded and jointed in cement mortar (1:3) both side left for appropriate finishing.	m ²	167,19		-
03	SUB TOTAL MASONRY WORK ETH BIRR				-
04	ROOF WORK				
4,1	Supply and fix roof cover in precoated or galvanized EGA 400,0.4mm thick fixed to steel lattice purlin. Price shall include ridge cap, Dia 6mm fixing J-bolts and water proof washers.(purlin measured in horizontal projection)	m ²	178,10		-

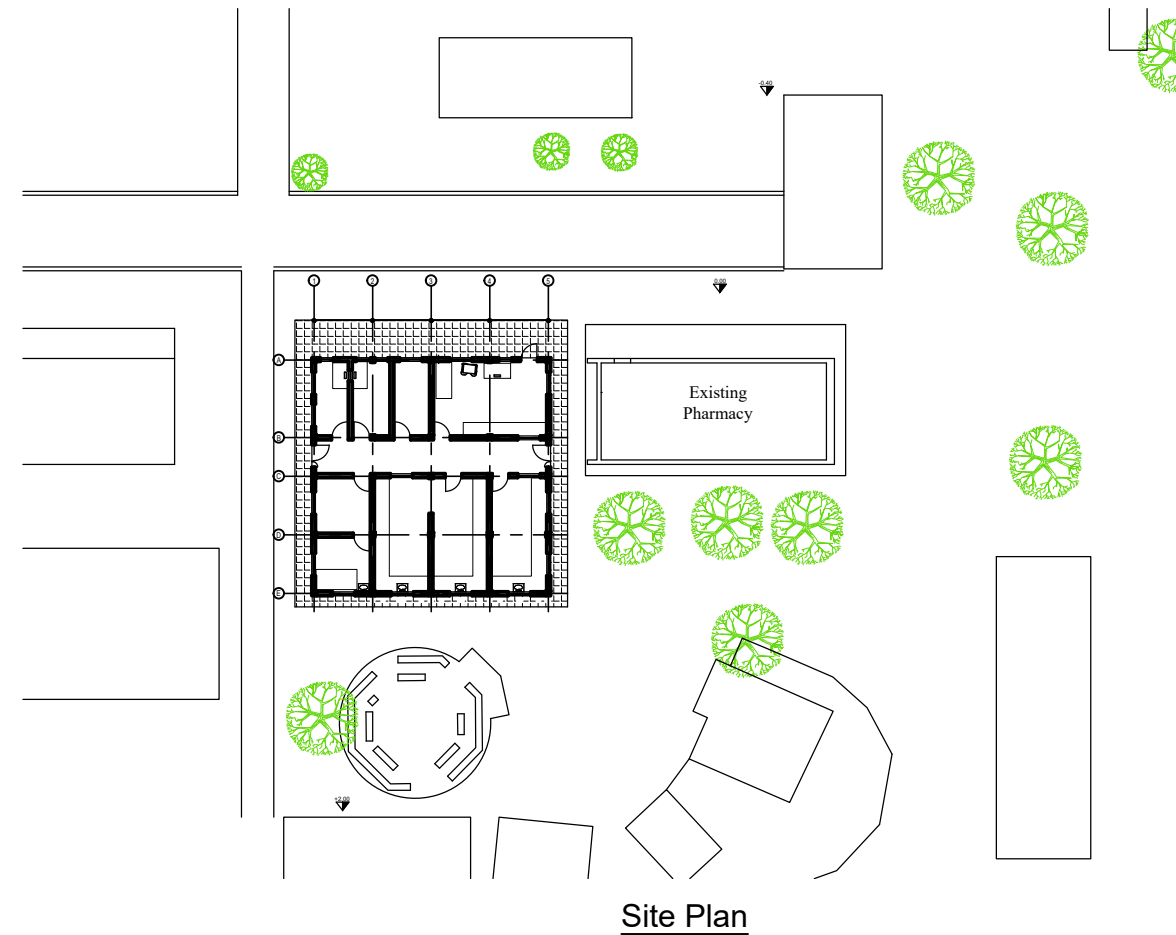
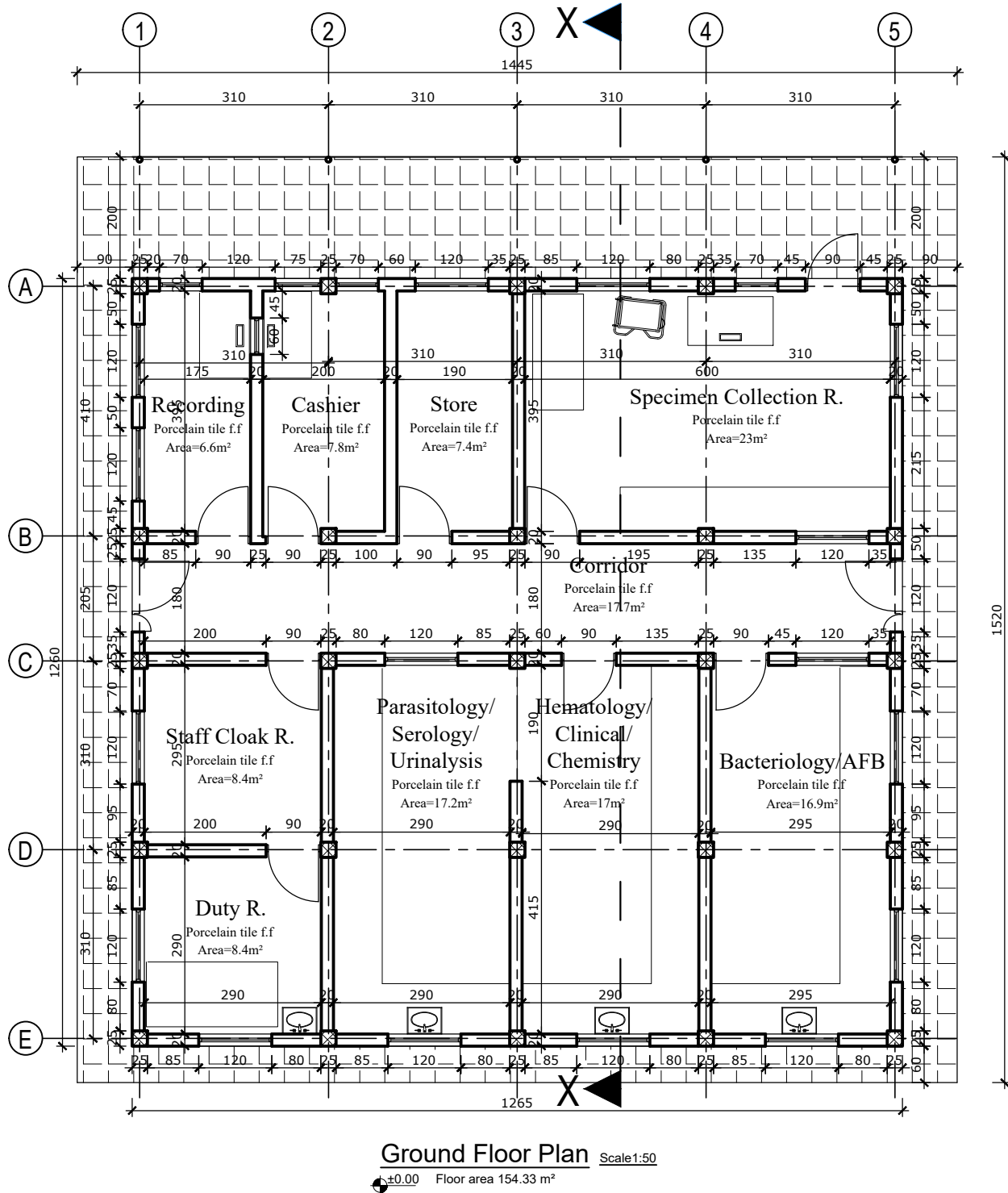
4,2	Supply and fix G-28 galvanized flat metal sheet gutter as per the detail drawing. price shall include all the necessary accessories, metal bracket, one coats of antirust .Development length =100cm	m ²	25,00		-
04	SUB TOTAL ROOF WORK ETH BIRR				-
06	METAL WORK				
6.1	Aluminum doors, windows and curtain walls				
	Aluminum windows and doors made of extruded profiles of 6060 standard of UNI3569 HB65 norms dimensional tolerance and thickness of the aluminum to be of UNI3879 norm spacer for the glazing and panels with average from 10 - 42mm. Aluminum profile shall be of Approved color with brushed finish cut and assembled to the sizes and shapes shown on the schedule of windows and doors. Manufacturing of the door and windows subject to approval of shop drawings to be provided by the Contractor. Price shall include 6mm thick nonreflective tinted glass, approved type of locks, necessary door stopper, and handle. All shall be according to the detail drawing. Hinges, Locks, Profiles and all important accessory samples should approved by the architect.				
	Standards Comply with the following standard. Hot dip galvanized coating on iron and steel articles BS 729 Anodic oxidation coating on Aluminum BS 1615 Anodic oxide coating on Aluminum for external architectural application BS 3987 Wrought steel for mechanical & allied engineering purposes BS 970				
6.1.1	Aluminum Doors				
6.1.1.1	Aluminum door type D1, size 90*270cm	No	9,00		-
6.1.1.2	Aluminum door type D1, size 120*270cm	No	2,00		-
6.1.2	Aluminum Window				
6.1.2.1	Aluminum Window Type W-1 size 120cm x 120cm	No	17,00		-
6.1.2.2	Aluminum Window Type W-2 size 60cm x 120cm	No	4,00		-
6.1.2.3	Aluminum Top Window Type W-3 size 120cm x 60cm	No	6,00		-
06	SUB TOTAL METAL WORK ETH BIRR				-
07	STEEL WORK				
	The following shall be provided as required for the satisfactory completion of the works. * Structural steel profiles, welding consumables, bolts, nuts and washer and Grouting concrete. * Labor for fabrication, assembly and erection. * Equipment, tools, scaffolding necessary for fabrication, assembly and erection.				
	Comply with the following standards, or equivalent: -				
	TESTS Tests to verify the grade and mechanical properties of the structural steel and welding of fabricated steel shall be carried out if required by the Engineer. Test samples shall be those randomly selected by the Engineer. The specific requirements of testing as detailed in BS 4360 shall be followed, to the extent determined by the Engineer.				
7,1	CHS POSTS				
7.1.1	CHS 80*3mm for Vertical Posts	kg	73,97		-
7,2	Truss Structure				
7.2.1	Truss, T1				
7.2.1.1	RHS 80*80*3.5mm for Horizontal truss member	kg	229,93		-
7.2.1.2	RHS 60*60*2.5mm for Vertical and Diagonal truss members	kg	128,64		-

7.2.2	Truss, T2				
7.2.2.1	RHS 80*80*3.5mm for Horizontal truss member	kg	400,39		-
7.2.2.2	RHS 60*60*2.5mm for Vertical and Diagonal truss members	kg	222,98		-
7.2.3	Truss, T3				
7.2.3.1	RHS 80*80*3.5mm for Horizontal truss member	kg	380,08		-
7.2.3.1	RHS 60*60*2.5mm for Vertical and Diagonal truss members	kg	176,94		-
7.2.3	Truss, T4				
7.2.3.1	RHS 60*60*3mm for Horizontal truss member	kg	149,27		-
7.2.3.1	RHS 50*50*2.5mm for Vertical and Diagonal truss members	kg	62,64		-
7,3	Lattice Purlins:				
7.3.1	RHS 30mm x 30mm x 2mm top and bottom Horizontal members	kg	713,21		-
7.3.2	RHS 25*25*2mm for Vertical and Diagonal Purlin members	kg	281,66		-
7,4	Metal plates				
7.4.1	Gusset Plate - (850mm x 320mm x 300mm) - Trapezoidal shaped The cost shall include Cutting the plate to size, welding to truss and plate, Painting antirust and placing in place as shown in the drawing.	Pcs	26,00		-
07	SUB TOTAL FOR STRUCTURAL STEEL WORK ETH BIRR				-
08	WALL AND FLOOR FINISHINGS				
8.1	PLASTERING & POINTING				
	Finishing work includes all surface pre cleaning, removal of mortar by chiseling, making good edges of columns and beams, preparation of grooves b/n surface where ever indicated, preparation and application of finish, polishing and cleaning after end of work.				
8.1.1	Cement Mortar Plastering to internal wall. Plaster shall be applied in two coats of mortar with the following ratio: First coat: 1 Part cement to 2.5 parts aggregate by volume. Second Coat: 1 Part of cement to 3 parts of aggregate by volume. The work includes chiseling for vertical concrete wall, columns and vertical beams.	m ²	624,15		-
8.1.2	Gypsum Plaster (plaster of Paris) to internal wall: Plaster shall be applied in one coat of 3mm thick gypsum : The final fine coat gypsum plaster to be applied by trowel shall consist of one part of gypsum to three parts of lime putty, applied to a thickness of 3mm. The plaster shall be finished truly level and smooth. The plaster shall be allowed to cure. No finish shall be applied to gypsum plaster before the age of 28 days.	m ²	624,15		-
8.1.3	Cement Mortar Plaster to External wall: Plaster shall be applied in three coats of mortar with a ratio of 1:3. The final coat of cement plaster to be applied on two coat plaster shall consist of one part of cement to two parts of fine aggregate complying to BS 1199 by volume applied by trowel to a maximum thickness of 3mm. The surface shall be finished truly level and smooth. This coat shall be cured by watering for a minimum of seven days and allowed to cure for at least 28 days before further finish is applied on it.	m ²	207,91		-
8.2	Wall and floor finish				
8.2.1	Supply and fix 600X600X10mm Porcelain ceramic floor tiles of approved sizes and quality with cement mortar backing and joints grouted in colored cement. Pattern, color and quality shall be approved by the Engineer.	m ²	130,40		-

8.2.2	100x10mm porcelain ceramic skirting stuck to wall with cement mortar (1:3)mix.	Lm	159,90		-
8.2.6	280x30mm throated and weathered Granite door and window sill bedded in cement mortar (1:3) mix. It shall be chamfered at the edge, provide water drip at bottom face of sill and 2% slope towards outside. All according to the Engineer's approval.	Lm	35,40		-
08	SUB TOTAL FINISHING WORK ETH BIRR				-
09	PAINTING				
9.1	Apply three coats of approved quality plastic paint. Price shall include pre-cleaning and preparation of surfaces.				
9.1.1	To all internal wall and ceiling surface.	m ²	624,15		-
9.1.2	To external wall surface.	m ²	207,91		-
09	SUB TOTAL PAINTING WORK ETH BIRR				-
10	SANITARY INSTALLATION WORKS				
	All fixtures, equipments, pipes & materials which are specified below shall subject to the Engineer's approval, based on Samples, Catalogues and/or Brochures presented by the contractor. Unit Price shall include all the necessary installation accessories and all assistance civil works there to for the proper installation and operation of the sanitary wares, pipe works and any other related sanitary works.				
10,1	SANITARY APPLIANCES INSTALLATION				
10.1.1	Supply and fix <u>High quality</u> Gold Dragon or equivalent brand <u>Hand wash Basin</u> . The fixture shall conform to BS5506-3 or equivalent institution. The mixing faucets, waste drain holes, bottle trap, waste fitting, connecting pieces, fixing, <u>female attakini(60cm long)</u> and supporting elements and all other accessories shall comply with relevant clauses of BS standard or equivalent institution. size: <u>520x420mmx850 mm high</u>	pcs	4,00		-
10,2	WATER SUPPLY SYSTEM				
10.2.2	Supply and install Polypropylene Random Co-polymer resins (PP Type 3 raw material) PPR PN-20 to internal cold water distribution system as shown on the drawing. Complete with all the necessary fittings and accessories. All diameters specified here are internal (Nominal) diameters.				
	a) Dia. 25 mm	ml	25		-
10.2.3	Supply and fix 15mm dia chrome plated brass quarter turn angle valves with chrome plated copper connecting pipe, union nut and chrome plated brass wall flanges, and accessories complete in all respects. The Angle valve should be capable resisting of PN-10 before hand wash basins, water closets and other fixtures.	pcs	4		-
10,3	WASTE WATER DRAINAGE SYSTEM				

	All domestic waste, vent and storm water pipe lines shall be comply to BS 459, BS 4660, BS 5481 as appropriate, using double ring seals and gaskets complying with BS 2394 uPVC, PN-6 pipes and shall be provided with a minimum slope as stated in the drawing. Pipes and necessary fittings shall be standard quality and be free from damage during storage, construction and etc. Unit price shall include all the necessary assistance civil works, such as excavation cartaway, fixing or hanging to walls, beams or slabs. etc., necessary fittings such as bends, Y, etc. Storm water uPVC, PN-6 pipes shall resist the external temperature and the quality shall meet the purpose. Flushing and testing of waste water system. Flushing has to be done to clean the pipe line from debris and silts. All waste water Pipe shall be tested by water pressure of 1.5 meters head for minimum of Four Hours.				
10.3.1	Providing, laying and jointing of internal uPVC PN-6 waste pipes with all uPVC pipe fittings including jointing with solvent cement joints and testing of joints etc. according to where shown on the drawings. Complete with all the necessary fittings. Provide cleaning detail for all waste water riser pipes as per the detail drawing.				
10.3.1.1	Dia. 50 mm, Outer diameter	ml	30		-
10.3.2	Providing, laying and jointing of uPVC PN-6 storm water down pipes with all uPVC pipe fittings including jointing with solvent cement joints and testing of joints etc. according to where shown on the drawings. Complete with all the necessary fittings.				
10.3.2.1	Dia. 110 mm, Outer diameter	ml	35		-
10.3.3	Supply and construct Dia 300mm half concrete Open pipe around the building and pavement. Price shall include Excavation, 100mm thick red ash base and cement mortar mix (1:3) Side joint. The Work includes Connecting to External ditch.	ml	45,00		-
10	SUB TOTAL FOR SANITARY WORK ETH BIRR				-
11	ELECTRICAL INSTALLATION				
	Supply, Install and Test all Electrical Systems: Power Distribution Boards with Circuit Breakers, Light Fittings with Lamps, Switches, Outlets and Others including required items and accessories. All items shall be Industry standard and approved equivalent types.				
11,3	Switch Board				
11.3.1	Main Switch Board (MDB) in sheet steel enclosure, floor standing with lockable door including bus bars of 3x25Amp, 3 Phase rating, neutral and earth bars, connection terminals, complete and consisting of:-				
	3pcs,16A,MCB,1Phase				
	3pcs,10A,MCB,1Phase				
	Including 25% reserve pitches	No	1		-
11,4	Feeder Power Cables				
11.4.1	Multi-core power cable copper conductor, color coded, in CABLE SHAF, connected and tested, all as specified and as shown on drawings				
	CABLES				
11.4.1.1	3x4mm sq.	lm	40		-
	PVC PIPES				
11.4.1.2	PVC conduit of 16 mm diameter	lm	60		-
11,5	Extra Over Light Points for Switches				
11.5.1	Flush mounted Single switch points fed through PVC insulated conductors of 2x2.5mm ² inside PVC conduits of 16mm diameter, including junction boxes	No	9		-

11.5.2	Flush mounted double switch points fed through PVC insulated conductors of 3x2.5mm ² inside PVC conduits of 16mm diameter, including junction boxes	No	2		-
11,6	Light Points				
11.6.1	Flush mounted light points fed through PVC insulated conductors of 3x2.5mm ² inside PVC conduits of 16mm diameter, including junction boxes with covers and insulating screw cap connectors, complete	No	20		-
11,7	Extra Over Light Points for Flush Mounted Switches				
11.7.1	Flush mounting single switch	No	9		-
11.7.2	Flush mounting double switch	No	2		-
11,8	Flush Mounted Socket Outlet Points				
11.8.1	16A/1P socket outlet points fed through PVC insulated conductors of 3x2.5mm ² inside PVC conduit of 16mm diameter including junction boxes with covers and insulating screw cap connectors.	No	32		-
11,9	Flush Mounted Socket Outlets with Earth Contact				
11.9.1	Flush mounting socket outlet of 16A 1Phase.	No	32		-
11,10	Light Fittings				
	Supply, Connect and test including lamps and complete accessories, all as specified or described in lighting fittings schedule and as shown on the drawings.				
11.10.1	36w, 60x60 LED Box panel Light	NO	20		-
11	SUB TOTAL FOR ELECTRICAL WORK ETH BIRR				-



GENERAL NOTES

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No.	REVISION / ISSUE	DATE

Key Plan:

ARCHITECTURAL DESIGN

Project Name:
Gambela Primary Hospital

Project Address
 Location: Gambela
 Sub city: Kebele / Wereda: ---
 Parcel No: - House No.: -
 Title Deed no.: -

Project Owner:
CUAMM - DOCTORS FOR AFRICA

Drawing Title:
Site plan, Ground floor plan

Project Status:
 New Modification As Built

Designed By:
Staff

Signature:

Drawn By:
Staff

Checked By:
Solomon Tesfay

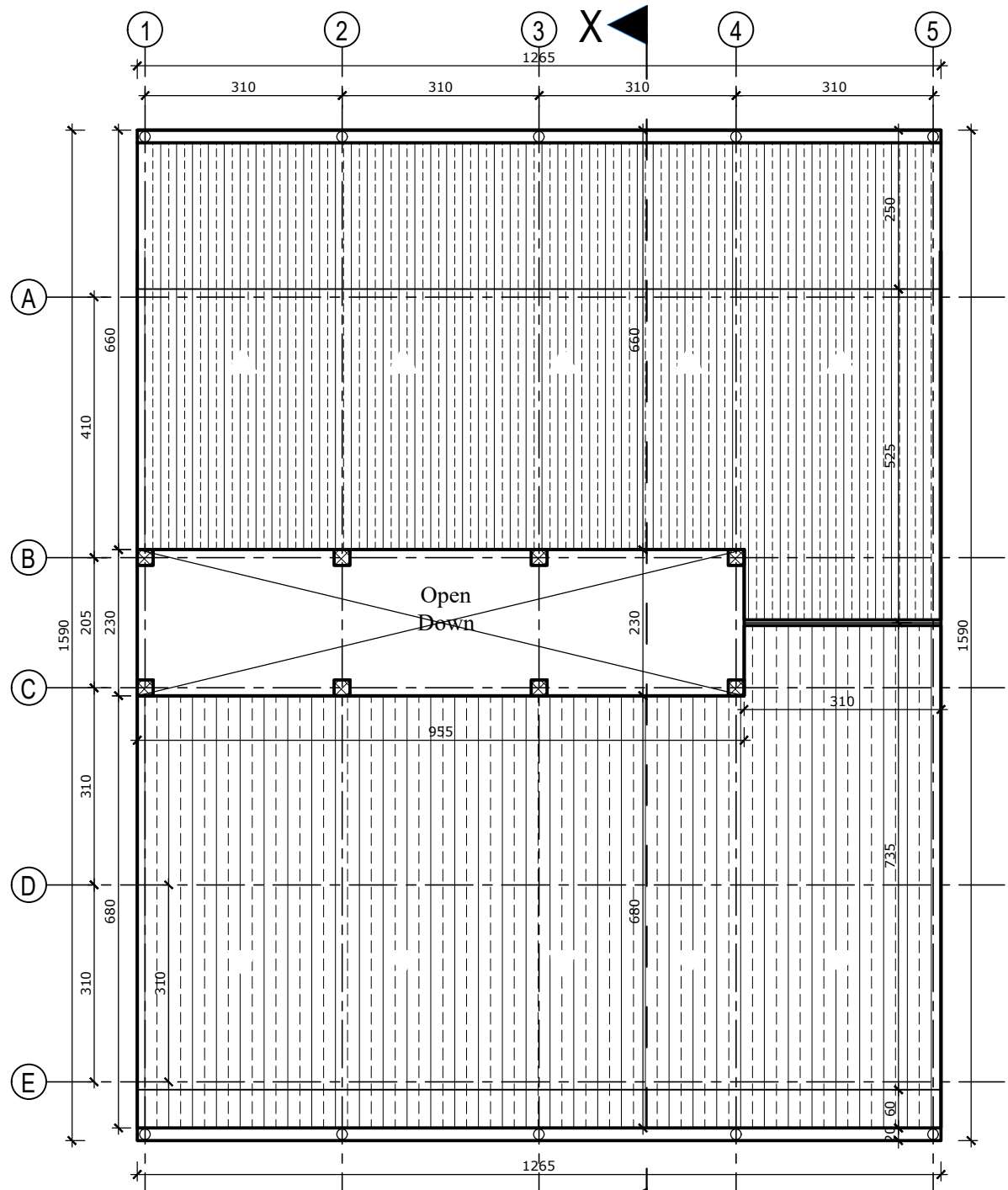
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Scale:
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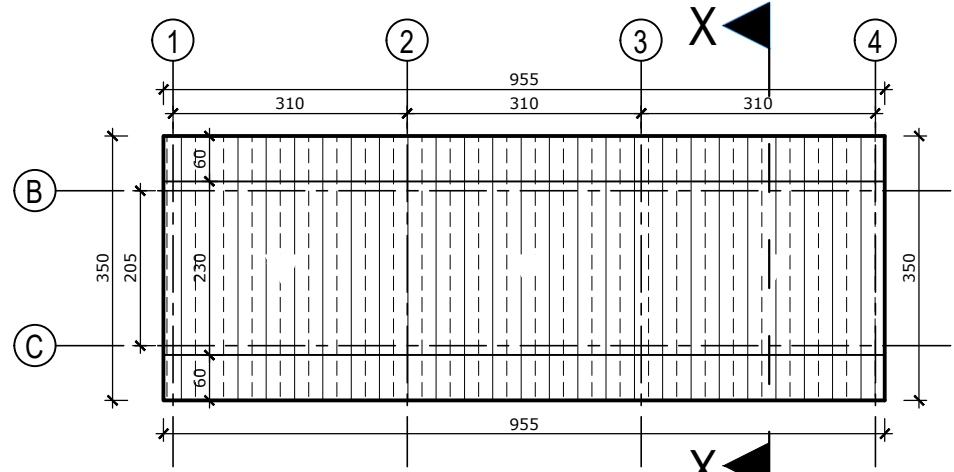
Date:
August-2023

Project No.: _____ Paper Size: ISO A1

Drawing No.
AR
01/03



Roof Plan Scale 1:50
+3.00



Roof Plan 1 Scale 1:50
+5.20

GENERAL NOTES

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- _____

No.	REVISION / ISSUE	DATE

Key Plan:

ARCHITECTURAL DESIGN

Project Name:
Gambela Primary Hospital

Project Address
Location: Gambela
Sub city: ----- Kebele / Wereda: ---
Parcel No.: - House No.: -
Title Deed no.: -----

Project Owner:
CUAMM - DOCTORS FOR AFRICA

Drawing Title:
Roof Plan

Project Status:
 New Modification As Built

Designed By:
Staff

Signature:

Drawn By:
Staff

Checked By:
Solomon Tesfay

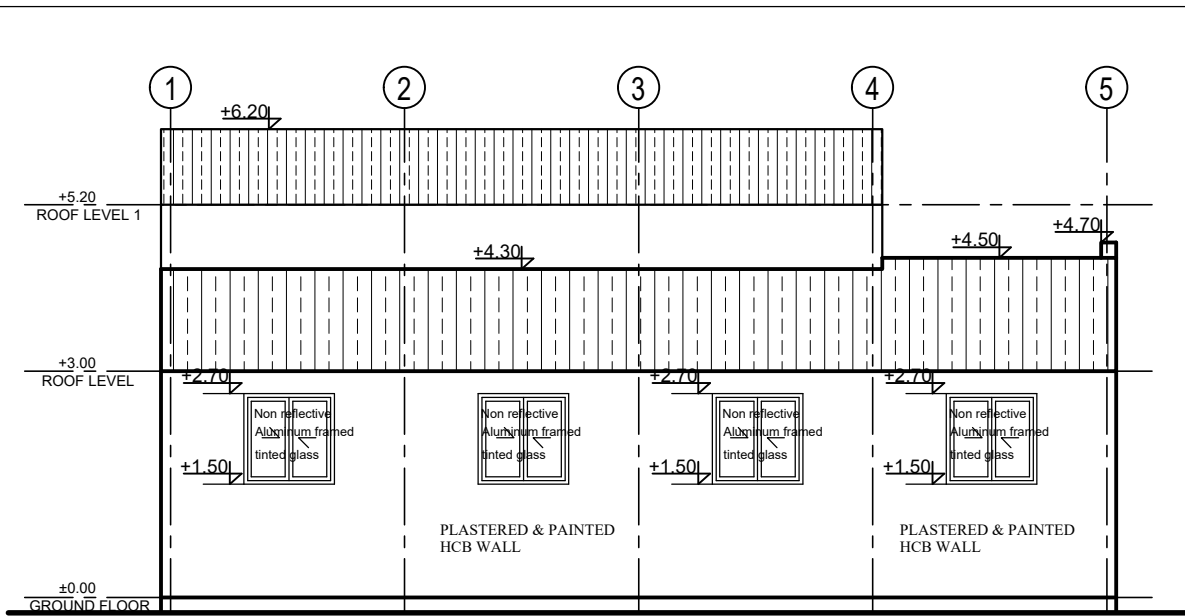
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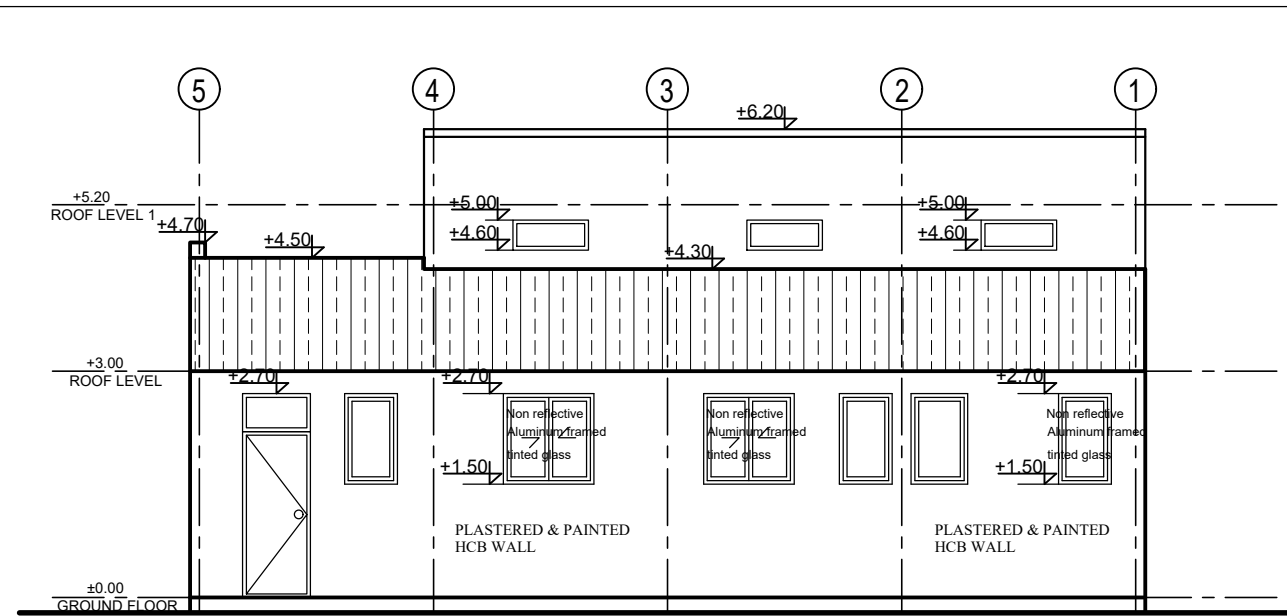
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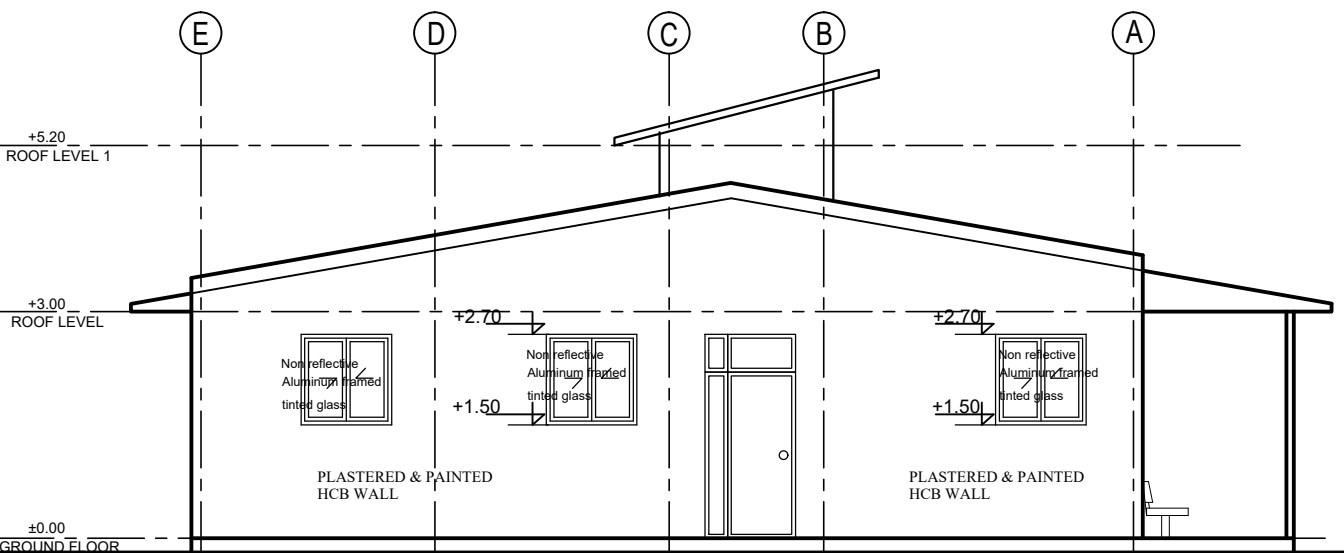
AR
02/03



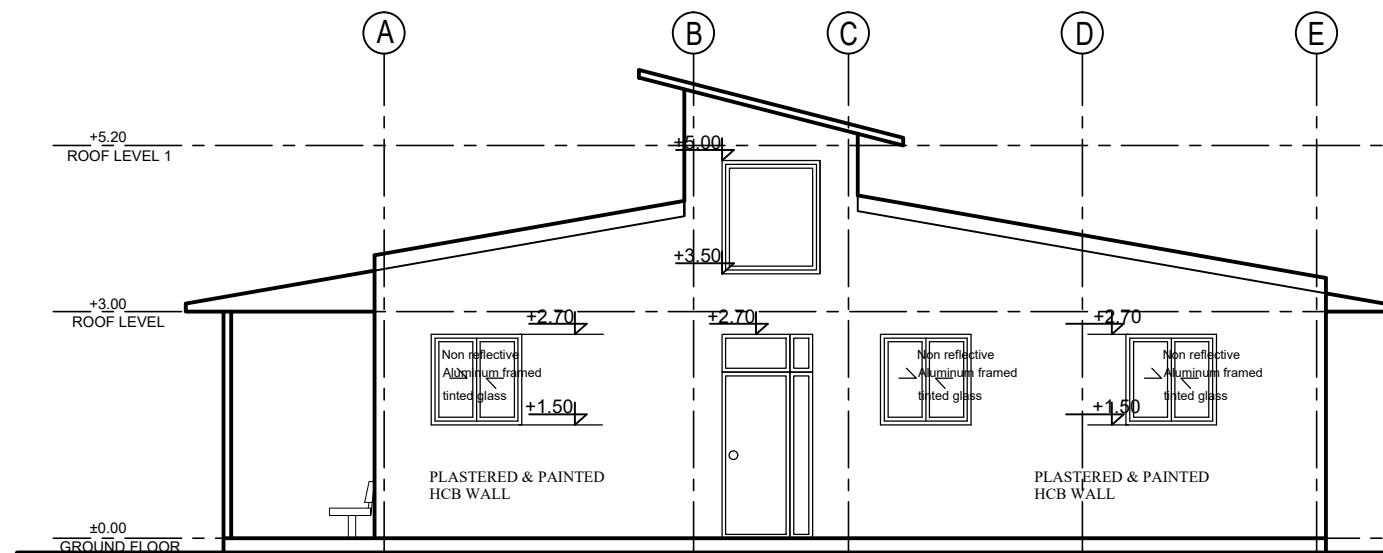
FRONT ELEVATION Scale 1:50



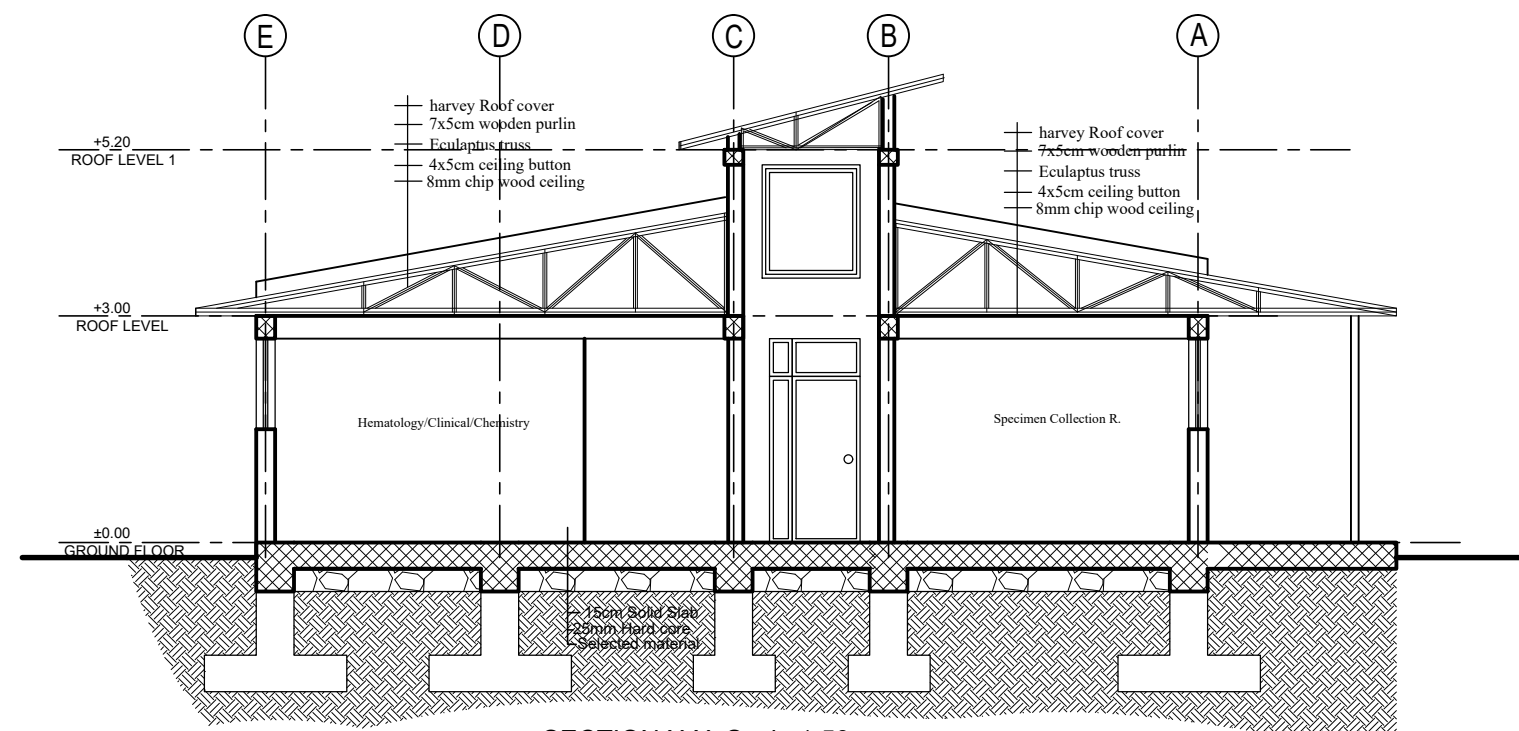
REAR ELEVATION Scale 1:50



RIGHT SIDE ELEVATION Scale 1:50



LEFT SIDE ELEVATION Scale 1:50



SECTION X-X Scale 1:50

GENERAL NOTES

No.	REVISION / ISSUE	DATE

Key Plan:

ARCHITECTURAL DESIGN

Project Name:
Gambela Primary Hospital

Project Address
Location: Gambela
Sub city: Kebele / Wereda: ---
Parcel No.: - House No.: -
Title Deed no.: -

Project Owner:
CUAMM - DOCTORS FOR AFRICA

Drawing Title:
Sections and Elevations

Project Status:
 New Modification As Built

Designed By:
Staff

Signature:

Checked By:
Solomon Tesfay

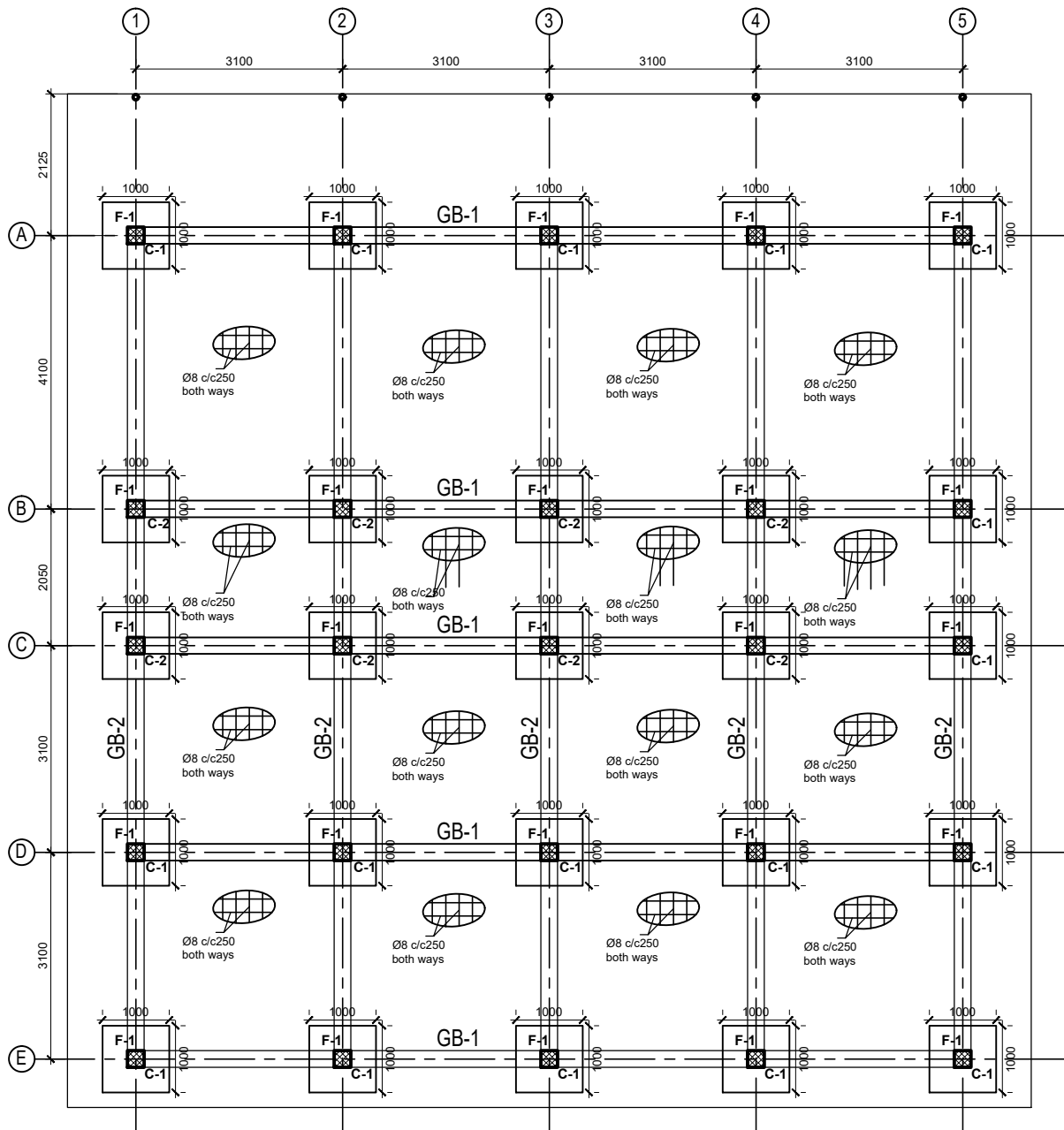
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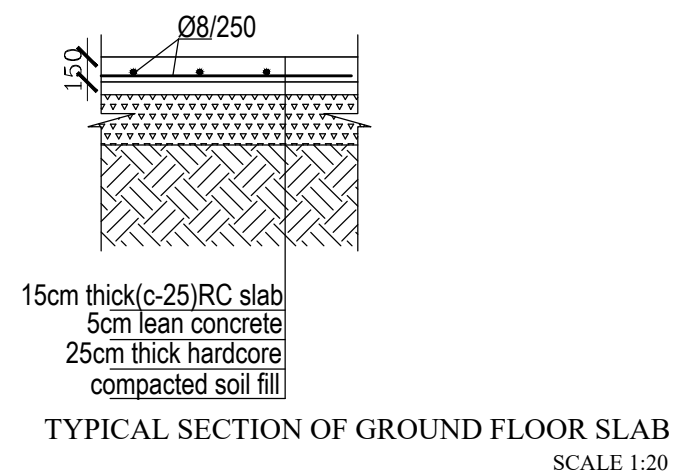
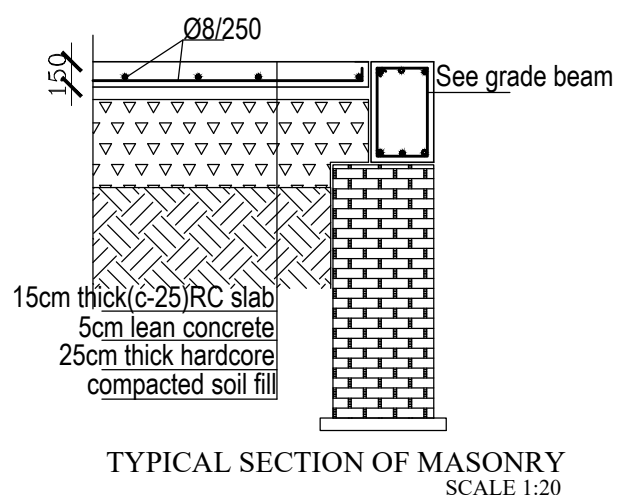
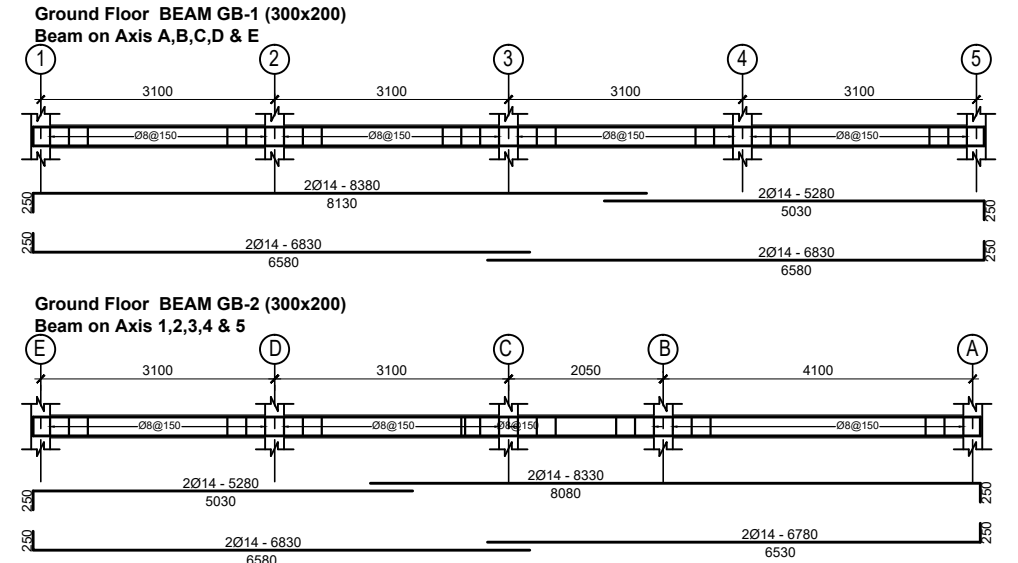
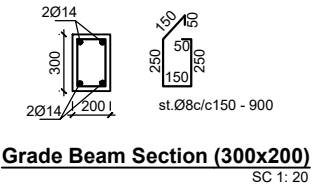
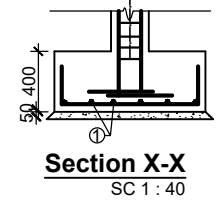
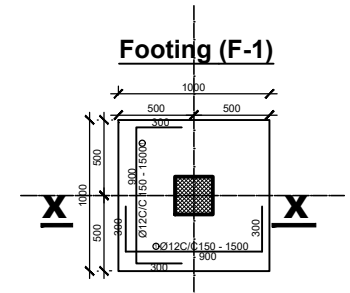
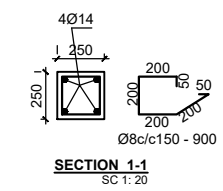
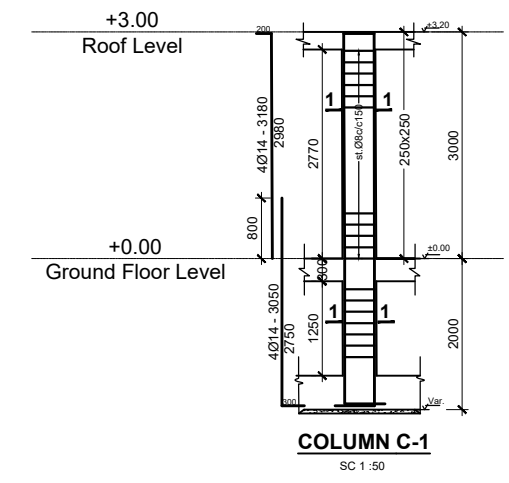
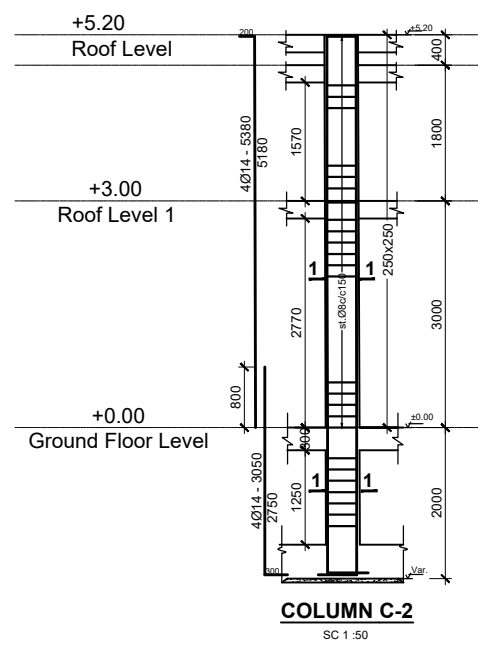
Date: August-2023

Project No.: ----- **Paper Size:** ISO A1

Drawing No.
AR
03/03



GROUND FLOOR SLAB, COLUMN, FOUNDATION & BEAM LAYOUT & REINFORCEMENT
(Slab Thickness 150mm)



GENERAL NOTES

No.	REVISION / ISSUE	DATE

STRUCTURAL DESIGN

Project Name
GAMBELA PRIMARY HOSPITAL

Project Address
 Location: Kebele / Wereda:
 Sub city: House No.:
 Parcel No.: - House No.: -
 Title Deed no.:

Project Owner
DOCTORS WITH AFRICA - CUAMM

Drawing Title
Ground Floor slab Reinforcement and Beam Detail

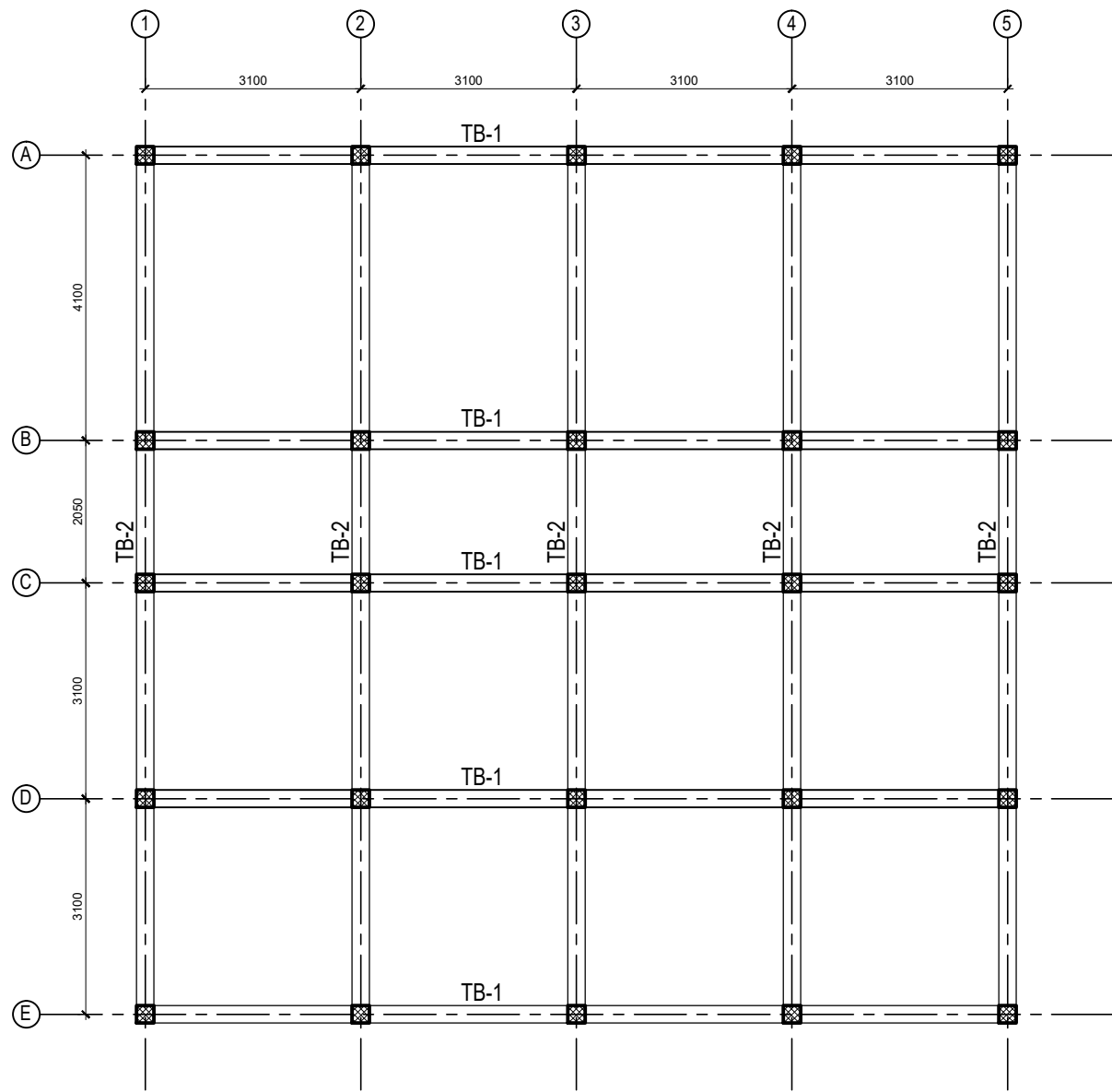
Project Status
 New Modification As Built

Designed By
 Solomon Tesfay

Drawn By
 Staff

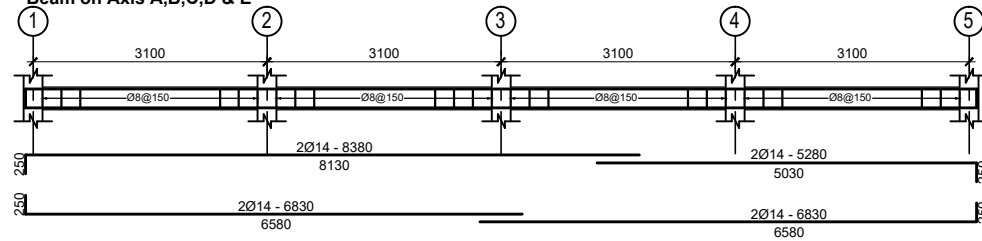
Checked By
 Staff

Scale 1:50	Drawing No. ST/01/03
Date Aug-2023	
Project No.	Paper Size ISO A1

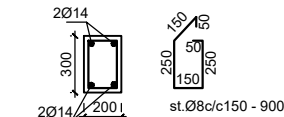
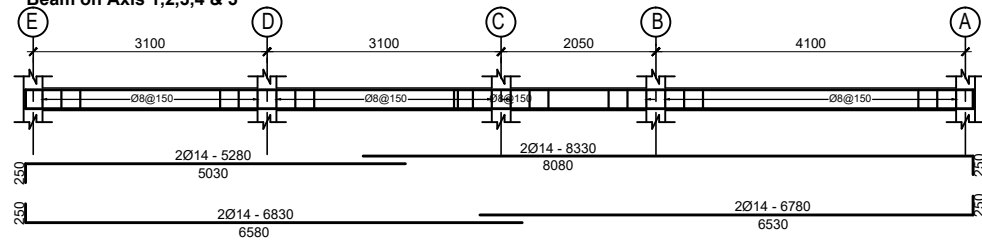


ROOF BEAM LAYOUT PLAN

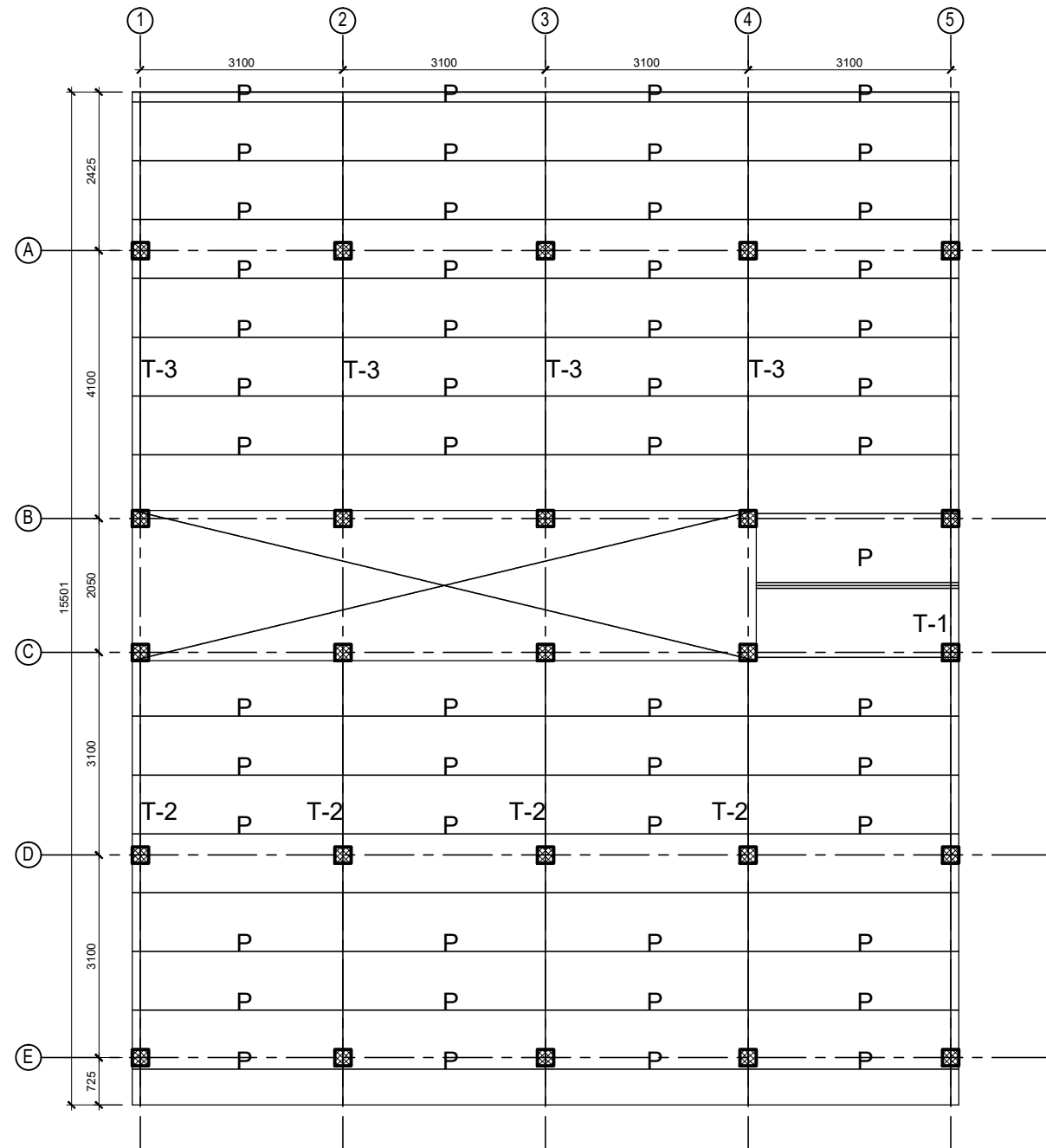
Top Tie BEAM TB-1 (300x200)
Beam on Axis A,B,C,D & E



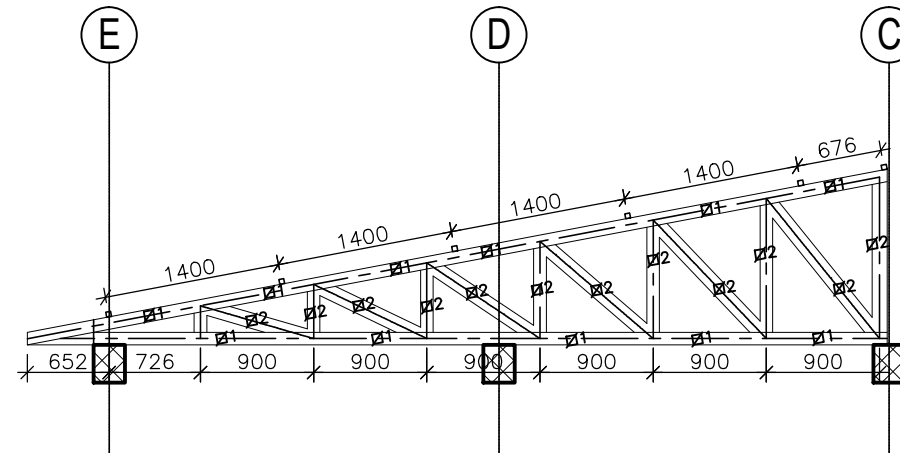
Top Tie BEAM TB-2 (300x200)
Beam on Axis 1,2,3,4 & 5



Top Tie Beam Section (300x200)
SC 1: 20



**ROOF TRUSS LAYOUT PLAN
@level +3.00**



RAFTER TRUSS DETAIL T-2
(4 Pcs.)
SCALE 1:50

GENERAL NOTES

No.	REVISION / ISSUE	DATE

STRUCTURAL DESIGN

Project Name
GAMBELA PRIMARY HOSPITAL

Project Address
Location:
Sub city: Kebele / Wereda:
Parcel No.: - House No.: -
Title Deed no.:

Project Owner
DOCTORS WITH AFRICA - CUAMM

Drawing Title
Roof Beam and Truss Layout Plan

Project Status
 New Modification As Built

Designed By
Solomon Tesfay

Drawn By
Staff

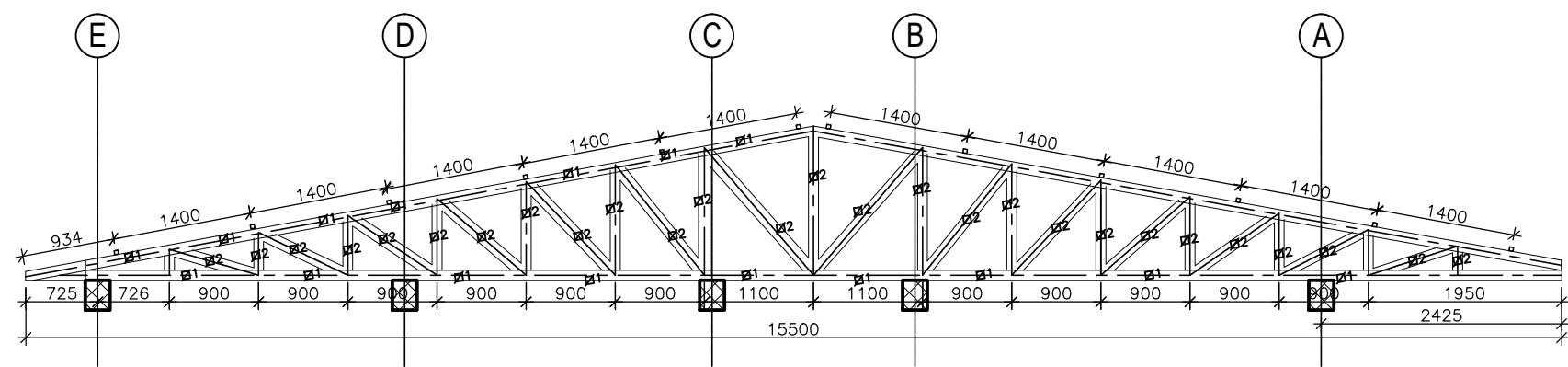
Checked By
Staff

Scale
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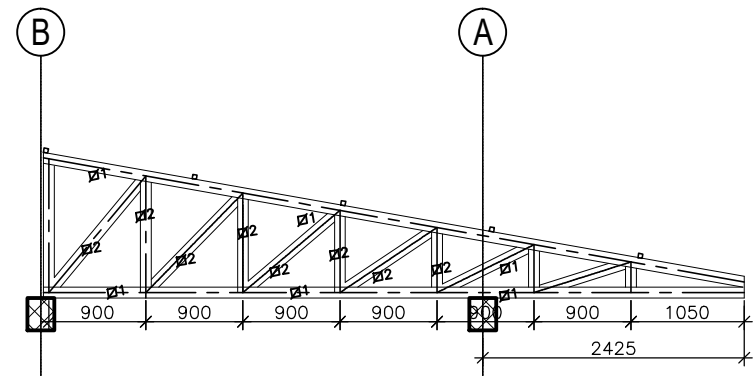
Date
Aug-2023

Project No.

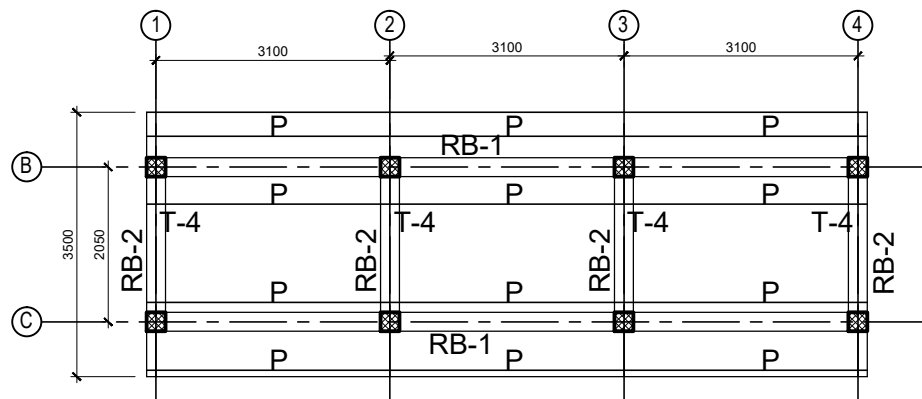
Drawing No.
ST 02/03
Paper Size
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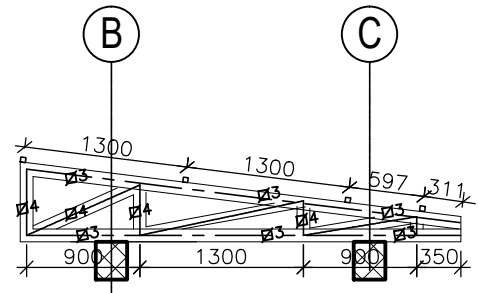
RAFTER TRUSS DETAIL T-1
(1Pcs.)
SCALE 1:50



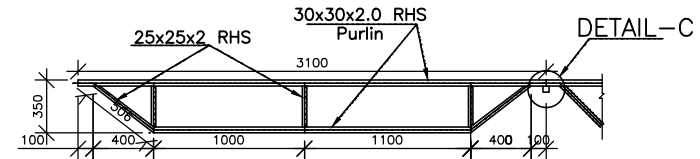
RAFTER TRUSS DETAIL T-3
(4Pcs.)
SCALE 1:50



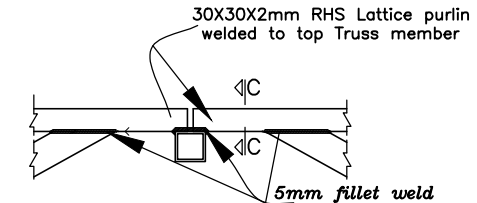
ROOF TRUSS LAYOUT PLAN 1
@level +5.20



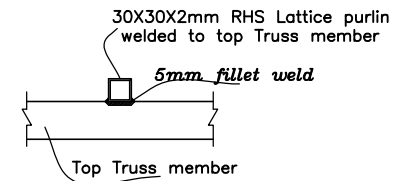
RAFTER TRUSS DETAIL T-4
(4Pcs.)
SCALE 1:50



STANDARD PURLIN DETAIL (Welded Connection)
SCALE 1:25

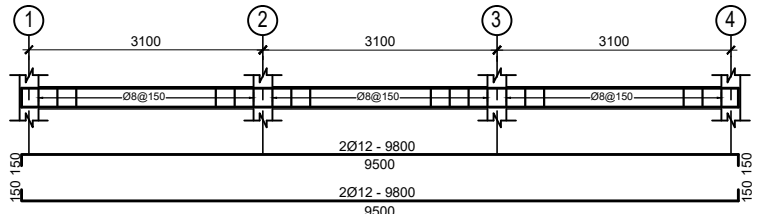


DETAIL C
SCALE 1:5

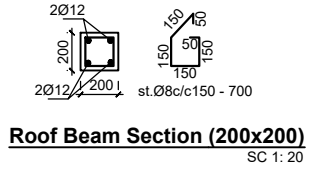
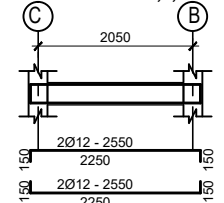


SECTION C-C

ROOF BEAM RB-1 (200x200)
Beam on Axis A & B



ROOF BEAM RB-2 (200x200)
Beam on Axis 1,2,3 & 4



MATERIAL USED FOR TRUSSES

- 1- TOP AND BOTTOM MEMBERS 80X80X3mm
- 2- VERTICAL AND DIAGONAL MEMBERS 60X60X2.5mm
- 3- TOP AND BOTTOM MEMBERS 60X60X3mm
- 4- VERTICAL AND DIAGONAL MEMBERS 50X50X2.5mm

GENERAL NOTES

- *Minimum thickness of weld 3mm
- *Bolt strength as specified
- *Trusses should be welded when connected to each other
- *Use 5mm thick connection plate for length > 6m.
- *Provide a camber of 50mm at the center.
- *All Measurements are in mm. unless specified.
- *No scaling

GENERAL NOTES

No.	REVISION / ISSUE	DATE
-----	------------------	------

STRUCTURAL DESIGN

Project Name
GAMBELA PRIMARY HOSPITAL
Project Address
Location:
Sub city: Kebele / Wereda:
Parcel No.: - House No.: -
Title Deed no.:
Project Owner
DOCTORS WITH AFRICA - CUAMM

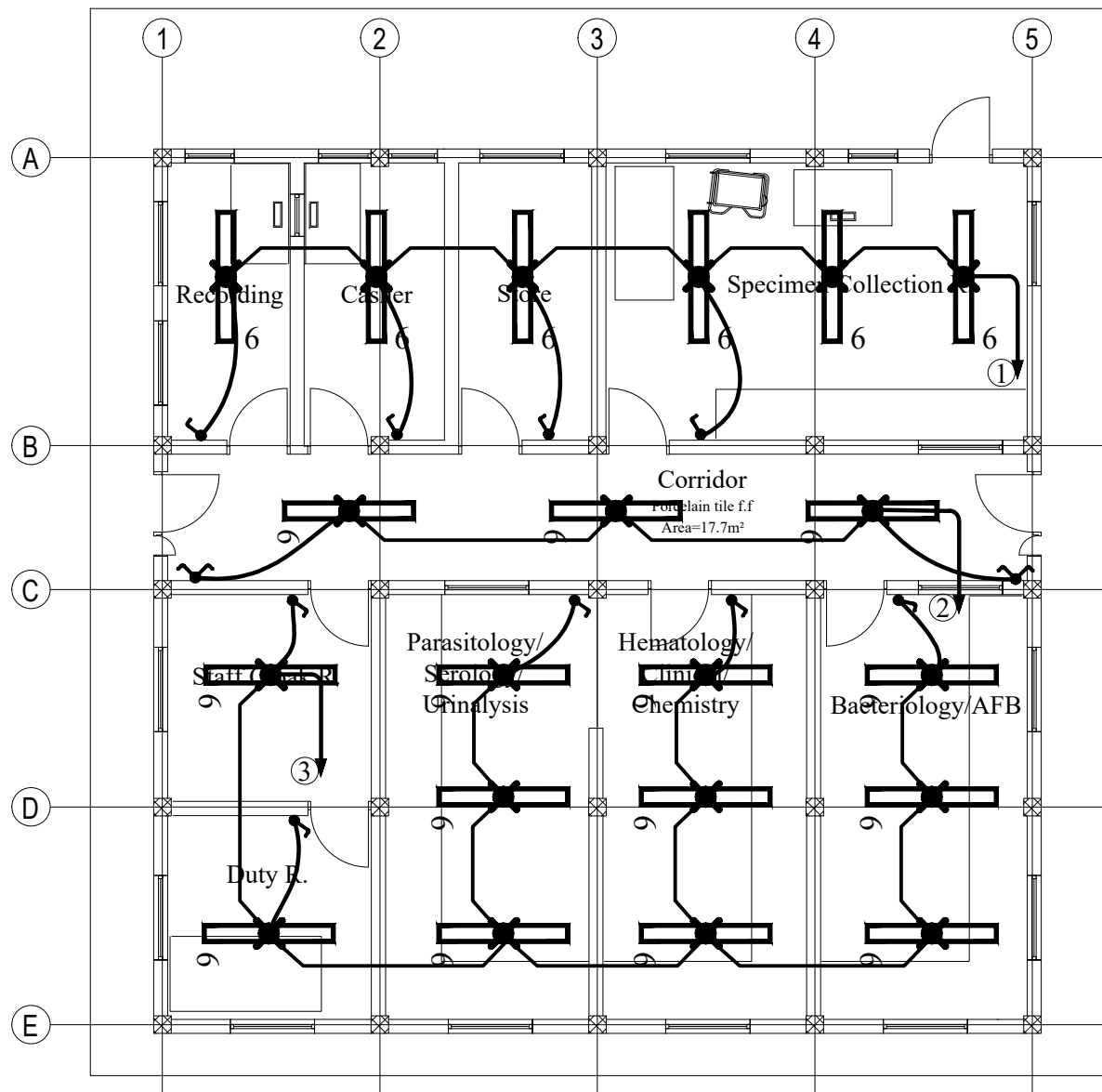
Drawing Title
Truss layout And Roof Beam Detail And Section

Project Status
 New Modification As Built
Designed By
Solomon Tesfay

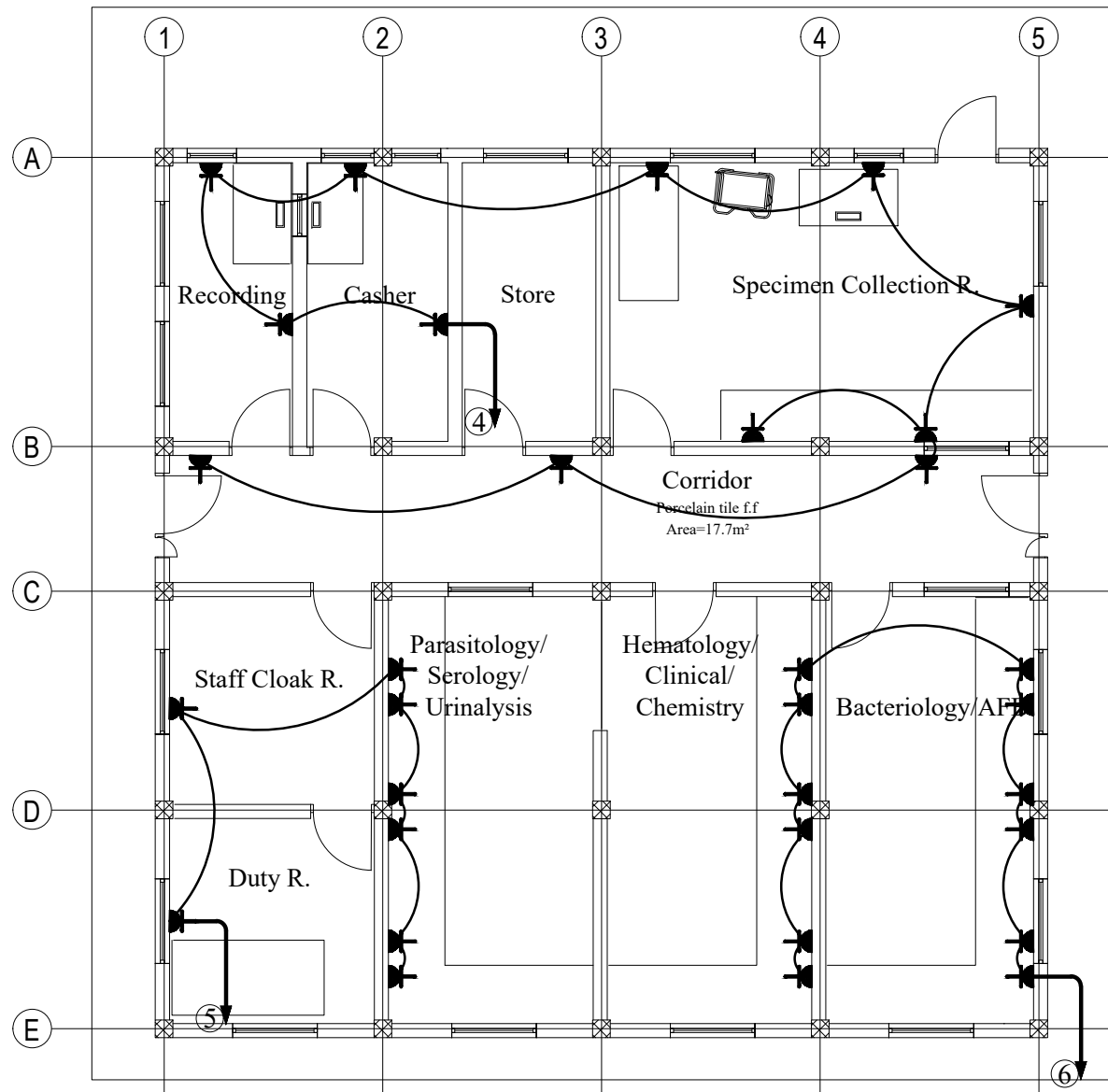
Drawn By
Staff
Checked By
Staff

Scale
1:50
Date
Aug-2023
Project No.

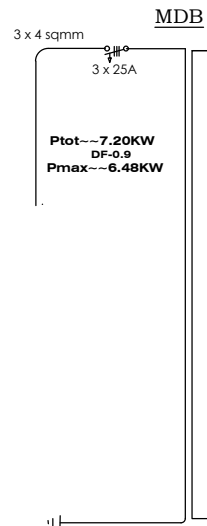
Drawing No.
ST 03/03
Paper Size
ISO A1



GAMBELA LIGHT LAYOUT



GAMBELA SOCKET LAYOUT



NO	DESCRIPTION	I (A)	A (sqmm)	P(KW)	Phase alloc		
					R	S	T
1	LIGHTING	10	2 x 2.5	0.24	○		
2	LIGHTING	10	2 x 2.5	0.12		○	
3	LIGHTING	10	2 x 2.5	0.44			○
4	SOCKET OUTLET	16	3 x 2.5	1.60	○		
5	SOCKET OUTLET	16	3 x 2.5	2.40		○	
6	SOCKET OUTLET	16	3 x 2.5	2.40			○
	RESERVE						
	RESERVE						
TOTAL				7.20	○	○	○

$P_{tot} \approx 7.20KW$ $P_{max} \approx 6.48KW$ $S_{max} \approx 7.62KVA$
 $df = 0.90$ $pf = 0.85$

GENERAL NOTES

No.	REVISION / ISSUE	DATE

Key Plan:

ELECTRICAL DESIGN

Project Name:
Gambela Primary Hospital

Project Address
 Location: Gambela
 Sub city: Kebele / Wereda: ---
 Parcel No: House No.: -
 Title Deed no.:

Project Owner:
CUAMM - Doctors for Africa

Drawing Title:
Electrical Detail

Project Status:
 New Modification As Built

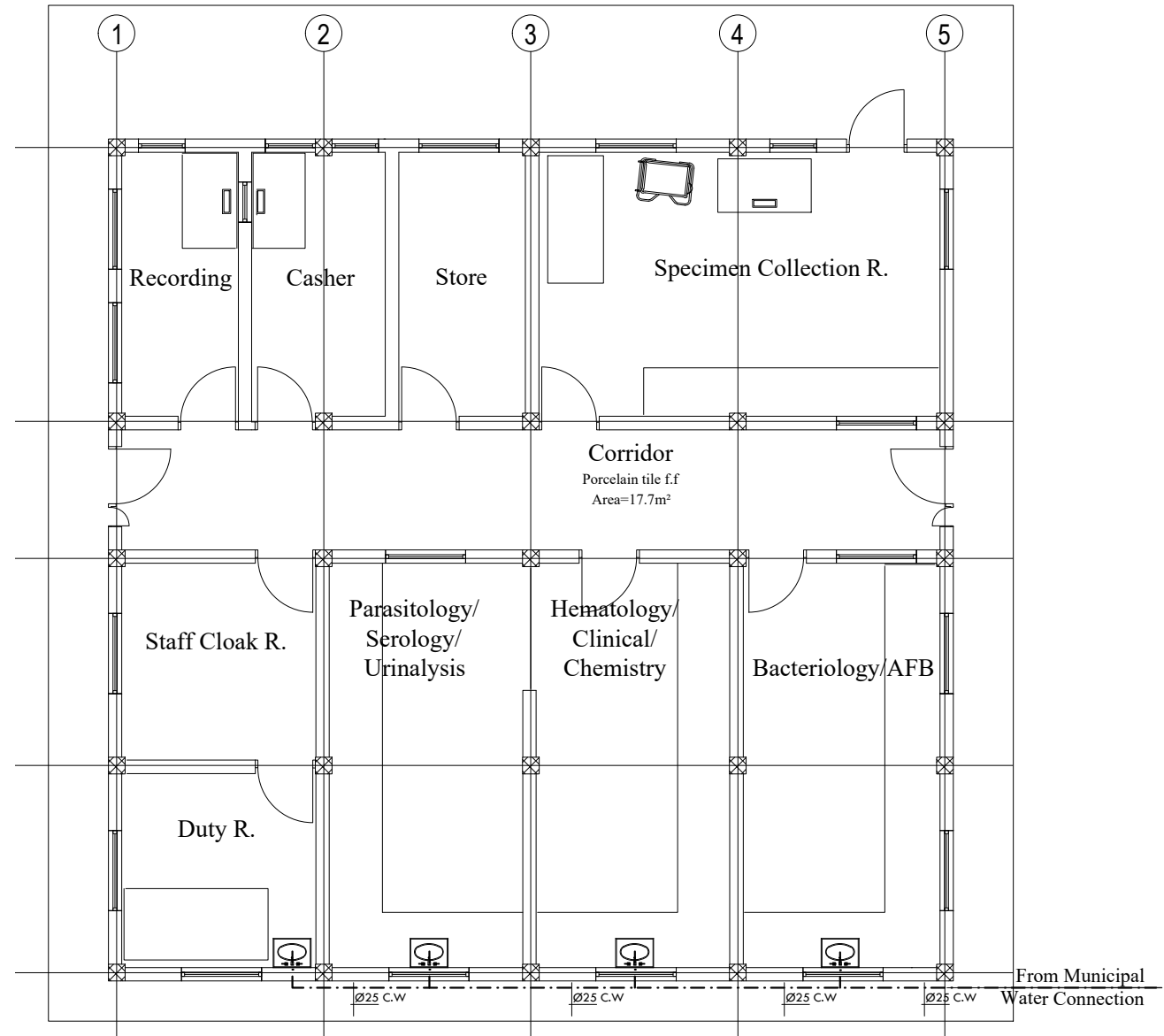
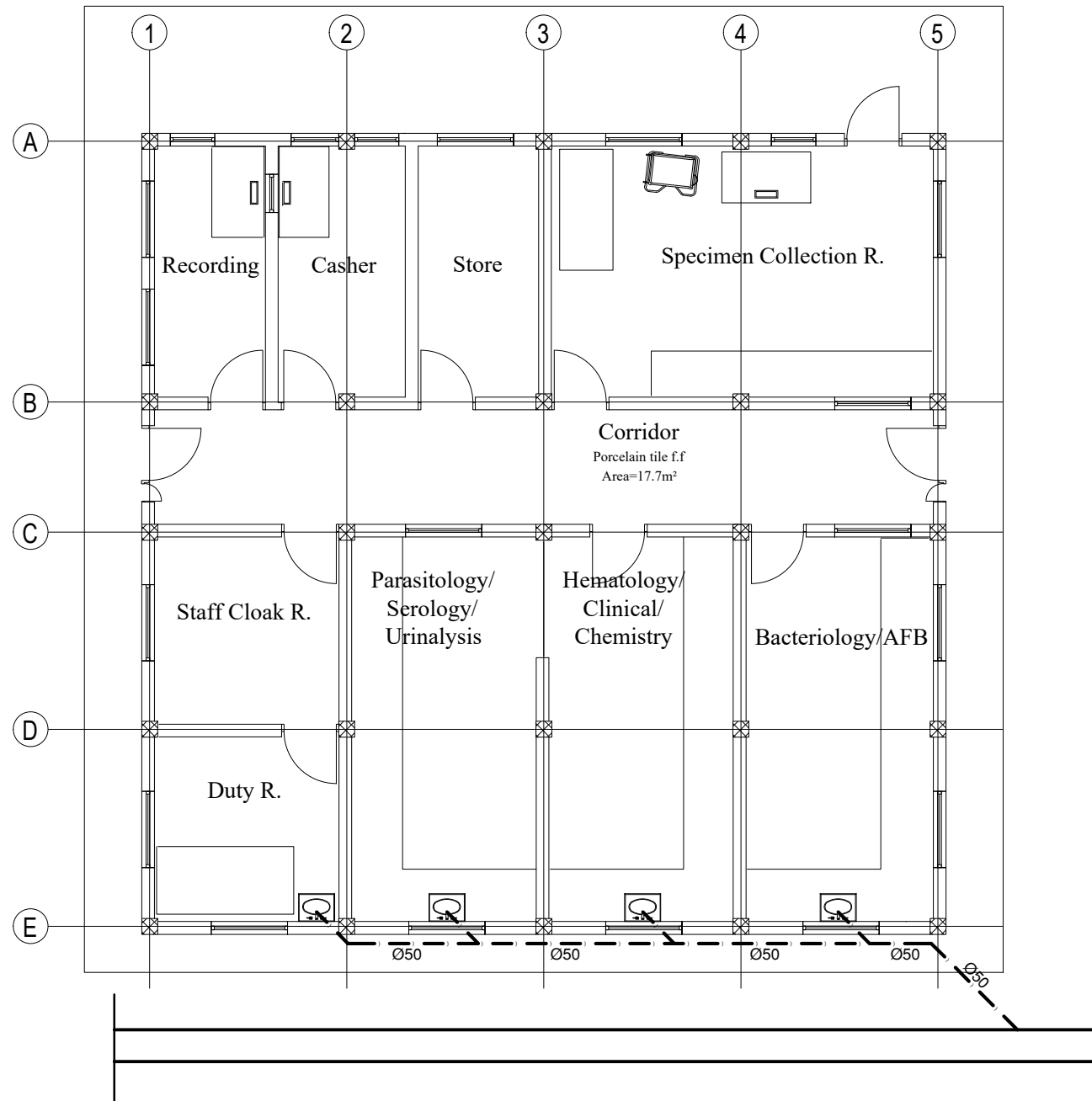
Designed By:
Staff

Signature:
Staff

Checked By:
Staff

Measurement unit:
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 Scale:
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 Date: **Aug-2023**
 Project No.:

Drawing No.
EL 01/01
 Paper Size
ISO A1



GENERAL NOTES

No.	REVISION / ISSUE	DATE

Key Plan:

SANITARY DESIGN

Project Name:
Gambela Primary Hospital

Project Address
Location: Gambela
Sub city: Kebele / Wereda: ---
Parcel No.: - House No.: -
Title Deed no.: -----

Project Owner:
CUAMM - Doctors for Africa

Drawing Title:
Sanitary Detail

Project Status:
 New Modification As Built

Designed By:
Staff

Signature:

Drawn By:
Staff

Checked By:
Staff

Measurement unit:
 mm cm mtr

Scale:
1:50

Date: **Aug-2023**

Project No.: -----

Drawing No.
SN 01/01
Paper Size
ISO A1