



Agricultural Research Council
Plant Health and Protection
P/Bag X134, Queenswood, Pretoria 0121

PLANT PATHOGEN QUARANTINE FACILITY UPGRADE

BID SPECIFICATION CRITERIA

- **PROJECT LOCATION**

Agricultural Research Council - Plant Health and Protection
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SECTION ONE – BRIEF OVERVIEW

1.1 BACKGROUND

The ARC - Plant Health and Protection (ARC-PHP) is upgrading an existing, but largely disused laboratory complex in order to conduct research on quarantine plant pathogens in support of agriculture in South Africa. Work done within the facility will require accurate and reproducible controlled environments to allow for repetitive physiological experiments on a variety of crops (e.g., maize, wheat, sunflower, vegetables) and ornamental plants. This will require the accurate control of light intensity, relative humidity, and temperature but, as the facility is being upgraded to conduct experiments involving restricted quarantine micro-organisms, these will need to be provided whilst maintaining strict containment at all times. To this end, upgrades will also support the eventual implementation of quarantine mechanisms including controlled airflow, access control and the decontamination of all waste produced by the facility (i.e., wastewater, exhaust air, etc). The envisioned renovations and upgrades will thus enable the laboratory complex to operate as a BSL3 (Biosafety Level 3) post-entry quarantine facility that is secure, fit for purpose, and consistent with international best-practices and standards. Furthermore, the completed facility will need to conform to the regulations set out by the Department of Agriculture, Land Reform and Rural Development (DALRRD Directorate: Inspection Services) for post-entry quarantine facilities operating in South Africa (i.e., Biosafety level 3 for plants [BL3-P]).

The aim of the facility is to grow plants and perform research on plant quarantine organisms, for example, but not limited to:

1. Study of pathogen-host interactions.
2. Screening of breeding lines against agriculturally important disease under quarantine conditions.
3. Production of infected seed lots and subsequent development and validation of detection protocols; includes various different bacterial pathogens as well as viruses and viroids.
4. Fungicide efficacy and resistance.
5. Testing of chemical and biological products on crops for increased yield and disease resistance.
6. Study of insect vectors of plant diseases.

1.2 CURRENT STATUS

The existing laboratory complex is now largely unused and in a state of disrepair. Of importance, however, is the fact that some sections of the facility were originally designed for, and previously used as quarantine growth rooms. As such, a number of features normally incorporated into the design and construction of post-entry quarantine facilities are already present. The complex is highly compartmentalized, already has walk-through shower facilities, integrated ducting for air-circulation, drainage separate from the rest of the building and is isolated in terms of location from the routine campus activities and workflow (see also Appendix 1.1). Nevertheless, some renovations and upgrades are needed in order to return the facility to a fully operational state that adheres to modern quarantine standards.

Integral to this proposal is the expansion of the original quarantine envelope to encompass areas surrounding these quarantine growth rooms to include a fifth, and much larger growth room, as well as additional laboratory and storage space, thus consolidating these areas into a single facility. In order to make these additional areas fit for purpose, minor renovations are required and upgrades to a number of items such as lighting, climate control and monitoring, flooring, laboratory benching and growth-room shelving are needed. The addition and modernization of other features are also required to bring the facility up to BSL3 standards. Foremost of these will be the installation and commissioning of an air-handling system (incorporating air extraction via HEPA filters, negative air-pressure gradients within the facility and in situ HEPA filter

decontamination), upgrades to the drainage system and integration with a wastewater decontamination system, upgrades to doors and the installation of an access control system.

1.3 CONSTRUCTION PHASES

Although the objective of this project is to upgrade the current laboratory complex to a fully operational BSL3 quarantine facility, circumstances dictate that this be accomplished in two phases. These phases will be distinct from one another but cannot be independent of one another. Upgrades and renovations done during Phase One must be completed in such a way as to support the installations in Phase Two. Specifications for the entire project are provided herein (see Section Three) but construction elements separated into their respective phases as below:

Phase One - Facility design and renovation:

Phase One will finalise the design of the facility (including Phase Two elements) and complete much of the proposed renovation work and upgrades to fixtures and fittings. Work done during this phase is intended to provide a consolidated, and so far as possible, fully renovated and operational laboratory complex, but without certain BSL3 elements installed.

Phase Two - Quarantine integration and commissioning:

Phase Two will involve the installation of outstanding equipment and fixtures needed to achieve a BSL3 rating, as well as the commissioning of the completed quarantine facility.

PLEASE NOTE:

PROPOSALS FOR THIS TENDER SHOULD COST ONLY THOSE ELEMENTS INCLUDED IN PHASE ONE.

A proposed separation of construction elements into either Phase One or Two is provided in Section Three of this document. However, bidders should include or omit elements from Phase One if doing so will aid in the practicality and efficiency of construction, reflect a cost saving, or increase the functionality of the facility at the completion of Phase One. Clear reasoning must be given for moving items between phases. Please note the CIDB grading for the current tender.

SECTION TWO – GENERAL REQUIREMENTS

2.1 GENERAL CONDITIONS

A professional service provider in the construction industry is required by ARC-PHP for the renovation of an existing laboratory complex. The complex is to be upgraded with the eventual goal of functioning as a quarantine facility with a containment level of BSL3 (DALRRD Directorate: Inspection Services BL3-P) upon completion of Phase Two.

All costs for the completion of Phase One to be included in the current tender as line items in a quote. This should follow, as far as possible, the numbering and layout of the tables contained in section three of this document to enable comparison between bids. Additional/optional costs to be line itemised as well – and indicated as optional or recommended in quote.

No 'bill of quantities' will be supplied and prospective bidders are responsible for verifying all measurements and quantities.

Retention of a contingency amount of 10% of the total value of the tender, including additions, will be retained for a period of 6 months.

If sub-contractors are used for any portion of this tender, the bidder should include the contractor's details as part of the bid.

2.2 SITE INSPECTIONS

All prospective service providers are to attend a compulsory site meeting with the ARC-PHP representative before submitting quotations. Any aspects of the tender document not clear will be discussed during the site visit. Details of this meeting (date and place) will be communicated at a later date. Failure to attend this meeting or inspection will lead to the bidder being automatically disqualified.

The service provider shall inspect and examine the site and its surroundings and satisfy himself/herself before submitting his/her quotation as to the nature of the site so far as is feasible. This should include, but not be limited to, the nature of the work required, the layout of the building complex, quantities, existing equipment, fixtures and fittings, means of access to the site, etc. In general, the bidder shall obtain all necessary information as to the risks, contingencies and other circumstances which may influence or affect his/her work.

It remains the service provider's responsibility to arrange for labour, transport, off-loading, storage and safe keeping of material, workshop provisioning, scaffolding, equipment and tools required for the execution of the work in general. No claims arising (in terms of money or time) from a lack of knowledge in this regard will be considered.

The service provider shall be deemed to have satisfied himself/herself before submitting the quotation as to the correctness and sufficiency of his/her quotation for the works, rates and prices he/she has stated in the quotation shall cover all his/her obligations under the work to be done for the proper completion of Phase One.

2.3 GUARANTEES

The service provider shall guarantee the installation, workmanship, materials and mechanical equipment used under this building project for a period of twelve (12) months. The guarantee will commence on the date of receipt of the total and completion of Phase One.

During this guarantee period the service provider should also avail themselves to answer technical questions regarding installations/renovations completed in Phase One, should the need arise during the construction of Phase Two.

2.4 OCCUPATIONAL HEALTH AND SAFETY ACT, 1993 AS AMENDED

All work must be done in accordance with the conditions as set out in the Occupational Health and Safety Act, 1993 (Act 85 of 1993) as amended. All staff should be properly equipped with the appropriate personal protective equipment and a designated OHS officer should be present on site at all times.

2.5 USE OF WATER AND ELECTRICITY

WATER:

The service provider should note that one or more of the following sub clauses shall apply to this project. On serviced sites, the service provider may use water free of charge, subject to the following:

1. All the necessary temporary plumbing, connections, etc., shall be done by the service provider at his/her own expense and removed on completion. The site shall be left in the same condition as it was when originally handed over to him/her.
2. Before submitting his/her quotation, the service provider shall acquaint himself/herself with the extent and availability of the water supply on site. If the existing supply is found insufficient, the service provider will at his/her own expense supplement any shortage.
3. Water will be supplied free of charge to the service provider, but shall only be used for execution of the work and under no circumstances for any other purpose. Strict precautions shall be maintained at all times to prevent any waste.
4. The ARC-PHP shall at all times be given preference with regard to the water supply and the service provider shall be held responsible for the unimpeded supply to existing buildings.
5. No monetary claim and/or claim in respect of the prolongation of time shall be conceded if the water supply does not at all times meet the service provider's requirements.

ELECTRICITY:

The service provider must note that one or more of the following sub-clauses shall apply to the project. On serviced sites, the service provider may use the electricity free of charge, subject to the following:

1. All essential connections, supply and installation of connections and safety apparatus, wiring, etc., shall be done by the service provider at his/her own expense and removed on completion. The site shall be left in the same condition as it was when originally handed over to him/her.
2. The above-mentioned temporary work shall be performed by a qualified electrician according to the requirements and to the total satisfaction of the ARC-PHP. The service provider shall at all times comply with all statutory requirements, safety measures, etc. that may apply to the distribution and consumption of electricity, as well as the requirements and obligations that may apply to the ARC-PHP and shall exempt the ARC-PHP from any claims that may arise from the consumption of electricity from existing supplies.
3. Before submitting his quotation, the service provider shall acquaint himself/herself with the extent and

availability of the electricity supply to/on the site. If the existing supply is found insufficient, any shortage shall be supplemented by the service provider at his own expense.

4. Electricity will be supplied free of charge to the service provider, but shall only be used for execution of the work and under no circumstances for any other purpose. Strict precautions shall be maintained at all times to prevent any waste.
5. ARC-PHP shall at all times be given preference with regard to the electricity supply and the service provider shall be held responsible for the unimpeded supply to existing buildings.
6. No monetary claim and/or claim in respect of the prolongation of time shall be conceded if the electricity supply does not at all times meet the service provider's requirements.

2.6 PROVISIONAL PROJECT PLAN

Bidders to provide a provisional project plan to accompany their quotes for this tender. This should outline their design concept of the envisioned building at completion (i.e., including both Phase One and Two). The plan should demonstrate an understanding of quarantine containment principles to underpin the proposed construction elements and new equipment to be used and, so far as is feasible, should address all the requirements described within this document. All renovations and new utilities, benching, ducting, access controls, trunking, etc., should be clearly indicated or described. Furthermore, bidders should endeavour to demonstrate how their work completed during Phase One will be compatible with the requirements of Phase Two. This project plan must also indicate a timeline with deliverables for the completion of Phase One only. ***Non-submission of a provisional project plan would be deemed as non-compliance and the bid will be removed from the process.***

2.7 UNAUTHORISED PERSONS

The service provider shall at all times keep un-authorized persons strictly away from work areas. Under no circumstances may any person be allowed to sleep or keep any possessions (material) on the building site during the project period or thereafter unless prior arrangement is made.

2.8 DISTURBANCE

The existing buildings on the site will be in use during execution of the contract and the service provider shall make allowance for the convenience and safety of ARC-PHP employees and clients. The ARC-PHP provides essential services to a number of industry stakeholders; construction work must be executed in such a manner that it will not have negative impact this service delivery.

The service provider shall perform all work with as little noise and mess as possible and with the minimum disturbance to adjacent and existing buildings and their occupants. He/she shall keep the site, structure, etc. sufficiently wet at his/her own expense during the operations to prevent dust and shall provide and erect all necessary dust-screens to protect the occupants of adjacent and existing buildings, all to the satisfaction of ARC-PHP.

The service provider shall take all the precautions to protect adjacent buildings from damage and he/she alone shall be held liable for any damage to persons or property because of insufficient precautions.

The service provider shall alert ARC-PHP security whenever they are on site (i.e., supervisor daily sign in at security), must take the necessary steps to ensure that the workers do not wander around in existing buildings unless necessary for their activities. All personnel to be clearly identifiable at all times when on site.

The service provider shall comply with the requirements of any laws or regulations relating to the use of

explosives and air-pressure drills.

PLEASE NOTE:

After acceptance of a bid, a final detailed site preparation plan should be submitted to ARC-PHP prior to the expected commencement date. All information required for the accurate preparation of the site, for example, utility inputs/outputs, cable thicknesses, KW/Amp required, measurements, concrete strength, location of site office, activities, etc., must be clearly indicated and specified within this document.

It shall be the service provider's responsibility to arrange for an inspection of the buildings and adjacent sites in the presence of the ARC-PHP's representative to identify any defects such as cracks, etc., in buildings, rainwater canals, kerb stones, etc., that may possibly be further damaged during execution of this project.

Such defects shall be recorded to refute any allegations that they have been caused by the building operations under this project. If such defects are in fact present, the service provider shall record them and submit this in writing to the representative before work commences. If the service provider fails to inform the representative in writing, it shall be assumed that there are no such defects.

2.9 SITE MEETINGS AND PROCEDURES

A weekly site meeting is to be held throughout the duration of the project to discuss progress and a site book must be kept of discussions at these meetings. ARC-PHP shall reserve the right to convene an additional site meeting at any time as required. The service provider and site manager shall promptly attend all site meetings and ensure that all relevant persons under his/her supervision are notified timely.

2.10 PROGRESS SCHEDULE

Once appointed and within three (3) weeks after the site has been handed over, the service provider shall submit to the ARC representative a fully detailed project programme or schedule in which all aspects of the work have been taken into consideration to complete Phase One. Strict adherence to the provisions of this programme shall be required and the service provider shall report any deviations and/or future deviations to the ARC-PHP representative and submit a new programme indicating variations during their weekly site meetings. It is desirable for all work to be completed within a maximum of six months from date the site is handed over.

If the service provider wishes to deviate from the contract period specified, he/she shall obtain the written permission, as per weekly discussion, of the ARC-PHP and a penalty clause of 5% of the total value of the contract will be initiated for each additional week extending past the project plan dates presented to the ARC-PHP.

2.11 ALTERATIONS AND OLD FIXTURES

With the demolition and removal of existing structural components, the utmost care shall be taken to avoid any damage to the remaining parts of the buildings or equipment. The contractor shall repair any damage that may occur during the undertaking of this work at his/her own expense, to the full satisfaction of the ARC-PHP.

Old materials or fixtures removed via alterations, except if specifically described to be re-used, remain the property of the ARC-PHP. These may not be used in the new construction, except with the specific written permission of the representative, with the concomitant adjustment of prices. Old fixtures shall remain the property of the ARC-PHP and the service provider shall store these on site. The ARC-PHP representative will point out a suitable storage location.

2.12 RUBBLE

The service provider shall make provision for the clearing of rubble from work areas and, on completion, removal of all rubble from site. Cleaning of all machine rooms and the scrubbing of all floors and paving shall leave the site in a clean and perfect condition for immediate use and occupation. Care should be taken not to use any cleaning agents or material that could damage the surfaces being cleaned.

2.13 IMPLEMENTS, ETC.

The service provider shall supply, maintain and remove on completion, or if requested, all implements, scaffolding, tools, etc., that may be required for the execution of this work. On completion of the project, the service provider shall remove at his/her own expense all construction implements belonging to him/her or his/her subcontractor, and leave the building site and adjacent grounds in a clean and orderly condition.

2.14 LOSS

The contractor shall be liable for any loss due to theft or damage of materials used for the project as well as the contents of the buildings from the time the site is handed over, and until completion. Therefore, the service provider shall take the necessary precautions for protection against such losses.

2.15 PROTECTION OF BUILDINGS

The service provider shall make provision for the protection of the site and adjacent areas. This shall include the use of temporary screens, canvas, dust sheets, gutters, outlet pipes, drainage ditches, storm water canals, etc., and the pumping of water where necessary to keep all parts of the building free of dust and water.

The service provider should erect a temporary drywall in the non-quarantine passage outside the main entrance to separate the work site from adjacent ARC-PHP offices and laboratories that will be in use during the project.

He/she shall also make provision for the temporary protection of all completed work, and existing or new apparatus that may be damaged by further construction work or by other contractors, to the satisfaction of the ARC-PHP representative and for the duration of the project.

The service provider shall be held solely responsible for any damage to ARC-PHP infrastructure because of insufficient precautions.

2.16 INJURY TO PERSONS

The service provider will be responsible for injuries to persons and indemnify the ARC-PHP against any liability, loss, claim or law-suit of any nature in accordance with the Common Law or Acts of the Republic, on account of an injury or death due to acts of a person undertaking this work, except where the injury arises on account of actions undertaken by personnel of the ARC-PHP.

2.17 QUALITY OF PAINT

Paints used must be at least of industrial standard as prescribed by the relevant SANS-specifications and must be approved by the ARC-PHP representative prior to use. Empty containers must be disposed of according to the appropriate safety legislation.

2.18 MAINTENANCE AND TRAINING

Bidders to provide details on the lifespan of the new facility and a proposed maintenance schedule for all equipment and components therein. Bidders to indicate items requiring regular technical support after the

completion of the project, provide a checklist and proposed maintenance schedule for these items and whether this technical support is located in South Africa.

Full initial on-site training in English is to be included as part of the proposal for systems within the facility, with dates to be set after consultation with ARC-PHP personnel to schedule training on site (± 3 people) upon completion. It is desirable to have training and instructional manuals provided in English during the training session.

All software installation disks, keys, dongles, or other requirements for legal operation of the system must be provided to the ARC-PHP upon installation (in English). Additional details to be provided: Is the software proprietary? If so, will the licence be retained by the bidder or installer or will it lie with the ARC (preferable)? Will future updates or renewals require additional cost? Envisioned costs, if any, of these upgrades or renewals should be indicated. Details of the Operating System the instrument is running. Details of additional software, if any, which could be offered for additional functionality.

2.19 SPECIAL CONDITIONS

The ARC-PHP reserves the right to select or omit elements or line items presented herein as the budget or scope of the project permits.

Bidders are to provide a company profile and at least three (3) contactable (e-mail or phone) references of clients for whom similar work was done.

All work done and materials used must comply with the Occupational Health and Safety Act, as well as the relevant National building regulations and South African National Standards. Where regulations demand, certificates of compliance to be provided for work done.

See Section Four for additional compulsory requirements for prospective bidders and documents to accompany bids.

COVID-19:

The appointed service provider will be responsible for the safety of their employees and must take all possible precautions to prevent transmission of the disease whilst on site. Cloth masks should be worn by all staff at all times, and $\geq 70\%$ alcohol-based hand sanitiser made available at designated points. Staff should submit to daily screening including a temperature check before accessing the site each day. Physical distancing between staff should be maintained as far as possible around both the work site and break areas. It is encouraged that daily routines be implemented to clean and disinfect all 'high-touch' surfaces and equipment. Should a staff member become ill on site and later test positive for COVID-19, the service provider will be responsible for the proper sanitisation of the site (e.g., fumigation). All national regulations and restrictions imposed by the South African Government must be adhered to for the duration of the project.

SECTION THREE - DESIGN

3.1 PHASE ONE: TECHNICAL SPECIFICATIONS

NO.	TECHNICAL SPECIFICATION [PHASE 1]	QTY.	UNIT PRICE	TOTAL COST
1	DESIGN AND LEGAL REQUIREMENTS			
1.1	Prospective bidders to provide a provisional project plan to accompany their bids which should include a design concept of the envisioned building at completion (i.e., including Phase 1 and Phase 2). So far as is feasible, this should address all the requirements described herein, with all renovations and new utilities, benching, access controls, trunking, etc., clearly indicated or described.	<i>To accompany bid</i>		
1.2	A floor layout (not to scale) is attached for reference (Appendix 1) – the bidder shall verify all measurements indicated on the plan, and described herein. The ARC will not be held liable for any incorrect measurements and/or losses.			
1.3	For containment purposes it is essential that piped systems (water, air conditioning runoff, sewage, etc.) and trunking (electrical, networking, air conditioning ducting, etc.), should be installed with a minimal number of intrusions through the quarantine envelope (i.e., to the outside of the building). All intrusions should be tightly sealed (air-tight), on both sides of the barrier, with a durable caulking material, e.g., silicon, etc., Where possible the finish of the caulking material must be smooth and unbroken to facilitate easy inspection. Where possible access to the utilities should be easily available for maintenance, when required. Where feasible, supporting apparatus (such as pumps, heating, cooling and ventilation equipment, serviceable components of the autoclave, etc.) is to be located outside the quarantine envelope to minimize the need for service personnel to enter the facility.			
1.4	The ARC retains the right to accept/reject or propose alterations to the design(s).			
1.5	The final facility design must adhere to all specifications as indicated within this document, and as per the requirements for BL3-P facilities. Additional information on the minimum requirements for a containment facility for plant pathogen work (BL3-P facility) can be obtained on the South African Department of Agriculture, Land Reform and Rural Development website: (https://www.dalrrd.gov.za/Branches/Agricultural-Production-Health-Food-Safety/Genetic-Resources/Biosafety/Services/Guideline-Documents) under “Guidelines for work with genetically modified organisms” (Laboratory guidelines are on page 24 (focussing on micro-organisms) and the plant biosafety levels are on page 40, under the section ‘Containment measures for GMO’s conducted in greenhouses’). Bidders are also encouraged to read “A Practical guide to containment” by D. Adair and R Irwin (ISBPracticalGuidePlantContain.pdf) for more information, and which can be downloaded at: https://vtechworks.lib.vt.edu/handle/10919/78423.			

NO.	TECHNICAL SPECIFICATION [PHASE 1]	QTY.	UNIT PRICE	TOTAL COST
	The regulations set within the above-mentioned regulatory frameworks, have been specified within this document but bidders are encouraged to confirm they are within the specifications for BL3-P (or above). The specifications as stipulated here are mandatory unless higher specifications are mentioned in the BL3-P guides.			
1.6	Bidders should clearly indicate in their proposals any improvements to the proposed design elements and equipment specified herein, where those changes will increase the overall functionality, safety, efficiency and usability of the facility, and/or a cost saving.			
2.	SCHEMATIC DRAWINGS, BUILDING PLAN AND RECORDS			
2.1	Regulatory compliance: Preparation and submission of all notices, drawings, and the building plan for the proposed renovations to the municipality for approval (as or if necessary), prior to the commencement of work on Phase 1.			
2.2	Final designs for all mechanical works (i.e., the air-handling, electrical, cooling and wastewater treatment systems), detailing their constituent elements where relevant (e.g., ducting, HEPA filtration, air-pressure gradients, etc.), and confirming that the specified criteria demanded of each system will be achieved with the proposed design, to be signed off by a suitably-qualified, professional (ECSA, CESA) registered engineer prior to the commencement of work.			
2.3	A detailed layout/schematic drawing of the facility needs to be supplied upon completion of Phase 1 of the project (excl. Phase 2 components). This is not only to allow easy maintenance of systems within the facility, but also to provide evidence to the regulatory bodies of the different systems, their installations and the actions taken to ensure containment. Please indicate: - Internal and external construction, including all dimensions, insulation, walling, trunking, doors, materials list, etc. - All penetrations into and out of the structure, i.e., ports, trunking, plumbing, networking, etc., must be clearly indicated on the layout. - Photographic proof of specific treatments performed, e.g., treated surfaces before painting, proof of sealing, etc. - Electrical layout of facility, including wiring, trunking, control systems, probe locations, facility lighting, etc. - Water layout of the facility with directional flows, including incoming water, and positions of directional controls/barriers, drains, filters water sterilisation apparatus, etc. - Environmental control system of the facility outlining: - Temperature control: Air-conditioning systems, their isolators, ducting, circuits, controls, probes, etc. - Air input and exhaust system: For bringing fresh air into the facility, all ducting needed to support the air-handling unit to be installed in Phase 2. - Light control system for growth rooms, locations of plugs on each circuit, additional moveable lighting units, tubing/trunking, switches, etc. - Furnishing layout within the facility, including shelving, benches, water basins, equipment (listed), etc.			

NO.	TECHNICAL SPECIFICATION [PHASE 1]	QTY.	UNIT PRICE	TOTAL COST
	6. Emergency exit plan and emergency equipment: Locations of emergency doors, notifying equipment, fire extinguishers, etc.			
2.4	Records of inspections during construction: Records of weekly meetings and inspections must be submitted upon completion of construction. The signing off of any remedial actions, as well as of milestones contained in the progress schedule must be clearly indicated. A copy of the site book must be supplied.			
2.5	Certification of key features on completion of Phase 1: Bidders are also to demonstrate key features, supply appropriate certification documentation and/or evidence that the required specifications herein have been met. These must include: 1. Maintenance of required temperatures and relative humidity. 2. Light intensities ($\mu\text{mol.m}^{-2}.\text{s}^{-1}$).			
2.6	Manuals, training and guarantees: Upon completion of work, all instruction manuals, software keys, passwords, written guarantees and warranties of newly installed equipment and materials must be provided. Training of ARC-PHP staff must also be undertaken where necessary.			
3.	WALLS AND CEILING			
3.1	All wall, ceiling, and door solutions must be: 1. Resistant to repeated washing and decontamination with penetrating liquids and chemicals (bleach and caustic solutions). 2. Impenetrable to microbes. 3. Resistant to long-term moisture exposure. 4. Rust proof. Walls and ceilings throughout the facility to be repainted with white exterior enamel paint with the exception of the airlock/baffle that is to be painted black. Growth areas' walls, doors and ceilings should be painted with waterproof, anti-fungal and highly reflective (e.g., gloss white exterior enamel) paint for additional light reflection. This should not fade or discolour in the presence of the high intensity growth lights.			
3.2	All penetrations into the structure, i.e., wall, ceiling or floor, shall be sealed - as per regulations - to ensure containment and facilitate negative pressure within the facility. Proof to be supplied on products used, photos, etc.			
3.3	New brickwork: 1. Lower height of doors and remove windows around main entrance / baffle area - new brickwork, lintels and door frames (see point 7 - Doors connected to the main entrance / baffle or 'air-lock'). 2. Construction of new wall to close in laboratory 2 to separate it from the baffle and external non-quarantine passage. Installation of an observation window (s) in this wall approximately $\pm 1200\text{mm} \times 1000\text{mm}$ (double pane or toughened $\geq 8\text{mm}$ thick glass, sealed airtight) [see also Appendix 1.4]. 3. Demolition of interior toilet walls and new brickwork to close access to toilet from exterior (baffle side), (i.e., to enable access to toilets from the interior of quarantine without passing through the shower), - new brickwork, lintels and door frames [see also Appendix 1.4].			

NO.	TECHNICAL SPECIFICATION [PHASE 1]	QTY.	UNIT PRICE	TOTAL COST
	4. Removal of old autoclave, dipping tank and fume extraction cabinet (incl. ducting) - Provision of new door in place of autoclave (new brickwork, lintels, door, door frame) to allow access from the entrance corridor to laboratory 1; installation of a window in place of dipping tank ($\pm 1200\text{mm} \times 1000\text{mm}$, 6mm double pane laminate); seal extraction cabinet (new brickwork).			
4	FLOORING			
4.1	The flooring must be: 1. Resistant to repeated washing (abrasion resistant) and decontamination with penetrating liquids and chemicals (bleach and caustic solutions). 2. Impenetrable/ impervious to microbes such as bacteria and fungi that may degrade wood or other organic products, as per regulations. A monolithic, i.e., a one-piece floor cover, is highly desirable. To this end industrial epoxy or similar, without joints is highly recommended. If joints have to be inserted, these have to be just as impenetrable/ impervious to water, chemicals, microbes, etc., as the product. Details on all treatments of the floor, below and under the covering, to be provided and proof once constructed. 3. The edging should also be coved (100 mm up onto the walls) to allow easy cleaning. The top of the edging should be well worked off and sealed to maintain containment and seal – an aluminium strip is proposed (details to be provided). 4. Resistant to long-term exposure to moisture, fertilisers, growth mixes, heavy tables, human traffic, etc. usually found in growth areas. 5. Resistant to slippage when wet. 6. Maintenance details of this surface sealing to be provided – if any.			
4.2	Sturdy, level and lined with the appropriate solution that conforms to the specifications set out within this document, without lifting, leaking, etc., while under high moisture conditions, while remaining easy to clean. Able to carry heavy loads, such as plant shelves of more than $\pm 350\text{ kg}$ per square meter. The floor must be able to support these weights without damaging or warping.			
5	WATER SUPPLY AND DRAINAGE			
5.1	Additional water points or necessary extension of existing lines must be surface mounted. A 15 mm copper line is proposed with brass fittings.			
5.2	Threaded taps (to allow the attachment of a hosepipe) must be fitted within the growth areas. These should be securely mounted to the wall at an ergonomic height of $\pm 900\text{ mm}$ for easy access when in use.			
5.3	A water source and drainage solution for the steam outlet is required for the autoclave in its new position on the external wall of the facility. Provisions must be made in the design to accommodate this. A closed system is highly recommended.			
5.4	Floor drain outlets within the growth rooms to be modified to encompass a screen and soil trap (filter sock). These should be stainless steel, top serviceable, with removable components to enable easy cleaning. A water seal in the decontamination system is recommended.			

NO.	TECHNICAL SPECIFICATION [PHASE 1]	QTY.	UNIT PRICE	TOTAL COST
5.5	The drainage piping grade/substances must be corrosion resistant and able to handle all decontamination and sterilization chemicals used within the facility, which includes, but are not limited to: bleach, fertilisers, chemical decontamination treatments, formaldehyde, etc.			
5.6	All vents to drainage system must be fitted with filters (preferably 0.2 micron hydrophobic membrane filters).			
6.	WASTEWATER TREATMENT			
6.1	In Phase 2 of this project a water decontamination system is to be installed in the basement of the facility prior to the exit of the combined drain outlets for the entire facility (excl. toilets) - see point 2, Phase two: Technical specifications. Although this installation is scheduled for Phase 2, any alterations and upgrades to the drainage system done in Phase 1 need to be done in such a way as to facilitate the integration of such a system, as well as all the eventual drainage alterations that will be required for Phase 2.			
7	DOORS			
7.1	Installed doors must contribute to the security and physical containment of the facility. All doors should be: 1. Self-closing (door closers), gasketed around entire perimeter, sturdy (e.g., wood or aluminium framed), and have insulating properties. 2. All doors should fit tightly against the jamb and have a sweep at the threshold. A standard door sweep must be included on all internal doors, consisting of a strip of neoprene or rubber. Where possible this should close against a raised profile at floor level. 3. Doors connected to the main entrance / baffle or 'air-lock' area must maintain an air-tight seal. Magnetic neoprene or silicon seals around the entire perimeter of the door must seal tightly against a 360° stainless steel frame (i.e., airlock or 'submarine' doors). 4. All doors must also be lockable by key. Three copies of each key, clearly labelled with the room designation, are to be supplied during handover of the facility. This would be an added security measure if the access control system experiences any problems. 5. The main entrance door, airlock baffle door, as well as the entry door to each growth room should be compatible with the access control system to be installed in Phase 2 - see point 3, Phase Two: Technical specifications.			
8	ALARM, ACCESS-CONTROL, EMERGENCY NOTIFICATION/MONITORING AND COMMUNICATION SYSTEMS			
8.1	An alarm system, access-control system, emergency/environmental monitoring system, and communication system are to be installed in Phase 2 - see points 3, 4, and 5, Phase Two: Technical specifications. Consideration of these systems should be given during Phase 1 in terms of any alterations or penetrations that may be required.			

NO.	TECHNICAL SPECIFICATION [PHASE 1]	QTY.	UNIT PRICE	TOTAL COST
	It is desirable that any control interface or monitoring panels (with the exception of the alarm system activation panel to be located outside the main entrance) be located in the entrance corridor.			
9	BENCHING AND SHELVING			
9.1	Laboratory benching/shelving: A standard benching design is proposed: Bench dimensions: 760 mm (depth) x 900 mm (height), fixed to walls around circumference of laboratories. Bench surfaces to be white in colour, scratch, stain and chemical resistant, and waterproof. Supported by steel epoxy / powder coated frames with adjustable screw in feet. Suspended cabinets (8) are desirable incorporating both drawers and cupboards. A galvanised steel mesh-grating bench is required for work with soil, etc. Bench dimensions: 760 mm (depth) x 900 mm (height) x 2500mm (length). Additional wall mounted shelving units (8) without doors [approx. 400 mm (depth) x 750 mm (height) x 1200mm (width)], free-standing storage cupboards (4) with glass doors [approx. 400 mm (depth) x 2000 mm (height) x 1200mm (width)], and wall mounted shelving solution (2 walls in the storeroom, 400 mm depth) to be supplied and installed. Additional stainless steel sinks to be installed as per specifications (See 4.1, 5.1, and 9.1, in section 3.2. Phase One: Facility description and proposed activities). Drainage holes must be stainless steel, top serviceable, contain a large, removable particle sieve and be closable. See also Appendix 1: 1.4 Proposed alterations and fixture layout. All furnishings must be resistant to chemical decontamination products, water absorption and suitable for repeated usage.			
9.2	Shelving in growth rooms: Repair/repaint ('make good') water damaged feet, corroded sections, screws, fixtures etc. Finish must be resistant to corrosion from chemical decontamination, fertilizers, irrigation water, etc. Incorporation of pre-existing shelving is strongly encouraged. Dimensions of individual shelf levels: 4380 mm (l) x 750 mm (w). Growth rooms 1 – 4: Two shelving levels per wall-mounted shelf, 2 shelf units per room attached lengthwise to opposite walls - total of 4 shelving levels / irrigation zones per room. Growth room 5: Two shelving levels per wall-mounted shelf, 3 shelf units per room attached lengthwise to opposite walls as well as one freestanding unit running lengthwise in the centre of the room - total of 10 shelving levels / irrigation zones. 1. New lighting to be suspended or mounted onto shelves. However, removal or adjustment of individual zones of lights will be required and the design must incorporate this. 2. Removable drip trays, 1460 mm (l) x 750 mm (w) x 50 mm (d) x 1,2mm (t) stainless steel (316), with a 15 mm diameter 50 mm long drainage pipe outlet, must be manufacturer for each of the shelves (to protect light			

NO.	TECHNICAL SPECIFICATION [PHASE 1]	QTY.	UNIT PRICE	TOTAL COST
	banks on lower shelves). Drains must be designed to allow draining to a common rear mounted pipe with sufficient fall to enable water to drain straight to the floor drain (Grated-mesh covered channels cut into the floor may be required). An optional chemical resistant plastic solution – if cheaper than the stainless steel solution – with the same specifications, can also be provided. Envisioned design is attached (Appendix 3). Bidders to provide drawings or description of their design(s) on offer for approval.			
10	NOTICES AND SIGNAGE			
10.1	Aluminium framed noticeboards (A4) - with reusable opening and closing frames and plastic cover – should be placed outside the entrance to the facility, as well as on the outside of each growth room door within the facility (total of 7). This is as per legislation requirement for notices to users/visitors entering the facility. Additional frames must be installed in strategic locations indicating emergency escape routes or exit plan for the facility - positioning to be communicated. A copy of the emergency plan should also be posted outside the entrance of the facility.			
10.2	Engraved Perspex room labels or similar (Approximate dimensions: 30 x 6 cm) should be placed on each door (total of 13), e.g., “Tissue Culture / Seedlings Incubator”, or “Growth Area 1”, etc. Exact designations to be communicated.			
10.3	All safety signage, as stipulated within this document and by legislation, needs to be provided and installed where required, at the standard required.			
10.4	Emergency arrows should be installed in all rooms to indicate the exit plan within the facility.			
11	FIRE PREVENTION			
11.1	Fire extinguishers to be placed outside the entrance to the facility (1), in each laboratory (2), entrance corridor (1), in the wash-up area (1) and in the passage outside the growth rooms (1). Appropriate signage should be provided and installed.			
11.2	Certificate of compliance in accordance with appropriate legislation to be provided prior to hand-over at the end of Phase 1.			
12	ELECTRICAL			
12.1	It is desirable for the facility to use the existing DB board boards. Certification to compliance to modern standards. System must be linked to onsite generator back-up.			

NO.	TECHNICAL SPECIFICATION [PHASE 1]	QTY.	UNIT PRICE	TOTAL COST
12.2	All systems required for maintaining containment and climate control are required to be on the emergency generator backup system and / or have their own battery backups or UPS systems.			
12.3	All circuits must be clearly labelled at both the switches/isolators and on the DB board.			
12.4	Additional power trunking can be surface mounted where possible. All trunking to be sealed with silicone to ensure containment.			
12.5	Certificate of compliance in accordance with appropriate legislation to be provided prior to hand-over of Phase 1.			
12.6	Growth rooms: 1. Trunking within the growth areas should be installed is near the top, close the ceiling where feasible for safety reasons. Details to be provided. 2. General plugs (Crabtree), or safety plugs with switches, are proposed for each of the shelving lights (watertight housings). 3. Not more than 4 plugs may be on the same circuit breaker. 4. Bidders to provide sufficient number of plugs for the lights proposed to be used within each area (see point 13 below), as well as at least three additional plugs per room - one extra plug will be for additional lighting and should be on the same day/night circuit as the current light installations. The other extra two plugs should be on constant power. 5. Each growth area must be on its own light control system that would control all the lights (including additional plug for lights) within that area to obtain the desired day/night cycles. Individual plug switches at the power skirting level could be used to deactivate individual lights if required.			
12.7	Laboratory area: 1. All trunking to be installed above the benching standards (1,200 mm is recommended) and in accordance with the safety regulations. A single/double trunking at the ceiling could be surface mounted for utility routing. 2. Bench trunking in laboratory 1 to provide an additional 8 plugs and 4 additional plugs in laboratory 2. 3. All the appropriate plugs, circuits, breakers, etc., required for the indicated infrastructure (including those to be installed under Phase 2 - i.e., pass-through autoclave, air-handling unit, wastewater decontamination system) and equipment (i.e., fridges, freezers, etc.), able to cope with their loads, to be provided, installed and commissioned during phase 1 as far as possible. 4. General plugs (Crabtree), or the appropriate rated plugs should be used. 5. Not more than 4 plugs may be on the same circuit breaker. 6. All isolators, plugs, etc., installed within the trunking must have an additional 1m "slack" on the circuit where feasible to allow additional movement if required.			
12.8	An access-control system employing magnetic locks to be installed in the airlock/baffle, and a 'shower in use' signal and air-dehumidifiers in the shower rooms is to be installed in Phase 2 - see points 3, and 9, Phase Two: Technical specifications. Consideration of these systems should be given during Phase 1 in terms of any alterations or penetrations that may be required to supply these systems with power.			

NO.	TECHNICAL SPECIFICATION [PHASE 1]	QTY.	UNIT PRICE	TOTAL COST
13	LIGHTING			
13.1	General lighting: Recommended lighting intensities for laboratories (± 1000 LUX), passages and service rooms (± 800 LUX) shower rooms (± 600 LUX): 1. Replacement of existing fixtures with modern energy efficient, sealed fluorescent fixtures (electronic ballasts) or equivalent lighting. Additional lighting may be required to meet desirable light levels in laboratory areas. 2. Manual white light switches (make good existing where possible). 3. All lights must be on the emergency circuit.			
13.2	Growth lights (inside growth rooms, high output): This is a facility for plant growth and manipulation. Plant growth lighting is therefore extremely important for the success of the facility. The following minimum requirements are placed on the high-intensity LED lighting to be supplied for the growth areas: 1. Ensure that the supplied LED light solution could run on standard single phase South African power (± 220-240V, 50Hertz). 2. Light fixtures for plant growth facilities, with 5W LED lights or larger, to be supplied and installed. 3. A minimum of 3 year or longer warrantee on lights to be provided. 4. Each growth room must be on its own light control system that would control all the lights within that area to obtain the desired day/night lengths (timers). Individual plug switches at the power skirting level could be used to deactivate individual lights if required. 5. Lights will be used for both plant growth and flowering and should therefore be fully balanced on the red (± 630-680nm) and blue (± 430-480nm) wavelengths to achieve this. Additional wavelengths (white (480-630), NIR/IR, UV, etc) for other light harvesting structures would be highly beneficial. Percentages should be approximately 15-20% blue, 60-70% red and 10% of the other wavelengths. Bidders are encouraged to investigate "LumiGrow", "Black Dog LED" or "LG Mars II" as possible providers of lighting units. LEDs used in these light units should be from reputable suppliers like CREE, Osram, etc. 6. All the relevant heat removing systems (fans and heat sinks) to be included in the fixtures. 7. Lights to be mounted in two horizontal planes per shelving rack, and must be removable and be adjustable up/down to within 500mm above the shelf level (See shelving diagram – Appendix 3). 8. A minimum of $1,000 \mu\text{mol.m}^{-2}.\text{s}^{-1}$ PPFD (photosynthetic photon flux density) light is required at the top of the plants in the photosynthetically active region (PAR) (400-700nm) if the light source is 500 mm above it, while maintaining the 1,200mm x 750mm footprint. This performance is to be demonstrated upon delivery. 9. The proposed supplier (company) and model, light outputs, wavelengths produced, mounting height for optimal usage, watt inputs, optimal area enlightened by the unit, heat output (BTUs), etc., and other information to be supplied as part of the offer. 10. Life expectancy as well as any maintenance (if required) to be indicated. A minimum of three years warranty on these high-end lights is required. 11. The availability of spares, location of support and envisioned down time expected for breakdowns, to be indicated.			

NO.	TECHNICAL SPECIFICATION [PHASE 1]	QTY.	UNIT PRICE	TOTAL COST
	12. Lights to be safe for operating within a growth facility (i.e., high-humidity environment). Documentation to be supplied with bid. 13. Bidders to provide solution with regards to practical and cost effective design and arrangement of lighting fixtures around pre-existing shelving units (see also point 9.2, Phase One: Technical specifications and Appendix 3).			
14	CLIMATE CONTROL			
14.1	Laboratory areas: Wall mounted split unit air conditioning units (2) must be supplied, installed and commissioned for each laboratory to achieve the desired temperature range (20-30°C). Condensation outlet to be routed to a drainage point / basin within quarantine. Compressor/inverter to be positioned on outside of building adjacent to facility (<i>NO exchange of air between inside and outside quarantine areas</i>). R410A gas should be used. External units must be installed ≥1900 mm above the ground. Units to be placed on galvanised racks/brackets that are secured to the outside wall. Details on offer to be supplied.			
14.2	Growth rooms: Bidders to provide a solution to obtain the specified temperatures and relative humidity within each growth room as described below. Built-in redundancy in the system and utilisation of pre-existing refrigeration units where feasible is strongly encouraged (pictured below).  Temperature: 1. Individually set and adjustable. 2. All growth areas must be automated and individually adjustable for: a. Different time periods, and b. Different temperatures for these periods, i.e., allow night and day-time temperature settings, e.g., 18h @ 25°C day and 8h @ 20°C night or 12h @ 25°C day and 12h @ 22°C night, etc. 3. Growth areas must be adjustable between a constant 10°C and 40°C (±2°C maximum deviation). 4. Temperature settings on controllers must not change during a power outage, i.e., not reset to default settings during power outages/generator activation – ‘Last-state-memory’. Once power is restored, the controlled set temperatures for that time period must be active.			

NO.	TECHNICAL SPECIFICATION [PHASE 1]	QTY.	UNIT PRICE	TOTAL COST
	5. It is recommended that a growth room or greenhouse specified control system be used for the environmental control of each growth room within the facility, i.e., to control at least: a. Day/night length, b. Day/night temperature, c. Digital data logging of above parameters obtained from control measurements would be desirable for each growth room. Compatible with emergency notification / remote monitoring system desirable (e.g., MONNIT system). Relative humidity: Relative humidity should be maintained in the growth rooms between 40-70%.			
14.3	All penetrations to be sealed on both the entrance and exit points with the appropriated sealant. Draining of units to be channelled to internal drains for decontamination.			
14.4	It is further advised (<i>optional</i>) to install double capacity air conditioning or solution on offer, in the bigger growth area to act as backups in the case of one system going down and for redundancy.			
15	AIR HANDLING SYSTEM, NEGATIVE PRESSURE AND AIR-FILTERING			
15.1	An air-handling system incorporating negative pressure gradients within the facility and HEPA filtration of exhaust air is to be installed in Phase 2 - see point 7, Phase Two: Technical specifications. Consideration of these systems should be given during Phase 1 in terms of any alterations or penetrations that may be required. <u>This is especially relevant to any modifications, alterations or additions to the pre-existing ducting</u> (pictured below).  It is desirable that any control interface or monitoring panels for these systems be located in the entrance corridor.			

NO.	TECHNICAL SPECIFICATION [PHASE 1]	QTY.	UNIT PRICE	TOTAL COST
16	IRRIGATION SYSTEM			
16.1	Automated drip irrigation system to be designed, installed and commissioned in each growth room servicing all shelving zones. Growth rooms 1-4: 4 Independently programmable irrigation zones per room (1 per shelving level; 2 levels on opposite walls). Growth room 5: 10 Independently programmable zones.			
16.2	The system should comprise of the following elements: 1. Each shelving level or irrigation zone to cater for 72 potted plants - see also Appendix 3, 3.2 (Total for rooms 1-4: 288 pots each; Room 5: 720 pots). 2. Self-closing and pressure compensated 8 litre/hour CNL drippers (Netafim) to be used, each dripper delivering water through micro tubes (4mm) and pegs to 4 pots. 3. Associated supply pipes (15-20mm – Class 3 LDPE), filters, clamps, and other fittings to be installed. Supply pipes to be neatly mounted to rear of shelving unit closest to the wall. 4. Water supply from storage/ feeder tanks within each room fitted with appropriate pump/ pressure regulator to ensure sufficient pressure to provide 2 litres per hour per plant pot throughout the entirety of each irrigation zone.			
16.3	Storage/feeder tanks (5) connected to water source to be supplied and installed in each growth room - Rooms 1-4: ≥260 litre plastic Jojo tank; room 5: ≥500 litre plastic 'slimline' Jojo tank. Tanks to be fitted with the necessary inline pre-filters and shut-off valves, must have an automated filling mechanism, be mounted on appropriate galvanised steel platforms (≥500mm above floor level); and be fitted with a tap at the base of each.			
16.4	Appropriate valve manifold with a pressure regulator to be designed and fitted to distribute water from storage/feeder tank to each irrigation zone: One solenoid valve (24 volt inline solenoid valve with flow control) per irrigation zone, or equivalent plants - see also Appendix 3, 3.2.			
16.5	One controller to be fitted per growth room (e.g., Rainbird F55324 ESP-RZXE 4 station indoor irrigation controller or equivalent).			
16.6	See proposed design Appendix 3. Bidders to provide drawings of their design(s) on offer for approval.			
17	AUTOCLAVE			
17.1	A new double-door pass-through autoclave is to be installed in Phase 2 - see point 8, Phase Two: Technical specifications. Consideration of the placement of the autoclave, electrical supply and a drainage solution should be given during Phase 1. Provision for insulation, electricity (380V, 3-phase, 32A/phase - specification to be confirmed), water supply and drainage (withstand 100°C) for the autoclave in the proposed new position to be incorporated into bids.			
17.2	It is preferable that the new autoclave be installed in the storeroom in place of the window already installed between the storeroom and non-quarantine passage (minor modifications may be needed). <i>As a second</i>			

NO.	TECHNICAL SPECIFICATION [PHASE 1]	QTY.	UNIT PRICE	TOTAL COST
	<i>option</i> the exterior wall in laboratory 1 can be knocked through to the non-quarantine passage to accommodate future installation of the autoclave. This should be done in Phase 1 and a temporary drywall fitted in this hole to ensure laboratory one is secure until the autoclave can be installed in Phase 2. Under this second scenario the window in the storeroom to be bricked up.			
18	ADDITIONAL ITEMS			
18.1	Four (4) storage locker units to be installed in shower rooms (1 either side of the shower). Each locker unit to consist of ≥ 10 individual lockers approximately 300mm (l) x 300mm (d) x 400mm (h), lockable with solid doors (i.e., no glass doors).			
18.2	Commercial air curtains (3) to be fitted above the door from laboratory 2 to the airlock/baffle, and above each door from the entrance corridor to the quarantine clothing storage (1200mm wide, ≥ 170 Watts, ≥ 1600 m ³ of air per hour).			
18.3	A temporary drywall to be erected in the non-quarantine passage adjacent to the edge of laboratory 2 to physically separate the work site from adjacent ARC-PHP offices and laboratories. This should be removed prior to the hand-over of Phase One. Exact positioning to be discussed.			

3.2 PHASE ONE: DESCRIPTION OF PROPOSED ACTIVITIES

This section includes a proposed breakdown of activities to be undertaken per room or area during Phase One. Specifications underpinning each activity are listed in the section above. Costs for labour can be specified in this section or if already incorporated into pricing above, this costing can be omitted here.

NO.	ACTIVITY DESCRIPTION	[PHASE 1]	QTY.	UNIT PRICE	TOTAL COST
1	MAIN ENTRANCE				
1.1	i. Lower height of door and remove windows (new brickwork, lintel), installation of outer airlock/baffle door, magnetic seals and sub-frame. ii. Door size must accommodate movement of large machinery, plant trolleys, etc into facility (dimensions to be confirmed). iii. Placement of fire extinguisher. iv. Installation of the temporary drywall in the non-quarantine passage.				
2	AIRLOCK / BAFFLE				
2.1	i. Entire baffle area to be painted black (including ceiling) (exterior enamel weatherproof, fungal resistant paint) with the exception of the floor. ii. Seal any service gaps/inspection hatches, etc. iii. Floor resurfaced using industrial epoxy covering, coved edges. iv. Fit internal airlock/baffle doors (x4 = 2 shower room doors, laboratories 1 and 2).				

NO.	ACTIVITY DESCRIPTION [PHASE 1]	QTY.	UNIT PRICE	TOTAL COST
	v. Lower height of doors and remove windows (new brickwork, lintels, wall around door to laboratory 2), installation of doors, magnetic seals and sub-frames where necessary. vi. Doors to shower rooms and laboratory 2 standard size, door to laboratory 1 to accommodate movement of large machinery, plant trolleys, etc., into facility (standard height, full width of baffle - dimensions to be confirmed). vii. Install appropriate signage. viii. Make good light fixtures and switches.			
3	SHOWER ROOMS  			
3.1	i. Complete renovation of both shower rooms - new tiling throughout, fixtures, mirrors, taps, and basins. ii. Demolition of interior toilet wall and new brickwork to close access to toilet from exterior (baffle side) - to enable access to toilets from the interior of quarantine without passing through shower. iii. Repaint walls and ceiling (white exterior enamel weatherproof, fungal resistant paint). iv. Flooring (incl. showers) resurfaced using industrial epoxy covering, coved edges. v. Installation of storage locker units vi. Make good/replace light fixtures (sealed fixtures), switches, achieve specified LUX levels.			

NO.	ACTIVITY DESCRIPTION	[PHASE 1]	QTY.	UNIT PRICE	TOTAL COST
4	ENTRANCE CORRIDOR				
4.1	i. Repaint walls and ceiling (white exterior enamel weatherproof, fungal resistant paint). ii. Seal any service gaps/inspection hatches, etc., iii. Flooring - resurfaced using industrial epoxy covering, coved edges. iv. Install appropriate signage (i.e., notices and escape plan). v. Make good/replace existing light fixtures (sealed fixtures), switches, achieve specified LUX levels. vi. Make good/upgrade doors and seals (incl. door sweeps and closers) on shower room access doors, new door to laboratory 1 and growth rooms 1-4. vii. Installation of new door into laboratory 1, and windows looking into laboratories 1 and 2 using existing openings (6mm laminated glass, airtight seal). viii. Installation of air curtains above each shower room access door. ix. Make good growth room (1-4) DB boards - certification of wiring to modern standards. x. Removal and replacement of old sink - new sink, taps, bench, wall-mounted shelf. xi. Installation of two freestanding cupboards. xii. Placement of fire extinguisher.				
5	LABORATORY 1				

NO.	ACTIVITY DESCRIPTION [PHASE 1]	QTY.	UNIT PRICE	TOTAL COST
5.1	i. Repaint walls and ceiling (white exterior enamel weatherproof, fungal resistant paint). ii. Seal any service gaps/inspection hatches, etc. iii. Flooring - resurfaced using industrial epoxy covering, coved edges. iv. Install appropriate signage (i.e., notices and escape plan). v. Make good/replace existing light fixtures (sealed fixtures), switches, achieve specified LUX levels. vi. Knock through exterior wall (to non-quarantine passage) to facilitate future installation of the new autoclave to be installed in Phase 2 [as option]. Install electrical power, water supply, drainage and temporary drywall. vii. Install split-unit air conditioner. viii. Installation of benches, suspended cabinets, wall mounted shelves and additional basin. ix. Install bench trunking, electrical wiring and additional plug points (8), as well as computer network link. x. Placement of fire extinguisher. xi. Removal of old autoclave, dipping tank and fume cabinet (incl. ducting) - Provision of new door in place of autoclave (new brickwork, lintels, door, door frame); installation of a window in place of dipping tank ($\pm 1200\text{mm} \times 1000\text{mm}$, 6mm double pane laminate); seal fume cabinet (new brickwork).			
6	WASH-UP AND STORAGE 			
6.1	i. Repaint walls and ceiling (white exterior enamel weatherproof, fungal resistant paint). ii. Seal any service gaps/inspection hatches, etc. iii. Flooring - resurfaced using industrial epoxy covering, coved edges. iv. Install appropriate signage (i.e., notices and escape plan). v. Make good/upgrade doors and seals (incl. door sweeps) on wash-up access door. vi. Make good/replace existing light fixtures (sealed fixtures), switches, achieve specified LUX levels. vii. Install double stainless steel sink (depth $\geq 300\text{mm}$) with splash guard, benches, suspended cabinets, and wall mounted shelf. viii. Install wall mounted shelving solution in storage room (2 walls), and seal up existing window (new brickwork). ix. Placement of fire extinguisher.			

NO.	ACTIVITY DESCRIPTION	[PHASE 1]	QTY.	UNIT PRICE	TOTAL COST
7	REAR CORRIDOR AND GROWTH ROOM ACCESS				
7.1	i. Repaint walls and ceiling (white exterior enamel weatherproof, fungal resistant paint). ii. Seal any service gaps/inspection hatches, etc. iii. Flooring - resurfaced using industrial epoxy covering, coved edges. iv. Install appropriate signage (i.e., notices and escape plan). v. Make good/replace existing light fixtures (sealed fixtures), switches, achieve specified LUX levels etc. vi. Installation of two freestanding cupboards and steel mesh-grating bench. vii. Make good/upgrade doors and seals (incl. door sweeps and closers) on all passage, and growth room doors 1-5. viii. Placement of fire extinguisher.				
8	GROWTH ROOMS (1-5)	 			
8.1	i. Repaint walls and ceiling (white exterior enamel weatherproof, fungal resistant paint). ii. Seal any service gaps/inspection hatches, etc. iii. Flooring - resurfaced using industrial epoxy covering, coved edges.				

NO.	ACTIVITY DESCRIPTION [PHASE 1]	QTY.	UNIT PRICE	TOTAL COST
	iv. Install appropriate signage (i.e., notices and escape plan). v. Make good/replace existing light fixtures (sealed fixtures), switches, achieve specified LUX levels. vi. Repair/repaint ('make good') water damaged feet, corroded sections, screws, fixtures, etc., on pre-existing shelving units. vii. Fitting of new plant growth light panels, drip trays and drip tray drainage system. viii. Install irrigation system with all associated controls, taps, fittings, piping, etc.. ix. Installation of storage/feeder tanks with all associated platforms, fittings, taps, etc. x. Make good existing basins [growth rooms 1-4]; install new double sink (depth ≥300mm) and benching solution beneath window in growth room 5. xi. Retrofit floor drainage (additional drainage channels) and existing floor drains to accommodate 'drainage sock'. xii. Verification/service of existing cooling units. Certification of wiring to modern standards. xiii. Installation of all necessary electrical wiring, trunking and sensors (temperature and relative humidity). xiv. Service and verification of refrigerator units - certification of specified environmental variables.			
9	LABORATORY 2 			
9.1	i. Repaint walls and ceiling (white exterior enamel weatherproof, fungal resistant paint). ii. Seal any service gaps/inspection hatches, etc. iii. Flooring - resurfaced using industrial epoxy covering, coved edges. iv. Install appropriate signage (i.e., notices and escape plan). v. Make good/upgrade doors and seals (incl. door sweeps and closers) on access door to growth room 5. vi. Make good/replace existing light fixtures (sealed fixtures), switches, achieve specified LUX levels. vii. Construct new wall to close in laboratory 2 and separate it from the external non-quarantine passage (new brickwork). Install observation window (s) (±1200mm x 1000mm – double pane or toughened ≥8mm thick glass, sealed airtight) in this wall. viii. Install split-unit air conditioner. ix. Installation of air curtain above access door to airlock/baffle.			

NO.	ACTIVITY DESCRIPTION [PHASE 1]	QTY.	UNIT PRICE	TOTAL COST
	x. Removal and replacement of old sink - install new sink, taps, bench, wall-mounted shelf. xi. Install additional electric wiring, trunking and plug points (4), as well as computer network link. xii. Placement of fire extinguisher.			

3.3 PHASE TWO: TECHNICAL SPECIFICATIONS

PLEASE NOTE:

Specific items listed under Phase Two are for reference and should not be costed under this tender.

NO.	TECHNICAL SPECIFICATION [PHASE 2]
1	SCHEMATIC DRAWINGS AND RECORDS UPON COMPLETION
1.1	A detailed layout/schematic drawings of the facility needs to be supplied upon completion of Phase 2 of the project. This is not only to allow easy maintenance of systems within the facility, but also to provide evidence to the regulatory bodies of the different systems, their installations and the actions taken to ensure containment. This layout, together with the one provided at the end of Phase 1 will be required to obtain approval from the Regulator to operate the facility, and as such needs to provide clear dimension and penetration sites into/out of the containment envelope, and should further indicate the: 1. Security layout of the facility which must include: a. Access control system and its layout, i.e., fingerprint readers, trunking/ tubing, control system, battery backups, power supplies, emergency notification devices, etc. b. Alarm system, including door contactors, sensors, keypads, alarm unit, battery backups, power supply, tubing, alarm notification lighting and siren, etc. 2. Environmental control system of the facility outlining: a. Air-handling system: For bringing fresh air into the facility, all ducting, dimensions, ratings and capacity, and locations of fans, HEPA filters etc. Air movement within the facility, indicating direction of air movement and pressure differentials between the different areas.
1.2	Certification of key features on completion: Bidders are also to demonstrate key features, supply appropriate certification documentation and/or evidence that the required specifications herein have been met. These must include: 1. Alarm and warning system activation. 2. Door access controls. 3. Negative pressure gradients.

NO.	TECHNICAL SPECIFICATION [PHASE 2]
	4. Proper functioning of sterilisation systems (wastewater, autoclave). 5. Treatment of exhaust air (HEPA filter certification). Facility air leakage rate.
1.3	Manuals, training and guarantees: Upon completion of work, all instruction manuals, software keys, passwords, written guarantees and warranties of newly installed equipment and materials must be provided. Training of ARC-PHP staff must also be undertaken where necessary.
2.	WASTEWATER TREATMENT
2.1	A water decontamination system must be supplied, installed and commissioned at the exit of the combined drain outlets for the entire facility (excl. toilets). This system can be located in the basement/service void beneath the facility so it can be gravity fed and must employ the following elements: Contaminated water entering the system must first pass through a UV sterilisation tube (± 1000 litres/hr, delivering $\geq 80 \text{ mJ/cm}^2$, with an integrated 'sleeve wiping system' – details to be confirmed), following which water to pass through a particle filter(s) to screen out larger debris. Access to the UV sterilisation tube and particle filter must be easy for servicing but lockable. Water then to be routed to sealed storage reservoir. A stainless steel reservoir/tank with total volume of $\pm 1000 \text{ L}$ or larger is proposed. Access to this tank (but securable and lockable) is required to allow the depositing of chlorine floating chemical treatment if needed. Wastewater from the reservoir should then be heat sterilised in batches at 121°C for ≥ 20 minutes via an adjacent automated 36 kW boiler system. Once sterilised and cooled, water can be released into the general farm sewer system (See also Appendix 2 for drainage pipe routing at present (2.1) and proposed layout (2.2) to facilitate these upgrades). The proposed system must be secure, sealed and tamper proof, with no way for contaminated water to leave prior to treatment, while allowing easy maintenance and access. The decontamination system must sit within a waterproof concrete trough or basin large enough to hold the cumulative contents of the entire system should any of the above elements rupture or leak. The lining of this trough should be resistant to chemicals (chlorine, formaldehyde, etc.). Bidder to provide solution (design and details on offer, especially on the maintenance of containment, treatment access, materials used, verification methods, etc.).
2.2	Damaged, cracked or corroded pipes in the basement/service void need to be replaced or 'made good' so as to ensure containment and the integrity of the drainage system.
3	DOORS AND ACCESS CONTROL
3.1	A fully functional, independent, access-control system incorporating fingerprint readers must be supplied, delivered and installed within the facility. The system must control and log all access within the facility. Multiple access zones (up to 6) must be independently programmable to grant or restrict access to each of these different areas within the facility. The main entrance door as well as the entry door to each growth room should be controlled independently via a controlled access system (fingerprint readers). Within the entrance airlock baffle, the system must also prevent more than one door being open at a time (e.g., by employing interconnected magnetic locks).

NO.	TECHNICAL SPECIFICATION [PHASE 2]
3.2	Emergency exit 'break-glass switches' or manual overrides must be installed for exiting through doors controlled by the access system in an emergency. These "break glass" or manual overrides must be linked to the facility's alarm system and must trigger the alarm when used.
3.3	All door access control systems to be on battery backup power in case of an emergency.
4	EMERGENCY NOTIFICATION/MONITORING AND COMMUNICATION SYSTEMS
4.1	A detection, monitoring and notification system – preferably as part of the internal environmental control system, which can detect any loss in power, or deviation from environmental norms (e.g., excessive temperature), or a loss in negative pressure must be installed to provide immediate warning of problems (e.g., MONNIT system or similar). Smoke detectors should be installed in all rooms. Easy on and off switching is required to allow fumigation to take place, especially within the growth areas. Compatible with emergency notification / remote monitoring system is desirable (e.g., MONNIT system). The system must have its own dedicated battery backup.
4.2	The ability to remotely monitor the environmental control conditions within the facility via web-based apps would be of added benefit to bids.
4.3	An external antenna may be required for the emergency notification system. If this system requires its own antenna, then it needs to be installed for a fully functional system. If additional WiFi networking/phone infrastructure can be linked to the above-mentioned emergency notification system, this should be clearly indicated, else an appropriate access port (temporarily closed until needed), with ducting (if required) must be provided and clearly indicated for a WiFi/VOIP phone system(s). Integration with the existing ARC-PHP network and VOIP system is desirable.
4.4	Location of port and possible site for the router and phone, to be indicated in design plan of facility. Integration with the existing ARC-PHP network and VOIP system desirable.
4.5	An intercom/VOIP phone system to be provided to allow communication with personnel within the facility without having to enter the facility. Phones (3) to be located in laboratory 1 and 2, and in the rear corridor. Integration with the existing ARC-PHP network and VOIP system is desirable.
5	ALARM SYSTEM
5.1	An alarm system must be installed within the facility with contactors on all airlock doors (5) and optical sensors for the laboratory areas (2). Compatible with emergency notification / remote monitoring system desirable (e.g. MONNIT system).
5.2	Bidders to ensure that all wiring is within piping/trunking, thus presenting a smooth surface for decontamination. The bidder is to ensure that the alarm solution installed and commissioned is in line with the current security systems and notification services we have on site.
5.3	Proof to be provided by integrating the new facility to the existing security infrastructure (and response) on site.

NO.	TECHNICAL SPECIFICATION [PHASE 2]
5.4	The system must have its own dedicated battery backup with a siren and red light on the outside of the facility to indicate unauthorised access. It would be an added advantage if the system installed would be able to notify the Facility Manager via email/SMS of a breach in security.
5.5	Control panel to be installed outside the main airlock / baffle entrance.
5.6	The ability to assign and use multiple user codes is desirable.
6	NOTICES AND SIGNAGE
6.1	Notice of quarantine restricted area to be posted outside the entrance of the facility - listing regulations, restrictions and responsible or emergency contact personnel - details to be communicated. Sign bearing the official designation of the facility to be installed at the entrance to the facility - details, design and dimensions to be communicated.
7	AIR HANDLING SYSTEM, NEGATIVE PRESSURE AND AIR-FILTERING
7.1	Supply, install and commission an operational air-handling / fresh air replacement system within the facility that is completely isolated from the main building air-conditioning system.
7.2	The extraction system should have an automatic variable speed drive to compensate for increasing filter loads, thereby ensuring constant air supply and uninterrupted negative pressure within the facility.
7.3	Negative pressures must be maintained at a minimum of -25Pa in the baffle/airlock, -50Pa in the laboratories and internal passages, and -65Pa in the growth rooms. It is desirable to have magnehelic gauges (or equivalent) (3) with audible alarm must be centrally located within each pressure zone within the facility to monitor pressure (Deviation from the set-point by ± 10Pa for more than 2 minutes should trigger the alarm). Compatible with emergency notification / remote monitoring system desirable (e.g., MONNIT system).
7.4	It is desirable that the completed facility will be able to operate in two distinct configurations depending on changing research needs - fully BSL3 or a second configuration where laboratory 2 and growth room 5 will be isolated from the main facility and can be operated as a BSL2 laboratory (See APPENDIX 1, 1.2 and 1.3). To this end, it is desirable for growth rooms to be isolated from one another to prevent cross-contamination (i.e., air from one growth room should not be routed through any of the adjacent growth rooms). Of particular importance therefore will be the prevention of air exchange between laboratory 2 and growth room 5, with the rest of the facility when operating under configuration 2 (APPENDIX 1, 1.3).
7.5	All exhaust air must be HEPA filtered before leaving the quarantine containment area. A pre-screen should be used to screen larger particles before air reaches the HEPA filter to maximise the useable life of the filter. It is preferable for the HEPA filter housing to be located outside the physical building so that filters can be replaced without entering quarantine (See also Appendix 1). An appropriate 'in-place' decontamination system is therefore essential. Training to be provided to enable ARC-PHP staff to replace filters if possible. Appropriate certification of the proper functioning of the filter must be given prior to the hand-over of the facility. Two additional filter sets, one set for each filter housing, should also be supplied as part of the bid.

NO.	TECHNICAL SPECIFICATION [PHASE 2]
7.6	Fan motors /assembly to be located outside the facility as far as possible to enable servicing of machinery without entering quarantine. Easy accessibility for inspection and maintenance is desirable. It is desirable for the air-handling unit to be placed in the basement.
7.7	It is desirable that any control interface or monitoring panels for these systems be located in the entrance corridor.
7.8	Bidders to provide solution with regards to practical and cost effective installation of air-handling system (i.e., location, serviceable parts, access to filters, etc. Incorporation of pre-existing ducting is strongly encouraged.
8	AUTOCLAVE
8.1	Install and commission a double-door pass-through autoclave (laboratory 1) necessary to steam sterilise quarantine waste materials such as soil, containers, etc. (Examples include: Getinge Model GE 6610; Systec D-Series Dx-200; Steridium SD 460). Details as below: i. Multiple steam treatments desirable (i.e. $\geq 121^{\circ}\text{C}$ maintained for ≥ 20 minutes at approximately 210kPa, 'Bowie and Dick' cycles, etc. ii. Capacity ± 250 litres. iii. Maintain integrity of quarantine: Electronic control to ensure that both internal and external doors cannot be opened simultaneously; unit properly fitted and insulated with all penetrations and service gaps properly sealed. iv. Validation of treatment efficacy via sensors is desirable.
8.2	Autoclave must be serviceable from outside quarantine (from non- quarantine passage). Bidders to supply recommended maintenance schedule.
9	ADDITIONAL ITEMS
9.1	'Shower in use signal': A system that can indicate when the shower is in use (e.g., a small indicator light outside each shower room access door). A manual switch system is acceptable but a system that is integrated with the access door locks is preferable (i.e., light comes on when doors are locked). Bidders to provide description of their design(s) on offer for approval.
9.2	Air circulation/dehumidifying system for shower rooms to prevent excessive condensation in these rooms. Wall mounted 'condensation' type dehumidifier installed in each room is preferable (e.g., Munters CDP-T 50) (Cannot vent to exterior of building unless HEPA filtered; drainage can be routed to shower or basin drainage). Bidders to provide description of their design(s) on offer for approval.
9.3	UV Insect trap/killer (30 Watt) for airlock/baffle.
9.4	Security fencing to be installed around refrigeration control unit on east side of building. Welded mesh flat panel - 'clear view type' fencing, 2100mm (H), with lockable gate.
9.5	Installation of a water softener (resin and brine tank type) to treat the water supply for the entire facility (Hardness PPM and to be communicated).

3.4 PHASE TWO: DESCRIPTION OF PROPOSED ACTIVITIES

NO.	ACTIVITY DESCRIPTION [PHASE 2]
1	MAIN ENTRANCE
1.1	i. Installation of fingerprint access panel, alarm control panel, and appropriate signage. ii. Integrate with interconnected magnetic lock system (i.e., only one door open at a time in airlock/baffle). iii. Install alarm contactors on main entrance door.
2	AIRLOCK / BAFFLE
2.1	i. Installation of a UV insect trap. ii. Doors - Integrate with interconnected magnetic lock system (i.e., only one door open at a time in airlock/baffle). iii. Fitting of pressure sensor and integration with facility monitoring system. iv. Install alarm contactors on remaining doors exiting the airlock/baffle.
3	SHOWER ROOMS
3.1	Installation of 'shower in use' system and dehumidifying equipment.
4	LABORATORY 1
4.1	i. Install and commission new double-door pass-through autoclave. Validation of treatment efficacy. ii. Installation of alarm system passive optical sensor. iii. Installation of intercom/VOIP phone.
5	REAR CORRIDOR AND GROWTH ROOM ACCESS
5.1	i. Fitting of pressure sensor and integration with facility monitoring system. ii. Installation of access control (fingerprint readers: growth rooms 1-5) and control panels (growth rooms (1-4)). iii. Installation of intercom/VOIP phone.
6	GROWTH ROOMS (1-5)
6.1	Installation of pressure sensors and integration of all sensors (temperature, relative humidity and pressure) into facility monitoring system.

NO.	ACTIVITY DESCRIPTION [PHASE 2]
7	LABORATORY 2
7.1	i. Installation of alarm system passive optical sensor. ii. Installation of intercom/VOIP phone.
8	BASEMENT
8.1	Wastewater treatment system: i. Installation and commissioning of 'wastewater decontamination system' (particle filters, UV steriliser, stainless steel tank, and boiler unit). ii. Inspect/make good existing drainage piping for facility where feasible, new pipes as necessary. iii. Pipes serving quarantine to be painted red (as pictured below), and clearly labelled "Quarantine Containment Pipework - Do not disturb". iv. Isolate/separate quarantine drainage from the rest of buildings drainage. v. Re-route/combine all quarantine piping into a single system to enable all water leaving the facility (excluding the two toilets) to pass through the 'wastewater decontamination system' before reaching main building outlet. Disconnect only the two toilets so as to bypass system - see also Appendix 2, 2.2). vi. Construction and waterproofing of concrete trough around water sterilisation system. 
8.2	Air-Handling unit: i. Installation and commissioning of new air-handling unit, air-extraction, fans and HEPA decontamination systems. ii. Inspect/make good existing ducting where feasible, new ducting as necessary (pictured below). iii. Ducting serving quarantine must be clearly labelled "Quarantine Containment Ducting - Do not disturb". iv. Seal off/separate existing central air conditioning system from all ducting in quarantine facility.

NO.	ACTIVITY DESCRIPTION [PHASE 2]
	
8.3	Fresh water supply to the facility: i. Fitment of one-way valve water supply line (i.e., 'back-flow preventer') installed to prevent any water from running out of the system if breached. ii. Inspect/make good existing water supply pipes. iii. Installation of a water softener (resin and brine tank type) to treat the water supply for the entire facility.
9	SECURITY FENCING
9.1	 Erect welded mesh flat panel ('clear view type') security fencing around refrigeration control unit on east side of building. Include lockable gate.

SECTION FOUR – BIDDING CRITERIA

4.1 GENERAL

- i. **Bidders must provide a provisional project plan to accompany their quotes for this tender.** This should outline their design concept of the envisioned building at completion (i.e., including both Phases One and Two) and also indicate a timeline with deliverables for the completion of Phase One. Proposals demonstrating a thorough understanding of quarantine containment principles, show careful consideration of the facilities requirements and demonstrate compatibility between Phases One and Two will be looked on favourably (see also Section 2, point 2.6).
- ii. The bidder must give a detailed price breakdown for Phase One of the project only. This should follow, as far as possible, the numbering and layout of the tables contained in section three of this document to enable comparison between bids. The ARC has the right to choose or omit certain aspects of the quotation as set out in the specification document.
- iii. The appointed contractor will be responsible for the following:
 - a. All building material (i.e., steel bolts, nuts, cement, sand, and other consumables) and equipment needed (i.e., scaffolding, cement mixers, tools, etc.).
 - b. All labour, transport, etc., necessary to facilitate the project.
 - c. Preparation and submission of plans for approval by the appropriate regulatory authority prior to the commencement of work, and/or as necessary.
 - d. Final designs for mechanical installations, detailing their constituent elements and confirming that the specified criteria demanded of each system will be achieved with the proposed design, to be signed off by a suitably-qualified, professional (ECSA, CESA) registered engineer prior to the commencement of work.
 - e. Provision of onsite training for ARC-PHP personnel on new infrastructure and systems at completion.
 - f. The contractor is responsible for all legal Health and Safety requirements according to the OHS Act until the site is handed over to the ARC-PHP.
 - g. The contractor shall guarantee the installation, workmanship, materials and mechanical equipment used under this building project for a period of twelve months.
 - h. An OHS inspection will take place upon commencement of the project.
 - i. The contractor must also familiarise and adhere to all points described in Section Two of this document.
- iv. Bidders to clearly indicate in their proposals any improvements to the proposed design elements and specified equipment to be installed, where those changes will increase the overall functionality, safety, efficiency and usability of the facility, and/or a cost saving.
- v. The specifications of infrastructure/equipment listed above may contain errors or omissions. Bidders should arrange for a site visit to familiarise themselves with the requirements of the facility and scope of work required prior to submitting their proposals.

4.2 CIDB GRADING

A CIDB grading of 4 ME or GB or above is compulsory.

4.3 OUTSOURCING

Sub-contracting will be permitted. Full details of proposed sub-contractors to be provided with the bid so far as possible. The appointed contractor will remain responsible for ensuring all work carried out by sub-contractors is to a standard in accordance with the specifications/requirements described herein. Selection and appointment of sub-contractors to be done by the appointed contractor, the ARC-PHP will not appoint sub-contractors.

4.4 COMPULSORY REQUIREMENTS OF BIDDERS

- i. Bidders to provide a provisional project plan with this tender.
- ii. The project plan must indicate a timeline with deliverables for the completion of Phase One.
- iii. If sub-contractors are used for any portion of this tender, the bidder should include the contractor's details so far as is possible.
- iv. Bidders are expected to attend a compulsory site visit at the present facility at a specified date to be communicated.
- v. The bidder must give a detailed price breakdown for Phase One of the project only.
- vi. The two envelope tendering system will be followed. The bidding price must be in a separate envelope.
- vii. The bidders shall provide the ARC (accompanying the bid document by the closing date/time) with the following information:
 - a. A company profile.
 - b. A current valid company Tax Clearance Certificate in good standing.
 - c. A current valid CIDB Certificate in good standing.
- viii. Three original reference letters are required for each bidder where that bidder undertook similar projects (i.e., similar scope, for example the renovation or construction of new quarantine containment facilities) that were recently completed (see also 4.5 Evaluation Criteria). The referred work must not be older than seven years. The ARC Evaluation committee has the right to contact these people. Reference letters must be from the client and has to include the following information:
 - a. Name of the business (client's company).
 - b. Location of the project site.
 - c. Contact person who is knowledgeable of the work that was done, including a contact telephone number, cell phone number and e-mail address.
 - d. Description of the type of work done by the bidder including photos of the project and highlighting bidder's role in the project.
 - e. Rand value of the work successfully completed by the bidder and the date of completion.
 - f. Date of the project (completion/commission date).

PLEASE NOTE:

Bidders who fail to submit all of the above mentioned requirements will be disqualified.

4.5 EVALUATION CRITERIA

All bidders and proposals will be evaluated according to compliance with the listed specifications, company 'functionality' of the potential bidder (as per table below), BBBEE level and price. Points will be allocated and weighed on the following criteria and procedure:

1. Compliance with the specification will be evaluated by an ARC appointed Bid Evaluation Committee.

2. Company functionality:

Company functionality:	
• <u>Project team experience:</u> i. <u>Technical capability of personnel</u> The bidder shall include resumes of the project management personnel and sub-contractors that will be assigned to this work and actually be working on the project for its duration. ii. <u>Company resources and support staff resources</u> Organizational structure, staffing and experience of the relevant staff (Incl., resumes).	40%
• <u>Company experience and past performance:</u> Previous experience of the company demonstrated by a list of relevant construction projects that the company has recently completed. Consideration of the scope of work, your company responsibilities during these projects, and their rand value will be used for the evaluation.	30%
• <u>Project plan and capability</u> i. Technical approach, methodology and work plan to achieve the completed project. ii. Manufacturing and construction capacity & ability to conduct the work outlined in the specifications within the desired time frame. iii. Risk management, problems predicted and planned solutions. iv. Quality management (traceable quality inspection/checklist during manufacturing, construction and commissioning). v. Demonstrated knowledge of quarantine containment principles.	30%
TOTAL POINTS	100%

Points for company functionality will be awarded as follows:

2.1 Project team experience:

- 1 point will be allocated to a tenderer whose project team includes experience in construction of laboratory or equivalent facilities.
- 2 points will be allocated to a tenderer whose project team includes experience in project management and construction of laboratory facilities without containment requirements.

- c. 3 points will be allocated to a tenderer whose project team includes experience in architectural design, project management and construction of laboratory facilities with containment requirements.
- d. 4 points will be allocated to a tenderer whose project team includes experience in architectural design, project management, construction and commissioning of quarantine facilities up to a Biosafety Level 2 rating.
- e. 5 points will be allocated to a tenderer whose project team includes experience in architectural design, project management, construction and commissioning of Biosafety Level 3 quarantine containment facilities.

2.2 Company experience and past performance:

- a. 1 point will be allocated to a tenderer who has done projects in supply, delivery, installation, renovation and commissioning of quarantine or similar laboratory structures with a value of up to R500 000.
- b. 2 points will be allocated to a tenderer who has done projects in supply, delivery, installation, renovation and commissioning of quarantine or similar laboratory structures with a value of R500 000 up to R1 000 000 in the last 7 years.
- c. 3 points will be allocated to a tenderer who has done projects in supply, delivery, installation, renovation and commissioning of quarantine or similar laboratory structures with a value of R1 000 000 up to R3 000 000 in the last 7 years.
- d. 4 points will be allocated to a tenderer who has done projects in supply, delivery, installation, renovation and commissioning of quarantine or similar laboratory structures with a value of R3 000 000 up to R6 000 000 in the last 7 years.
- e. 5 points will be allocated to a tenderer who has done projects in supply, delivery, installation, renovation and commissioning of quarantine or similar laboratory structures with a combined value of more than R6 000 000 in the last 7 years.

2.3 Project plan and capability:

- a. 1 point will be allocated to a tenderer who has provided a project plan but has not demonstrated the capability to address the requirements of the project as specified herein.
- b. 2 points will be allocated to a tenderer who has a detailed project plan but has demonstrated capability to address very few of the project requirements.
- c. 3 points will be allocated to a tenderer who has a detailed project plan and has demonstrated the capability to address the majority of the project requirements specified.
- d. 4 points will be allocated to a tenderer who has a detailed project plan and demonstrated capability that addresses all the requirements of the project.
- e. 5 points will be allocated to a tenderer who has an elaborated project plan and has demonstrated capability that addresses all the requirements of the project as stated above, and can give the ARC a value added service (please state what service you can add to this project).

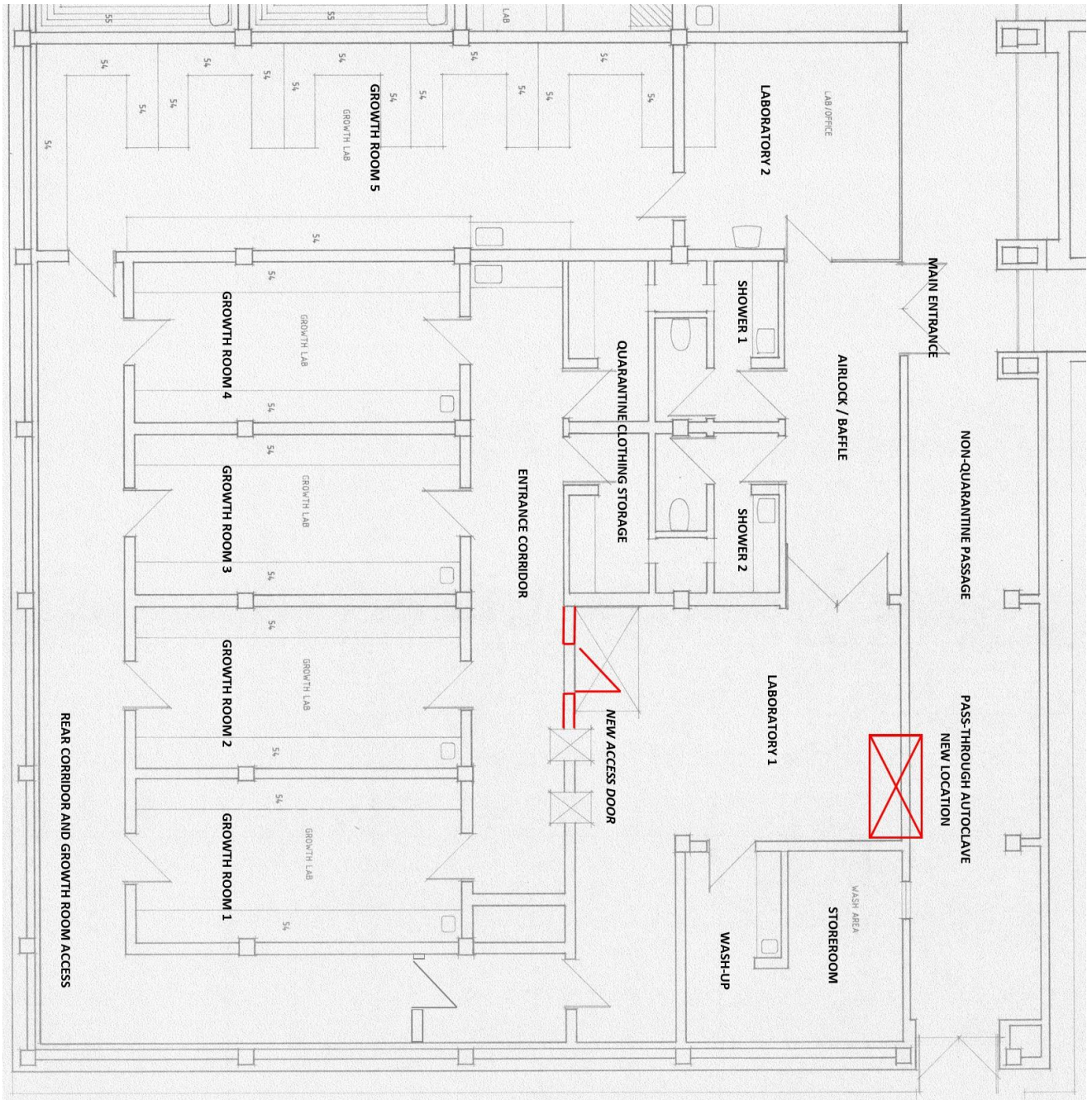
3. Total Score for company functionality

Bids that do not obtain a minimum score of 60% for functionality will be disqualified and will not be evaluated further on price and BBBEE.

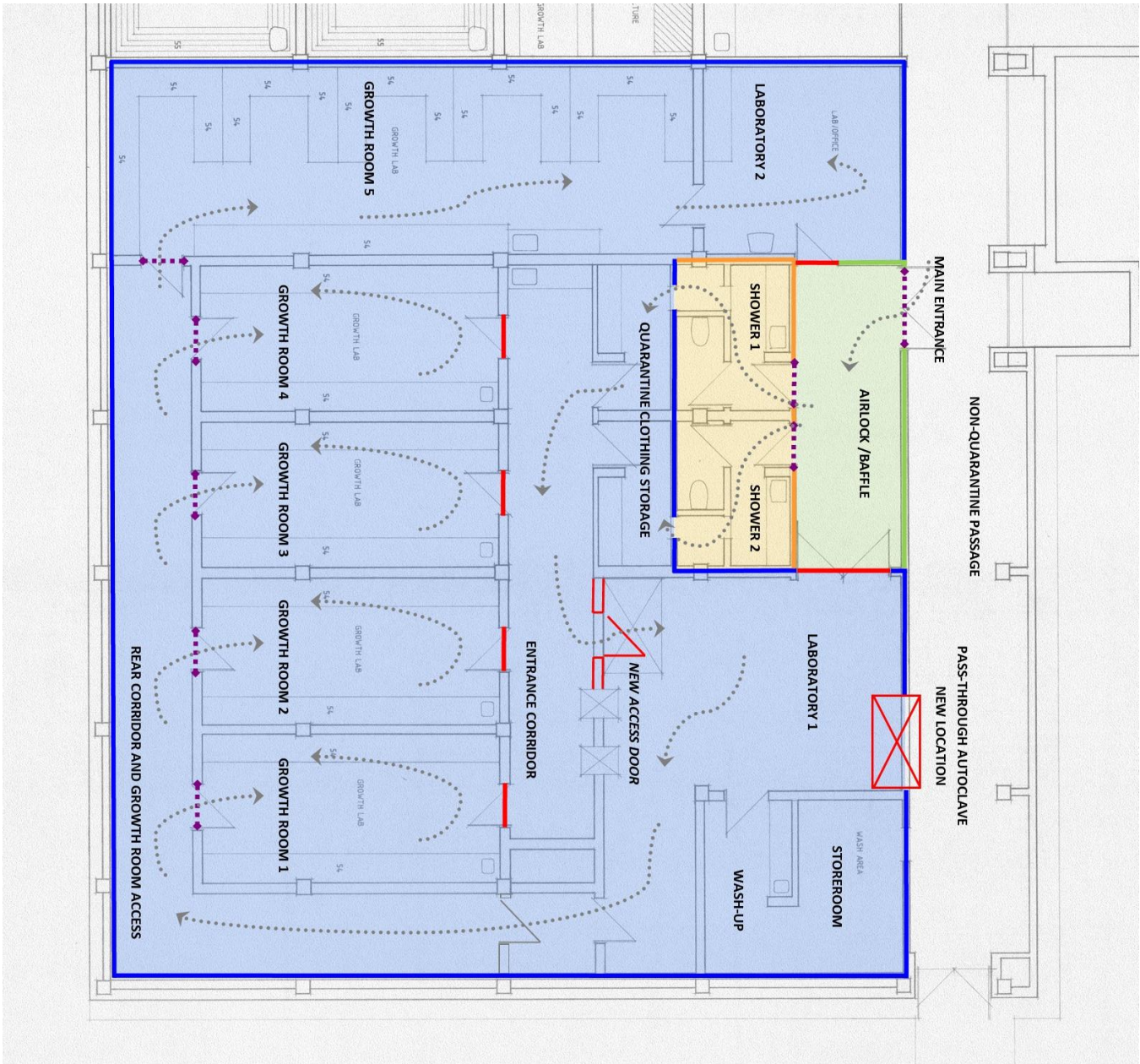
4. Final scoring

Final evaluation will be based on BBBEE score and pricing. 80 Points will be allocated to pricing and 20 Points will be allocated to specific goals in terms of the PPPFMA.

APPENDIX 1 – FLOORPLANS



1.1 BASIC FLOOR PLAN



1.2 CONFIGURATION 1 -

FULLY BSL3

MAIN ENTRANCE BAFLE: Access via main entrance into darkened baffle; interlocking magnetic doors allow entry into either standard-level, or high-level

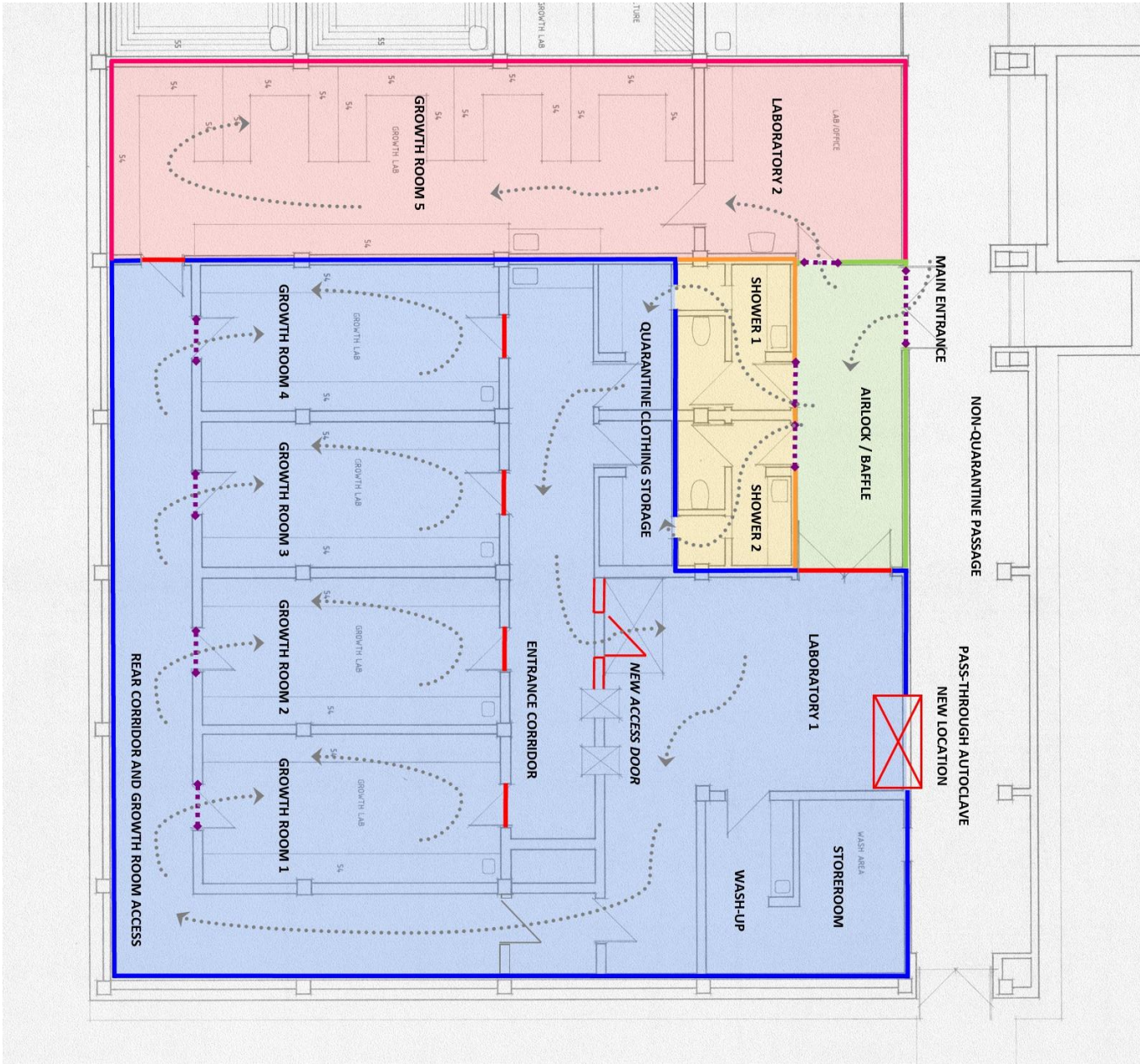
SHOWER AREA: Separate male and female clothes storage, toilet and shower-out facilities.

HIGH-LEVEL CONTAINMENT AREAS: Microbial work areas including laboratory 1, growth rooms (1-4), store room and wash-up area, access to pass-through autoclave and air-handling unit.

LOCKED DOORS: Emergency access only, Large equipment access via main entrance baffle.

ACCESS CONTROLLED DOORS: Authorised fingerprint access, programming and user logging facilitated by computer software.

WORKFLOW: Direction of movement through facility, exit is the reverse of direction indicated.



1.3 CONFIGURATION 2 - INCORPORATING A BSL2

LABORATORY

MAIN ENTRANCE BAFLE: Access via main entrance into darkened baffle; interlocking magnetic doors allow entry into either standard-level, or high-level (through shower area) containment areas.

SHOWER AREA: Separate male and female clothes storage, toilet and shower-out facilities.

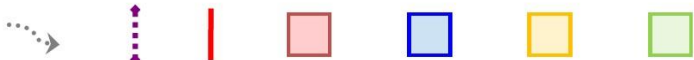
HIGH-LEVEL CONTAINMENT AREAS: Microbial work areas including laboratory 1, growth rooms (1-4), store room and wash-up area, access to pass-through autoclave and air-handling unit.

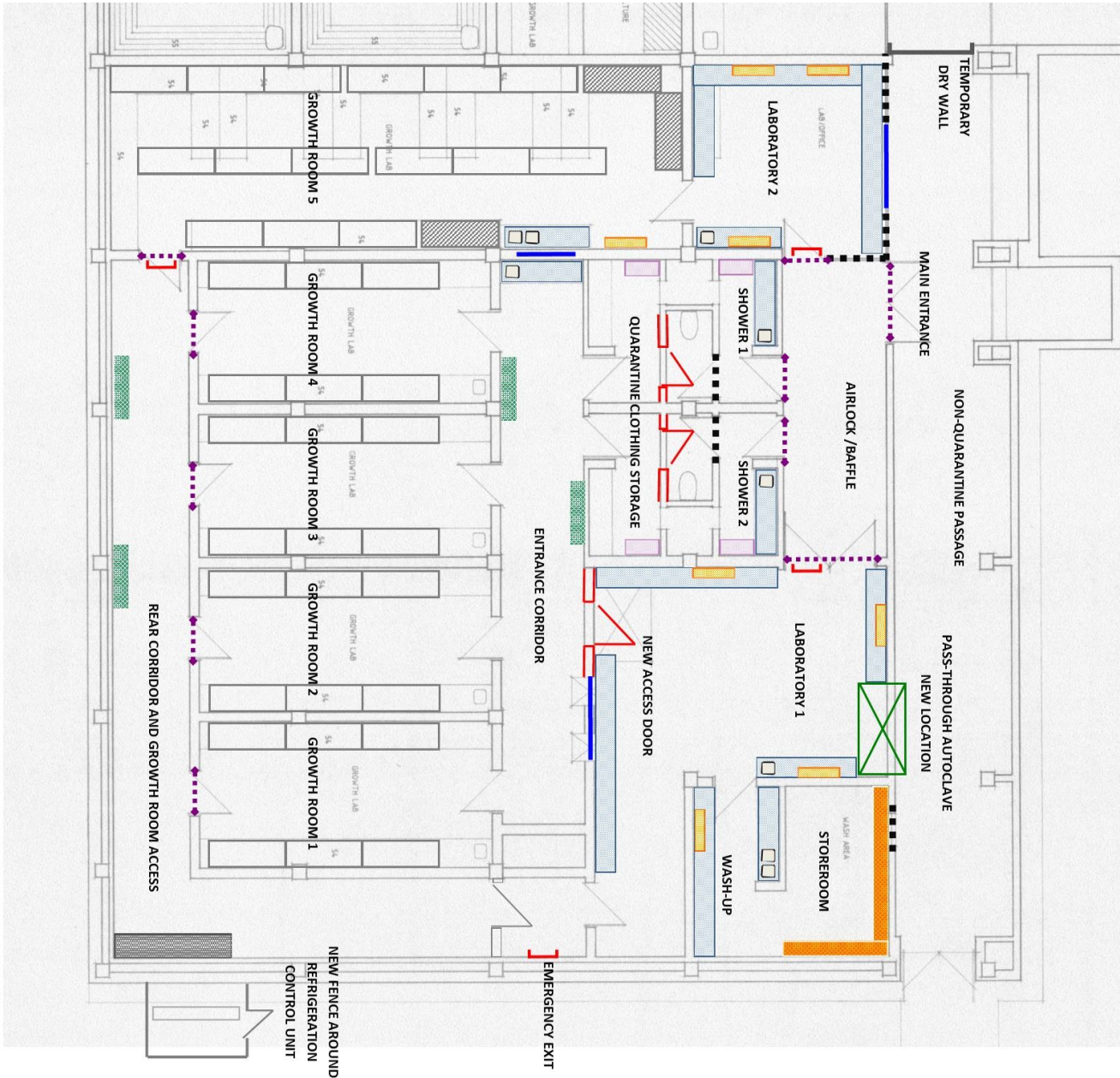
STANDARD-LEVEL CONTAINMENT AREAS: Tissue culture and arthropod work areas incorporating laboratory 2 and growth room 5, no shower-out.

LOCKED DOORS: Emergency access only, large equipment access via main entrance baffle.

ACCESS CONTROLLED DOORS: Authorised fingerprint access, programming and user logging facilitated by computer software.

WORKFLOW: Direction of movement through facility, exit is the reverse of direction indicated.



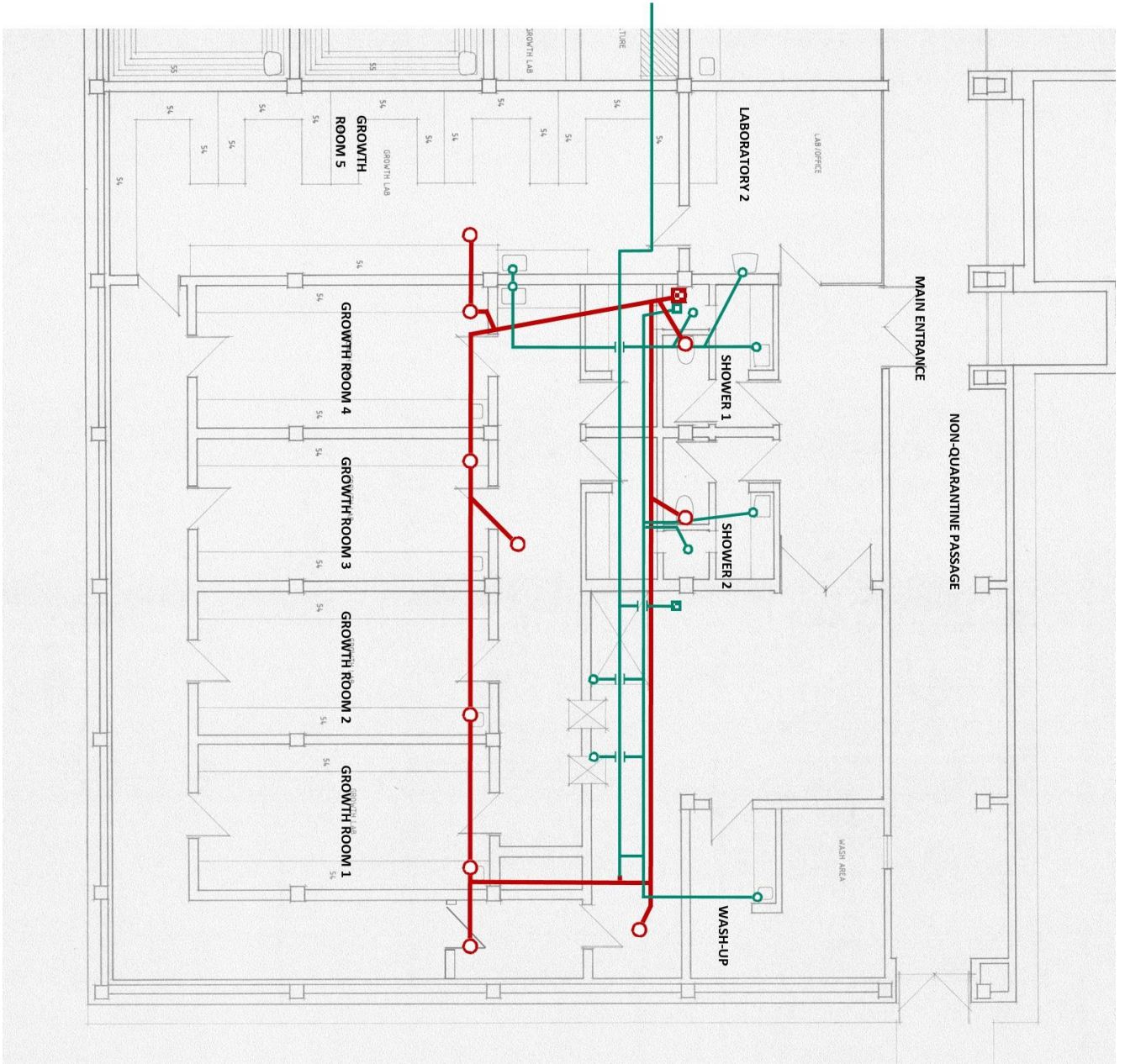


1.4 PROPOSED ALTERATIONS &

FIXTURE LAYOUT

-  **FREE-STANDING CURBOARDS:** Proposed location of new cupboards.
-  **LOCKERS:** Lockers in shower area.
-  **NEW BENCHING:** Proposed locations of new benching.
-  **WALL MOUNTED CABINETS:** Proposed locations of new cabinets.
-  **EMERGENCY ESCAPE DOORS:** Doors fitted with Emergency escape bars.
-  **ACCESS CONTROLLED DOORS:** Authorised fingerprint access and/or airlock doors, programming and user logging facilitated by computer software.
-  **NEW BRICKWORK:** Brick up windows around Laboratory 2 and in store room.
-  **WALL-MOUNTED SHELVING:** New shelving in storage room.
-  **NEW WINDOWS:** Location of windows.
-  **SOIL PREP. STATION:** Galvanized steel mesh bench.

APPENDIX 2 – DRAINAGE



2.1 BASEMENT DRAINAGE

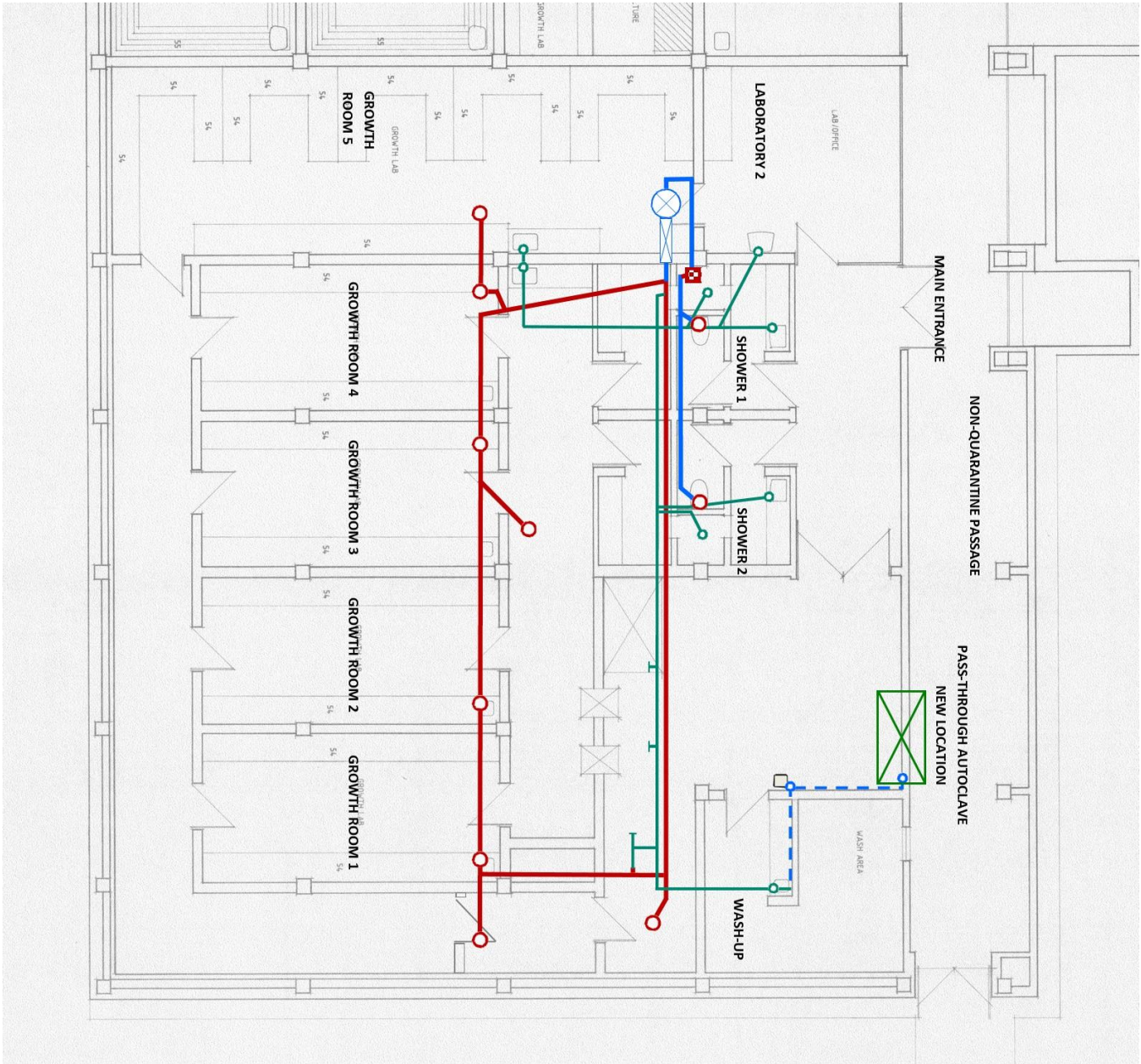
AT PRESENT

  FLOOR DRAINS: Drains through floor of facility in through roof of basement.

  MAIN DRAINAGE OUTLET: Water goes underground, exits building to main Rodeplaat sewage system.

 MAIN DRAINAGE PIPE: Main drainage pipe draws water from growth rooms and toilets (?). Suspended from roof in basement (diameter approximately 150mm).

 SECONDARY DRAINAGE PIPE: Thinner drainage pipe draws water from basins and showers (?). Suspended from roof in basement diameter approximately 80mm.



2.2 PROPOSED NEW DRAINAGE LAYOUT

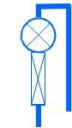
 **FLOOR DRAINS:** Drains through floor of facility in through roof of basement.

 **MAIN DRAINAGE OUTLET:** Water goes underground, exits building to main Rooideplaat sewage system.

 **MAIN DRAINAGE PIPE:** Main drainage pipe draws water from growth rooms and toilets (?). Suspended from roof in basement (diameter approximately 150mm).

 **SECONDARY DRAINAGE PIPE:** Thinner drainage pipe draws water from basins and showers (?). Suspended from roof in basement diameter approximately 80mm.

 **NEW DRAINAGE:** Surface mounted along wall to inter-sect drainage point in wash-up.



WASTE WATER DECONTAMINATION SYSTEM: Pipes re-routed to pass through UV sterilizer, particle filter, storage tank, and boiler before being re-routed back to the main drainage outlet point.

NOTE: Removal of both toilets in shower rooms (i.e., bypass decontamination system, no solids to enter system).

APPENDIX 3 – SHELVING AND IRRIGATION SYSTEM

3.1 PROPOSED VALVE MANIFOLD FOR GROWTH ROOM IRRIGATION

