



AGRICULTURAL RESEARCH COUNCIL

INVITATION TO BID:

TENDER NO: ARC/07/05/2025

THE APPOINTMENT OF A SERVICE PROVIDER FOR SUPPLY, ASSEMBLY, INSTALLATION AND COMMISSIONING OF TILAPIA RECIRCULATION AQUACULTURE SYSTEM (RAS) AT AGRICULTURAL RESEARCH COUNCIL—ANIMAL PRODUCTION IRENE.

Technical Enquiries:

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COMPANY NAME	SUPPLIER REGISTRATION NUMBER	UNIQUE REGISTRATION NUMBER	
			Main Contractor
			sub- contracted / joint venture 1
			sub-contractor / joint venture

CLOSING DATE: 04 JULY 2025 TIME: 11:00 AM

THE DETAILS AND CONTENTS OF THIS DOCUMENT ARE CONFIDENTIAL AND FOR CONSIDERATION AND RESPONSE BY THE RECORDED RECIPIENTS ONLY

COMPULSORY SITE BRIEFING SESSION

DATE AND TIME: 17 June 2025 @ 10:00

VENUE: ARC, Olifantsfontein Road, Irene, Main Building



TENDER SUBMISSION

Completed and sealed tender submissions reflecting “**ARC/07/05/2025 and the name of the tenderer**” must be deposited into the **Tender Box located at Old Olifantsfontein Road, Main Building, Irene, Pretoria** for the attention of: “Supply Chain Management”, by no later than **11:00 (eleven o’clock) on 04 July 2025.**

Tender documents submitted after the closing time and date specified will not be Considered. **No submissions sent by email or facsimile will be accepted.**

Bidders are requested to submit one (1) complete document into the tender box (Original for functionality proposal including financial proposal) and prepare one (1) copies of bid document. **A USB of the bid document must be submitted.**

SITE BRIEFING DATE: 17 JUNE 2025

VENUE: ARC, Old Olifantsfontein Road, Irene (Main Building)

CLOSING DATE: 04 JULY 2025

CLOSING TIME: 11:00 AM



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TERMS OF REFERENCE FOR SUPPLY, ASSEMBLY, INSTALLATION AND COMMISSIONING OF TILAPIA RECIRCULATION AQUACULTURE SYSTEM (RAS) AT AGRICULTURAL RESEARCH COUNCIL-ANIMAL PRODUCTION, IRENE.

1. INTRODUCTION AND BACKGROUND

The Agricultural Research Council (ARC) is a Research Science and Technology institution of excellence in South Africa, which operates within the National System of Innovation. The ARC has a mandate for innovative and creative agricultural research, technology development and transfer aimed at the advancement of South African agriculture.

Animal Production is based in Irene, with several satellite stations strategically positioned throughout the country. This research focus area carries out primary and secondary research, development and technology transfer with respect to Animal Breeding and Improvement, Aquaculture, Rangelands and Nutrition, and Food Science and Technology to improve productivity and sustainable resource utilisation. In addition, this research focus area serves as the custodian of national assets such as the conservation of animal, forage and bacterial culture collection genetic resources, including databases and DNA banks associated with them

The ARC seeks to Appoint a service provider that will be responsible for The Supply, Assembly, Installation and Commissioning of Tilapia Recirculation Aquaculture System (RAS) at Agricultural Research Council-Animal Production, Irene.

2. OBJECTIVE

The ARC is seeking to appoint service provider for The Supply, Assembly, Installation and commissioning of Tilapia Recirculation Aquaculture System (RAS) at Agricultural Research Council-Animal Production, Irene.

3. SCOPE AND EXTENT OF WORK

See Attached on Appendix A.

NB: Bidders must provide detailed costing as per the Given Pricing Schedule and clearly stipulate the grand total for entire project on the SBD 3.1 & bidder's financial proposal with letter head.

4. EXPECTED DELIVERABLES

- Fully Functional and Complete Re-circulation Aquaculture System (RAS) at Agricultural Research Council-Animal Production campus, Irene. GPS Coordinates 25.8994° S, 28.1999° E.
- The RAS must be a Turnkey system.
- RAS must be as per the specifications.
- Commission of the system and on-site training of the staff.
- Training manuals on how to operate the system must be provided.
- Manuals on how to troubleshoot basic problems must be provided.
- COC on the electrical work done on the system must be provided.

5. DURATION OF THE PROJECT

The project should be installed and commissioned with 6-8 months after signing SLA and issue of purchase order.

6. PAYMENT TERMS

Payment will be done within 30 days in accordance to the following terms:

- Payment will be done in two phases.
 - o 50% payable after the site establishment by the service provider and is approved by ARC
 - o 30% payable after the project is completed
 - o 20% payable after the ARC has tested and fully certified that the project is fully functional within 3 months of completion.

7. COMPULSORY BRIEFING SESSION

A Compulsory briefing session is required.

- **Venue:** ARC Irene campus, Old, Olifantsfontein Rd, Irene, 0062 (Main Building)
- **GPS Coordinates:** 25.8994° S, 28.1999° E.
- **Date:** **17 June 2025**
- **Time:** **10:00 am**

8. EVALUATION CRITERIA

The evaluation for this bid will be carried out in the following **FOUR (4)** phases

- Phase 1: Pre-Compliance and administrative requirements
- Phase 2: Mandatory Requirements
- Phase 3: Functionality Criteria
- Phase 4: Price and Specific goals

8.1 PHASE 1: PRE-COMPLIANCE

During this phase bid documents will be reviewed to determine the compliance with SCM Returnable documents, tax matters and whether proof of registration on Central Supplier Database (CSD) has been submitted with the bid documents at the closing date and time of The bid. Bids which do not satisfy the compliance criteria will not be evaluated further. The bid proposal will be screened for compliance with administrative requirements as Indicated below

ITEM NO.	ADMINISTRATIVE REQUIREMENTS	CHECK/COMPLIANCE
1.	Master Bid Document	Provided and bound
2.	SCM - SBD 1 - Invitation to Bid	Completed and signed
3.	SBD 3.1 and Annexure A Pricing Schedule	Fully Completed
4.	SCM - SBD 4 – Bidders Disclosure	Completed and signed
5.	CSD Registration	Attached CSD registration number.
6.	Tax Compliance	SARS Tax Compliance Status Certificate with Pin (Tax Clearance certificate)
7.	SCM - SBD 6.1 - Preference Points Claim Form in terms of the Preferential Procurement Regulations 2022	Completed and signed
8.	In case of bids where Consortia / Joint Ventures, Consortia/Joint Venture agreement signed by both parties must be submitted with bid proposal	JV agreement completed and signed, if applicable

8.2. Phase 2: Mandatory Requirements

	Mandatory Requirements	Attach Proof (Yes/ No)
1	Fully Completed SBD 3.1 and Annexure A Pricing Schedule	
2	3 Reference letters for RAS aquaculture with <ul style="list-style-type: none">- Contactable references- Project of Similar size and nature of the tender- To the Value of R 3 million and above	
3	Qualified Project leader with RAS aquaculture system experience	
4	Qualified Electrical engineer registered with ECSA	
5	COIDA Registration	
6	Professional Liability Insurance cover of R 5 million	
7.	Compulsory Site Briefing	

8.3 PHASE 2: FUNCTIONALITY CRITERIA

FUNCTIONALITY CRITERIA

The bidder must score a minimum of **70%**, during phase 3 (functionality/technical) of the evaluation to qualify for Phase 4 of the evaluation where only points for price and Specific goals will be considered

The following values/ indicators will be applicable when evaluating functionality:

0 = Non-compliance; 1 = Poor; 2 = Fair; 3 = Average; 4 = Good; 5 = Excellent

PHASE 3			
GUIDELINES FOR CATEGORY CRITERIA	FUNCTIONALITY (GUIDELINES FOR CRITERIA APPLICATION)		WEIGHT
Bidder's record of similar previous services in aquaculture (RAS) projects (attach company profile).	Number of relevant projects that were successfully completed and functional in aquaculture (RAS) system by the service provider with value of R 3 million and above	Indicator	30%
	No Reference letter of projects with similar scope provided	0	
	Reference letter of 1 project covering the criteria within the scope	1	
	Reference Letters of 2 projects covering the criteria within the scope	2	
	Reference letters of 3 projects covering the criteria within the scope	3	
	Reference Letters of 4 projects covering the criteria within the scope	4	
	Reference Letters of 5 or more projects with criteria within the scope	5	
Bidders experience and track record (attach profiles/ CVs of project leader and key staff to be assigned to the project)	Project Leader and key technical staff combined years of experience in Installation and assembling of aquaculture (RAS) projects.	Indicator	20%
	0 - 3 years' experience	1	
	4 - 6 years' experience	2	
	7- 10 years' experience	3	
	11 - 14 years' experience	4	
	15 or more years of experience	5	

Bidder's record of similar previous work completed in aquaculture (RAS) with similar Production capacity	Experience in installing and commissioning of a complete Functional RAS aquaculture system with production capacity of 3 tons and above of Tilapia	Indicator	40%
	No Reference Letters / Completion Letter	0	
	Reference letter/Completion Letter of 1 project covering the criteria within the scope	1	
	Reference letter/Completion Letter of 2 project covering the criteria within the scope	2	
	Reference letter/Completion Letter of 3 project covering the criteria within the scope	3	
	Reference letter/Completion Letter of 4 project covering the criteria within the scope	4	
	Reference letter/Completion Letter of 5 project covering the criteria within the scope	5	
Relevant Bidders qualifications and professional registrations in relation to the scope of work.	Proof of Project leader qualifications relevant to RAS system design, installation, Assembly and Maintenance such as Engineering, Aquaculture, animal science or agriculture	Indicator	10%
	No relevant professional qualification or registration	0	
	Relevant Diploma qualifications	1	
	Relevant Degree/ Post graduate diploma of the qualifications identified	2	
	Relevant Honours Degree in the qualifications identified	3	
	Relevant Master's Degree in the qualifications identified	4	
	Relevant Doctorate in the qualifications identified	5	
Total points on functionality			100%

8.4 PHASE 3: PRICE AND SPECIFIC GOALS

Preference point system applicable for this bid is **80/20**

SPECIFIC GOALS

In line with the Preferential Procurement Regulations 2022, a preference point system must be followed, where:

For contracts with a prescribed Rand value, a maximum of 20 points will be allocated for specific goals in this bid as follows.

The Preferential Procurement Regulations 2022 includes the implementation of RDP goals as one of the specific goals, therefore over and above the awarding of preference points in favour of HDIs, the activities listed as contributors towards achieving the goals of the RDP (published in Government Gazette No. 16085 dated 23 November 1994) will also be applied.

	SPECIFIC GOALS	POINTS
1	51 % owned by HDIs (people who had no franchise on national elections prior to 1994)	6
2	51 % owned by Women	4
3	51 % owned by Youth	4
4	51 % owned by People with disabilities	2
5	BEE status Level:1- 4	2
	Implementation of RDP goals (The promotion of SMMEs)	2
	TOTAL FOR SPECIFIC GOALS	20

9. PRICE

Bid will be awarded to a bidder with the highest points on price and Specific goals on condition that they have met all phases of the evaluation criteria and complied with the tender requirements set out in the tender document. The bidder will be allocated 80 of the price and 20 for SPECIFIC GOALS

The points scored by a tenderer in respect of SPECIFIC GOALS contemplated in section 5, read with section 2(1)(b)(i) and (ii) and 2(1)(c), of the Preferential Procurement Policy Framework Act, 2000 (Act No. 5 of 2000), and with effect from 16 January 2023. Made the regulations set out in the Preferential Procurement Regulations 2022 Schedule

section 2(1)(e) of the Act an organ of state must, in the invitation to submit tenders, clearly specify the specific goals for which a point may be awarded, must be added to the points scored for price.

10. BID SUBMISSION REQUIREMENTS

Bidders should ensure that the following submission requirements, which will be needed for evaluation purposes are included in their bid proposal and are as follows:

- a. The service provider must draft a table of contents which will indicate where each document is located in the proposal.
- b. The proposal shall consist of one master original document, and must clearly indicate the Prices on SBD 3.1
- c. Standard bidding documents (SBD1, 3.1, 4, 6.1.
- d. Copy of Central Supplier Database (CSD) report
- e. SARS Tax Status Pin.
- f. BEE certificate / Affidavit

11. LEGISLATIVE FRAMEWORK OF THE BID

Tax Legislation

- a. Bidder must at all times attempt to be compliant when submitting proposal to ARC and remain Compliant for the entire contract term with all applicable tax legislation, including but not limited to the Income Tax Act, 1962 (Act No. 58 of 1962) and Value Added Tax Act, 1991 (Act No. 89 of 1991).
- b. Bidders who make taxable supplies in excess of R1 million in any 12-month consecutive period are liable for compulsory VAT registration, but a person may also choose to register voluntarily provided that the minimum threshold of R500 000 has been exceeded in the past 12-month period. Bidders who meet the above requirement must register as VAT vendors, if successful, within one month of award of the bid.
- c. SARS Tax Status Pin requirements/ or Central Supplier Database (CSD) number or report must be provided.

12. PROCUREMENT LEGISLATION

- a. Bidders should be cognisant of the legislation and/or standards specifically applicable to the services.
- b. If the application is made by a joint Venture or Partnership, the accreditation credentials in the name of the joined entities should be submitted. Members in the joint venture must meet the requirement of the proposal.

PRIVACY AND PROTECTION OF PERSONAL INFORMATION ACT 4 OF 2013

Protecting personal information is important to the Agricultural Research Council (ARC). To do so, ARC follows general principles in accordance with applicable privacy Laws and the Protection of Personal Information Act 4 of 2013 (POPIA).

- a. ARC'S role as the responsible party is, amongst others to process personal information for the intended purpose for which it was obtained and in line with legal agreements with its respective/ prospective services providers and third parties
- b. ARC will process personal information only with the knowledge and authorisation of the Bidder/respondent and will test personal information which comes to its knowledge as Confidential and will not disclose it, unless so required by law or subject to the exception Contained in the POPIA.
- c. ARC reserves all the rights afforded to it by the POPIA in the processing of any of its Information as contained in this bid and the bidder/respondent is required to comply with all Prescripts as detailed in the POPIA relating to all information concerning ARC.
- d. In responding to this bid, ARC acknowledges that it will obtain and have access to personal information of the bidder/respondent. ARC agrees that it shall only process the information disclosed by the bidder/respondent in their response to this bid for the purpose of evaluation and subsequent award of the tender and in accordance with any applicable law.

13. SPECIAL CONDITIONS OF CONTRACT.

- a. All the conditions specified in the General Conditions of Contract (GCC) will apply and where Conditions in the special conditions of contract contradicts the conditions in the general conditions of contract the special conditions of contract will prevail.
- b. Letter of Authority to sign documents on behalf of the company.
- c. The proposals should be submitted with all required information containing technical information.
- d. Bidders failing to meet pre-compliance, mandatory requirements, and functionality Minimum score will automatically be disqualified.
- e. Service providers are requested to submit a Central supplier registration report to claim for specific goals
- f. SBD 6.1 must also be duly completed, signed, and submitted alongside the bid to claim preference points. Failure to do so will result in B-BBEE preference points being forfeited.
- g. If the application is made by a Joint Venture or Partnership, the accreditation credentials in name of joined entities should be submitted. Members in the joint venture must meet the requirement of the proposal.
- h. Poor or non-performance by the bidder will result in cancellation of works orders.

14. SUB-CONTRACTING CONDITIONS/ REQUIREMENTS

- a. In a case a tenderer is intending to sub-contract portion of work, such tenderer awarded a contract may only enter into sub-contracting arrangements with the approval of the department In relation to a designated sector, a contractor will not be allowed to subcontract in such a manner that the local production and content of the overall value of the contract is reduced to below the stipulated minimum threshold.
- b. The contractor is not allowed to sub-contract more than 25% of the contract value after award to another enterprise that does not have equal or higher B-BBEE status level, unless the intended sub-contractor is an EME that has the capability and ability to execute the sub-contract.

15. PAYMENT TERMS

- a. ARC undertakes to pay out in full or as per deliverables within thirty (30) days all valid claims for work done to its satisfaction upon presentation of a substantiated claim and the required reports stipulated in special conditions. No payment will be made where there is outstanding information/ work not submitted by the Service Provider/s until that outstanding information is submitted.

16. Technical Enquiries

Contact Person

Name: Dr. Mary-Jane Thaela-Chimuka

Email: ThaelaMJ@arc.agric.za

Contact number: 012 672 9316

17. SCM Enquiries

Contact Person

Name: Benjamin Motuba

Email. Motubabp@arc.agric.za

Contact number: 012 672 9114

APPENDIX A

Specification of the RAS System

INSTALLATION OF RECIRCULATING AQUACULTURE SYSTEMS (RAS) AT ARC-ANIMAL PRODUCTION INSTITUTE

1. SPECIFICATIONS

FIGURE 1A: BUILDING (NO 2) WITH PROPOSED QUARANTINE/BROODSTOCK- AND RESEARCH HATCHERY SYSTEMS SCHEMATIC OUTLAY

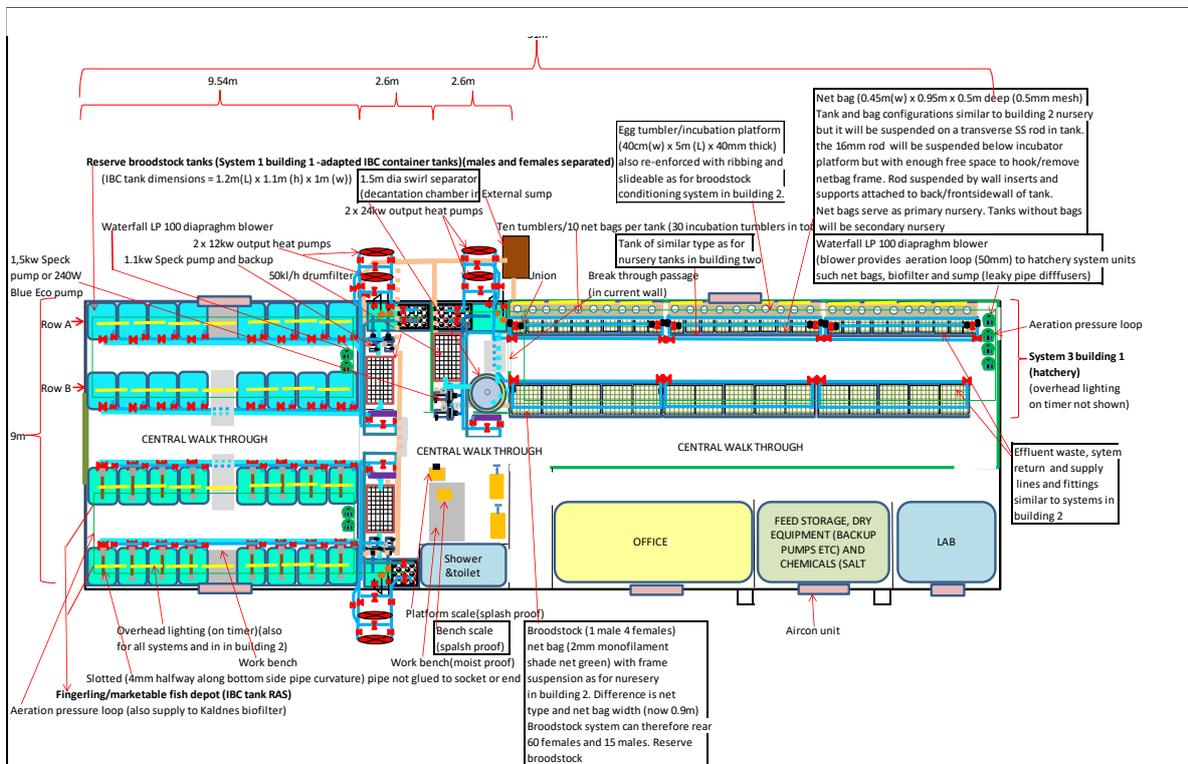


Fig 1A.1 Broodstock tanks system layout (Building 1)

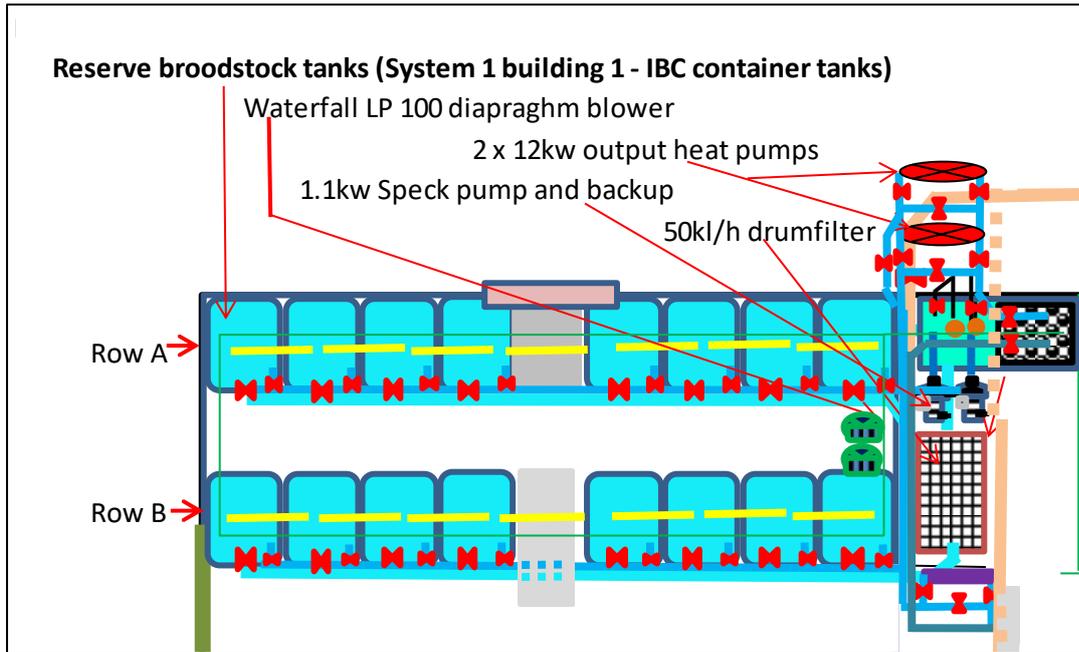
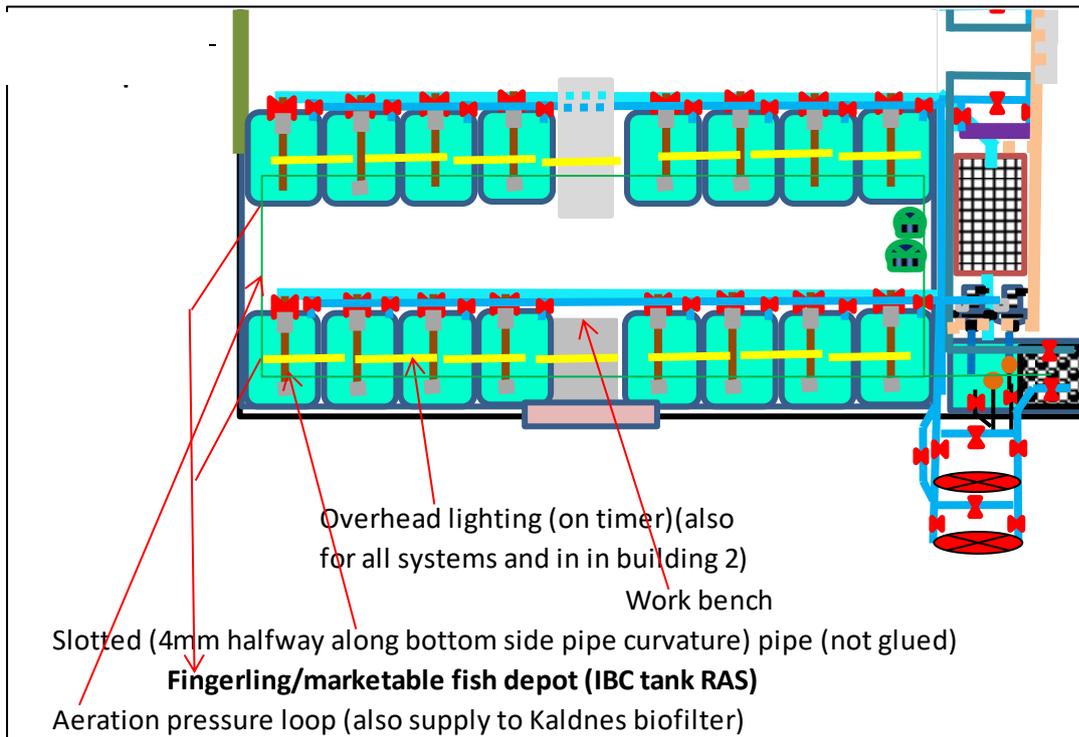


Fig 1A.2 Fingerling depot (Building 1)



FUNCTIONALITY: RESERVE BROODSTOCK KEEPING - AND DEPOT TANK SYSTEMS (FIGURES 1A.1-1A.2)

Discussion will be similar for each of the two systems except where otherwise indicated. Sixteen keeping tanks of the IBC (intermediate bulk container) type (1KL) is selected due to its foot print

efficacy, practicality and relative cost. (See Fig 1A.1/2 and 7). Two rows of eight tanks deployed at the left of slide door entrance side as shown in Fig 7. One row of eight tanks separated between tank 4 and five as walkway space or space provided for a moist proof bench when tanks lined against the building wall. The collective volume of these tanks is 16KL

The top part of the polyethylene tanks are opened (crate structures removed and tank cut open just before top side tapering curvature to lateral wall) (Fig 7). All tanks can be covered with a removable 6mm SS *stainless steel frame with 17% shade net (Allnet) attached to prevent fish from jumping out. The frame attached loosely to the back bar frame of the IBC tank with heavy duty cable ties (x 3 and evenly spaced) so that it can act as a hinge. If the frame net not in use, it must be able to be flipped backwards to rest against back wall (or fixed to wall mount clips as used for fishing rods).

The bottom exit valve of purchased tanks is modified to accommodate a 50mm PVC pipe. The pipe will end in a 50mm glue socket inside the tank and directly against the exit port inside tank. A removable extension pipe (bottom slotted -5mm) is inserted in the socket with opposite open end (with unglued elbow) against bottom opposite wall of tank. The tank exit elbow receives a standpipe (fixed to tank frame with heavy duty cable ties) slightly higher than the normal water level in the tank – created by the head fall of 100mm between the tank water level and the backwash level of water in the drumfilter (filter room). The standpipe will serve as overflow indicator if slots in the mentioned bottom pipe may get blocked. See standpipe configuration in Fig 7. The bottom valve of standpipe configuration can be opened to drain all the tanks simultaneously (only) to external waste pipe line via the system return line, which is also a potential drain line (110mm butterfly valve) connection to 160mm waste pipe line (wall exit).

The IBC tanks must have galvanized or preferably plastic support platforms (forklift area) and be treated with a rust resistant chemical, including the frame of these tanks. The tanks to be mounted on rubber mats (second hand conveyer belt type) in order to space the metal frame away from floor covered water, but mainly to insulate tanks to some extent from the cold floor during winter. The exit pipe of each tank is equipped with a 50 mm PVC valve and then to the tank bordering return water “backbone” flow line (110mm). The 50mm PVC pipe connection between valve and backbone can be of the grommet type or preferably a saddle. The installation as such that the 110 mm line is aligned closest the tank bank in order to be out of the way of tank operators working in tanks. The 110 mm pipe to be concealed and protected by a cement step that will also serve as a platform for workers to stand on.

The drumfilter filter system of the respective 16 IBC tank RAS systems (broodstock and fingerling depot) will be housed in the adjacent office/rooms (Figure 1A.1 and 1A.2). It will receive the 2 x 110 mm pipe lines from each 8 IBC tanks via a reducer Y-piece (160 mm) that will extend as a common pipe entering the drumfilter (Fig 7). The 110 mm pipe of row B will be straight all the way and will enter the filter room via a hole in the wall. The drumfilter/biofilter (Fig 7 example) will therefore be spaced away from the filter room wall by the 160 mm pipe. The 160mm pipe will finally branch to respectively connect to the main waste exit duct from system filter waste lines (valve controlled), as well as the drum filter/biofilter. The main system filter 160 mm backbone pipe exit will reach the outside of the building (existing external sump), and which therefore will serve as IBC system drain, component effluent (sump or drumfilter) and routine sludge effluent pipe (broodstock system IBC). The ergonomic design of pipes and valves will allow for easy access by the systems operator.

The 110 mm effluent pipe (draining fingerling system IBC tanks; receiving sludge from drumfilter or sump drain) of the depot tank system (Fig 1A.2) will not pass through the filter room side of building wall to the exterior of building, but will run around the drumfilter, pass walkway passage (cement

cover ramp), and eventually pass underneath the system sump (of broodstock filter system) to the exterior of the building to connect directly with the existing external sump.

During recirculation the return water from all IBC tanks will pass through the drumfilter (30-50kl/h and 60 μ screen). Drumfilter (reputable model) approx. dimensions [1m (w) x 1.2m (L) x 1m (h) and equipped with a water proof UV unit to keep the drum screen from biofouling (spare x 3 provided by service provider). The backwash effluent of drumfilter will be discharged into the discussed waste line (160 mm) via grommet or saddle connection. The effluent waste line will run below the fibreglass sump tank (with legs –Figure 5 concept), which is of the same type as for nursery tanks later discussed (also Building 2), but shortened in length to fit the width of the filter room (approx. 2.6m). The sump will receive water from the drum filter at a head differential of 100 mm. The total head differential from system IBC tanks to sump is therefore approximately 200mm. The sump is equipped with an overflow pipe just higher than the normal circulation level in system tanks, to accommodate water levelling during load shedding. Head differential will be created by the system pump and resistance in systems piping and fittings. Water from the overflow and drainage of sump will join in the mentioned 110 mm effluent pipeline that will join into the common 160 mm backbone pipe discussed. The external sump overflow will translocate waste water to the earth dam in the proximity. The IBC tanks system sump is divided internally in two compartments – an open compartment (1 m x 1 m) and an oyster net basket compartment containing Kaldnes fluidized bed biomedica (1.6 m x 1 m x 0.6 m) (Fig 7). The 5 mm mesh oyster net basket is fixed in position by a 20 mm pipe skeleton to which the net basket is attached with cable ties.

The sump is respectively serviced with borehole water from external reservoir by a pressure demand pump, or in emergency with a municipal water line (backup), both with inline shut valve, flush valve and float valve (50 mm-HP for municipal line). The municipal water line equipped with an inline carbon cartridge to remove residual chlorine). Twenty spare cartridges must be supplied by service provider. The cartridge filter is in the line that will only split after the filter to the three system sumps of building 1. Borehole water will be the preferred source of water and will be supplied by four external interconnected tanks (20 kl) on plinths to provide gravity pressure flow to the system sumps (building 1 and 2). These tanks will be filled by a borehole pump on demand (pressure switch). The water tanks will also be continuously aerated by a blower (Waterfall LP 100 + backup) and diffuser system. The borehole water line (50mm) for each system sump will be split to a flush valve (50 mm) and float valve (50 mm LP). All control valves for both municipal and borehole lines are reachable in sump (ergonomics consideration).

The system delivery water pump (20 kl/h economical submersible pump alternative – see Fig 7) abstract water from sump (pump mounted in 4 mm oyster net grid box) and supply circulation water (63 mm pipe) to the 16 system IBC tanks via a PVC non-return valve. The second pump (20 kl/h economic pump with controller) supply water via a non-return valve to all filter components and this pump also connected to the system circulation pump line if the system tanks circulation pump fails – valve controlled). Filter/treatment components include heat pumps- biofilter, as well as UV sterilizers (see Fig 7 & 8). The system and filter pumps are mounted parallel to each other and change over functions by way of valve control. The latter allows for the operation of 1 pump only, and with water supply to all system components if it is required (valve control).

Pump failure must be reported by an alarm system to operator (GSM - sms) and physical siren. The first reduced (63-50 mm) branched supply line to the UV sterilizer bank will be via the wall on the passage side of room. The UV sterilizer bank (3 x 55 w units per system) will be mounted against the wall on the passage side and the return treated water line(7kl/H) will run parallel to the incoming piping (above 110 mm return pipe discussed) to the sump overhead area (7 kl/H). The second branch

will supply water released with venturi jet introduction into the Kaldnes biofilter in oyster net basket and in biofilter of drumfilter (~7 kl/H). The UV sterilizer bank consists of a parallel water supply system to each UV unit (see Figure 8). The third branch is supplying water via reduced (63 mm x 50 mm) line branch is to the heat pump system (two 12-13 kw output heat pumps). The pipe and valve connections of the two heat pumps in parallel and the water supply line split to respectively supply water to each of the two heatpumps. Each heatpump equipped with a bypass control valve so that the flow through heatpump can be slowed and heat coil contact time increased (Fig 1A.1/2) & 7).

The main common 63 mm water supply line from the system pump is passing through the filter room floor-level wall in line with the tank wall at a level that will position the pipe on top of the 110 mm return pipe (cable tie strapping). The 63 mm supply pipe will branch at this point to run on the 110 mm return pipe of row B. For each two tanks a common supply pipe (32 mm) will branch vertically between the tanks from the 63 mm “backbone” and split with a T-piece to each tank (below the top horizontal rod of tank metal frame). The T-piece equipped with a 32 x 25 mm reducing bush. A 25mm ball valve will be installed, followed by a union and a 90 degree bend and venturi jet. The union can adjust the angle of the 25 mm venturi jet flow (aeration objective). For each tank, the union can be connected to a spare elbow and pipe piece if the venturi is removed due to its flow resistance (tank filling up etc). The 25 mm water supply line to each tank fixed to the tank frame upper bar in such a way that it is out of the way of the operator and cover net (jumping fish). Introduced to each tank via control valve (25 mm). Row A pipe (63 mm) will T – off from main supply line and run on top of the 110 mm return pipe, with branching to each tank running against the tank wall (cable ties) and T –off with a reducing bush to 25 mm Valve, 25 mm venturi and subsequent elbow per each tank. Row B will be serviced similarly but the 63 mm pipeline will be running on the floor behind IBC tanks, with 25 mm riser pipes, valves, venturi’s and elbows to each tank. The riser pipes will be clamped to tank crate grid with cable ties. A cement floor will be cast over piping to enable non-obstructed walk space between tank row banks, but also to facilitate open surface area for trolley use (such as in Building 2). The cement bench areas will allow for working space between wall mount tanks 4 and 5 (Fig 1A.1 and 1A.2).

The broodstock and fingerling systems are both illuminated with overhead lighting (28 x 18 w LED T8 moist proof units with diffuser lenses (double lights per casing). The lights must be controlled by a digital timer. One LED tube per unit must be off or can also be switched on by separate switch (after timer). Two units of each lighting type mentioned must also be installed in each filter room in a way that will cover all floor space of these rooms evenly.

Notes:

- Aeration of each IBC tank and Kaldnes biofilters will be provided by an overhead ring main aeration loop (63mm) as outlined in Figures (Fig 1A.1 and 1A.2). The pumps for the aeration loop will be discussed as for functionality of the production hatchery and broodstock system, (F1A.3)
- The aeration system, water pumps and lighting system for each of the two IBC tanks systems must be connected to a UPS system (not the air conditioners or heat pumps). The power consumption estimated for the UPS system will be 500w (LP100w aerators x 5), 480w for water pumps (ACP 20 low energy pumps) and lighting (144 W). Total = 1,3kw. The UPS station must be ventilated and installed at the sub-DB serving electricity to both IBC tank systems. The size of the UPS system: 4x 200 AH deep cycle batteries (Lithiumiron phosphate) and 2,5 kw single phase inverter (48 V). If funds allow the solar panels on building roof can assist UPS if load shedding or power failure occur for long periods.
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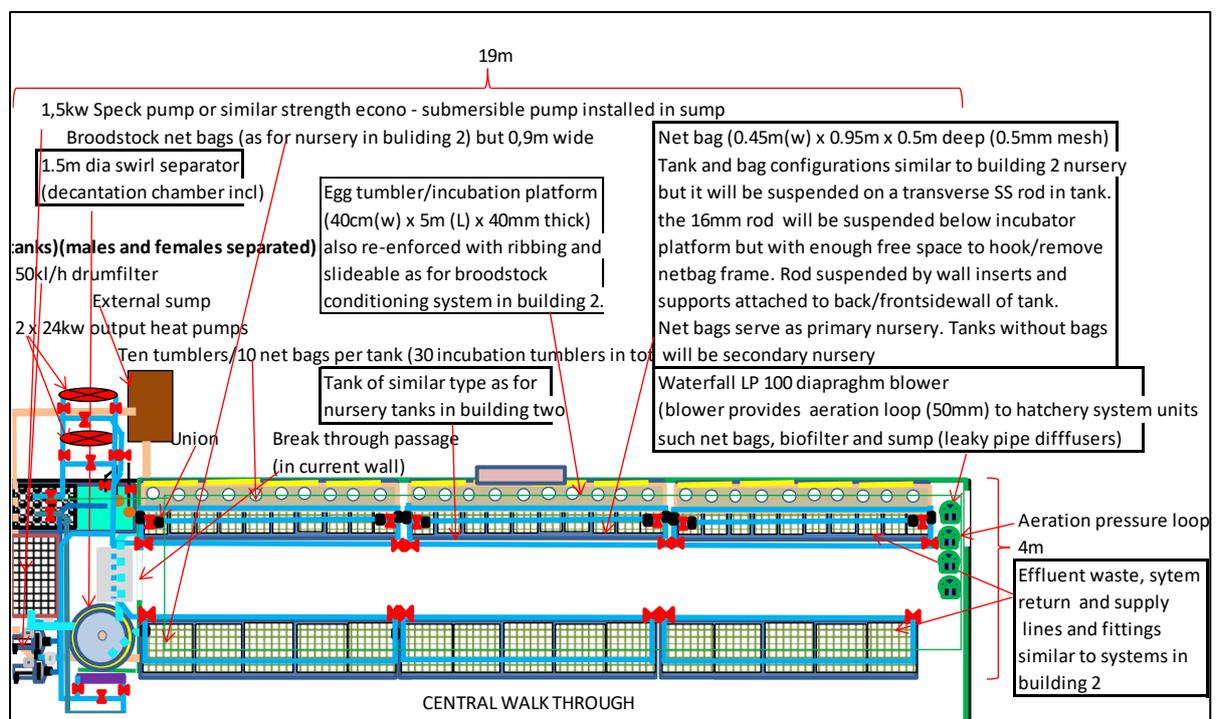
TABLE 1: ESTIMATED COST BREAKDOWN FOR RESERVE BROODSTOCK KEEPING - AND DEPOT TANK SYSTEMS (FIGURES 1A.1-1A.2)

COMPONENT	Specification compliance: Yes/No (Indicate 'Yes' or 'No'; describe deviation from requested spec)	QUANTITY	TOTAL
1000 L IBC tanks new		32	
LP100 aerators		5	
ACP120 submersible pumps with controllers		4	
200AH deep cycle batteries (Lithiumiron phosphate)		4	
System switchgear +GSM sms warning system (including siren)		1	
6mm stainless steel frames with 17% shade net cover (1,2 x 1 m) and cable tie hinges		32	
Tank exit valves (50 mm), standpipe valves + 50mm PVC glue on valves for heat pumps, UV sterilizers, biofilter and sump supply with external water		84	
63 mm PVC valves for pump delivery controls to system rows and pressure loop		6	
110 mm butterfly valve with flanges for PVC pipe connection (system effluent shut or drainage connection)		4	

160mm butterfly valve with flanges for PVC pipe connection (system effluent shut or drainage connection)		2	
Profidrum/biofilter (30kl/h minimum) combo with UV sterilizer for drum screen treatment		2	
Fibreglass sump with rust proof legs (150 mm heigh) (2,6 m x 1 m x 1 m)		2	
Kalnes biomedica (7 mm dia) in cubic meters		1	
Oysternet baskets (1.5 m x 0.9 x 0,6 m) and two sub pump baskets with cable tie closed lids		4	
Aeration diffusers (200 mm leaky pipe) for each IBC tank, biofilter ring (5 m) in meter		30	
Microjet airline pipe (4 mm) for all diffusers in meter		150	
25 mm venturi jets		32	
50 mm HP float valves		2	
50 mm LP float valves		2	
Inline carbon filter cartridge x 20 and housing for municipal water line		20	
20 kl JOJO Tanks		4	
LP100 aerators (JOJO tanks)		2	
55w UV sterilizer with 50 mm unions		6	
13 kw output heatpump		4	
Borehole and supply to interconnected 20 KL JOJO tanks (float switch controlled)		1	

Piping, fittings, support structures for overhead airline supply and lighting.		1	
Contingencies (civil works, cement, cable ties, etc)		1	
2400 BTU Aircon		6	
Estimated Total			

Fig 1A.3 Production hatchery and broodstock system(Building 1)



FUNTIONALITY: PRODUCTION HATCHERY AND BROODSTOCK SYSTEM

This system are of similar configuration (floor tapering, piping etc) as for experimental nursery system/broodstock pair keeping (building 2 – Fig 1B). RAS reticulation is also relatively similar to the systems discussed in building 2, though with exception of the biofilter position (in sump) and room deployment of filter/pump system components as described for the IBC tank systems filter rooms in building 1 (Fig 7). Furthermore, the swirl separator is also smaller (1.5 m decantation chamber diameter) due to reduced footprint availability.

The nursery tanks (against the room wall) do not receive any breeders at any given stage (as in the experimental system of building 2) but is dedicated to hatch and grow fish larvae to juvenile size for the IBC tank depot system (Fig 1A). Therefore the fibreglass platform and pipe, valve etc fixed accessories are similar than described for the hatchery tanks in building 2, except that the incubators

are differently spaced and reduced to 10 per tank, and similarly the below larval rearing net bags (0.45 m(w) x 0.95 m x 0.5 m deep (0.5 mm mesh)). The five net bags per broodstock tank row are made of 2mm monofilament mesh and bag dimensions are (0.9 m (w) x 0.95 m x 0.5 m deep). Net bag construction outlay for the hatchery system is as per Fig 5 and for broodstock system as per Fig 3. as already mentioned of these the below but the footprint of spray bar orifice spacing is obviously different since the net bags for the breeder pairs are of different size ((45 cm (W) x 60 cm (D) x 90 cm(L))(Figure 3).

The unions of the two riser delivery pipes per tank (broodstock system) will be connected to an overhead spray bar that will deliver equal volumes of water for all the net bags via orifices with size and quantity per net bag calculated by an online orifice calculator, considering all three tanks and 15 net bags, and most importantly the delivery volume of system pump minus branched off delivery to the hatchery system 30 egg tumbler incubators or alternative use of overhead spray bars supplying water jets to the hatchery net bags (x30). The spray bar orifice sizes adapted to pump output capacity (submersible ACP 20 pumps – 180 w).

When net bags are removed in the broodstock system, then the overhead spray bar can be replaced by the venturi /elbow or venturi spray bar + end plug options as discussed for the broodstock/hatchery system in building 2.

The aeration system will provide an overhead pressure loop supply of air to all net bags via a 63 mm pipe loop and two connected Microjet tubing lines per diffuser (**90 lines and 45 diffusers – 150 mm length**). Each net bag will therefore receive a leaky pipe diffuser which can be controlled by the inline connected Microjet choke valves. The overhead loop pipe (63 mm) will be connected to the Microjet tubing using a Microjet fitting with screw on the one end (50 mm pipe insert via drilled hole and Pratley steel sealant, and Microjet pipe connection nipple on the other end (Microjet pipe insert). The loop pipe can be attached with cable ties to the suspended 16 mm stainless steel round bar supporting the light fittings already discussed. Biofilter aeration similar as for the depot and broodstock reserve IBC tank systems.

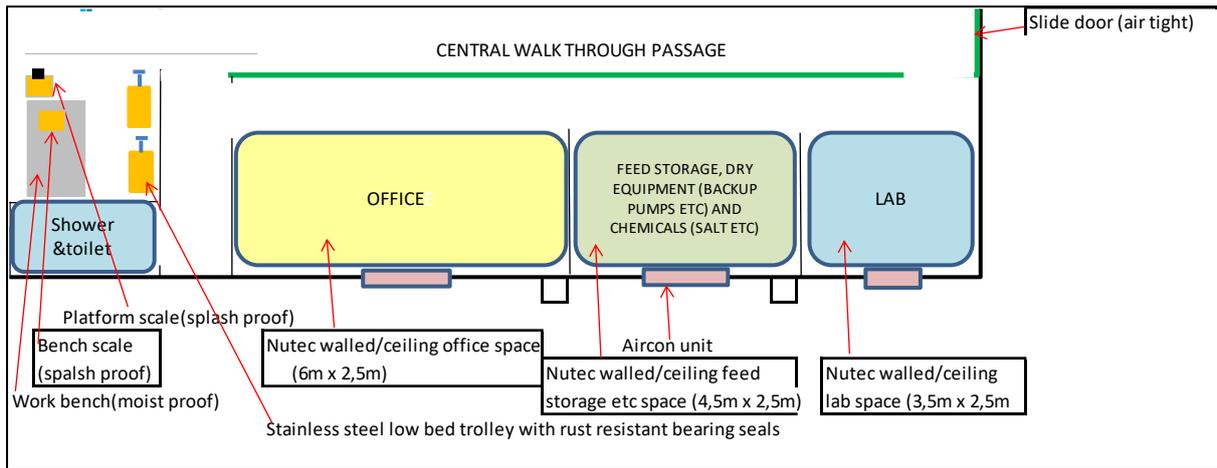
TABLE 2: ESTIMATED BUDGET FOR PRODUCTION HATCHERY AND BROODSTOCK SYSTEM

COMPONENT	Specification compliance: Yes/No (Indicate 'Yes' or 'No'; describe deviation from requested spec)	QUANTITY	TOTAL
LP100 aerators		5	
ACP120 submersible pumps with controllers		2	
200 AH deep cycle batteries (Lithiumiron phosphate)		4	
System switchgear (DB and wiring) +GSM sms warning system (including siren)		1	
6mm stainless steel (10 mm) frames with 17% shade net cover (1 x 0.9 m)		16	
Tank exit valves (75 mm), standpipe valves		12	

50 mm PVC glue on valves for heatpumps, UV sterilizers, biofilter and sump supply with external water. Also to 15 systems tanks (double inlet loop) and dip tanks supply and drainage.		32	
75 mm PVC valves for pump delivery controls to system rows and pressure loop		2	
45 cm(w) x 90 cm(L) x 45 cm (d) mesh screen(500 micron monofilament (insect net screen) in square meter		50	
45 cm(w) x 90 cm(L) x 90 cm (d) mesh screen(500 micron monofilament (insect net screen) in square meter		50	
Profidrum/biofilter (50 kl/h minimum) combo with UV sterilizer for drum screen treatment		1	
Fibreglass sump with rust proof legs (130 cm height) (2,6 m x 1 m x 1 m)		1	
Kalnes biomedica (7 mm dia) in cubic meters		0,75	
Oysternet sub pump baskets with cable tie closed lids		2	
Aeration diffusers (150 mm leaky pipe length) for each net bag, biofilter ring (5 m) in meter.		12	
Microjet airline pipe (4 mm) for all diffusers in meter		120	
18 w T8 coolwhite LED tube lights units with weather proof casing (double tube - also supplied)		20	
Spare LED tubes T8 18 w Coolwhite		10	
50 mm HP float valves		1	
50 mm LP float valves		1	
Fibreglas tanks (5 m x 1 m (w) x 0.6 m -0.7 m deep tapered floor as per Fig 2. Equipped with rust proof SS feet and rustproff support frame.		3	
55 w UV sterilizer with 50mm unions		4	

55 w UV sterilizer tubes spare		4	
24 kw output heatpump		2	
1.6 m diameter swirl seperator with decantation gutter (17 cm wide) and bottom exit sludge valve		1	
1.6 m diameter swirl separator without decantation gutter and functioning as biofilter with exit pipe slots close to bottom and properly screened with 4 mm oysternet tube with closed end. Biofilter also equipped with aeration tube and overhead venturi x2 (50 mm with control valves (50 mm)supply from system pump		1	
Fibreglass platforms (as per figure 4-6 and functionality description) complete (40 cm(w) x 5 m (L) x 40 mm thick), but with 10 evenly installed egg tumbler incubators and control valves(15 mm) and microjet filters (15 mm), fittings and 5l bottle all included. Per unit		3	
Piping (including net bag float pieps, pipe clips, fittings, small valves etc for systems plumbing, support structures for overhead airline supply and lighting.		1	
Stainless steel (12 mm) for net bag frames (3.4 m per frame) in meters		136	
Contingencies (civil works, sisolation insulation, cement, cable ties, suspension ss frame for aeration and lighting etc)		1	
Estimated Total			

Fig 1A.4 Supportive additional structures (Building 1)



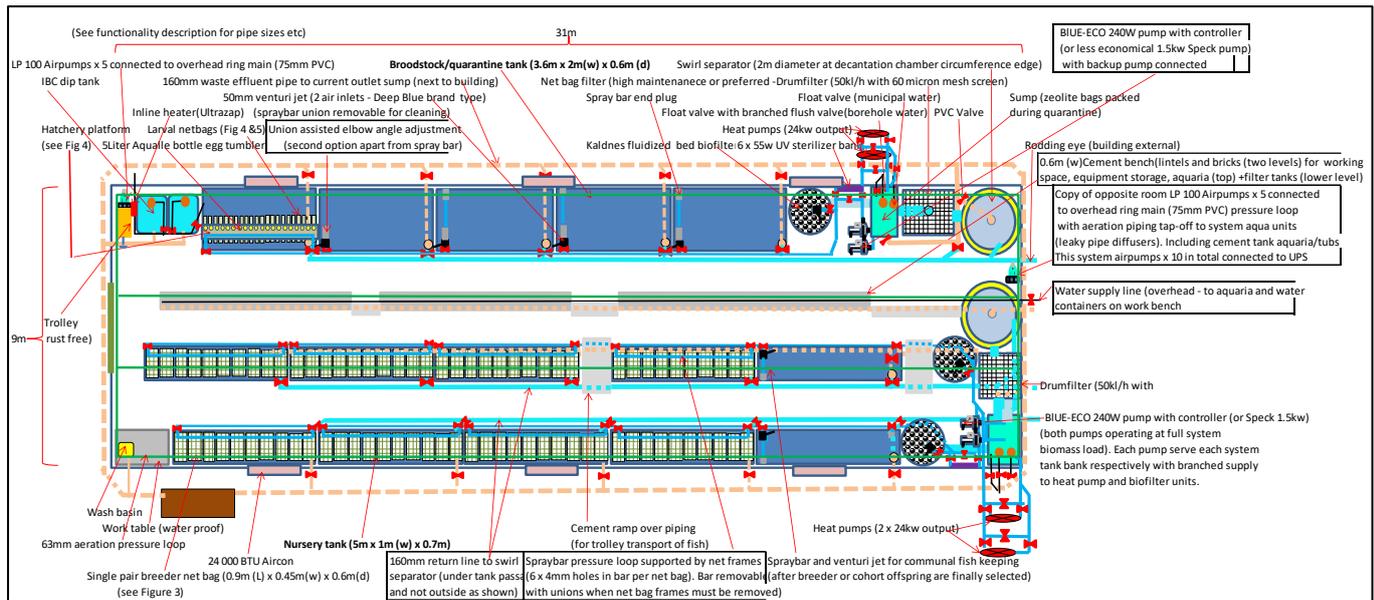
Functionality: Supportive additional structures/equipment

The space in filter room of depot system allows for installation of a benchtop (electronic scale- splash proof) and racking below for equipment, as well as parking for a platform scale (30 kg and 2 g resolution) and platform trolleys (Fig 1A.4). Benchtop also equipped with overhead aeration lines from air supply loop discussed.

TABLE 3: ESTIMATED COST BREAKDOWN FOR SUPPORTIVE ADDITIONAL STRUCTURES/EQUIPMENT

COMPONENT	Specification compliance: Yes/No (Indicate 'Yes' or 'No'; describe deviation from requested spec)	QUANTITY	TOTAL
Workbench moist proof with PVC top (2 m x1 m x 90 cm high)		1	
Rustproof, splash proof platform scale (30 kg and 1 g division)		1	
Stainless Steel 2 Tier Trolley, Utility Cart (95 cm high, 51 cm wide, 83 cm long, 66 cm intertier distance, 17 cm floor height to first tier)		2	
Nutec wall office, storage room and lab space at R1800 per square meter. Room collective space = 36 m ²		36	
Rustproof, splash proof bench scale (30 kg and 1 g division)		1	
Contingencies (civil works, cement, cable ties, equipment, etc)		1	
Estimated Total			

FIGURE 1B: BUILDING (NO 2) WITH PROPOSED QUARANTINE/BROODSTOCK- AND RESEARCH HATCHERY SYSTEMS SCHEMATIC OUTLAY



EXPERIMENTAL BROODSTOCK CONDITIONING/PRIMARY HATCHERY SYSTEM (FIGURE 1B)

a) Quarantine tank and dipping tanks

Two IBC tanks will be used as **dip tanks** for new brood fish arrivals and is also closest to the entrance door of the building. The first tank can be used to acclimatize new arrivals and the second to dip fish. Chemicals can be weighed on the **opposite corner bench**, which will have sub benchtop space (closed) for storing these chemicals. The 1st of **five fibreglass broodstock tanks (3.6m x 2m x 0.6m (shallow depth))** is next to the dip tank IBC and can be used to quarantine the fish by having a flow through function (borehole and preheated with inline Ultrazap heater – before supplying water to dip or quarantine tanks), as well as aeration from **central blower system** (see General Notes section). The water line supplying the IBC tanks will branch to alternatively supply preheated/non-heated (system or external fill up) water to the temporary quarantine tank (Fig 1B).

b) Broodstock/hatchery tanks

The plan is using fibreglass broodstock/hatchery tanks, which are preferred above IBC tanks - to improve footprint coverage of these tanks, optimize depth and water heating for broodstock keeping, and most importantly to accommodate all mainline piping below the tanks with accessibility to valves and bottom storage racks for net bags (efficient footprint utilization)(Fig 5). The fibreglass tanks have a tapered floor tilting from both the side wall and back wall of tank – towards the exit opening. The **support steel (50mm square tubing = 2mm thick) frame of the tank** is also fibre glassed for rust proofing and structural re-enforcement.

The broodstock tank water leaves the tank exit drain point (0.7m deep) via a slotted removable 160mm PVC plug (broodstock) or a 500-900 micron sock net (**garden insect netting x 5m²** for all tank exits))covered skeleton cut pipe (160mm)(hatchery function). The sock net equipped with a 2mm stitched aperture in top pipe opening (overflow backup). The water then enters a 160mm bottom drain socket. The second lower part of socket accommodates a 160 x 75mm reducing bush cut in half so that 50% of 160mm socket space is still 160mm. Two 6mm stainless steel pins are forced through a 5.5mm drill hole in this area (cross pins – water leak proof) so that no big fish can plug the reducing exit line. A 90 degree elbow (75mm) and a 45 degree elbow (75mm) guides water into a

75mm Y-piece with straight axis perpendicular to the return line T-piece (160mm)(Fig 5). A 75mm PVC valve is installed between the mentioned Y –piece and return T-piece (160mm), which is fitted with a 160mm x 75mm reducing bush in the receiving side of T-piece. The Y-piece also directs waste/tank drain water straight through the building wall and is fitted with a 75mm valve just at the outside of the wall. The **75mm valves for both the effluent and return line** with 75 bore through-flow in valve. External 75mm valve must have a removable handle to prevent external fiddling or sabotage. The external pipe is joining into a common 160mm pipeline running to the external sump of the building. An exception of effluent modification will be done only for tank 1 (next to the IBC dip tanks discussed). When a flow through is mediated the valve to the system return line is closed and will the tank drain completely. For this reason, a standpipe before and after the external valve will be installed (T-pieces). The standpipes will be connected with each other with one elbow and one T-piece (siphon break) (Fig 5).

The return water pipe (160mm) from all 5 tanks to filter system lies on the inner side of the delivery water line (75mm) from system pump (Fig 5). The latter borders the inner side of the front tank (Figs 4 &5). The 160mm return water line is extended with T-piece and valve which are opened to routine flush the return line due to sludge build up and unhygienic conditions created. The return line receives also water from the remaining 4 broodstock conditioning tanks and before entering the swirl separator it also branches off to an effluent line receiving waste products from the system sump-, drumfilter and swirl separator effluent lines. This branch-off is shut with a **160mm butterfly valve**. Should the system tanks also be drained, or assist with flushing the exit line, then the butterfly valve can be opened for the purpose (Fig 1B).

The 160mm return line finally enters the **fibreglass swirl separator (1.7m diameter and peripheral decantation chamber diameter = 2m)** where the cylinder meets the conical part – and at a tangential angle (see Fig 10). Water will spill over the complete circumference of the separator cylinder top opening at a height of 100mm less than the water level in the broodstock tanks (~1.1m). The water will then fall in the decantation chamber (outer vertical wall = 30cm) and the chamber floor width is 17cm. Therefore, the cylinder diameter is 1.66m so that the total diameter of the unit will not exceed 2m. The overflow of the main cylinder will run through a net bag (2mm mesh and spare bag with 3mm mesh) that will lock around the inner cylinder by stitching an elastic (Jockey type) around the circumference of bag. The bag also equipped with an opening in the middle stitched to a float ring (160mm). Water must escape through this ring if the net bag gets blocked and the elastic is not pulling automatically of the inner ring (blocking pressure). The swirl separator also equipped with a sludge valve (75mm) which is joining into the abovementioned effluent pipe (160mm) transporting water to the external sump. If uncaught escaped juvenile fish to be harvested from the swirl separator then system tank return valves are closed, system pump temporary shut, and the 160mm return inlet of the swirl separator closed with a butterfly valve. The swirl separator effluent valve opened in order to trap fish in external sump.

The return line from swirl separator to the drum filter is by way of a mounted 160mm socket flash fit to the floor of the decantation chamber so that the chamber can drain completely if system water flow stops. From the decantation chamber the 160mm line joins into the **drumfilter (50kl/h capacity with 60µ screen and spare screen supplied)**. The **drumfilter equipped with a UV sterilizer** that can be replaced. **Three spare UV sterilizers** to be supplied (plug and play). Drumfilter (Profidrum example) must be maintained with after service parts immediately available from South African supplier. Drumfilter size and footprint similar to those described for systems in Building 1. Water exits the drumfilter into the system **fibreglass sump (2m x 1m x 1.3m (d))** as per Fig 1B. The system sump overflow level is determined by a 50mm standpipe connected to an exit elbow fibre glassed in the wall

of tank about 70cm from floor level. The standpipe level will be adjusted to balance the head flow of system water towards the sump. The overflow pipe and floor level drain exit (50mm) both are connected to the abovementioned 160mm effluent pipe serving the drumfilter (backwash line) and swirl separator effluent line to external waste water sump. The sump equipped with **similar raw water supply equipment as described for Building 1**. Slotted plastic crates can also fit in the sump open area and filled with **Zeolite chip bags (veggie bags)** if the biofilter of the system is still immature since hatcheries are not always running continuously. At least **200 kg Zeolite chips** (Pratley SA) and veggie bags + slotted crates must be supplied by service provider. The crates must be placed between the drumfilter inflow point and the system pump abstraction point so that water can flow through the crates.

Two system pumps will abstract (63mm pipe) and supply water from sump - in a similar installation configuration as described for the pumps in building one systems (Fig 1A). As demo model for electricity saving purposes it is recommended that **economic pumps (ACP120 with controller)** be used as main supply pump, and the backup pump as well. This proves a better economy for fish keeping and is suitable for UPS power supply (load shedding). Delivery pipes (63mm) of both pumps supplied with non-return valves before pipes join into one line (75mm pipe). The 50mm branch of delivery of water to **UV unit (4 x 55w units – service provider to supply 12 spare lamps)** and **heatpumps (24kw output)** with similar configurative outlay as discussed for Building 1 systems. However, heated water from the heatpumps will enter the system sump and not the biofilter. The water from the UV sterilizer bank will enter the stand alone cylindrical biofilter (**fluidized Kaldnes type = 0.7m³ media**) with similar size than the swirl separator without decantation chamber (Fig 1). Water exits the biofilter column through a firm 5mm mesh non rustable grid lying on the cone-to cylinder border of the filter, and then exits at the bottom point (75mm) at floor level. The biofilter is covered with a **90% shade cloth net bag (elastic stitched)** and the bag is equipped with openings for the UV exit water and aeration piping entrances (biofilter light sensitive. Biofilter also equipped with an **aeration ring (leaky pipe approx. 5m)** connected to the overhead aeration ring main as for building 1.

The main 75mm supply line runs on the floor (clamped) and supply two delivery points (50mm reduced) to each of the five system tanks (3.6m x 2m (w) x 0.6m (shallow depth point), thus 10 delivery points. Each **4kl tank (0.55m average water depth) is of the fibreglass type with fibreglass coated support legs similar to** the description given for broodstock/hatchery systems in building1. Each of the delivery points is a riser pipe with **50mm valves**, an elbow (90°) and a union (Fig 4 & 5). The union is connected to one of three piping options pending the application. The first application is a **50mm venturi fitting with elbow (adjustable injection angle)**. The second is replacement of the elbow with a **pipe as spraybar (5mm holes and quantity of holes for 5 tanks** calculated by online orifice calculator) (Fig 1B). The third application as per Fig 4-6 when the union is connected to a fixed 50mm (backbone) x 15mm pipe manifold and associated components all housed by a slide-able fibreglass platform (when not union connected). The 50mm manifold includes **twenty units of 50x15mm reduced outlets** originating from twenty respective 50mm T-pieces, after which the manifold connects again to the second 50mm union (supply line loop) from the second pump supply delivery riser line of the same tank (Fig 4). The indicated T-pieces are vertically passing through the fibre glassed platform. A reduced outlet (reducing bush =50x15mm) is connected to a 15mm union and then a 90° elbow (15mm) connected to a 15mm valve. The latter is connected to a service-able Microjet filter, which is connected to 50mm glue on T-piece via a 15mm reducing bush (Fig 5 & 6). The two vertical outlets of the 50mm T-piece is respectively equipped with a 50x20mm reducer (bottom) and 50 x 40mm reducer (top). The latter reducer is further fitted with a 40x 20mm reducer that is 50% cut in half in length and fully inserted in the 50 x 40mm reducer. The inner (20mm) pipe-seat stop of both the 50 x 20mm and 40 x 20mm reducers is smoothly flattened by sanding it with a Dremel® grinder on the inside so that

a 20mm PVC pipe can slide in it when moved by hand. Also, the 40 x 20mm reducing bush is perforated in its spacer seat (Fig 6) with approximate 3mm holes using a sharp point heated soldering iron.

The one end of a 40mm PVC pipe is glued into the mentioned half space in 50 x 40mm reducer within 50mm T-piece, and the other end fit in the 4cm thick pre-drilled spaced fibreglass platform from the bottom. The pipe also firmly locks over the screw cap of egg tumbler hatchery bottle (Aqualle 5L still water bottle). The screw cap of the bottle is equipped with a 18-19mm hole through which the mentioned 20mm pipe can firmly slide. The 20mm pipe will guide upwelled water (valve controlled velocity) in the bottle downwards towards the floating net bag in the broodstock /hatchery tank. The 20mm pipe is long enough to commence about 4 cm lower than the cut open bottom lip of inverted 5L bottle, and ends deep enough into the floating hatchery net bag space so that the latter can be locked in position and not drift away. Flow into the egg tumbler incubator is mediated by water passing through the 3mm holes in seat of 40 x20mm reducer, as well as the bottle cap area around the 20mm PVC pipe insert (also done with heated soldering iron). When incubation and larval evacuation completed, the 20mm PVC pipe can be removed from the top and all water in the bottle can drain through to the net bag below. The net bag larvae are then transferred to the corresponding number (1 of 100) net bag in the nursery system (Fig 1).

The fibreglass platform, 50mm pipe manifold and all associated fittings, pipes, filters, valves and egg tumbler incubators are all integrated as one unit which can be removed or re-installed. When the tanks are used for broodstock keeping, then the platform complex is disconnected from the 50mm unions before it is moved backwards towards the back wall area of the tank. The fibreglass platform therefore is designed to accommodate all described components for twenty times 5L incubators, as well as to slide on the side walls of the fibreglass tank. The platform crosscut view (Figs 4-6) indicates guide lips (tank slide) and is also structurally re-enforced with ribbing. **The platform is prefabricated with 4cm thick wood properly fibre glassed with resin and matting.** Where the platform is drilled for fitting or pipe passages, the walls of such passages are also properly coated with fibreglass.

When broodstock is reared the platform with pipe manifold and hatchery structures is shifted to stop against the back wall of hatchery tanks. The upper wall border of the tanks is attached to a flat lip surface (5cm and 90° outward angle) so that the platform can slide on this surface, but mostly to ensure wall firmness against wall bulging (water pressure).

To prevent fish escapes (jumping), **a stainless frame (6mm round bar), with 17% Allnet shade net attached to it - is used to cover tanks (4 frames at 1.5m x 0.9m each)** by lying on the fibreglass platform and locking to front wall of fibreglass tanks with a stop lip. The frames are stowed away on non-rustable platform surface below tanks. This storage area also used for storing air dried (outside building) de-commissioned floating hatchery net bags. The latter is made up of a double layer of 25mm PVC pipe, enveloped by a 0.5mm net loop and bag stitched to it from the bottom (Fig 5).

c) Fibreglass nursery tanks (broodstock pair keeping)(Fig 1B)

This system tanks are of similar configuration (floor tapering, piping etc) as for the broodstock/hatchery tanks but with different dimensions (**5m x 1m (w) x 0.7m(d)**)(Fig 2 – cross section) **and quantity (x10)**. RAS reticulation is also similar than discussed for the broodstock hatchery tanks but spray bar orifice spacing is obviously different since the net bags for the breeder pairs are of different size (**45cm(W) x 60cm(D) x 90cm(L)(2,1m²)**)(Figure 3). The same bags are used to raise breeder specific offspring (from egg tumbler incubators are spawned by the breeder pair in net bag). During this time the unions of the two riser delivery pipes per tank will be connected to an overhead

spray bar that will deliver equal volumes of water for all the net bags via orifices with size and quantity per net bag calculated by an online orifice calculator, considering all ten tanks and 100 net bags, and most importantly the delivery volume of system pump minus branched off delivery to the biofilters (2 in this system due to higher bioload than in the broodstock/hatchery system) and heat pump banks, as well as frictional loss. The orifice sizes determined by delivery pump (ACP20 – as for the other systems).

The biofilter media volume (2 filters) is doubled in the hatchery/broodstock pair keeping system since the bioload will be doubled in this system (offspring raising = 600 per tank). The layout incorporation and piping of the second biofilter are as per outlay in Figure 1B. The return line from biofilter is also to the sump (not shown in Fig 1). When net bags are removed then the overhead spray bar can be replaced by the venturi /elbow or venturi spray bar + end plug options as discussed for the broodstock/hatchery system.

The sludge effluent of the second row of the fibreglass nursery tanks (broodstock pair keeping) is not directed (per tank) through the wall and external effluent pipe, but is joining with a 160mm pipe running below the tanks towards the external effluent pipe of the building. Valve control and positioning of the effluent line is shown in Figures 1 and 2. As for the broodstock/nursery tanks, all air dried net bags and cover net frames (broodstock jumping control) will be stored on non-rustable platforms below the tanks (Fig 2).

d) Bench top outlay for research work (Fig 1B)

Lintels of about 4m in length mounted on brick pillars (x4) and with 0.6m width (smooth surface with final cement work) will be spaced as per FIG B and about 1m high. The bench can accommodate glass aquaria (research) which will also receive aeration supply from the aerator ring main supply. The overhead supply of borehole/municipal water(20mm) with stop valves about 90cm above bench top surface. A drainage pipe of 110mm will run along bench and floor border to receive any effluent from bench structures. The 110mm pipe will have two 0.8m riser pipes (63mm) per bench - into which effluent water can be directed. The bench top also illuminated by weather proof lighting (single tube T8 units as for other systems) and controlled by a centralised timer and breaker switch.

GENERAL NOTES (lighting, insulation and aeration for all systems):

As for the other three systems and also the systems in building 2, the tanks will be illuminated by overhead (approx. 1m above tank surface water) LED tubes with at least similar lux value than 30w fluorescent tubes) in weather proof casings (2 tubes per casing). The 16mm stainless steel attachment bar (suspension stabilization) and cabling +light units can be suspended by durable attachments (non-rustable) to the wooden support structure of the building roof. In the case of the IBC tank usage, 2 units (1.2m each) will cover three IBC tanks with lighting. The lights will be controlled by a moist proof wall mount digital timer as mentioned for systems in building 1. The photoperiod setting for each system must be separately controlled by respective timers. At least 20 spare LED tubes (18W T8 tubes at 1,2m each – coolwhite) must be supplied by the systems installation contractor.

It is recommended that all unnecessary openings between the building and outside be sealed to prevent cooling of the buildings during winter periods. Since the water will be warmed but heatpump action – it is advised that 24000 BTU air conditioners be used to heat the building atmosphere during winter (see schematics for building one and two), since heated water only will cause water condensation and even ceiling “rain” in the building. The consequence of condensation will be rusting

of all metal parts, erosion of electrical gear, ceiling wood rotting, and the growth of mould everywhere. Insulation of the ceiling **with Sisalation 450 foil** will also help to trap heat in the building.

All aerators (LP 100) in buildings must be mounted on wall bracket platforms close to the ceiling so that warm air can be recycled back to the aqua-systems via diffusers. Each leaky pipe diffuser constructed as per Figure 9.

For building 2 the aeration loop will provide an overhead pressure loop supply of air to all net bags/ longitudinal cement bench tanks/bowls via a 63mm pipe loop and with two connected Microjet tubing lines per diffuser (500 lines and 250 diffusers). Each net bag/cement bench tank will therefore receive a diffuser which can be controlled by the inline connected Microjet choke valves. The overhead loop pipe (63mm) will be connected to the Microjet tubing using a Microjet fitting with screw on the one end (63mm pipe insert via drilled hole and Pratley steel sealant, and Microjet pipe connection nipple on the other end (Microjet pipe insert). The loop pipe can be attached with cable ties to the suspended 16mm stainless steel round bar supporting the light fittings – which in the case of building 2, is also mounted above the cement bench. The 63mm pipe will also provide aeration to the Kaldnes biofilters of both RAS filter systems in broodstock filter system in building 2. Building two will have 10 LP 100 aerators installed. UPS backup power system (loadshedding) similar to Building 1 but with 3 stations (1 for hatchery system and 2 for broodstock system plus all lighting)

Table 4: Estimated budget figures for experimental broodstock conditioning/primary hatchery system (FIGURE 1B)

COMPONENT	Specification compliance: Yes/No (Indicate 'Yes' or 'No'; describe deviation from requested spec)	QUANTITY	TOTAL
1KL IBC tanks new		2	
LP100 aerators		10	
ACP120 submersible pumps with controllers		6	
200AH deep cycle batteries (Lithiumiron phosphate)		12	
System switchgear (DB and wiring) +GSM sms warning system (including siren)		2	
6mm stainless steel frames with 17% shade net cover (1,5x 0.9 m)		20	

Tank exit valves (75 mm), standpipe valves		30	
50 mm PVC glue on valves for heatpumps, UV sterilizers, biofilter and sump supply with external water. Also to 15 systems tanks (double inlet loop) and dip tanks supply and drainage.		96	
75 mm PVC valves for pump delivery controls to system rows and pressure loop		3	
18 cm(w) x 50 cm(L) x 35 cm (d) mesh screen(500 micron) monofilament (insect net screen) in square meter		220	
45 cm(w) x 90 cm(L) x 60 cm (d) mesh screen(500 micron) monofilament (insect net screen) in square meter		2	
Profidrum/biofilter (50 kl/h minimum) combo with UV sterilizer for drum screen treatment		2	
Fibreglass sump with rust proof legs (130 cm height) (2,6 m x 1 m x 1 m)		2	
Kalnes biomedica (7 mm dia) in cubic meters		2,2	
Oysternet sub pump baskets with cable tie closed lids		6	
Aeration diffusers (150 mm leaky pipe length) for each net bag, biofilter ring (5 m) in meter (x 3 units). Also for bench top supply. 20 mm leaky pipe in meters		70	
Microjet airline pipe (4mm) for all diffusers in meter		500	

18w T8 coolwhite LED tube lights units with weather proof casing (double tube - also supplied)		46	
Spare LED tubes T8 18w Coolwhite		23	
50mm HP float valves		2	
50mm LP float valves		2	
Inline carbon filter cartridge x 20 and housing for municipal water line		20	
Fibreglas tanks (3.6 m x 2 m x 0.6 m -0.7 m deep tapered floor as per Fig 4. Equipped with rust proof ss feet and rustproff support frame.		5	
Fibreglas tanks (5 m x 1 m (w) x 0.6 m -0.7 m deep tapered floor as per Fig 2. Equipped with rust proof SS feet and rustproof support frame.		10	
Bench with lintels and 4 pillar cemented bricks and final smooth top finish (4 m x 0.6 m) and 1m high. Packing space below bench top		4	
55 w UV sterilizer with 50 mm unions		12	
55 w UV sterilizer tubes spare		25	
24 kw output heatpump		4	
1.6 m diameter swirl seperator with decantation gutter (17 cm wide) and bottom exit sludge valve		2	

1.6 m diameter swirl separator without decantation gutter and functioning as biofilter with exit pipe slots close to bottom and properly screened with 4mm oysternet tube with closed end. Biofilter also equipped with aeration tube and overhead venturi x2 (50 mm with control valves (50 mm) supply from system pump		3	
Fibreglass platforms (as per figure 4-6 and functionality description) complete with 20 installed egg tumbler incubators and control valves(15 mm) and microjet filters (15 mm), fittings and 5l bottle all included. Per unit		5	
Piping (including net bag float pieps, pipe clips, fittings, small valves etc for systems plumbing, support structures for overhead airline supply and lighting.		1	
Stainless steel (12 mm) for net bag frames (3.4 m per frame) in meters		340	
Contingencies (civil works, wash basin, extra work bench, sisolation insulation, cement, cable ties, suspension ss frame for aeration and lighting etc)		1	
24000 BTU Aircon		6	
Estimated Total			

Overall estimated budget (R3 348 789) excludes installation costs, external works, generator backup (UPS functions as backup for generator failure, effluent lines between buildings, as well as to pond. Fish handling equipment, lab requirements, office content, spare pumps and fittings, and biosecurity requirements.

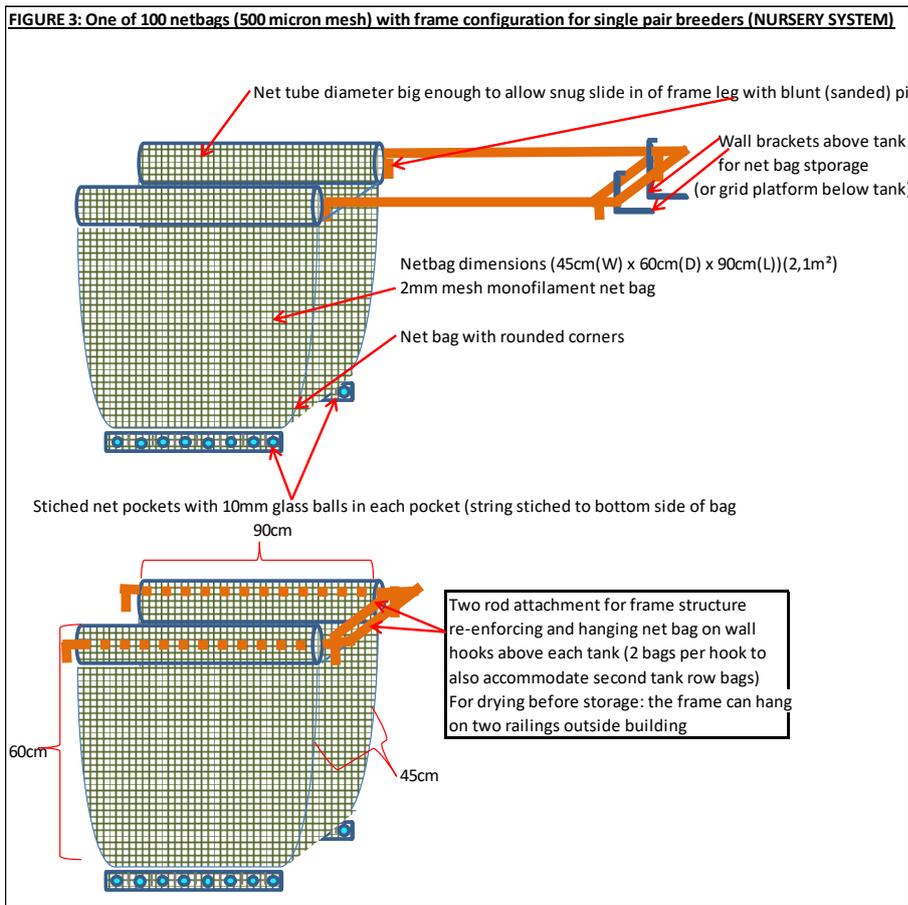
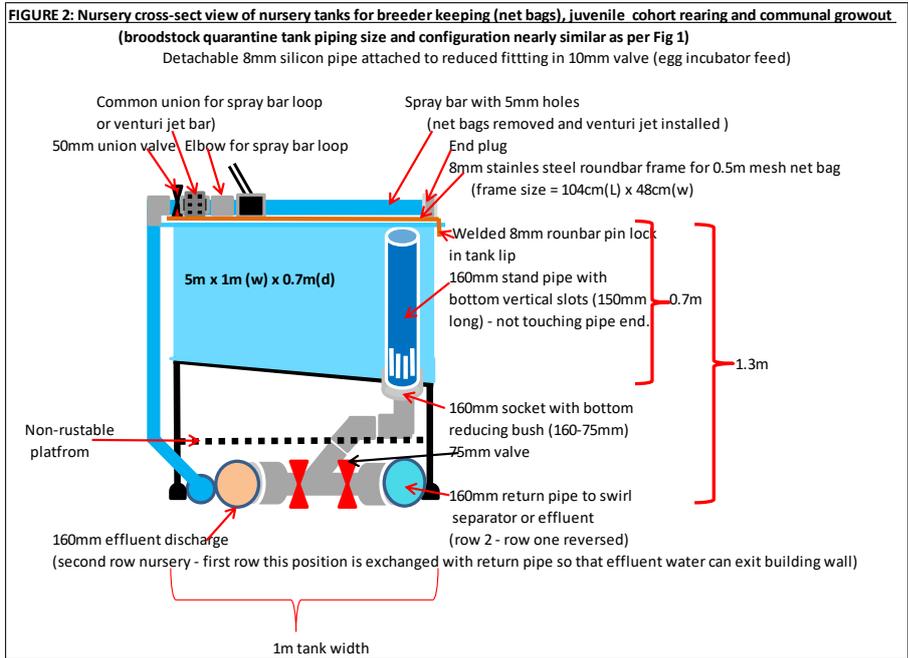


FIGURE 4: Crossect- overhead removable hatchery platform and outlay

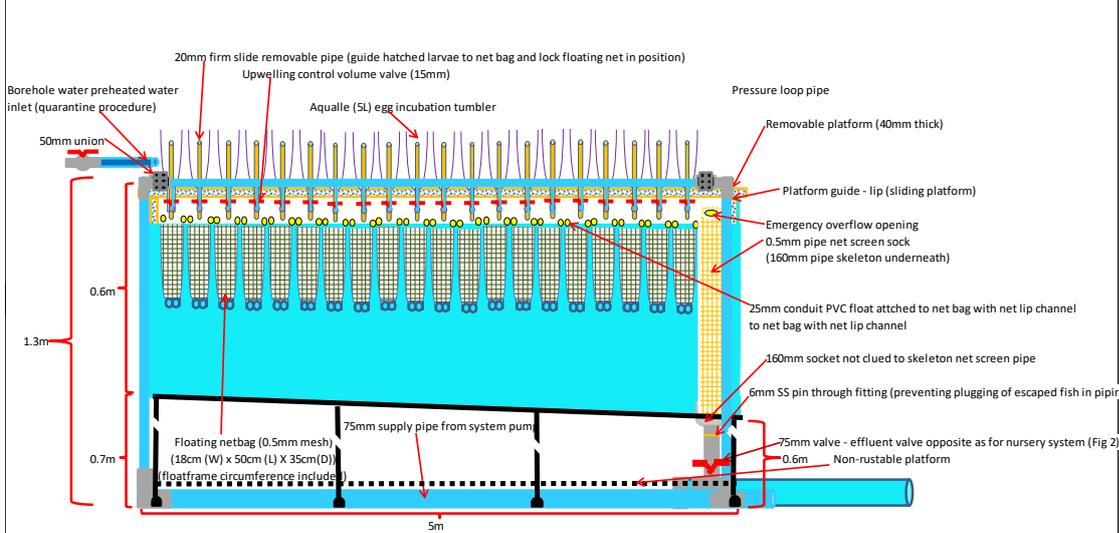
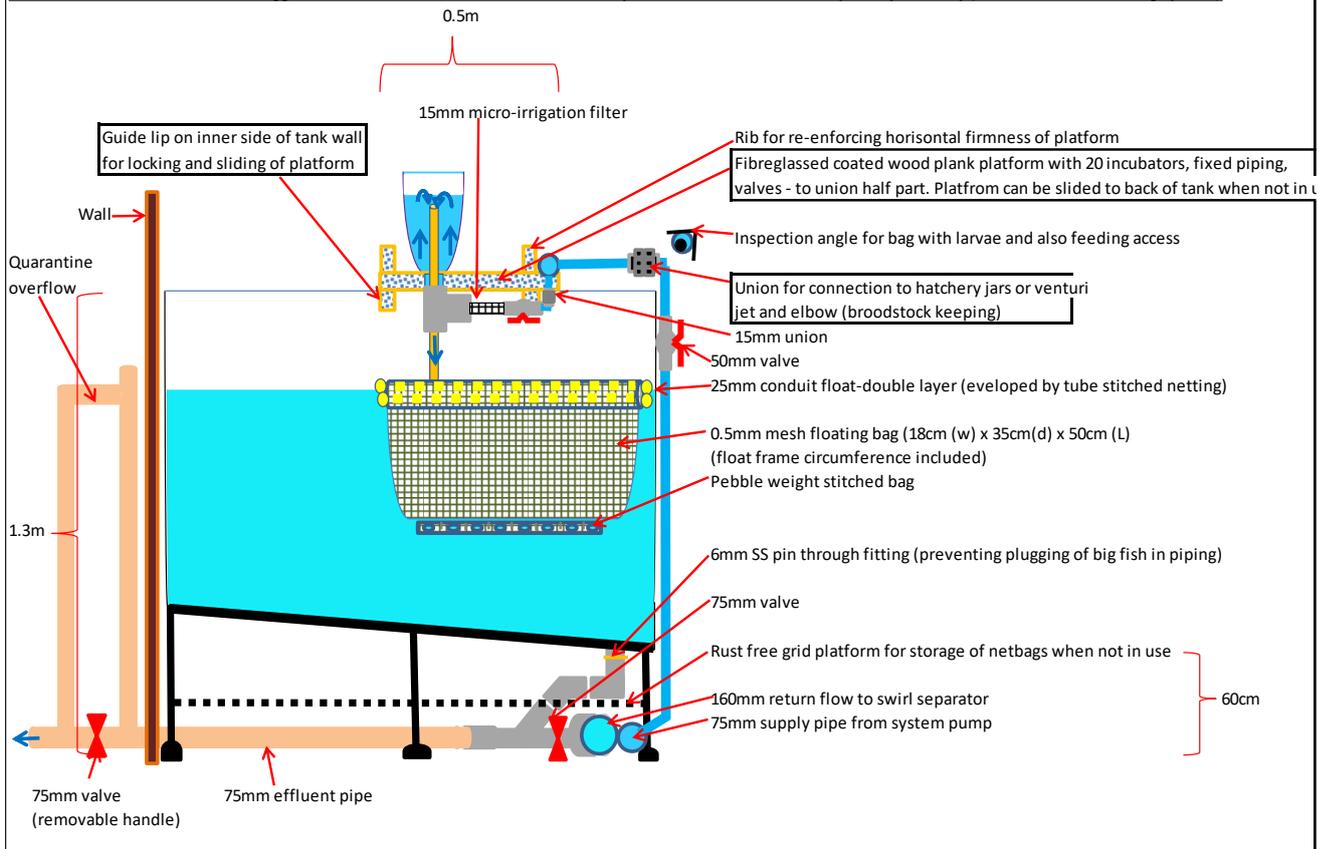


FIGURE 5: Side view of one of 100 egg tumblers mounted on removable/slidable platform of broodstock tank/primary hatchery (broodstock conditioning system)



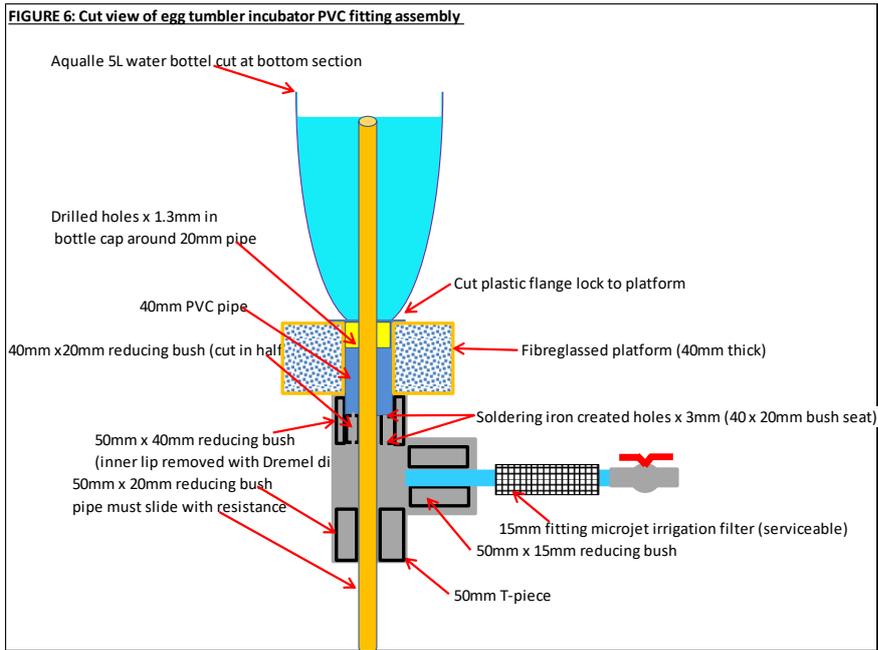


FIGURE 7: Component picture examples

<p>LP 100 Airpump (140L/H AT 4,3m depth)</p>	<p>Heatpump example</p>	<p>UV Sterilizer</p>	<p>Economy pump with controller - as opposed to pool pumps (hi energy cost)</p>
<p>Drumfilter and biofilter combined (Profidrum)</p>	<p>Cut open IBC tank (1KL)</p>	<p>Kaldnes biomedica (biofilter)</p>	<p>Standpipe configuration - tank exits</p>
<p>Tank bank return water connection outlay</p> <p>160mm Y-piece</p> <p>160-110 reducing bush</p> <p>160mm pipe (to drum filter)</p> <p>110mm pipe (from one tank bank)</p>			

FIGURE 8: UV Bank outlay and for clamp connection to wall

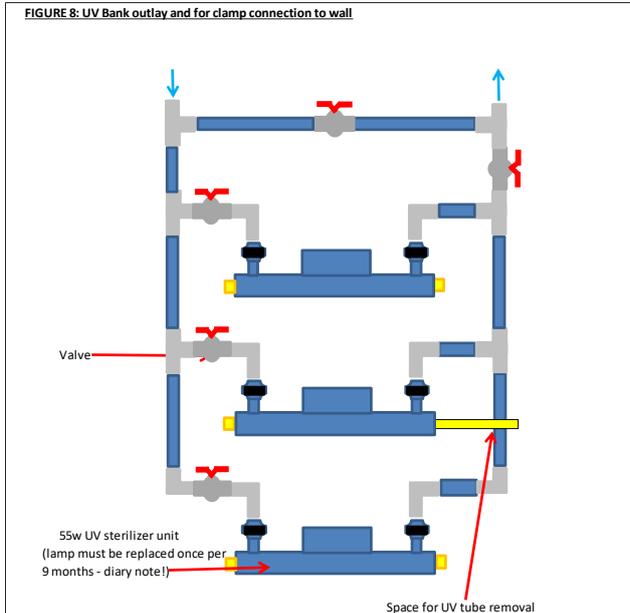


FIGURE 9: Leaky pipe diffuser construction

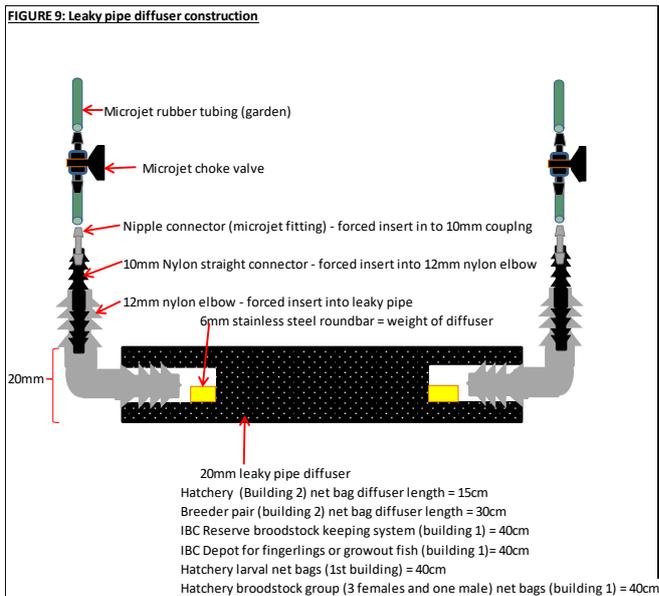
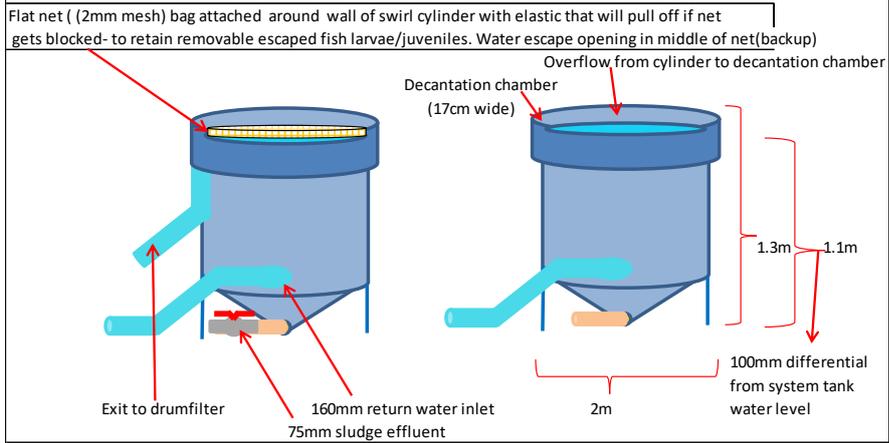


FIGURE 10: Swirl separator outlay



PART A INVITATION TO BID

YOU ARE HEREBY INVITED TO BID FOR REQUIREMENTS OF THE (NAME OF DEPARTMENT/ PUBLIC ENTITY)					
BID NUMBER:	ARC/07/05/2025	CLOSING DATE:	04 July 2025	CLOSING TIME:	11:00
DESCRIPTION	Supply, Assembly, Installation and Commissioning of Tilapia Recirculation Aquaculture System (RAS) at Agricultural Research Council-Animal Production, Irene. ARC-AP.				
BID RESPONSE DOCUMENTS MAY BE DEPOSITED IN THE BID BOX SITUATED AT (STREET ADDRESS)					
Agricultural Research Council – Irene Campus (Main Building)					
Old Olifantsfontein Road					
Irene, 0062					
BIDDING PROCEDURE ENQUIRIES MAY BE DIRECTED TO			TECHNICAL ENQUIRIES MAY BE DIRECTED TO:		
CONTACT PERSON	Mr. Benjamin Motuba		CONTACT PERSON	Dr. Mary-Jane Thaela-Chimuka	
TELEPHONE NUMBER	012 672 9114		TELEPHONE NUMBER	012 672 9316	
FACSIMILE NUMBER			FACSIMILE NUMBER		
E-MAIL ADDRESS	motubabp@arc.agric.za		E-MAIL ADDRESS	ThaelaMJ@arc.agric.za	
SUPPLIER INFORMATION					
NAME OF BIDDER					
POSTAL ADDRESS					
STREET ADDRESS					
TELEPHONE NUMBER	CODE		NUMBER		
CELLPHONE NUMBER					
FACSIMILE NUMBER	CODE		NUMBER		
E-MAIL ADDRESS					
VAT REGISTRATION NUMBER					
SUPPLIER COMPLIANCE STATUS	TAX COMPLIANCE SYSTEM PIN:		OR	CENTRAL SUPPLIER DATABASE No:	MAAA
B-BBEE STATUS LEVEL VERIFICATION CERTIFICATE	TICK APPLICABLE BOX] <input type="checkbox"/> Yes <input type="checkbox"/> No		B-BBEE STATUS LEVEL SWORN AFFIDAVIT	[TICK APPLICABLE BOX] <input type="checkbox"/> Yes <input type="checkbox"/> No	
[A B-BBEE STATUS LEVEL VERIFICATION CERTIFICATE/ SWORN AFFIDAVIT (FOR EMES & QSEs) MUST BE SUBMITTED IN ORDER TO QUALIFY FOR PREFERENCE POINTS FOR B-BBEE]					
ARE YOU THE ACCREDITED REPRESENTATIVE IN SOUTH AFRICA FOR THE GOODS /SERVICES /WORKS OFFERED?	<input type="checkbox"/> Yes <input type="checkbox"/> No [IF YES ENCLOSE PROOF]		ARE YOU A FOREIGN BASED SUPPLIER FOR THE GOODS /SERVICES /WORKS OFFERED?	<input type="checkbox"/> Yes <input type="checkbox"/> No [IF YES, ANSWER THE QUESTIONNAIRE BELOW]	
QUESTIONNAIRE TO BIDDING FOREIGN SUPPLIERS					
IS THE ENTITY A RESIDENT OF THE REPUBLIC OF SOUTH AFRICA (RSA)?			<input type="checkbox"/> YES <input type="checkbox"/> NO		
DOES THE ENTITY HAVE A BRANCH IN THE RSA?			<input type="checkbox"/> YES <input type="checkbox"/> NO		
DOES THE ENTITY HAVE A PERMANENT ESTABLISHMENT IN THE RSA?			<input type="checkbox"/> YES <input type="checkbox"/> NO		
DOES THE ENTITY HAVE ANY SOURCE OF INCOME IN THE RSA?			<input type="checkbox"/> YES <input type="checkbox"/> NO		
IS THE ENTITY LIABLE IN THE RSA FOR ANY FORM OF TAXATION?			<input type="checkbox"/> YES <input type="checkbox"/> NO		
IF THE ANSWER IS "NO" TO ALL OF THE ABOVE, THEN IT IS NOT A REQUIREMENT TO REGISTER FOR A TAX COMPLIANCE STATUS SYSTEM PIN CODE FROM THE SOUTH AFRICAN REVENUE SERVICE (SARS) AND IF NOT REGISTER AS PER 2.3 BELOW.					

PART B TERMS AND CONDITIONS FOR BIDDING

1. BID SUBMISSION:	
1.1.	BIDS MUST BE DELIVERED BY THE STIPULATED TIME TO THE CORRECT ADDRESS. LATE BIDS WILL NOT BE ACCEPTED FOR CONSIDERATION.
1.2.	ALL BIDS MUST BE SUBMITTED ON THE OFFICIAL FORMS PROVIDED-(NOT TO BE RE-TYPED) OR IN THE MANNER PRESCRIBED IN THE BID DOCUMENT.
1.3.	THIS BID IS SUBJECT TO THE PREFERENTIAL PROCUREMENT POLICY FRAMEWORK ACT, 2000 AND THE PREFERENTIAL PROCUREMENT REGULATIONS, 2017, THE GENERAL CONDITIONS OF CONTRACT (GCC) AND, IF APPLICABLE, ANY OTHER SPECIAL CONDITIONS OF CONTRACT.
1.4.	THE SUCCESSFUL BIDDER WILL BE REQUIRED TO FILL IN AND SIGN A WRITTEN CONTRACT FORM (SBD7).
2. TAX COMPLIANCE REQUIREMENTS	
2.1	BIDDERS MUST ENSURE COMPLIANCE WITH THEIR TAX OBLIGATIONS.
2.2	BIDDERS ARE REQUIRED TO SUBMIT THEIR UNIQUE PERSONAL IDENTIFICATION NUMBER (PIN) ISSUED BY SARS TO ENABLE THE ORGAN OF STATE TO VERIFY THE TAXPAYER'S PROFILE AND TAX STATUS.
2.3	APPLICATION FOR TAX COMPLIANCE STATUS (TCS) PIN MAY BE MADE VIA E-FILING THROUGH THE SARS WEBSITE WWW.SARS.GOV.ZA.
2.4	BIDDERS MAY ALSO SUBMIT A PRINTED TCS CERTIFICATE TOGETHER WITH THE BID.
2.5	IN BIDS WHERE CONSORTIA / JOINT VENTURES / SUB-CONTRACTORS ARE INVOLVED, EACH PARTY MUST SUBMIT A SEPARATE TCS CERTIFICATE / PIN / CSD NUMBER.
2.6	WHERE NO TCS PIN IS AVAILABLE BUT THE BIDDER IS REGISTERED ON THE CENTRAL SUPPLIER DATABASE (CSD), A CSD NUMBER MUST BE PROVIDED.
2.7	NO BIDS WILL BE CONSIDERED FROM PERSONS IN THE SERVICE OF THE STATE, COMPANIES WITH DIRECTORS WHO ARE PERSONS IN THE SERVICE OF THE STATE, OR CLOSE CORPORATIONS WITH MEMBERS PERSONS IN THE SERVICE OF THE STATE."

NB: FAILURE TO PROVIDE / OR COMPLY WITH ANY OF THE ABOVE PARTICULARS MAY RENDER THE BID INVALID.

SIGNATURE OF BIDDER:

CAPACITY UNDER WHICH THIS BID IS SIGNED:
(Proof of authority must be submitted e.g. company resolution)

DATE:



TAX CLEARANCE CERTIFICATE REQUIREMENTS

It is a condition of bid that the taxes of the successful bidder must be in order, or that satisfactory arrangements have been made with South African Revenue Service (SARS) to meet the bidder's tax obligations.

1. In order to meet this requirement bidders are required to complete in full the attached form TCC 001 "Application for a Tax Clearance Certificate" and submit it to any SARS branch office nationally. The Tax Clearance Certificate Requirements are also applicable to foreign bidders / individuals who wish to submit bids.
2. SARS will then furnish the bidder with a Tax Clearance Certificate that will be valid for a period of 1 (one) year from the date of approval.
3. The original Tax Clearance Certificate must be submitted together with the bid. Failure to submit the original and valid Tax Clearance Certificate will result in the invalidation of the bid. Certified copies of the Tax Clearance Certificate will not be acceptable.
4. In bids where Consortia / Joint Ventures / Sub-contractors are involved, each party must submit a separate Tax Clearance Certificate.
5. Copies of the TCC 001 "Application for a Tax Clearance Certificate" form are available from any SARS branch office nationally or on the website www.sars.gov.za
6. Applications for the Tax Clearance Certificates may also be made via eFiling. In order to use this provision, taxpayers will need to register with SARS as eFilers through the website www.sars.gov.za.



PRICING SCHEDULE – FIRM PRICES (PURCHASES)

NOTE: ONLY FIRM PRICES WILL BE ACCEPTED. NON-FIRM PRICES (INCLUDING PRICES SUBJECT TO RATES OF EXCHANGE VARIATIONS) WILL NOT BE CONSIDERED

IN CASES WHERE DIFFERENT DELIVERY POINTS INFLUENCE THE PRICING, A SEPARATE PRICING SCHEDULE MUST BE SUBMITTED FOR EACH DELIVERY POINT

Name of bidder..... Bid number...**ARC/07/05/2025**.....

Closing Time 11:00 Closing date.....**04 July 2025**.....

OFFER TO BE VALID FOR...**120**...DAYS FROM THE CLOSING DATE OF BID.

ITEM NO.	QUANTITY	DESCRIPTION	BID PRICE IN RSA CURRENCY ** (ALL APPLICABLE TAXES INCLUDED)
----------	----------	-------------	---

- Required by:
- At:
- Brand and model
- Country of origin
- Does the offer comply with the specification(s)? *YES/NO
- If not to specification, indicate deviation(s)
- Period required for delivery
- *Delivery: Firm/not firm
- Delivery basis

Note: All delivery costs must be included in the bid price, for delivery at the prescribed destination.

** "all applicable taxes" includes value- added tax, pay as you earn, income tax, unemployment insurance fund contributions and skills development levies.



Pricing schedule

SUMMARY OF PRICING SCHEDULE

Priving Items	Price Including VAT if applicable
Table 1: Figure 1A.1-1A.2 Reserve Broodstock keeping and Depot Tank system	R
Table 2: Figure 1A.3 Production of Hatchery An Broodstock system	R
Table 3: Figure 1A.4 Supportive additional Structures/Equipment	R
Table 4: Figure 1B Experimental Broodstock conditioning/ primary hatchery system	R
Assembly, Installation and Commissioning of the entire project	R
Total Amount for the Project	R

TABLE 1: ESTIMATED COST BREAKDOWN FOR RESERVE BROODSTOCK KEEPING - AND DEPOT TANK SYSTEMS (FIGURES 1A.1-1A.2)

COMPONENT	Specification compliance: Yes/No (Indicate 'Yes' or 'No'; describe deviation from requested spec)	QUANTITY	TOTAL
1000 L IBC tanks new		32	
LP100 aerators		5	
ACP120 submersible pumps with controllers		4	
200AH deep cycle batteries (Lithiumiron phosphate)		4	
System switchgear +GSM sms warning system (including siren)		1	

6mm stainless steel frames with 17% shade net cover (1,2 x 1 m) and cable tie hinges		32	
Tank exit valves (50 mm), standpipe valves + 50mm PVC glue on valves for heat pumps, UV sterilizers, biofilter and sump supply with external water		84	
63 mm PVC valves for pump delivery controls to system rows and pressure loop		6	
110 mm butterfly valve with flanges for PVC pipe connection (system effluent shut or drainage connection)		4	
160mm butterfly valve with flanges for PVC pipe connection (system effluent shut or drainage connection)		2	
Profidrum/biofilter (30kl/h minimum) combo with UV sterilizer for drum screen treatment		2	
Fibreglass sump with rust proof legs (150 mm heigh) (2,6 m x 1 m x 1 m)		2	
Kalnes biomedica (7 mm dia) in cubic meters		1	
Oysternet baskets (1.5 m x 0.9 x 0,6 m) and two sub pump baskets with cable tie closed lids		4	
Aeration diffusers (200 mm leaky pipe) for each IBC tank, biofilter ring (5 m) in meter		30	
Microjet airline pipe (4 mm) for all diffusers in meter		150	
25 mm venturi jets		32	
50 mm HP float valves		2	
50 mm LP float valves		2	

Inline carbon filter cartridge x 20 and housing for municipal water line		20	
20 kl JOJO Tanks		4	
LP100 aerators (JOJO tanks)		2	
55w UV sterilizer with 50 mm unions		6	
13 kw output heatpump		4	
Borehole and supply to interconnected 20 KL JOJO tanks (float switch controlled)		1	
Piping, fittings, support structures for overhead airline supply and lighting.		1	
Contingencies (civil works, cement, cable ties, etc)		1	
2400 BTU Aircon		6	
Estimated Total			

TABLE 2: ESTIMATED BUDGET FOR PRODUCTION HATCHERY AND BROODSTOCK SYSTEM

COMPONENT	Specification compliance: Yes/No (Indicate 'Yes' or 'No'; describe deviation from requested spec)	QUANTITY	TOTAL
LP100 aerators		5	
ACP120 submersible pumps with controllers		2	
200 AH deep cycle batteries (Lithiumiron phosphate)		4	
System switchgear (DB and wiring) +GSM sms warning system (including siren)		1	
6mm stainless steel (10 mm) frames with 17% shade net cover (1 x 0.9 m)		16	
Tank exit valves (75 mm), standpipe valves		12	
50 mm PVC glue on valves for heatpumps, UV sterilizers, biofilter and sump supply with external water. Also to 15 systems tanks (double inlet loop) and dip tanks supply and drainage.		32	
75 mm PVC valves for pump delivery controls to system rows and pressure loop		2	
45 cm(w) x 90 cm(L) x 45 cm (d) mesh screen(500 micron) monofilament (insect net screen) in square meter		50	
45 cm(w) x 90 cm(L) x 90 cm (d) mesh screen(500 micron) monofilament (insect net screen) in square meter		50	
Profidrum/biofilter (50 kl/h minimum) combo with UV sterilizer for drum screen treatment		1	
Fibreglass sump with rust proof legs (130 cm height) (2,6 m x 1 m x 1 m)		1	
Kalnes biomedica (7 mm dia) in cubic meters		0,75	
Oysternet sub pump baskets with cable tie closed lids		2	
Aeration diffusers (150 mm leaky pipe length) for each net bag, biofilter ring (5 m) in meter.		12	
Microjet airline pipe (4 mm) for all diffusers in meter		120	

18 w T8 coolwhite LED tube lights units with weather proof casing (double tube - also supplied)		20	
Spare LED tubes T8 18 w Coolwhite		10	
50 mm HP float valves		1	
50 mm LP float valves		1	
Fibreglas tanks (5 m x 1 m (w) x 0.6 m -0.7 m deep tapered floor as per Fig 2. Equipped with rust proof SS feet and rustproff support frame.		3	
55 w UV sterilizer with 50mm unions		4	
55 w UV sterilizer tubes spare		4	
24 kw output heatpump		2	
1.6 m diameter swirl seperator with decantation gutter (17 cm wide) and bottom exit sludge valve		1	
1.6 m diameter swirl separator without decantation gutter and functioning as biofilter with exit pipe slots close to bottom and properly screened with 4 mm oysternet tube with closed end. Biofilter also equipped with aeration tube and overhead venturi x2 (50 mm with control valves (50 mm)supply from system pump		1	
Fibreglass platforms (as per figure 4-6 and functionality description) complete (40 cm(w) x 5 m (L) x 40 mm thick), but with 10 evenly installed egg tumbler incubators and control valves(15 mm) and microjet filters (15 mm), fittings and 5l bottle all included. Per unit		3	
Piping (including net bag float pieps, pipe clips, fittings, small valves etc for systems plumbing, support structures for overhead airline supply and lighting.		1	
Stainless steel (12 mm) for net bag frames (3.4 m per frame) in meters		136	
Contingencies (civil works, sisolation insulation, cement, cable ties, suspension ss frame for aeration and lighting etc)		1	
Estimated Total			

TABLE 3: ESTIMATED COST BREAKDOWN FOR SUPPORTIVE ADDITIONAL STRUCTURES/EQUIPMENT

COMPONENT	Specification compliance: Yes/No (Indicate 'Yes' or 'No'; describe deviation from requested spec)	QUANTITY	TOTAL
Workbench moist proof with PVC top (2 m x1 m x 90 cm high)		1	
Rustproof, splash proof platform scale (30 kg and 1 g division)		1	
Stainless Steel 2 Tier Trolley, Utility Cart (95 cm high, 51 cm wide, 83 cm long, 66 cm intertier distance, 17 cm floor height to first btier)		2	
Nutec wall office, storage room and lab space at R1800 per square meter. Room collective space = 36 m ²		36	
Rustproof,splash proof bench scale (30 kg and 1 g division)		1	
Contingencies (civil works, cement, cable ties, equipment, etc)		1	
Estimated Total			

Table 4: Estimated budget figures for experimental broodstock conditioning/primary hatchery system (FIGURE 1B)

COMPONENT	Specification compliance: Yes/No (Indicate 'Yes' or 'No'; describe deviation from requested spec)	QUANTITY	TOTAL
1KL IBC tanks new		2	
LP100 aerators		10	
ACP120 submersible pumps with controllers		6	
200AH deep cycle batteries (Lithiumiron phosphate)		12	
System switchgear (DB and wiring) +GSM sms warning system (including siren)		2	
6mm stainless steel frames with 17% shade net cover (1,5x 0.9 m)		20	
Tank exit valves (75 mm), standpipe valves		30	
50 mm PVC glue on valves for heatpumps, UV sterilizers, biofilter and sump supply with external water. Also to 15 systems tanks (double inlet loop) and dip tanks supply and drainage.		96	
75 mm PVC valves for pump delivery controls to system rows and pressure loop		3	
18 cm(w) x 50 cm(L) x 35 cm (d) mesh screen(500 micron) monofilament (insect net screen) in square meter		220	

45 cm(w) x 90 cm(L) x 60 cm (d) mesh screen(500 micron) monofilament (insect net screen) in square meter		2	
Profidrum/biofilter (50 kl/h minimum) combo with UV sterilizer for drum screen treatment		2	
Fibreglass sump with rust proof legs (130 cm height) (2,6 m x 1 m x 1 m)		2	
Kalnes biomedica (7 mm dia) in cubic meters		2,2	
Oysternet sub pump baskets with cable tie closed lids		6	
Aeration diffusers (150 mm leaky pipe length) for each net bag, biofilter ring (5 m) in meter (x 3 units). Also for bench top supply. 20 mm leaky pipe in meters		70	
Microjet airline pipe (4mm) for all diffusers in meter		500	
18w T8 coolwhite LED tube lights units with weather proof casing (double tube - also supplied)		46	
Spare LED tubes T8 18w Coolwhite		23	
50mm HP float valves		2	
50mm LP float valves		2	
Inline carbon filter cartridge x 20 and housing for municipal water line		20	
Fibreglas tanks (3.6 m x 2 m x 0.6 m -0.7 m deep tapered floor as per Fig 4. Equipped with rust proof ss feet and rustproff support frame.		5	
Fibreglas tanks (5 m x 1 m (w) x 0.6 m -0.7 m deep tapered floor as per Fig 2. Equipped with rust proof SS feet and rustproof support frame.		10	

Bench with lintels and 4 pillar cemented bricks and final smooth top finish (4 m x 0.6 m) and 1m high. Packing space below bench top		4	
55 w UV sterilizer with 50 mm unions		12	
55 w UV sterilizer tubes spare		25	
24 kw output heatpump		4	
1.6 m diameter swirl separator with decantation gutter (17 cm wide) and bottom exit sludge valve		2	
1.6 m diameter swirl separator without decantation gutter and functioning as biofilter with exit pipe slots close to bottom and properly screened with 4mm oysternet tube with closed end. Biofilter also equipped with aeration tube and overhead venturi x2 (50 mm with control valves (50 mm) supply from system pump		3	
Fibreglass platforms (as per figure 4-6 and functionality description) complete with 20 installed egg tumbler incubators and control valves(15 mm) and microjet filters (15 mm), fittings and 5l bottle all included. Per unit		5	
Piping (including net bag float pieps, pipe clips, fittings, small valves etc for systems plumbing, support structures for overhead airline supply and lighting.		1	
Stainless steel (12 mm) for net bag frames (3.4 m per frame) in meters		340	

Contingencies (civil works, wash basin, extra work bench, sisolation insulation, cement, cable ties, suspension ss frame for aeration and lighting etc)		1	
24000 BTU Aircon		6	
Estimated Total			

BIDDER'S DISCLOSURE

1. PURPOSE OF THE FORM

Any person (natural or juristic) may make an offer or offers in terms of this invitation to bid. In line with the principles of transparency, accountability, impartiality, and ethics as enshrined in the Constitution of the Republic of South Africa and further expressed in various pieces of legislation, it is required for the bidder to make this declaration in respect of the details required hereunder.

Where a person/s are listed in the Register for Tender Defaulters and / or the List of Restricted Suppliers, that person will automatically be disqualified from the bid process.

2. Bidder's declaration

2.1 Is the bidder, or any of its directors / trustees / shareholders / members / partners or any person having a controlling interest¹ in the enterprise, employed by the state? **YES/NO**

2.1.1 If so, furnish particulars of the names, individual identity numbers, and, if applicable, state employee numbers of sole proprietor/ directors / trustees / shareholders / members/ partners or any person having a controlling interest in the enterprise, in table below.

Full Name	Identity Number	Name of State institution

2.2 Do you, or any person connected with the bidder, have a relationship

¹ the power, by one person or a group of persons holding the majority of the equity of an enterprise, alternatively, the person/s having the deciding vote or power to influence or to direct the course and decisions of the enterprise.

with any person who is employed by the procuring institution? **YES/NO**

2.2.1 If so, furnish particulars:

.....
.....

2.3 Does the bidder or any of its directors / trustees / shareholders / members / partners or any person having a controlling interest in the enterprise have any interest in any other related enterprise whether or not they are bidding for this contract? **YES/NO**

2.3.1 If so, furnish particulars:

.....
.....

3 DECLARATION

I, _____ the _____ undersigned, (name)..... in submitting the accompanying bid, do hereby make the following statements that I certify to be true and complete in every respect:

- 3.1 I have read and I understand the contents of this disclosure;
- 3.2 I understand that the accompanying bid will be disqualified if this disclosure is found not to be true and complete in every respect;
- 3.3 The bidder has arrived at the accompanying bid independently from, and without consultation, communication, agreement or arrangement with any competitor. However, communication between partners in a joint venture or consortium² will not be construed as collusive bidding.
- 3.4 In addition, there have been no consultations, communications, agreements or arrangements with any competitor regarding the quality, quantity, specifications, prices, including methods, factors or formulas used to calculate prices, market allocation, the intention or decision to submit or not to submit the bid, bidding with the intention not to win the bid and conditions or delivery particulars of the products or services to which this bid invitation relates.
- 3.4 The terms of the accompanying bid have not been, and will not be, disclosed by the bidder, directly or indirectly, to any competitor, prior to the date and time of the official bid opening or of the awarding of the contract.
- 3.5 There have been no consultations, communications, agreements or arrangements made by the bidder with any official of the procuring

² Joint venture or Consortium means an association of persons for the purpose of combining their expertise, property, capital, efforts, skill and knowledge in an activity for the execution of a contract.

institution in relation to this procurement process prior to and during the bidding process except to provide clarification on the bid submitted where so required by the institution; and the bidder was not involved in the drafting of the specifications or terms of reference for this bid.

- 3.6 I am aware that, in addition and without prejudice to any other remedy provided to combat any restrictive practices related to bids and contracts, bids that are suspicious will be reported to the Competition Commission for investigation and possible imposition of administrative penalties in terms of section 59 of the Competition Act No 89 of 1998 and or may be reported to the National Prosecuting Authority (NPA) for criminal investigation and or may be restricted from conducting business with the public sector for a period not exceeding ten (10) years in terms of the Prevention and Combating of Corrupt Activities Act No 12 of 2004 or any other applicable legislation.

I CERTIFY THAT THE INFORMATION FURNISHED IN PARAGRAPHS 1, 2 and 3 ABOVE IS CORRECT.

I ACCEPT THAT THE STATE MAY REJECT THE BID OR ACT AGAINST ME IN TERMS OF PARAGRAPH 6 OF PFMA SCM INSTRUCTION 03 OF 2021/22 ON PREVENTING AND COMBATING ABUSE IN THE SUPPLY CHAIN MANAGEMENT SYSTEM SHOULD THIS DECLARATION PROVE TO BE FALSE.

.....
Signature Date

.....
Position Name of bidder

PREFERENCE POINTS CLAIM FORM IN TERMS OF THE PREFERENTIAL PROCUREMENT REGULATIONS 2022

This preference form must form part of all tenders invited. It contains general information and serves as a claim form for preference points for specific goals.

NB: BEFORE COMPLETING THIS FORM, TENDERERS MUST STUDY THE GENERAL CONDITIONS, DEFINITIONS AND DIRECTIVES APPLICABLE IN RESPECT OF THE TENDER AND PREFERENTIAL PROCUREMENT REGULATIONS, 2022

1. GENERAL CONDITIONS

1.1 The following preference point systems are applicable to invitations to tender:

- the 80/20 system for requirements with a Rand value of up to R50 000 000 (all applicable taxes included); and
- the 90/10 system for requirements with a Rand value above R50 000 000 (all applicable taxes included).

1.2 To be completed by the organ of state

(delete whichever is not applicable for this tender).

- a) The applicable preference point system for this tender is the 90/10 preference point system.
- b) The applicable preference point system for this tender is the 80/20 preference point system.
- c) Either the 90/10 or 80/20 preference point system will be applicable in this tender. The lowest/ highest acceptable tender will be used to determine the accurate system once tenders are received.

1.3 Points for this tender (even in the case of a tender for income-generating contracts) shall be awarded for:

- (a) Price; and
- (b) Specific Goals.

1.4 To be completed by the organ of state:

The maximum points for this tender are allocated as follows:

	POINTS
PRICE	80
SPECIFIC GOALS	20
51 % owned by HDIs (people who had no franchise on national elections prior to 1994)	6
51 % owned by Women	4

3.2. FORMULAE FOR DISPOSAL OR LEASING OF STATE ASSETS AND INCOME GENERATING PROCUREMENT

3.2.1. POINTS AWARDED FOR PRICE

A maximum of 80 or 90 points is allocated for price on the following basis:

$$Ps = 80 \left(1 + \frac{Pt - Pmax}{Pmax} \right) \text{ or } Ps = 90 \left(1 + \frac{Pt - Pmax}{Pmax} \right)$$

Where

- Ps = Points scored for price of tender under consideration
Pt = Price of tender under consideration
Pmax = Price of highest acceptable tender

4. POINTS AWARDED FOR SPECIFIC GOALS

- 4.1. In terms of Regulation 4(2); 5(2); 6(2) and 7(2) of the Preferential Procurement Regulations, preference points must be awarded for specific goals stated in the tender. For the purposes of this tender the tenderer will be allocated points based on the goals stated in table 1 below as may be supported by proof/ documentation stated in the conditions of this tender:
- 4.2. In cases where organs of state intend to use Regulation 3(2) of the Regulations, which states that, if it is unclear whether the 80/20 or 90/10 preference point system applies, an organ of state must, in the tender documents, stipulate in the case of—
- (a) an invitation for tender for income-generating contracts, that either the 80/20 or 90/10 preference point system will apply and that the highest acceptable tender will be used to determine the applicable preference point system; or
 - (b) any other invitation for tender, that either the 80/20 or 90/10 preference point system will apply and that the lowest acceptable tender will be used to determine the applicable preference point system,
- then the organ of state must indicate the points allocated for specific goals for both the 90/10 and 80/20 preference point system.

Table 1: Specific goals for the tender and points claimed are indicated per the table below.

(Note to organs of state: Where either the 90/10 or 80/20 preference point system is applicable, corresponding points must also be indicated as such.)

Note to tenderers: The tenderer must indicate how they claim points for each preference point system.)

The specific goals allocated points in terms of this tender	Number of points allocated (90/10 system) (To be completed by the organ of state)	Number of points allocated (80/20 system) (To be completed by the organ of state)	Number of points claimed (90/10 system) (To be completed by the tenderer)	Number of points claimed (80/20 system) (To be completed by the tenderer)

DECLARATION WITH REGARD TO COMPANY/FIRM

4.3. Name of company/firm.....

4.4. Company registration number:

4.5. TYPE OF COMPANY/ FIRM

- Partnership/Joint Venture / Consortium
- One-person business/sole propriety
- Close corporation
- Public Company
- Personal Liability Company
- (Pty) Limited
- Non-Profit Company
- State Owned Company

[TICK APPLICABLE BOX]

4.6. I, the undersigned, who is duly authorised to do so on behalf of the company/firm, certify that the points claimed, based on the specific goals as advised in the tender, qualifies the company/ firm for the preference(s) shown and I acknowledge that:

- i) The information furnished is true and correct;
- ii) The preference points claimed are in accordance with the General Conditions as indicated in paragraph 1 of this form;

- iii) In the event of a contract being awarded as a result of points claimed as shown in paragraphs 1.4 and 4.2, the contractor may be required to furnish documentary proof to the satisfaction of the organ of state that the claims are correct;
- iv) If the specific goals have been claimed or obtained on a fraudulent basis or any of the conditions of contract have not been fulfilled, the organ of state may, in addition to any other remedy it may have –
 - (a) disqualify the person from the tendering process;
 - (b) recover costs, losses or damages it has incurred or suffered as a result of that person’s conduct;
 - (c) cancel the contract and claim any damages which it has suffered as a result of having to make less favourable arrangements due to such cancellation;
 - (d) recommend that the tenderer or contractor, its shareholders and directors, or only the shareholders and directors who acted on a fraudulent basis, be restricted from obtaining business from any organ of state for a period not exceeding 10 years, after the *audi alteram partem* (hear the other side) rule has been applied; and
 - (e) forward the matter for criminal prosecution, if deemed necessary.

<p>.....</p> <p>SIGNATURE(S) OF TENDERER(S)</p>
<p>SURNAME AND NAME:</p> <p>DATE:</p> <p>ADDRESS:</p> <p>.....</p> <p>.....</p> <p>.....</p>

THE NATIONAL TREASURY

Republic of South Africa



**GOVERNMENT PROCUREMENT:
GENERAL CONDITIONS OF CONTRACT**

July 2010



GENERAL CONDITIONS OF CONTRACT

1. Definitions

The following items shall be interpreted as indicated:

- 1.1 “Closing time” means the date and hour specified in the bidding documents for the receipt of bids
- 1.2 “Contract” means the written agreement entered into between the purchaser and the supplier, as recorded in the contract form signed by the parties, including all attachments and appendices thereto and all documents incorporated by reference therein.
- 1.3 “Contract price” means the price payable to the supplier under the contract for the full and proper performance of his contractual obligations.
- 1.4 “Corrupt practice” means the offering, giving, receiving, or soliciting of anything of value to influence the action of a public official in the procurement process or in contract execution.
- 1.5 “Countervailing duties” are imposed in cases where an enterprise abroad is subsidised by its government and encourage to market its products internationally.
- 1.6 “Country of origin” means the place where the goods were mined, grown or produced or from which the services are supplied. Goods are produced when, through manufacturing, processing or substantial and major assembly of components, a commercially recognised new product results that is substantially different in basic characteristics or in purpose or utility from its components.
- 1.7 “Day” means calendar day
- 1.8 “Delivery” means delivery in compliance of the conditions of the contract or order.
- 1.9 “Delivery ex stock” means immediate delivery directly from stock actually on hand.



- 1.10 “Delivery into consignees store or to his site” means delivered and unloaded in the specific store or depot or on the specified site in compliance with the conditions of the contract or order, the supplier bearing all risks and charges involved until the goods are so delivered and a valid receipt is obtained.
- 1.11 “Dumping” occurs when a private enterprise abroad market its goods on own initiative in the RSA at lower prices than that of the country of origin and which have the potential to harm the local industries in the RSA.
- 1.12 “Force majeure” means an event beyond the control of the supplier and not involving the supplier’s fault or negligence and not foreseeable. Such events may include, by is not restricted to, acts of the purchaser in its sovereign capacity, wars or revolutions, fires, floods, epidemics, quarantine restrictions and freight embargoes.
- 1.13 “Fraudulent practice” means a misrepresentation of facts in order to influence a procurement process or the execution a contract to the detriment of any bidder, and includes collusive practice among bidders (prior to or after bid submission) designed to establish bid prices at artificial non-competitive levels and to deprive the bidder of the benefits of free and open competition.
- 1.14 “GCC” means the General Conditions of Contract.
- 1.15 “Goods” means all of the equipment, machinery, and / or other materials that the supplier is required to supply to the purchaser under the contract.
- 1.16 “Imported content” means that portion of the bidding price represented by the cost of components, parts or materials which have been or are still to be imported (whether by the supplier or his sub-contractors) and which costs are inclusive of the costs abroad, plus freight and other direct importation costs such as landing costs, dock dues, import duty, sales duty or other similar tax or duty at the South African place of entry as well as transportation and handling charges to the factory in the Republic where goods covered by the bid will be manufactured.
- 1.17 “Local content” means that portion of the bidding price, which is not included in the imported content provided that local manufacture does take place.
- 1.18 “Manufacture” means the production of products in a factory using labour, materials, components and machinery and includes other related value-adding activities.



- 1.19 "Order" means an official written order issued for the supply of goods or works or the rendering of a service.
- 1.20 "Project site", where applicable, means the place indicated in bidding documents.
- 1.21 "Purchaser" means the organisation purchasing the goods.
- 1.22 "Republic" means the Republic of South Africa
- 1.23 "SCC" means the Special Conditions of Contract
- 1.24 "Services" means those functional services ancillary to the supply of the goods, such as transportation and any other incidental services, such as installation, commissioning, provision of technical assistance, training, catering, gardening, security, maintenance and other such obligations of the supplier covered under the contract.
- 1.25 "Supplier" means the successful bidder who is awarded the contract to maintain and administer the required and specified service(s) to the State.
- 1.26 "Tort" means in breach of contract.
- 1.27 "Turnkey" means a procurement process where one service provider assumes total responsibility of all aspects of the project and delivers the full end product / service required by the contract
- 1.28 "Written" or 'in writing" means hand-written in ink or any form of electronic or mechanical writing.

2. Application

- 2.1 These general conditions are applicable to all bids, contracts and orders including bids for functional and professional services (excluding professional services related to the building and construction industry), sales, hiring, letting and the granting or acquiring of rights, but excluding immovable property, unless otherwise indicated in the bidding documents.



2.2 Where applicable, special conditions of contract are also laid down to cover specific goods, services or works.

2.3 Where such special conditions of contract are in conflict with these general conditions, the special conditions shall apply.

3. General

3.1 Unless otherwise indicated in the bidding documents, the purchaser shall not be liable for any expense incurred in the preparation and submission of a bid. Where applicable a non-refundable fee for documents may be charged.

3.2 With certain exceptions, invitations to bid are only published in the Government Tender Bulletin. The Government Tender Bulletin may be obtained directly from the Government Printer, Private Bag X85, Pretoria, 0111, or accessed electronically from www.treasury.gov.za

4. Standards

4.1 The goods supplied shall conform to the standards mentioned in the bidding documents and specifications.

5. Use of contract documents and information inspection

5.1 The supplier shall not, without the purchaser's prior written consent, disclose the contract, or any provision thereof, or any specification, plan, drawing, pattern, sample, or information furnished by or on behalf of the purchaser in connection therewith, to any person other than a person employed by the supplier in the performance of the contract. Disclosure to any such employed person shall be made in confidence and shall extend only so far as may be necessary for purposes of such performance.

5.2 The supplier shall not, without the purchaser's written consent, make use of any document or information mentioned in the GCC clause 5.1 except for purposes of performing the contract.

5.3 Any document, other than the contract itself mentioned in GCC clause 5.1 shall remain the property of the purchaser and shall be returned (all copies) to the purchaser on completion of the supplier's performance under the contract if so required by the purchaser.



5.4 The supplier shall permit the purchaser to inspect the supplier's records relating to the performance of the supplier and to have them audited by auditors appointed by the purchaser, if so required by the purchaser.

6. Patent rights

6.1 The supplier shall indemnify the purchaser against all third-party claims of infringement of patent, trademark, or industrial design rights arising from use of the goods or any part thereof by the purchaser.

7. Performance Security

7.1 Within thirty (30) days of receipt of the notification of contract award, the successful bidder shall furnish to the purchaser the performance security of the amount specified in the SCC.

7.2 The proceeds of the performance security shall be payable to the purchaser as compensation for any loss resulting from the supplier's failure to complete his obligations under the contract.

7.3 The performance security shall be denominated in the currency of the contract, or in a freely convertible currency acceptable to the purchaser and shall be in one of the following forms:

a) A bank guarantee or an irrevocable letter of credit issued by a reputable bank located in the purchaser's country, or abroad, acceptable to the purchaser, in the form provided in the bidding documents or another form acceptable to the purchaser; or

b) A cashier's or certified cheque.

7.4 The performance security will be discharged by the purchaser and returned to the supplier not later than thirty (30) days following the date of completion of the supplier's performance obligations under the contract, including any warranty obligations, unless otherwise specified in SCC.

8. Inspections, tests and analysis

8.1 All pre-bidding testing will be for the account of the bidder.



- 8.2 If it is a bid condition that supplies to be produced or services to be rendered should at any stage during production or execution or on completion be subject to inspection, the premises of the bidder or contractor shall be open, at all reasonable hours, for inspection by a representative of the Department or an organisation acting on behalf of the Department.
- 8.3 If there are no inspection requirements indicated in the bidding documents and no mention is made in the contract, but during the contract period it is decided that inspections shall be carried out, the purchaser shall itself make the necessary arrangements, including payment arrangements with the testing authority concerned.
- 8.4 If the inspections, tests and analyses referred to in clauses 8.2 and 8.3 show the supplies to be in accordance with the contract requirements, the cost of the inspections, tests and analysis shall be defrayed by the purchaser.
- 8.5 Where the supplies or services referred to in clauses 8.2 and 8.3 do not comply with the contract requirements, irrespective of whether such supplies or services are accepted or not, the cost in connection with these inspections, tests or analyses shall be defrayed by the supplier.
- 8.6 Supplies and services which are referred to in clauses 8.2 and 8.3 and which do not comply with the contract requirements may be rejected.
- 8.7 Any contract supplies may on or after delivery be inspected, tested or analysed and may be rejected if found not to comply with the requirements of the contract. Such rejected supplies shall be held at the cost and risk of the supplier who shall, when called upon, remove them immediately at his own cost and forthwith substitute them with supplies which do comply with the requirements of the contract. Failing such removal the rejected supplies shall be returned at the suppliers cost and risk. Should the supplier fail to provide the substitute supplies forthwith, the purchaser may, without giving the supplier further opportunity to substitute the rejected supplies, purchase such supplies as may be necessary at the expense of the supplier.
- 8.8 The provisions of clauses 8.4 to 8.7 shall not prejudice the right of the purchaser to cancel the contract on account of a breach of the conditions thereof, or to act in terms of Clause 23 of GCC.

9. Packing

- 9.1 The supplier shall provide such packing of the goods as is required to prevent their damage or deterioration during transit to their final destination, as indicated in the contract. The packing shall be sufficient to withstand, without limitation,



rough handling during transit, and open storage. Packing, case size and weights shall take into consideration, where appropriate, the remoteness of the goods' final destination and the absence of heavy handling facilities at all points in transit.

- 9.2 The packing, marking and documentation within and outside the packages shall comply strictly with such special requirements as shall be expressly provided for in the contract, including additional requirements, if any, specified in SCC, and in any subsequent instructions ordered by the purchaser.

10. Delivery and documents

- 10.1 Delivery of the goods shall be made by the supplier in accordance with the terms specified in the contract. The details of shipping and / or other documents to be furnished by the supplier are specified in SCC.

- 10.2 Documents to be submitted by the supplier are specified in SCC.

11. Insurance

The goods supplied under the contract shall be fully insured in a freely convertible currency against loss and damage incidental to manufacture or acquisition, transportation, storage and delivery in the manner specified in the SCC.

12. Transportation

- 12.1 Should a price other than an all-inclusive delivered price be required, this shall be specified in the SCC.

13. Incidental services

- 13.1 The supplier may be required to provide any or all of the following services, including additional services, if any, specified in SCC:

- a) Performance or supervision of on-site assembly and / or commissioning of the supplied goods;
- b) Furnishing of tools required for assembly and / or maintenance of the supplied goods;



- c) Furnishing of a detailed operations and maintenance manual for each appropriate unit of the supplied goods;
- d) Performance or supervision or maintenance and / or repair to the supplied goods, for a period of time agreed by the parties, provided that this service shall not relieve the supplier of any warranty obligations under this contract; and
- e) Training of the purchaser's personnel, at the supplier's plant and / or on-site, in assembly, start-up, operation, maintenance, and / or repair of the supplied goods.

13.2 Prices charged by the supplier for incidental services, if not included in the contract price for the goods, shall be agreed upon in advance by the parties and shall not exceed the prevailing rates charged to other parties by the supplier for similar services.

14. Spare parts

14.1 As specified in SCC, the supplier may be required to provide any or all of the following materials, notifications, and information pertaining to spare parts manufactured or distributed by the supplier:

- a) Such spare parts as the purchaser may elect to purchase from the supplier, provided that this election shall not relieve the supplier of any warranty obligations under the contract; and
- b) In the event of termination of production of the spare parts:
 - (i) Advance notification to the purchaser of the pending termination, in sufficient time to permit the purchaser to procure needed requirements; and
 - (ii) Following such termination, furnishing at no cost to the purchaser, the blueprints, drawings and specifications of the spare parts, if requested.

15. Warranty



- 15.1 The supplier warrants that the goods supplied under the contract are new, unused, of the most recent or current models, and that they incorporate all recent improvements in design and materials unless provided otherwise in the contract. The supplier further warrants that all goods supplied under this contract shall have no defect, arising from design, materials, or workmanship (except when the design and / or material is required by the purchaser's specifications) or from any act or omission of the supplier, that may develop under normal use of the supplied goods in the conditions prevailing in the country of final destination.
- 15.2 This warranty shall remain valid for twelve (12) months after the goods, or any portion thereof as the case may be, have been delivered to and accepted at the final destination indicated in the contract, or for eighteen (18) months after the date of shipment from the port or place of loading in the source country, whichever period concludes earlier, unless specified otherwise in SCC.
- 15.3 The purchaser shall promptly notify the supplier in writing of any claims arising under this warranty.
- 15.4 Upon receipt of such notice, the supplier shall, within the period specified in SCC and with all reasonable speed, repair or replace the defective goods or parts thereof, without costs to the purchaser.
- 15.5 If the supplier, having been notified, fails to remedy the defect(s) within the period specified in SCC, the purchaser may proceed to take such remedial action as may be necessary, at the supplier's risk and expense and without prejudice to any other rights which the purchaser may have against the supplier under the contract.

16. Payment

- 16.1 The method and conditions of payment to be made to the supplier under this contract shall be specified in the SCC.
- 16.2 The supplier shall furnish the purchaser with an invoice accompanied by a copy of the delivery note and upon fulfilment of other obligations stipulated in the contract.
- 16.3 Payments shall be made promptly by the purchaser, but in no case later than thirty (30) days after submission of an invoice or claim by the supplier.
- 16.4 Payment will be made in Rand unless otherwise stipulated in SCC.



17. Prices

- 17.1 prices charged by the supplier for goods delivered and service performed under the contract shall not vary from the prices quoted by the supplier in his bid, with the exception of any price adjustments authorised in SCC or in the purchaser's request for bid validity extension, as the case may be.

18. Variation orders

- 18.1 No variation in or modification of the terms of the contract shall be made except by written amendment signed by the parties concerned.

19. Assignment

- 19.1 The supplier shall not assign, in whole or in part, its obligations to perform under the contract, except with the purchaser's prior written consent.

20. Subcontracts

- 20.1 The supplier shall notify the purchaser in writing of all subcontracts awarded under the contracts if not already specified in the bid. Such notification, in the original bid or later, shall not relieve the supplier from any liability or obligation under the contract.

21. Delays in the supplier's performance

- 21.1 Delivery of the goods and performance of services shall be made by the supplier in accordance with the time schedule prescribed by the purchaser in the contract.
- 21.2 If at any time during performance of the contract, the supplier or its sub-contractor(s) should encounter conditions impeding timely delivery of the goods and performance of services, the supplier shall promptly notify the purchaser in writing of the fact of the delay, its likely duration and its cause(s). As soon as practicable after receipt of the supplier's notice, the purchaser shall evaluate the situation and may at his discretion extend by the supplier's time for performance, with or without the imposition of penalties, in which case the extension shall be ratified by the parties by amendment of contract.
- 21.3 No provision in a contract shall be deemed to prohibit the obtaining of supplies or service from a national department, provincial department or a local authority.



- 21.4 The right is reserves to procure outside of the contract small quantities or to have minor essential services executed is an emergency arises, the supplier's point of supply is situated at or near the place where the supplies are required, or the supplier's services are not readily available.
- 21.5 Except as provided under GCC Clause 25, a delay by the supplier in the performance of its delivery obligations shall render the supplier liable to the imposition of penalties, pursuant to GCC Clause 22, unless an extension of time is agreed upon pursuant to GCC Clause 21.2 without the application of penalties.
- 21.6 Upon any delay beyond the delivery period in the case of a supplier contract, the purchaser shall, without cancelling the contract, be entitled to purchase supplies of a similar quality and up to the same quantity in substitution of the goods not supplied in conformity with the contract and to return any goods delivered later at the supplier's expense and risk, or to cancel the contract and buy such goods as may be required to complete the contract and without prejudice to his other rights, be entitles to claim damages from the supplier.

22. Penalties

- 22.1 Subject to GCC Clause 25, if the supplier fails to deliver any or all of the goods or to perform the services within the period(s) specified in the contract, the purchaser shall, without prejudice to its other remedies under the contract, deduct from the contract price, as a penalty, a sum calculated on the delivered price of the delayed goods or unperformed services using the current prime interest rate calculated for each day of the delay until actual delivery or performance. The purchaser may also consider termination of the contract pursuant to GCC Clause 23.

23. Termination for default

- 23.1 The purchaser, without prejudice to any other remedy for breach of contract, by written notice of default sent to the supplier, may terminate this contract in whole or in part:
- a) If the supplier fails to deliver any or all of the goods within the period(s) specified in the contract, or within any extension thereof granted by the purchaser pursuant to GCC Clause 21.2;



- b) If the supplier fails to perform any other obligation(s) under the contract; or
- c) If the supplier, in the judgement of the purchaser, has engaged in corrupt or fraudulent practices in competing for or in executing the contract.

23.2 In the event the purchaser terminates the contract in whole or in part, the purchase may procure, upon such terms and in such manner as it deems appropriate, goods, works or services similar to those undelivered, and the supplier shall be liable to the purchaser for any excess costs for such similar goods, works or services. However, the supplier shall continue performance of the contract to the extent not terminated.

23.3 Where the purchaser terminates the contract in whole or in part, the purchase may decide to impose a restriction penalty on the supplier by prohibiting such supplier from doing business with the public sector for a period not exceeding 10 years.

23.4 If a purchase intends imposing a restriction on a supplier or any person associated with the supplier, the supplier will be allowed a time period of more than fourteen (14) days to provide reasons why the envisaged restriction should not be imposed. Should the supplier fail to respond within the stipulated fourteen (14) days the purchaser may regard the intended penalty as not objected against and may impose it on the supplier.

23.5 Any restriction imposed on any person by the Accounting Officer / Authority will, at the discretion of the Accounting Officer / Authority, also be applicable to any other enterprise or any partner, manager, director or other person who wholly or partly exercises or exercised or may exercise control over the enterprise of the first-mentioned person, and with which enterprise or person the first-mentioned person, is or was in the opinion of the Accounting Officer / Authority actively associated.

23.6 Is a restriction is imposed, the purchaser must, within five (5) working days of such imposition, furnish the National Treasury, with the following information:

- (i) The name and address of the supplier and / or person restricted by the purchaser;
- (ii) The date of commencement of the restriction
- (iii) The period of restriction; and
- (iv) The reasons for the restriction.



23.7 If a court of law convicts a person of an offense as contemplated in sections 12 or 13 of the Prevention and Combating of Corrupt Activities Act, Act no 12 of 2004, the court may also rule that such person's name be endorsed on the Register for Tender Defaulters. When a person's name has been endorsed in the Register, the person will be prohibited from doing business with the public sector for a period not less than five years and not more than 10 years. The National Treasury is empowered to determine the period of restriction and each case will be dealt with on its own merits. According to section 32 of the Act the Register must be open to the public. The Register can be perused on the National Treasury website.

24. Anti-dumping and countervailing duties and rights

When, after the date of bid, provisional payments are required, or anti-dumping or countervailing duties are imposed, or the amount of a provisional payment or anti-dumping or countervailing right is increased in respect of any dumped or subsidised import, the State is not liable for any amount so required or imposed, or for the amount of any such increase. When, after the said date, such a provisional payment is no longer required or any such anti-dumping or countervailing right is abolished, or where the amount of such provisional payment or any such right is reduces, any such favourable difference shall on demand be paid forthwith by the contractor to the State or the State may deduct such amounts from moneys (if any) which may otherwise be due to the contractor in regard to supplied or services which he delivered or rendered, or is to deliver or render in terms of the contract or any other contract or any other amount which may be due to him.

25. Force Majeure

25.1 Notwithstanding the provisions of GCC Clauses 22 and 23, the supplier shall not be liable for forfeiture of its performance security, damages, or termination for default is and to the extent that his delay in performance or other failure to perform his obligations under the contract is the result of an event of force majeure.

25.2 If a force majeure situation arises, the supplier shall promptly notify the purchaser in writing of such condition and the cause thereof. Unless otherwise directed by the purchaser in writing, the supplier shall continue to perform its obligations under the contract as far as is reasonable practical, and shall seek all reasonable alternative means for performance not prevented by the force majeure event.

26. Termination for Insolvency



26.1 The purchaser may at any time terminate the contract by giving written notice to the supplier if the supplier becomes bankrupt or otherwise insolvent. In this event, termination will be without compensation to the supplier, provided that such termination will not prejudice or affect any right of action or remedy which has accrued or will accrue thereafter to the purchaser.

27. Settlement of disputes

27.1 If any dispute or difference of any kind whatsoever arises between the purchaser and the supplier in connection with or arising out of the contract, the parties shall make every effort to resolve amicably such dispute or difference by mutual consultation.

27.2 If, after thirty (30) days, the parties have failed to resolve their dispute or difference by such mutual consultation, then either the purchaser or the supplier may give notice to the other party of his intention to commence with mediation. No mediation in respect of this matter may be commenced unless such notice is given to the other party.

27.3 Should it not be possible to settle a dispute by means of mediation, it may be settled in a South African Court of Law.

27.4 Mediation proceedings shall be conducted in accordance with the rules of procedure specified in the SCC.

27.5 Notwithstanding any reference to mediation and / or court proceedings herein

- a) The parties shall continue to perform their respective obligations under the contract unless they otherwise agree; and
- b) The purchaser shall pay the supplier any monies due to the supplier.

28. Limitation of Liability

28.1 Except in cases of criminal negligence or wilful misconduct, and in the case of infringement pursuant to Clause 6;

- a) The supplier shall not be liable to the purchaser, whether in contract, tort, or otherwise, for any indirect or consequential loss or damage, loss of use, loss of production, or loss of profits or interest costs, provided that this exclusion



shall not apply to any obligation of the supplier to pay penalties and / or damages to the purchaser; and

- b) The aggregate liability of the supplier to the purchaser, whether under the contract, in tort or otherwise, shall not exceed the total contract price, provided that this limitation shall not apply to the cost of repairing or replacing defective equipment.

29. Governing language

- 29.1 The contract shall be written in English. All correspondence and other documents pertaining to the contract that is exchanged by the parties shall also be written in English.

30. Applicable law

The contract shall be interpreted in accordance with South African laws, unless otherwise specified in SCC.

31. Notices

- 31.1 Every written acceptance of a bid shall be posted to the supplier concerned by registered or certified mail and any other notice to him shall be posted by ordinary mail to the address furnished in his bid or to the address notified later by him in writing and such posting shall be deemed to be proper service of such notice.
- 31.2 The time mentioned in the contract documents for performing any act after such aforesaid notice has been given, shall be reckoned from the date of posting of such notice.

32. Taxes and duties

- 32.1 A foreign shall be entirely responsible for all taxes, stamp duties, license fees, and other such levies imposed outside the purchaser's country.
- 32.2 A local supplier shall be entirely responsible for all taxes, duties, licence fees, etc. incurred until delivery of the contracted goods to the purchaser.
- 32.3 No contract shall be concluded with any bidder whose tax matters are not in order. Prior to the award of a bid the Department must be in possession of a tax



clearance certificate, submitted by the bidder. This certificate must be an original issued by the South African Revenue Services.

33. Transfer of contracts

33.1 The NIP Programme administered by the Department of Trade and Industry shall be applicable to all contracts that are subject to the NIP obligation.

34. Amendments of contracts

34.1 In terms of section 4 (1) (b) (iii) of the Competition Act no. 89 of 1998, as amended, an agreement between, or concerted practice by, firms, or a decision by an association of firms, is prohibited if it is between parties in a horizontal relationship and if a bidder(s) is / are or a contractor(s) was / were involved in collusive bidding (or bid rigging).

34.2 Of a bidder(s) or contractor(s), based in reasonable grounds or evidence obtained by the purchaser, has / have engaged in the restrictive practice referred to above, the purchaser may refer the matter to the Competition Commission for investigation and possible imposition of administrative penalties as contemplated in the Competition Act No 89 of 1998.

34.3 Is a bidder(s) or contractor(s), has / have been found guilty by the Competition Commission of the restrictive practice referred to above, the purchaser may, in addition and without prejudice to any other remedy provided for, invalidate the bid(s) for such item(s) offered, and / or terminate the contract in whole or part, and / or restrict the bidder(s) or contractor(s) from conducting business with the public sector for a period not exceeding ten (10) years and / or claim damages from the bidder(s) or contractor(s) concerned.

