



**UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION
TERMS OF REFERENCE (TOR)**

**FOR THE PROVISION OF LONG TERM SERVICES
RELATING TO THE DEVELOPMENT OF INTEGRATED AGRO-FOOD PARKS**

**PACKAGE C:
PREPARATION OF DETAILED DESIGN AND ENGINEERING PLANS FOR THE
INTEGRATED AGRO-FOOD PARKS, INCLUDING RURAL TRANSFORMATION
CENTRES**

DATE: 16 MAY 2024

1. Background

The outcome of the feasibility and technical studies will define the design and implementation modalities of the programme that will cover the project objectives. This phase undertakes a series of interrelated technical studies, resulting in an IAFP masterplan, a financial analysis (complete with project cost estimations and revenue streams), a development strategy, a governance system and private sector participation model, and an implementation schedule with phasing recommendations. The preparation of the master plan will require detailed architectural drawings, including with area statement of floor plates for the proposed buildings for common amenities. The designs should cover base enabling infrastructure, core infrastructure, industrial infrastructure and social infrastructure. The engineering design stage covers allocation and sizing of built-up areas for various activities and common facilities, road networks, stormwater drainage network with recharge facilities, comprehensive water supply system, sewerage system along with sewage treatment plant and recycling of treated wastewater for green and landscaped areas, electrical distribution centre along with locations and capacities of transformers, landscaping plan, solid waste management system, access control in the form of entry and exit, security, appropriate fire hydrant systems, and others.

2. The Scope of the services

Preparation of detailed design and engineering plans for the IAFP and related facilities. The critical contents of the detailed design and engineering plans shall include, but not be limited to, the following aspects:

- World class infrastructure to facilitate the industries in setting up their units and thereafter running the units without any difficulty in respect of basic facilities including internal and external roads, power, water, communications, drainage, sewerage system, sewage treatment plant, effluent treatment plant, storm water drains, rain water harvesting, firefighting etc.
- Provision of specialized infrastructure such as cold storages, quarantine facilities, quality control labs, quality certification centers, raw material storage, controlled and modified atmospheric storage, central processing unit.
- The sizes of the APH and RTC, locations, zoning, administrative office, bank, canteen and other required utilities/facilities; the details of which are described in the feasibility study of the IAFP (to be provided).

- Furthermore, the state of the art environmental infrastructure shall also be created to ensure environmental sustainability.

Table 2.1: Outline of the Design and Engineering Plans

Item Description	Items Details
A. Common Site Infrastructure	
Site grading	Undertake compressive site survey <ul style="list-style-type: none"> • Identifying and quantifying the area for land grading • Quantification of cutting and filling • Site landscaping within the zone area • Establishing the usage of cut quantity like whether the soil can be used directly for filling the low lying area, etc.
Land development	Works associated with landscaping around the APH, including green areas
Compound wall and fencing	Cost effective design with signature gate and entrance plaza
Road works	<ul style="list-style-type: none"> • Determine the traffic condition, density of traffic and traffic circulation • Study the soil characteristics • Study the type of road construction like flexible, non-flexible pavements with respect to durability, initial cost, periodical maintenance cost etc. and determining the best suited to the area • Roadside buffer requirements • Pedestrian walkways/circulation design • Signage • Road markings • Detailed engineering for various types of road and traffic condition • Design of culverts as per standards • Detailed engineering of various types of culverts like box, pipe, small bridges etc
Drainage system	Study the existing drains to determine the efficacy of the drainage system with respect to present catchments area, existing & proposed rainwater harvesting structures, ponds, streams, etc. <ul style="list-style-type: none"> • The drainage system of the area should take into account natural features. Determine efficiency with respect to present catchments area and rain water harvesting structures (if any) as well as ponds, streams, etc. in the area identified for the APH. • Inclusion of outfall structures • Design for storm water drainage system, including identification and design of required appurtenances • Design should include identification of possible locations for culverts as well as enlarging culverts in areas in the immediate vicinity of the IAFP. (Detailed engineering of various types of culverts like box, pipe, small bridges etc.)

Water supply	<ul style="list-style-type: none"> • Based on likely water capacity utilization, design a water supply and distribution system for the APH, including borehole options and rainwater harvesting • The system should include a detailed hydraulic design of inlet sump, trunk main, overhead / underground storage reservoirs, local distribution piping network to each individual unit, pumping stations and electrical systems in the distribution network • Identification of appurtenances, including fire hydrants.
Water pump house building and main reservoir	<ul style="list-style-type: none"> • General layout for pump house building • Schematic layout of electrical system in pump house • Piping layout in pump house • Details of underground and elevated service reservoirs – General arrangement to meet capacity needs • RTC details of elevated service reservoir, stairs, ladders lightening protection, lighting, piping arrangement and puddle flange details in elevated service reservoir
Sewerage scheme	<ul style="list-style-type: none"> • Based on utilization study, design the sewage and industrial wastewater system for the APH. • The design should include, sewage/industrial wastewater collection system, sewage pumping stations and appurtenances such as manholes, vents shafts etc. The system should also include mechanical / electrical systems, as applicable, as well as detailed hydraulic design for sewage collection system, sewage pumping stations and appurtenances. • Design of treated water distribution network should also be included.
Sewerage / sludge treatment plant	<ul style="list-style-type: none"> • As part of the sewage and industrial wastewater system for the APH, a detailed hydraulic & process design of sewage / sludge treatment plant – modular approach with phasing is required. • Design should include structure as well as mechanical and electrical components. • The design should incorporate a sludge handling system, and disposal system for treated sewage • Preparation of general arrangement and other working drawings for above components.
Effluent treatment scheme	<ul style="list-style-type: none"> • Detailed hydraulic design for industrial wastewater collection system, effluent pumping stations and appurtenances such as man holes, vents shafts etc. including identification of mechanical / electrical systems as applicable • Preparation of general arrangement and other working drawings for above components • Scheme and design of treated water distribution network

Effluent treatment plant	<ul style="list-style-type: none"> • Detailed hydraulic & process design of effluent treatment plant – modular approach with phasing • Structural design of effluent treatment plants • Design of mechanical, electrical components • Design of sludge handling system • Design of disposal system for treated effluent • Preparation of general arrangement and other working drawings for above components
Solid waste management	<ul style="list-style-type: none"> • Design of integrated municipal solid waste management system including collection with emphasis on source segregation, transportation, treatment and sanitary landfill system • Preparation of general arrangement and other working drawings for above components
Power supply and distribution	<ul style="list-style-type: none"> • Linking with external source • Internal distribution system with distribution with sub-stations • Wiring diagram • Earthing details and lighting protection
Street lighting	<ul style="list-style-type: none"> • Study the area for selection of street lighting products according to road utilization needs and frequency (Primary roads, secondary roads, factory roads etc.) • Collect the necessary data like length, width, height of mounting, aiming angle, and beam angle for calculating the value to know the utilization value of the fixture. • Decide the reflection factors, glare index etc. • Decide the spacing of street lighting products by choosing the single sided, staggered, and double sided and to suit the type of road considered. • Design of suitable electrical system • Preparation of general arrangement and other working drawings for above components
External connectivity infrastructure – approach road, power, water supply, drainage, telecom networking etc.	All drainage, waste and power systems, and telecom network should be complete with connections to related systems outside APH boundaries.
Firefighting system	<ul style="list-style-type: none"> • Layout drawings and detailing for firefighting system like underground sump, pumping lines, pump connection details etc. Appurtenances such fire hydrants should also be included. • Detailed analysis of firefighting requirements under different scenarios with merits and demerits and selection of most appropriate model
B. Detailed overview of individual units	

	<ul style="list-style-type: none"> • Concept plans for individual units based on master plan • Schematic drawings for the approved concept plan • Floor plans for individual units of standard design factories • Typical structures for amenities and standard design factories • Elevation and section • Views • Design & detailing of infrastructure facilities
C. Preparation of detailed working drawings for the individual units	
Construction drawings for standard design factories	<ul style="list-style-type: none"> • Excavation and earth works required before construction, including grading levelling, compacting works • Structural drawings • Designs should take into consideration earthquake resistance features as per relevant code • Foundation details • Structural details of plinth beam, lintels and columns • Structural metal works • Floor slab, roof slab and beams • All structural details for architectural details • Architectural and design details • Concrete and masonry works • Wall sections & elevations • Interior fit out and furniture drawings • Partition wall drawings • Staircases • Roof covering • Doors and windows • Floor, wall and ceiling finishes • Painting works • Electrical installation • Water supply and sewage/drainage works (including connection to common Agro-Food Park infrastructure) • Toilet details • Roof drainage, including rain water piping and utilization • Where required, all connections to common Agro-Food Park infrastructure

Expected demands in the coming 3 (+ 2) years

The Long-term Agreement(s) will be established for an initial period of three (3) years with possibility of extension for additional up to two (2) years (i.e. total LTA(s) period of up to five (5) years). The contractor(s) will provide deliverables as defined in the specific call-off orders within the Long-term Agreement.

UNIDO will not commit to purchase any minimum quantity of the services, and purchases will be made only if and when there is an actual requirement. UNIDO will not be liable for any cost in the event that no purchases are made under any resulting LTA.

LTA Requirements	2024	2025	2026	Grand Total USD\$
	Estimate USD\$	Estimate USD\$	Estimate USD\$	
Package C: Engineering Design	0	1,250,000.00	1,000,000.00	2,250,000.00

3. General Time Schedule

The overall duration of this work shall be in total 7-9 months from the date the service provider signed the contract.

4. Results / Deliverables

The assignment shall be completed once the following deliverables will be received and accepted by UNIDO:

<i>No.</i>	<i>Activities</i>	<i>Deliverables</i>	<i>Time Schedule</i>
1	Inception report	Detailed work plan and design methodology	Three weeks signing respective call-off Purchase Order /Contract
2	Progress report	Interim design plans and drawings, technical reports etc.	Five weeks after signing respective call-off Purchase Order /Contract
3	Draft design report	Draft design report (within initial designs concepts) covering all items listed in section 3	6 months after signing respective call-off Purchase Order /Contract
4	Final engineering design drawings and plans	Detailed engineering design drawings and plans	9 months after s signing respective call-off Purchase Order /Contract

Note: An annex to the report should include a list of all the persons consulted/interviewed, first- or second-hand data used, reports referenced, as well as a bibliography of documents used for the study. Deliverables must be provided in the English language.

5. Reporting and Monitoring

The service provider will work under the supervision of the UNIDO Project Manager, and coordinating with the in-country project team accordingly. A kick-off meeting will be organized at the early stage of the assignment under respective call-off Purchase Order/Contract with the UNIDO team at HQ and the project team.

The service provider shall identify a focal person for facilitating communication and coordination. The focal person will be responsible for coordinating with UNIDO and reporting regularly to the UNIDO Project Manager (or the delegated expert) regarding the progress of the services required.

The project team will share relevant information with the service provider. The project team will monitor the progress and evaluate the results of the activities undertaken by the service provider.

For Annexes (1-9) please refer to the Terms of Reference - Introductory