

Terms of Reference

for

Consultancy Services for Design and Supervision (D&S) for the Establishment of Technology Centers under Export Competitiveness for Jobs (EC4J) Project (Package no. S53)

1. Project Background

Bangladesh's need for diversification of its economy at large and the export basket in particular, is well recognized by the policy makers, the private sector as well as development partners. The seventh Five-Year Plan (2016-2021) and the Bangladesh Export Policy for 2015-18 identify potential growth sectors that are increasingly competitive in international markets or showing signs of comparative advantage that could play an important role in economic and export diversification. The Ministry of Commerce has set an ambitious export target of reaching US\$ 60 billion by 2021.

The Project Export Competitiveness for Jobs has been designed on request from the Economic Relations Division (ERD), Ministry of Finance, Government of Bangladesh, with the objective of strengthening export competitiveness and increasing investment and employment in some priority sectors such as Leather & Leather Goods, Footwear (leather & non-leather), Light Engineering (Electronics, Electrical Goods, Bicycle, Automobile, Accumulators, Battery, etc.) and Plastics. To achieve this objective, Ministry of commerce is directly implementing a project titled "Export Competitiveness for Jobs" financed by the World Bank Group. The Project is expected to directly contribute to the Government of Bangladesh's policy objective of diversifying exports beyond ready-made garments (RMG). The project is effective from December 11, 2017 and currently at the implementation stage.

The targeted sectors face a number of interrelated capability barriers including lack of awareness and access to modern technology and production processes; lack of skilled workforce, lack of access to testing, accreditation and certification bodies for local and international product standards and conformance infrastructure; poorly developed business advisory services and weak local supply chains. This, in addition to challenges in accessing capital, and lack of awareness of good international management and production practices, will potentially constraint Bangladesh's manufacturing sector into low technology / low value added /price dependent business models and domestic markets.

In order to contribute to addressing those constraints the Project proposes establishment of four Technology Centers (TCs) - three for General Engineering (two in the vicinity of Dhaka city and the other in Chattogram), and a Design and Technology Centre (DTC) for the Leather & Leather Goods and the Footwear sector in and around Dhaka.

2. Project Development Objective

The Project Development Objective (PDO) is to contribute to export diversification and more and better jobs in targeted sectors.

3. Brief Description of the Project

The project is structured around four components: (a) market access support program; (b) productivity enhancement program; (c) public investment facility for infrastructure constraints (PIFIC); and (d) project implementation, monitoring and evaluation.

Market Access Support Program will support firms to access international markets and integrate in global value chains. It will engage at the sector and firm levels to increase their investment to meet national, international and buyer-specific environmental, social and quality (ESQ) standards. This will be implemented through nation-wide awareness building, institutional capacity building, and matching grants to improve compliance standards at the firm level. Additionally, this component will support capacity building for market intelligence for key markets and sector-level branding.

Productivity Enhancement Program will support establishment of four technology centers (TCs) within proximity to existing production clusters. The TCs will enable access to modern technologies, mold & dye making, design facilities, testing and calibration services, training of technical workforce, business advisory services, job works, etc.

Public Investment Facility for Infrastructure Constraints will support the development of selected infrastructures in industrial clusters of the targeted sectors such as connecting TCs with utility services; constructing access roads, establishing recycling and storage facility, last mile connectivity, etc.

Project Implementation, Monitoring and Evaluation

This component will finance equipment, operating expenses, training and consulting services of the Project Implementation Unit (PIU) helping ensure that a strong team is in place to manage day-to-day operations including technical, fiduciary safeguards, Monitoring and Evaluation (M&E) and impact evaluation commitments.

Productivity Enhancement Program is the second component of the EC4J project. This component will address two sets of constraints related to productivity improvements in the targeted sectors: (a) a shortage of relevant skills and (b) use of inferior technology by firms, which both impede product quality, innovation, and ESQ compliance. Bangladesh has some of the world's lowest unit labor costs in the manufacturing sector. Raising labor productivity through improvements in skills formation and training is essential to strengthen export competitiveness and, by extension, raising labor income. Greater technology adoption and diffusion is essential to raise productivity in Bangladesh's emerging export industries. Access to shared production technology and shared services allows firms to buy vital production technology (such as specialty machinery, advanced tools, and dyes) and obtain testing on material inputs and finished products—none of which is currently available locally. It will also allow firms to utilize common machinery for designs, mold making, casting, and prototyping where it is not economical for them to purchase this equipment themselves due to a lack of economies of scale. It will also allow firms to obtain training for both management, staff, and receive on-site business advisory services to ensure that they maximize the absorption of the new technologies and training. The lack of technology and services was repeatedly highlighted in roundtable discussions as a critical disadvantage to the local leather, footwear, and light engineering micro, small and medium enterprises (MSMEs). The establishment of TCs is widely considered the appropriate model for meeting these needs, which to the extent possible will focus on function rather than industry—all to maximize economic and social gains. A public incentive is needed to address significant entry barriers because of large up-front capital investment required in machinery, plant, and operating staff; persistent coordination failures within individual sectors that have inhibited the development of active markets for these technology services; and the industry-specific public goods associated with the centers. The Project plans to establish four Technology Centers (TCs) in Dhaka and Chittagong to address the technology awareness and utilization barriers, and skills gaps across the targeted sectors. The TCs will be established as not-for-profit organization and the TCs would help industries in the targeted sectors including MSMEs to increase productivity and strengthen opportunities for product development, design, and innovation. Preliminary findings and recommendations from the prefeasibility study has indicated that promising locations for the technology centers are:

- i. within proximity to Dhaka with a focus on light /general engineering / services for electrical and electronics goods;
- ii. within proximity to Dhaka with a focus on general engineering /plastics;
- iii. within proximity to Chittagong with a focus on light /general engineering /plastics; and
- iv. within proximity to Dhaka with focus on leather & leather goods and footwear;

The Project now intends to hire a consulting firm for Design and Supervision (D&S) for construction of four Technology Centers (TCs).

Earlier consulting services were carried out for a detailed feasibility study including development of viable business models for the Design and Technology Center (DTC). In addition, the consulting services for the General Engineering Technology Centers (GETCs) is going on for the development of viable business models for establishing GETCs and to identify a diverse range of services and technology to be housed at the GETCs. While it is also important for the industry to meet immediate needs to strengthen its position in the global market, it will be essential to consider future requirements in order to achieve sustained competitiveness by substantially improving social, environmental and quality compliance standards in the targeted sectors.

4. Objective of Consulting Services

The objective of the assignment is to provide (i) detailed design (architectural and structural for civil, electrical and electro-mechanical works), (ii) technical specifications, (iii) preparation of bidding documents, (iv) cost estimates and (v) construction supervision, monitoring and relevant services from design stage to final handover of the construction works of four Technology Centers (TCs). The TCs include one Design and Technology Centre (DTC) for leather & leather goods and footwear, and three General Engineering Technology Centers (GETCs) for light engineering, plastics, and other relevant manufacturing sectors.

5. Purpose of the Technology Centers (TCs)

Technology Centers are an institutional setup to support industries (including MSMEs) gain access to technology, technology adoption and diffusion, skilled human resources and business advisory services. The TCs will have a number of roles to play as indicated in the feasibility studies for the TCs. It would house modern manufacturing equipment and processes for training and demonstration, specialty machines for engineering services, specialized testing lab for quality, safety and compliance including product design and development provisions. Workforce training would be provided on new production technologies and processes (a key potential revenue source for the TCs). The target market will be both MSMEs and large sized businesses depending on the specific subsector needs, and strategies driving the overarching objectives. The TCs will address cross cutting issues with an emphasis to the common functions (e.g. design, mold and die making, casting, fabrication, testing and calibration services, etc.). The Feasibility Study will inform the types of services to be provided by the TCs. Below are some of the indicative services:

- i. Technology demonstration and use - housing modern manufacturing equipment and processes, and providing their access to MSMEs for demonstration and use (e.g. for small batches);
- ii. Address the knowhow gaps by providing hands-on training to the technical workforce on new production technologies and processes;
- iii. Business advisory services - including production and technology upgradation, digitization, automation, product design, improvement of quality and compliance, change management, improvement of resource efficiency and supply chain management, etc.;
- iv. Internationally accredited machinery, product and component performance testing and certification services (another potential revenue source);
- v. Supply chain and market development services;
- vi. These TCs have facilities typically like classrooms, production and training workshops, conference hall, labs, hostel, dormitories and or residential facilities, recreational facilities (both indoor & outdoor e.g. basketball / table tennis) and a provision for lake / water body etc. with keeping in mind for proper utilization with minimum land.

The ultimate goal is to ensure easy access to state-of-the-art technology, skill formation and training across the industry value chain, geographies and functionalities. These activities will enable the strengthening of MSME and improve its competitiveness in the global market.

The construction work for various TCs shall be taken up under EC4J project that is expected to be completed by June 2022 in a phased manner. The D&S Consultant shall be technical expert for designing, supervising, monitoring and other relevant services. The D&S Consultant shall carry out the complete engineering services related to the project, including design, construction supervision, monitoring and other relevant services for the TCs construction works.

6. Scope of Work for the Consulting Services

The D&S consultant will provide services across the following stages and activities:

Stage 1: Reconnaissance of the Selected Land, Soil Testing, Design & Estimates of Boundary Wall, Prepare IEE Report / Checklist (if necessary) and ToR for ESIA and ESIA Report etc. for TCs

The D&S Consultant shall visit the site, collect data and carry out required activities such as measurement etc. to ascertain how many number of soil testing requires, determine the fencing arrangement (say boundary wall including entry etc.). And also to consult with the community and through transect for preparing Initial Environmental Examination (IEE) Report / Checklist (if necessary) and to prepare ToR for Environmental and Social & Impact Assessment (ESIA) etc. following Bangladesh Environmental Conservation Act, 1995 (BECA, 1995), Bangladesh Environmental Conservation Rules, 1997 (ECR, 1997) and the World Bank Environmental and Social Safeguard Policies / Guidelines.

The stage consists of following activities

Activity 1.1: Carried out soil testing in different locations as per requirement for design purposes.

Activity 1.2: Design and cost estimate with technical specification to prepare bidding document for construction of fencing / boundary wall.

Activity 1.3: Prepare Initial Environmental Examination (IEE) report / checklist including a ToR of ESIA to submit Department of Environment (DoE) and to obtain necessary approval / clearance.

Activity 1.4: Prepare draft Environmental and Social Assessment Reports (ESIA) for each TCs to submit PIU for review and onwards concurrence from the World Bank (if necessitate) to obtain necessary clearance / approval on ESIA reports for each TC from DoE.

Stage 2: Site Evaluation and Design Concepts

This stage involves pre-construction activities related to site evaluation, and preparation of design based on Feasibility Study Reports (FPRs) for TCs, ESIA report, and other relevant pertaining issues in consultation with PIU. The D&S Consultant is expected to keep the following objectives in mind while preparing the concept design:

- World class facility to facilitate delivery of the proposed services (considering the types of technology services and machineries to be installed as indicated in the Feasibility Study reports of the TCs;
- Eco-friendly to minimize the adverse environmental and social impact (e.g. water harvesting, solid waste and water effluent management, sanitary and kitchen waste water management, sound and vibration management, renewable energy, use of eco-friendly material, etc.);
- Energy efficient design;
- Economical to reduce the total cost of ownership;
- Flexible with respect to usage and expansion /contracting in the future;
- Architecture influenced by the local heritage and culture of the region;
- Friendly for disabled and/or physically challenged people.

The stage consists of following activities:

Activity 2.1: Site Evaluation

The D&S Consultant shall carry out following investigations / assessments at each TC project sites to generate relevant data required for designing the facility:

- Contour survey of the plot;
- Geotechnical investigation for soil bearing capacity;
- Geotechnical investigation for mechanical and chemical analysis of substrata;
- Geotechnical investigation for Ground Water Table and chemical analysis of water;
- Electrical resistivity test;
- High Tension Power Transmission Lines if in vicinity;
- Natural / seasonal water bodies / streams in site and in vicinity of < 2 Km
- Location of plants and trees on site >1.5 m height which need to be cut / relocated
- Signal strength for various telecommunication services providers;
- Collecting metrological data pertaining to maximum, minimum temperatures, humidity and rainfall from the Meteorological Department.

Activity 2.2: Concept design

The D&S Consultant shall prepare design basis report by referring the Feasibility Study Reports (FSRs) of GETCs/DTC, ESIA reports, and other relevant data from authentic sources and the consultation with TP and others. The Design shall be as per the design basis report prepared by D&S Consultant and agreed by the Client. The D&S Consultant shall prepare two distinct concept layouts considering effective usage of area and space, natural elements as wind, sunlight, aesthetic values etc. for each TC. The concept layouts / presentations shall essentially consist of following CAD Drawings in 2D and 3D, Digital walkthrough.

Stage 3: Master Plan Preparation

This stage involves preparation of detailed master plan for the entire land plot consisting of the following for each TC in consultation with the Technology Partners (TPs) that will be hired by PIU:

- Buildings outline;
- Roads, ramps approaches, and main gate layouts;
- Open spaces, amenity spaces including landscapes, garden and parking areas;
- Coordinated services layout;

- External firefighting / hydrant system layout;
- Electrical substation, backup power generation;
- Storm / rainwater drainage layout including rainwater harvesting scheme;
- Sewer system layout including connections to local sewer system if available or locations of STP/ ETP if required including discharge management of treated sanitary and effluent water;
- Water supply and irrigation network, including connection;
- Renewable energy generation plan and location of such facility;
- Area statement including broad sizing of the utilities viz. Connected Electrical Load, Firewater reservoir and pump sizes, HVAC TR rating, etc.

Stage 4: Preparation of Detailed Drawings, Technical Specifications, Bill of Quantities (BOQ), Cost Estimates and Bidding Documents.

The two distinct design concepts for each TCs shall be reviewed by the Project Director / Establishment Committees (EC) with the help of PIU and after approval of final design concept, the D&S Consultant shall prepare the bidding documents considering all detailed drawings, technical specifications, BOQ, cost estimates and savings and / or benefits of the green building elements. The detailed design shall be with respect to the finalized Master Plan. The designers are expected to visit the project sites at set frequency with minimum one visit per month and in addition as and when required or demanded by the client / site manager. The bidding documents would be prepared in accordance with the formats and standards defined in the World Bank guidelines / Central Procurement Technical Unit (CPTU) for procurement of such works in consultation with the PIU. For large contracts to be procured under International Competitive Bidding (ICB) procedure, the Bidding Documents would be prepared using World Bank Standard Bidding Documents for ICB. For National competitive bidding, the consultant would prepare the bidding documents based on model bidding documents for works prepared by the World Bank;

The Consultant will prepare specifications for Environmental, Social, Health and Safety requirements to be included in the bidding document. In preparing detailed specifications for ESHS requirements, the specialists should refer to and consider project reports e.g. ESIA/ESMP, required standards including World Bank Group EHS Guidelines, relevant international conventions or treaties etc., national legal and/or regulatory requirements and standards (where these represent higher standards than the WBG EHS Guidelines), relevant international standards e.g. WHO Guidelines for Safe Use of Pesticides, relevant sector standards e.g. EU Council Directive Concerning Urban Waste Water Treatment etc.

For all contract packages, the Consultant will prepare detailed engineering design, drawings, BOQ, bid documents, etc. for the TCs, and ensure that designs are carried out in accordance with appropriate international/national engineering standards. For preparing detailed designs and bidding documents, the consultant would carry out, but not limited to, the following activities:

Activity 4.1: Architectural Design Scope

Detail Architectural Design shall comprise the following:

- Detail design of each building (considering the purpose, functional aspects and operation need including types of technology services and machineries to be installed);
- Develop the design keeping in mind the safe and easy lifting of the machineries, equipment to be housed at the TCs and subsequent maintenance work;
- Three dimensional studies for coordination of various services;
- Preparation of schedule for doors, windows, plumbing etc.;
- Issue of Good for construction drawings;
- Preparation of infrastructure development plan;
- Preparation of site development plan;
- Interact with various disciplines to incorporate utility requirements;
- Drawings & documentation for approval of various statutory authorities;
- Application for approval from statutory / local authority;
- Technical support for various approvals & sanctions.

Activity 4.2: Structural Design of Buildings Scope

The D&S Consultant consistent with applicable laws, statutory permissions, construction requirements, Bangladesh National Building Code (BNBC) and other regulatory codes and preliminary Design Basis Reports, shall prepare and compile the detailed design & engineering requirements for each TC as under:

- Prepare alternative structural schemes interacting with architect / client;
- Detail structural analysis for building and other structures;
- Prepare detail specifications of items proposed to be used in construction;
- Issue of good for construction structural drawing; and
- Implementation of Green Building Concept.

The ADR (Architectural Design Report) and DBR (Design Basis Report) prepared by the D&S Consultant shall be submitted to the Client for approval. The approval to such ADR and DBR shall be to the context of the functionality intended at each TC. However, D&S Consultant shall be responsible for correctness and adequacy of the Design.

Activity 4.3: Electrical Design Scope

Detail Engineering & Design shall comprise all temporary / permanent / internal / external / backup power distribution, including agreement computation, engineering drawing & safety installations as under:

- Preparation of single line diagram for LT distribution & lighting distribution;
- To review equipment, load list & submit distributed generation (DG), transformer, panel & cable sizing calculations;
- Preparation of high tension & low-tension substation layout;
- Electrical layout and Piping and Instrumental diagram (P&ID) for Cable tray, Illumination, power, earthing & route plan for power cable & control cable etc.;
- Preparation of control wiring diagram for interlocks & alarms wherever applicable;
- Designing internal lightning, street lighting, yard lightning etc.;
- Specifications & layout of emergency lights provision, wherever required;
- Emergency power supply & distribution including internal provision in main switch gear to switch over emergency power;
- System power flow & fault level analysis;
- Relay coordination & setting;
- Earthing & lightning protection system design;
- Scheme for Data / Voice cabling & computer systems and networking;
- Bill of quantities for items to be procured;
- Issue "good for construction drawings"; and
- Coordinating with electricity Supply Company / board for sanction and release of power load.

Based on design parameters as per relevant Bangladeshi / International standard of all the electrical equipment, the Consultant will prepare and submit the design basis report to client for review and approval. After getting the approval, the Consultant will create the distribution network area wise / system wise to meet the power requirement in terms of single line diagrams, substation layouts, earthing and lightning layouts and lighting layouts and detailed specification for all equipment included data sheets etc.

Preparation of layout and scheme for extra low voltage system includes fire detection system, public address system, telephone, data, TV system, access control system, CCTV. integrated building management system etc. However, D&S Consultant shall be responsible for correctness and adequacy of the Design for each TC.

Activity 4.4: HVAC System Design Scope

Detail design & engineering of HVAC system for each TC shall comprise designing, detailing, value engineering and specifying with schedule of quantities for all works pertaining to air-conditioning, ventilation, smoke exhaust and fresh air supply system. It conforming to the standards, statutes, regulations and safety codes of BNBC etc. and design to efficiently and effectively operate for maximum energy efficiency and low noise level in all climatic conditions and as under:

- Load Estimate-Cooling & Heating;
- Designing of Entire Ventilation system;
- Determine room-by-room loads and airflows using standard manual calculation procedures;

- Layout duct system on floor plan, accounting for the direction of joists, roof hips, firewalls, and other potential obstructions;
- Determine conflict locations and types, duct lengths, and connections required to produce layout given construction constraints;
- Size duct system according to standard manual calculation procedures;
- Size HVAC equipment to sensible load using standard manual procedures;
- Equipment selection based upon design calculations and green concepts;
- Closely interact with the architect / clients and prepare preliminary schemes for approval;
- Issue "good for construction drawings".

Activity 4.5: Mechanical Design Scope

Detail engineering & design of mechanical system & utilities for each TC shall comprise the following:

- Preparation of equipment layout for process plant & utilities;
- Detail engineering design for hot, cold & compressed air piping based upon Process layout & machinery inlet & outlet parameters;
- Preparation of piping layout based upon layout of process plant & utilities;
- Design sufficient capacity compressor for the system based upon information available from various machine input requirements;
- Design sufficient capacity chilled water plant & cooling tower based upon information available from various machines input requirements;
- Design water distribution system based upon water requirement at various machines & at office /toilet places;
- Prepare equipment data for the use of civil /structure designs including dynamic factors for moving / rotating / vibratory equipment;
- Closely interact with the architect / clients and prepare preliminary schemes for approval;
- Prepare procurement specification for various bought out items & package equipment;
- Issue of good for construction drawings.

Activity 4.6: Fire & Life Safety Design Scope

Design and Engineering of each TC shall comprise fire hydrant system, fire alarm, firewalls with fire doors, fire escape staircases, doors etc. As per Part 4 of Bangladesh National Building Code (BNBC) (2006 or latest) and suitably incorporating leading practices as per global standards and as follows:

- Prepare detailed Master Design Document List & Design Basis;
- Prepare a scheme for the Fire Fighting System.

Fire Hydrant System consists of wet riser cum down comer; hydrants, hose reel and hose box; booster pump, sprinkler pump, main pump, jockey pump and diesel engine driven pump; automatic fire hydrant panel etc. Fire Alarm System consists of smoke detectors. Heat detector etc.; manual call point; local controls panels and main control panels; public address system and hooter.

- Closely interact with the architect / clients and prepare preliminary schemes for approval;
- Issue of good for construction drawings;
- Provisional and final Fire No Objection Certificate (NOC) from relevant local fire authority.

Activity 4.7: Environmental Engineering & Design Scope

Detail design & engineering of ETP / STP, Rainwater harvesting design etc. for each TC shall comprise the following:

- Prepare design brief after collecting inputs;
- Closely interact with architect / clients & prepare preliminary schemes for approval;
- Preparation of drawing for obtaining required statutory approvals;
- Study of effluent characteristics;
- Effluent testing;
- Department of Environment's clearance certificate to establish and operate;
- Waste disposal and sewage treatment systems design;
- Development of water harvesting and irrigation methods;
- Process study for soft water, DM (de-mineralized) water, cooling water, chilled brine,

- steam etc.;
- Process requirement study for waste and sewage water system and selecting appropriate treatment;
- Preparing Piping & Installation Diagrams (P&IDs) for various systems for approvals;
- Detail design for piping and routes;
- Equipment specifications, inquiry and selection;
- Installation and testing supervision; and
- Issue of good for construction drawings.

Activity 4.8: Office Interior Work Design Scope

Detail interior design shall comprise the following for each TCs:

- Formulation of the concept;
- Prepare drawings in accordance with concept finalized with client;
- Finalization of detail specification of all items & bought out items with client;
- Preparation of drawings for interior fit outs; and
- Issue of good for construction drawings.

Activity 4.9: Landscaping Design Scope

Detail design & engineering of landscape design for each TC shall comprise the following:

- Formulation of the concept considering local flora and fauna;
- Prepare drawings in accordance with concept finalized with client and issue of good for construction drawings;
- Study current substrata condition of landscape area;
- Design grass, trees & shrubs pattern as per climatic conditions & availability of substrata at site; and
- Design good irrigation system for landscaping work using recycled water.

Activity 4.10: Building Management System (BMS) Design

Detail design & engineering of BMS design for each TC shall comprise the following:

- HVAC control system design & detailing;
- Electrical distribution controls design & detailing;
- Water supply control design & detailing;
- Lighting control design & detailing;
- Access control design & detailing;
- Security, surveillance and safety design & detailing;
- Advanced communication system design & detailing.

Activity 4.11: Preparation of Bill of Quantities (BOQ)

The D&S Consultant/s shall prepare a detailed bill of quantities (with item wise quantity and rate) as per the above engineering brief and concept design. The BOQ prepared by the D&S Consultant must be vendor neutral.

Activity 4.12: Detailed Cost Estimation

The D&S Consultant/s will be required to prepare the cost estimate based on the detail design and seek approval of the same from the TC Establishment Committees (EC) / PIU of the Project. Cost estimate should be good enough to be used for budget authorization and must have suitable contingency for the TCs Establishment works.

Activity 4.13: Risk Identification and Mitigation

The D&S consultant shall identify the key risks for each facility related to execution of each TCs Establishment of the project. The D&S Consultant/s shall analyze each of the risks and will suggest mitigation plan for it.

Stage 5. Construction Supervision and Monitoring and Contract Management.

Activity 5.1: The Consultant would ensure construction quality and contractors performance. The consultant shall conduct full time technical supervision of all construction /erection activities by the contractors & would be responsible for all construction supervision contracts covering all project activities and, in that context, would carry out, but not limited to the following activities:

- Work closely with field engineering staff in order to ensure quality and timely completion of the works.
- For the civil works, goods, and equipment supply and installation contracts, the consultant would be responsible for inspection and supervision of the construction works, installation of equipment and testing of construction material, in order to ensure that the works implemented, and goods supplied are in accordance with the designs, specifications and terms and conditions of the relevant contracts and standards.
- Provide strong on-site project supervision team of key and non-key experts, with an onsite project office, report daily progress of the works and monitor deliverables strictly against the agreed work plan submitted by the contractor;
- Contract administration and management;
- Supervision of construction activities
- Preparation of monthly progress reports
- Issuance of completion certificates, and preparation of documents as required for acceptance of works/goods by the owner;
- Assurance for proper demobilization and restoration of the construction sites after completion, O&M during warranty period by the contractors
- In the event of contractual dispute which may result in legal action, adjudication or arbitration between the contractor and the employer, and on the instruction, will assist client in collating and preparing factual documentation which describes the circumstances of the dispute.
- Ensure implementation of Quality Assurance Check List for all category of works in order to establish a systematic construction procedure
- Ensure compliance of safeguard instruments for all contract packages.
- Ensure implementation of safeguard compliances stated in BOQs of the bidding documents.
- Ensure withholding of interim payments to the contractors if they failed to implement the items for safeguard compliance of BOQ items for all Contract Packages.
- Supervise all construction works during implementation as per contract agreement through establishing procedures for systematic on-site checking and monitoring of quality and quantities of all work items, including field checks to confirm integrity of survey data, application of improved and modern methods for construction of TCs, roads, bridges, culverts, land development, boundary wall, drainage structures etc.
- Verify the test results to ensure the quality of works and goods conducted by the contractors as stated in the bidding documents.
- Prepare Variation Order in light of contract agreement and recommend for approval, if required. In this case, proper attention should have to be paid during design and preparation of BOQ so that the numbers of Variations could be kept minimum.
- Review and approve the contractors work program and progress schedules ensuring that the Contractors' have incorporated / followed the most effective and expeditors methodology for carrying out the works.
- Assist client concerning the Schedule of handing over the sites, and possible delays due to lack of possession with a view to assuring that the Contractors are given possession of the Site in accordance with the agreed work program.
- Inspect borrow pits, and crushing plants, and order tests of materials and ensure adherence to specifications and approve the sources of materials.
- Make arrangement to check the quality of the materials brought to site, ensure quality of construction consistent with the specifications.
- Jointly inspect with client the completed civil works and assist informal taking over, and review and approve or prepare "as built" drawings and plans (as the case may be), and provide reports testifying satisfactory completion of the contracts.

- Presence of Team Leader in all monthly progress review meetings.
- Supervision and monitoring of works based on the work program submitted by the contractors.
- Ensure that the contractors are maintaining site order books and recording their activities as per the work program.
- Ensure complete presence of their staff during all casting executed by the contractors.
- Ensure that the tests and frequency of tests stated in the bidding documents and compliance of the test results are being done by the contractors.
- The measurement book (MB) to be signed by the Consultant.

Activity 5.2: MIS Reporting

- Develop an integrated construction schedule on MS Project (or similar widely accepted tool) with two-week micro plans for activities covering all trades and monitor compliance. The plan must clearly articulate the critical path (CPM);
- The D&S Consultant shall bring to prompt attention to each TC Establishment Committees (EC) / PIU any activity which is slipping from critical path (CPM or baseline);
- The D&S Consultant shall conduct fortnightly reviews and recasting of schedules where necessary to make up for lost time;
- The D&S Consultant shall submit a monthly report on the progress made and hold apart from regular meetings with the Contractors where it shall brief the progress of the TCs construction works; and
- The D&S Consultant shall use on-line secure report mechanism for each TCs construction works to report progress, status update so that all stakeholders including the Government, TC Establishment Committees, the World Bank and other stakeholders can view it.

Activity 5.3: Certification of Bills

The D&S Consultant shall be responsible for reviewing and certifying the bills of work done submitted by the Contractor (s):

- Checking and certifying of bills submitted by the Contractor in accordance with the contract;
- Review and certify measurement as per applicable standards and the contract;
- Deduct / hold appropriate amount from the bills in case of any non-compliance observed with respect to quality and safety, till such non-compliance is addressed by the Contractor (s);
- Review and approve rate analysis in consultation with PIU for any extra / non-scheduled items executed by the Contractor (s);
- Review and comment any claims made by the Contractor (s);
- Assessment of cost over-runs / savings with every bill;
- Preparation of deviation statements (financial) at predetermined stages;
- Manage change orders;
- Review and certify final bills of the Contractor (s) to facilitate payment; and
- Maintain accurate records of all date and quantities of work carried out. In addition, maintain all payments made to the Contractor(s), and all materials and equipment supplied to the site.

Activity 5.4: Completion Certification and Handing Over

The D&S Consultant shall assess the completeness of works as per the contract and shall certify the completion, allowing the client to initiate occupying process into the premises. Following activities are expected under acceptance / handing over:

- Visit the works completed as announced by the Contractor, generate list of snags, and issue the same to the Contractor for action;
- Monitor performance during defects liability period and enforcing rectification of defects;
- Document relevant material, work test reports, measurements, commissioning reports pertaining to each section of the work;
- Check for signage, markers for cables, trench covers, proper functioning of various systems;
- Review as built drawings submitted by the Contractor (s);
- Review the status of relevant statutory approvals;
- Certify the virtual completion and the final completion of works as applicable;
- Testing, commissioning and handing over the facility;

- Detailed inspection at completion of work and during defect liability period, Co-ordination with the contractors to rectify the defects during the defects liability period which shall be one year after the handing over of the site; and
- Recommending release / forfeiture of securities / guarantees.

Activity 5.5: For Environment, Social, Health and Safety (ESHS) the scope of services of the consultant for civil works supervision should be based on the following:

The Consultant shall ensure that the Contractor's ESHS performance is in accordance with good international practice and delivers the Contractor's ESHS obligations.

The ESHS and RSMF related services include but are not limited to:

- Review the Contractor's Environment and Social Management Plan (C-ESMP) prepared based on the Strategies and Management Plans as are necessary to manage the ESHS risks and impacts of ongoing works including all updates and revisions;
- Review the Code of Conduct submitted by the bidders including its implementation arrangement that will be apply to the Contractor's employees and subcontractors. The Code of Conduct shall ensure compliance with the ESHS provisions of the contract, including those as may be more fully described in the Works Requirements in Section of the bidding document.
- Review ESHS and RSMF (to the extent applicable) provisions of method statements, implementation plans, GBV/SEA prevention and response action plan, drawings, proposals, schedules and all relevant Contractor's documents;
- Play an active role to ensure that the Contractors, Labor *Sarders*, and laborers are made fully aware of the GRM and its objectives and functions, as well as the hearing and redress process. The Consultant will also ensure that Grievance Redress Committees (GRCs) are established at the work sites.
- Monitor closely and prepare bi-monthly reports which the Implementing Agency would share with the Bank. The report will contain implementation status of all plans that have operationalized the Bank's social safeguard policies, as well as the corporate requirements on gender, citizen engagement, GBV/SEA, GRM and the like.
- Review and consider the ESHS risks and impacts of any design change proposals and advise if there are implications for compliance with ESIA, ESMP, consent/permits and other relevant project requirements;
- Supervise regularly Contractor's compliance with ESHS requirements in accordance with the approved safeguard documents including its GBV/SEA obligations, with and without contractor and/or client relevant representatives, as necessary, but not less than once per month
- Undertake audits and inspections of Contractor's accident logs, community liaison records, monitoring findings and other ESHS related documentation, as necessary, to confirm the Contractor's compliance with ESHS requirements;
- Agree remedial action/s and their timeframe for implementation in the event of a noncompliance with the Contractor's ESHS obligations;
- Ensure appropriate representation at relevant meetings including site meetings, and progress meetings to discuss and agree appropriate actions to ensure compliance with ESHS obligations;
- Check that the Contractor's actual reporting (content and timeliness) is in accordance with the Contractor's contractual obligations and submit a monthly report to IA;
- Review and critique, in a timely manner, the Contractor's ESHS documentation (including regular reports and incident reports) regarding the accuracy and efficacy of the documentation;
- Undertake liaison, from time to time and as necessary, with project stakeholders to identify and discuss any actual or potential ESHS issues;
- Establish and maintain a grievance redress mechanism including types of grievances to be recorded and how to protect confidentiality e.g. of those reporting allegations of GBV/SEA.
- Ensure any GBV/SEA instances and complaints that come to the attention of the consultant are registered in the grievance redress mechanism

Stage 6: Support Management of Contracts

The Consultant would assist Project Director on management of contract activities and advise necessary measures towards smooth implementation of the construction Contracts. The Consultant would also keep provision of any other specialist services as may be required from time to time.

Stage 7: Statutory' Approvals and Certificates

The D&S Consultant shall identify and obtain all pre-construction stage statutory approvals. The D&S Consultant shall also identify all the approvals required during and after completion of the construction that shall be included in the scope of the Contractor (s). The D&S Consultant shall prepare time schedule for submission of all statutory approvals and certificates applicable as per government rules /regulation. Any expenditure related to these approvals like statutory fee etc. shall be borne by EC4J Project. The D&S Consultant shall prepare time schedule for submission of all statutory approvals and certificates applicable as per government rules / regulation.

8. Location and Duration of the Assignment

Duration of the contract would be up to 3 (three) years. The Project proposes establishment of four Technology Centers (TCs) - three for General Engineering (two near Dhaka city and the other in Chattogram), and a Design and Technology Centre (DTC) for the Leather & Leather Goods and Footwear sector in and around Dhaka.

9. Code of Conduct

For supervision of civil works contracts: All experts and support staff of the Consultant:

- (i) Comply with applicable laws, rules, and regulations
- (ii) Comply with applicable health and safety requirements to protect the local community (including vulnerable and disadvantaged groups), the Consultant's Experts, the Client's personnel, and the Contractor's personnel, including sub-contractors and day workers (including wearing prescribed personal protective equipment, preventing avoidable accidents and a duty to report conditions or practices that pose a safety hazard or threaten the environment)
- (iii) Must not use of illegal substances
- (iv) Must follow Non-Discrimination in dealing with the local community (including vulnerable and disadvantaged groups), the Consultant's Experts, the Client's personnel, and the Contractor's personnel, including sub-contractors and day workers (for example, on the basis of family status, ethnicity, race, gender, religion, language, marital status, age, disability (physical and mental), sexual orientation, gender identity, political conviction or social, civic, or health status)
- (v) Must show respect while Interactions with the local community(ies), members of the local community (ies), and any affected person(s) (for example to convey an attitude of respect, including to their culture and traditions)
- (vi) Must prohibited Sexual harassment (for example to prohibit use of language or behavior, in particular towards women and/or children, that is inappropriate, harassing, abusive, sexually provocative, demeaning or culturally inappropriate)
- (vii) Must avoid Violence, including sexual and/or gender-based violence (for example acts that inflict physical, mental or sexual harm or suffering, threats of such acts, coercion, and deprivation of liberty)
- (viii) Must prohibited Exploitation including sexual exploitation and abuse (for example the prohibition of the exchange of money, employment, goods, or services for sex, including sexual favors or other forms of humiliating, degrading behavior, exploitative behavior or abuse of power)
- (ix) Must Protect of children (including prohibitions against sexual activity or abuse, or otherwise unacceptable behavior towards children, limiting interactions with children, and ensuring their safety in project areas)
- (x) Should ensure Sanitation requirements (for example, to ensure workers use specified sanitary facilities provided by their employer and not open areas)
- (xi) Must avoid of conflicts of interest (such that benefits, contracts, or employment, or any sort of preferential treatment or favors, are not provided to any person with whom there is a financial, family, or personal connection)
- (xii) Protection and proper use of property (for example, to prohibit theft, carelessness or waste)
- (xiii) Duty to report violations of this Code
- (xiv) Non-retaliation against personnel who report violations of the Code, if that report is made in good faith

Each Expert shall sign indicating that they have:

- (i) received a copy of the code;
- (ii) had the code explained to them;
- (iii) acknowledged that adherence to this Code of Conduct is a condition of employment; and
- (iv) understood that violations of the Code can result in serious consequences, up to and including dismissal, or referral to legal authorities.