



CEYLON PETROLEUM CORPORATION

Project Title:

CONSTRUCTION OF A JET A-1 TRANSFER PIPELINE FROM MUTHURAJAWELA TO BIA KATUNAYAKE AND CONSTRUCTION OF JET A-1 STORAGE TANKS AND ASSOCIATED FACILITIES WITH MODIFICATIONS TO THE EXISTING TERMINAL FACILITY AT MUTHURAJAWELA

Document Title:

TECHNICAL SCOPE OF WORK FOR


**ENGINEERING, PROCUREMENT, CONSTRUCTION
TURNKEY CONTRACTORS**

**PART-[A]: CONSTRUCTION OF A JET A-1 FUEL
PIPELINE FROM MUTHURAJAWELA TO BIA
KATUNAYAKE**

Project Owner: CEYLON PETROLEUM CORPORATION (CPC)


Document No.: PMN-117258-010

Bid Ref. No.: B/21/2025


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1 INTRODUCTION

The present document defines the TECHNICAL SCOPE OF WORK which has to be executed by the EPC/Turnkey CONTRACTOR (hereinafter referred as CONTRACTOR) in order to perform the detailed engineering design and fabrication drawings, supply of equipment and materials, installation, inspection, mechanical testing, internal & external painting, insulation, obtaining third party inspector's approval, pre-commissioning, start-up, commissioning, delivery and operation (hereinafter referred as WORK) of an Aviation Fuel Pipeline (hereinafter referred as PROJECT) owned by Ceylon Petroleum Corporation (CPC), (hereinafter referred as OWNER) and proposed to connect the Muthurajawela tank farm with the aviation fueling terminal of Bandaranaike International Airport (BIA) at Katunayake, Sri Lanka.

The TECHNICAL SCOPE OF WORK refers to the content of the overall scope of the quality, HSE, engineering, design, procurement, construction and inspection activities, actions, collaborations and synergies, which must be effectively, efficiently, successfully and timely organized, staffed, developed, monitored, executed and closed-up by CONTRACTOR and its Subcontractors, partners, vendors and manufacturers, with respect to the agreed, terms, conditions, content, budget and timeline of the Contract Agreement (hereinafter referred as CONTRACT) that CONTRACTOR, as an entity qualified to perform the PROJECT, shall countersign with OWNER, in order to perform and deliver the PROJECT to OWNER.

The present TECHNICAL SCOPE OF WORK is supported by a number of appendixes, which are integral parts of the CONTRACT and include technical data, information, drawings, specifications, material requisitions of the specific to the PROJECT Front End Engineering Design (FEED). CONTRACTOR shall take into consideration, review and improve the material of the FEED studies in the terms of its responsibilities to perform the PROJECT in accordance of the provisions of the CONTRACT.

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2 ABBREVIATIONS & UNITS


2.1 Abbreviations

AFC	: Approved for Construction
ALARP	: As Low As Reasonably Practicable
API	: American Petroleum Institute
ASME	: American Society of Mechanical Engineers
ATEX	: Atmosphères Explosibles (or Explosive Atmospheres)
BEDD	: Basic Engineering and Design Data
BIA	: Bandaranaike International Airport
BOQ	: Bill of Quantities
BVS	: Block Valve Station
CAPEX	: Capital Expenditures
CCTV	: Close Circuit Television
CEB	: Ceylon Electricity Board
CIP	: Chemical Injection Package
CKE	: Colombo Katunayake Expressway
CSR	: Corporate and Social Responsibility
COPC	: Construction Organization and Planning Chart
CP	: Cathodic Protection
CPC	: Ceylon Petroleum Corporation
CPM	: Critical Path Method
CSP	: Constructability Program
CSPL	: Capital Spare Parts List
CPSTL	: Ceylon Petroleum Storage Terminals Limited
DCS	: Distributed Control System
DIN	: German Institute for Standardisation
DMCS	: Documentation Management and Control System




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DP	: Differential Pressure
DTM	: Digital Terrain Model
EDMS	: Electronic Document Management System
EDR	: Engineering Document Register
EFD	: Engineering Flow Diagram
EIA	: Environmental Impact Assessment
EIS	: Environmental Impact Statement
EMMP	: Environmental Monitoring and Management Plan
EMS	: Emissions Schedule
EPC	: Engineering, Procurement and Construction
ERP	: Environmental Reinstatement Plan
ESD	: Emergency Shut Down (valves)
EQRIA	: Environmental Qualitative Risk Assessment
FAC	: Final Acceptance Certificate
FAT	: Factory Acceptance Test
FJC	: Field Joint Coating
FCP	: Field Coordination Procedure
FEED	: Front End Engineering Design
FORC	: Field Organization Chart
FOC	: Fiber Optic Cable
FTD	: Final Technical Documentation
GIS	: Geographic Information System
HAZOP	: Hazardousness and Operability (study)
HAZID	: Hazards Identification (study)
HDD	: Horizontal Directional Drilling
HDPE	: High Density Polyethylene Pipe
HMI	: Human Machine Interface

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HSE	: Health, Safety and Environment
HV	: High Voltage
HVAC	: Heating, Ventilating and Air Conditioning
JIG	: Joint Inspection Group
IATA	: International Air Transport Association
IEE	: Initial Environmental Examination
I/O	: Input/Output
ISO	: International Organization for Standardization
ISR	: Inquiry Status Report
ITP	: Inspection and Testing Plans
JIG	: Joint Inspection Group
LAS	: Look Ahead Schedule
LOI	: Letter of Intent
LV	: Low Voltage
MCC	: Mechanical Completion Certificate
MOM	: Minutes of Meetings (also known as: Notes of Meeting-NOM)
MOV	: Motor Operated Valve
MPR	: Monthly Progress Report (or Project Master Schedule)
MPS	: Master Project Schedule
MTO	: Material Take Off
MV	: Medium Voltage
NCS	: Noise Control Study
NDT	: Non Destructive Test (or NDE: Non Destructive Examination)
NOS	: Noise Specification
NSR	: Noise study Report
O&M	: Operation and Maintenance
OCS	: Overall Construction Schedule

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OPEX	: Operational Expenditures
PAC	: Provisional Acceptance Certificate
P&ID	: Process and Instrumentation Diagram
PCCS	: Project Cost Control System
PCMP	: Project Construction Management Plan
PE	: Polyethylene
PFD	: Process Flow Diagram
PLC	: Programmable Logic Controller
PMT	: Project Management Team
PO	: Purchase Order
POC	: Project Organization Chart
PPC	: Public Power Company (organization for electricity)
PPT	: Public telephone and Communication (organization)
PRSC	: Procurement Schedule
PRMP	: Project Risk Management Plan
PRV	: Pressure Relief Valve
PSPL	: Permitting and Safety Plan
PWHT	: Post Welding Heat Treatment
QA	: Quality Assurance
QC	: Quality Control
QHSE	: Quality, Health, Safety and Environment
QM	: Quality Manager
QMN	: Quality Manual
QMS	: Quality Management System
QNRA	: Quantitative Risk Assessment
QPL	: Quality Plan
ROW	: Right of Way (also defined as working zone)


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RPDP	: Roads and Plant Drainage Plan
PDMP	: Project Demobilization Plan
PQR	: Performance Qualification Record
PRV	: Pressure Relief Valves
PVSL	: Potential Vendors and Subcontractors List
SAT	: Site Acceptance Test
SBCL	: Subcontrcators List
SBCPR	: Subcontracting Progress Register
SCADA	: Supervisory-Control and Data Acquisition
SCLPP	: Social Care and Livelihood Proetction Plan
SDA	: Static Dissipator Additives
SGWPP	: Surface and Groundwater Protection Plan
SMP	: Stakeholders Management Plan
SMYS	: Specified Minimum Yield Strength
SoW	: Scope of Work
SPIR	: Spare Parts List and Interchangeability Record
TMP	: Traffic Management Plan
TPI	: Third Party Inspection
T/R	: Transformer Rectifier
TRV	: Thermal Relief Valve
VCFS	: Visual Check Fuel Sampler
VDU	: Visual Display Unit
WBS	: Work Breakdown Structure
WMP	: Waste Management Plan
WPR	: Weekly Progress Report
WPS	: Welding Procedure Specification
WPQ	: Welder(s) Performance Qualification

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2.2 Units

barg	:	bar gauge
°C	:	Degree Celcius
mm	:	Milimeters
cm	:	Centimetres
m	:	Meter
km	:	kilometer
cm ²	:	sqaure centimeter
m ²	:	square meter
m ³	:	cubic meter
g	:	gram
Kg	:	kilogram
m ³ /sec	:	cubic meter per second
kW	:	Kilowatt
MW	:	Megawatt
t	:	Tonne
Mt	:	Metric tonne
Pa	:	Pascal
kPa	:	Kilo-Pascal
Kg/cm ²	:	Kilogram per square centimeter
N	:	Newton
kN	:	kilo-Newton


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3 DEFINITIONS

CPC	CEYLON PETROLEUM CORPORATION. Also referred as OWNER of the Project
CONTRACT	The content of the entire EPC/Turnkey CONTRACT
CONTRACTOR	The Engineering, Procurement and Construction (EPC) contractor is a single or joint venture business entity which will carry out the detailed engineering design of the project, procure all the equipment and materials necessary, and then construct to deliver a functioning facility or asset to the Owner.
Environmental Impact Assessment (EIA)	Environmental impact assessment (EIA) is the formal process used to predict the environmental consequences (positive or negative) of a plan, policy, program, or project prior to the decision to move forward with the proposed action. Formal impact assessments may be governed by rules of administrative procedure regarding public participation and documentation of decision making, and may be subject to judicial review. An impact assessment may propose measures to adjust impacts to acceptable levels or to investigate new technological solutions. It is also referred as Initial Environmental Examination (IEE).
Environmental Qualitative Risk Assessment	Is the document presenting the results of estimating risks and impacts to populations and the environment by hazardous substances or activities emanating from the construction and operation of the Project
Mechanical Completion	The checking and testing of equipment and construction to confirm that the installation is in accordance with drawings and specifications and ready for commissioning in a safe manner and in compliance with project requirements.
Non-destructive Testing (NDT)	Non-destructive testing (NDT) is a wide group of analysis techniques used in science and industry to evaluate the properties of a material, component or system without causing damage to it. NDT does not permanently alter the article being inspected. Common NDT methods include ultrasonic, magnetic particle, liquid penetrant, radiographic, and eddy-current testing.
OWNER	CEYLON PETROLEUM CORPORATION

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PROJECT	Construction of a Jet A-1 Transfer Pipeline from Muthurajawela to BIA, Tank farm at Muthurajawela and Associated Developments.
Punch List	A Punch List describes incomplete work or malfunction of equipment or construction.
Right of Way (RoW)	A narrow, un-obstructed strip or corridor of land of a specific width directly above the pipeline and around the supporting facilities, where some of the property owner's legal rights have been granted to a pipeline owner.
Stakeholder	A person, group, organization, member or system who affect/benefit or can be affected/benefitted by the project.
Stakeholder engagement	Stakeholder Engagement is a process of sharing information and knowledge, seeking to understand the concerns of others and building relationships based on collaboration
TECHNICAL SCOPE OF WORK	The description for the technical scope of services of the Engineering, Procurement and Construction CONTRACTOR
CPC	CEYLON PETROLEUM CORPORATION. Also referred as OWNER of the Project
CONTRACT	The content of the entire EPC/Turnkey CONTRACT


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4 SCOPE OF WORK IDENTIFICATION

4.1 General

CPC intends to select a suitable contractor to design, construct, testing, pre-commission, commission, handover and defects rectification of a Jet A-1 Fuel Pipeline to connect the Muthurajawela tank farm with the aviation fueling terminal of Bandaranaike International Airport at Katunayake, Sri Lanka. The PROJECT constituents are the following, but not limited to:

- (a) Complete review and updating of all aspects of FEED documentation.
- (b) Detailed Engineering design including soil investigation where necessary.
- (c) A 10-inch internally and externally coated below ground Jet A-1 fuel pipeline of approximately 21 [km]
- (d) Three (3) interim Block Valve Stations (BVS) located along the pipeline route.
- (e) Two (2) Scraper Stations and associated infrastructures located at Muthurajawela and at BIA aviation fueling terminal, all fully equipped to serve operation, inspection and maintainability of the entire pipeline system.
- (f) A Metering station at the BIA premises.
- (g) A complete Cathodic Protection system along the pipeline route.
- (h) Power supply system for all the BVS considering all cases of regular and/or emergency operations of the entire pipeline system.
- (i) All PROJECT specific electrical, instrumentation and control, cathodic protection, leak detection and communication systems.
- (j) All the related infrastructures, road crossings, structural protection measures, plant utilities and facilities appropriate for the safe and proper operation of the entire pipeline system.
- (k) Temporary access roads with associated facilities wherever necessary.
- (l) Reinstatement or rerouting work not limiting to public roads, temporary access roads & facilities, structures and any utility line facilities back to its original condition after laying of the Jet A-1 transfer pipeline and related facilities as per terms and conditions of the stake holders.
- (m) Pipeline tie-in work at Muthurajawela and BIA.
- (n) Pressure and Surge Control valve shall be installed at the BIA end. Further, Pressure relief valve shall also be incorporated to limit the operating pressure at the BIA end of the pipeline at 10 bars.
- (o) Preparation of construction drawings and method statements for the construction of entire pipeline and obtaining approval from the respective stakeholders.

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CONTRACTOR shall perform a complete review, checking and updating of all aspects of FEED documentation, production of the detailed engineering and design, procurement of materials and equipment, testing at manufacturer's worksite, material receipt and storage at PROJECT sites, fabrication, construction, assembly, installation, inspection, testing, mechanical completion, pre-commissioning, initial acceptance, commissioning, rectification of defects and start-up of the entire PROJECT and OWNER'S training in accordance with the provisions, requirements, instructions, datasheets, specifications, drawings and any other aspects, issues and documents included in the tendering documentation and incorporated into the CONTRACT.


CONTRACTOR shall be fully responsible to carry out and deliver to OWNER a ready for operation PROJECT and its constituents, planned, permitted, designed, constructed, equipped and tested in full accordance with high standards of liquid hydrocarbons transportation and storage facilities industry as appropriate for the aviation fuel handling systems and associated developments. Also, CONTRACTOR shall provide all required effort, resources, materials, synergies and technological means to carry out the entire PROJECT and shall, also, guarantee the level of the required quality and performance.

CONTRACTOR shall comply with the conditions stipulated by the stake holder organizations including the Central Environmental Authority (CEA), Sri Lanka Land Reclamation and Development Corporation (SLLRDC), Road Development Authority (RDA), Provincial Road Development Authority (PRDA), Airport and Aviation Sri Lanka Limited (AASL) and other organizations as specified in the PART-4, Reference Documents of the Bidding document.

4.2 Main Project Objectives

The main objectives of the PROJECT are, but not limited to, the following:

- Design, construction, Testing, Pre-commissioning, Commissioning, handover and defects rectification of underground pipeline system for supplying Jet A-1 fuel from Muthurajawela to the BIA aviation terminal, in order to fulfil the daily demand of the target year 2030 which is predicted to be 3.5 million liters per day.
- Delivery of a 10-inch diameter internally and externally coated pipeline system of high performance, operability and reliability dealing with all the operational requirements of the tank farm that is to be developed at Muthurajawela area.
- Production of specific to the PROJECT and high quality detailed engineering and design outcome responding and complying to:

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- (a) The FEED studies, specifications and drawings and any other technical and technological input mentioned in the CONTRACT
 - (b) The applicable international industry standards, codes, regulations, and recommended/best practices in aviation fuel handling industry
 - (c) The environmental, social and safety regulations and legislation and instructions addressed by authorities and stakeholders of Sri Lanka, being compulsory and appropriate to the PROJECT
- Provision of high quality construction outcome with respect to international HSE and Risk management standards, ensuring avoidance of undesirable incidents during, and because of, the execution of all related to the PROJECT construction and erection activities
 - Procurement of high quality equipment and materials along with manufacturers' certifications and guarantees for long term operation, performance, serviceability and integrity
 - Provision of high quality pre-commissioning, commissioning, start-up and put in operation services with respect to international industry standards (JIG, EI, etc.)
 - Provision of any required support, training, knowledge transfer and technology updates to OWNER'S personnel throughout the PROJECT
 - Provision of any other means, resources, materials, effort and studies required for the proper and successful construction and operation of the PROJECT.

4.3 Scope of Work


CONTRACTOR shall be fully responsible to perform the entire SCOPE OF WORK including the complete detailed engineering and design studies, procurement of materials and equipment, testing at manufacturer's workshop and worksite, receipt and storage at worksite, fabrication, construction, assembly, installation, inspection, testing, mechanical completion, pre-commissioning, obtaining of Third Party Inspector's certifications, acceptance, commissioning, start-up and rectification of defects, training of OWNER'S personnel in accordance with the CONTRACT and as indicated in the Feasibility Studies, specifications, datasheets and drawings of the FEED content.

The SCOPE OF WORK of CONTRACTOR includes the following, but not limited to, principle activities:

- Review, evaluation, verification, correction, improvement, endorsement and incorporation into detailed engineering and design studies of the FEED documentation.

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- Performing of the necessary for the PROJECT value engineering as appropriate for the proposed technical solutions, material selection, endorsement of the design and any other services related to the PROJECT execution.
- Establishment of a PROJECT specific Engineering and Construction Management system related to: production of time schedule(s), project and construction plans, organization charts, documentation management and control, progress monitoring, reporting and controlling, contract administration, risk management, manpower allocation and performance, interface management, subcontracting and stakeholder management.
- Establishment of a specific to the PROJECT Environmental and Social management and permitting system to satisfy all the official permit requirements advised/instructed by Sri Lanka's authorities and to monitor/prevent and control any impacts identified in the specific to the PROJECT Initial Environmental Examination (IEE) and conditions stipulated by the CEA and other stake holder organizations.
- Performing of specific to the PROJECT detailed engineering and design studies relevant to all aspects of surveying engineering, pipeline routing design, civil and structural engineering, process and fire-fighting design, safety and risk studies, HAZOP and HAZID studies, access roads design, foundations, supports, leveling and pavement, temporary facilities design, underground utilities design, geological/geotechnical/soil investigations, hydrogeological investigation, seismic hazard assessment, coastal hazards assessment, stress analyses, geo-electrical assessment, mechanical and piping design of pipeline/crossings/BVS/scrapers, hydraulic surge protection, electrical, Solar systems design, cathodic protection, instrumentation, control and CCTV System, telecommunication design, leak detection system design, earthing Systems and Lightning/surge protection system design and design of the PROJECT interfaces.
- Provision of Procurement services including but not limiting to: purchasing, shipping, receipt, transportation, storage, protection, delivery and certification of materials, equipment and accessories for all mechanical, piping, steel structural, concrete, gravel aggregates and asphalt materials, electrical, Solar power, instrumentation, control, leak detection, earthing, cathodic protection and telecommunication items. Also, procurement services shall be provided for the spare parts required for pre-commissioning, commissioning and start-up and spares for two (2) years normal operation from the date of issue of taking over certificate.
- Construction, erection, installation, fabrication and testing of below ground pipeline sections, BVS, scraper stations (launcher and receiver), metering station, fire-fighting system, fiber optic cable (FOC), HDPE pipes, access roads, concrete/steel structures, concrete elements for the pipeline protection, piping and tie-ins, pipeline crossings, fabrication, installation and laying of the welded and tested pipeline sections, instrumentation, cathodic protection; also, reinstatement and PROJECT delivery.

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- Providing of temporary site facilities: Air conditioned site offices with furniture, utilities for watering, power, sewerage and drainage, material storage yards, field logistics, first aid and sanitary facilities with janitorial services, transportation means, telecommunication, security services etc.
- Preparation and delivery of all applicable and PROJECT specific documentation: engineering and design reports/drawings/calculations, data sheets, material requisitions, inspection and testing reports for all aspects of design and construction of the PROJECT.
- Establishment of PROJECT specific Quality and HSE Management systems (QHSE), Risk Management system, preparation, application and follow up of QHSE issues, plans and procedures covering entire PROJECT activities.
- Organization, planning, execution and follow up of all pre-commissioning, commissioning, start-up and put into operation activities.
- Provision of assistance to OWNER in all aspects of the PROJECT and training of OWNERS personnel to all systems of the constructed PROJECT facilities.
- Production of the PROJECT final documentation packages including all the as-built drawings, reports, calculations, operating manuals, data sheets, material requisitions, construction documentation, inspection and testing reports, welding documentation, procurement and shipping documentation, mechanical catalogues, non-conformance reports, QHSE records, etc.
- The OWNER will only obtain the approval for the pipeline route from the stakeholder organizations. The CONTRACTOR shall obtain approval from the stakeholders for the construction methodology proposed by the CONTRACTOR. The OWNER will only assist the contractor by issuing relevant letters when required.

**Full Document Set Can be purchased from Ceylon
Petroleum Corporation as indicated in the
Invitation for Bids**