



OIL & GAS DEVELOPMENT COMPANY LIMITED
PROCUREMENT DEPARTMENT (LOCAL) ISLAMABAD
SCHEDULE OF REQUIREMENT

Material :02 NOS WATER STORAGE TANKS, CAPACITY 5000 BBL'S EACH

Due Date:

Tender Enquiry No: **PROC/LF/PT/17896/20**

Bid Bond Value : **RS.2.0 MILLION**
Attachment(if any) : **YES**

EVALUATION WILL BE CARRIED OUT ON FULL

Sr No	Description	Quantity	Make/Brand offered	Unit	Unit Price (PKR) Inclusive Of All Taxes Except GST	Unit Price (PKR) Inclusive of GST	Total Price (PKR) Inclusive of GST	Delivery Period Offered	deviation from Tender Spec. If Any
1	WATER STORAGE TANKS, CAPACITY 5000 BBL'S EACH, DETAIL SPECIFICATION ATTACHED AT ANNEXURE 'A'.	2		Number					

Special Note:- The prospective bidders also download the master set of Tender Document

- The prospective bidders may keep in touch with OGDCL web site for downloading the clarifications/amendments (if any) issued by OGDCL.
- BID VALIDITY 150 DAYS FROM OPENING OF TECHNICAL BIDS. DELIVERY TERMS AS PER CLAUSE NO.21 OF SCOPE & PAYMENT TERMS AS PER CLAUSE NO.22 OF SCOPE.

Discount (if any) shall only be entertained on Schedule of Requirement of Bidding Document (Financial Proposal). If the discount is mentioned elsewhere in the bid, the same shall not be entertained.

Annexure "A"

Scope of Work for

WATER STORAGE TANKS.



1. GENERAL

This specification given hereunder describes for guideline purpose and covers the minimum requirement of design, construct, calibrate and commissioning of Buffer Tanks at OGDCL Kunnar Fields as below mentioned. Field is situated in District Hyderabad and are 25-30 km of Hyderabad City.

Kunnar Field 2 no.

OGDCL intends to hire the services of an experienced and well reputed contractor for construction of Buffer Tanks at Kunnar Field for storage of produced water. The scope of work generally includes the Design, Procurement of material, Construction, Calibration and Commissioning of the Buffer Tanks. Successful contractor shall have to offer at least 01-year maintenance free guarantee of the installed systems and system's total working life of 25 years.

2. CONTRACTOR'S SCOPE (GENERAL)

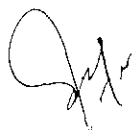
The contractor shall be responsible for minimum but not limited to the following;

- 2.1. Based upon the local conditions, soil investigations etc, the contractor shall design the tank foundation, base, shell, roof, stairs, nozzles, internals etc. The design should be completed in respect of calculation, drawings, material identification, sheet thicknesses and all other accessories specifications.
- 2.2. Procurement of material for these Buffer Tanks.
- 2.3. Construction of tanks including civil construction, Fabrication & Installation jobs according to design, drawings, procedures etc.
- 2.4. Testing, commissioning and calibration of tanks with complete details & procedures etc.

3. DESIGN

The basic purpose of scheme is the produced water will be transferred to CPI Separator which will reduce the oil content to the minimum level. After crude and water separation in CPI separator, recovered oil will be transferred back to storage tanks through recovered oil transfer pump and produced water will be transferred to buffer tanks through produced water transfer pumps. The preliminary use of these tanks will be to store produced water which is recovered by CPI Separator and then to send it towards Water injection pumps. The buffer tanks will be operating by lead lag philosophy i.e. when one tank is filled up to its maximum level the flow will be diverted to the other tank and injection from the overfilled tank will be carried out as long as the level reaches to its lowest level.

The contractor shall prepare a proposal for tank design, detailed engineering design/drawings and Bill of Material for tank construction, its internal protection and external protection. All these design/drawings documents should be submitted along with technical bid and should be according but not limited to the followings.



- 3.1. The buffer tanks should be of vertical cylindrical type having the storage capacity of 5020 BBLs of Liquid. The proposed tanks size for the same capacity is 39.37' dia., 26.25' length.
- 3.2. The design of tanks should include to the minimum requirement as per drawing # 0404177-PID-003 (attached)
- 3.3. The buffer tank should be fitted with necessary firefighting installations as splash plates, water deluge lines etc.
- 3.4. The foundations of tank be designed in a way to protect the tank bottom from corrosion. The soil in these areas is aggressive due to high water bed. The soil of the sites is marshy in nature and contractor has to consider this type of soil in his design.
- 3.5. The Tank foundation to be 4.5 feet (approx.) above NGL to match the levels with existing tank foundation of Kunnar Plant and foundations to be designed accordingly. Further the design of dyke walls also to be considered accordingly.
- 3.6. The construction material for tanks plates & Bottom should be A-283 Gr.-C / HR275, HR235, SS400 or equal with same properties. Plate thicknesses (min) should be as under for design.
 - Bottom 10 mm.
 - Shell 7-10 mm. (1st course of shell plate should be of 10 mm)
 - Roof 5 mm.

Note: If the bidder has not the design capability, he may hire the services of any reputed design/construction firm for preparation of design/drawings.

4. MATERIAL PROCUREMENT.

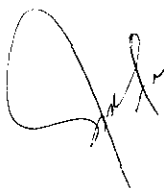
- 4.1. After final approval of the Detailed Engineering & Design from the company, the contractor will proceed for materials procurement and supply as per approved BOQ and data sheets.
- 4.2. In this regard bidder's responsibilities include procurement of material, transportation from manufacturer's site to the site store already established by the contractor.



- 4.3. The loading / un-loading of the material and shifting from site store to the site location shall be the responsibility of the contractor. OGDCL will not provide any sort of transportation / loading / un-loading facilities. If in case OGDCL provides such facility on contractor's request, that will be charges as per actual.
- 4.4. To determine the originality & authenticity of the material being used for this project, all material shall be 100% traceable and suitably marked for easy identification of manufacturer or supplier, grade, source, size and rating.
- 4.5. All foreign and local procured material shall be inspected by OGDCL engineer(s). OGDCL inspection engineer(s) shall have full right to accept / reject any material / equipment.
- 4.6. The defected/sub-standard/rejected material not conforming to the OGDCL requirements shall be replaced with the new one at bidder's account including transportation, handling demurrage etc.
- 4.7. The replaced material will be inspected once again and then be used by contractor after clearance from OGDCL professional.

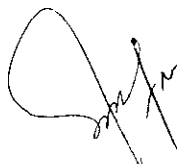
5. CONSTRUCTION AND INSTALLATION.

- 5.1. The bidder should be thoroughly familiar with the specifications of all the civil & mechanical works and shall ensure that all works are being completed in accordance with good industrial practice, relevant specifications and standards.
- 5.2. Contractor shall be responsible for all Civil, Fabrication erection, installation Calibration and commissioning jobs required for completing the project as per approved design.
- 5.3. The mechanical works include but not limited to followings:
 - Fabrication & welding of steel plates for tanks bottom, walls and roof
 - Fabrication and welding of tank structure (stairs, top fence, supports etc).
 - Fabrication and welding of all tank internals.
 - Fabrication and welding of pipe and fitting for all required nozzles.
- 5.4. The civil jobs include:
 - Soil analysis for its compactness and load bearing capability.
 - Excavation for tank ring and dyke wall foundations.
 - Construction of Tank foundation and Dyke walls.
 - Sand filling and its compactness inside the tank foundation ring.
 - Earth filling between dyke wall & foundation (if required).
 - Brick soling/stone pitching of land between foundation and dyke wall.
 - Concreted pit for the removal/recovery of water/oil in the area in case of rain and oil spillage.
 - Stairs at appropriate location at dyke wall.



- 5.5. The contractor shall conduct welder's qualification test by any reputable 3rd party for this project according to ASME Section IX and API-650. Only the qualified welders will be allowed for welding jobs for this contract.
- 5.6. All the necessary tests should be conducted regularly during the construction phase to maintain the quality of construction works (civil & mechanical) like soil compactness, cement strength, welding radiography physical inspection, hardness and other related tests.
- 5.7. All the tanks and pipes should be painted according to good industrial practice and specifications. After sand blasting a layer of primer coat must be done on the tank followed by two coats of good quality Epoxy Industrial paint as per design specifications.
- 5.8. The bottom and internal walls of tanks should be painted to protect the internals against the corrosive effects of water.
- 5.9. The contractor has to take care of all the necessary safety measures for doing the fabrication, installation and electrical jobs in the potential hazardous areas of oil & gas handling facilities.
- 5.10. The contractor is responsible for living arrangement of its manpower at his own account. Further he is also responsible for ensuring and using all necessary machinery at site required for construction, fabrication, installation and material handling during the entire project schedule at his own account.
- 5.11. Company shall have right to inspect all equipment that shall be brought for work. Company has the right to reject any equipment it deems not fit for work. In that case contractor shall immediately remove and replace the equipment with no cost to the company.
- 5.12. If any damage occurred to any equipment due to miss handling, improper storage, wrong installation procedure etc. during the project, that damage shall have to be rectified by the contractor without any cost to OGDCL.
- 5.13. Contractor should take all safety measures before starting of each day job, including safety meeting, emergency response plan meeting necessary HC detection tests before and during the process of any hot job or electrical works where the possibility of spark generation.
- 5.14. A graduate Project Site Engineer must be deputed by the contractor as the Incharge of all fabrication and construction activities and communication/correspondence with OGDCL site/project Incharge. The said engineer must be supported by qualified supervisors for each job
- 5.15. Bidder is required to provide the project team details and organization to OGDCL with its technical and financial proposal. Any change in organization and person of project team must be intimated to OGDCL for information/ approval as required

6. COATING & PAINTING



Before the final handover of the tanks, the contractor would ensure the application of internal coating and external painting as per guidelines mentioned below. The acceptable vendor for the painting are ICI only.

External Protective Coating.

For Shell and Fixed Roof

1. 1 coat of zinc rich epoxy primer at 50 microns dft
2. 2 coat of iron oxide paint at per coat 100 microns dft
3. 1 coat of acrylic modified polyurethane at 50 microns dft

Total dft 300 micron

Internal Protective Coating

Floor and first shell strake up to 2 meters height must be coated with FRP coating @ 3mm thickness while all the above roof & shell must be coated as per following

- i. One coat of red oxide 2 pack epoxy primer at 50 microns dft
- ii. Profile all discontinuities with an epoxy putty
- iii. Two coats of solvent free epoxy resin chopped strand mat coating.
- iv. One coat of solvent free epoxy and surfacing tissue
- v. One coat of solvent free epoxy sealer coat

Total dft 250 micron

7. TESTING & COMMISSIONING.

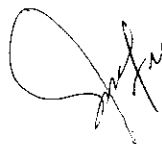
- 7.1. Bidder is responsible to carry out all tests during construction and post construction phase ensuring the integrity and performance of Buffer Tanks. This should include:
 - i. Compactness test for soil & sand filling (inside and outside of foundation ring).
 - ii. Concrete compressive strength tests (cube tests of different ageing) field density reports of fill materials.
 - iii. Welder qualification test.
 - iv. Radiography of weld joints of tank as per API-650.
 - v. Radiography of weld joints of piping spools.
 - vi. Hydraulic and vacuum test of Gun-Barrel tank.
- 7.2. Prior to testing and commissioning, The Contractor Shall Submit Detailed Testing & Commissioning Procedures as per codes
- 7.3. The contractor is responsible for tank calibration after successful completion of all tests by himself or through a reputed contractor. The calibration should be as per API 650, API 2555 and API 2250 using physical measurement, strapping and optical reference methods. The calibration charts prepared by the calibration firm must be witnessed/attested by government authorities for authentication as per law.



8. Scope of TPI/OGDCL Inspection:

TPI/OGDCL shall carry out the inspection according to API 650 and API 653 latest editions. Any issues during construction shall be evaluated according to these standard even not mentioned in the below scope. In any case, API standards shall be followed.

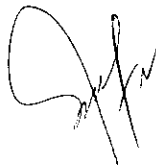
- 8.1. Material Identification through mill test certificates or through laboratory testing or other means.
- 8.2. Review / Witnessing of Procedure's qualification record and welder's qualification tests.
- 8.3. Inspection regarding construction of ring wall foundation as per drawing and other related civil works.
- 8.4. Inspection of roof, shell and bottom plates materials as per specification given in agreement
- 8.5. Inspection of welding consumables and to check the quality and suitability.
- 8.6. Inspection of Steel Structure assembly and welding.
- 8.7. Inspection of Shell Peaking, Bending, Roundness & Plumpness.
- 8.8. Inspection of Nozzle Orientation.
- 8.9. Witnessing of DPT and Pneumatic Leak Test where necessary.
- 8.10. Inspection of quality of welding of bottom, shell and roof plates.
- 8.11. Witnessing of vacuum box testing of bottom weld joints
- 8.12. Review results of radiography of horizontal, vertical and T-Joints of tank.
- 8.13. Stage inspections/hold points to be decided according to the Quality
- 8.14. Inspection plan to be submitted by TPI.
- 8.15. Witnessing of Hydrostatic Testing.
- 8.16. Witnessing of Calibration of Tank.
- 8.17. Report of findings
- 8.18. Overall responsibility for the excellent workmanship guaranteed through the above inspections and continuous site supervision shall be carried out by third party inspection firm /OGDCL at site at OGDCL's cost.



Note: All Inspection must be carried out by API-653 Certified Inspector. The contractor would facilitate and support the TPI/OGDCL engineers / inspectors during all the phases of the project.

9. INSPECTION, TESTING & COMMISSIONING.

- 9.1. Bidder is responsible to carry out all test during construction and post construction phase ensuring the integrity and performance of each Crude Oil Storage Tanks. This should include:
- i. Material inspection jointly with Reps. of Contractor and OGDCL prior to commencement of construction work.
 - ii. Compactness test for soil & sand filling (inside and outside of foundation ring).
 - iii. Concrete compressive strength test (cube tests of different ageing) field density reports of fill materials.
 - iv. Welder qualification test.
 - v. Radiography of weld joints of tank as per API-650
 - vi. Radiography of weld joints of piping spools.
 - vii. Hydraulic and vacuum test of tank

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- 9.2. Prior to testing and commissioning. The Contractor Shall Submit Detailed Testing & Commissioning Procedures as per codes of the area to be tested.
- 9.3. Purchaser / Engineering Contractor shall receive from Contractor all information regarding various phases of fabrication work so that Engineer's inspection can establish the quality of workmanship at the required fabrication stages.
- 9.4. Inspection by Owner or his representative shall not relieve the Contractor of the responsibility to replace any inadequate material and to repair any poor workmanship found on site.
- 9.5. Any material or workmanship that does not meet the requirements of this engineering specification may be rejected.
- 9.6. Material Certificates of all material etc. proposed to use for the tank shall be witnessed.
- 9.7. Any defective material or works found after acceptance at the time of rolling, machining or during erection and testing of tank shall be replaced without charge even if it has been accepted previously.
- 9.8. Welding procedure specification shall be submitted for approval, prior of welding procedure qualification.
- 9.9. Welding procedure qualification and welder qualification tests shall be carried out in the test facility to be approved.
- 9.10. Butt welds shall be full penetration and fusion. Quality of shell welded joints shall be evidenced by radiographic inspection, as specified in API-650.
- 9.11. Extent of Radiography shall be as specified in API-650. Purchaser / Engineering Contractor at any time reserve the right to have any joint radiograph. All welds which are unacceptable shall be repaired and retested through radiograph at contractor's expenses.
- 9.12. All radiographic reports along with the films shall be submitted for approval.
- 9.13. Fillet welds inspection shall be visual. In case that visual inspection of Purchaser's / Engineering Contractor's inspector reveals poor welds, acceptance or rejection shall depend on sectioning of these welds as per API-650
- 9.14. All tests be witnessed and approved by Engineer.
- 9.15. Surface preparation for painting shall have to be approved prior to the application of paint.
- 9.16. Inspection of fabrication and erection work shall not relieve the manufacturer of the responsibility to replace any inadequate material and to repair any poor workmanship found on site.



9.17. Tank Shell Testing

- After erection of the whole tank, all attachments and fixtures used for erection shall be removed and prior to connection to eternal piping the shell shall be tested by water filling.
- The tank shall be filled up to 2" (50 mm) above the top angle.
- All connections shall be blanked off.
- Filling rate shall not exceed 45m³ / hour up to top shell lower edge. From top shell lower edge upwards filling rate shall not exceed to 30m³ / hours.
- The telltale holes shall be used to pneumatically test attachment welds on reinforcing pads. The telltale holes shall be plugged after hydro test with non-hardening sealant or grease.

9.18. Tank Roof Testing

After the tank is finished, the welds of the roof shall be tested by an inner pressure which shall not exceed roof plate weight or by vacuum chamber applied on weld outer surface. Welding seams shall be lubricated with soap solution flax oil or other liquid suitable to tested **leakage**.

9.19. The contractor is responsible for tank calibration after successful completion of all tests by himself or through a reputed contractor. The calibration should be as per API 650, API 2555 and PI 2250 using physical measurement, strapping and optical reference methods. The calibration charts prepared by the calibration firm must be witnessed / attested by government authorities for authentication as per law. Calibration charts must be submitted to OGDCL after approval.

9.20. All material required (Like water pneumatic air etc.) for the testing would be arranged by the contractor at its own cost. It is not OGDCL responsibility.

9.21. INSPECTIONS/QUALITY PLAN.

<u>Activity</u>	<u>Purchaser/TPI Inspection</u>
Preproduction Meeting	H
Design Approval for tank	H
Design Approval CP System	H
Material Procurement	R
Material Procurement for CP System	R
Heat Treatment Certificates	R
Mill Test Reports	R
Material Inspection for Tank	H
Material Inspection for CP System	H
Welding Procedure & Welder Qualification	H

Fabrication	M
Radiographic Testing	M
Welding Repairs	M
Hydrostatic Testing	H
Commissioning of CP System	H
Painting and Coating	M

Note:

- H - Hold point, inspection or testing shall not proceed without the presence of the purchaser's representative.
- M - Monitor point, notification to the purchaser's representative of impending inspection or test activity is required.
- R - Review documentation, presentation of the specified.

10. COMPANY EXPERIENCE CRITERIA.

The contractor who intends for participate in this project must have 5 years of fabrication and installation experience. Further the contractor should submit a list of recent projects of similar nature carried out by him with brief scope of work, cost and completion duration along the technical portion of the bid. Contractor must have at least 3 equivalent capacities (5,000 BBLs) or higher capacity tanks construction on his credit otherwise his bid shall not be considered for further evaluation.

11. MARKING.

- 11.1 All plates, reinforcements, access steel structures, etc. shall be marked as specification in the detailed engineering design.
- 11.2 Marking shall be stamped in an easily visible place, using a striking dye, after protective coating application (if specified).
- 11.3 Tank identification tag with capacity, service, dimension, treatment, and year of manufacturing with Contractor complete address to be affixed permanently.

12. WORK SCHEDULE & REPORTS.

After the award of contractor, a detailed kick-off meeting to discuss the reporting channels and work schedule for timely completion of the project would be held in the OGDCL head office. OGDCL engineers would perform material inspection at the contractor's site; before mobilization for the material of construction, and contractor would intimate its schedule accordingly.

13. PROGRESS REPORTS.



The contractor shall prepare and submit to the company a monthly progress report detailing all actions that have occurred in the preceding month and actions anticipated in the coming month, the detail should be included but not limited to;

- Work in progress in shape executive summary.
- Work completed during the month.
- Problem areas.
- Proposal remedial actions associated with shortfalls/problems areas.
- Outstanding matters
- All monthly reports will be submitted on or before 5th of every month with API Inspector signature as well.

14. FINAL INSPECTION & COMMISSIONING.

OGDLC would undertake its routine site monitoring for the progress and reserves the right to carry out the mutually agreed inspection. Moreover, calibration of tanks; as per API certification requirement; is included in the contractor's scope of work.

15. HIRING OF SERVICES

In case Contractor hires the services of any activity for the project like designing, installation, fabrication, inspection etc. from other company. He must propose at least 03 Nos. of reputed companies at the time of submission of bids having at least 07 years relative experience. After approval of the bid no change regarding replacement of the sub-contractor can be made OGDCL would finally nominate one of the proposed sub-contractor.

16. ADDITIONAL / EXTRA WORK (S)

Company shall have the right to ask contractor for any work(s), which was not previously included in contractor's scope of work. However, the company shall be liable to pay for the extra work provided that the propos approval has been taken prior to the commencement of work. BOQ of extra work shall be applied.

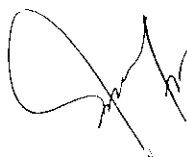
17. REPAIRS.

All welding defects shall be brought to the Purchaser's / Engineering Contractor's knowledge and approval shall be obtained before repairing them.
All remedies must get approval of the Purchaser / Engineering Contract.

18. PEAKING.

Using a horizontal mold to radius of 1m long peaking in any area of inside shell surface shall not exceed 12.7mm.

19. BANDING.



With a vertical sweep board 1m long, banding shall not exceed 12.7m. Measurements for tank shall would be performed before hydraulic test.

20. BOX-UP

After testing and calibration, all tanks shall be emptied and water disposed of as per instruction of Purchaser / Engineering Contractor. Tanks shall be thoroughly cleaned internally and boxed-up, including mounting, fitting, fixing and bolting of all tank fittings and accessories provided by Purchaser such a valves, level gauge, etc. The cost of this work shall be considered included in the Contractor's rates for fabrication of tanks.

21. DELIVERY OF TANKS.

Contractor is responsible to complete the tank in all aspects and handover to OGDCL in 180 to 210 days' time from that date of issuance of purchase order.

22. PAYMENT SCHEDULE.

Following is the payment schedule against tank:

- 15% Mobilization Advance against bank guarantee.
- 10% payment upon satisfactory completion of Ring Wall Foundation, installation of Anode Bed of CP System and sand filling as per drawings.
- 25% payment after procurement of material for tank plates and structure
- 10% payment after procurement of material for nozzles/valves/flanges, cp system etc.
- 20% payment after completion of fabrication/construction works (i.e bottom, roof, shell, stairs, completion of nozzle works etc.) and successful Hyderotesting of the tanks.
- 20% payment after handing over the tank upon killing all punch points upon completion of job.



Scope of work for above-ground storage tank bottom's CP Systems.

Independent and stand-alone Cathodic Protection System will be installed to protect tank bottom from external corrosion and the sacrificial anode for the internal surface of buffer tank with following minimum but not limited requirements.

1. Eligibility Criteria OF CONTRACTOR.

- i. The contractor should have proven experience 7-10 years of CP System's design, installation and commissioning including storage tanks.
- ii. Should have an established team on its pay-role consisting of local, experienced, certified and qualified man-power for CP System's installation and commissioning services. The installation & Commissioning engineer / supervisor should be;
 - a. 5 – 7 Years proven track record of similar job experience.
 - b. Preferably with engineering degree or at least DAE.
 - c. NACE CP Level – II or equivalent I-Corr Membership, relevant API or other recognized Equivalent professional certification.
 - d. Pakistani National (*Foreign national(s) who require security clearance shall be discouraged*)
- iii. Design engineer (Local or Non-Local) should be;
 - a. Well experienced not less than 10 years and have hands on experience of designing CP Systems for tanks.
 - b. Have Engineering Degree in relevant field.
 - c. Have NACE CP Level – III certification or equivalent I-Corr Membership or other recognized Equivalent professional certification
 - d. Contractor must be well aware of and follow relevant national regulations and international codes and standards specifically NACE / API relevant to above-ground storage tank's CP Systems.

2. Pre-design surveys and Tests.

The CP Contractor will have to carry out minimum following tests before design of CP Systems for tank bottoms.

- i. Soil resistivity tests.
- ii. Soil chemical tests specially for determining SRBs activity.
- iii. Any other test(s) which are deemed to be necessary for designing / installation of CP Systems under NACE / API codes guidelines.
- iv. Local corrosion history and already installed CP System's history.

3. Detail engineering and design.

After above tests / surveys, data and history collection, CP contractor will prepare detail engineering and design and will finalize BOQ. Following is to be done in this regard;



- i. An impressed current cathodic protection system based with T/R Unit as power of electrical source is to be designed for an approx. life of 20 years. Power rating of TR unit shall be calculated accordingly for mentioned life + 25% additional power to cater other requirements.
- ii. Only ANODE FLEX or Equivalent anodes shall be used. No grid or other system shall be allowed.
- iii. The design will ensure to have required potential for all tank bottoms for the design life of the system.
- iv. The protective criteria shall be minimum -ve 0.85 – 1.25 volts potential when measured with structure to soil potential as beneath the tank bottom and at periphery.
- v. Design philosophy, basis of design and design calculations will be provided.
- vi. Locations of all installations such as anodes, T/R unit, AJBs, CCBs, cable route etc shall be shown clearly in the design report.
- vii. Placement of Transformer rectifier shall be out the dyke wall of the tank and supply of Ac current shall be the responsibility of OGDCL.
- viii. Contractor shall also submit complete design report of internal surface through sacrifice anode system for approval.
- ix. Complete and detailed BOQ showing item's name, quantity required, detailed specifications, rating, local or foreign etc will also be prepared and made part of design report.
- x. When draft report is prepared and submitted for review, the CP contractor shall arrange presentation of the engineering and design work to OGDCL by their lead design engineer explaining all aspects of design & BOQ. The design shall be finalized only after that presentation.

4. Material procurement.

After finalization of the detailed engineering and design work and approval from OGDCL, contractor will proceed for material procurement with minimum following requirements.

a. General Requirements.

- i. The specs, ratings, quantity of each item / equipment for installation purpose shall be determined by the CP contractor according to final engineering and design.
- ii. All procurement shall be responsibility of contractor.
- iii. Inspection of all main equipment such as T/Rs, Anodes, cables, surge diverters, insulation joints / kits, AJBs, CCBs etc by OGDCL or Third Party inspection companies will be carried out.



- iv. All CP material shall be inspected by company engineer(s) in presence of contractor's representative on receipt at site for verification of specs, make, model, rating etc as per BOQ before installation. The defected / sub-standard material not conforming to the BOQ requirements / specifications / requirement, shall be replaced / changed at contractor's cost.
- v. All material shall be 100% traceable and suitably marked for easy identification of manufacturer or supplier showing grade, source, size, rating etc with proper tagging.

b. Transformer Rectifiers (T/R Unit)

- i. Preferably be Oil-Cooled and compliant to Hazardous area location Class-I, Zone-II. Such conforming information shall be clearly displayed in operating and maintenance manual or TR unit as well as on name plate.
- ii. Having proper power rating as per BOQ.
- iii. Manufacturer / contractor shall provide full operational guarantee of 2 years. In case of failure/ malfunctioning it should be repaired / replaced by the contractor at its own risk and cost.
- iv. Should be floor mounted, weatherproof, dustproof, corrosion resistive sheet preferably 316 SS material casing.
- v. Appropriately – rated armored type power supply cable from nearest available electrical DB to the transformer-rectifier and AC circuit breaker shall be contractor's responsibility. Power supply may be AC 180-240 VAC, 50 Hz. T/R should be able to cater these ratings. T/R should have constant potential & constant amperes type.
- vi. The rectifier shall have continuous reading, flush-mounted DC Voltmeter, Ammeter and preferably pipe-to-soil reading meter for measuring the input / output voltage and current. Meters shall be accurate within 5% of full-scale values and shall be linear from zero to full-scale value.
- vii. The T/R Units shall have multi-channel provision for current distribution.

c. Junction Box(es), Test Post Box(es), Current Distribution Box(es)

- i. All sort of boxes such as Anode Cable Junction boxes (AJBs), Positive Junction Boxes (PJBs), Current Control Boxes, test post boxes etc (whatever the case & requirement may be as per BOQ), shall be made of robust 16 gauge stainless steel plate, or cast aluminum alloy or equivalent, and provided for termination of +ve and -ve main cable.



- ii. The anode junction box / current control box must have capacity to cater / accommodate all the individual connections of all the anodes / structures of the system plus half of the installed anodes as spare for future connections.

d. Anodes

- i. The anode (only anode flex or equivalent similar type polymeric anodes) shall be designed to provide adequate CP current to 100 % of the tank bottom's protective current density specified for a minimum of 20 years period + 50% extra.
- ii. The anodes shall be designed to provide uniform current distribution. The number of anodes shall be determined by the total current requirement of the CP system(s) and the criteria of over-under protection.

e. Monitoring Facilities / Test Stations.

- i. Monitoring facilities shall be designed to ensure effective indication of the level of the Cathodic Protection at different locations around tank bottom.

f. Cabling

- i. The cable connections shall be made preferably by mechanical means, thermitic welding could be permitted keeping in view the safety matters at site premises.
- ii. Mechanical connection shall be made above ground only using cable lugs, nuts and serrated washers.
- iii. All ground electrical connections to the protected structure shall be fully encapsulated.
- iv. All cables shall be sized such that no excessive voltage drops occur which reduce the capacity of the system. All cables shall be insulated and sheathed to withstand the prevailing site condition. Drains cables and anode feeder cables shall be armored.
- v. All cables shall be buried in soft sand at a depth of at least 0.5 meters, provided with cable protection tiles and warning tape as considered suitable for the area.
- vi. Cables tags shall identify all the cables where they come above ground.
- vii. The CP cables shall be HMWPE or XLPE type with the minimum cross-section as below:

a.	Test lead and bonding	:	10 mm ²
b.	Positive circuit anode-rectifier	:	35-50 mm ²
c.	AC Power cable	:	70 mm
- viii. The supply and laying of all above-mentioned cables shall be the responsibility of contractor.
- ix. Standard cable color code shall be used for various purposes of cable connections.



g. Monolithic Blocks.

- i. Procurement and installation of monolithic blocks on all in-let and outlet flanges for electrical isolation of tanks from other structures will be responsibility of CP contractor.
- ii. Isolation kits instead of monolithic blocks will not be acceptable.

5. INSTALLATION / TESTING / COMMISSIONING.

- i. Installation, testing and commissioning shall be carried out under guidance and requirements of NACE and other relevant codes & standards and local regulations.
- ii. All T/R units and Anode Junction boxes / current control boxes shall be based on suitably designed solid concrete blocks.
- iii. A standard shade with appropriate material shall be made to protect T/R unit(s) control boxes, anode junction boxes.
- iv. When installation and commissioning of the CP system are completed in all respects, it will only be handed over to company after successful completion of trouble-free operation with complete polarization as per NACE standards.
- v. Final commissioning report and as built drawings will be prepared and submitted by the contractor.

6. Warranty / Guaranty.

- i. The contractor have to provide one year trouble free performance / operational guaranty (after handing over the system to the company) of the installed system.
- ii. The contractor has also to provide / assure after sale service guaranty in terms of technical expertise whenever needed during warranty period.
- iii. In case during performance / operational guaranty period, any fault is found in the system that will be rectified / replaced / repaired by the contractor immediately at no cost to OGDCL.

7. Applicable Codes & Standards.

- i. The contractor shall have to follow all applicable international codes / standards (*especially following listed NACE, API or equivalent BSI codes*) and local regulations and practice in vogue to complete the job.
 - a. NACE RP - 01 – 0169 / 2002.
 - b. NACE RP – 01 – 99.
 - c. NACE RP – 05 – 72.
 - d. NACE RP – 02 – 86.
 - e. API RP – 651.
 - f. BS – 7361.
- ii. It will be contractor's responsibility to be fully aware of the requirement of the applicable codes and standards.

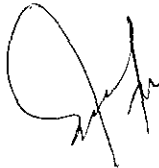


Data Sheet to be filled by Bidder

Sr. #	DESCRIPTION	PARAMETER	CONTRACTOR to Comply
1	GENERAL	Section 1, compliance required	
2	Compliance to SOW (i.e Design, construction and testing etc.) the Sections 2 to Section 21	As per guidelines mentioned.	
3	Compliance to Experience Criteria	5 Years , Section 9	
4	Experience certificates of the Company (at least three references required, for the technical suitability). Clients guaranteed certificates in the company's name.	Client's certificates required with dates, tank capacity and clients letters for completion of projects.	
5	Number of equivalent 5,000 barrels or more capacity tanks constructed by the contractor in its name and at least three tanks of 5,000 barrels or more capacity to be on the contractor's credit for qualification.	Mandatory experience required.	
6	Organogram of Company and Organogram of proposed team for site execution.		
7	Delivery period, any bidder/contractor offering additional time that exceeds from given delivery period, would be asked to match this timeline for further evaluation.	180 days	
8	Any deviation to this specification, each deviation to be marked by section wise description (if any) from 1 to 22.		
9	Provision of PEC registration certificate as proof of work experience in mechanical construction for C5 category or above whichever is applicable.	Valid PEC certificate to be attached for applicable category	
10	Provision of necessary experience showing competency for projects above PKR 50 Million.	Experience with client references, email, and telephone numbers to be provided	
11	Payment schedule as per Section 23	Compliance	
CP System of Tanks Bottom			
12	Compliance of Eligibility criteria of CP contractor	Bidder to provide the name of company with enough documentary proof of experience in the form of purchaser order, service order , LOI ,etc.	

13	Pre- design Test for CP system	Bidder to mention clearly in the technical bid all the tests to be carried out. Also Name(s) of the survey team member(s) along with his/their relevant survey experience.	
14	Detailed Engineering design of CP System recommendation/SOW compliance.	Bidder to provide clearly Name(s) / alternate of the design engineer(s) along with proof of relevant experience & certification.	
15	Compliance to relevant sections of Material Specifications of CP System	Compliance of Section-4 of relevant section.	
16	Compliance of installation & commissioning sections of CP System	Compliance of section-5 of relevant section.	
17	Warranty/Guaranty of CP System	Compliance of section-6 of relevant section.	

TO BE FILLED IN COMPLETELY BY THE BIDDER / CONTRACTOR.





PROCUREMENT DEPARTMENT (LOCAL), ISLAMABAD
SCHEDULE OF REQUIREMENT

Mandatory Checklist

Please confirm the compliance of the following mandatory information along with the bid(s) (failing which bids(s) will not be accepted)

Documents	To be Attached with the Technical/Financial Bids	Compliance	
		Yes <input type="checkbox"/>	No <input type="checkbox"/>
Original Bid Bond	Technical Bid	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Copy of NTN Certificate	Technical Bid	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Copy of GST Certificate	Technical Bid	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Confirmation that the Firm is appearing on FBR's Active Taxpayer List	Technical Bid	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Duly signed and stamped Annexure-A (Un-priced)	Technical Bid	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Duly filled, signed and stamped Annexure-B	Technical Bid	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Duly filled, signed and stamped Annexure-D	Technical Bid	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Duly filled, signed and stamped Annexure-L on Company's Letterhead	Technical Bid	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Duly signed and stamped Annexure-M on Company's Letterhead	Technical Bid	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Duly signed and stamped Annexure-N on Non-Judicial Stamp Paper duly attested by Notary Public	Technical Bid	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Duly filled, signed and stamped Annexure-A (Priced)	Financial Bid	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Duly filled, signed and stamped Annexure-C	Financial Bid	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Duly filled, signed and stamped Annexure-E	Financial Bid	Yes <input type="checkbox"/>	No <input type="checkbox"/>



PROCUREMENT DEPARTMENT (LOCAL), ISLAMABAD
SCHEDULE OF REQUIREMENT

For the Vendors/Contractors who opt to submit Bank Draft/Call Deposit/Pay order against Bid Bond/Performance Bond, our Accounts Department has finalized an arrangement for online payment to such Vendors/Contractors, which will be processed through (IBFT & LFT) for which following information is required:

i.	IBAN No. (International Bank Account Number 24 Digits)	
ii.	Vendor Name as per Title of their Bank Account	
iii.	Contact No. of Company's CEO/ Owner (Mobile & Landline)	
iv.	Bank Name.	
v.	Bank Branch Name and Code	

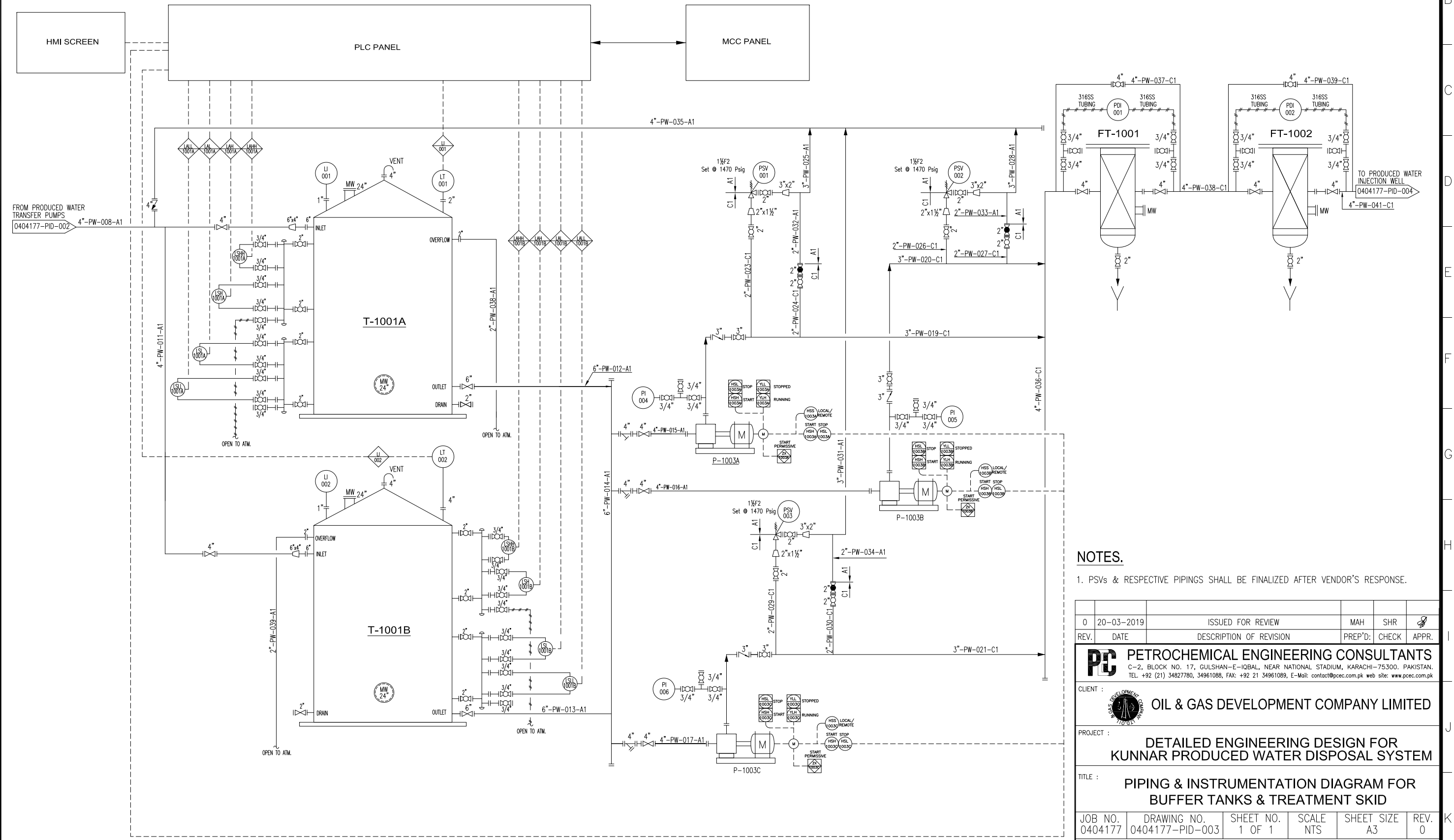
Name, Sign and Stamp of the authorized official of the Bidder(s) _____

PRODUCED WATER BUFFER TANK(T-1001A/B)		
PRESSURE psig	DESIGN	ATM
	OPERATING	ATM
TEMPERATURE °F	DESIGN	200 °F
	OPERATING	AMB
INTERNAL DIAMETER, ft		39.37
HEIGHT, ft		26.25

PRODUCED WATER INJECTION PUMP(P-1003A/B/C)	
CAPACITY (USGPM)	105
DIFF. PRESSURE psi	1450
HYDRAULIC POWER (kW)	88.3

PRODUCED WATER CHARCOAL FILTER (FT-1001)	
CAPACITY (BPD)	7200
PRESSURE DROP psi	5-10

PRODUCED WATER PARTICULATE FILTER (FT-1002)	
CAPACITY (BPD)	7200
PRESSURE DROP psi	5-10



NOTES.

1. PSVs & RESPECTIVE PIPINGS SHALL BE FINALIZED AFTER VENDOR'S RESPONSE.

REV.	DATE	DESCRIPTION OF REVISION	PREP'D:	CHECK	APPR.
0	20-03-2019	ISSUED FOR REVIEW	MAH	SHR	

PC PETROCHEMICAL ENGINEERING CONSULTANTS
 C-2, BLOCK NO. 17, GULSHAN-E-IQBAL, NEAR NATIONAL STADIUM, KARACHI-75300. PAKISTAN.
 TEL: +92 (21) 34827780, 34961088, FAX: +92 21 34961089, E-Mail: contact@pcec.com.pk web site: www.pcec.com.pk

CLIENT: **OIL & GAS DEVELOPMENT COMPANY LIMITED**

PROJECT: **DETAILED ENGINEERING DESIGN FOR KUNNAR PRODUCED WATER DISPOSAL SYSTEM**

TITLE: **PIPING & INSTRUMENTATION DIAGRAM FOR BUFFER TANKS & TREATMENT SKID**

JOB NO. 0404177	DRAWING NO. 0404177-PID-003	SHEET NO. 1 OF 1	SCALE NTS	SHEET SIZE A3	REV. 0
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