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**DUE DATE: 10/12/2018**



Government of India  
Bhabha Atomic Research Centre  
**Atomic Fuels Division**  
*Technical Services Section*

Ref: AFD / TSS / 2018 / 224148

November 26, 2018

## **Tender Enquiry**

To,

**Sub: Works Contract for “Fabrication, Supply, Testing, Installation and Commissioning of Working Platform, Inlet Water Pipeline, Water Drainage System, Water Pressurization System, Jet Cleaning Systems, Electric Hoists, Monorails & its supporting structure and Control Systems, as per attached schematic drawings & Technical specifications; for the Decontamination Facility at AFD”.**

Sealed quotations are invited for & on behalf of the President of India for Fabrication, Supply, Testing, Installation and Commissioning of Working Platform, Inlet Water Pipeline, Water Drainage System, Water Pressurization System, Jet Cleaning Systems, Electric Hoists, Monorail & its supporting structure and Control Systems, as per attached schematic drawings & Technical specifications; for the Decontamination Facility at AFD. The general description, scope of work and salient terms & conditions are as follow:

## 1. General Description

A specially designed decontamination & cleaning facility is being installed at site by the purchaser. The sub-systems (or components) being procured, are intended to be used as auxiliaries at the above facility. The scope of work includes Design of these sub-systems (components), Fabrication, Supply, Installation and Commissioning at site on the turn-key basis. All materials, consumables, labour etc shall be in the vendor's scope of work.

Schematic drawings displaying the salient features of sub-systems and their general arrangements are attached herewith. However, the vendor shall carry out the detailed design of these sub-systems in accordance with the operational requirements given in the respective paragraphs hereunder. The vendor shall prepare his own fabrication drawings and get them approved by the purchaser before commencing the work execution.

Further, vendor shall have to produce documentary evidence for the design capability of such sub-systems, at the time of site visit.

These sub-systems are to be erected into a radioactive environment and hence mandated safety precautions shall have to be adhered by the vendor. The departmental Health Physicist will brief about the safety precautions / procedures to be observed at site by the vendor's engineers and technician.

## 2. Scope of Work & Technical Specifications

The scope of work consists of following:

- 2.1 Working Platform
- 2.2 Inlet water Pipeline & Water Drainage System
- 2.3 Water Pressurization System
- 2.4 Jet Cleaning Systems
- 2.5 Electric Hoist, Monorail & its supporting Structure
- 2.6 Loading / Unloading Platform for the Items to be cleaned
- 2.7 Control Systems

### 2.1 Working Platform

The working Platform is to be designed considering the uniformly distributed load of 500kg/m<sup>2</sup>. Additionally, the concentrated load of 1000kg (anywhere on the total span of the beams) has also to be taken into account. Appropriate Factors of Safety, as mandated in the relevant structural design codes, may be taken on the yield point strengths of the constituent materials. The relevant IS standards mild steel & stainless steel sections (as and wherever mentioned on the drawing), are to be used for fabrication.

A 5000x5000x100mm size PCC floor is to be constructed at site to provide a flat & firm surface to the Working Platform.

The existing shed at site, is to be modified to make headroom for this working platform. The details will be explained to the vendor, at the time of site-visit.

The schematic drawing No.1 is attached herewith for the reference.

## 2.2 Inlet water Pipeline & Water Drainage System

### 2.2.1 Inlet water Pipeline

An appropriate size pipeline is to be provided to cater the fresh water requirements at the facility. The details are as under:

2.2.1.1	Material of construction	SS 304, Sch 40 Seamless Pipe
2.2.1.2	Standard to be followed	ASME B31.3
2.2.1.3	Total Length of the Pipelines	42 meters
2.2.1.4	Size of the Pipeline	To be designed by the vendor
2.2.1.5	Desired flow rate	200 LPM
2.2.1.6	Working pressure	0.2 kg/cm <sup>2</sup> to 2 kg/cm <sup>2</sup>
2.2.1.6	Control Valves (4 Nos.)	SS 304 Ball Valves (Full Bore and Flanged Type)

### 2.2.2 Water Drainage System

Liquid effluent arising out of the Decontamination Facility is to be transported to the plant effluent collection network, as per attached schematic drawing No. 2.

Accordingly, the following provisions are to be made by the vendor:

#### 2.2.2.1 Pumping System

2.2.2.1.1	Type	Single stage centrifugal Pump
2.2.2.1.2	Quantity	1 No.
2.2.2.1.3	Material of Construction	Carbon Steel
2.2.2.1.4	Working pressure	1 kg/cm <sup>2</sup>
2.2.2.1.5	Flow rate (at 1 kg/cm <sup>2</sup> pressure)	200 LPM
2.2.2.1.6	Accessories to be supplied with the Pump	Electrical Motor, Starter, Switchgears, mounting Bracket and 20 meter cables
2.2.2.1.7	Mounting details of the Pump	As per the attached schematic drawing No. 2

#### 2.2.2.2 Pipelines

2.2.2.2.1	Material of Construction	SS 304, Sch 40 Seamless Pipe
2.2.2.2.2	Standard to be followed	ASME B31.3
2.2.2.2.3	Total Length of the Pipelines	24 meters
2.2.2.2.4	Desired flow rate	200 LPM

2.2.2.2.5	Working pressure	0.1 kg/cm <sup>2</sup> to 1 kg/cm <sup>2</sup>
2.2.2.2.6	Size of the Pipeline	To be designed by the vendor
2.2.2.2.7	Control Valves (3 Nos.)	SS 304 Ball Valves (Full Bore and Flanged Type)

### 2.3 Water Pressurization System

The salient operational requirements are as under:

2.3.1	Type	Suitable multistage Pump
2.3.2	Quantity	1 No.
2.3.3	Material of Construction	Carbon Steel
2.3.4	Working pressure	30 kg/cm <sup>2</sup>
2.3.5	Flow rate (at 30 kg/cm <sup>2</sup> pressure)	60 LPM
2.3.6	Accessories to be supplied with the Pump	Electrical Motor, Starter, Switchgears, mounting Bracket and 20 meter cables
2.3.7	Mounting details of the Pump	As per the attached schematic drawing No. 3 & 4

### 2.4 Water Jets Cleaning Systems

It is envisaged that decontamination as well as cleaning of the components shall be accomplished by impact of the pressurized water Jets. The water Jets cleaning system shall consist of:

2.4.1 Fixed Jets

2.4.2 Flexible Jets

Their respective details are given below.

#### 2.4.1 Fixed Jets

The fixed position Jets (Nozzles) are to be provided on the three sides of the Ultrasonic - cum - Water Jet - Cleaning Tank (UWJC Tank).

*(The Ultrasonic - cum - Water Jet - Cleaning Tank shall be provided by the purchaser at site and hence not in the scope of supply of this tender enquiry)*

The schematic distributions of the fixed position Jets are shown on the schematic drawing No. 3. The process parameters and desired controls are given hereunder:

2.4.1.1	Jet creating device	High Pressure Water Nozzles
2.4.1.2	Quantity (Nozzles)	15 Nos. (5 Nos. on each side of the Tank)
2.4.1.3	Material of Construction	SS 304, machined
2.4.1.4	Mounting of Nozzles	Ball and Socket type joint
2.4.1.5	Flow rate of individual Nozzle	1 LPM
2.4.1.6	Working pressure	30 kg/cm <sup>2</sup>
2.4.1.7	Control Valves (Total 15 Nos.)	SS 304 Ball Valves (Threaded & full bore type)
2.4.1.8	Total lengths of the pipeline required for the fixed Jets	20 meters
2.4.1.9	Sizes of the Nozzles & Pipeline	To be designed by the vendor
2.4.1.10	Material of Construction of Pipelines	SS 304, Sch 40 Seamless Pipe

## 2.4.2 Flexible Jets

One flexible Jet alongwith control Valve is to be provided on three sides of the UWJC Tank, as shown on the schematic drawing No. 4. Thus, there shall be three Flexible Jets. The details are as under:

2.4.2.1	Jet creating device	High Pressure Water Nozzles
2.4.2.2	Mounting details	The Nozzles shall be mounted on one end of flexible synthetic rubber Hose. The other end of rubber Hose shall be fitted on the SS 304 Pipeline
2.4.2.3	Material of Construction	SS 304, machined
2.4.2.4	Flow rate of individual Nozzle	10 LPM
2.4.2.5	Working pressure	30 kg/cm <sup>2</sup>
2.4.2.6	Required control Valves (Total 3 Nos.)	SS 304 Ball Valves ( <i>Threaded &amp; full bore type</i> )
2.4.2.7	Total lengths of the pipeline required for the Flexible Jets	20 meters
2.4.2.8	Sizes of the Nozzles & Pipelines	To be designed by the vendor
2.4.2.9	Material of Construction of Pipelines	SS 304, Sch 40 Seamless Pipe

## 2.5 Electric Hoists, Monorail & its Supporting Structure

Two dedicated Electric Hoists are to be erected at site to cater the handling requirements of the decontamination and cleaning process. The hoists are to be mounted on a six meters long monorail and suitable column supports (height  $\approx$  4 meter). Two Electric Hoists are to be placed one meter apart on the monorail. Necessary provisions have to be made for movement of both Hoists in tandem. The required design details are as under.

### 2.5.1 Electric Hoist

2.5.1.1	Type	Electric Hoist
2.5.1.2	Quantity	2 Nos.
2.5.1.3	Capacity	2 Ton (1 Ton each)
2.5.1.4	Make & Model	INDEF, HC3 100NL
2.5.1.5	Longitudinal movements	$\approx$ 5 meters
2.5.1.6	Up / down movements	$\approx$ 2 meters
2.5.1.7	Accessories	Pendant, 10 electric meters cable, control panel etc

## 2.5.2 Monorail & Supporting Structure

2.5.2.1	Length of the Monorail	≈ 6 meter
2.5.2.2	Height	≈ 4 meter
2.5.2.3	Types of Load	Static & Moving Loads
2.5.2.4	Maximum working Load	2 Tons
2.5.2.5	Longitudinal movement of the Load	≈ 5 meters
2.5.2.6	Up / down movements of the Load	≈ 2 meters
2.5.2.7	Remarks	The Monorail & its supporting structures have to be designed for the above loads. The entire structure is to be painted yellow, after two coats of primer

### 2.6 Loading / Unloading Platform (for the items to be cleaned)

A platform to cater Loading / Unloading (for the items to be cleaned) is to be designed & fabricated. The tentative static working load on the platform may be taken as 2000kg. Standard mild steel structural sections are to be taken as materials of construction. The overall size of this Platform should be between 900x900x900mm to 1000x1000x1000mm.

### 2.7 Control Systems

An integrated Control Panel is to be provided for all the above sub-systems. The control panel is to be designed in accordance with the industrial ergonomic requirements. The control panel should have provisions of ON / OFF switches, MCBs, visual display of process parameters, salient control features, emergency STOP etc. Industrial grade powder coated sheet metal cabinet boxes are to be used.

## 3. Fabrication

- 3.1 All fabrication shall be as per ASME Section VIII Div. 1
- 3.2 All welding shall be by SMAW / TIG welding only. Welding procedure and welders shall be qualified as per ASME SECTION IX Prior to production welding.
- 3.3 Prior to actual production, fabrication drawings and welding procedures shall be approved by the purchaser.

## 4 Inspection & Quality Control

Vendor shall submit the detailed fabrication procedure along with the offer. This shall include:

- 4.1 Fabrication and inspection stages and testing methods in sequence listing all in details.
- 4.2 Procedures for welding and stress relieving.
- 4.3 Weld sequencing and identification.
- 4.4 Identification of witness and hold points in manufacturing plan.

- 4.5 Detailed fabrication drawing indicating weld configuration, location, weld joint identification etc shall be submitted prior to taking up the production.
- 4.6 Purchaser's representative shall have complete access to the works and vendor shall provide all necessary instruments, tools and documents etc. to conduct the checks.
- 4.7 Time schedule: The firm shall submit time schedule for the following for timely completion of the order.
  - 4.7.1 Fabrication drawings/ Fabrication schedule.
  - 4.7.2 Quality assurance plan & stage wise inspection schedule.
  - 4.7.3 Welding schedule and Welder's qualification.

## **5. QAP (Quality Assurance Plan)**

Vendor shall submit a documented procedure for Quality Assurance Plan and get it approved from the purchaser.

## **6. Welding requirements**

- 6.1 Welding procedures and welder shall be qualified as per ASME section IX proper to production weld.
- 6.2 Tungsten electrodes shall be conforming to ASME section-II, part-C, SFA 5.12, EW-Th2.
- 6.3 DP test shall be carried out by on all weld joints to check surface imperfections.

## **7. General Technical Requirements**

- 7.1 Vendor shall prepare its own fabrication drawings as per actual site conditions and should get it approved from concerned authority before commencement of work.
- 7.2 All fabrication work shall be carried out as per approved drawings only.
- 7.3 Vendor shall carry out actual measurements at site and suggest deviations if any to make necessary changes if required.
- 7.4 All material supply is in the scope vendor. Vendor shall use all relevant IS standard material for this work. Material testing reports (Chemical, Mechanical etc.) from govt. approved labs should be submitted for approval. Material identification and stamping shall be witnessed by departmental representative.
- 7.5 Vendor shall have to pass weld qualification and only qualified welders shall perform this work
- 7.6 In case of any technical doubts, vendor shall contact concerned authority for clarifications.
- 7.7 Vendor shall have to arrange for Arc / TIG welding m/c. along with all consumables (welding electrodes etc) required for this work.
- 7.8 Gas cutting, arc welding, grinding work etc. shall be carried out with utmost care. Vendor shall follow all safety measures while carrying out such work. Department shall provide gas cylinders for gas cutting purpose if required.

- 7.9 Burrs, sharp edges, projections etc. caused due to cutting, welding etc shall be removed to maintain smooth surface. Vendor shall maintain best quality workmanship.
- 7.10 Vendors shall have to give minimum one year guarantee for workmanship, materials and satisfactory performance of the entire system.

## **8. Final acceptance criterions**

- 8.1 Physical verification of all items and satisfactory performance trials at site, as per the technical specifications.
- 8.2 Vendor shall clear off all left out material at the end of the work and ensure clean work area before handing over.

9. Vendors having knowledge and experiences of preparing above mentioned documentations, BARC procedures, standard welding procedures, safety procedures, material testing and inspection facilities, calibrated equipments etc. shall be preferred for the work contract.

## **10. Terms & Conditions**

- 10.1 The work completion period is 4 months.
- 10.2 Taxes, if any, shall be specified separately.
- 10.3 The offer should also contain the work completion period.
- 10.4 Percentage of GST payable or included in your offer may be shown separately, i.e., Basic cost. Rs. XXXXX/- plus GST Rs. YYYYYY/-= Total Rs. ZZZZZ/- Cost of material. The installation charges applicable respectively may also be specified.
- 10.5 Any delay which is attributable to the contractor is liable for penalty @ ½ % per week (max. 5%) to be imposed on the contractor.
- 10.6 In case of delay in work completion, vendor may send request letter to concerned authority for extension in work completion period with proper justification for delay in work. Concerned authority may or may not give extension with or without penalty depending on the justification for delay.
- 10.7 Income tax @2% will be deducted from the Vendors bill.
- 10.8 Contractor may furnish their PAN no. & copy of GST Registration Certificate.
- 10.9 100% payment will be arranged after satisfactory completion of work at AFD and on submission of:
- a) Bills in triplicate b) Advanced stamped receipt c) Delivery Challan, d) Guarantee Certificate
- 10.10 Min. two workers & a supervisor shall be present at site during the work. During erection & commissioning of the furnace. The supervisor shall be experienced enough for safety (fire & personal) to oversee the site activities.
- 10.11 The upkeep of area is the responsibility of contractor. Any unwanted or extra materials shall be kept at designated area which will be shown by departmental supervisor. For elevated jobs proper Safety Belts shall be used by all workers.
- 10.12 Contractor shall obtain police verification certificate (PVC) for all his employees including his supervisors and workers engaged in the work.



10.13 Vendor shall obtain Medical Fitness certificates for all his workers involved in this work.

## 11. Confidentiality clause

11.1 No party shall disclose any information to any third party concerning the matters under this contract generally. In particular, any conformation identified as "Proprietary" in nature by the disclosing party shall be kept strictly confidentiality by the receiving party and shall not be disclosed to any third party without the prior written consent of the original disclosing party. This clause shall apply to the sub-contractors, consultants, advisers or the employees engaged by a party with equal force.

11.2 "Restricted information" categories under Section 18 of the Atomic Energy Act 1962 and "Official Secrets" under Section 5 of the Official Secrets Act 1923. :-

11.3 Any contravention of the above-mentioned provisions by any contractor, sub-contractor, consultant adviser or the employees of a contractor will invite penal consequences under the aforesaid legislation

11.4 Prohibition against use of BARC's name without permission for publicity purposes. :-The contractor of sub-contractor, consultant, adviser or the employees engaged by the contractor shall not use BARC's name for any publicity purpose through any public media like Press, T.V. or Internet without the prior written approval of BARC.

## 12. Site Visit

12.1 The contractor shall have to visit the site to comprehend the scope of work. The same will be arranged by the undersigned. The site can be visited from 04/12/2018 to 05/12/2018 between 10.00 hrs to 14.00 hrs on working days only. However, for site visit, prior intimation of at least two working days is necessary for arranging the entry permits.

**12.2 Vendors must have the previous experience in Design of Pumping Systems, Process Piping and Material Handling Systems along with the quality assurance plan. The vendor shall have to provide documentary evidence for the same while requesting for the site visit. The quotations submitted without site visit and documentary evidences of relevant experience shall not be considered under any circumstances.**

12.3 Contractor shall have to carry valid Photo identity card (Driving license, passport, Aadhaar card) while visiting this premises. Failing to bring valid identity cards, vendors will not get access into our premises. Further, entry permits will not be arranged for next dates if vendors unable to visit the site on permitted dates for any reasons. Contractor should not carry any type of electronic items such as mobile, pen drive, camera etc with him/her at the time of visit.

12.4 For preparing entry permit, you can contact the undersigned on ph. No. 25594927 or can mail to [hsharma@barc.gov.in](mailto:hsharma@barc.gov.in) giving complete details of Firm, name of

visitors, occupation/designation, identity proof, PVC details, probable date of visit etc.

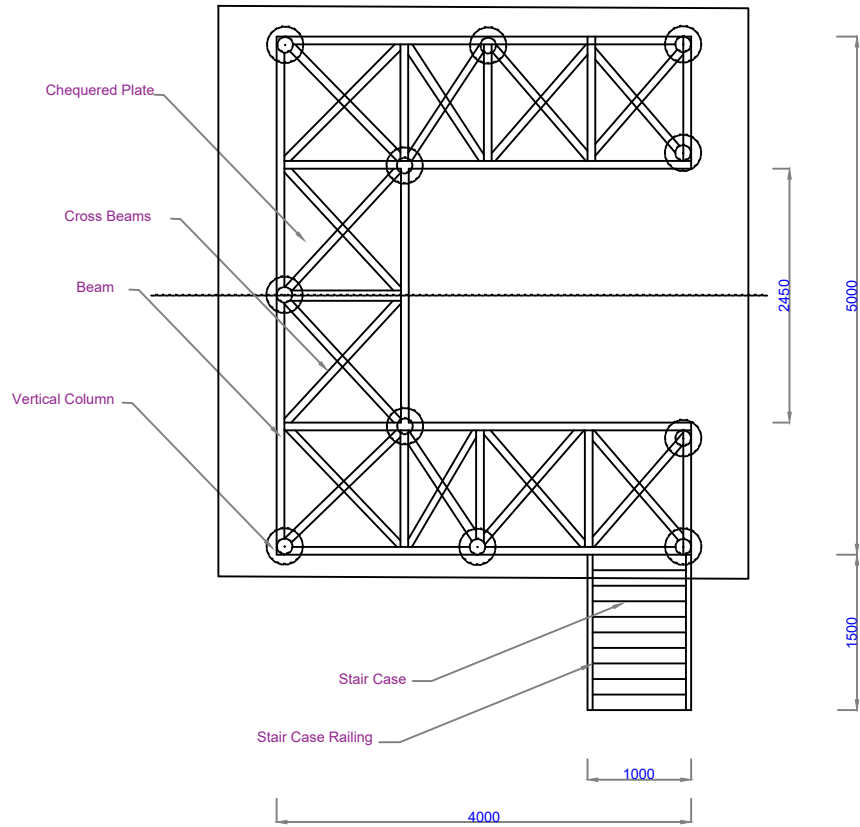
13. Quotations are to be in printed letter head / quotation format which should consists of sales tax registration number registered with local ST authority / CST authority, PAN of the firm, service tax registration number etc. Quotations that are received in computer generated form will be considered as invalid & rejected.
14. Sealed quotations must be forwarded by Registered Post or Speed Post ONLY. Quotations forwarded through any other routes will not be considered.
15. Sealed quotations should be super scribed on the envelope with the reference number of this letter, and should be addressed to and reached by 10/12/2018 (16.00 hrs) to:

**Shri Hariom Sharma**  
TO/D, Technical Services Section,  
Atomic Fuels Division  
Bhabha Atomic Research Centre,  
Trombay, Mumbai-400085

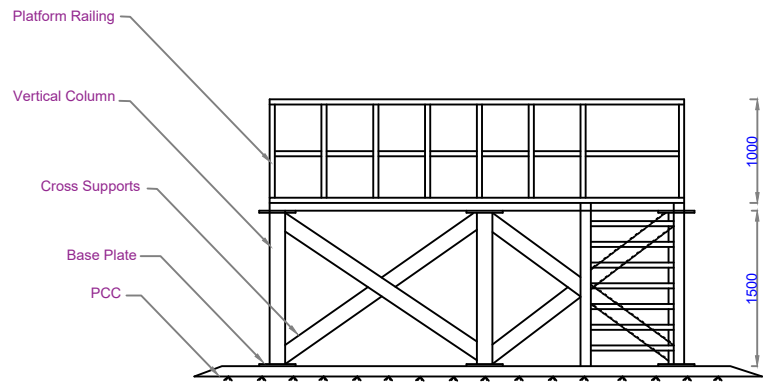
**(Hariom Sharma)**  
TO/D, TSS, AFD

**(Surendra Kumar)**  
SO/H, TSS, AFD  
(for & on behalf of The President of India)

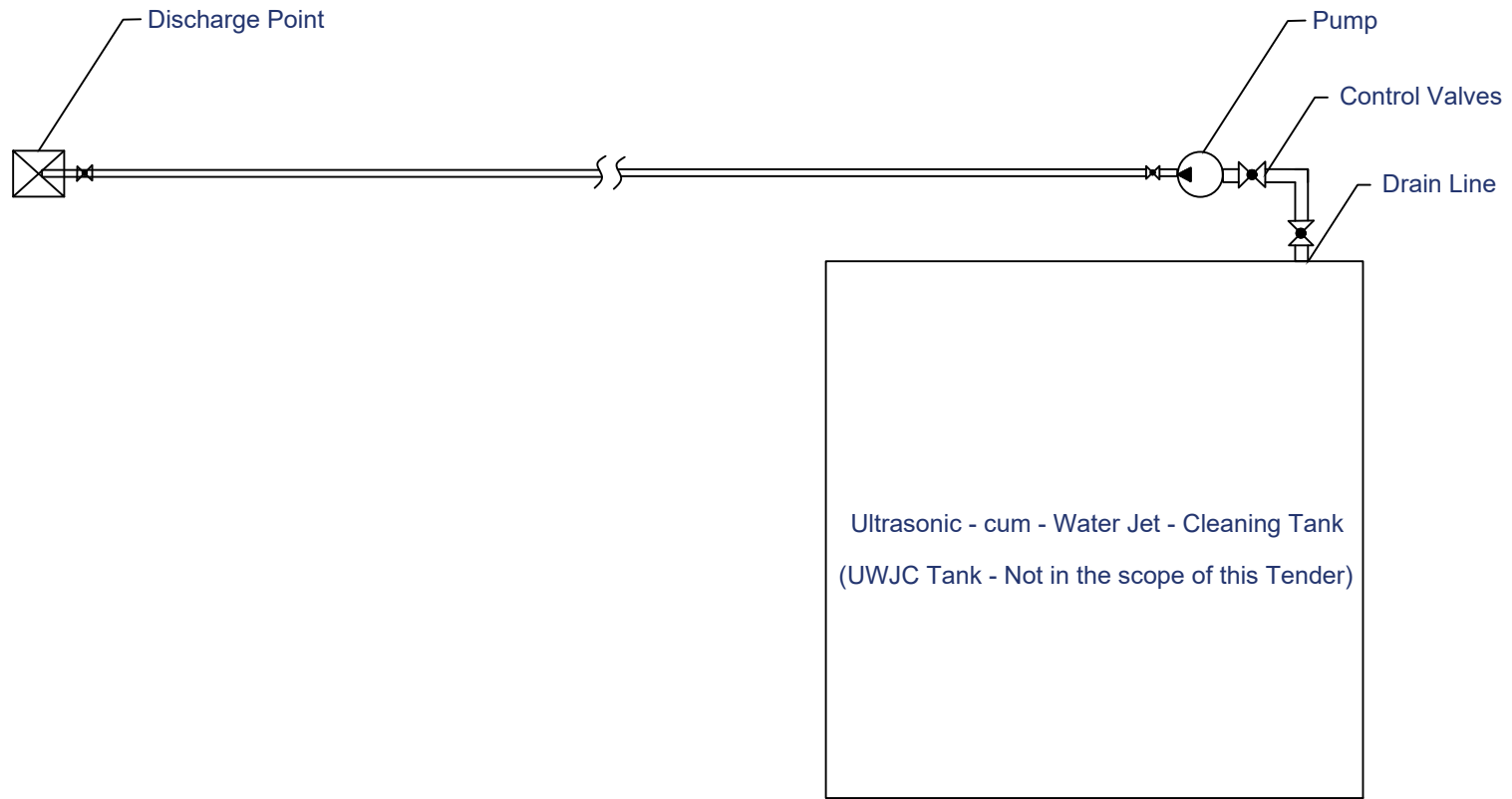
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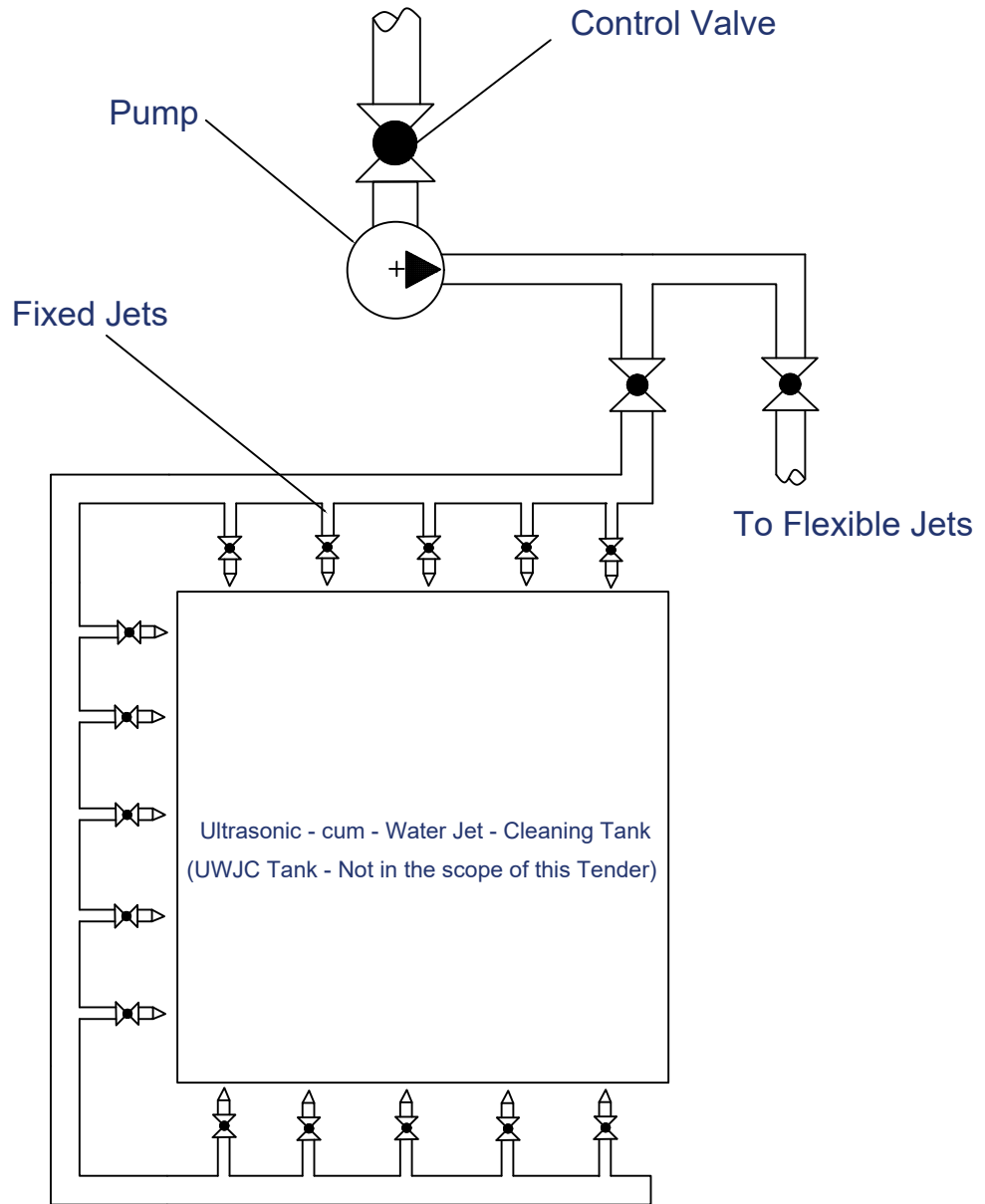
Bill of Materials			
S No	Item	Qty	Specifications
12			
11			
10	PCC Floor	1 No.	Cement Concrete
9	Base Plate	As per Drwg.	Mild Steel
8	Cross Supports		ISMC150, Mild Steel
7	Platform Railings	70 m	SS 304 40NB x 3mm Thk
6	Stair case Railings	10 m	SS 304 40NB x 3mm Thk
5	Stair Case	1 No.	Mild Steel
4	Chequered Plate		SS 304, 3mm Thick
3	Cross Beams	As per Drwg.	Mild Steel
2	Beams		Mild Steel
1	Vertical Columns		Mild Steel Standard Pipe



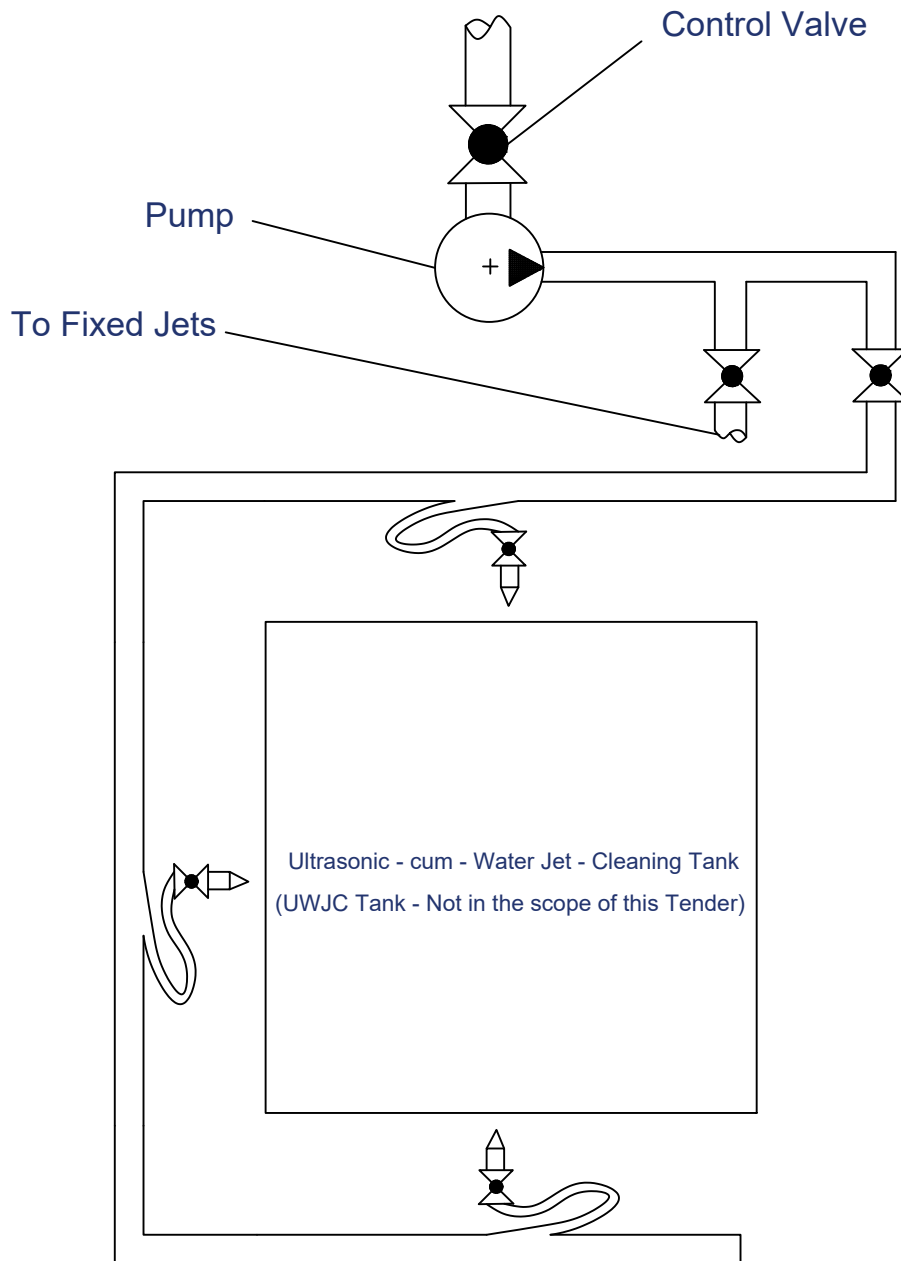
Working Platform (Schematic drawing No. 1)



Water Drainage System (Schematic drwg No. 2)



Fixed Water Jets (Schematic drwg No. 3)



Flexible Water Jets (Schematic drwg No. 4)