



Engineering College, Ajmer,
N.H.8 , Barliya Circle, Near Nareli Temple, Ajmer

ECA/TEQIP-III/2020/46 PURCHASE ORDER

Package Code: TEQIP-III/2019/RJ/GECA/113

Current Date: 12-Mar-2020

Package Name: GECA/TEQIP-III /2018-19/Civil-Fluid Mechanics
and Hydraulics & Hydraulic Machines Lab

Method: Shopping Goods

PO Reference No : TEQIP-III/2019/RJ/geca/113

Date of Issue: 12-Mar-2020

Subject : GECA/TEQIP-III /2018-19/Civil-Fluid Mechanics and Hydraulics &
Hydraulic Machines Lab

Purchaser : Engineering College, Ajmer, N.H.8 , Barliya Circle, Near Nareli Temple,
Ajmer

Supplier Name: M/s Mass International
Plot No. 459, Phase I, sector 2, IGC,
HSI IDC, SAHA, Ambala-133104 (Haryana)


With reference to our correspondence, Engineering College, Ajmer, N.H.8 , BARLIYA CIRCLE, NEAR NARELI TEMPLE, AJMER, is pleased to award this detailed Purchase Order to for supply of items as per the details given below at a total cost (Contract Value) of **Rs. 1113613.20(In Words: Eleven Lakhs Thirteen Thousands Six Hundred Thirteen And Paise Twenty Only)**

S. N.	Item Name	Qty.	Place of Delivery	Installation Requirement
1	Equipment For Determine The Viscosity of A Given Fluid (Falling Ball Viscometer)	1	Engg. College, Ajmer N.H. 8, Barliya Circle, Near Nareli Temple, Ajmer	Onsite installation and testing & commissioning required.
2	Various Pressure Measuring Devices	1		
3	Equipment For Determination Of Minor Losses	1		
4	Equipment For Determination C_d for Broad Crested Weir	1		
5	Verification Of The Momentum Equation Apparatus	1		
6	Tilting Bed Open Channel Flow (To determine Manning's & Chezy's coefficient of roughness for the bed of a given channel. To study and plot characteristics curve of hydraulic jump. To study velocity distribution in open channel flow.)	1		
7	Centrifugal Pump Test Rig with variable speed	1		
8	Francis Turbine Test Rig	1		
9	0.5 inch nozzles valves standard make	2		
10	1 inch nozzles valves standard make	2		
11	0.5HP Motor pump (Kirloskar /Crompton/ Texamo / Havells)	1		
12	0.5 Inch gardening PVC pipes (100 feet length)	1		
13	1 Inch gardening PVC pipes (100 feet length)	1		



(Handwritten signatures)

Total price (without taxes) : Rs. 943740
Total applicable taxes : Rs. 169873.20
Total price (with taxes) : Rs. 1113613.20
Total Octroi & Other Charges : Rs. 0
Delivery : Engineering College, Ajmer, N.H.8 , Barliya Circle, Near Nareli Temple, Ajmer
Testing/Installation Clause (if any): On site installation and testing & commissioning required. Price must be included in quotation.
Training Clause (if any) : Yes
Technical Specifications : As per Annexure - 1
Delivery Period : 45 days or as early possible
Warranty (In Months): 36 Months from the date of successful acceptance of items.
Liquidated Damages : Liquidated Damages will be charged at the rate of 0.66% per day, L.D. Max. 10% on pre tax billing amount if delivery period exceeds 45 days. Purchase Order shall be understood cancelled automatically without any prior notification if delivery period exceeds 60 days
Performance Security : Performance security amount Rs 47187/- at the rate of (5 %) of the Total contract value to be submitted in form of Bank guarantee of any Nationalized. Bank only within 21 day from the date of issue of PO Bank valid upto 39 months, within 21 day from the date of issue of PO including acceptance of P.O.
Payment Terms : Below are the payment terms-
Satisfactory Delivery & Installation - 90% of total cost
Satisfactory Acceptance - 10% of total cost
Invoice Generation: The invoice has to be generated against GST No. **08AABAP0959P1ZZ** of Govt. Engineering College, Ajmer

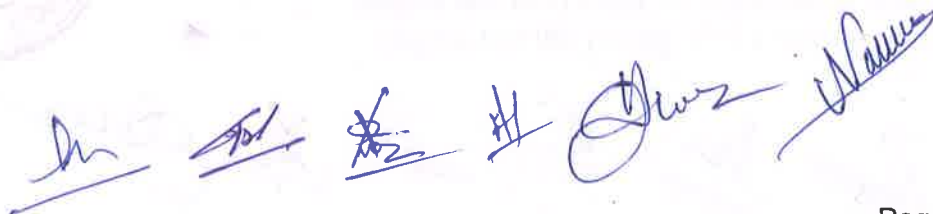

Dr. U. S. Modani
Principal
Govt. Engineering College,
AJMER



Accepted by Signature:

Date:

Address:



Annexure I

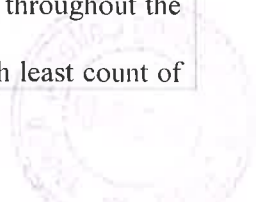
S. N.	Item Name	Specifications
1	Equipment For Determine The Viscosity Of A Given Fluid (Falling Ball Viscometer)	<ul style="list-style-type: none"> ➤ Single columns: ID 75 mm Material- Borosilicate Glass Length- 1200mm. ➤ Gate Valves: 2 Nos for each column ➤ Stop Watch: Electronic. ➤ Steel balls: Two of different size 10Nos ➤ Plastic balls: Two of different density 10Nos ➤ Tube light arrangement: For visualization. ➤ Fluid should be provided. ➤ Minimum overall dimension-20" x 20"
2	Various Pressure Measuring Devices	<ul style="list-style-type: none"> ➤ Pressure measurement devices: -Single column manometer -U tube type manometer -Inclined tube type manometer -Pressure gauge ➤ Pipe line : ½ inch Pipe material- GI For fitting the manometers ➤ Orifice: Dia ≈ 10 mm To create the pressure difference. Made of brass 2mm thickness ➤ Water Circulation: ½ HP Pump (KIRLOSKAR/TEXAMO/CRI/CROMPTON GREAVES/ HAVELLS) ➤ Sump Tank: Capacity 70 Ltrs. of 1.2mm thick of stainless steel sheet 304 grade. ➤ Minimum overall dimension-72" x 20"
3	Equipment For Determination Of Minor Losses	<ul style="list-style-type: none"> ➤ Test sections: ➤ Made of stainless steel ➤ Sudden Enlargement-From 15 mm to 25 mm, Sudden contraction- From 25 mm to 15 mm, Bend 1/2", Elbow 1/2", Ball valve 1/2", Gate valve 1/2" ➤ Water Circulation: ½ HP Pump (KIRLOSKAR/TEXAMO/CRI/CROMPTON GREAVES/ HAVELLS) ➤ Flow Measurement: Using Measuring Tank with Piezometer, Capacity 25 Ltrs. 1.2mm thick of stainless steel 304 Grade. ➤ Sump Tank: Capacity 50 Ltrs. of 1.2mm thick of stainless steel 304 Grade. ➤ Pressure Measurement: Inverted U tube Manometer (No mercury needed). ➤ Minimum overall dimension-75" x 20"
4	Equipment For Determination Cd for Broad Crested Weir	<ul style="list-style-type: none"> ➤ Channel test section: Size 600 x 250 x 180 mm of stainless steel 304 grade. ➤ Types of weir/notches: 3 Broad Crested Weir (3 mm brass plate) 45° V Notch (3 mm brass plate) 60° V Notch 3 mm brass plate) ➤ Digital pointer gauge: With least count 0.1mm for measuring the height of fluid over the notch in flow channel ➤ Water Circulation: ½ HP Pump (KIRLOSKAR/TEXAMO/CRI/CROMPTON GREAVES/ HAVELLS) ➤ Flow Measurement: Using Measuring Tank with Piezometer,



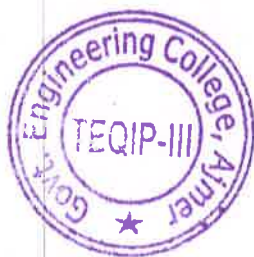
5	Verification Of The Momentum Equation Apparatus	<p>Capacity 25 Ltrs. 1.2mm thick of SS sheet 304 grade.</p> <ul style="list-style-type: none"> ➤ Sump Tank: Capacity 50 Ltrs. of 1.2mm thick of SS sheet 304 grade. ➤ Stop watch: Electronic ➤ Minimum overall dimension-44" x 18" ➤ Test section: Fitted with a brass nozzle & acrylic jet enclosure. ➤ Four trargets: 90° Flat Plate, 180° Hemispherical Cup, 45°/135° oblique surface & 135° conical surface ➤ Water Circulation: ½ HP Pump (KIRLOSKAR/TEXAMO/CRI/CROMPTON GREAVES/HAVELLS) ➤ Flow Measurement: Using Measuring Tank with Piezometer, Capacity 25 Ltrs. 1.2mm thick of SS sheet 304 grade. ➤ Sump Tank: Capacity 50 Ltrs. of 1.2mm thick of SS sheet 304 Grade. ➤ Stop watch: Electronic ➤ Dead weights made of stainless steel 304 (50gms, 100gms, 200gms, 300gms, 500gms and 1000gms) each one should be provided with set-up. ➤ Minimum overall dimension-45" x 18"
6	Tilting Bed Open Channel Flow (To determine Mannings's & Chezy's coefficient of roughness for the bed of a given channel. To study and plot characteristics curve of hydraulic jump. To study velocity distribution in open channel flow.)	<ul style="list-style-type: none"> ➤ Flume dimensions: Test Section 8 m, Overall length 10 m, Depth of the flume: 0.35 m, Width of the flume: 0.20 m, Height of the flume bed from the ground: 1.5 m ➤ Tilting should be done by screw jack. ➤ Flume Material: <ul style="list-style-type: none"> (i) Inlet and outlet section made from 2 mm thick SS 304 Grade sheet. (ii) Flume bed material should be made from 6 mm thick SS sheet 304 grade. (iii) All storage tanks/sump tanks should be made from 2 mm thick SS sheet 304 grade with sufficient stiffener support. (iv) Inlet and outlet of the flume should be from the bottom of the flume ➤ Flume stand material: Heavy duty rectangular steel hollow section Grade YST 310 as per IS 4923 painted with corrosion resistant with industrial PU Paint. ➤ Test Section: Minimum 8 m long having transparent 10 mm thick Toughened Glass on either side of flume. ➤ Pump Type: 5 HP having max. 1440 RPM and heavy duty Industrial AC drive compatible with the pump to be provided. Kirloskar/Crompton/Texamo/Havells make pump should be connected with the sump and should be able to provide discharge to the flume. ➤ Pipes: Corrosion resistant Stainless steel grade 304/engineering plastic material. ➤ Perforated plates, one horizontal and one vertical at the inlet made SS 304 Grade to be provided. ➤ Sliding Tail gate made of SS 304 (thickness 3 mm sheet) at the outlet at the flume. ➤ Venturimeter with manometer should be provided for discharge measurement at the delivery pipes. ➤ There should be SS 304 grade rail throughout the top of the flume. ➤ Three carriages should be provided which can move throughout the length of the flume from inlet to sliding tailgate. ➤ The carriages should have Digital Height Gauge with least count of



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7	Centrifugal Pump Test Rig with variable speed	<p>0.1 mm.</p> <ul style="list-style-type: none"> ➤ Drainage valves: 2 numbers, one at the bottom of the inlet section and another at the bottom of the delivery pipe. These two to be fitted in a short drainage pipe and connected to the systems. ➤ Detailed drawings, design and simulation to be provided for validation of strength of the flume for full load condition along with tender submission without which the bid will be rejected. ➤ Maximum deflection of the bed should be within 3 mm. Simulation details and files should be provided along with the bid otherwise the bid will be rejected, Side wall deflection should be maximum 2 mm. ➤ The following Accessory should be provided along with the set up:-, Pitot tube with single column manometer and Roughened bed Minimum 2 types. ➤ Minimum overall dimension-38feet x 5feet ➤ Centrifugal pump: Kirloskar/Crompton/Texamo/Havells, Capacity 1 HP, Speed 2800 RPM (max.), Head 12 m (max.) should be coupled with an AC Motor with The resistor controlled AC drives for variable speed. ➤ RPM and power should be measured by RPM Indicator with Proximity sensor and electronic energy meter respectively. ➤ RPM of the Pump should be displayed with the help of RPM sensor having resolution of 0.0001428 & least count 0.00857 RPM. ➤ Water circulation: From sump tank, 1.2 mm thick, Capacity 110 liters, made of stainless steel 304 Grade ➤ Flow measurement should be done by measuring tank, 1.2 mm thick, made of stainless steel 304 Grade, Capacity 70 liters, with piezometer tube and electronic stop watch. ➤ Pressure measurement: Bourdon type Pressure Gauge ➤ Control panel should be comprises of Mains Indicator and MCB for overload protection. ➤ Operating/instruction manual and sample calculations with graphs of Head v/s Discharge, Pump efficiency v/s Discharge. ➤ Minimum overall dimension-90" x 18"
8	Francis Turbine Test Rig	<ul style="list-style-type: none"> ➤ Francis turbine: Output 1kW, Discharge 1000 LPM, speed 2200rpm and supply head 15m fitted with runner made of CNC Machined brass. Rope break drum type Dynamometer, Dia 200mm should be provided. ➤ Water Circulation by centrifugal pump: 7.5 HP, 3 Phase Kirloskar/Crompton/Texamo/Havells, ➤ Sump tank: 200 liters capacity and draft tube should be made of Stainless steel. ➤ Venturuy meter with Differential Pressure manometer should be provided for discharge measurement. ➤ Minimum Efficiency Of the turbine should be at least 55%. ➤ For Technical Evaluation Detailed drawings, Technical Manual, Sample calculations ➤ Characteristics Curves <ul style="list-style-type: none"> a) Unit Speed Vs Unit Discharge, b) Unit Power Vs Unit Speed, c) Unit Speed Vs Overall Efficiency, ➤ Operating Curves <ul style="list-style-type: none"> a) Discharge Vs Output power, b) Discharge Vs overall Efficiency, c) Muscle Curve:- Efficiency Vs RPM of Francis turbine to be provided with Tender documents.



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		<ul style="list-style-type: none"> ➤ Control Panel Compromising off Digital Rpm Indicator with Proximity sensor, MCB for overload protection, Mains indicator and phase prevention relay for safety. ➤ Should be future ready to delivers us the Data logging facility in equipment. ➤ Minimum overall dimension-68" x 30"
9	0.5 inch nozzles	0.5 inch nozzles valves standard make
10	1 inch nozzles	1 inch nozzles valves standard make
11	0.5HP Motor pump	0.5HP Motor pump (Kirloskar/Crompton/Texamo/Havells)
12	0.5 Inch gardening PVC pipes	<ul style="list-style-type: none"> ➤ 0.5 Inch gardening PVC pipes (100 feet length) standard make
13	1 Inch gardening PVC pipes	1 Inch gardening PVC pipes (100 feet length) standard make
	General Technical Terms and Conditions	<ul style="list-style-type: none"> • All the Valves required in equipments should be manufactured as per EN ISO 9001 Standard and 100% tested in accordance with EN 12266-1 standard. • The whole set-up should be well designed and arranged on a rigid structure made of MS square pipe 32 mm × 32 mm × 2 mm thickness and painted with industrial polyurethane (PU) Paint. • All other materials in contact with water should be corrosion resistant. • The name plate of each experiment setup should be provided. • All water pipes, tanks and related fittings of each equipment should be made of Stainless Steel - 304 Grade • All the Equipment have to be demonstrated at college site, results should be repeatable within ±2% of the sample calculations provided and standards. • Equipment should be upgradable for Data Logging Facility in future. • Operating/instruction manual and sample calculations, Photographs and line diagram of the equipment must be provided along with bid documents for the technical evaluation. • All the products quoted should have CE Certification.








Annexure 2 (Purchase Order)

PERFORMANCE SECURITY FORM

To: _____ (Name of Purchaser)

WHERE AS (Name of Supplier)
hereinafter called "the Supplier" has undertaken , in pursuance of Contract (Notification of Award) No..... dated,..... 2019 to supply.....
.....(Description of Goods and Services) hereinafter called "the Contract".

AND WHEREAS it has been stipulated by you in the said Contract that the Supplier shall furnish you with a Bank Guarantee by a Nationalized bank for the sum specified therein as security for compliance with the Supplier's performance obligations in accordance with the Contract.

AND WHEREAS we have agreed to give the Supplier a Guarantee:

THEREFORE WE hereby affirm that we are Guarantors and responsible to you, on behalf of the Supplier, up to a total of (Amount of the Guarantee in Words and Figures) and we undertake to pay you, upon your first written demand declaring the Supplier to be in default under the Contract and without cavil or argument, any sum or sums within the limit of (Amount of Guarantee) as aforesaid, without your needing to prove or to show grounds or reasons for your demand or the sum specified therein.

This guarantee is valid until theday of.....2019.

Signature and Seal of Guarantors

Date.....2019.

Address:.....
.....
.....

Note: *The Bank Guarantee to be issued by nationalized bank only and is to be submitted on a non-judicial stamp paper of Rs. 100/- (One Hundred only). The non-judicial stamp paper should be purchased in the name of issuing bankers. The Issuing bank must provide its Head Office/Regional office addresses of communication*



