

## Clarification of Technical Queries

<b>Concrete Lab</b>	
<b>Query</b>	<b>Clarification</b>
Tensile strength loading frame is 50kN and 25kN for compression and tensile capacity respectively. Why strain-controlled loading cell is 10kN+Calibration process?	If we increase the capacity of Load cell than least count may increase so it is preferable to use same capacity load cell of 10 KN. Secondly for stable frame, frame capacity should be double or more the capacity of Load cell. So, specs should be as it is.
Curing Tank zinc coating- it was suggested to replace zin coated with stainless steel.	Stainless steel is better. Zinc can be changed to stainless steel.
Balance (Capacity: 800 / 5500 g, sensitivity: 0.01 / 0.1 g,) the capacity and resolution are not compatible	It is Dual Capacity Balance, for 800gm least count is 0.01 and for 5500gm least count is 0.1gm. So, specs should be as it is.
Sieve shaker: Noise reduction cabinet, lined internally with sound-proofing material for noise reduction in compliance with CE directive. It was pointed that maybe there is no need of sound proofing?	Sieve shakers for concrete lab need Soundproof cabinet as shaker vibrating intensity is high for sieving coarse material, coarse material sieving is noisy so specs should be as it is.
UTM-V-JAWS: V-jaws for round samples 16-91mm. It was suggested to add 10mm as lower dimension.	Add 10mm as lower dimension.
UTM: Special clamping device for samples up to Ø 60 mm or 60 x 60 mm. (This requires clarification- what does it mean?)	With the help of this Clamping device the sample holding capacity of Extensometer is increase by Día 60mm or 60x60mm. Last 8 Lines of Tender specifications are of Extensometer.
Compression machine capacity	Capacity: 3000 kN.
<b>Soil mechanics &amp; Highway Engineering Lab</b>	
<b>Query</b>	<b>Clarification</b>
Hydrometer method: Cooling coil-require chiller or not. please clarify the cooling coil	Means Heater has cooling coil capability as well, with this cooling coil you will attach chiller for testing below ambient temperature. Chiller is already coming with item no. 22 penetrometer in same lab. Same chiller can be used with item no. 5. So, specs should be as it is.
Solution balance: Capacity: 20 Kg, accuracy: 0.1 g. Why it is manual? Also, the resolution and capacity issue?	Correct resolution is 1gm instead of 0.1gm. Balance is Manual because it is rugged and suitable for field use as well. Digital balance is not suitable for field use.
Unconfined compression machine hand operated: 50 kN capacity, load ring 2 kN capacity (The 2kN load ring is very less, it is suggested to provide a reasonable loading load cell.)	2KN or Low capacity proving ring is suitable for unconfined testing, as samples need very low force. Low capacity proving has better least count.
Unconfined compression machine hand operated: dial gauge 10 x 0.01 mm. This dial gauge must be corrected to the sample size ..they suggested 20mm or maybe 40mm	10mm Dial gauge is also OK. So, specs should be as it is.

Miscellaneous Tools-Soil Lab: digital thermometer, -40 to +550C ( check the temp range, also they said to include the thermocouple)	Temp range is ok. It should have a stainless-steel probe of length 125mm or above, suitable for temperature measurement of granular material.
CBR TESTING MACHINE ( Why it has 8 channels, can 2 channel work, if not state a reason.)	8 channels will allow to upgrade the system in future for unconfined, marshal, split tensile and other testings. So, specs should be as it is.
<b>Public Health Engineering</b>	
<b>Query</b>	<b>Clarification</b>
BOD-Measurement-System (Incubator??)	So, if one use cool incubator at item no. 14 it will use it for BOD apparatus as well
Oven ; suggested to change 300 degree to 250 degree	Required Temp range for different tests in civil engineering is from ambient to Max 100C. Keeping in view double factor of safety 200C oven temperature is also OK.
Incubator Temperature +70°C, Capacity: 53L, Power supply 230V 50/60HZ A.C. (Starting temperature of incubator)	It should be cool incubator to accommodate BOD apparatus, 2nd simple incubator is already mentioned in item no. 9. Renowned manufacturers have lower temperature range is from -10C.
The types of tests in the item “VIS spectral photometer with RFID* technology” need to be mentioned (clarification of the Expert is required).	It measures the chemical contaminations in water / ions / chemical analysis of liquids.
Name of misc. chemicals	Annexure A
<b>Hydraulics lab</b>	
<b>Query</b>	<b>Clarification</b>
MULTI PURPOSE FLOW CHANNEL (Version 12.5 m) Working section (height / width): 300 / 80 mm. The height was suggested to be 400mm by Client.	Revised Specs: Annexure B  The cost estimate for revised specs=15 million PKR

## Annexure A

### List of chemicals

1	Bromocresol green	25 g
2	Metyl Orange	75 g
3	Methyl red	75 g
4	Silver Nitrate	75 g
5	Erichrome Black T Indicator	100 g
6	Silver Sulphate	100 g
7	Sodium Azide	200 g
8	Potassium Iodide	300 g
9	Phenolphthaline Indicator	300 g
10	Potassium Chromate	500 g
11	Murcury Sulphate	500 g
12	Hexamethylene Tetramine	500 g
13	Hydrazine Sulphate	500 g
14	Potassium Iodide	500 g
15	Di Potassium Hydrogen Phosphate	500 g
16	Di sodium Hydrogen Phosphate	500 g
17	Ammonium Purpurate	500 g
18	Sodium Chloride	2 kg
19	Ammonium Chloride	1 kg
20	Brium Chloride	1 kg
21	Sodium Hydrooxide	1 kg
22	Sodium Sulphate	1 kg
23	Sodium Thiosulphate(0.025 N)	1 kg
24	Potassium dichromate	1 kg
25	Disodium Salt of EDTA	1 kg
26	Ferrous Amonium Sulphate	1 kg
27	Calcium Chaloride	1 kg
28	Ferric Chloride	1 kg
29	Potassium Hydrooxide	1 kg
30	Magnisium Sulphate	2 kg
31	Potassium Hydrooxide	2 kg
32	Potassium Chloride	2 kg
33	Manganous Sulphate mono hydrate	5 kg
34	Alkaline iodide-azide Solution	200 ml
35	Ferrion Indicator	500 ml
36	Acetic Acid(Glacial)	1 ltr
37	Buffers Solution of pH 4.01	1 ltr

38	Buffers Solution pH 7.0	1 ltr
39	Buffers Solution pH 9.2	1 ltr
40	Glycerol	1 ltr
41	EDTA(Ethylenediamin Acid)	2 ltr
42	Mixed Indicator	2 ltr
43	Concentrated Sulfuric Acid(1:1)	2 ltr
44	Ethyle Alcohol	2.5 ltr
45	Sulphuric Acid 0.02 N	2.5 ltr
46	Concentrated Hydrochloric Acid	2.5 ltr
47	Ammonium Hydroxide	2.5 ltr
48	Starch Indicator Solution	5 ltr
49	Organic Free Water	
50	Distilled water	
51	Distilled Turbidity free water	

## **Annexure B**

### **Tilting Flow Channel / Multi-Purpose Flow Channel**

Flume dimensions: 300 mm wide, 450 mm high.

Flume length: 12.5 m.

Tilting adjustment: -1% to +3%.

Side walls: tempered glass.

Channel bed: stainless steel.

Head tank: stainless steel.

Storage tank: fiber glass storage tank is provided at downstream end of the channel. Storage tank has adequate water to fill the full channel.

Sluice gate: stainless steel, rack and pinion type, built-in at downstream end of flume.

Circulating pump: 5.5 kW with a maximum flow rate approximately 1800 lpm.

Flow measurement: flow digital display.

Power supply: 380V, 3Ph, 50Hz.

Stainless steel hook and point gauge 450 mm x 0.05 mm reading.

Basic weir plate with v-notch and rectangular notch weir attachment.

Sharp crested weir.

Broad crested weir, sharp edges.

Crump weir.

Trapezoidal weir.

Bridge pier, round or square.

Vibration pile.

Roughened bed, gravel, sand or corrugated.

### **Additional Accessories:**

Wave generator with variable speed geared motor

Absorbing beach, plain, roughened, or permeable

Syphon spillway made from clear acrylic and PVC

USBR type 2, 3 or 4 energy dissipater

Radial gate, rack and pinion drive with stainless steel attachment

**Clarification of Administrative queries**

- Page No.09, S.No.01 the mentioned term FOB may be considered as FOR.
- Page. No.10, In formula multiplying factor is 30. Formula is as under:-

$$40 - \left( \frac{r_i - R}{r_i} \right) \times 30$$