ANNEXURE- A

DETAILS OF TESTING CHARGES & QUANTITY OF SAMPLE REQUIREMENT FOR TESTING IN TWAD LAB

Sl No.	Name of material / tests to be conducted	Testing Charges	BIS No. (for Reference)	Quantity of Sample Requirement for testing in TWAD LAB
1	**Steel** (Name of test: Unit weight, Proof stress, Tensile strength and % of elongation)	**Rs. 1,400**	**BIS 1786:1985**	**Qty- 3 Nos. Steel rod of 1.00 m length for each size (straight, true to axis)** a) Brand Name b) Size and c) ISI Mark valid CML No. d)Type and Grade **Fe415 & Fe 500** should be clearly visible on the sample. e)The sample should be wrapped by Brown tape and should be authenticated with Name of Scheme/ ISI CML No by the sample collecting Officer using permanent marker.
2	**Cement** ((Name of test: Initial and Final setting time, Fineness, 3rd & 7th day compressive strength)	**Rs. 3,600**	**OPC 43Gr. BIS 8112:1991** **OPC53Gr. BIS 12269:1991**	**Qty- One sealed (50 Kg) full bag (OPC 43 Gr / 53 Gr) with following detail clearly printed on the bag** - a) Manufacturer's name and Trade mark b) Nature of cement/Grade c) BIS Certificate mark and CML No. d) Batch No **:** Week(within current three weeks) / Month / Year (Clearly Visible & Legible) The sample collecting Officer should authenticate the sample over cement bag with permanent marker pen at site. The cement bag may be taken back from the laboratory after completion of test.
3	**Sand (Fine aggregate)**- ((Name of test: Sieve analysis, Grading and Specific gravity.	**Rs. 1000**	**BIS 383:1970**	**Sand Qty- about 1/2 Cement bag(15Kg)**- a) Name of work b) Date of collection / Place c) Signature on the bag for authentication with permanent marker.
4	**Coarse aggregate- 40 mm only**. ((Name of test: Sieve analysis and Specific gravity)	**Rs. 1000**	**BIS 383:1970**	**Coarse aggregate – 40mm Qty - about 15 kg** - a) Name of work b) Date of collection / Place c) Signature on the bag for authentication with permanent marker

Sl No.	Name of material / tests to be conducted	Testing Charges	BIS No. (for Reference)	Quantity of Sample Requirement for testing in TWAD LAB
5	**Coarse aggregate- 20 mm ,12.5mm and 10mm** ((Name of test: Sieve analysis, Specific gravity and Crushing value)	**Rs. 1,600**	**BIS 383:1970**	**Coarse aggregate- 20mm, 12.5mm and 10mm Qty - about 15 kg** - a) Name of work b) Date of collection / Place c) Signature on the bag for authentication with permanent marker
6	**Concrete cubes** ((Name of test: Compressive strength)	**Rs. 1000**	**BIS 456:2000**	**The Concrete cubes should have the following details marked by nail at the time of casting** (should not be engraved at later stage) - a) Date of casting b) Grade of mix c) Identification mark **(short form of component)** d) The well casted cubes have to be handed over well before the due date for 7 days / 28 days testing, the date of testing should be reckoned inclusive of date of casting as per BIS. The size of cube should be 15cm x 15cm x15cm. **At least minimum 3 cubes (1set) should be sent for each test.** **Qty -** For 1 to 5 cum vol of concrete - 1Set For 6 to 15 cum vol of concrete - 2Sets For 16 to 30 cum vol of concrete - 3Sets For 31 to 50 cum vol of concrete - 4Sets Signature on the cube by sampling officer with permanent marker pen for authentication .
7	**Hollow Blocks** ((Name of test: Compressive strength)	**Rs. 1200**	**BIS 2185:1983 (Part I) BIS 383:1970**	**Qty- Hollow blocks 3 Nos full size**. The sample should be wrapped by Brown tape and should be authenticated by sampling officer with permanent marker on it (For at least one block)
8	**Bricks** ((Name of test: Water absorption, Compressive strength and Efflorescence)	**Rs. 2,500**	**BIS 3495:1992 BIS 1077:1992**	**Qty- 15 Bricks with Brand name**. The sample should be wrapped by browntapeandshouldbe authenticated by sampling officer with permanent marker on it (for at least one brick).

Sl No.	Name of material / tests to be conducted	Testing Charges	BIS No. (for Reference)	Quantity of Sample Requirement for testing in TWAD LAB
9	**Paver Blocks** ((Name of test: Water absorption and Compressive strength)	**Rs. 1,900**	**BIS 15658:2006**	**Qty- 12 Paver blocks with Brand name**. The sample should be wrapped by Brown tape and should be authenticated by sampling officer with permanent marker on it (for at least one Paver block).
10	**Filter Media Sand** - ((Name of test: Acid solubility, % of impurities, Loss of Ignition, Effective size and Uniformity coefficient)	**Rs. 2,500**	**BIS 8419:1977**	**Qty- Filter Media Sand – about 15 kg**. a) Name of work b) Date of collection and Place c) Signature of the sampling officer on the bag for authentication with permanent marker.
11	**Filter Media Pebbles** - ((Name of test: Acid solubility, % of impurities, Effective size and Uniformity coefficient)	**Rs. 2,500**	**BIS 8419:1977**	**Filter Media Pebbles** **Up to 20 mm – Qty 15 kg.** **For 40 mm – Qty 20 kg** **Above 40 mm – Qty 50 kg** a) Name of work b) Date of collection and Place c) Signature of the sampling officer on the bag for authentication with permanent marker.
12	**Un plasticized Polyvinyl Chloride Pipes - PVC for Water Supply** ((Name of test: Short term Hydrostatic pressure test, Impact strength test at 0 deg Centigrade, Density, Reversion test at 150 deg centigrade, Dimensions and wall thickness)	**Rs. 3,300**	**BIS 4985:2000**	**a) Qty- PVC Pipe 3 nos of 1.50m length (out of 3, 1 no with socket, 2 No with spigot from different pipes of same batch No.).** The Make, ISI CML No. and Batch No., Size & class should be clearly legible and visible on pipes surface, third party test logo affix on socket pipe Name of the scheme, Field Engineer's, Sample collection officer and contractor's signature on all the **three pipes surface with permanent** marker pen. **b) Five samples of 5 cm length Taken from five different pipes of above same batch** with authentication of the collection officer in all the samples with Batch number (The samples may be cut in the spigot end of the pipe so that machine cutting end is visible at one end of the sample)

Sl No.	Name of material / tests to be conducted	Testing Charges	BIS No. (for Reference)	Quantity of Sample Requirement for testing in TWAD LAB
13	**Un plasticized Non - Pressure Polyvinyl Chloride - UPVC-U Pipes for UGSS** - ((Name of test: Short term Hydrostatic pressure test for pipe and joints, Impact strength test at 0 deg Centigrade, Reversion test at 150 deg centigrade, Vicat softening temp test, Dimensions and wall thickness)	**Rs. 3,300**	**BIS 15328/2003**	**Qty - PVC-U Pipes 3 nos of 1.50m length (without socket) and 3 nos of 0.60m length with socket**. The Make, ISI CML No. and Batch No., Size & Nominal Ring Stiffness should be clearly legible and visible on pipes surface, third party test logo affix on socket pipe Name of the scheme, Field Engineer's, Sample collection officer and contractor's signature on all the three pipes surface with permanent marker pen.
14	**AC Pipe upto 400 mm** ((Name of test: Hydraulic and Transverse crushing strength)	**Rs. 1,530**	**BIS 1592:1989**	**Qty- One full length of AC pipe with clearly visible brand name and batch number** . Two set of CID Joints with bolt and nuts, "O" Ring (six nos.), The sample collecting officer should authenticate the sample with permanent marker pen at site.
15	**Galvanized Iron - GI Pipe** **Upto 50 mm** ((Name of test: Dimensions, Unit weight, Bending test and Mass of Zinc coating) **65 mm and above** ((Name of test: Dimensions, Unit weight, Flattening test and Mass of Zinc coating)	**Rs. 3,200**	**BIS 1239/1992 (Part I)**	**a) GI Pipe Upto 50 mm One piece of 1.2m length.** **For 65 mm and above one piece of 1.2m length.** b) The Make with ISI CML No. Size & class Should be clearly legible and visible on the pipe surface. The sample collecting officers should authenticate all the samples with permanent marker pen at site. The straight pipe should be cut true to axis at least 30cm away from the threaded portion**.** c) Name of the scheme, Field Engineer's, Sample collection officer and contractor's signature on all the three pipes surface with permanent marker pen
16	**Stoneware – SW pipe** ((Name of test: Hydraulic test, Water absorption test, Acid and Alkali resistance test and Crushing strength test)	**Rs. 3,000**	**BIS 651/2007**	**Qty - Stoneware pipe 3 Full pipes with socket**. a) Make, Batch no & size with third party test logo affix should be clearly legible and visible on the pipe surface. b) The sample collecting officers should authenticate on all pipes with permanent marker pen at site. c) Name of the scheme, Field Engineer's, Sample collection officer and contractor's signature on all the three pipes surface with permanent marker pen. Any damage in transit will liable for rejection.

Sl No.	Name of material / tests to be conducted	Testing Charges	BIS No. (for Reference)	Quantity of Sample Requirement for testing in TWAD LAB
17	**M 30 Concrete Mix Design** -	**Rs. 17,000**	**BIS 10262/2009**	**Qty :** **Cement - 1 bag (OPC Grade)** **Sand - 4 bags** **Coarse Aggregate(12.5mm,20mm size) – 4 bags are required.** **For cement : One sealed(50 Kg full bag (OPC 43 / 53 Gr) with following detail clearly printed on the bag** - a) Manufacturer's name and Trade mark b) Nature of cement/Grade c) BIS Certificate mark and CML No. d) Batch No **:** Week(within current three weeks) / Month / Year (Clearly Visible & Legible) The sample collecting Officer should authenticate the sample over cement bag with permanent marker pen. For Sand and Coarse Aggregate a)Name of work b) Date of collection / Place c) Signature on the bag for authentication with permanent marker pen
18	**Ductile Iron - DI pipe for Water supply** ((Name of test: Hydraulic Test, Dimensional Property, Coating)	**Rs.7500/- (for 100mm to 300mm Dia.)** **Rs.10000/- (For 350mm to 600mm Dia.)**	**BIS 8329/2000**	**Qty - Ductile Iron(DI) One Full length** **Ductile Iron S/S. pipe in standard length and sample of minimum 1.5 m cut barrel pipe from spigot end of above same batch** . Make, CML No. & Batch No. with third party test logo affix should be clearly, legible and visible on the pipe surface. Name of the scheme, Field Engineer's, Sample collection officer and contractor's signature with permanent marker pen inside pipe over cement mortar lining.
19	**High Density Polyethylene-HDPE Pipe (PE100 grade) for Water supply** **(**(Name of test: Density, MFR, Carbon Black Content, Hydraulic Test, Dimensioning, Carbon Dispersion, Reversion Test)	**Rs. 14,000**	**BIS 4984/1995**	**Qty - HDPE Pipe(PE 100 grade) 3 Nos of 1.5m from standard length pipe**. The Make, ISI CML No. and Batch No., Size & class should be clearly legible and visible on pipes surface, third party test logo affix on socket pipe Name of the scheme, Field Engineer's, Sample collection officer and contractor's signature on all the three pipes surface with permanent marker pen.

Sl No.	Name of material / tests to be conducted	Testing Charges	BIS No. (for Reference)	Quantity of Sample Requirement for testing in TWAD LAB
20	**Double wall corrugated High Density Polyethylene- HDPE Pipe for UGSS** **(**(Name of test: Density, MFR, Carbon Black Content, Hydraulic Test, Dimensioning, Carbon Dispersion, Reversion Test)	**Rs. 14,000**	**BIS 16098/2 2013**	**Qty – DWC HDPE Pipe- 3 Nos of 1.5m from standard length pipe**. The Make, ISI CML No. and Batch No., Size & class should be clearly legible and visible on pipes surface, third party test logo affix on socket pipe Name of the scheme, Field Engineer's, Sample collection officer and contractor's signature on all the three pipes surface with permanent marker pen.
21	**Electrical Cable**	**As given below**	**BIS 10810/1984**	**Qty – Minimum 20 m length of cable to be collected.**
a	PVC Insulated Cables	Rs 8500 per sample for 1.5/2.5/4.0/ 6.0/ 10/16.00 sq.mm		
b	PVC Insulated (HD) Cables up to 1100 V	Rs 8500 for 4.00 sq.mm to 35.00 sq.mm Rs 10500 for 50 sq.mm to 150.00 sq.mm Rs 12000 for 185 sq.mm Rs 14000 for 240 sq.mm and Rs 18500 for 300 & 400 sq.mm		
c	PVC Insulated (HD) Cables 3.3 KV up to & Including 11 KV	Rs 12000 for 3 C 95 sq.mm, 3 C 70 sq.mm Rs 14000 for 3 C 120/150/185/ 240 sq.mm,		
d	XLPE Cable for voltages up to and including 1.1 KV	Rs. 12000/- upto 3 core for cables up to 95 sq.mm and Rs 2300/- for additional Core for cables above 95 sq.mm &up to 240 sq.mm.		

ANNEXURE- B

Upgraded version of Norms for Routine Sample Collection

a. CEMENT & STEEL

i) One set of sample have to be taken for each and every name work as per IMIS entry of IPP/RWS schemes. Single sample does not holds good for many number of works clubbed together in single agreement by package tender.

ii) One set of sample have to be taken for each and **every consignment** for CWSS of Rural / Urban/ Major Project/Stand alone.

iii) The validity of CML by BIS should be in alive for operative year of license.

b. ALL PVC - PIPES

U PVC Pipe for WS , U PVC-U Pipe for UGSS AND HDPE /MDPE / DWC PIPE

i) If a contractor uses the same batch No. for different works,

One set of sample have to be taken for each and every name of work as per IMIS entry of IPP/RWS Schemes. Single sample does not holds good for many number of works clubbed together in single agreement by package tender.

ii) For CWSS of Rural//Urban/Major Project/Stand alone schemes one set of sample for every one lot reckoned as 1000 Nos of pipes/lot (i.e.**6,000m**) of same batch/brand is required subject to the production of copy of purchase bill along with third party test certificate with test report in full shape should be produced compulsory.

iii) For more than 6,000 m, additional samples should be collected by inspection officers for every 6,000 m and as afore said documents should be attached.

iv) The validity of CML by BIS should be in alive for operative year of license.

c. GALVANIZED IRON (GI) PIPE

One set of sample for every batch / CML of 500m length for RWS schemes. Exemption may be allowed for below 100m length to be used for minor works.

For CWSS of Rural /Urban/ Major project additional sample **for every 500m** should be collected by sample collection officer. Third party test certificate should be annexed as like for PVC Pipe.

The validity of CML by BIS should be in alive for operative year of license.

d. STONE WARE PIPE(SW)

One set of sample have to be taken for same batch of 3000m length should be collected. Additional sample should be collected **for every 3000m** length of same batch/brand. The copy of purchase bill along with bucca third party test certificate with test report in full shape should be produced compulsory.

e. DUCTILE IRON PIPE (DI)

The validity of CML by BIS should be in alive for operative year of license. If the requirement of each and every size of DI pipe for a work as per the sanctioned estimate is less than 500 metres, there is no need to carry out the test in the Material Testing Laboratory after obtaining the pre delivery inspection certificate. If the requirement of each and every size of DI pipe for a work as per sanctioned estimate exceeds 500 metres, the following testing procedure should be followed: For every size one sample for each lot **(a lot of not more than 1000 numbers**) should be collected for testing.

f. Norms for Electrical cable:

- The third party certificates /Pre Delivery Inspection certificates should be verified.
- The validity of CML by BIS should be in live for operative year of licence.
- The sample should contain the following :
    1. Make
    2. Brand
    3. ISI,CML No
    4. Size & Core of cable
- For all types of cables , **one sample (20 m length) for cable of length above 200 m and up to 500m should be collected for sampling.**
- Additional samples 1 No each for cable for every 500 m length or part there off should be collected for sampling.
- Sampling need not be carried out if supply of cables of length will be 200 m or less than 200 m
- Suitable provision for length of cables required for testing based on the no of samples (1 No of sample contains 20m)to be collected should be included in the estimate itself.
- Testing of cable is being carried out only at Quality Testing Lab, Madurai and the Lab is equipped to do the following tests on cables as per IS Specifications.
    - Visual Inspection,Conductor Resistance Test,Insulation Resistance Test,High Voltage Test,Shrinkage Test,Thickness of Insulation and Sheath,Tensile Strength,Heat Shock.

ANNEXURE- C

Conditions, Rules and regulations

1.Sample collection:

1. As per ground reality the sample should be collected at the site of work only by the sample collection officer duly after verifying the important documents as stipulated below.

   i. For all Materials (Cement, Steel & all Pipes) the validity of CML by BIS should be in alive for operative year of license.

   ii. For cement : Grade & production Week, Month & Year

   iii. For steel : Fe415/500, ISI Mark

   iv. For all Pipes : Make, Size, Class, Batch No/Lot No., Third Party inspection test certificate with test report in full shape from the approved Third Party Agency.

2. To avoid delay in receipt of sample for testing the following point have to be adhered scrupulously.
   a. Contradictory should be avoided between sample and format furnished both soft & hardcopy.
   b. The correct testing charges now in force have to be remitted in the form of Demand Draft to correct name of payee specified and communicated by concerned material quality testing laboratory with period of validity date as per banking account rules should be remitted.
   c. Any deviation of aforesaid terms and less payment will liable for rejection.
3. Exemption may be allowed for testing the materials of lesser quantity in minor works (ie) Anganwadies, PFs, Pump Room Kiosk and valve pit.

2. .TESTING CHARGES:

1. The testing charges have to be paid in advance at first by the contractor at the time of handing over of samples. The charges have to be paid by means of Demand Draft drawn in favour of specified designation communicated by concern laboratory.

   As per Managing Director's TWAD Board, Chennai Lr.No. F.7161/Testing Charges/SQMS/2013/Dt.02.12.2013 testing charges have to be refunded to the contractor on production of receipt however testing charges for failure sample by resample / replaced sample taken by inspection officer concerned should be borne by the contractor from his own cost.
2. The sample should accompany with covering letter along with prescribed format (hard copy) duly filled details of sample, scheme, etc., with signature of field officer, sample collecting officer.
3. One set of sample for any materials for two different contractors (Though same batch number) will not be accepted.
4. If different contractors are using the same batch no (of any materials) separate samples should be collected by each contractor and to be got tested.
5. If the contractor used already tested Batch No(PVC Pipe)in another scheme in which the requirement of the pipe below 250m,exemption may be granted for testing.

6. If a second (check) sample as super check have to done by the inspecting officer's (i.e. AEE (QATA) /EE /SE /CE /any inspection Officer) the contractor should permit them to take additional samples. However cost of such second testing will be borne by TWAD Board.
7. The sample will be accepted and admitted for testing in the Laboratory only when the above conditions are fulfilled.

3. FAILED SAMPLES :

a) RESAMPLE procedure :

1. In case of PVC Pipes, if it is fail in Impact test and still within the permissible limit to continue the test as per BIS, the additional sampling should be done by the higher Officers or QATA Engineer, from the same batch No. at site of work. The cost should be borne by the contractor only for proving its quality.
2. If the sample collected by the field officers (AE, AEE, and EE) failed in the laboratory test, re- sampling (i.e same make and batch) should not be done as a matter of routine. However if the contractor feels that a second check for the same is required based on any specific reason the matter may be referred to the **Superintending Engineer** for taking a final decision, in such case **Double sample** have to be taken, with required testing charges which have to be borne by the concerned contractor only. Such things should be immediately informed to the Head office confidentially for taking further action. Further if the above resample fails in retesting also then the entire lot / batch should be rejected and removed from the site and the fact may be informed by certification to the Head Office (SQMS) by the concerned Executive Engineer. Moreover go for replaced sample by New Batch/Lot/Brand and also ensure the rejected materials are not used in any other works / Scheme also.

b) REPLACED SAMPLE Procedure:

3. REPLACED SAMPLE : The replaced sample (i.e new batch / Lot / New Brand) in lieu of the failed sample from the new lot arrival should be collected only by the AEE (QATA) of the territorial circle subject to the conditions on formation of certificate by the Executive Engineer concerned.
