



# Assuring quality of implementation under JJM

**National Jal Jeevan Mission**  
**Department of Drinking Water & Sanitation**  
**Ministry of Jal Shakti**

**11 May,2023**

## Why Quality Monitoring ?



- Ensure intended service delivery - Quantity, quality, regularity and long term sustainability
- Scheme to function till design period
- Compliance of design documents, standards, statutory requirement
- Technical assistance to local contactor having limited knowledge and skill
- Avoid re-work – Time and cost saving
- Adherence to health and safety
- Effective and efficient operation and maintenance
- Minimum operation and maintenance cost

# Quality Monitoring – Institutional Framework



## Institutional mechanism for quality monitoring

### State Level

Level 1 : JEs/ AEs/ AEEs

Level 2 : EEs

Level 3 : State Quality Monitoring Team comprising Sr. Officials

Independent Quality Monitoring : **Third Party Inspection Agency (TPIA)**

TPIA team should comprise Team Leader, QC Engineer, Civil Engineer, Electro-mechanical Engineer and other specialist as per project requirement

Involvement of **community** in joint inspection

**Central Level-** NJJM Team/ National Wash Experts

## Quality monitoring – Project life cycle

Stage -1 : Planning and design development stage

Stage -2 : Execution of work at site

Stage- 3 : Commissioning of scheme/ Trail Run

Stage -4 : Operation & maintenance

# Expectations from third party inspection agencies



## Pre-Construction Activities

- Design documents review and familiarization with scheme
- Facilitate development of Quality Assurance and Quality control plan
- Develop checklist / activity tracker for quality monitoring
- Manpower planning – Deployment of adequate and trained human resource

## During Construction Activities :

- Checking of manufacturer test report of material , vendor data for electro- mechanical equipment;
- Random sampling of construction materials/ equipment for independent testing;
- Sample quality check of construction work relating to civil, mechanical and electrical components for:
  - ✓ intake structures
  - ✓ reservoirs/ pumping stations/ treatment plants
  - ✓ transmission / distribution line
  - ✓ house connections/ FHTC

## Expectations from third party inspection agencies (contd...)

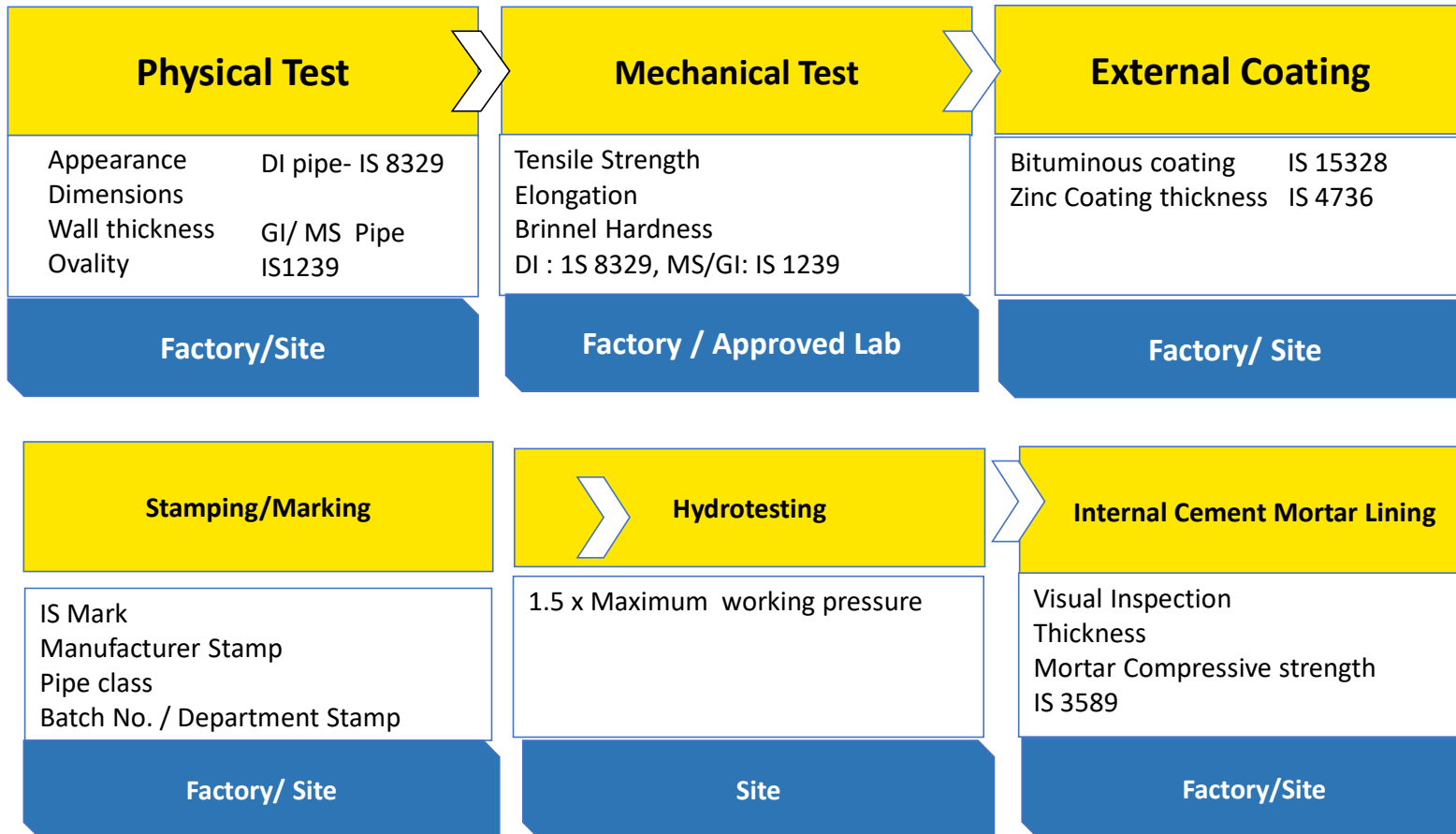


- Overall compliance to relevant IS standards/DPR specifications/drawings;
- Remedial action in case of defects observed during inspection;
- Verify measurements of works & recommendations on payments;
- Inspection of health and safety measures at site
- Regular reporting on progress of work, construction quality issue, any impediment which may impact project delivery timeline and quality etc.
- Any other work related to quality control decided by the Department during construction work

### Post Construction Activities :

- Ensure functioning of scheme during trial run;
- Report any defect for remedial action
- Ensure As- built drgs. are prepared to actual site condition and all major assets are geo tagged
- Submittal of vendor data, warranty of electro-mechanical / equipment

## Pipe material testing : Metallic pipes



# Pipe material testing for plastic pipes

## Physical

Appearance	HDPE- IS 4984
Dimensions	PVC pipe – IS 4985
Wall thickness	
Ovality	

Factory/ Site

## Chemical & Mechanical

Elongation	<p><b>Table 8 Scale of Sampling for Tests for Hydraulic Characteristics, Reversion, Overall Migration, Density, MFR and Carbon Black Content, Dispersion</b> ( Clause 9.2.4.2 )</p> <table border="1"> <thead> <tr> <th>No. of Pipes</th> <th>Sample Size</th> </tr> </thead> <tbody> <tr> <td>Up to 150</td> <td>3</td> </tr> <tr> <td>151 to 1 200</td> <td>5</td> </tr> <tr> <td>1 201 to 35 000</td> <td>8</td> </tr> </tbody> </table>	No. of Pipes	Sample Size	Up to 150	3	151 to 1 200	5	1 201 to 35 000	8
No. of Pipes		Sample Size							
Up to 150		3							
151 to 1 200		5							
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Melt Flow Rate									
Carbon Black Content –									
Density									
Reversion Test									
Migration Test									

Factory/ On site

## Stamping/Marking

IS Mark	HDPE- IS 4984
Manufacturer Stamp	PVC pipe – IS 4985
Pipe Specs	
Batch No / Lot No.	

Factory

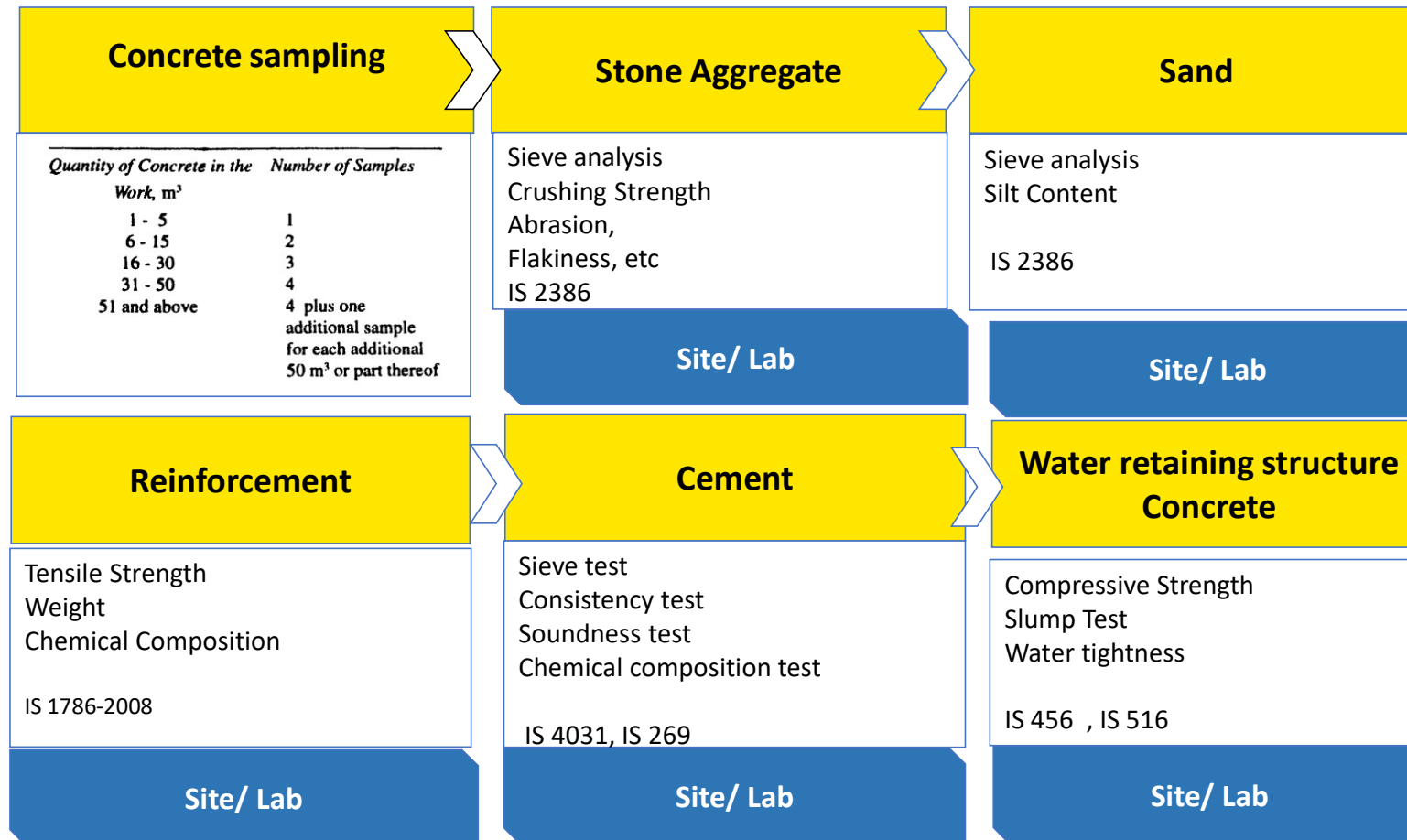
## Hydrotesting

1.5 x Maximum working pressure	IS 4984-2016
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Factory/ On site










# Material testing for R.C.C work



Non-Destructive Testing  
Rebound Hammer



## Tools for material testing at site

Sr. No.	Tools	Purpose	Photo	Standards
1.	Hand Hacksaw	Pipe cutting		GI Pipe: IS 1239-2004 DI Pipe : IS 8329-2000 HDPE Pipe: IS 4984-1995 (Carbon black – Max 2.5 %)
2.	Digital Screw Gauge	Measurement of pipe thickness		
3.	Digital Vernier Caliper	Measurement of inside and outside pipe dia		
4.	Digital Portable Spring Balance	Weight of pipe		
5.	Digital Zinc Coating Thickness Gauge	Measurement of zinc coating of GI Pipe and MS structure for Tank		35 Micron for GI pipe (BIS 4736-1986) 120 Micron for MS Str. (MNRE Guideline)
6.	Rebound Hammer	Measurement of concrete strength		
7.	Wire Gauge Measurement Disc	Measurement of electrical wire dia / gauge		

## Stacking of Pipes

Bad Practice

-

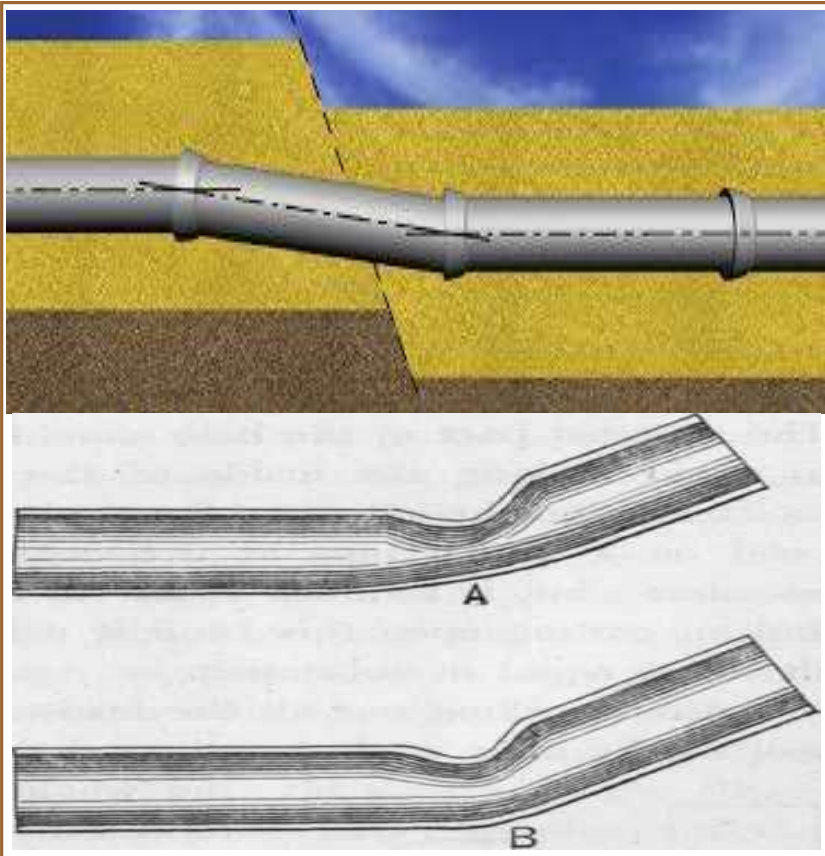


Good Practice

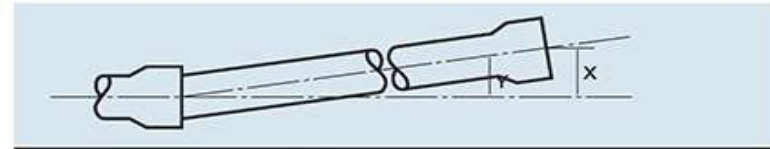
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# Pipe Bending



## JOINT DEFLECTION CHART

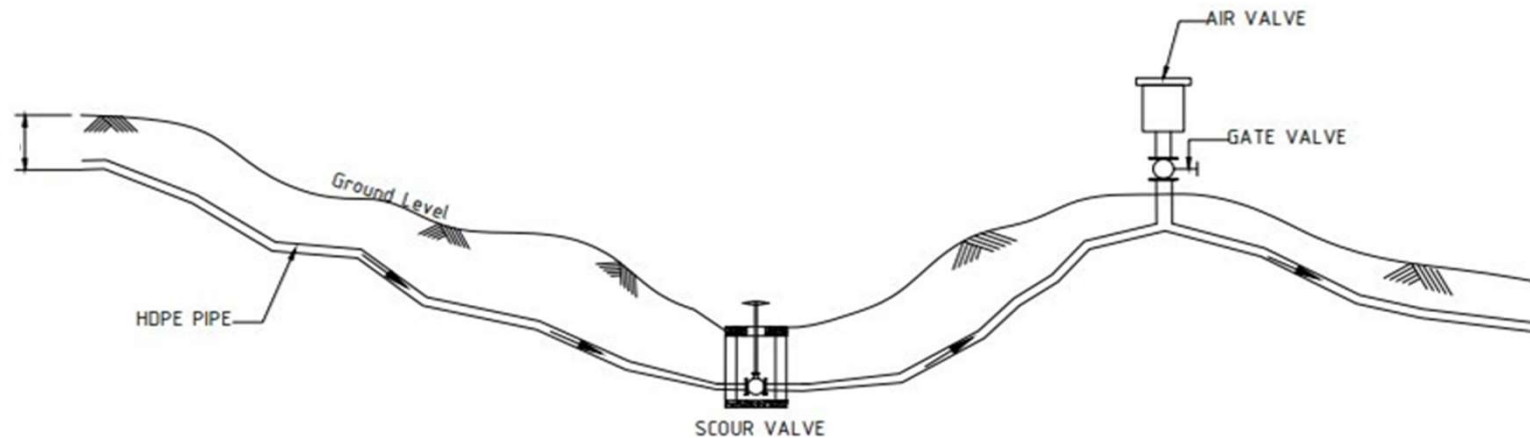


**PUSH-ON JOINT PIPE**  
**Maximum Allowable Joint Deflection**

Pipe Size In.	Y-Maximum Joint Deflection in Degrees	X Deflection in Inches 18 ft. Length	Approximate Radius in ft. of Curve Produced by Succession of Joints 18 ft. Length
3	5°	19	205
4	5°	19	205
6	5°	19	205
8	5°	19	205
10	5°	19	205
12	5°	19	205
14	5°	19	205
16	5°	19	205
18	5°	19	205
20	5°	19	205
24	5°	19	205
30	5°	19	205
36	4°	15	260

## Laying of Pipe Line

- Trench width:  $D + 200$  mm
- Depth of trench: 1.0m
- Levelling of bottom
- Sand cushion in rocky areas
- Backfilling & compaction
- Appropriate location of valves
- Restoration of roads



# House connection manifold

Bad Practice

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Good Practice

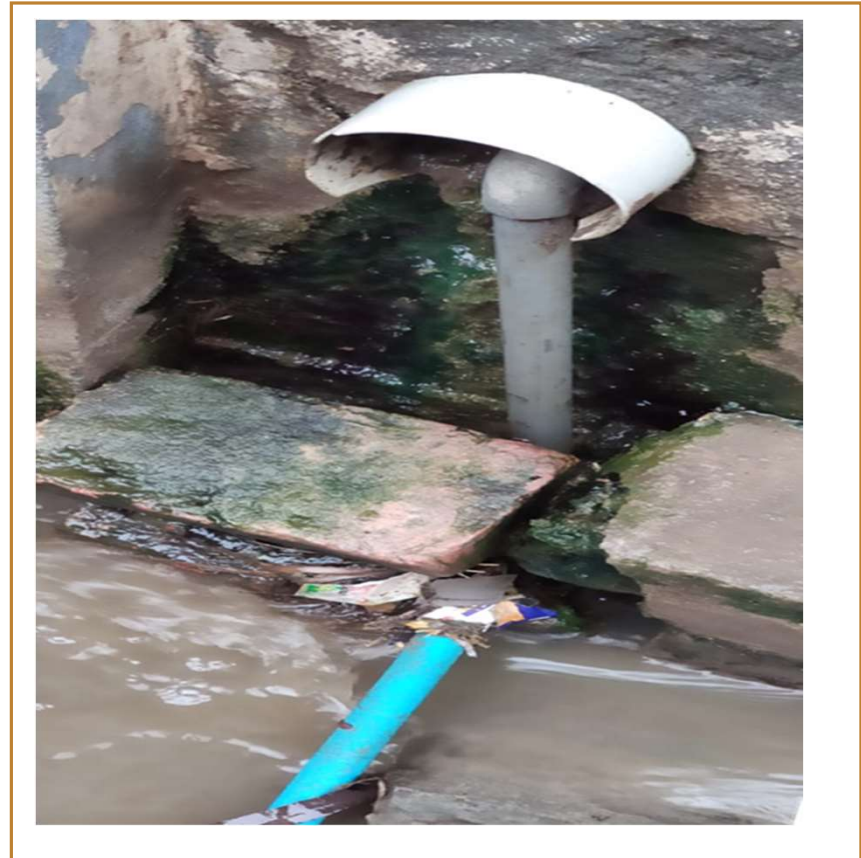
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## FHTC – Bad Practice



## FHTC – Bad Practice



## FHTC – Good Practice

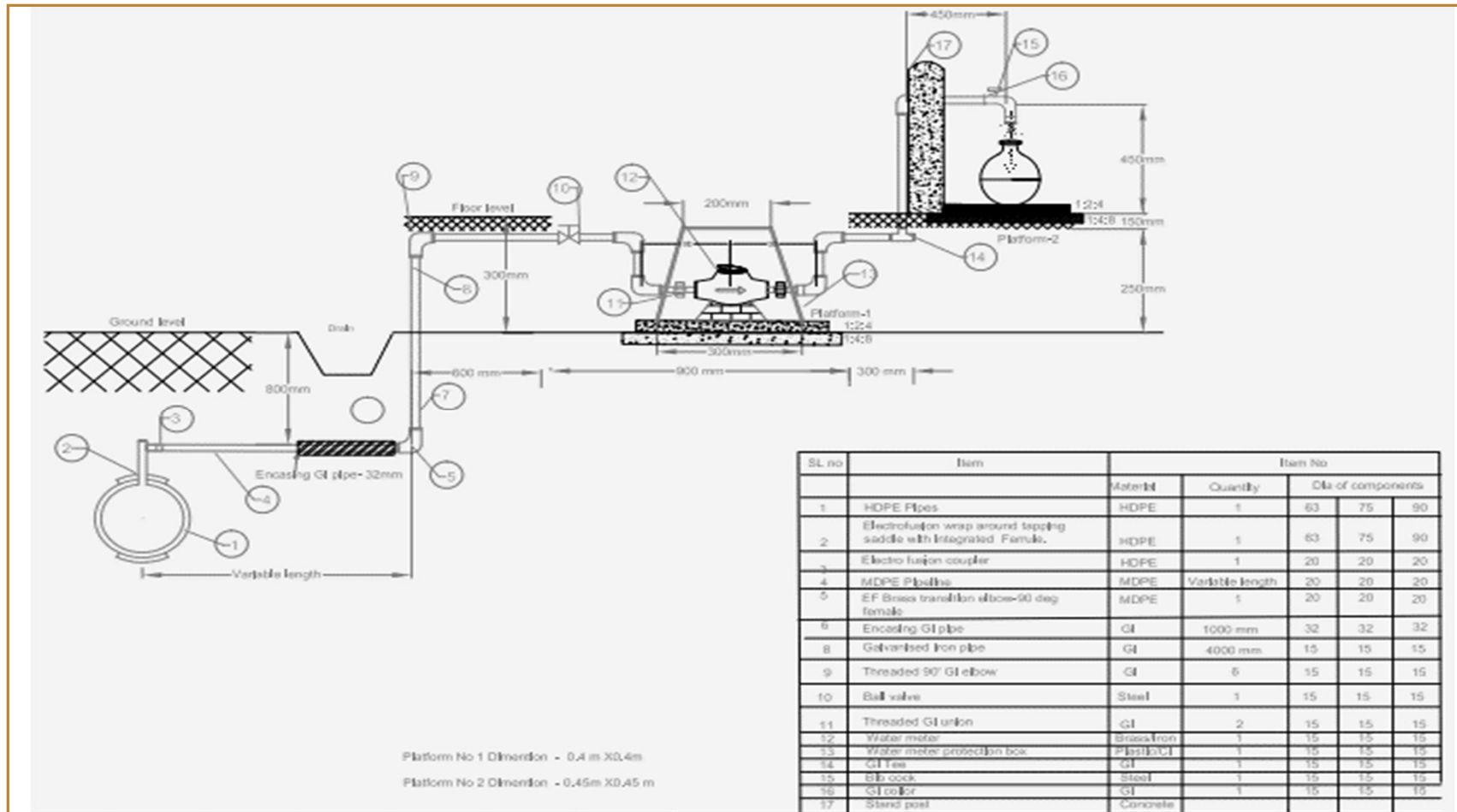


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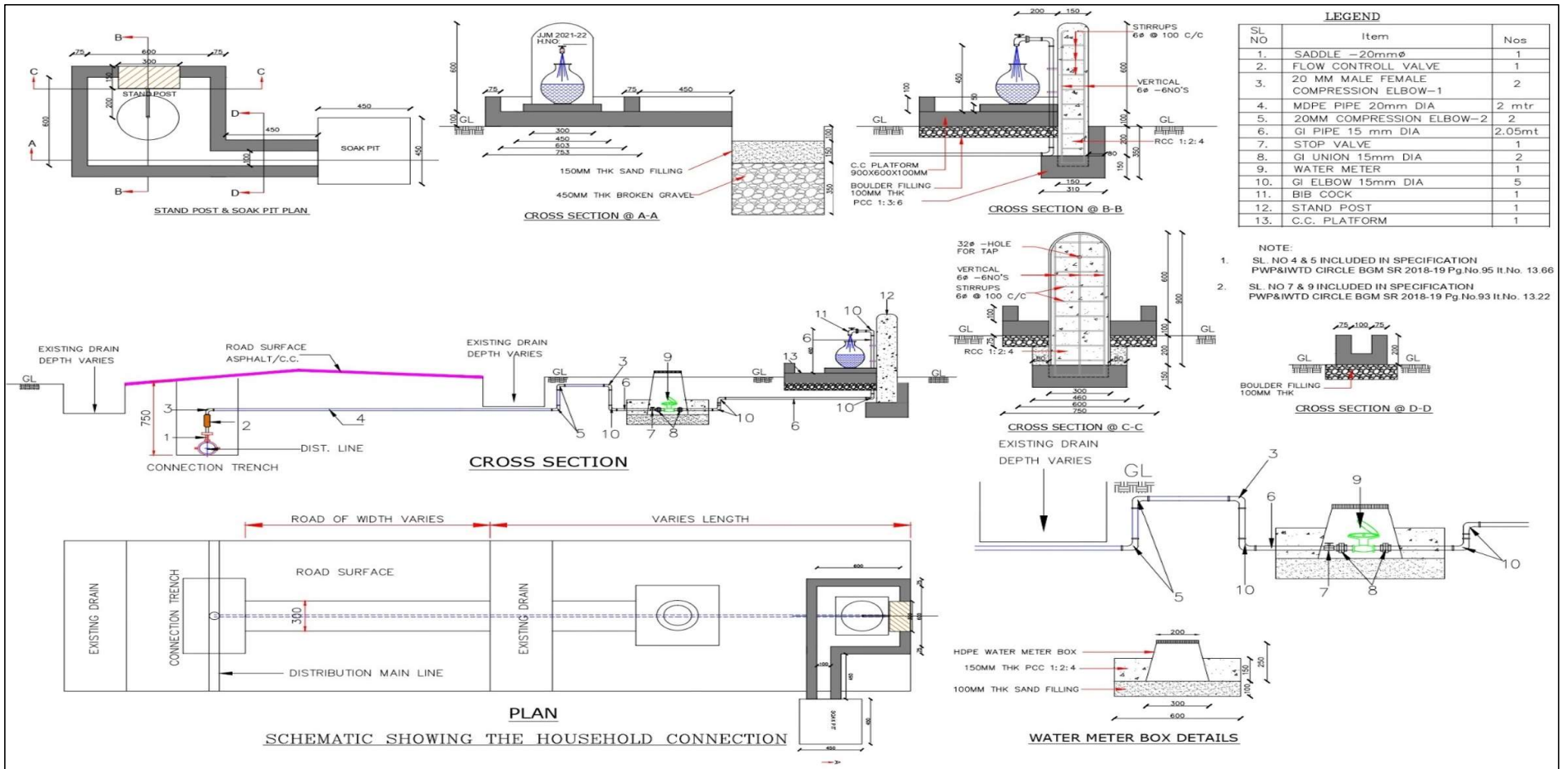




# General arrangement of FHTC



# General arrangement of FHTC (Contd..)



## Over Head Tank – Scaffolding

Bad practice

-



Good Practice

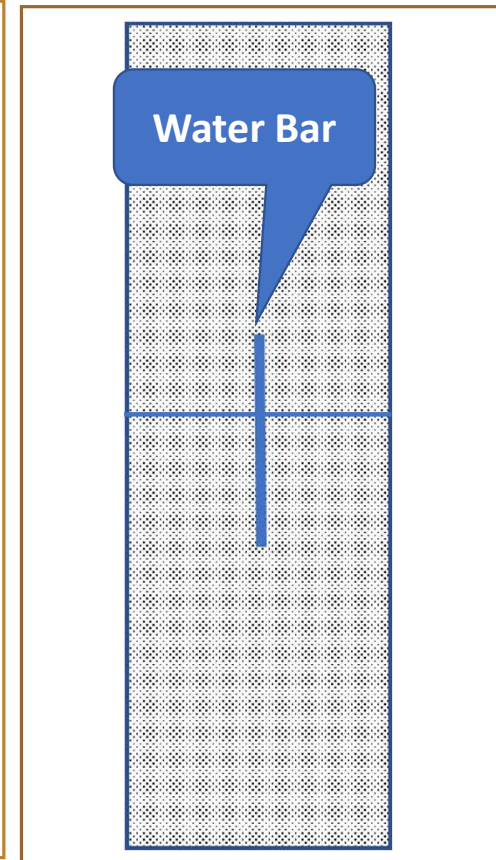
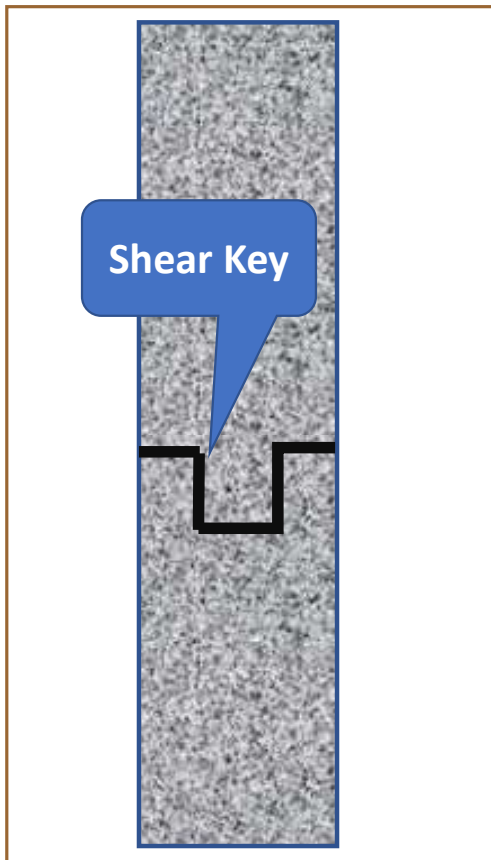
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# Reservoir- Shuttering and concrete work



# Construction of RCC tanks



# Pump house and valve chamber -Issues



# Project Signage



## Status of TPIA technical staff & number of schemes

State /UT	No. of Agencies	Number of schemes	Nos. of Technical Staff deployed by TPIA on field	Schemes per Technical staff
Andhra Pradesh	4	74,520	47	1,586
Sikkim	1	1,791	2	896
Tripura	3	17,358	21	827
Jharkhand	4	97,766	136	719
Assam	5	1,00,053	194	516
Maharashtra	4	43,434	121	359
Haryana	2	6,683	23	291
Arunachal Pradesh	3	6,970	30	232
Meghalaya	3	7,872	45	175
India	152	6,31,897	5,443	116
Uttarakhand	8	17,356	152	114
West Bengal	4	11,028	143	77
Madhya Pradesh	31	39,097	509	77



## Status of TPIA technical staff & number of schemes

State /UT	No. of Agencies	Number of schemes	Nos. of Technical Staff deployed by TPIA on field	Schemes per Technical staff
Rajasthan	3	12,134	158	77
Chhattisgarh	27	37,072	497	75
Tamil Nadu	9	18,366	286	64
Manipur	1	1,218	28	44
Uttar Pradesh	5	41,623	1,007	41
Puducherry	1	96	3	32
Kerala	9	1,722	60	29
Ladakh	2	420	16	26
Goa	1	256	10	26
Himachal Pradesh	2	1,748	69	25
Jammu & Kashmir	3	3,251	163	20
Odisha	10	16,505	983	17
Gujarat	7	621	740	1



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*Thank You*