Audit Report

Rural Water Supply Scheme Name:

Village:

Taluka:

District:

Third Party Assessment Report: Phase-I / Phase-II

Date:

KOLHAPUR INSTITUTE OF TECHNOLOGY'S COLLEGE OF ENGINEERING (AUTONOMOUS), KOLHAPUR

Department of Civil Engineering

KIT's College of Engineering (Autonomous), Kolhapur

Audit Team Members:

1) Mr. Omkar Suryawanshi
   Asst. Prof.
   Dept. of Civil Engineering, KIT
   Kolhapur

Coordinator:

Dr. Aditya Khebudkar

Head, Associate Prof.

Dept. of Civil Engineering, KIT

Kolhapur

khebudkar.aditya@kitcoek.in

Department of Civil Engineering

KIT's College of Engineering (Autonomous),
Kolhapur

Gokul Shirgaon, Kolhapur,
416234 Maharashtra,India.

Telephone: 9168781199

https://www.kitcoek.in

1 INTRODUCTION

1.1 Project background

Kolhapur Zilla Parishad empaneled KIT's College of Engineering, Kolhapur as a third-party evaluator for technical inspection of the selected Rural Water Supply Schemes (RWSS) in the district. The overall aim of this assignment is to improve sustainability, efficiency and equitability of these schemes. As per the **Government Resolution No: Gra. Pa. Dho.- 1114 / Case No.61 / Pa.Pu.-07, Dt. 15 June 2015**, the technical inspection of the RWSS is to be undertaken during two phases: First evaluation after 30% work completion and second after 70% completion of the scheme. Kolhapur Zilla Parishad has shortlisted 13 ongoing schemes under National Rural Drinking Water Program (NRDWP) for third-party inspection in _____ taluka. KIT is evaluating these schemes through design verification, physical asset verification, and performance and adherence of scheme to design as per the approved Detailed Project Report (DPR). This sub-module discusses the findings of the technical inspection undertaken for the _____ Rural Water Supply Scheme which is ongoing scheme.

1.2 Objectives of Technical audit

The objectives of the technical audit are as follows:

- Assessment of the scheme Detailed Project Report (DPR) to know design details of assets proposed in the scheme and to check whether supporting documents are prepared.
- To check if design verification of key assets of the scheme given in DPR is appropriate.
- Physical verification of assets to know whether the scheme has been implemented according to design mentioned in the DPR.
- Checking the scheme performance to assess its sustainability
- Summarize findings and propose recommendations.

1.3 Inspection methodology

The scheme was evaluated by following a detailed methodology comprising data collection, necessary field visits and data analysis. The activities include:

- Assessment of supporting documents and study of design of assets
- Verification of Distribution network design

- Excavation for assets verification at specification level
- Ensuring source sustainability and quality of material by checking the yield test report and material test report respectively
- Tracing of rising main and distribution network for getting actual paths and lengths
- Measurement of pump flow rate in order to know the duration for filling of ESR
- Collection of household connections data and zone wise distribution of habitation by interviewing the Gram panchayat officials and operator
- Measuring actual flow rates across the distribution network
- Ensuring whether the scheme has covered all households and checking amount of water received by household having individual connection.
- Providing success indicator score for scheme depending upon progress of scheme, developed by Auditors. Interpretation of scheme numbered from 0-100 is provided in following chapter.

2 Scheme overview

_____ is a village located in _____Tehsil of Kolhapur District. It is situated at a distance of _____ km from the district headquarter. Average annual rainfall in this area is _____mm. The selected scheme for the technical inspection was sanctioned in 20___-20___. The scheme is designed for ____ years to serve an estimated population of _____people.

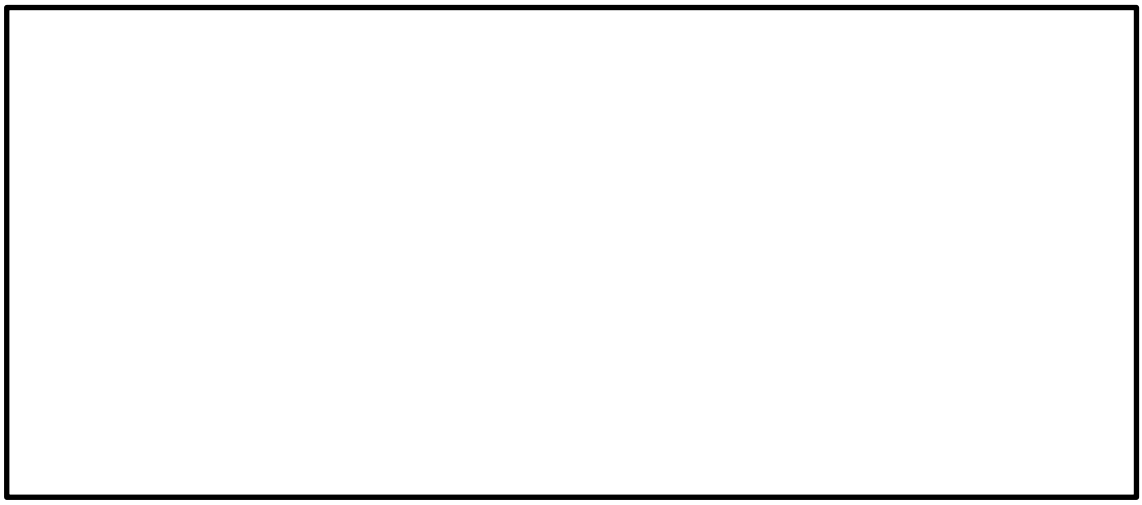

Figure 1: Google map image showing _____ village

Details of the scheme from the detailed project report (DPR) are mentioned in table 1.

Table 1: Scheme details

Scheme Name			
Taluka, District		_____, Kolhapur	
Sanction Year		20 – 20	
Source			
Villages and Habitations covered			
Scheme capacity			
Technical approval date		**Administrative approval date**	
Work Order date		**Time limit**	
Total Budget estimate		**Budget spent**	
Implementation agency (GP/ Zilla Parishad/ MJP/ VWSC)			

2.1 Scheme description

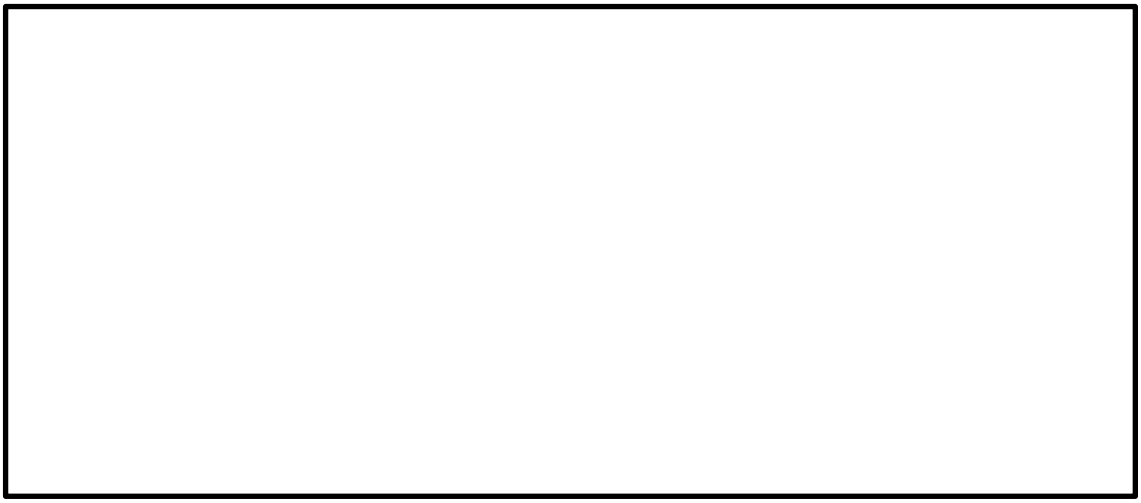

Figure 2: Schematic layout of the scheme

2.2 Site visit details

Physical verification of all the assets of the scheme is done by site visit. Activities carried out and purpose of site visits are mentioned in table 2.

Table 2: Site visit details

Sr. No.	Visit Dates	Purpose	Activities
1			Assets verification, discussion with VWSC, Gramsevak and villagers
2			

3 Planning and Design Audit

3.1 List of documents in DPR

In order to check official procedure for demanding the scheme, utility of material and source sustainability, the documents verified are listed in Table 3.

Table 3: Documents assessed

Document	Present in DPR (YES/ NO)	Remarks
Demand letter		
GSDA permission/ authorization letter/ report		
Yield Test		
Material test report		
Water quality test		
Land acquisition document		
VWSC/ SAC		
Budget Estimate		
Distribution system Summary		
Key plan		
Survey map		

3.2 Planning verification

3.3 Design verification

The first step of technical audit is to undertake a design verification of different assets of the scheme. Hydraulic designs of various assets as mentioned in the DPR were verified to ascertain whether the given design details of various assets are correct or not.

Table 4: Assets design details

Design component	Dimensions	From DPR	From design verification	Remarks
Population forecasting	Year			
Demand	MLD			
Raw water Pumping machinery	BHP			
	Total Head			
	Pump flow rate			
Raw Rising main	Diameter			
Distribution main	Diameter Range and respective length			

Design verification was done by using actual data, on the length of rising main provided in DPR.

4 Implementation Audit

Physical asset verification is done as per the following steps:

4.1 Physical assets verification

Physical verification of assets includes checking performance and adherence of scheme to the design as per the DPR. Physical assets to be verified include: source, rising main, pumping machinery, pump house, ESRs, and distribution network. The physical assets were verified through on-site inspections, details are provided in Table 5.

Table 5: Physical assets detail

Asset name	Dimensions	From DPR/ Structural design	From Field visit	Remarks
Storage tank (ESR)	Length x width			
	Depth + Free board			
	Volume			
	Staging height			
Distribution network	Diameter (mm) – Length (m)			
	Material			

5 Assets summary

- **Distribution network –**

6 Operation Audit

Data collected on operation status of the scheme is presented in the following sub- sections:

6.1 Operations of the scheme

6.2 Serviceability of scheme

- **Coverage** –

- **Quality** –

- **Quantity** –

- **Equity** –

As the scheme is partially completed, flow measurement activity is carried out in the different zones of the village. The flow rate was measured at the tap in three households in three zones that they receive the water from ESR.

Table 6: Flow measurement

Sr. No.	Zone Name	Location	Size of utensil (liters)	Time (seconds)	Avg. Flow (LPS)	Avg. Water available for 30 min (lit)
1						
2						
3						
4						
5						
6						
7						
8						
9						

6.3 Maintenance of the Scheme

Table 8: Annual charges

Sr. No.	Heads	From DPR (Rs.)	Actual (Rs.)
i	Annual M&R charges		
ii.	Labor charges		
iii.	Chemical charges		
iv.	MSEB charges		
	Total annual expenditure		
i	Taxable houses		
iii	Revenue from each household connections		
	Total revenue		

7 Scheme Findings

7.1 Assessment of the documents

7.2 Assets

Since the scheme is partially completed, laying distribution network was completed and same is monitored during the field verification of the audit.

- **Source**

- **Distribution network**

7.3 Operation

No of zones:

No of sluice valve:

No of connections:

Frequency :

Time of supply:

Intensity of Pressure :

7.4 Service level

7.5 Success Indicator

The success indicator score is categorized as follows:

1) **Excellent (above 85) -** Status of scheme is very good, very likely to succeed with minor improvements
2) **Good (71 – 85) -** Satisfactory status of scheme is expected, likely to succeed with few improvements
3) **Satisfactory (55 – 70) –** Scheme likely to succeed only with non-trivial improvement
4) **Poor (below 55) -** Likely to fail without major improvement in all phases

Table 9: Final Success Indicator score

Sr No	Phases	Final Marks	Out of
1	Planning & Design		
2	Implementation		
3	Operation and Maintenance		
4	Exit and Handover		
Total			
Final score			

8 Recommendations

8.1 Scheme specific

8.2 General

Dr. Aditya Khebudkar

Project Coordinator

Department of Civil Engineering,

KIT's College of Engineering,

Kolhapur