



Formulation of Inception Report for EPC Cum O&M Water Supply Project

Mr Kanchan V Patil	Post Graduate Student (Construction & Management), Department of Civil Engineering, Imperial College, of Engineering & research, Pune (Maharashtra, India)
Prof. Dr. A. W. Dhawale	HOD, Department of Civil Engineering , Imperial college of engineering and research,Pune(Maharashtra, India)
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I. INTRODUCTION

Day by day it is getting difficult to extract the water from wells, river and from other natural sources of water, so it is necessary to go for planned sustainable water supply system for water supply projects, background of project such as locality, for rural areas number of Gram Panchayats Funding details like Word Bank Assisted or State Govt or Central Govt assisted. Duration of water supply like 24x7 etc this details affect the infrastructure capacities of various components of water supply scheme. Should mentioned structure of project such as EPC, BOT OR EPC cum O&M

PROJECT SCOPE OF WORK

The scope of the project for each scheme is as below.

- 1) Intake well and pump house with allied components
- 2) Providing and laying of raw water transmission main
- 3) Construction of conventional Water Treatment Plant with allied components.
- 4) Providing and laying of pure water gravity mains.
- 5) Construction of Elevated Service Reservoirs of different capacities and staging

PROJECT PREPARATION

Includes establishment of SPV OR Joint venture for Implementation of project Contract Agreement agencies or Government organizations like Public health department.Submission of Requisite Performance Security

As per GCC starting date of project and duration of implementation and operation and maintenance period First Report – Inception Report The current report is the Inception Report as per Clause mentioned in “Design-Build, Operations & Maintenance and Transfer Services Appendix” to the General Conditions of Contract.

The Inception Report contains information about the status of the Project preparation and implementation, any problems encountered during the project preparation, validation of the projected water demand, revised overall procurement plan & contracting strategy and expected Project implementation schedule.

II.STATUS OF PROJECT PREPARATION & IMPLEMENTATION

The scope of work has two stages viz., Design-Build stage, and O&M stage.

The Design-Build Start date as per the Contract is given. Initial field studies, investigations and surveys - Topographical

Survey, Geotechnical Survey, seasonal Water Quality Analysis, Household Survey, etc. This Section elucidates the various field studies initiated and their progress as on date.

RECONNAISSANCE SURVEY

A complete reconnaissance of the Project area has been carried out – covering sites for Intake structure, Transmission line alignments, Water Treatment Plant sites – through multiple visits by a team of experts from the Operator’s side along with Department Engineers. Critical initial observations have been made during the reconnaissance, which are discussed in later Sections of this repo

During the reconnaissance, the team also explored the possibilities of alternative locations of intake site, raw transmission main alignments, location of Water Treatment plants, alignment of feeder main system from Clear water storage

reservoir to service reservoir, location of Elevated Service Reservoirs (ELSR) etc.

TOPOGRAPHICAL SURVEY

Topographical survey work is being done using total station instrument and DGPS instrument for the entire project area. The detailed topographical survey is carried by using Total Station and correlating the same with GPS data for raw water source area, pipe line route including for alternate alignments for Raw Water Pumping Main and Clear Water Pumping Main, Distribution network etc.

The survey work includes recording levels along the road network at 30m interval, Bathymetry survey at river water intake, 10 m x 10 m grid survey for intake structure, 10 m x 10 m grid survey for WTP Site and Reservoirs site.

The surveys are monitored by Operator’s Engineers and field investigation progress is updated on the base map. The survey map will be prepared in AutoCAD file and GIS file format.

The quantum of survey work envisaged for design of the proposed project components are given below:

- a) Bathymetry Survey as per Locations selected
- b) Block contour survey at Intake, WTP, ESR sites
- c) Transmission main survey
- d) Feeder Main & Distribution system

RAW WATER QUALITY ANALYSIS

Raw Water quality analysis is an important activity in deciding the degree of water treatment and establishing the design parameter for water treatment. The pre monsoon raw water samples are collected at intake locations and got tested.

4. GEO TECHNICAL INVESTIGATION

Geo Technical investigations are being carried out to assess the bearing capacity of soil and aggressiveness of soil character in regards to corrosion against the structure. The geotechnical investigation is being carried out at Intake locations, WTP locations, Elevated Service Reservoir locations. For this work assistance of experts from NIT Jamshedpur is taken and the work is in progress. The work of Geo technical investigation is completed at both the intake sites and the work is in progress at HUDCO park i.e site for Chhotagovindpur WTP site

5. HOUSEHOLD CONSUMER SURVEY

A detailed Household Consumer Survey / Door to Door survey is being carried out to assess is water demand at street level for the present and the future with due consideration of land use pattern. This survey is being done at Chhotagovindpur and Bagbera.

In a meeting held with the "Local Representative" of Project Area the ground realities are understood and the situation is assessed. From them some information about Government Housing Colonies is also obtained

6. MEETING WITH LOCAL REPRESENTATIVE

With this information's, the mapping of the households before the execution of the survey has been started. The mapping of household also creates the identity of the household, by giving each property a unique building number. Subsequent to the assignment the Building/property ID's house hold survey has been proceeded.

7. DOOR TO DOOR SURVEY IN PROJECT AREA

For this a mobile application is developed, tested and implemented. This application has features to collect the data and synchronize the same seamlessly with the database. Currently the application is being used to collect household information by the surveyors.

III. POPULATION PROJECTIONS (Sample Chart)

Sl.	Name	Census Population			Projected year		
		1981	1991	2001	2014	2029	2044
1	1	14,778	19,368	24,781	3,362	46,782	65,216
2	2	8,425	10,338	18,385	29,373	49,284	80,221
3	3	11,315	14,830	19,929	27,976	40,581	58,305
4	4	12,250	14,987	15,767	18,828	22,477	26,988
5	5	11,726	13,000	10,918	15,330	2,740	33,285
	Total	58,494	72,523	89,780	124,869	181,864	264,015

1.1. Design Population for Project Area (Sample Figures)

Year	Population as per DPR	Pop. as per Design criteria	Pop. as worked out by Operator
Census population 2001	89,780	89,780	89,780
Population 2011			113,486
Initial stage 2014	124,869	124,869	131,740
Inter mediate stage 2029	181,863	181,863	177,821
Ultimate stage 2044	264,014	264,014	256,999

IV. WATER DEMAND ESTIMATES

Sl.	Description	Unit	WATER DEMAND in MLD		
			Year	2014	2029
1	Population	Nos.	131,740	177,821	256,999
2	Water demand @ 135 LPCD	MLD	17.78	24.01	34.69
3	Fire demand	MLD	1.15	1.33	1.60
4	Total demand	MLD	18.93	25.34	36.30
5	Losses in distribution @10%	MLD	1.89	2.53	3.63
6	Clear water Requirement	MLD	20.83	27.87	39.93
7	Losses in Transmission @5%	MLD	1.04	1.39	2.00
8	Net quantity at WTP outlet	MLD	21.87	29.27	41.92

1. ADOPTING RATE OF WATER SUPPLY & LOSSES

The water demand for entire Project area is now assessed based on the following norms as given in CPHEEO Manual:

- Rate of Supply -135 lpcd
- Fire demand in KL - 100 (P/1000)^0.5
- Distribution losses - 10%
- Clear Transmission Losses - 5%
- Water Treatment losses - 3%
- Raw Transmission Losses - 2%

2. WATER DEMAND ESTIMATION FOR PROJECT AREA

The projected Water Demand for various design period 2029 & 2044 is given below.

Table 1: Projected Water Demand – (2029 & 2044)

Sl.	Description	Unit	WATER DEMAND in MLD		
			Year	2014	2029
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V. ENVIRONMENTAL MANAGEMENT PLAN

The Environmental Management Plan (EMP) addresses the requirements for successfully mitigating the likely adverse impacts and identifies the post project monitoring requirements needed for the successful implementation of the suggested mitigation measures. Environmental Management Plan has been listed out in Table 2. It will be the responsibility of the Operator to ensure implementation of the Environmental Management Plan

Table 2: Possible Environmental and Social Issues in water supply Project

Project	Possible Environmental and Social Issues														
	Land Use	Hydrology and Drainage Patterns	Surface & Ground Water Quality	Water Logging	Air Quality	Noise	Solid Waste	Destruction of habitation/ Vegetation	Disturbance to other Services	Urban Congestion	Urban Aesthetics	Public Health and safety	Smell and Smoke	Hazards due to handling of toxic chemical	Resettlement and Rehabilitation
Water Supply															
1. Laying of pipes	+					-	-	-			-	+	+		
2. Water treatment Plant	+					-	-	-				+	+		
3. Pumping Stations	+					-	-					+	+		
4. Service Reservoirs	+							-				+	+		
Note :	Major Impact	- -													
	Minor Positive Impact	+													
	Minor Negative Impact	-													
	Minor Positive Impact	+													

Table 3: Environmental Management Plan

Project Component	Activities	Impacts	Phase of Construction	Major Measures
Pipe laying	Earth work excavation	Dust Pollution	Construction	Construction site & access roads should be sprinkled/ washed with water, where there is substantial dust pollution.
	Construction of valve chambers	Road blockage & traffic diversion	Construction	Adequate & safe measures for diverting of traffic will be provided. Restrict timings of operations. Liaise with police & Highway authorities.
		Water pollution	Construction	Adequate clearance between water mains & sewer lines shall be maintained. Lateral clearance of 3m, vertical clearance of 0.5 m between invert of water main & top of sewer line. Water supply lines will be laid above the sewers.

Pumping Mains & Pumping Stations	Earth work excavation & filing	Dust Pollution	Construction	Construction site & access roads should be sprinkled/ washed with water, where there is substantial dust pollution.
	Operation of Plumbing systems & diesel generator sets	Noise Pollution	Post Construction	Frequent lubrication, periodic inspection & proper use of spare parts.
		Water Pollution	Post Construction	Water should not be contaminated due to usage of fuel & lubricants

Project Component	Activities	Impacts	Phase of Construction	Major Measures
Water Treatment Plant	Earth work excavation	Dust Pollution	Construction	Construction site & access roads should be sprinkled/ washed with water.
	Filling, Embankment	Formation	Construction	There is substantial dust pollution.
	Construction of WTP	Water Pollution	Construction	Adequate facilities for disposal of sludge to be provided.
	Operation of WTP	Air Pollution	Post Construction	Proper Operation of WTP by undertaking preventive maintenance, corrective maintenance with prompt repairs, good house-keeping, process monitoring and proper documentation of O & M activities shall be maintained.
Service Reservoirs	Filling up of excavated areas (plying of trucks)	Dust pollution. Marginal increase in levels of oxides Nitrogen & sulphur.	Construction	Construction site & access roads should be sprinkled/ washed with water, where there is substantial dust pollution. Construction equipment and vehicles should be kept well-tuned.
	Earth work excavation, Filling embankment During construction	Dust Pollution	Construction	Construction site & access roads should be sprinkled/ washed with water, where there is substantial dust pollution. Adequate provision for drainage of water and disposal of Sludge arising from periodic cleaning

1.CONSTRUCTION PHASE

The recommended measures needed to minimize and mitigate the construction phase impacts are given in Table 15. The approach adopted has been in such a way to recommend mitigation measures, that are of two types (i) precautionary measures and (ii) compensatory measures, wherever applicable. In most of the cases, the recommended mitigation measures are precautionary in nature.

1.1. Management of Noise Impacts

Following precautionary measures will be implemented for the management of noise impacts.

To minimize the impact, construction operations in residential and sensitive areas should be restricted to between 7.30 a.m. and 6.00 p.m. (this pertains to the distribution system only which is a small component

Noise level will be reduced by provision of encasement to generator sets and concrete mixers at the sites.

Operators of heavy machinery and workers in near vicinity will be provided with earplugs and other protective measures for safety.

1.2. Managing Impact on Air Pollution

Construction activities and the consequent transportation activities add to the air pollution in the region. Impact of the air pollution will be moderate and shall be of short term in

nature. The Precautionary measures shall be as follows:

Construction equipment, machinery and diesel engines will be maintained in good condition so as to reduce emissions.

Dust will be controlled by sweeping and sprinkling with water.

Trucks carrying dust and sand to and from the construction site will be covered or wetted to minimize release of dust.

1.3. Managing Impact Due to Labour Camps

Considering the long construction period of the project, the local and migrant labourers will pose some stress on utility services, such as water supply and sanitation. The Precautionary measures shall be as follows:

Labour camps if required to be set up will be provided with adequate water supply, sanitary facilities and drainage. Necessary and appropriate transportation facilities to the labour

Table 4: Environmental Management Plan – Construction Phase

Sl	Issues	Action To be taken	Responsible agencies	Time Frame for Implementation
1	Site clearance, flora and fauna	Adequate precaution against damage to existing structures, electricity and telephone lines and other infrastructure services. A minimum level of tree plantation will be ensured. No important species are present in the area	SPV, Contractor Public health Deptt (Sate Govt Deptt)	During period of construction of the project - Do -
2	Storage of materials	Site for storage of construction materials Disposal of debris refuse to be identified.	SPV, Contractor Public health Deptt (Sate Govt Deptt)	Before commencement of the project
3	Air pollution and vibrations	Noisy construction operations in residential and sensitive areas should be restricted between 7.30 a.m. to 6.00 p.m. Provision of ear plugs to operators of heavy machinery and workers in near vicinity Proper maintenance of construction equipment's and vehicles to meet emission standards and to keep them with low noise Provision for fixing of generators and concrete mixers at site. Where residences are located within 200 from construction sites and in sensitive areas like hospitals, schools, and zoological parks, etc, noisy construction work shall be undertaken during day time only (7.30 hrs to 18.00 hrs). During night, material transport should be uniformly distributed to minimize noise impacts	SPV, Contractor SPV, Contractor SPV, Contractor	During period of execution of the project - Do - - Do -
4	Dust Pollution at constr. sites	Trucks carrying construction material to be adequately covered	SPV, Contractor	- Do -
5	Earth work excavation	Disposal of surplus excavated earth at identified sites. Ensure minimum hindrance to normal local activities and business	SPV, Contractor C&BDWSPL	- Do - -Do-
6	Constr. Labour	Planning of labour camps needs to be done to ensure adequate water supply, sanitation & drainage etc., in conformity with the Indian labour Laws	SPV, Contractor	- Do -
7	Procu. of constr. Material	Procurement of construction material only from permitted sites and quarries	SPV, Contractor	- Do -
8	Risk of accidents	During construction, effective safety and warning measures shall be adopted to reduce accidents	SPV, Contractor	- Do -
9	Cultural relics	If fossils, coins, articles of value or antiquity, structures and other remains of geologic or archaeological interest are found, the local government shall be immediately informed of such discovery and excavation shall be stopped until identification of cultural relics by the authorized institution and clearance is given for proceeding with work.		Do -

VII. IMPLEMENTATION SCHEDULE & SUPERVISION PROCEDURE

IMPLEMENTATION OF THE PROJECT

For implementation of the project, a proper planning, and coordination procedure is being established. As per the contract document, the execution of fully functional water supply system will be completed in desired duration in months. Macro level implementation schedule / program for for the Project is the most important Task

PROCUREMENT PLAN & CONTRACTING STRATEGY

For timely execution of work, the works will be divided into number of sub-work and will be taken up in hand for execution.

SUPERVISION PROCEDURE AND REPORTS

For effective and quality implementation of the project, an organized engineering and administrative team is being established at site. The team includes qualified persons having experience in executing and supervising similar kind of project. The proposed organization chart of the project is furnished below.

REPORTING:

During the design build period, Design Reports, Quarterly, Annual, and Final Reports will be prepared and submitted. All reports shall be submitted in the English language in hard format for submission to the Owner.

- 1) Inception report
- 2) Preliminary design report
- 3) Final design report
- 4) Quarterly Reports: Throughout the assignment Quarterly Reports shall be submitted to the Owner by the fifteenth day of the following month. Each report will show events and progress for the activities of each of the main tasks.

The Content of quarterly reports shall include:

Chart and description of work and goods of each stage: Design, production, transportation, construction, installation, testing, commissioning, guarantee test and acceptance; Comparisons of actual and planned progress including percentage completion achieved for each activity;

Details of any aspects which may jeopardize the completion in accordance with the contracts, and the measures being (or to be) adopted to overcome such aspects;

Copies of the assurance documents, test results and certificates of materials; Safety statistics, including details of any hazardous incidents and activities relating to environmental aspects and public relations;

Projected contractual payments for next four quarters;

5) Final Report: Final Report will be prepared, one month prior to the end of the Design Build Contract for handing over to the Owner. The Final Report will be in fact a review of the entire tasks fulfilment and include the necessary conclusions. Upon receipt of the Owner's comments and suggestions final version of the report will be prepared and submitted.

Conclusion –

- 1) Now a days Water supply project mainly executed under BOT- O&M due to lack of funds at Government side.
- 2) It is very important to formulate the methodology of the project to implement effectively within stipulated time frame.
- 3) In such EPC Project Preparation of Details Project Report the basic indicative document for beeding purpose and further formulation of Inception report, Preliminary Design Report, Final Design Report.
- 4) Simultaneously participation of local authorities is also important Part

5) Coordination with Administrative authorise to handover the required land for ELSR, WTP,INTAKE is also important to complete the project within Time, it is observed that delay of such project is mainly due to non cooperation of local citizens, criminal self-interest of local public representative.

6) Selection of Intake location is important to ensure perineal water supply

7) Location and elevation of WTP is important to ensure the gravity flow to ELSR so to minimise the energy consumption in long term

8) Location of ESR is important to ensure to maintain minimum ferrule pressure as per specification.