**GUIDELINES FOR PREPARATION OF DETAILED PROJECT REPORT FOR**

**RURAL PIPED WATER SUPPLY SCHEMES**

1. **EXECUTIVE SUMMARY**

1.1 Executive summary should consist of the brief of the scheme viz. essential features of proposed schemes – project area with location & communication, existing water supply status, identification of problem in terms of quantity, quality and source as well as system sustainability of existing system in use, basic planning strategy with approach adopted w.r.t design period, details of project, details of project proposed components in brief including utilization existing assets in best possible manner with sustainability measures as per NRDWP guidelines.

1.2 **PROJECT AT A GLANCE**

|  |  |  |
| --- | --- | --- |
| **Sl. No** | **DESCRIPTION** | **Details** |
| 1 | District |  |
| 2 | Block |  |
| 3 | Number of Village |  |
| 4 | Latitude/Longitude of proposed Village  (in degree decimal minutes) |  |
| 5 | Population forecast |  |
| 1. Population as per 2011 Census |  |
| 1. Present population |  |
| 1. Proposed execution period |  |
| 1. Population after execution period |  |
| 1. Population after 10 years |  |
| 1. Population after 20 years |  |
| 1. Population after 30 years |  |
| 6 | Water Demand |  |
| 1. Present Water Demand |  |
| 1. Demand after execution |  |
| 1. Demand after 10 years |  |
| 1. Demand after 20 years |  |
| 1. Demand after 30 years |  |
| 7 | Present Water Supply Level |  |

3. **POPULATION**

3.1 Census data of a village

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Year** | **Population** | **Increase** | **Percentage increase** | **Increment increase** |
| 1971 |  |  |  |  |
| 1981 |  |  |  |  |
| 1991 |  |  |  |  |
| 2001 |  |  |  |  |
| 2011 |  |  |  |  |
| Total average |  | I | lg | r |

3.2 Population forecast

(a) By Arithmetical Increase Method p = present population

(suitable for less increase)

n = no of decade

Pn = P+nxl l = average increase

(b) By Geometrical Increase Method

(Suitable for rapid increase)

Pn = P(I+lg/100)n lg = average percentage

Increase

(c) By Incremental Increase Method

(Suitable for average increase)

Pn = P+nl+n(n+1)xr r = average incremental

2 increase

5. **INSTITUTIONAL SET UP**

5.1 Details set up of VWSC (Village WATSAN Committee)

5.2 Role of VWSC in present O&M activities

5.3 Propose O&M activities

6 **WATER SECURITY PLAN**

6.1 The acquisition/usage of all water sources, catchment and all other land related to water supply works shall be the sole responsibility of the beneficiaries and be free from all incumbencies.

6.2 Details availability of various water resources and their conjunctive use for different activities, details of water recharging and conservation resources proposed, rain water harvesting, convergence with other programme.

**7. PRESENT STATUS OF WATER SUPPLY & SANITATION:**

7.1 Piped water supply

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Sl.No | Name of source | Location | Elevation | Type of source | Year of commissioned | Monthly discharge in lpm | |
| source | Reservoir |
|  |  |  |  |  |  |  |  |

7.2 Hand pump tube wells

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Sl.No | Name /code no.of HPTW | Location | Elevation | Discharge lpm | remarks |

**8. DETAILS PROPOSED SCHEME:**

Minimum target shall be 40 lpcd. If the source permit, scheme may be designed for 55 lpcd or more. Hydraulic and structural design of all the major components of the scheme such as dam intake well cum pump house, infiltration gallery,, pump houses, raw and clear water pumping mains/water treatment plant including underground sump/raw and clears pumps and motor transformers and solar systems, conveyance mains, distribution system including over head or ground reservoirs, any sustainability structures such as check dams or dykes ect must be done as per standard engineering practices and applicable manuals and codes of the Bureau of India Standards, Based on such design, details of the following major components should be given in the scheme.

8.1 **SOURCE**: It shall be ensured that sources so selected shall be capable of meeting water requirement of the system for the design period with due consideration to climate change and anticipated activities in an around as well in the upstream of the source. Source for the least 3 (three) years data may be taken as below:

**MONTHLY SOURCE DATA**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Sl.No | Name of source | Date of measurement | Discharge in lpm | Measurement taken by |
|  |  |  |  |  |

**Note**: Source discharge measurement must be taken by at least Regular staff. Sub-Divisional Officer concerned should take at least one measurement of the source during the last driest period. In case of pumping schemes, at least one time measurement should be taken by Executive Engineer concerned.

**OPTIMIZATION CHART OF RESERVOIR CAPACITY & GRAVITY MAIN SIZE**

**with MONSOON SURGE FLOW and LIMITED BASE FLOW**

Name of Village =

Circle =

Division =

Sub-Division =

District =

Last census year =

Last census population =

Base year =

Base year population =

Design period =

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Project year = | Eg. 2017 | Eg. 2027 | Eg. 2037 | Eg. 2047 |
| Projected population = |  |  |  |  |

Source discharge in lpm (driest) = Eqn :- I

Predicted lpcd at driest period for design = \_\_\_\_\_\_\_\_\_\_\_Eqn:- I\_\_\_\_\_\_\_\_\_\_\_\_

dopulation with the source discharge with 24 x 60 x Population after 30 years

no depletion.

Ipcd for Reservoir capacity design adding 5% = Eqn :- II

Institution demand, 10% line loss, 5% live stock

G/Main flow wrt Ipcd of normal reservoir = Eqn:- III x Population after 30 yrs

Capacity design (in Ips) 24 x 60 x 60

**SURVEY DATA OF CONVEYANCE MAIN: Velocity of Flow in conveyance main should be designed within 0.6 m/sec – 2 m/sec**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Station** | **Chainage** | **Elevation** | **Latitude** | **Longitude** |
| Intake  1  2  .  .  .  .  Valley 1  12  .  .  .  .  Summit1  .  .  .  .  .  .  .  .  Reservoir | Bench Mark  0-100m  100-200m  .  .  .  .  E.g : 1100-1150m  1150-1200m  .  .  .  .  E.g: 2000-20120m  2020-2100m  .  .  .  .  .  . | E.g: 1000m  920m  922m  .  .  .  .  955m  948m  .  .  .  .  .  .  800m |  |  |

The distribution layout should be such as to facilitate isolation of sections metering for assessment and control of leaking and waster. Elevation of service reservoir shall be kept so as to maintain minimum residual pressure. Pressure zoning in the distribution system ensures equalization if water supply in the area. It shall be ensured that zones shall be interconnected.

Provision for Fire Hydrant and household connections must be incorporated in the Detailed Project Report.

9. **WATER USE EFFICIENTCY**: Provision of bulk water meter at conveyance main shall be made at the entrance of each habitation.

10. **SCHEME COMPLETION SCHEDULE**: Schedule of completion for each item of the Scheme shall be prepared in a simple Bar Chart format easily understood and used by the field staff of the implementing Agency; PRI, the VWSC and the user group.

11. **LAND AVAILABILITY**: The land required for construction of all the components of the scheme shall be arranged by the village/habitations free of cost from all encumbrances. No Scheme shall be taken up without the written deeds of the Village Authority/Revenue Department. (e.g V.C Pass/Periodic pass/LSC). Photo copy of V.C Pass/Periodic Pata/LSC or Land Availability Certificate must be enclosed at the beginning of the Detailed Project Report.

12. **OPERATION & MAINTENANCE**:

1. PUMPING SCHEME: Annual Operation and Maintenance cost giving details of estimated expenditure on all major components such as electricity, chemicals, HSD, Oil & lubricant, man power, civil works and pipelines etc shall be prepared and incorporated in the Detailed Project Report.
2. GRAVITY SCHEME: Maintenance Cost for mobilization of WATSAN Committee for 1 (one) year may be build-in in the estimate.

13. **RATE**: All Rates outside PWD/PHED SOR should be supported by relevant documents.

14. **ABSTRACT OF COST** : As per annexure – I or II depending upon the type of Scheme i.e Pumping Scheme or Gravity feed Scheme.

15. **PER CAPITA COST**

a) Present :

b) Design :

**OPTIMIZATION CHART FOR RESERVOIR CAPACITY**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Sl.  No. | Month | Days | Source  Discharge | Water to be withdrawn from source i.e Supply | | Water Demanded by Public | | Supply  Demand | Cumulative  Deficiency |
| lps | lps | litre | lps | litre | litre | litre |
| 1 | January |  |  |  |  |  |  |  |  |
| 2 | February |  |  |  |  |  |  |  |  |
| 3 | March |  |  |  |  |  |  |  |  |
| 4 | April |  |  |  |  |  |  |  |  |
| 5 | May |  |  |  |  |  |  |  |  |
| 6 | June |  |  |  |  |  |  |  |  |
| 7 | July |  |  |  |  |  |  |  |  |
| 8 | August |  |  |  |  |  |  |  |  |
| 9 | September |  |  |  |  |  |  |  |  |
| 10 | October |  |  |  |  |  |  |  |  |
| 11 | November |  |  |  |  |  |  |  |  |
| 12 | December |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  | Surplus Days |  |  |  |  |  |  |  |  |
|  | Deficit Days |  |  |  |  |  | Capacity |  |  |

Junior Engineer Sub Divisional Officer Executive Engineer

\_\_\_\_\_\_\_\_\_\_\_\_\_ Sub Division \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Sub Division \_\_\_\_\_\_\_\_\_\_\_\_\_\_ Sub Division

\_\_\_\_\_\_\_\_\_\_\_\_\_ : Mizoram \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ : Mizoram \_\_\_\_\_\_\_\_\_\_\_\_\_\_ : Mizoram

**ITEM-WISE ARRANGEMENT**

***for***

**PREPARATION OF ESTIMATES FOR WSS**

**Annexure-I**

**WATER SUPPLY SCHEME (PUMPING)**

1. **ABSTRACT OF COST :-**
2. Civil Works
3. Pumps and Machineries
4. Power Supply/ Electrification
5. HOT Crane
6. Water Quality Control
7. Communication
8. Contingencies
9. **DETAILED ESTIMATE :-**
10. **Civil Works :**
11. Approach Road
12. Site Development
13. Intake Works
14. Raw Water Gravity Main
15. Supply/ fittings/ laying of pipes, etc. complete
16. Jungle Clearance
17. Footpath
18. Support Pillars
19. Schedule of Materials
20. Water Treatment Plant
21. Aerator
22. Flush Mixer
23. Sedimentation tank/ Clarifier
24. Slow Sand Filter/ Rapid Sand Filter/ Horizontal Roughing Filter
25. Chemical house
26. Clear Water Sump and Backwash Tank
27. Pump House
28. Buildings
29. Security Fencing
30. Clear Water Rising Main
31. Supply/ fittings/ laying of pipes, etc. complete
32. Jungle Clearance
33. Footpath
34. Support Pillars/ anchorage block
35. Schedule of Materials
36. Feeding Main
37. Supply/ fittings/ laying of pipes, etc. complete
38. Jungle Clearance
39. Footpath
40. Support Pillars
41. Schedule of Materials
42. Distribution System
43. Supply/ fittings/ laying of pipes, etc. complete
44. Jungle Clearance
45. Footpath
46. Support Pillars
47. Schedule of Materials
48. **Pumps and Machineries** :
49. Details of Pump
50. Details of Pump Motor
51. Details of Pump for Treatment Unit
52. **Power Supply/ Electrification** :
53. Details of Transformer (*incl connection line, etc. complete*)
54. Details of DG Set
55. Details of Solar Power units
56. Control Panels
57. Internal Electrification
58. **HOT Crane** :
59. **Water Quality Control** (*Details of Disinfectant used*) :
60. **Communication** :
61. **Contingency** :

Annexure-II

**WATER SUPPLY SCHEME (GRAVITY)**

1. **ABSTRACT OF COST :-**
2. Intake Works
3. Gravity Main
4. Distribution System
5. Water Treatment Plant
6. Carriage
7. Contingency
8. **DETAILED ESTIMATE** :
9. **Intake Works** :
10. Intake arrangement
11. Footpath to Intake
12. **Gravity Main** :
13. Supply/ fitting/ laying of Pipes, etc. complete
14. Jungle Clearance
15. Footpath
16. Support Pillars
17. Schedule of Materials
18. **Distribution System** :
19. Supply/ fitting/ laying of Pipes, etc. complete
20. Reservoir
21. Construction of Reservoir
22. Approach Road to Reservoir
23. Public Stand Post cum T-Cluster
24. Valve Chamber / T-Cluster
25. Water Supply to School, Anganwadi and Graveyard
26. **Water Treatment Plant (WTP)** :
27. Aerator
28. Sedimentation Tank
29. Rapid**/**Slow Sand Filter/ Horizontal Roughing Filter
30. **Indemnification fee :**
31. **Transportation of Materials :**
32. **Miscellaneous :**
33. **Contingency :**