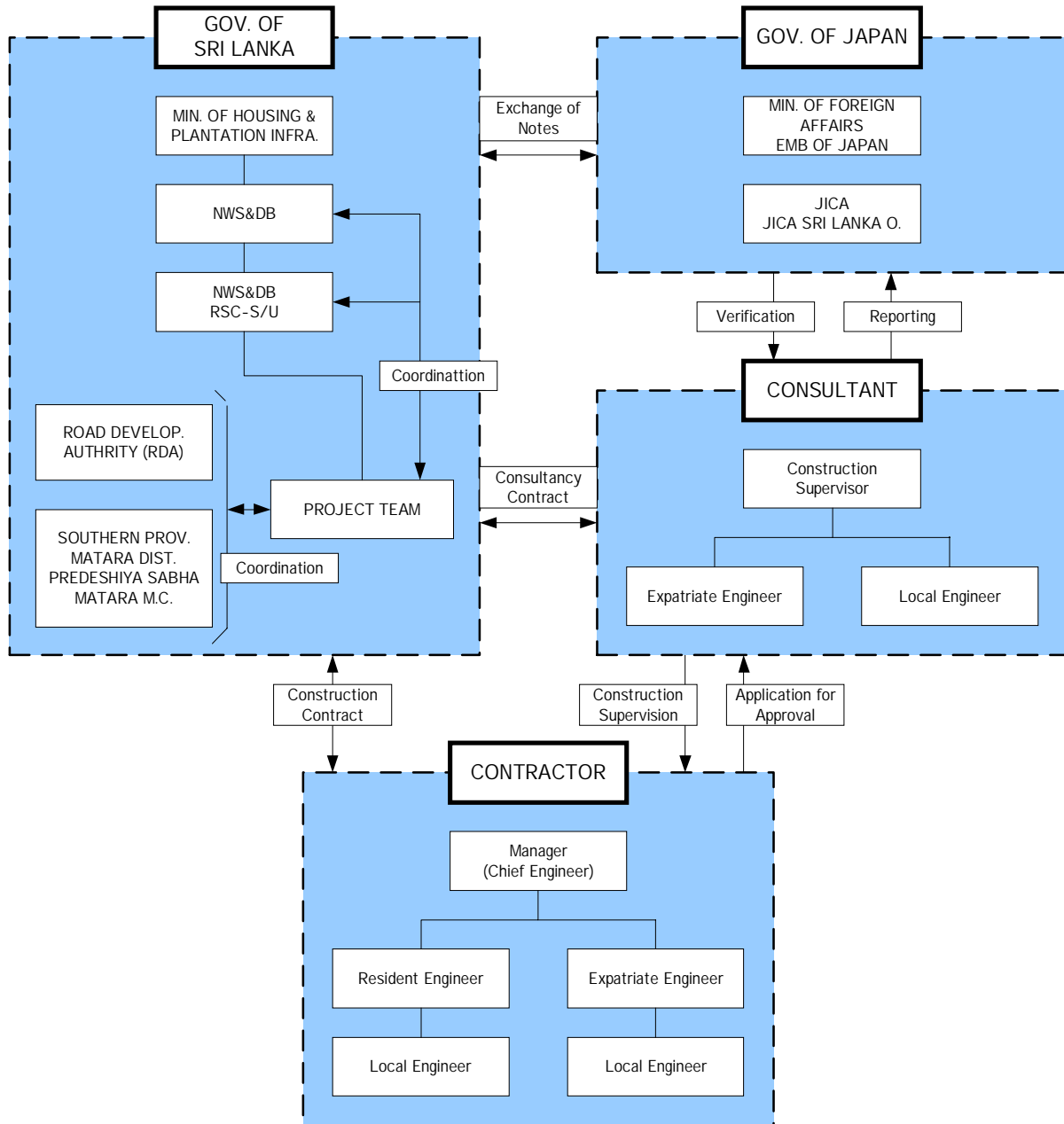


## 2-2-4 Implementation Plan

The executing agency of the Project is the National Water Supply & Drainage Board (NWS&DB) under the direction of the Ministry of Housing & Plantation Infrastructure. The implementation system is shown below in **FIGURE 2.8**.



**Figure 2.8 Project Implementation Diagram**

### 2-2-4-1 Implementation Policy

The project team, which will be organized in the Regional Support Center – Southern/Uva (RSC-S/U) of NWS&DB, shall be consistently in charge of the Project implementation from

the detailed design stage. The project team shall be responsible for the following work:

- Reception of NWS&DB for the Project
- Liaison and adjustment with the divisions concerned in NWS&DB
- Liaison and cooperation with the external agencies concerned with the Project
- Arrangement of designing and bidding works as the counterparts of the Japanese consultant
- Mobilisation of staff required for an additional survey and test, if any

The Japanese consultant will undertake the detailed design, bidding procedure and construction supervision in order to proceed with the construction work smoothly and to complete it within the given construction period. The consultant will send a civil engineer, who will be stationed in Matara, to supervise the whole of the construction work as an agent of NWS&DB, and other engineers as required; for example, at the completion time of the major facilities and at the end of the fiscal year.

The main part of the Project is to construct a water supply system composed of intake, raw water transmission, treatment, clear water transmission, storage and distribution facilities, and works at Kadduwa Intake and Malimbada WTP include the civil, architectural, mechanical and electrical ones, while others are pipe-laying works. It is considered appropriate that the Japanese civil engineering contractor who has experience in the construction of water supply facilities will undertake the work.

In selecting the contractor, the open bid system will be adopted and the qualification and selection criteria for bidders will be defined during the preparatory work for bidding through negotiation with and confirmation from NWS&DB.

The facilities will not function with one fiscal year construction works due to the following reasons:

- (1) Even though the construction works at Malimbada WTP and clear water transmission pipe-laying works will be done separately, they will take more than one year, respectively.
- (2) The project is composed of each component for intake, raw water transmission, treatment, clear water transmission, storage and distribution and will then function as a water supply system when all components will be completed and connected each other.

#### **2-2-4-2 Implementation Condition**

The local contractors in Sri Lanka have sufficient experience for the pipe-laying work and it will be no problem to use such a local contractor as a subcontractor for the pipe-laying work. The construction works at the intake and water treatment plant includes civil, architectural, mechanical and electrical components. There is little space for the contractor's management office in the premise of a water treatment plant, therefore, the contractor will be required to lease the private land taking into account the stockyard for ductile cast iron pipes to be imported. The following is the special consideration in the construction works.

- (1) During the pump replacement work at Kadduwa Intake which cannot stop operation, the contractor will make a elaborate construction plan for existing structure reinforcement, pump replacement and piping in the pump station and discuss with the officer in charge of the intake.
- (2) The rock excavation with explosion will be necessary near the existing water treatment facilities and a quarter in the construction works at Malimbada WTP. As the WTP also cannot stop operation, the construction works should be proceeded carefully paying full attention to no trouble in WTP operation and safety for a quarter.
- (3) The road running in front of Malimbada WTP, the span crossing river with a sandbar continuously and the section where the new inland transmission pipes run in parallel with an existing coastal transmission pipes near Gandara Service Reservoir are under the jurisdiction of RDA. There may be sever conditions for pipe-laying works from RDA. The contractor is required to discuss the works with RDA and comply with its guideline.
- (4) The river crossing works at the drainage pump station and drainage gate bridges will be scheduled out of the flood season with no trouble in pump and gate operation.
- (5) The pipes are in principle laid under the public roads. In Sri Lanka, the contractor who undertakes the pipe-laying works is responsible for by temporary pavement and regular pavement will be done by the road administration office such as RDA, Matara district, Predeshiya Sabha and Matara Municipal Council through the payment of allotment for ewinstatement.
- (6) When explosion method will be used in the pipe-laying works for rock excavation, the contractor should pay full attention to traffic control and safety of surrounding residents.
- (7) There is no example that the Environmental Impact Assessment (EIA) was required for the construction of a water treatment plant in Sri Lanka. However it is favorable

to take the Environmental Protection License (EPL) for smooth plant operation without trouble. It is required to take this EPL one (3) month before the plant will enter into operation.

#### **2-2-4-3 Scope of Work**

The land acquisition cost shall be borne by the Sri Lanka side. There are two sites to be acquired, namely (1) wastewater treatment facility site to treat backwash drain, etc. near Malimbada WTP and a new service reservoir site at Diyagaha.

For the site grading, the wastewater treatment facility site has been already developed as a flat land and left unused. The new service reservoir site is located on a hill with steep slope, therefore the use of construction cable is expected for material conveyance during the construction work, it is better to leave it up to the contractor.

The reinstatement cost for the roads that the pipe-laying works will be done shall be borne by the Sri Lanka side as proposed in the letter dated 7 October 2002 for the acceptance of the construction of a new water supply system with a treatment capacity of 15,000 m<sup>3</sup>/day by the Japanese side.

For drawing a power line and water pipe into the proposed sites, there is no problem in case of the wastewater treatment facility site, since power line and water pipes are running on the road in front of the site. There is an existing power line along the road on the foot of a new service reservoir and a water pipe will be available in the Project implementation.

In the facilities to be constructed in the premises of Kadduwa Intake and Malimbada WTP, gates and fence have been already provided. However it is necessary to provide a gate and fence for the wastewater treatment facility site and new service reservoir sites by the Sri Lanka side at the completion time of the Project.

There are some defects in the existing coastal clear water transmission system which will interfere the flow of water when the flowrate in the pipelines will be increased by the completion of the Project

#### **2-2-4-4 Consultant Supervision**

(1) Detailed Design

In case the Government of Japan decides to implement the Project based on the result of the basic design study, then the E/N will be concluded between the Government of Japan and the Government of Sri Lanka will make a contract with the Japanese consultant, the Government of Japan will verify the contract, and the consultant will start the detailed design.

Upon commencement of the work, the consultant will conduct topographical survey, soil investigation and detailed field surveys in the field, make a detailed design and prepare design drawings and documents.

## (2) Bidding

After the approval of all bidding documents by NWS&DB, the consultant will enter into the bidding stage. As an agent of NWS&DB, the consultant will undertake a series of following works.

- (1) To receive the prequalification applications from bidders one week after the prequalification declaration.
- (2) To appraise the prequalification applications immediately after receipt and select the prequalified bidders
- (3) To distribute the bidding documents to the prequalified bidders and conduct the bidding after taking one month as preparation period in the presence of the staff of JICA and NWS&DB
- (4) To assist in the contract negotiations and conclusion between the successful bidder and NWS&DB.

## (3) Construction Supervision

The construction work at the intake and water treatment plant consists of civil, architectural, mechanical, and electrical works, while transmission and distribution works are mainly pipe-laying. The resident engineer to be sent by the consultant will be a civil engineer and architects, mechanical and electrical engineers will be sent for a short time (at the completion of the major facilities for example). Additionally, local engineers will be hired to assist the consultant's resident engineer due to many construction site for the intake, water treatment plant, service reservoir, transmission and distribution pipelines.

The consultant's resident engineer will hold close meetings with NWS&DB, other agencies

concerned and with the Japanese contractor in order to implement the Project and to strictly comply with the submission of regular reports to the JICA Sri Lanka office.

#### (4) Technical Guidance for Plant Operation

At the time of completion, the contractor provides technical guidance on operation and maintenance of facilities for one month. There are many skilled plant operators since Malimbada WTP is operated and maintained as a leading plant in the RSC-S/U and the same treatment processes as the existing ones are adopted in the Project, the special technical guidance will be necessary. An advantage of the BNR method is that it can realize a high nutrient removal rate for items other than organic matter. On the other hand, there are a lot of monitoring/control items.

#### **2-2-4-5 Procurement Plan**

The construction materials necessary for the Project shall be procured in Sri Lanka to the greatest extent possible; however, those items which are not obtainable in a country or of which the quality or specifications do not meet the requirements, cannot be reliably procured with regard to distribution volume or cost shall be procured from Japan or third countries.

##### (1) Materials to be procured in Sri Lanka

sand, gravel, cement, brick, concrete block, framing wood, concrete aggregate, ready-mixed concrete, reinforcing bar, poly-vinyl chloride (PVC) pipe, light oil, gasoline, etc.

The quality of these materials is based on the British Standard and are considered sufficient for the Project.

##### (2) Materials/equipment to be procured from Japan

water intake pump, water transmission pump, chlorinator, chlorine-feed pump, chlorine leakage detector, chemical tank, valves and gates used at the intake and WTP (part)

##### (3) Materials/equipment to be procured from third countries

ductile cast iron pipe, electric panel for power receiving, power distribution, instrumentation and equipment, flow meter, level gauge, pressure gauge, valves and gates used at the intake and WTP (part)

The materials and equipment to be procured from Japan and third countries will be transported from Colombo Port to a stockyard in Matara via A2 road of which milage is about 160 km.

(1) Materials/equipment to be procured from Japan

Yokohama Port (Japan) Colombo Port (Sri lanka) (via A2 road) Matara

(2) Materials/equipment to be procured from third countries

Embarkation Port (third country) Colombo Port (Sri Lanka)  
(via A2 road) Matara

#### **2-2-4-6 Quality Control Plan**

The structures to be constructed and goods to be used in the Project are required to have function and quality based on the standards and criteria specified in the general specifications, particular specifications, drawings and so on studied and prepared in the detailed design stage. Through the application of proper quality control methods at the construction works, the civil and architectural structures to be constructed at the sites will be designed based on the British Standards (BS), and the quality of goods to be delivered to the sites will be confirmed to comply with the design requirements. The concrete quality will be checked by the tests for concrete strength, slump, water-cement ratio, etc in the field in addition to the preliminary verification of concrete aggregate quality, concrete conditioning, concrete placement plan and so on.

The following standards and criteria will be applied to the materials and construction works.

Standards for structural calculation

BS 8110 : 1985 – For framed building structures

BS 8007 : 1987 – For water retaining structure

The following British Standards (BS) and other internationally-accepted standards will be used In the detailed design work.

BS 5950 – Structural steel  
BS 5400 – Building and related structures  
BS 8004 – Foundations  
BS 6399 Part 1 – Design loading for buildings – Live Loads  
BS CP3 Chapter V Part 2 – Basic data for the design of buildings – Wind Loads  
BS 6312 – Guide to selection of constructional sealants  
BS 4449 – Hot rolled steel bars for the reinforced concrete  
BS 4461 – Cold worked steel bars for the reinforced concrete  
BS 5328 – Specification for concrete including ready-mixed concrete  
ISO 4179 – Ductile iron pipes for pressure and non-pressure pipelines – Centrifugal  
cement mortar lining – General requirements  
BS 4772 : 1988 – Ductile iron pipes and fittings  
BS 5155 : 1984 Butterfly valves  
BS 5150 : 1990 Cast iron gate valves  
Or equivalent quality to those stipulated in the above standards

For ductile cast iron pipes, ISO standards are applied regarding dimensions of goods and quality control in the manufacturing process, the consultant will check each quality one by one when ductile cast iron pipes will be delivered to the stockyard in Matara and require the replacement of nit acceptable pipes without cost to NWS&DB.

#### **2-2-4-7 Implementation Schedule**

A total of 30 months is required for the Project implementation including six (6) months for detailed design, 20 months for construction works with one (1) month for test operation, and some months for bidding procedures, as shown in **FIGURE 2.9**. Upon completion of the Project, the contractor will provide technical guidance during the test run for one (1) month.



Table 2.9 Implementation Schedule

