

## 9. POST CONSTRUCTION PHASE

### 9.1 FOR COMMUNITY APPROACH

#### 9.1.1 Interaction with Community (Users)

Post-construction assessment is done after the bridge has been completed. It is very important that the bridge has been built well and serves the people for a long time. For this purpose, a meeting has to be organized giving 7 days' notice for compulsory participation of all the users, all the members of the UC, local bridge crafts-persons, and the members of the VDC and the DDC. The donors and others supporting the bridge building are also invited in the meeting. But their presence is not compulsory. The agenda of the meeting is:

- Final Inspection and Issuing the Work Completion Report;
- Disclosure of financial resources and expenditures;
- Formation of Bridge Maintenance Committee for Routine Maintenance;
- Hand over of tools to the BMC
- Environment effect assessment
- Issues on Routine and Major Maintenance

The DDC technician takes the lead role in explaining the technical aspects of the bridge and the importance of maintenance and taking care of the bridge.

#### 9.1.2 Bridge Final Inspection

Once the bridge construction is complete, the DDC technician has to perform a Final Inspection (Check) of the bridge. This is the concluding process in Community Bridge Building. This process addresses the final inspection of the bridge from a technical point of view. The final inspection is to result in a "Work Completion Certificate" confirming that the bridge has been constructed following the SSTB norms and standards. For the procedures of this Final Check, the technician has to refer to the SSTB Manual and the Design and Drawings of the particular bridge.

The DDC must have trained technicians capable of performing a quality Final Check. For this purpose the DDC should recruit the right number of technicians for training as suggested by the SUPPORTING AGENCY. Like all other technical support to the UCs, and obviously for the Final Check as well, the DDC has to create a pool of technicians ranging from Engineers to Sub-overseers. In order to make the inspection a participatory one, it is better to apply local measuring indicators to assess the quality. For example, one can take comparative indicators like full moon (*Purnima*) vs. crescent moon (*Aadha*) and new moon (*Aunsi*). Or one can use the Venn diagram to let the users evaluate their job. During the assessment, if the job is found completed, issue the Work Completion Certificate. In case, there are still some works to be completed, let the users complete the jobs and ask them to inform the DDC. For this, give the users the remaining work to be done in writing and let them draw a new action plan.

#### 9.1.3 Environment Effect Assessment

It is necessary to assess the effect (positive or negative), created by the new bridge on the locality. Discussions with the users on this subject have to be recorded. The effect concerns natural/geographic/climatology and, social and economic changes in the area.

#### 9.1.4 Disclosure of Cost

At the final community meeting, information on the total cost estimation, including breakdown, quantity estimates and contributions as planned by each stakeholder has to be presented. The DDC technician should explain all the information. Calculate the total costs and the actual contribution made by each stakeholder. Be sure to include the contribution of all: the UC, the users, labour (to be derived from the Project Book and expressed in NRs.), the VDC/DDC, the SUPPORTING AGENCY

and others involved. The UC also has to show how the resources of different kinds and types from different sources were utilized, i.e., resource utilisation from a financial perspective. This entails calculating the total cost and its breakdown into the various components, as well as the breakdown of contributions by each stakeholder. Disclose this information to the users. Any doubts and questions by the users must be fully addressed. The users have to approve the results, once all doubts have been satisfactorily addressed. This is a **public auditing**. The DDC technician has to listen carefully to the users if there is any difference of opinion. If such differences are observed, let the UC clarify this and satisfy the concerned. As this is the most sensitive step, give everybody a chance to speak out to guarantee positive results.

### 9.1.5 Routine Maintenance and Responsibility Allocation

The bridge is the property of the Community. Therefore, it goes without saying that the Community has to take proper care of the routine maintenance to enhance the life expectancy of their bridge. A Bridge Maintenance Committee (BMC) has to be established to perform the routine maintenance. Upon completion of the construction, the tools used are to be handed over to the newly formed BMC. The roles and responsibilities of the BMC need to be well discussed and understood during the process. From the very beginning, the users are the owners of the SUPPORTING AGENCY Supported Bridge. Hence, there is no need of handing over once the bridge has been completed. A Users' Committee carries out the construction of the bridge, and during the construction, the users at large observe the performance of the UC members. Therefore, while forming a Bridge Maintenance Committee (BMC), the users will choose the UC members on the basis of their performance during the construction phase. They can add members to the BMC by choosing some interested bridge users that live in the vicinity of the bridge, if they so wish. The BMC can consist of all the UC members and the bridge builders involved. Or it can be a Committee formed by some chosen UC members, some chosen interested bridge users living in the vicinity of the bridge and the involved bridge builders. Whatever the case, **inclusion of the actual bridge builders in the BMC is a must**, because they know the technical details of the bridge and are able to monitor the condition and apply the proper maintenance measures. For sustained use and long life expectancy of the constructed bridge, a transparent and known system for maintenance has great importance.

After the formation of the BMC, the UC must hand over the remaining tools to the newly formed Committee. This will enable the BMC to ensure proper Routine Maintenance using these tools. Because of this handing-over, keeping a proper record of such tools by the UC is very important. The DDC has to monitor the use of such tools once they are handed over to the BMC. This is to prevent unnecessary and inappropriate use of the tools by bridge users or the BMC.

**Maintenance and Bridge Condition:** Maintenance has two facets. One is Routine Maintenance, which only includes cleaning of bridge parts, tightening of nuts and bolts, cleaning the debris and re-fixing the dry stones. Another is Major Maintenance, which includes changing the walkway deck, the crossbeams and the wire net and the maintenance of the foundation walls. Routine Maintenance is not very demanding, but Major Maintenance requires a considerably high financial input. However, if Routine Maintenance is done properly and regularly, Major Maintenance is less necessary and could be postponed, thus saving a lot of money.

The DDC has to make the BMC entirely responsible for the Routine Maintenance. For the Major Maintenance, the DDC has to make the BMC responsible in managing the work, but the DDC has to provide the financial requirement with local authorities like the VDC and outside agencies if available in the district. Finally, the DDC has to monitor the condition of the bridges supported through the DDC and also others, if there are any in the district. Monitoring the bridge condition will enable the DDC to assess the performance of the BMC and to decide whether to employ the BMC for the Major Maintenance as well. After the Major Maintenance, the DDC has to keep a record of the resources received and utilized, including the final assessment of the job done.

### 9.1.6 Bridge Completion Report and Certificate

Once the final assessment is done, the Bridge Completion Report and the Work Completion Certificate are issued:

The formats are given in the SOS manual, Vol. 2.

## **9.2 FOR CONTRACTING APPROACH**

### **9.2.1 Final Check**

After the Work Completion Report (WCR) is received along with the Quality Assurance Document from the contractor, the Inspecting Engineer shall visit the site for the Final Check. The work may be a new bridge or major maintenance of an old one. The following points need to be checked:

- \* All the cables are adequately pre-tensioned. The free cable ends are properly protected to prevent the cable strands from unwinding.
- \* No nuts, bolts, washers or clamps are missing or loose.
- \* Check that the wire mesh is of required size and required specifications.
- \* The non-galvanized threaded steel parts are painted with coaltar.
- \* The suspenders are true to the vertical and in proper tension.
- \* The towers are true to the vertical (Suspension bridge).
- \* All the windties and windguy cables are in design geometry and in proper tension.
- \* The bridge is not tilted or skewed.
- \* The protective structures are as per the design.
- \* Access to the bridge is proper and functional.
- \* The bridge surroundings, approach trail, drains, retaining structures and other relevant structures are properly cleaned off dirt and surplus excavated or construction materials. The minimum clearance of all the steel parts from the ground surface has been maintained.
- \* And the overall appearance of the completed bridge looks aesthetically impressive.

The IE shall take relevant photos.

The IE shall give written instructions to the contractor for rectification if the work is unsatisfactory. The IE has to fill in the Inspection Form for final Inspection and submit it along with a copy of the site instructions given to the contractor and relevant photos.

The IE shall issue the Work Completion Certificate (WCC) along with the filled-in Inspection Form for final Inspection and relevant photos.

### **9.2.2 Work Completion Certificate**

After the bridge is accepted fully, the employer issues a certificate. For detail refer to Chapter 8.4.2.2.

### **9.3.3 Maintenance Period**

The contractor is responsible for maintenance of any defects occurred during the maintenance period of six months. Maintenance period is counted from the date of issue of Work Completion Certificate.