

Managing the Construction Process for Government Projects in the Philippines

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Summary

Development efforts in the Philippines have created a construction sector with considerable concern about policies that have been pursued and implemented in the past. Previous experiences and accumulated bottlenecks in project implementation combined with the present Asian regional financial crisis are strongly affecting the construction sector and therefore a need to rethink and analyse the present construction management procedures and policies as well as policy improvements to identify the areas which need reforms are in order. In the light of large government budget deficits, the Philippine Government must take strong initiative to analyse and rethink its strategy to maximize and optimize its financial resources.

Foremost in the agenda for improvement is the planning and design capability to allow formulation of appropriate design criteria for various structures. Since natural calamities that are common in the country have tremendous effect on structures, it is a must that these should clearly be considered in the preparation of design standards. Time has come to reconsider past strategies and to update design guidelines. Second, it is crucial that supervision services be strengthened to ensure that quality is never, under any circumstances, compromised. And finally, maintenance planning and property management should be given serious attention. Although we have to build structures with appropriate design standards and correct workmanship such that the facility should be able to last its economic life, deterioration of facilities is a continuing process and so must maintenance be in order to succeed.

This paper describes and analyses the construction management process generally undertaken for government projects in the Philippines applying the Implementing Rules and Regulations of Presidential Decree No. 54. It has for its case study the reconstruction of the two-storey 1,000 square meters Asian Development Bank Project Management Office Building located in 2nd Street, Port Area, Manila, Philippines. It is structured in three major parts: Design Stage, Production Stage and the Property Management Stage. In each part, management

and administrative procedures as it had been done for the Project was discussed. The objective is to review how this Project was implemented as well as outline general experiences encountered by the writer during each stage of project management which are typical of most construction projects and the conclusions derived from these experiences which could be used as baseline for policy-makers for future policy-making decisions. Solutions vary and are most often based on local construction standards and cultural influences. Lastly, an epilogue in the last part is presented to reemphasize and focus on the most important points of the paper as described above.

Introduction

Construction plays a vital role in the development of a country. Over the past years, the Philippines has emerged to be an economic tiger despite the recent currency turmoil in the Southeast Asian Region. The Government is confident that the economy will remain on its track and continues to manifest strength and stability.



Figure 1. Map of the Republic of the Philippines

For this paper, I have chosen as a case study the reconstruction of the two-storey, 1,000 square meters Asian Development Bank-Project Management Office Building located in the DPWH Compound, 2nd Street, Port Area, Manila.

It should be noted that for projects financed partly or wholly from international financing institutions such as World Bank or Asian Development Bank, as well as from bilateral and other similar sources, the international conditions of contract or FIDIC and the rules and regulations of the specific “Bank” or the more commonly-used term “Bank Guidelines” apply.

However, for purposes of discussing local rules, regulations and practices, this paper will describe the construction management procedure as it has been applied to a locally-funded government project.

Aim of the Paper

This paper aims to describe and analyze the construction management process that has been applied by the Asian Development Bank Project Management Office under the Department of Public Works and Highways to a locally-funded government building project, the reconstruction of the two-storey 1,000 square meters Asian Development Bank Project Management Office Building located in 2nd Street, Port Area, Manila Philippines hereafter referred to as the Project.

This paper also intends to discuss actual experiences and problems insofar as construction management procedures in locally-funded government projects in the Philippines are concerned which could provide baseline for future policy-making decisions.

Economic and Political Conditions

In order for the reader to have a clearer understanding of the Philippine construction industry, it would be essential to provide a brief background of the economic and political situations in the country and how these sectors affect the construction industry in general and the Project in particular.

Economic

The Philippine economic growth in the last five years was propelled mainly by exports followed by investments. The remittances of overseas workers together with investment income from abroad were the major factors contributing to the country’s continued economic stability.

Like its counterparts in many developing countries, the construction industry in the Philippines is an essential contributor to national development and economic growth. Compared to the economy’s major industry sectors, construction ranks second to manufacturing in terms of output and share to total employment.

In general, the upward trend in construction demand is attributable to the stable political situation and sound economic conditions of the Government despite the present financial crisis being experienced by the Southeast Asian Region. Significant policy reforms put in place by the Government greatly influenced the direction and growth of construction investments in the country.

The Government has increased capital outlay for infrastructure especially in the rural areas. The enactment of Republic Act 6959 known as the BOT Law (Build-Operate-Transfer) in 1990 opened up vast opportunities for tapping the resources, initiatives and active participation of the private sector to support the Government’s programs such as development of power plants, mass transit railway lines, road and bridge networks, international airport facilities, housing programs. The law allows private business to build, finance, operate and maintain an infrastructure facility for the Government with the agreement that the businessman can collect tolls, fees and rates on the facility over a period of time, and turning the facility over to the Government after a prescribed period of time. With the BOT Law, the Government can not focus on building the necessary infrastructure facilities without being duly constrained by budgetary and funding deficiencies.

Demand for residential construction has also increased with the implementation of the Urban Development Housing Act of 1992 and the Comprehensive & Integrated Shelter and Urban Financing Act.

Generally, the country’s policy direction is towards liberalization. In the light of globalization, the Government also had to push for a full utilization of developmental loans. It enacted Republic Act 8182, known as the Official Development Assistance (ODA) Act of 1996, to exclude ODA from the foreign debt limit so as to facilitate and optimize the utilization of ODA resources. Provided in this Act, among others, is the preference of funding rural infrastructures, countryside development and economic zones.

The Infrastructure Program of the Government under the Medium Term Philippine Development Plan is financed from both local and foreign-sourced funds. Local funds are derived from continuing annual budgetary appropriations (Public Works Act and the General Appropriations Act), government equity contributions to government-owned or controlled corporations, corporate earnings, grants and national government and corporate domestic borrowings. Government corporations source foreign funds out from the national government’s contract loans and direct foreign obligations. Most foreign loans of the country come from foreign and international lending institutions such as the World Bank, Asian Development Bank, United States Agency for International Development, Japan Overseas Economic Cooperation Fund among others.

The Philippines belongs to the Association of South East Asian Nations and is a member country of the Asian Development Bank, which has its main headquarters in Mandaluyong City, Philippines.

Political

The Philippines is a democratic state headed by a President directly elected by the people for a term of six years. A bicameral legislature consists of the House of Representatives whose members are elected for three-year terms and the Senate whose members are elected every six years. Judicial power is vested in the Supreme Court and lower courts. It is divided into 78 provinces headed by governors and 1608 towns and cities headed by

mayors. To run the country more efficiently, the provinces are grouped into 16 administrative regions.

The Project, the Participants and the Process

The Project

The Project, the reconstruction of the Asian Development Bank Project Management Office Building, is located at the DPWH National Capital Region Compound, 2nd Street, Port Area, Manila. The building reconstruction includes the utilization of some structural components of the building such as columns and outer beams, demolition and replacement of the roof beams, additional stiffeners, partitions, flooring and roofing, electrical works, plumbing works and mechanical works.

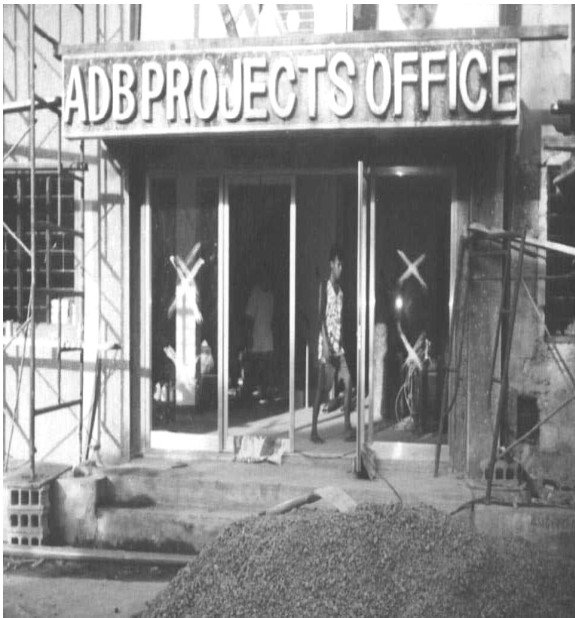


Figure 2. The Project

The Participants

In the Philippines, there are three main groups of participants in the construction process. These are the owners, contractors and consultants. The owners or clients of the construction projects can be classified as either public or private groups. Public sector refers to government agencies which implements public construction projects while private sector are those private entities which undertakes private residential, commercial and industrial construction.

The major infrastructure agencies in the Philippines are the Department of Public Works and Highways (DPWH) and the Department of Transportation and Communications.

The Owner of the Project is DPWH, the national infrastructure arm of the Philippines. Composed of about 20,000 personnel nation-wide, the DPWH is headed by the Secretary and assisted by 4 Undersecretaries. The major or key organizational units are: 6 staff services (Administrative and Manpower Management Service,

Comptrollership and Financial Management Service, Legal Service, Internal Audit Service, Monitoring and Information Service and Planning Service); 5 staff bureaus (Bureau of Research and Standards, Bureau of Equipment, Bureau of Maintenance, Bureau of Design and Bureau of Construction); 16 administrative regional offices (with about 116 district engineering offices) and Project Management Offices implementing foreign-assisted projects, three of the biggest are the project management offices for World Bank-assisted, Japan Overseas Economic Cooperation Fund-assisted and the Asian Development Bank-assisted projects. Following is the simplified organizational chart of DPWH showing the line and staff relationships of various offices.

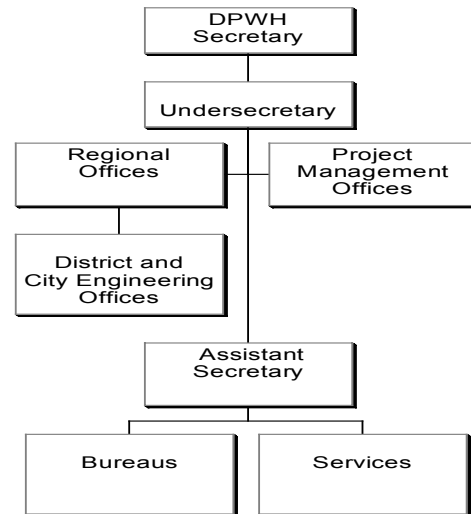


Figure 3. Simplified DPWH Organizational Chart

The implementing office of the Project is the Asian Development Bank Project Management Office, hereafter referred to as the Executing Agency. It is headed by a Project Director and supported by Project

Managers and about 60 technical and administrative support staff. Also under the control and direction of the Project Director are international and domestic consultants, as well as staff, who have been engaged to assist the Executing Agency in the detailed engineering and construction supervision of various infrastructure projects.

The Executing Agency provided administrative and technical supervision for the Project. A Project Manager and a Project Engineer (as well as technical and administrative support staff) were assigned to take charge of the supervision services for the Project.

The Contractor of the Project is W. Red Construction and Development Corporation, hereafter referred to as the Contractor, with its Office located at 23 Judge Juan Luna Street, San Francisco del Monte, Quezon City.

The Process

In the Philippines, there are two distinct systems that govern the tendering and implementation of public and private construction contracts.

Private Construction

Contractors are usually selected on the basis of their reputations as competent builders or in consideration of

their personal relationships with the project owner. Private contracts are also generally negotiated or tendered through sealed canvass bidding. The contract is awarded at the price agreed upon through the negotiation process. The terms and conditions of the contract constitute the law or agreement between the contracting parties.

Public Construction

Another law – Presidential Decree No. 1594 and its Implementing Rules and Regulations (much like the AB 92 of Sweden) primarily governs government infrastructure contracts, particularly those funded from local appropriations, by the contract terms and conditions. However, for projects funded partly or wholly from foreign financing, the International Conditions of Contract or “FIDIC” and the Bank Guidelines apply.

The Implementing Rules and Regulations of Presidential Decree No. 1594 and Its Objectives

As an overview, Presidential Decree No. 1594 has been formulated and approved by the Government of the Philippines to adopt a comprehensive, uniform and updated set of policies and guidelines, rules and regulations covering government contracts for government infrastructure and other construction projects in order to achieve a more efficient and effective implementation of these projects. It is intended to:

- Bring about maximum efficiency in project implementation and minimize project cost and contract variations through sound practices in construction management;
- Promote healthy partnership between the government and the private sector in furthering national development, and
- Enhance the growth of the local construction industry and optimize the use of indigenous manpower, materials and other resources.

Generally, government construction projects are undertaken by contract after competitive public bidding. Projects may be undertaken by administration or “force account” or by negotiated contract only in exceptional cases where time is of the essence, or where there is lack of qualified bidders or contractors, or where there is a conclusive evidence that greater economy and efficiency would be achieved through this arrangement.

Design Stage

In this part, it is intended to discuss the Project organization, specific contracting procedures applied, project planning, project financing, budget control, information technology and other relevant experiences which may be useful in future projects.



Figure 4. Construction in Progress

Project Organization

The Project is a locally funded project and consequently, the Executing Agency without consultants directly undertook the detailed engineering and construction supervision. Shown here is the typical organizational chart of a project management office in the DPWH.

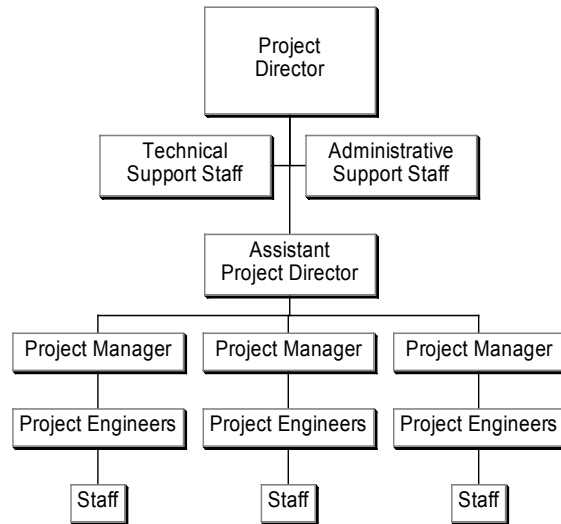


Figure 5. Typical Organizational Chart of a Project Management Office

The Project Director recommends to the DPWH Undersecretary for approval the Project documents. These includes the plans and specifications, programs of work, contract documents, change orders, progress payments and other documents pertaining to the Project. He has overall responsibility for the implementation of all projects being implemented by the Project Management Office concerned.

The Project Manager:

- Inspects and monitors the work to ensure compliance with requirements.
- Resolves conflict on technical matters relative to drawings, specifications and other contract documents.

- Coordinates with local government units and other agencies concerned regarding the Project.
- Provides overall management and makes recommendation to the Project Director.
- Conducts weekly coordination meeting with Contractor.

The Project Engineer or Resident Engineer on site:

- Supervises the implementation of work.
- Foresees potential problems and inform the Project Manager accordingly.
- Reviews the Contractor's request for any changes in the Project and makes recommendation.
- Supervises the testing of materials and prepares and submits a summary of the monthly testing results.
- Assists the Project Manager in the overall construction administration that basically includes identifying the problems and resolving it.
- Monitor closely the performance of the Contractor from the approved schedule to the actual progress.
- Prepares and submits progress reports, supervises the implementation of the work and recommends to the Project Manager accordingly.
- Checks the materials and workmanship.
- Records all approved deviations and review the as-built plans.
- Recommends turnover and acceptance.

Procurement and Contracting Procedures

Procurement of capable contractors is one of the basic ingredients for a successful implementation of a project. There can, however, be no guarantee that an ideal contractor will always be chosen. The DPWH has instituted a standardized procurement procedure to ensure that the most suitable contractor for the project is employed.

Prequalification of Contractors

The prequalification of contractors was done by the Executing Agency including the preparation of the tender documents that were issued to prequalified contractors. For a prospective contractor to be qualified, he/she must meet certain technical requirements that will enable him/her to satisfactorily implement the Project, such as:

- A. Technical
 1. Experience and Capability (track record of completed similar projects)
 2. Equipment (quantity and quality owned/pledged to be used for the project)
 3. Qualifications of Key Personnel (Project Manager and key staff)
- B. Financial
 1. Present Net Worth on Working Capital
 2. Credit Line
 3. Working Capital

To determine the financial capacity of the contractor, a statement from a bank or a financing institution authorized/licensed by the Central Bank of the Philippines that the bank/financing institution commits to provide the contractor, if awarded the contract, a credit line in an amount specified by the Executing Agency which is equal to the average operating expenses of the project for two

(2) months or ten percent (10%) of the approximate total project cost, whichever is less, or a cash deposit certificate in the amount specified. The Cash Deposit Certificate is released only by the Executing Agency only when the cost of the remaining works is 10% of the total project cost or when the contract time remaining is less than two months before completion as certified by the Executing Agency through the issuance of a Statement of Work Accomplished.

The Prequalification, Bid and Awards Committee also checks the contractor-applicant's performance in his on-going government and private projects. If there is a reported slippage (difference between scheduled and actual accomplishment per approved PERT/CPM and approved revisions usually indicated in percentage negative) of more than 15%, unsatisfactory quality of work and/or performance of his obligations under his contracts, and if these causes are found due to his fault or negligence, the contractor-applicant is predisqualified to participate in the bidding.

Government construction projects are usually undertaken by contract after competitive public bidding. Projects may be undertaken by administration or "force account". However, negotiated contract may be entered into under exceptional cases where time is of the essence, or where there is lack of qualified bidders or contractors, or where there is a conclusive evidence that greater economy and efficiency would be achieved through this arrangement but only with prior authority from the Secretary of Public Works and Highways (for projects costing P10 Million and below) or the President of the Philippines (for projects costing above P10 Million). A project may be negotiated only under special circumstances such as:

1. In times of emergencies, where time is of the essence, arising from natural calamities where immediate action is necessary to prevent imminent loss or life or property or to restore vital public services such as collapsed bridges or buildings, cut road sections or breached dikes;
2. Where the project is adjacent or contiguous to an ongoing project and it could be more economical that the project be prosecuted by the same contractor less mobilization costs, and provided that he has no slippage and has demonstrated a satisfactory performance in his on-going project.
3. Failure to award after two(2) public biddings for valid causes.

Generally, contractors are invited to bid through advertisement of at least three (3) times in at least 2 newspapers of general circulation.

Before the submission of bids, a pre-bid conference for the Project was done to allow prequalified contractors to clarify matters pertaining to the project. Presidential Decree No. 1594 prescribes the two-envelope system that requires a bidder to comply with certain requirements.

Each bid was submitted in two sealed envelopes, envelope No. 1 containing all the legal and technical documentation such as: Authority of the Signing Official, Construction Schedule and S-Curve, Construction Methodology, Project Organizational Chart, Manpower Schedule, Equipment Schedule, Site Inspection

Certificate, Bid Security (2 ½ % of the total bid price in the form of cash, manager’s check, bank or surety bond, callable on demand) and Certification that the detailed estimates and payments schedule are in the second envelope. Envelope No. 2 should contain the bid prices in the bill of quantities, detailed estimates and cash flow by quarter and payments schedule.

The approved agency estimate (DPWH’s estimate) is held confidential until the bidding date.

Award Limitations

The award of contract for government contracts in the Philippines is subject to certain parameters or limits. The law says that no award of contract should be made to a bidder whose bid price is higher than the approved agency estimate (AAE) or allowable government estimate (AGE) whichever is higher or lower than 70% of the AGE. AGE is equal to one half of the sum of the AAE and the average of all responsive bids.

$$AGE = AAE + \frac{\sum \text{Responsive Bids}}{N}$$

For purposes of determining the average of all responsive bids, bids higher than 120% of the AAE or lower than 60% of the AAE are not considered.

The Executing Agency may declare a failure of bidding in the event of any of the following condition and may conduct a rebidding:

1. When no bids are received.
2. When all bids received are higher than 120% of the AAE or lower than 60% of the AAE
3. Failure to award the contract with award limitations.

The Executing Agency has the right to reject all bids and declare a failure of bidding if it finds reason to suspect an evident collusion among contractors and to disregard any bid that is obviously unbalanced, particularly in the major items. An unbalanced bid is a bid containing one or more pay items that are 30% higher than the unit AGE in respect to major items (equal or greater than the AAE).

Project Planning

Following are the activities done by the Executing Agency in the design and project-planning phase for this Project:

1. Preparation of project concept and project parameters.
2. Site Investigation and Geotechnical Investigation.
3. Analysis of preliminary designs, general outline drawings and specifications of structural, civil and building services
4. Preparation of detailed architectural drawings comprising floor plans showing finishes and all non-structural elements and partitions, sections, ceiling plans, interior walls, doors, windows and finishing schedules
5. Detailed engineering analysis of structural framing system
6. Detailed engineering analysis of designs on the Building Services comprising: Plumbing,

- Mechanical, HVAC, Electrical, Communication, Safety and Security
7. Preparation of the Bill of Quantities and Cost Estimates.
8. Preparation of the Final Design Report and the detail design drawings.

The above designs were made adopting the National Building Code of the Philippines, otherwise known as Presidential Decree No. 1096, which embodies criteria for building design, construction, use, occupancy and maintenance. Works were estimated to be finished in 180 calendar days.

Project Financing

The funds for the Project were taken from two sources. The Government Service Insurance System released P3 Million and the remaining P8 Million was taken from the Calendar Year 1996 Quick Response Fund of DPWH. A Certificate of Availability of Funds released under a Special Allotment Release Order No. F3-96-0052 was issued for the Project.

Budget and Budget Control

Before implementing the Project, the Program of Work was prepared by the Executing Agency. The Program of Work showed the estimates of the work items, quantities and costs, estimate of the actual number of working days required to complete the project including the unworkable days considered unfavorable for the prosecution of the project and a PERT/CPM network of the project activities.

Normally, DPWH allows total mark-up (Overhead, Contingencies and Miscellaneous plus Profit) between 20 to 30%. Following was the breakdown of the budget cost:

<i>Item</i>	<i>% of Total</i>	<i>Amount (in pesos)</i>
A. Direct Cost	71.43	7,279,695.47
B. Mob/Demob Cost(2% of A)	1.43	145,593.91
C. Indirect Cost		
C.1 Overhead, Contingency and Misc. (OCM) (13% of A)	9.29	946,360.41
C.2 Profit (15% of A)	10.71	1,091,954.32
C.3 VAT (10% of A)	7.14	727,969.55
D. Total Construction Cost	100	10,191,573.65
E. Project Management Cost (5% of D)		509,578.68
Estimated Project Cost		10,701,152.34

Information Technology

The plans were prepared using AutoCAD Software and the estimates were prepared using theTIMBERLAND Program from Canada introduced in Manila by Cannfil. The PRIMAVERA Software, a project management tool, was utilized for the preparation of time and cost bar charts as well as the PERT/CPM and S-Curves.

Experiences to use in Future Projects

Following are some of the general experiences encountered by the Executing Agency during project design phase (pre-construction phase):

1. Unsatisfactory level of surveys. In government projects in the Philippines, there are too many cases of construction schedule delays, cost overruns or at times poor quality of work. The reasons may be attributed to: (a) non-existence of essential data than can only be available when there have been enough examples of similar projects in the past; (b) inadequate surveys either because of lack of time or lack of funds; or (c) unsatisfactory level of designer's or foreign consultant's expertise and technology maybe because of their lack of experience of local conditions. The weak points in surveys are mostly during the project identification survey, pre-feasibility survey and the reconnaissance survey. These surveys are carried out in order to obtain funding for projects including foreign technical assistance funding. However, at this stage, funds for the project are usually not yet allocated and the funds available for the surveys are usually inadequate, sometimes non-existent. The only funds available for this type of survey are funds from local recurrent budget that is usually very tight. If surveys of this type are inadequate, projects cannot be identified effectively, their priority cannot be accurately assigned and the development plan as a whole cannot be conducted appropriately. For such preparatory surveys to be carried out effectively, sufficient local funds need to be appropriated.
2. Omissions and errors in the design drawings prepared by consultants. Generally, the Philippines, which avail of foreign loans or financing assistance, are required, as part of the loan agreement, to hire foreign consultants, who might not be too familiar with the local conditions resulting in omissions and errors in the preparation of the design plans and specifications. On the other hand, local consultants, as a matter of policy, are paid much lower than their foreign counterparts resulting in low level of performance. Given the tight budgetary situation, it is understandable for the Government to limit the budgets including funds for consulting services. However, remuneration for local consultants needs to be raised in order that more effective services may reasonably be expected of them. At present, there is little incentive for local consultants to improve the quality of their work and as a result, expensive foreign consultants have to be employed. Local consultants' fees should be raised and this is the best way to encourage technology transfer to local consultants. Otherwise, the country has to rely more on foreign consultants who, in most cases, have little or no familiarity at all with the local conditions. Also, the Government has insitutionalized a system of penalizing delinquent or erring contractors by blacklisting them from entering into any contracts with any government agencies. However, to date, there has yet a system established to penalize erring consultants who have caused the government great deal of money through defective or deficient design drawings.
3. Disorderly collection and arrangement of survey data. Survey data are frequently collected in different ways owing to the fact that consultants, even foreign ones, conduct most surveys. Survey results are frequently incompatible or cannot be measured meaningfully. In such a situation, the usefulness of data is limited. To avoid this inconvenience, it is necessary to have a computerized or systematized data collection of technical standards and methods.
4. Inappropriate design criteria. Inappropriate or at times unacceptably low design criteria are sometimes seen in some cases. Given the fact that natural conditions such as strong typhoons, earthquakes and volcanic eruptions are existing in the Philippines and these have a tremendous effect on infrastructures, more cautious provisions should be incorporated into the design standards. Because of insufficient budgets, cost saving is always a prime task for the Government and this sometimes results in inappropriate or at times, too low a level of design standards. Technical standards should always be prepared on scientific grounds and if this aspect is neglected the level of work will inevitably be inadequate, the life span of the product will be shortened, maintenance will be difficult and repair cost will increase. In the Philippines, maintenance and repair are usually more difficult, costly and time-consuming.
5. Insufficient attention to safety, disaster prevention and environment protection. Allocation of funds for this purpose is always difficult in the Government where the need for new construction or production is pressing. Even though development is greatly needed, safety and environment protection must be given due attention in order to make development itself sustainable and ensure that it contributes to enhancing the quality of people's lives. Such considerations should be clearly reflected in the design standards. Applied design standards are not always optimal, realistic or at times, appropriate. It is necessary to prepare such standards taking into account local conditions. Also, facilities related to a project are often inadequate or dangerous. Safety standards for construction work need to be more stringent. People's lives are even more likely to be affected by social environment degradation in developing countries, so careful attention should be paid to project impact on people's lives.
6. Design change during implementation. This matter is one that tends to escape notice but it is very important. Sometimes design specifications are altered during implementation without due consideration to possible consequences. And then there would be a problem between price negotiation between the government and the contractor, which might result in possible delays in completion. It is therefore important that careful attention should be given in preparing the design to avoid or at the very

least minimize any design changes during implementation, which inevitably lead to delays.

7. Excessive amount of time for procurement. In some cases, too much time is devoted to procurement that if we compare project implementation schedules with procurement schedules, they often require almost the same amount of time including award and contract perfection. Slow procurement does not always equal to careful procurement. If there is too much time devoted to procurement, we open up to opportunities for various adverse pressures from different parties (most of them are politicians) regarding the contract procurement. Shortening to the best possible time could eliminate corruption.

Conclusions

In the light of large government budget deficits, time has come to reconsider past strategies and to update design guidelines. There is a need to improve planning and design capability by means of training and cooperative studies especially in the Philippines where infrastructure are almost always affected by natural calamities like (earthquakes, supertyphoons, volcanic eruptions and at times, man-made factors such as heavy user loads. Such considerations should clearly be taken into account and therefore, design standards should be updated considering these local phenomena.

There is also an apparently growing need for development and the government could set up reform policies. Planning and policy objectives may be well advised to focus increasingly but gradually on first, enlarging the utilization of resources domestically and locally available in terms of building materials, intermediate manufactures and other supplies, labor and skills, technologies and know-hows as well as domestic financing; and second, allowing sufficient time during the planning process for a specific project to be valued against various criteria before going to the next stage of determining the design and preparing the detailed technical plans.

However, the accomplishment of these targets can not be easily achieved. There should be a fundamental change in the development aspirations of the Government as well in the current practice of forecasting and planning the construction sector. Furthermore, it is common that basic planning data and reference targets of the national plan (which have to be introduced and considered as early at the planning stage) are frequently neglected.

Despite the fact that in some cases, economic and technical analysis are still incomplete, construction projects are often included in the national plans and thereby have to cope with time constraints.

Production Stage

This part intends to discuss the tendering and contracting process as well as the construction methodology undertaken to implement the Project. Experiences generally encountered during construction stage are also presented in this part.

Tendering

The Executing Agency has obtained authority from the Secretary of Public Works and Highways for this Project to be undertaken through simplified bidding. What is simplified bidding? In a capsule, simplified bidding is basically bidding without advertisement, an integral ingredient of a public bidding. The Executing Agency has reviewed the track record of several contractors who have experiences in building projects. A longlist was sourced from an in-house database. After review of the longlist, the Executing Agency came up with a shortlist of four (4) contractors who were invited to submit prequalification statements for evaluation. These contractors are:

1. W. Red Construction and Development Corporation
2. R. R. Encabo Construction and Traders
3. Performance Builders and Developers
4. R. C. Tagala Construction

The Executing Agency evaluated the prequalification statements submitted by the four contractors that were invited and they were all found to be qualified to bid based on their technical capability gauged by the extent and quality of their relevant experience, performance and track record, the suitability of their available construction equipment, adequacy of the proposed project organization and personnel, financial capacity and compliance to administrative and legal requirements. A Resolution approved by the Prequalification, Bids and Awards Committee chaired by the Undersecretary for Operations was issued prequalifying the four contractors.

Four bids were received and these were opened and read in the presence of the bidder's representatives. Each bid was submitted in two sealed envelopes, Envelope No. 1 containing all the legal and technical documentation and Envelope No. 2 with the bid and detailed estimates. For this particular project, when Envelope Nos. 1 were opened to check and verify the compliance with the requirements, the envelope of Performance Builders did not contain the PERT/CPM and Construction Method and because of this, the corresponding Envelope No. 2 which contained the bid, were returned to Performance Builders unopened. The other three bidders have satisfactorily complied with the documentary requirements in Envelope No. 1 and therefore their bids were opened and read as follows:

<u>Bidder</u>	<u>Bid Amount</u>	<u>AAE Variance</u>
R. C. Tagala	P12,101,434.10	13.08%above
W. Red	P11,430,272.16	6.81% above
R.R. Encabo	P13,695,787.26	27.98%above

The Government's Approved Agency Estimate that was held confidential until the bidding date was read during the bid opening as P10,701,152.34. The contract was awarded to W. Red Construction and Development Corporation for offering the lowest responsive bid.

Contracting

The contract was awarded to W. Red Construction and Development Corporation, hereafter referred to as the Contractor, at the price of P11,430,272.16.

A unit-price form of contract was employed for this Project. This is the most common form of contract in the public sector in the Philippines and it simply means that the final contract cost is dependent on the actual quantities installed or constructed because it is very seldom that government projects in the Philippines have had no variation orders.

Upon approval of the contract, the Contractor posted a performance bond in the form of a surety bond equivalent to 10% of the contract price to guarantee the faithful performance of the Contractor of his contractual obligations. The Performance Bond could also be in the form of cash, manager's check, cashier's check, and bank guarantee or surety bond. Then, the government issued the Notice to Proceed that became effective 10 days after contract approval. The contract time was set at 180 calendar days.

Production Planning

The Project requires manpower-intensive operation with the support of equipment. At the start, manpower and equipment were immediately deployed at the job site based on the priority of utilization. Other manpower and equipment requirements were mobilized based on the submitted Manpower and Equipment Utilization Schedule.

The Project required the following equipment to be provided by the Contractor: one (1) unit Stake Truck, one (1) unit Wheel Loader, two (2) units Concrete Mixer, two (2) units Concrete Vibrator, one (1) unit Concrete Buggy, one (1) unit Portalift, one (1) unit Plate Compactor, one (1) unit Bar Cutter, one (1) unit Bar Bender, one (1) unit Water Tank, one (1) unit Dump Truck and one (1) unit Crane.

Construction of the Project started with the erection of scaffolds for the demolition of the existing roof beams and clearing of all possible areas in order to facilitate a smooth flow of work. Excavation for structures followed then the placing of gravel fill and simultaneously after compaction, the placing of rebars for wall footings and stiffeners. Concreting of wall footings and stiffener foundation commenced followed by the layout of CHB for walls and concreting of stiffeners. Simultaneously, preparation of formworks for roof beams followed before actual pouring of concrete. After concreting of all roof beams has been completed, scaffolds had been gradually removed to allow room for the preparation of floor joists and flooring. However, some bench had been left while curing of roof beams has been finished. After removing all formworks, installation of trusses and purlins and laying of CHB for outerwalls have proceeded. Then, partitioning, ceiling, electrical works and plumbing works followed. Finishing works also started on some portion of the building. Simultaneous with the finishing works, painting and varnishing was done.

As soon as the contract was awarded and the Notice to Proceed issued by the Executing Agency, the Contractor posted key personnel in the jobsite, provided equipment to be used and erected temporary works. The layout was planned so that their removal during the execution of the permanent works would be easy. The Contractor's organization was not excessively staffed to ensure efficient job execution.

The Contractor submitted and implemented a safety plan to include measures to be taken to protect the workers, safety devices were installed and first aid facilities were provided. He provided enough copies of the plans and specifications and distributed them among his staff so that they could be thoroughly acquainted with the details.

The Contractor was also generally responsible for the following:

1. Obtaining necessary licenses and permits in connection with the contract
2. Siting and making access to site
3. Erection of temporary site office
4. Construction of temporary quarters
5. Arrangement for construction equipment and tools
6. Arrangement for labor and materials sufficiently in advance to avoid delays.
7. Taking Safety Precautions
8. Purchasing Materials
9. Disposal of materials obtained from demolition.

The Contractor analyzed his requirement of materials and determined the sequence in which they must be purchased. They referred to the material quotations received at the time of preparing his tender for the job. Materials that will be needed first were given first attention such as concrete materials, formworks, nails etc. Following this, reinforcing steel, framing timbers were considered next. A program for purchase was prepared. Without a program, the purchasing is liable to result in the arrival of things either too soon or too late, with the possible consequence of prolonged storage at the site and possible deterioration or loss, or it is late, causing delay at work.

Quality Assurance

An efficient organization should produce not only an output but also a product or service having quality not lower than the standard specified. Output without quality gains nothing and any organization that lacks in maintaining its quality standards fails to fulfil its purpose. The interest of quality and quantity (output) tend to conflict with each other and one of the most important problems in construction is to increase output while maintaining quality and this should never, under any circumstances, be compromised.

Materials Quality Control Program

The Contractor prepared the Materials Quality Control Program and the Project Engineer approved this. The Materials Quality Program contains the type and number of testing to be done for each material. Most of the testing standards being used in the Philippines are adopted from

the American Testing Standards. DPWH strictly requires that material sample specimens are tested in accredited laboratory testing centers and witnessed by a Government representative. The Government's Materials Engineer, under the supervision of the Project Engineer, made sure all materials delivered have undergone strict inspection and all materials incorporated in the project have passed all required tests accordingly.

When the Project reached an accomplishment of 95% of the total contract amount, the contract time was suspended and the Government upon the request of the Contractor convened the Quality Assurance Unit Inspectorate Team, a composite inspectorate team, to make preliminary inspection and to submit a punchlist that will contain the remaining works and work deficiencies for necessary corrections in preparation for the final turnover of the project. These will be done with the remaining time duration left.

DPWH Secretary Gregorio R. Vigilar has created the Quality Assurance Units in 1995 to strengthen the quality assurance program of the Department. The Quality Assurance Unit is composed of representatives from the Bureau of Design, Bureau of Construction, Bureau of Maintenance and Bureau of Research and Standards and are tasked to conduct a quarterly assessment of projects, both completed and on-going. They are also responsible for inspecting projects to determine completion and acceptance.

Economic Control – Budget Review and Reconciliation

This stage intends to discuss the financial program of the Contractor, the mode of payments made to the Contractor including provisions for price adjustments as well as the conditions when a variation order (and its associated cost) and time extension can be issued.

Financial Program of the Contractor

Upon approval of the contract, the Contractor requested the Government for an advance payment not exceeding 15% of the contract price but only upon the submission and acceptance by the Government of an irrevocable standby letter of credit of equivalent value from a commercial bank or a guarantee bond, callable on demand. This advance payment will be repaid by the Contractor by deducting 20% from his periodic progress payments with the first repayment to be made when the contract value of the work executed and materials delivered shall equal or have exceeded 20% of the contract price.

A capitalization of two (2) months operating expenses or P1,000,000 was considered sufficient by the Executing Agency for the Contractor to start the Project, considering that there will be a 15% Advance Payment of P1,714,540.82 bringing the total capitalization to P2,814,540.82. Following is the scheduled monthly accomplishment:

1 ST Month	-	0.08%
2 nd Month	-	5.87%
3 rd Month	-	16.50%

4 th Month	-	24.26%
5 th Month	-	38.98%
6 th Month	-	14.31%
Total	-	100%

Once a month or for an accomplishment of at least P1 million, the contractor submits a request for payment of work accomplished. Such request for payment is verified and certified by the Project Engineer/Manager. Progress payments are subjected to retention of 10% referred to as "retention money". Such retention is based on the total amount due to the contractor prior to any deduction and shall be retained from every progress payment until 50% of the value of works are completed provided the work is done satisfactorily and on schedule. The total retention money will only be released upon final acceptance of the project and will answer for uncorrected defects and remaining works.

In some projects such as this, increase or decrease in quantities or reclassification of items is necessary to suit actual field conditions or as a great disparity between plans "bidding plans" and "as staked plans" or construction drawings prepared after a joint survey by the contractor and the government. In this case, the Government may issue a variation order. A variation order may be in the form of a change order or an extra work order. A change order may be issued when there is a decrease or increase in the original quantities or a reclassification of item. An extra work order, on the other hand, is issued where (a) there are additional works needed and necessary for the completion of the project which were not included in the original contract; (b) where there are unknown physical conditions at the site of an unusual nature.

If the project engineer believes a change order or an extra work order is necessary, he prepares the proposed order accompanied with the necessary plans, backup calculations or computations indicating the quantities of the additional works per item and indicating where the specific locations are needed and a detailed estimate of the work including the justification for such a need, for approval by the Project Director or Undersecretary whenever applicable. The cost of the extra work is based on the item costs in the original contract. However, if the extra work involves items not included in the original contract, the unit prices will have to be reviewed and approved by the DPWH Estimating Committee.

A separate Supplemental Agreement is issued for all change orders and extra work orders if the aggregate amount exceeds 25% of the original contract price.

The Project Engineer recommends payment requested by the contractor for any extra work and accompanied by a statement, giving a detailed accounting and record of amount for which he claims payment.

Should the amount of additional work entitle the Contractor for an additional time, then an extension of contract time is allowed. However, no time extension is granted to the Contractor for ordinary unfavorable weather conditions, non-availability of equipment or materials for which causes the Government is not responsible or when the affected activities do not fall within the critical path of the approved PERT/CPM network.

For this Project, overruns occurred in some quantities amounting to about 10% of the contract price. The cost will be incorporated in the Final Change Order.

Adjustment or escalation of prices for work accomplishment on infrastructure construction are allowed using a parametric formula to compensate for fluctuation of prices of construction supplies and materials, equipment and labor which would bring about during the period under consideration where an increase or decrease of more than 5% of the original contract unit prices of items of work occurred.

Project Monitoring

To ensure timely and effective remedial steps in response to delays in project implementation, Department Order No. 102, series of 1988 was issued for strict implementation. For projects with:

1. Slippage of 5% (Early Warning Stage) – The contractor shall be given a warning and required to submit a catch-up program to eliminate the slippage and the Project Engineer shall provide thorough supervision and monitoring of the project.
2. Slippage of 10% (ICU Stage) – The contractor shall be given a second warning and required to submit a detailed action program on a fortnightly (two weeks) basis which commits him to accelerate the work over a defined time period. Furthermore, the contractor shall be instructed to specify the additional input resources, money, manpower, materials, equipment and management – which should be mobilized for the project.
3. Slippage of 15% (Make or Break Stage) – The contractor shall be issued a final warning and required to come up with a more detailed program (weekly) together with the required additional input resources.
4. Slippage beyond 15% (Terminal Stage) – The Project Engineer initiates termination or rescission of the contract and take-over the remaining work by administration or assignment to another contractor.

In all cases, the Project Engineer and the Project Manager are both held accountable for the success or failure of the project implementation including the slippages incurred and the elimination thereof.

If the project is terminated (that means the cause is not due to the Contractor's fault), the Contractor is paid for all items of work executed and accomplished at the rates and prices prescribed in the contract including the reasonable cost of removal of the construction plant as well as the cost of materials or goods delivered on site and accepted by the Project Engineer.

If the project is rescinded (that means the cause is due to the Contractor's fault or negligence), the Contractor will be blacklisted and all monies (performance bond, retention money and progress payments due him for the Project as well as for other government projects) is withheld to cover the cost of completing the Project.

When all the works have been finished and executed in accordance with the plans and specifications as provided

in the Contractor, the DPWH will conduct the final inspection. Upon notice from the Contractor of the completion of all the Works, the DPWH will constitute the Quality Assurance Units for final inspection. If however, any work, in whole or in part, is found unsatisfactory, the Quality Assurance Unit will issue a Punchlist indicating the works to be redone and the Contractor should comply with these instructions. Upon completion of the works, the DPWH will issue the Certificate of Completion, on which date the warranty period will commence.

If the Contractor fails to complete the work within the specified contract time, he pays the Government liquidated damages equivalent to the following:

$$LD = 0.75 \times CP/CP \text{ where:}$$

LD is the liquidated damage

CP is the total contract price minus the value of the completed portion

CT is the contract time plus all approved time extensions

In no case should the LD exceed 15% of the total contract price. Otherwise, the performance bond is forfeited. An incentive bonus, not to exceed 10% of the total contract price is given for projects completed ahead of schedule without any suspension order or time extension granted and is computed by the formula:

$$IB = 0.75 \times VWA \text{ where:}$$

IB is the incentive bonus

VWA is the value of works accomplished ahead of time

Experiences to use in Future Projects

Following are some of the general experiences encountered by the Executing Agency during the Production Stage:

1. The Problem of unreasonably low price. Excessive attention to procurement does not always result in optimal procurement. It sometimes results in inadequate procurement, if not worse. The Government sometimes tries very hard to get the lowest price but the lowest price may not always be the best price. If the contract price is too low, the contractor will be tempted to cut costs including costs that are vital to maintaining quality. If it is not possible to reduce his costs in his way, the contractor may terminate the contract or worse, abandon the project. If this happens, the government may opt for another bidding that will definitely increase the project costs and may delay the implementation of the project to the detriment of the beneficiaries. And if the contractor continues to work, he will have to shoulder all the losses. Then, the contractor will surely be weakened or worse, bankrupt.
2. Problems resulting from terminating or rescinding a contract. More attention should be paid to this problem. If an on-going work is terminated, even though the payment made to the contractor can be recovered or recouped through the performance bond, the loss caused by delayed implementation is usually much greater than the amount covered by the bond. The inconvenience suffered by the beneficiaries is also great. The best way to prevent this may be the

introduction of the performance guarantee system, where a performance guarantee is issued by a reliable system. This is what we do with foreign-assisted projects where we require contractors to post performance guarantee only in the form of a letter of credit or a bank guarantee. Since these forms are quite difficult and expensive to obtain, the contractors would be having second thoughts asking for a termination of the contract.

3. Bureaucracy in the processing of change orders. Sometimes change orders are inevitable. Judgement is always important on the part of the project engineer or project manager. The processing of the change orders should be streamlined. As a rule, works covered by a change order cannot be started unless the change order is approved. The long period of approving the change order can cause interruptions and delays in the implementation of the project that will result in serious consequences, as in the construction period will be extended, cost will be increased and the quality of work may be impaired. If this matter will not be properly dealt with, even how excellent the design is, it will be of little use.
4. Unreliable cost estimation. Even though the final contract price will be determined through bidding, the cost estimates made by the owner or the owner's consultants still needs to be accurate and reliable. Standard unit prices should be adopted. If this is not carried out, it is very difficult to answer criticisms from the public regarding contract price. Competitive bidding may not always be the best method for procurement. In such case as a very small project or when a project calls for a technology of a limited number of contractors, competitive bidding can even be unfairly disadvantageous to the project. If the project is too small or is to be implemented in a place where there are very few contractors interested, competitive bidding may not always give the best results. A negotiated contract can always be a second option. However, if there is no standard unit prices, negotiation would be very difficult to carry out effectively and the contract price may appear doubtful. It would also be hard to convince everyone of the appropriateness of the prices. So we have to go back to competitive bidding.
5. Unsatisfactory workmanship and loose supervision. One of the most important reasons for the low level of quality of construction is deviation from the approved design and specifications. Unsatisfactory workmanship and loose supervision caused this. Poor design or poor workmanship can either cause the failure of a project. If the design is right and the project is a failure, then workmanship is poor. The background to this is that there is always a strong pressure to cut costs by reducing quality arising from a cutthroat competition among contractors to get a project. If one wants to have good project, one must be ready to pay more. Good quality almost always means more money.
6. Inadequate capability of contractor. What ultimately determines the quality of work is the capability of the contractor. No matter what efforts are made by the

owner, no matter how excellent the supervisory consultants are, if the capability of contractor is inadequate, satisfactory quality of work cannot be attained. Every effort needs to be made to choose a capable contractor through the procurement procedure. There can, however, be no guarantee that an ideal contractor will always be chosen. If the contractor's capability is found to be inadequate after commencement of work, the best approach may not be to terminate or rescind the contract but to help the contractor by means of technical and managerial support services.

7. Too much reliance on foreign consultants, foreign contractors and imported materials. Foreign contractors and consultants as well as imported materials enjoy a privileged access to the scarce resource of foreign currency, which tends to generate a bias towards the use of local inputs. Hence, in cases, where appropriate, governments could decrease foreign firms' foreign exchange quotas and to persuade them to employ local contractors, materials, equipment as well as engineering design.
8. Insufficient attention to safety and disaster prevention. A number of accidents have occurred in building construction sites in the country. Implementation of Safety Standards needs to be more stringent. People's lives are affected and so careful attention should be paid to protect these lives.

Conclusions

Inadequate capability of contractors, too much reliance on foreign consultants, and poor supervision are only some of the experiences generally encountered during the implementation stage. Foremost, supervision services should be strengthened. It is necessary to employ experienced consultants for supervision. However, unlike survey or design, supervisory services last quite a long time and therefore, if a large number foreign consultants will be employed, the cost of supervision will be too great. It is therefore more economical to employ experienced local consultants who could be retirees, both from the government and private sectors for this purpose. However, remuneration for local consultants needs to be raised in order that a more effective service maybe reasonably expected of them.

Policies to strengthen and promote the utilization of domestic resources in terms of availability and factor price proportion should also be pursued. A larger and better utilization of locally available building materials and development of appropriate project design (product technology) should be considered whenever possible and feasible in order to reduce dependency on increasingly expensive materials and equipment imports and to save on the scarce capital factor. This applies to both financing capital in foreign and in national currency. Such a strategy implies as a first priority target the development of a construction technology policy to be based (1) on existing building materials and capability and efficiency of domestic construction and building materials and (2) on development potential. Furthermore, action should be taken by the Government to get domestic contractors

more involved. However, particular attention should be given to the strengthening of the domestic contractors' entrepreneurial capabilities in terms of organization and management, by training courses and seminars or assistance on-the-job in order for them to be more competitive with the foreign ones. The Government should also provide progress payments promptly according to schedule and speedy settlements for completed projects.

Property Management

Facilities not maintained will cease to fulfil their intended functions. Wear and tear sets in immediately after construction. Individual components eventually fail, in turn, causing damage to other components. It is therefore necessary to have a good system of property management.

Life Cycle Economy

In government projects in the Philippines, a Warranty Period of one (1) year is provided and calculated from the date of final completion of the contract works as certified by the Executing Agency. Within the above prescribed period, the Contractor should maintain the facility at his own expense and is liable for any failure or defect noted which is traceable to poor workmanship, use of poor quality materials or non-compliance to plans and specifications. The Contractor, at his own expense, should correct the defects and failure or refusal to do so will warrant the Executing Agency to carry out the corrective work with all the consequential expenses consequential chargeable from any monies due to the Contractor. However, defects and failures due to ordinary wear and tear and for causes other than the fault of the Contractor shall not be taken against the Contractor.

After one year, a certificate of acceptance is issued by Executing Agency the facility is now turned-over to the Government for property management or maintenance. However, the Contractor, after the date of issuance of a Certificate of Final Acceptance for the project, remains criminally and administratively liable for any damages or defects discovered on the works due to faulty construction and or use of materials of inferior quality as provided under Article 1723 of the Civil Code of the Philippines.

Maintenance Planning

Maintenance is works done to keep a facility in, or restore it to, a condition where it can perform its intended functions. In the DPWH, maintenance for all facilities are done by the Regional or District Engineering Offices where the facilities are located and the activities are divided into:

1. Preventive Maintenance and Routine Maintenance where works are carried out to a predetermined plan to reduce the risk of failure. It is done at regular intervals.
2. Corrective Maintenance where works are carried out after failure has occurred.

3. Emergency Repair works where works are done to avoid serious consequences.

The DPWH sets aside regular maintenance funding for maintenance of infrastructure facilities. Funds are released directly to the Regional Offices and District Engineering Offices where the facilities are situated since the maintenance responsibility is already vested in the Regional Directors and District Engineers upon the turnover of these facilities after completion and acceptance. Figure 6 shows the Organizational Chart of Offices in DPWH responsible for maintenance planning and maintenance of facilities.

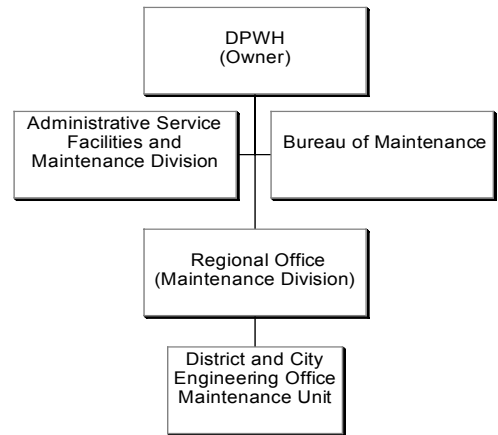


Figure 6. DPWH Maintenance Organization

This DPWH National Capital Region, where the structure is situated will maintain this Project upon its completion. Regular Maintenance Fund appropriated annually from the DPWH Infrastructure Budget will be released for maintenance purpose. However, it is worth mentioning that DPWH also avails portion of foreign loans to finance a Preventive Maintenance Program for repair/rehabilitation of infrastructure.

When the facility is damaged by calamities like typhoons or earthquake, the DPWH has a separate funding called the Quick Response Fund, where immediate repair works are charged but only to make the structure habitable or usable (for unroofed or collapsed buildings) or just to ensure mobility (for cut-off roads and bridges) or to prevent further damage (for breached dikes).

The DPWH has institutionalized a system of assessing and rating the condition of a particular facility. A maintenance inspector may rate the condition of a facility as Very Good, Good, Fair and Poor ratings. The rating system is then used to assess or prioritize which facilities need immediate attention and the appropriate maintenance activities required.

The DPWH also has, as one of its program, the Maintenance by Contract system. Under this system, maintenance of facility could be contracted out to as much as 50% of the total maintenance funding of the region or district engineering offices. The remaining 50% are done through Maintenance by Administration since the DPWH should have some maintenance capability

(equipment and labor) to address emergency situations especially in times of calamities.

Connection to the Design Stage – Feedback

In the Philippines where limited funds for maintenance are available, maintenance planning should be given serious consideration. From one viewpoint, higher priority should be given to maintenance and rehabilitation of infrastructure rather than to new infrastructure construction. The rationale is given this way: “Why do we have to build and construct when we cannot even properly maintain the existing infrastructure facilities?”

This policy may be right theoretically but a policy that provides more funds for maintenance and rehabilitation than for new construction may have an unexpected impact on national development strategy. If we think this way, we might be sending a wrong signal to the community that since it is all right to appropriate large funds for maintenance, one might think that the quality of new construction would be degraded. Because if we build structures properly, say a road, with correct design standards and workmanship, the road should be able to last its economic life. But we have seen cases where roads deteriorate say in 2 or 3 years after construction. It would therefore be economically disastrous to cut costs and quality during construction with the thinking that a larger maintenance costs would be appropriated later. It should be remembered that the best way to maintain a construction project is to construct a high-quality product to reduce maintenance and repair costs.

Shortage of funds is often given as a reason for poor maintenance. Of course, funds are required, but positive results can be achieved with limited budgets if maintenance work is approached in a systematic way with well-defined priorities. Poor maintenance or lack of it results from lack of consciousness and motivation or interest among involved parties.

In the Philippines, maintenance and rehabilitation of government infrastructure are undertaken by the national government, if national facilities and by local government units, if local facilities, after completion since the property ownership is of the government.

Experiences to use in Future Projects

Following are some general experiences encountered by the Executing Agency during the warranty and maintenance period.

1. Contractor’s refusal or failure to undertake maintenance works during the warranty period. In some cases, contractors, after project completion, fail or refuse to do maintenance or repair works. Since it is still their contractual obligation to do so and there is no formal project acceptance by the Executing Agency yet, facilities are allowed to deteriorate during this period. The DPWH, in case of failure of the contractor to maintain the facility, may employ other entities or undertake the maintenance works by Administration with all consequential costs

chargeable against any monies due to the Contractor. This means non-release of their Performance Bond and the retention money. There is also the final billing that can be held by the Executing Agency.

2. Non-involvement in maintenance of most of the institutional staff and the public in general. Often, many people (including institutional staff) think that maintenance is none of their business and that they will not do anything even if they were the users of the facility. This attitude could probably be traced to the fact that the facilities are owned by the government and therefore, such attitudes make it easy for people not to exercise the kind of care they normally would give to their own homes and possessions. If users can be made to perceive that maintenance is everybody’s concern and business, then we are more than halfway with achieving our objective of less maintenance cost.
3. Use of foreign loans for rehabilitation. The shift in priority from new construction to maintenance and rehabilitation has also resulted in a shift in foreign assistance (including foreign loans) from new construction to maintenance and rehabilitation. Even though maintenance and rehabilitation are important, foreign assistance, especially loans should not be provided for it. If foreign loans are provided for maintenance and rehabilitation, it means the country has to shoulder two loans for one project. Such a policy will surely lead to burden problem. However important, maintenance should be carried out using the country’s own budget. That is, the beneficiary should shoulder the cost. Using foreign loans for maintenance and rehabilitation sometimes caused a bad effect on the people, causing them to forget their own responsibilities. Foreign assistance should be provided only for new capital expenditure and maintenance appropriations should be provided from one’s own budget.
4. Insufficient local government capability. In the Philippines, maintenance and rehabilitation of national facilities are undertaken by the national government after completion. But ownership of the local facilities is transferred to local government units with the enactment of the Philippine Local Government Code, along with the maintenance responsibilities and maintenance funds. However, in most cases, local government units are weak, in terms of both technical and managerial capabilities and therefore appropriate support from the national government should be provided.
5. Government’s failure to forfeit surety bonds of delinquent contractors. Under Presidential Decree No. 1594, performance bond could be in the form of a surety bond callable on demand. In the Philippines, contractors would often secure a surety bond issued by surety companies because of low premiums instead of other forms such as bank guarantee or letter of credit. However, this form has been an unreliable form of guarantee since surety companies have managed to always find reasons and ways not to pay the Government including filing of court cases. It would therefore be more advantageous to the

Government if the performance guarantee would be in the form of a letter of credit or a bank guarantee and since these are more expensive and difficult to obtain, the contractor would have second thoughts in neglecting the Project.

Conclusions

Facilities deteriorate from the moment they are constructed because of exposure to a variety of natural forces and from tear and wear by the users. The influence of natural forces varies with climate, design, materials and standards of workmanship. Deterioration of facilities, whether buildings or roads, is a continuing process and so must maintenance be in order to succeed. Regular maintenance, attending to the defects while they are still minor, is the most cost-effective strategy because replacement (which costs much more), will be required less often.

Therefore, it is important, particularly when starting such activities, that involved staff and other participants also perceive their work as an important activity and a permanent one at that. A forceful motivating factor is to know that maintenance funds are available and will be available in the future. So it is very essential for maintenance managers and maintenance staff to employ good maintenance planning and know which activities to prioritize for optimum fund utilization.

The creation of positive attitudes to maintenance – through an awareness of the importance of such activities – is essential to ensure that all involved parties are motivated to participate actively.

Furthermore, maintenance capacity building, especially for local government units, should be done by the national government to determine the training needs, outline the type and extent of training activities, identify appropriate training staff and facilities and to extend these trainings to the involved personnel.

Basic data should always be updated and supplemented. Inspection and monitoring of facilities, whether vertical or horizontal structures, should be continuously undertaken. Although time-consuming, inspection will allow maintenance managers to get full access to all information and most importantly, it should be carried out early enough to allow time for the analysis and completion of the maintenance planning. A list of priorities should then have to be made, especially if the works involved rehabilitation (meaning more funds), adapting to local conditions and reflecting the preferences of involved parties. However, if funds are very much limited, such interests might conflict and therefore efforts must be made to establish priorities acceptable to all parties involved.

Epilogue

The recent economic turmoil now being experienced by the Philippines and its neighboring countries in Southeast Asia has strongly affected the whole construction industry sector. It is therefore necessary that the Philippine Government takes strong initiative to analyze and rethink

its strategy to maximize and optimize its scarce financial resources. Foremost in the agenda for improvement are the planning and design capabilities. A need to improve the design and planning capability to allow formulation of appropriate design criteria for each structure must be addressed.

Since natural calamities like earthquakes, floods and supertyphoons and volcanic eruptions which are existing in the Philippines have a tremendous effect on structures, it is almost a must that such considerations should clearly be taken into account in the preparation of design standards. In the light of large government budget deficits, time has come to reconsider past strategies and to update design guidelines.

In the construction stage, unsatisfactory workmanship by contractors, loose supervision, insufficient attention to safety and disaster prevention is only some of the experiences encountered. Therefore, it is necessary that supervision services should be strengthened. It is also critical that only experienced consultants are employed for supervision to ensure quality output. It should be remembered that quality should never, under any circumstances, be compromised. Output without quality gains nothing and any organization that fails to maintain its quality standards fails to fulfil its purpose.

Finally, in the Philippines where limited funds for maintenance are available, maintenance planning should be given serious attention. From one viewpoint, higher priority should be given to maintenance and rehabilitation of infrastructure rather than to new infrastructure construction. The rationale is given this way: “Why do we have to build and construct when we cannot even properly maintain the existing infrastructure facilities?”

This policy may be right theoretically. But on the other hand, if we think this way, we might be sending a wrong signal that since it is alright to appropriate large funds for maintenance, one might think that the quality of new construction will be degraded. Because if we build structures properly with correct design standards and workmanship, the facility should be able to last its economic life and maintenance cost would be down to the minimum. But we have seen cases where newly constructed structures deteriorate say in 2 or 3 years after construction. It would therefore be economically disastrous to cut costs and quality during construction with the thinking that a larger maintenance costs would be appropriated later. It should be remembered that the best way to maintain a construction project is to construct a high-quality product to reduce maintenance and repair costs. Deterioration of facilities is a continuing process and so must maintenance be in order to succeed.

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