

## Role of Project Management Consultancy in Infrastructure Project

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**Abstract :** Infrastructure sector is a key driver for the Indian economy. The sector is highly responsible for propelling India's overall development and enjoys intense focus from Government for initiating policies that would ensure time-bound creation of world class infrastructure in the country. It deals with Roads, Railways, Urban infrastructure, Ports, Airports and Power. For such large projects, which includes large investments from government, highly skilled expertise is needed which ensures target completion of project by optimizing time and resources. This paper highlights various roles of a PMC in pre-tendering, tendering and post-tendering stage of a road infrastructure project starting from Client's requirement, conceptual alternatives, surveys and investigations, estimation to operation and closing stage.

**Keywords:** Project Management Consultancy(PMC), Role Matrix, Infrastructure Sector

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### I. Introduction

The Project Management Consultancy is a professional consulting firm with knowledge and experience in a specialized area of assisting organization that makes sure target completion of project. It plays various roles in many aspects for successful completion of the project using its highly skilled, qualified and experienced staff from inception to completion. Nowadays almost every infrastructure project is executed under planning and supervision of consultancy to maintain the required quality and prevent overruns. Hence to cope with the rapid growth in construction industry, PMC needs to carefully plan, organize, coordinate and execute the project.

This paper shows a generalized matrix of roles of PMC in a road construction project from initiation to closing of the project. PMC is most effective and efficient when it is involved in total project cycle. This includes overall planning, coordination, monitoring and controlling of a project in order to produce a functionally and financially viable project that will be completed on time, within authorized cost and with the required quality standards.

### II. Need For Project Management Consultancy

1. Lack of technical team which is highly skilled, qualified and experienced.
2. As large amount is involved in such projects, Client cannot just rely on contractor.
3. Lack of awareness to latest advanced technology.
4. Poor managerial skills for material, manpower and cost management of contractor.

### III. Methodology

#### 3.1 View of Client

As per requirement and provision in development plan, client needs to construct a proper road infrastructure project at a specific location. So because of unavailability of suitable or sufficient staff, time, etc. client wishes to appoint a consultant for the proposed project and hence client needs to publish a notice inviting "Request for Proposals" for consultants in National papers to inform consultants available in market.

#### 3.2 View of Consultant

After looking the notice, consultants need to fill the tender with proper study of project location, financial status of client, availability of concerned staffs, social issues in concerned areas, etc. The role may be specified in pre- tender or tender or post- tender stage or even regarding design related work.

#### 3.3 Eligibility of Consultant

Even after interest of consultant in such a competitive market, consultants need to fulfill the client's expectations from technical eligibility point of view such as past experience in prescribed duration of similar type of project, turnover, availability of staff, tax clearance certificates, etc. And even after that, financial bid quote of consultant also matters compared to other consultants. The lowest eligible bidder will be considered for award of contract, after conducting negotiations, if found satisfactory.

### 3.4 Appointment of Consultant

After fulfilling all selection criteria consultant needs to get approval with letter of acceptance(LOA) with client's concerned authorized person in front of standing committee of corporation. After approval at this stage, consultant gets work order from client's authorized person.

### 3.5 Roles of PMC in Road Infrastructure

**TABLE 1. Roles in Pre-tendering Stage**

Client's Requirement	Depends on provision of surrounding development as planned in city development plan.
Reconnaissance Survey	<ul style="list-style-type: none"> <li>• Study of development plan w.r.t connecting road network</li> <li>• Existing utility plan</li> <li>• Topographic survey</li> </ul>
Conceptual alternatives	Based on available topographic details, available space and traffic density various conceptual alternatives are prepared. For example, to provide subway or flyover, tunnel or open excavation, etc.
Cost Estimate	Approximate cost estimate is done based on unit cost of similar type of project
Prefeasibility report	Based on preliminary cost estimate feasibility of the project is determined.
Meeting and presentation	After submitting all prepared alternatives with corresponding tentative cost and feasibility, a meeting is held to show drawbacks and advantages of each alternative and the doubts/queries are clarified.
Approval	Approval of an alternative by the client depending upon the fund availability and suitability
After approval of an alternative detailed project report is prepared which shall include:	
Surveys and Investigations	Traffic survey and forecasting: Traffic count, origin-destination survey and cross-pedestrian survey, axle load survey and forecasting of traffic for the period of analysis using proper traffic growth rates derived from suitable methods.
	Topographic survey: Backbone of detailed engineering design as it gives base to decide type of project alternatives.
	Utility survey: It includes details of existing utilities like water supply lines, drainage lines, etc. in consultation with the respective authorities.
	Axle load survey: It includes tests to know the pavement performance and design.
Socio Economic study	Project location details and its contribution in income of state in the form of GSDP. Industries located in or near project area, transport connectivity, educational facilities, tourism, health and economy.
Drawings	It includes: general arrangement drawing, plan and profile, approach ramp details, drainage plan, utility shifting plan, electrical details, etc.
Detailed Engineering Design	Geometric design, design of pavements and shoulders, design of embankments, design of grade separator and intersection, etc.
Project Costing	Detailed estimate is prepared which shall include abstract, measurement, and rate analysis for all components of project. Estimates for land acquisition and utility relocation shall also be included if required.
Economic Analysis	Economic analysis shall include cost and benefits expected to occur in project life cycle because of construction of the project. It shall also include IRR, CBR, NPV, which will give idea about feasibility of the project.
Environmental Impact Assessment	It includes impact of project on environmental conditions at both construction and operation stage.
Approval from Client's side	It shall include getting technical sanction from various authorities or departments. It also includes justification of all work with their references and base such as IS code, IRC, MORTH, etc.

**TABLE 2. Roles in Tendering Stage**

Drafting Of Tender Documents	It includes: Tender notice Instructions to tenderers Conditions of contract(General, special and additional) Contract details Samples of forms and agreements Declaration of the contractor and tender form Schedule- B Bill of Quantities (BOQ) and Rate Analysis(RA) Item wise specifications and general technical specifications Scope of work Set of drawings
Publishing Notice For Inviting Tender	After approval of all above tender documents from client's authorized person tender notice will be published in national newspapers.
Sale of Tender Documents	According to conditions of payment above, to purchase tender, various contractors shall pay the related amount to client and will purchase tender copies for their study.
Prebid meeting	It includes: Verification of person's authority sent by contractor on behalf of company. Clarification of old doubts from contractor's side. Changes/rectifications of mistakes in some conditions mentioned in tender

	Informing contractor about the date of submission of tenders and bidding
Common set of Deviation (CSD)	It includes drafting of CSD which shall include various clauses in which changes were finalized in prebid meeting.
Bidding	Once the tender submission is completed on the dates given to the tenderer, bid opening shall be carried out in presence of authorized person of contractor and client. It includes technical and financial bid.
Work Order Stage	This stage includes intimating contractor about submission of performance security as decided in tender condition. After necessary documentary approval, contractor shall be issues work order(Day from which contractor's work period starts)

**TABLE 3. Roles in Post-Tendering Stage**

Follow up of Documentary work	It includes intimation to contractor for submission of necessary documents mentioned in tender, collection of same and verification, etc. The documents to be submitted are: Policies and insurances Layouts and facility details Mobilization advance Work programme and quality assurance manual Traffic diversion plan Staff details, etc.
Follow up in execution stage	This stage includes checking of all activities coming under finalized project which includes: Shifting of utilities Construction of service road Construction of finalized alternative Construction of storm water drainage system Electrical work Landscaping work Road furniture, signage, etc. In execution stage various roles are there for a consultant which includes supervision, instruction, compliance, etc.
Supervision	It includes follow up of request sent by concerned engineer for inspection of various activities prior to execution as decided in tender clauses. The request shall be for: Checking of coordinates Checking of excavation levels, strata Checking of shuttering Checking of steel reinforcement Checking of concreting Carrying out onsite or laboratory tests, etc. Giving instructions to adopt suitable measures Recording measurements
Review of Progress Reports and Work Programme	Verification, correction and keeping records of signed report of the same. It includes preparation of: Daily progress report Monthly progress report Status of financial progress, planned versus actual Details of advances and recoveries Details of RA bills Execution summery Status of guarantees/insurances Details of site meetings held. Review of work programme includes comparison of contractor's actual work progress with the planned programme submitted by the contractor. It gives the idea about lag or lead in various activities coming under project.
Quality Checking and Maintenance	It includes maintaining the quality of construction by instructing the contractor time to time to conduct necessary tests as mentioned in tender conditions. It involves both laboratory and onsite testing.
Meeting correspondence	This includes informing client and contractor's representatives for meeting for discussing issues related to site, payment or any change in programme of work due to site conditions and getting approval from concerned authorities in some critical situations like shut down of water supply lines, electrical supply, etc.
Billing	Since proper billing work avoids extra payment, fraud, etc. PMC plays vital role in this process in checking Running Account Bill, Escalation bill and final bill.
Project Close-up stage	This includes approval of the project closeout and assessment report that indicates an understanding and formal agreement that the project is ready to be closed.
Operation stage	This stage involves inspecting the defects if any occurred in structure in operation stage of project and getting it rectified in defect liability period defined in tender condition.
Bottleneck issue situations	These include handling cases expected to occur resulting in project overruns such as Land/site handover, geological surprises, design/scope change, contractual disputes, etc.

#### IV. Conclusion

Project Management Consultants, by application of their skills and experiences, give effective solutions to problems that are uncertain and can cause delays and cost overruns. PMC can give intelligent advices with its

outsider perspective as it is not influenced by either of the parties(client and contractor). In this paper, interdependency of roles is observed in which small omission or negligence at any point affects further steps. Though a client cannot completely rely on consultants and due to involvement of PMC the client may not be able to continue the same relationship with the contractor, it is desirable to initially make a proper analysis of work in all stages, and then involve a PMC for success of a project.

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