

Monitoring of Construction Projects Feasibility by Bank Investment Supervision Approach

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Abstract Technical, financial and organisational feasibility study methods in compliance with a Bank Investment Supervision requirements have been presented. Methodology of construction project appraisal for financing and execution professional preparation have been laid out – technical documentation, arrangements, realisation. Analysis and assessment of Bank Investment Supervision consisted of Project Execution Plan, geotechnical and environmental conditions, permit design, agreements and decision impacts of local authorities, engineering contract for construction works, project insurance and performance bonds, schedule of execution tasks and their costs, payment plan, investment budget and project economical effectiveness, scope of monthly construction works execution assessed by Earned Value Method approach, significant risks measurable assessment and handover procedure of construction project. Engineering, Project and Construction Management (EPCM) approach to investment process and solid, consequent, regular construction projects monitoring executed by professional Banking Supervision Inspector make possible to minimise any faults of inappropriate financing of construction projects.

Keywords Construction Project, Bank Investment Supervision, Risk Significance

1. Introduction

The Bank Investment Supervision (BIS) / Project Monitoring services stand for monitoring of a construction project in terms of quality as well as the financial schedule of works, in order to evaluate the progress of works in respect of the loan drawdown provisions [1-3].

The scope of the services includes:

- Preparation of Initial Report;
- Preparation of Monthly Reports;
- Preparation of Final Report

The main parties involved in carrying out the construction project are:

- Lender / Bank - Financial Institutions considering a grant of an investment loan to finance the objective investment Project;
- Borrower / Investor - Economic entity, acting under the jurisdiction of the laws of Poland which intends to begin the investment Project;
- Project Monitor / Engineer - Company providing services of technical supervision on behalf of Financial Consortium, prepared to undertake monitoring of the progress of works during the investment.

2. Scope of BIS Services

2.1. Initial Report

Based on the scope of services outlined below, initial site inspection, interviews with the Investor's project management team and other project parties, analysis of the design and technical documentation for permit furnished by the Investor, the Initial Report includes a general characteristics of the Project, based on the construction design (data of the Property, data on space and cubic capacity, architectural and construction description). Also confirmation that the Borrower has obtained all permits, clearances, opinions, arrangements and decisions necessary to carry out the Project together with an opinion that they were issued in accordance with all legal regulations is presented. The Initial Report must consist of an opinion regarding fulfilment by the Investor of all obligations and requirements resulting from the local spatial development plan, decision on development conditions, building permit and other documents, decisions and permits necessary for Project performance and obtaining a decision permitting the use of buildings constructed as part of the Project, together with the opinion that they were issued in accordance with the relevant legal

regulations. BIS is obliged to provide an assessment of the contents of the technical project documentation which will be necessary to carry out the Investment including an opinion concerning the architectural design content. Also opinion is prepared concerning the Construction Contract and other agreements related to Project execution, including verifying whether the Project has been contracted and if the costs of the Project Contractor and payment conditions are consistent with market conditions, if the dates of payment and Construction Contract performance meet those stated in the Project performance schedule, amount and payment dates of costs incurred by the Investor in relation to the Construction Contract and other Agreements related to the Investment in relation to the Preliminary Project Budget and the approved plan for costs, cash flow projection. BIS is supposed to assess the Preliminary Project Budget and the Project performance schedule: i.e. if the costs of construction works and additional works are at market levels and are sufficient to perform the scope of work, together with an assessment of the Investment's economic feasibility in relation to the plan of costs and cash flows approved by the Investor, including the funds committed to date. An opinion whether all items contracted are included in the Project Budget, Confirmation of Project performance pursuant to the Preliminary Project Performance Schedule, opinion on the progress of construction and the quality of works up to the date of inspection and deviations from the contractual and project plans together with establishing the status of material progress of the construction works and their compliance with the design, opinion on the matter of significant entries to the construction log influencing the progress of works and pointing to possible threats that may influence the correct course of the investment process are needed as well. BIS is expected to prepare confirmation of the scope of the Project insurances, including confirmation that the Project contractor, Investor and other participants in the investment process have insurance agreements in effect providing appropriate insurance and civil liability protection for the Investment as well as assessment of the organization and coordination plans for the project, assessment of the organizational structure in place for the Investment, qualifications of the participants in the investment process, including the construction site supervisor and supervision inspectors. As far as financial aspects are concerned confirmation of Equity investments made is important, confirmation that outlays and expenses incurred for the performance of the project are at appropriate levels, including confirmation that the payments are in accordance with the conditions of the Construction Contract and other agreements related to Project performance taking account of actual project progress and Confirmation that Subcontractors payments are up to date.

2.2. Monthly Reports

Based on the documentation furnished by an Investor, monthly inspections of the construction site, interviews with the Investor's project management team and other project parties, as well as verification of relevant invoices, a Monthly Report includes opinion, based on the conclusions made by the Engineer during the site visit, on the current Project progress including an assessment of physical progress of construction works and an assessment of the progress of works since the previous inspection as well as deviations of progress from the Project schedule and also an opinion on compliance of the Works with legal regulations, Project documentation, the construction contract and other agreements entered into, opinion on deviations from Project assumptions. BIS needs to prepare an assessment of the Project's legal status including confirmation that the Investor or Project contractor has obtained all necessary permissions and permits required, analysis of significant entries to the Construction Log Assessment of Project schedule performance, Project Budget performance with review of cash flows. Also confirmation that the value of the performed construction works and additional costs meets the amount of cash funds invested in the Project and confirmation that the VAT tax, which is to be financed from the VAT draw down, is related to the Project performance and was included in the appropriate section of the Project Budget, but was not included in any previous Contractor's report are obligatory. BIS is expected to elaborate opinion concerning the achievability of the Project Budget, in individual budget items, separated into costs incurred after preparing the Periodical Report, costs discussed as part of the current Report, other amounts to be incurred, opinion on extra / additional construction works in terms of the project budget and schedule, assessment of invoices and other financial documents being the basis for the disbursement of the tranche of the loan or VAT loan, in their consistency with the construction contract, project budget, other agreements, if the loan agreement allows them to be financed from the loan or the VAT loan and assessing if the these invoices are actually reflected in the performed and received construction works, ordered and utilized materials, progress of construction works. BIS is supposed to assess significant current issues and actions – especially information on delays and threats to Investment performance and confirm of the Investor investing equity in Project performance contributed pro-rata with successive disbursements of the Construction Loan pursuant to the conditions of Project financing.

2.3. Final Report

Based on the documentation referred to above, the last inspection of the construction site, interviews with the Investor's project management team and other project parties, as well as verification of all documents referred to below, a Final Report is elaborated and consists of opinion

on Investment completion and commissioning, including:

- Consistency of the completed Project with the design;
- Consistency of the completed Project with the Project Budget;
- Consistency of the completed Project with the Project schedule;
- Consistency of the actual standard of the Building with the specification, pursuant to the design and project documentation;

At the end of a Project BIS must prepare an opinion confirming the possibility for the Investor to obtain a final investment usage decision, in the case of issuing a conditional decision, an opinion confirming the possibility of issuing a final usage permit decision and opinion of the construction facility performance being consistent with the decision on development conditions, the construction project and conditions of the building permit, confirmation of completion of the works by the Project contractor pursuant to the construction contract, removal of all defects and final takeover of the building by the Investor.

3. Bank Investment Supervision Indications

The outputs of entire assessment undergone in a process of Bank Investment Supervision are formulated as comments and recommendations in a very first executive summary report.

3.1. Assessment of Project Development for Implementation and Financing

In order to assess the readiness of the Construction Project in question for financing and implementation, the Employer provided the Banking Supervision Inspector with the Project documents required for the Inception Report preparation.

The list of BIS's most significant comments on the Construction Project development and implementation as well as recommendations to be followed before the financing of the Project by the Bank are elaborated: The Project implementation key aspects are formulated in the most comprehensive and transparent table executive summary table format pinpointing:

- Comments – important Project facts presented for the attention of the Bank and the Investor;
- Recommendations – significant Projects defects that must be removed or improved by the following Project assessment as not arise cumulative Project risks while execution.

3.2. Final Recommendations on Project Feasibility

As a result of deep recognition and documented investigation undergone within a process of a Bank Investment Supervision the following final recommendations have been drawn and presented to the Bank for the Project positive financing release:

- A. The Construction Project has been implemented correctly so far from the technical, legislative and financial aspects;
- B. The Construction Project is sufficiently developed for implementation as far as its technical/design and legislative/formal aspects are concerned, however its safe implementation will require that partial costs and interim dates must be specifically controlled;
- C. The Construction Project is feasible within the assumed budget but BIS points out the identified risks to the Project in question in the form of comments on the present state and recommendations to be followed in future.

4. Bank Investment Supervision Risks Identification

On the basis of the 12-year author's practice of Bank Investment Supervision developed methodology significant construction projects risks have been identified and measured: risks of the highest impact values and risks of the biggest likelihood appearance. The research has been recorded in 400 – 450 reports of 42 investment projects in advanced manufacturing, commercial, residential, hotels and apartment housing sectors. Entire group of risks has been divided into 3 groups equivalent to 3 phases of investment process [2-3] for which the most significant risks have been determined [4-7].:

- P - phase of projects preparation and design works
- C - phase of projects construction and erection
- M - phase of projects maintenance and exploitation

5. Conclusions on Bank Investment Supervision Risks Significance

All identified risks appearing at entire life – cycle of construction projects have been presented in tables 1, 2 and 3. At least one risk [8-10] of the highest measured level of significance (around 0.3) is highlighted at each phase of investment process:

1. Phase P: Delayed agreements and environmental decisions
2. Phase C: Not following Health & Safety requirements on site
3. Phase M: Insufficient commercialisation or production capacity of commercial investment.

Table 1. Risks significance – phase P of projects preparation and design works

| No. | Significant risks at preparation & design works phase P | Impact [0;1] | Likelihood [0;1] | Significance [0;1] |
|-----|--|--------------|------------------|--------------------|
| 1 | Delayed agreements and environmental decisions | 1 | 0,3 | 0,30 |
| 2 | Building Permit Design non compliant with and Act of Building Permit Design Scope and Form | 1 | 0,1 | 0,10 |
| 3 | Protest against Building Permit | 1 | 0,1 | 0,10 |
| 4 | Unconfirmed Investor's Own Equity | 1 | 0,2 | 0,20 |
| 5 | Inconsistent administrative building decisions | 0,5 | 0,4 | 0,20 |
| 6 | Irrational procurement process for construction works | 0,2 | 0,1 | 0,02 |
| 7 | Incorrect structured budget for construction works | 0,7 | 0,2 | 0,14 |
| 8 | Unappropriated level of budget contingency | 0,3 | 0,4 | 0,12 |
| 9 | Improperly calculated break- even point of the project | 0,5 | 0,1 | 0,05 |
| 10 | Unbalance parameters of Cost – Time – Quality within agreement for construction works | 0,6 | 0,2 | 0,12 |

Table 2. Risks significance – phase C of construction and erection

| No. | Significant risks at construction and erection phase C | Impact [0;1] | Likelihood [0;1] | Significance [0;1] |
|-----|--|--------------|------------------|--------------------|
| 1 | Contractors not mobilised for construction works | 0,7 | 0,2 | 0,14 |
| 2 | Not following Health & Safety requirements on site | 0,9 | 0,3 | 0,27 |
| 3 | Delays of construction works in comparison to their schedule | 0,6 | 0,4 | 0,24 |
| 4 | Deviation of project budget use in comparison to financial plan | 0,5 | 0,3 | 0,15 |
| 5 | Undisciplined management of additional and substitute construction works | 0,9 | 0,1 | 0,09 |
| 6 | Insufficient supervision of quality and compliance of construction works | 0,8 | 0,3 | 0,24 |
| 7 | Inadequate Design Author Supervision and classification of significant changes of design solutions | 0,7 | 0,1 | 0,07 |
| 8 | Overstating of monthly quantities of construction works performed | 0,5 | 0,3 | 0,15 |
| 9 | Insufficient preparation for a building handover by Fire, Sanitary and Technical Supervision Authorities | 0,7 | 0,2 | 0,14 |
| 10 | Not obtaining Operation Permit issued by Construction Supervision Authority | 0,9 | 0,1 | 0,09 |

Table 3. Risks significance – phase M of maintenance and exploitation

| No. | Significant risks at maintenance and exploitation phase M | Impact [0;1] | Likelihood [0;1] | Significance [0;1] |
|-----|---|--------------|------------------|--------------------|
| 1 | Insufficient commercialisation or production capacity of commercial investment | 1 | 0,3 | 0,3 |
| 2 | Long lasting payback period with delay of break-even point | 1 | 0,2 | 0,2 |
| 3 | Post guarantee handover with many defects for removal or fee reduction | 0,8 | 0,2 | 0,16 |
| 4 | Retaining of fee in cash or performance bond as a due to poor quality of construction works after ineffective post guarantee handover | 0,8 | 0,2 | 0,16 |
| 5 | Inappropriate building exploitation not compliant with a building maintenance book | 0,2 | 0,1 | 0,02 |

There are further conclusions drawn from deeper analysis of 400 – 450 BIS reports elaborated on 42 construction projects:

1. Identified above risks of investment process have a significant impact (on average 0.65) on success of a construction project
2. Majority of construction risks appear with likelihood not exceeding the value 0.4.
3. Risks of the highest impact values affect the monitored projects with pretty low level of likelihood and those of the lowest impact values are aligned with higher level of likelihood. Lack of correlation of risks impact and their likelihood at really high level determines reasonable level of risks significance, not higher than 1/3 of possible significance in “risks monitoring” strategy. Therefore,

all professionally monitored construction risks are “manageable”.

4. Engineering, Project and Construction Management (EPCM) approach to investment process and solid, consequent, regular construction projects monitoring executed by professional Banking Supervision Inspector make possible to minimise any faults of inappropriate financing of construction projects.

6. Discussion on Construction Project Feasible for Financing

The Project implementation for financing key aspects are formulated in the most comprehensive and transparent table executive summary table format to assess values of Multi-Discipline Building-Permit Design, Decisions and Approvals, Environmental Issues, Land Surveying and Environmental Analyses, Organisational Structure of the Project, Construction Works Contract, Civil Liability Insurance, Construction Risks Insurance, Professional Indemnity Insurance, Construction Schedule, Payment Plan, Project Budget, Investor's Own Equity, Commercialisation of the Facility.

When is a Project ready for financing by a Bank? To some extent this is a subjective and confidential business Bank Committee decision. As far as Bank Investment Supervision role is concerned the positive recommendation for a Project to be financed must be clearly presented and proved in BIS rigorous, independent, audit reporting.

A reasonable, acceptable level of risks significance assessed as a result of BIS analysis for a Bank positive financing cannot be more than 1/3 of the average risk significance appraised at each stage P, C, M in “risks monitoring” strategy. Methods of approach to Project risk strategies are well presented in references [3 - 10].

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