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SUPPORT FOR IMPLEMENTATION OF PERFORMANCE BASED CONTRACT PILOT PROJECTS FOR DIRECTORATE GENERAL OF HIGHWAYS




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September 2010

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The views expressed in this report do not necessarily reflect the views of the Australian Indonesian Partnership or the Australian Government. Please direct any comments or questions to the IndII Director, tel. +62 (21) 230-6063, fax +62 (21) 3190-2994. Website: www.indii.co.id.

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This report has been prepared by Dr. Theunis F.P Henning who was engaged under the Indonesia Infrastructure Initiative (IndII), as part of the support to the Director General of Highways (DGH) to review procurement and contracting, including potential use of performance-based contracting (PBC) at regional or sub-regional levels, funded by AusAID.

The support provided by DGH is gratefully acknowledged. Any errors of fact or interpretation are solely those of the author.

Dr. Theunis F.P Henning

Jakarta, September 2010

Table of Contents

LIST OF TABLES

LIST OF FIGURES

LIST OF ACRONYMS

AusAID	Australian Agency for International Development
BINTEK	Technical unit of DGH
DGH	Directorate-General of Highways
IndII	Indonesia Infrastructure Initiative
MOF	Ministry of Finance
PBC	Performance-based Contracts
TET	Tender evaluation team

EXECUTIVE SUMMARY - SUPPORT FOR IMPLEMENTATION OF PERFORMANCE BASED CONTRACT PILOT PROJECTS FOR DIRECTORATE GENERAL OF HIGHWAYS

The Technical Directorate of DGH, Bintek has requested interim support from IndII to prepare the bidding documents and draft contract for two pilot Performance Based Contracts' (PBCs) projects on 30 kilometres of National Highway to be carried out under the current (2010) national budget (APBN). . This report, which has been prepared by the IndII consultant Theuns Henning, documents the review of the PBC tender document and the planned approach for the planned pilot projects. The locations for the two pilot projects are:

- The Ciasem-Pamanukan section: This is approximately 21 km of road that stretches from route position STA 117+050 (km post 117 plus 50m) – 121+250 and STA 123+350 – 141+100, located in West Java, east of Jakarta on the main Java north coast arterial road; and,
- The Demak -Trengguli section: This is approximately 11 km of road that stretches from STA 24 + 800 –STA 35+800, located in West Java , east of Semarang, on the main Java north coast arterial road.

The review has revealed that Bintek has made significant progress with the preparation of the tender document and processes. The tender document, as it currently stands, would fulfil most of the criteria as laid down by standard PBC template documents (such as those released by the World Bank). However, the review has highlighted a number of practical considerations that would enhance the value of the effectiveness of the PBC pilots and could provide more competitive tendering.

The consultant worked directly in the Bintek offices, which established a close working relationship with Bintek staff and this aided the support in the following ways:

a) Recommendations could be developed, discussed and reviewed on the basis of Indonesian legal, regulatory and procurement practices.

b) Facilitating the immediate knowledge transfer on PBC.

This report is a technical record of processes that have already been adopted within the tender documents. Specific recommendations on issues identified during the activity are detailed in the following sections and the body of this report.

In order to sustain the good work that has been completed by Bintek and all technical experts who gave inputs into this process, it is recommended that the DGH is provided ongoing support to implement effective PBC, to monitor the implementation of the pilots and to identify areas for improvement in the contracting and implementation of future PBCs.

A summary of the review findings are listed in the Tables E1 and E2:

Table E 1: Summary of the Tender Document Review Outcome

Item Reviewed	Appropriateness Rating
Pre-tender qualification process	✓✓✓
Tender documents and information	✓✓✓
Tender evaluation process	✓✓✓
Assessment criteria	✓✓✓
Tender information processes	✓✓
Tender specifications	✓✓✓
Supplied data	✓✓✓
Price hurdles	✓✓
Scope definition	✓✓✓

Notes: ✓✓✓ Appropriate for Indonesia application, ✓✓ Some minor adjustments required ✓ not currently included and needs consideration.

Table E 2: Summary of PBC Contract Review

Item Reviewed	Rating of Appropriateness
Contract term and structure	✓✓✓
Contract governance	✓✓
PBC terms of payment	✓✓✓
Method of specifying road condition performance	✓✓✓+
Risk sharing	✓✓
Data collection during contract	✓✓✓
Termination clauses	✓✓✓
Penalty clauses	✓✓
Underpinned quantities	✓
Dispute processes	✓✓✓

Notes: ✓✓✓ Appropriate for Indonesia PBC application, ✓✓ Some minor adjustments required ✓ not currently included and needs consideration

Specific Recommendations on Issues identified are summarised in Table E3

Table E 3: Specific Recommendations of Improving the PBC Contract for Pilot Areas

Topic Area	Recommendation
Continuous support for PBC implementation	The PBC implementation process can be given ongoing support by the organisations that have been involved to date, including the World Bank and AusAID. This support is required to ensure the sustainability of the PBC implementation and should continue for at least the duration of the pilot studies – i.e. the next four years.
Extent of pilot site	The starting position of the Demak Trengguli section can be shifted by approximately 2 km in order to exclude the intensive market area from the PBC contract.
Recommendations on the basis of site visit observations	The shoulder of both the sites could be build up to the height of the pavement. Preferably, the shoulder should be sealed using a different surface colour, indicating that it is for the exclusive use by motor cycles, thereby discouraging use by heavy vehicles. A full depth rehabilitation should be considered for certain parts of both sites; a simple overlay will not address some of the failures. DGH must provide a total estimate of the full depth rehabilitation requirement for this pilot and include the relevant quantities in the tender document; The drainage condition should be selected as a mandatory Key Performance Index KPI in the tender document.
Tender workshops	An interactive tender process can be implemented, which includes at least three interactive workshop meetings with each tender team. These meetings would need to be managed in accordance with set objectives and accompanying rules.
Risk of accepting very low tender prices	It is recommended to consider increased security if there is no option but to accept very low PBC tender prices. This can be done through the following two mechanisms: Increase the guarantee amount to levels higher than 10 percent. For instance, for tender prices below 80 percent of engineers estimate, the guarantee can be increased to 15 percent of engineers estimate; Introduce a sustainability hurdle at say at 60-70 percent of estimate. For tender prices below this level, the tender would be disqualified.
Contract governance	A management board should be established as part of the structure for the PBC. The role of the board will be mainly to assist in contractual decision making that will result in a successful outcome of the PBC contract in a fair and effective manner.
Risk sharing	All background risk should be specifically excluded from being the contractor's responsibility. A mechanism of compensation for dealing with some of these events must be specified in the contract. The management board in most cases would be instrumental in these instances. The contractors must work out all estimates based on their assessment of current overloading and provide for that in their quantities of work. Add a compensations framework for any growth beyond expected levels. The contractor carries all risk related to the performance of the roads for the full duration of the contract term.
Penalty and termination clauses	The current penalty clauses be augmented with incentive clauses, in order to encourage and suitably reward exceptionally good performance.

Topic Area	Recommendation
Information to tenderers	During tender workshops/information meetings, DGH must emphasise to tenderers that the main contractor's objectives in performance contracting are: To determine the appropriate maintenance strategy in year one of the contract, which is to be implemented thereafter for the duration of the PBC; and, To deliver improved quality and profitability outcomes by means of implementing robust management and decision making systems within the PBC.

CHAPTER 1: INTRODUCTION

1.1 PERFORMANCE BASED CONTRACTING IN INDONESIA

PBCs provide a number of benefits for road agencies within developing countries, including the ability to secure long-term funding for a particular network, with the understanding that it will be maintained at a pre-determined level of service. The World Bank has introduced PBC in a number of developing countries, including Indonesia, during 2005/06.

An assessment was undertaken under a previous assignment, to gauge the readiness of the industry to embark on PBCs. From this study, it was concluded that the Directorate-General of Highways (DGH) is ready for this transition, but needs to start with a pilot area prior to full implementation (Greenwood et al.,2006a).

Currently, there are three pilots being considered; two funded internally by the DGH and the third funded as part of the World Bank initiative. This report documents an initiative to support the DGH during the tender development, early tender and procurement stages of these pilots.

1.2 BACKGROUND TO THE ASSIGNMENT[1]

One of the key activities in the DGH-IndII Road Sector Development Program is a review of contracting within DGH and its regional and local units. This activity is scheduled to be part of Contract Package 3 which was under procurement at the time of preparation of this report. That activity will examine the contracting approach used by DGH now and consider how an increased use of PBCs and local community based routine maintenance contracts can gradually be extended to provide better accountability and user benefits. The activity will cover a range of jurisdictional units within DGH and will also consider a range of contracting types, from routine maintenance to major capital works.

The World Bank Indonesian Infrastructure Development Policy Loan (IDPL) includes a number of policy triggers – one of which is the implementation, in 2010, of a pilot PBC on a suitable target road selected by DGH. While the IDPL specifies that the pilot should be at least 100 km, DGH has decided to contract on a shorter section of 30 km out of the DGH internal budget for 2010. The experience gained in this pilot contract will be used to decide how best to expand this activity in the future, to other areas and other types of intervention.

The technical unit of DGH, Bintek, is tasked with implementing the pilot under this year's budget (2010), and Bintek has requested for interim support to prepare the bidding documents and draft contract. IndII agreed to field a special advisor to work specifically on the bidding documents and draft contract for the 30 km pilot project.

[1] Taken from the briefing scope of the project

1.3 OBJECTIVES AND SCOPE OF STUDY

The main objective of this project is to support the DGH in developing the tender document and tender process for the first pilot contract. Specific tasks related to this assignment include:

- Assemble the current standard bidding and draft PBC contract documents available on the World Bank website and from other specialists in the field. Review those draft documents with DGH and identify key elements of data which are required, to provide potential bidders with enough information to allow for quality bidding;
- work with DGH to identify data needs and to assist with sourcing such data, including information on traffic loading, current road condition and strength data. Such assistance is to be provided to the extent necessary to allow for determination of the appropriate performance standards;
- complete a field visit in consultation with DGH staff for the purposes of assessing data collection that may be needed, given the above review;
- prepare a full draft bidding document and draft tender process for the procurement of the contractors. These drafts are for review and modification, as needed, by DGH. Review DGH standard bidding procedures to determine whether any amendments to those procedures are needed to suit the specific nature of the contract;
- prepare performance standards to be included in the draft contract. Identify how and by whom performance will be verified and how that performance will be linked to the payment provisions for the works;
- finalise a draft contract for issue with the tender documentation. Obtain sign-off by DGH staff on the bidding documents, the performance standards and the draft contract; and
- prepare a full Activity Report according to IndII–AusAID requirements, including an executive summary, to provide an account of work undertaken as above. This report will be passed to the incoming contracting consultant as input to the main contract.

CHAPTER 2: PROJECT INPUT METHODOLOGY

2.1 OBJECTIVE

The objectives and scope of this project are summarised in Sections 1.2. The main objective for the project input was to provide **a valuable input to DGH and assist in their journey with the PBC implementation, with specific focus on knowledge transfer**.

2.2 KNOWLEDGE TRANSFER

Knowledge transfer of this project was structured around a number of processes:

- There have been a number of formal and informal discussions on the background of PBC and the PBC tender document. Both, the department and the consultant who developed the tender document, were involved in the discussion.
- There was an official presentation to the department and other stakeholders. During this presentation, fundamental principles were presented to the department and the main outcomes from this review were also discussed in detail.
- Then there were official presentations and meetings with the DGH senior management. During these, the main findings from this review and subsequent recommendations were explained and discussed in detail.

It has to be emphasised though that the success of this review was a function of the openness from DGH to accept the reviewers as part of the overall team. This also allowed for instantaneous consideration and adoption of some of the recommendations.

2.3 FUTURE INVOLVEMENT NEEDS

It has to be realised that the DGH has effectively only started their PBC journey and there are still significant improvements required in order to make PBC an effective procurement option for Indonesia. However, there is general acceptance within the DGH that they will 'learn from doing'. Likewise there is also a need for continuous support from external experts to assist in the learning process. The two main areas where support would be required are:

- Monitoring the progress of the pilot PBC project This monitoring needs to capture and document all learning from the pilot projects, plus implement a study to compare cost and outcomes to appropriate control sites; and,
- Start working and developing the next generation PBCs with the aim of not only improving the current process but also investigating alternative applications such as introducing PBCs in new construction processes and introducing Labour or Community Based principles into the PBC maintenance contracts.

Recommendation:
The PBC implementation process be continuously supported by the organisations that have been involved to date, including the World Bank and AusAID. This support is required to ensure the sustainability of the PBC implementation and should continue for at least the duration of the pilot studies – i.e. the next four years.

CHAPTER 3: DESCRIPTION OF THE PILOT AREAS

3.1 PILOT AREAS FOR NATIONAL BUDGET IMPLEMENTATION

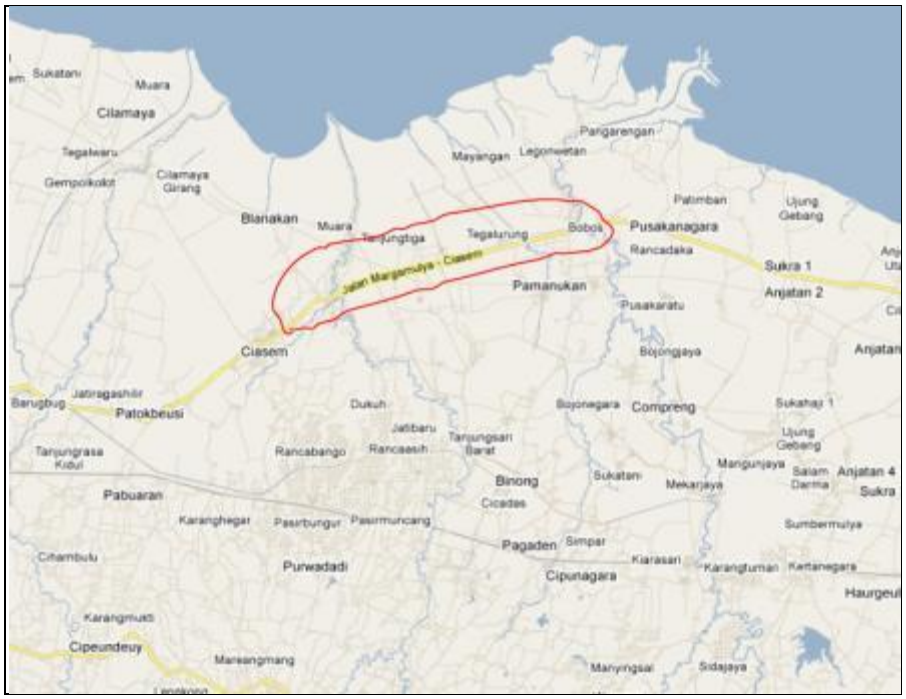
Two pilot locations have been selected for inclusion in the pilot project or projects to be funded under APBN:

- Ciasem - Pamanunkan;
- Demak – Trengguli

3.1.1 Ciasem – Pamanukan

The Ciasem -Pamanukan section is approximately 21 km of road that stretches from STA 117+050 – 121+250 and STA 123+350 – 141+100. It is located in West Java, east of Jakarta on the main Java north coast arterial road (refer to Figure 1).

Figure 1: Location of the Ciasem-Pamanukan Section



This section of road was originally an undivided two lane road, widened along the same centre-line to provide a divided four lane road with a cross section width of approximately 7.2 m for each carriageway (refer to Figure 2). As a result, part of each carriageway is constructed on the original road pavement structure and the widening on each side comprises the following structure based on the design drawings:

- 100 mm of imported and stabilised sub-base course; .
- 27 mm of concrete base course assumed to consist of reinforced precast blocks (see Figure 3 b).
- Asphalt Concrete (AC) overlay over the entire lane-width. The as-built (Figure 2) indicate this to be a 4 cm layer but it is unconfirmed whether it has been overlaid since the widening.

Figure 3a is a photograph that was taken at a location where a drainage structure is being replaced and this photo confirms the pavement details but also indicates that a much thicker AC layer may occur in some locations.

Figure 2: Cross section of the Ciasem-Pamanukan Section

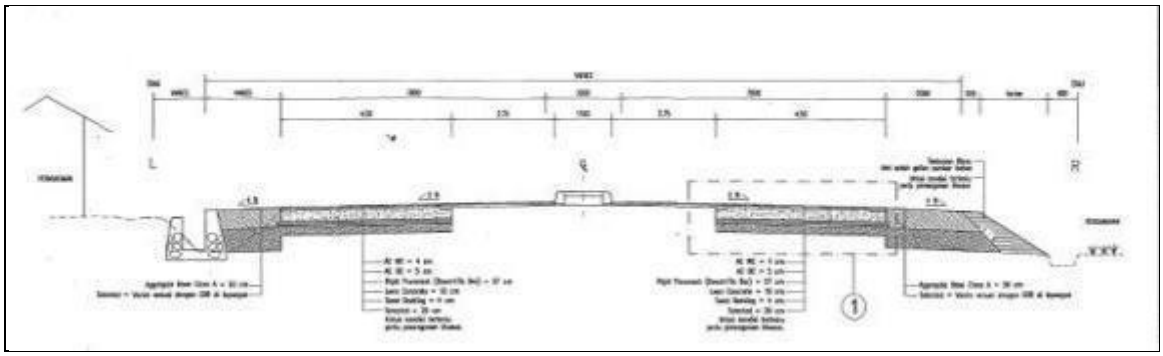


Figure 3: Photos taken of the Ciasem-Pamanukan Road

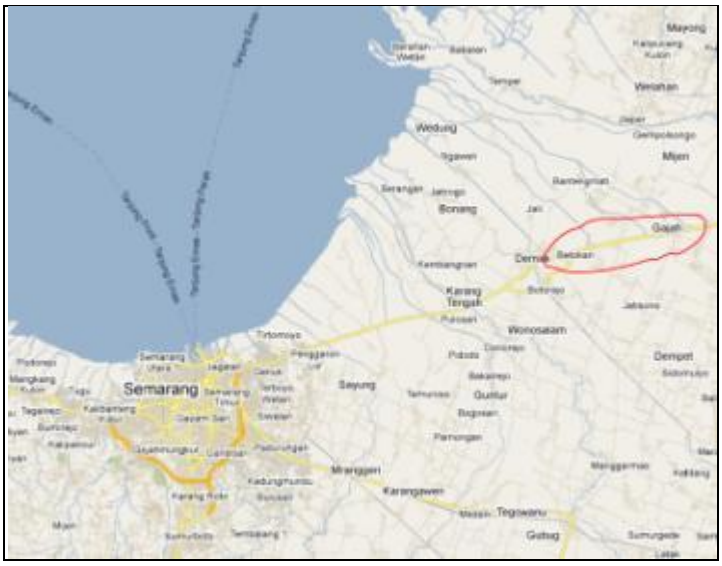
a) Photo depicting a cross section

b) Concrete pavement construction (outside PBC area but on the same road)

3.1.2 Demak - Trengguli

The Demak -Trengguli section is approximately 11 km of road that stretches from STA 24 + 800 –STA 35+800. It is located in West Java, east of Semarang on the main Java north coast arterial road. (Refer to the map in Figure 4).

Figure 4: Location of the Demak-Trengguli Section



The first 2 km of this road length is an undivided road in an urban area that is also an active market area (Refer to Figure 5a). In discussions with the regional Director of DGH, it was recommended that this section would be excluded from the PBC contract, sinceit would not only be difficult to maintain this portion of road according to the specification but also difficult to monitor it regularly. The road cross section changes to a four lane divided carriageway and transitions to a more rural area, but as illustrated in Figure 5b it is still heavily populated and may shortly become an urbanised area.

Figure 5: Photos taken of the Demak-Trengguli Road

a) Beginning of the section showing the market area

b) the densely populated rural area of the section

Recommendation:
The starting position of the Demak Trengguli section should be shifted by approximately 2 km in order to exclude the intensive market area from the PBC contract. The design information of this road indicates a full depth flexible structure that consists of an asphalt surface, constructed on stabilised base and sub base course. No as-built drawings were provided for this road section.

3.2 DESCRIPTION OF THE CONDITION

3.2.1 Condition: Ciasem - Pamanukan

During the site visit to the pilot areas, the main condition issues identified were:

- since no sealed shoulder is available, all light vehicles, especially motor cycles travel in the left-hand lane, while all heavy vehicles travel in the right-hand lane. This is working negatively on the pavement behaviour, especially since the stronger part of the pavement is on the rigid part of the pavement (left-hand side);
- as a result of the above, there is a distinct difference in the condition between the two lanes. The flexible part (fast lane) of the pavement shows signs of severe failure in some locations. In contrast, the rigid part (slow lane) is in a relatively good condition with joint cracks being the only viable defect;
- the shoulder is in a poor condition, being improperly drained, with high drop-offs from the pavement level, causing water to pond next to the road; and,
- more attention should be given to the surface drainage to ensure that there is no standing water next to the road.

Figure 6: Photos illustrating the condition of the Ciasem – Pamanukan Road Section

a) Notable difference in condition between lanes

b) shoulder drop-off and poor shoulder condition

3.2.2 Condition: Demak - Trengguli

The condition of the Demak-Trengguli section is mostly fair with some areas that display severe fatigue failures. However, one of the condition issues of most concern is to address the state of the road shoulders. Although a concrete curb and footpath is provided, the shoulders are unsealed. Therefore, the water is channelled onto the road which results in either wash-out of the shoulder or ponding in flat areas. On the section of the road in the more rural areas, the entire width of the road should be sealed.

Figure 7: Photo of the Trengguli PBC pilot area indicating shoulder condition

A further concern is the longitudinal drainage in general. A concrete drainage structure has been constructed but is not being maintained and it is difficult to establish how road surface water would reach the drain in the first place. There is also an irrigation/drainage canal which runs along the north side of the road, which receives surface runoff from the side drain. However, based on the site review which identified staining on the sides of the canal, it would appear that the canal level is higher than the invert of the drain and at some locations higher than the elevation of the road surface during flood conditions.

Recommendation:

- The shoulder of both the sites needs to be built up to the height of the pavement. Preferably, the shoulder should be sealed using a different surface colour, indicating that it is for exclusive use by motor cycles and thereby discouraging use by heavy vehicles.
- Full depth rehabilitation should be considered for certain parts of both sites – a simple overlay will not address some of the failures. DGH must do a full estimate of the full depth rehabilitation requirement for this pilot and include the relevant quantities in the tender document.
- The drainage condition should be selected as a mandatory Key Performance Indicator KPI in the tender document.

CHAPTER 4: REVIEW OF THE TENDER PROCESS

4.1 PURPOSE OF THE REVIEW

It is apparent that the DGH already has a well established tendering process in place that complies with both, the legal and procurement policy and requirements as specified by the Indonesian Government. Consequently, this review focused on the intent and culture shifts required for a PBC tender and how the current tender processes underpin the PBC concepts. The review excluded any validating of compliance of legal and procurement rules. A local consultant developed the tender documentation and it is assumed that these areas were sufficiently addressed.

The over-all review outcomes are summarised in Table 1 and further discussed in subsequent sections.

Table 1: Summary of the Tender Document Review Outcome

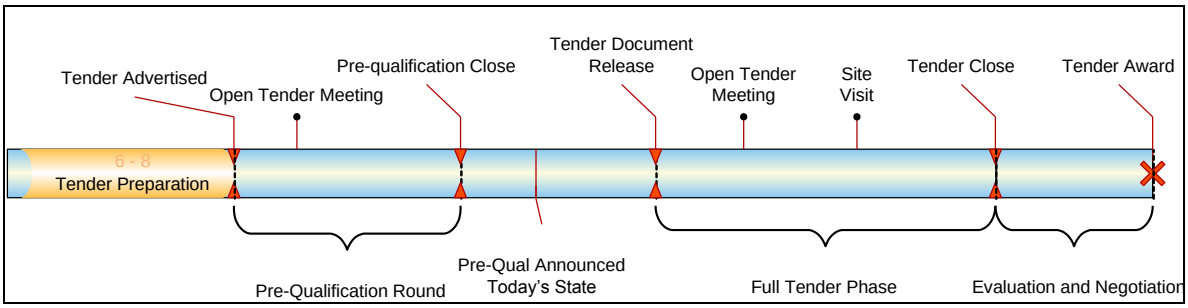
Item Reviewed	Appropriateness Rating
Pre-tender qualification process	✓✓✓
Tender documents and information	✓✓✓
Tender evaluation process	✓✓✓
Assessment criteria	✓✓✓
Tender information processes	✓✓
Tender specifications	✓✓✓
Supplied data	✓✓✓
Price hurdles	✓✓
Scope definition	✓✓✓

Notes: ✓✓✓ Appropriate for Indonesia, ✓✓ Some minor adjustments required ✓ not currently included and needs consideration

4.2 A DESCRIPTION OF THE CURRENT TENDER PROCESS

The current PBC tender process is depicted in Figure 8. It shows a two stage process consisting of an initial pre-qualification round and subsequently, the main tender itself. At the time of this review, DGH is preparing tender documents for the main tendering process for the two pilot projects. The individual steps are further discussed in the following sections.

Figure 8: Current PBC Tender Process



4.3 PRE-QUALIFICATION

The use of a two stage tender with pre-qualification of bidders has been carried out to ensure that only qualified contractors/consultants, who are capable of carrying out the work, proceed to the full tendering stage. Reducing the number of bidders to those qualified and capable, removes the considerable tender preparation by unqualified bidders who would have no chance of winning, and importantly keeps the evaluation of tenders to a manageable size; there has been a high level of interest, with over 160 prospective contractors submitting an expression of interest.

A tender evaluation committee of seven panel members was established comprising mainly DGH staff. All evaluation processes are being undertaken according to procurement rules as set by the current Government of Indonesia regulations. DGH may want to consider including some technical expertise on the evaluation panel to provide specialist input relating to specific PBCs and pavement design issues. Currently, such an input would go against prescribed tender processes. A policy change in this regard may be required.

4.3.1 Administrative Criteria used in Pre-Qualification

Assessment during the pre-qualification stage consisted of two parts - administrative criteria and a technical evaluation.

The administrative criteria are basically a confirmation of legal, financial and operating status of the company. The tenderers have to be fully compliant on all aspects related to the requirements stipulated in the document. These included:

- at least four years' experience in consulting;
- personnel requirements;
- equipment lists plus ownership;
- health and safety;
- ISO accreditation; and
- financial support from a reliable financial institution (bank guarantee for 20 percent of total value of the project estimate).

4.3.2 Technical Criteria used in Pre-Qualification

The technical evaluation was undertaken according to the evaluation sheets which are included in Annex A. It is noted from the sheets that most of the evaluation has been undertaken using a three point scale - very strong; sufficiently strong; and not strong, assessed against the following broad categories:

- basic capabilities
- company experience
- personnel
- equipment and,
- management.

4.3.3 Interaction with Tenders during Pre-Qualification

There is only one open tender meeting during the pre-qualification stage where all relevant information on the tender process is provided to the tenderers. In addition, at this meeting, the prospective tenderers are required to sign an integrity pact which includes confirmation that they have no conflict of interest.

4.4 FULL TENDER STAGE

Box 1: Current Status of Pilot Project

The current status of the project is that the contractors have been notified of the outcome from the pre-qualification stage. On approval from the MoF, the full tender documentation that successfully progressed through the pre-qualification stage will be released to the tenderers.

4.4.1 Tender Format

A two envelope system is to be used for the tender. The first envelope (Technical Proposal) is assessed using a weighted attribute method. The second envelope contains the price and is opened publicly, at which stage tenders are assessed based on the following formula, to determine the successful contractor:

$$\text{Final Score} = \frac{(\text{Technical Score})^{10}}{\text{Corrected Price}} \qquad \text{Equation 1}$$

Where:	Final score	is the score that will determine the leading tenderer
	Technical Score	is the score that is derived from the weighted attribute method
	Corrected Price	is the validated price corrected for any arithmetic errors

4.4.2 Workshop Meetings with the Tenderers

Tenderers are provided with the tender document plus all data, drawings and by-law information related to the contract length. More detailed discussions on information and data are provided in later sections.

Subsequent to document release, there is only one planned open tender meeting in the second stage of the tender, and one joint site visit. Although the tenderers are allowed to put any questions and clarifications to the Tender Evaluation Team (TET), there is no further interaction between tenderers and the TET. This is a significant shortcoming in the current process since most countries with experience in PBCs, such as New Zealand and Australia, use an intensive interactive process during the tendering of PBCs. Some benefits can be gained from an interactive process. These are:

- During the early stages of a PBC there is an imperative to establish a culture which is significantly different from traditional style contracts. The interactive meetings are a means to establish a more collaborative culture from the outset.
- Tenderers have the opportunity to challenge clauses of the contract and/or suggest changes to the contract that may lead to a mutual beneficial outcome. Note that any such amendments are issued to all tenderers to ensure consistency and fair competition.
- Presentation of alternative designs and/or maintenance processes, and/or schedules could be delivered to the TET, which not only serves as an opportunity to demonstrate skills, but also gives the TET the opportunity to make some changes to their tender document.

Recommendation:
There should be allowance in the current tender process for at least three workshop meetings with each tender team. These meetings need to happen on the basis of its set objectives and accompanying rules.

The aspects that are normally discussed at inter-active tender meetings include (but not limited to)[2]:

a) compliance with the performance criteria;

b) durability issues;

c) environmental and social issues;

d) whole of life cost issues;

e) consultation with third party stakeholders;

f) risk allocation;

g) pavement design and verification procedure, including the outputs from the procedure for four sites based on design inputs provided by DGH.

There are certain aspects, the discussion of which is not allowed at the meeting. This is because the objective of the meeting is to build a mutual understanding on the technical aspects of the tender, and not to influence the assessment process. In addition to that, the second envelope system does not allow any pricing issues to be discussed prior to tender assessment. These aspects, with restrictions on their discussion, are:

[2] Examples taken from NZTA PSMC006 Tender

a) Promotional material relating to the Tenderer or the Tenderer's key support companies;

b) Pricing information relating to any aspect of the Tenderer's Conforming Tender or Alternative Tender(s).

4.4.3 Tender Evaluation Criteria

The tender evaluation is undertaken against both, administrative and technical criteria. The full assessment form is included in Annex B.

The administrative aspects assessed include:

- Completeness, legality and validity of tender.
- Bid security – insurance, bank guarantee etc.
- Security of staff assigned.
- Joint venture letters.
- Superintendent.

The technical assessment of the tender includes rating for the following categories:

1. Methodology
    - Design
    - Construction techniques
    - Surface maintenance
2. Schedule
3. Performance achievement
4. Technical skills (work organisation)
    - Design and construction
    - Surface maintenance
5. Equipment list (capacity)
6. Design drawings
7. Subcontractor work

Similar to the pre-qualification, the tender evaluation is undertaken using a weighted attribute method. It was established that approximately 40 percent of the technical weighting is assigned to the methodology that includes design and maintenance scheduling. It is important for this evaluation that sufficient weighting is provided for the methodology and although the current structure seems appropriate, it should be monitored for its effectiveness during the actual tender.

4.4.4 Information Provided to the Tenderers

All available data and information relevant to the road sections must be provided to the prospected tenderers. This includes all condition and survey data, as-built drawings, traffic counts and any consent issues that may exist on the road. The tendency is that better tender prices are normally

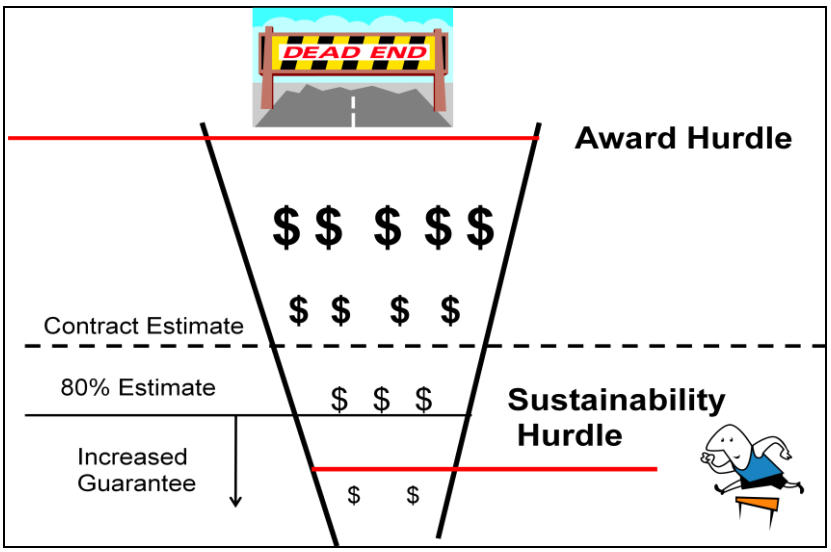
received when more information is provided to contractors due to a reduction in uncertainties. Contractors will build some risk costs into their tender prices to provide for unknown factors.

4.5 PRICE HURDLES

DGH has set some boundaries around the expected tender prices to ensure that their over-all budget is not exceeded. In addition to that, tenders' prices that are much lower than the engineer's estimate are penalised by a requirement for increased contract guarantees. Figure 9 illustrates these concepts graphically. The following concepts are indicated:

- The award hurdle **(disclosed to tenderers)** is the maximum allowable tender price – any tender above this price would lead to a disqualification of the tender.
- Contract estimate **(NOT disclosed to tenderers)** – This is an engineering estimate prepared by DGH and includes the total price for the rehabilitation and subsequent maintenance work.
- Below 80 percent of the estimate is a cut-off for increased guarantees. Where the normal guarantee is based on a 10 percent of the tender price, below this point, the guarantee is calculated on the basis of 10 percent of the contract estimate.
- The sustainability hurdle **(NOT disclosed to tenderers)** is recommended for adoption in DGH PBC tenders since there is not sufficient protection against the risk of too low tenders currently. It is recommended as an absolute lowest cost for the tender. It will not be practically achievable to undertake work below this price and as a consequence, all tenders with prices below this level are disqualified.

Figure 9: Schematic Illustration of Tender Price Hurdles



It is apparent that DGH is not sufficiently protected against unrealistically low tender prices for the PBC. One of the limitations of a PBC is that the tender process is longer and as a result the tender preparation and assessment costs are higher than a traditional style contract. It is therefore in the interest of both, the contractor and DGH, to be successful in the PBC contract. Recommendations to increase the safeguard for having to accept too low tender prices are listed below.

Recommendation:

It is recommended that to provide more protection against the risks of accepting low PBC tender prices, the following mechanisms be adopted:

a) Increase the guarantee amount to higher levels than 10 percent, say below 80 percent of estimate it is increased to 15 percent of engineers' estimate;

b) Introduce a sustainability hurdle at say at 60-70 percent of estimate. Below this level a tender would be disqualified.

CHAPTER 5: REVIEW OF THE TENDER DOCUMENT AND CONTRACT CONDITIONS

5.1 PURPOSE AND ASSUMPTIONS OF THE REVIEW

The purpose of the contract review was to ensure that the main principles of the PBC concept are sufficiently and appropriately adopted for the Indonesian contracting industry. Not all aspects have been reviewed in detail, compliance to legislation and tendering rules being outside scope for this review. The review has been carried out comparing the prime aspects against best practice and literature available from the World Bank and/or other countries using PBC contracts. Table 2 summarises the main outcomes from the review.

Table 2: Summary of PBC Contract Review

Item Reviewed	Rating of Appropriateness
Contract term and structure	✓✓✓
Contract governance	✓✓
PBC terms of payment	✓✓✓
Method of specifying performance	✓✓✓+
Risk sharing	✓✓
Data collection during contract	✓✓✓
Termination clauses	✓✓✓
Penalty clauses	✓✓
Underpinned quantities	✓
Dispute processes	✓✓✓

Notes: ✓✓✓ Appropriate for Indonesia, ✓✓ Some minor adjustments required ✓ not currently included and needs consideration

5.2 CONTRACT TERM AND STRUCTURE

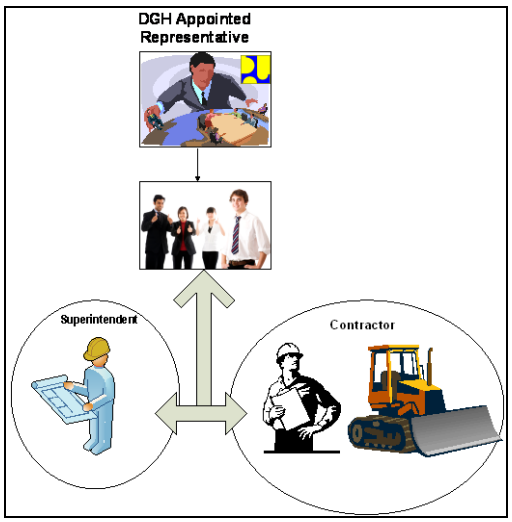
Earlier feasibility studies of introducing PBC to Indonesia (Greenwood et al.,2006b) recommended that any initial PBC implementation should consist of a physical works component(i.e. initial necessary rehabilitation works) followed by a period of performance based maintenance. This recommendation has been taken on board and both the DGH PBC pilot contracts consist of significant physical works during the first year of the contract followed by three years of performance based maintenance work.

As experience and confidence grows, DGH can start considering having longer term contracts, including extended networks and including more work on the basis of performance specifications only.

5.3 CONTRACT GOVERNANCE

The current governance structure for PBC consists of just the DGH superintendent and the contractor's site manager. The DGH superintendent reports to the DGH management structure. This approach still follows a traditional contract style and it is recommend that an alternative governance structure be adopted which is more progressively aligned to the objectives of PBCs. Such a structure is presented in Figure 10. It shows the partnership approach between the contractor and the DGH on site with a first reporting layer to a management board. Representation of this board consists of senior management from both, the DGH and the contractor. A third independent party fills the third position on the board. The board then ultimately reports to the DGH regional director.

Figure 10: Recommended Governance Structure for PBC



The main advantage of having the management board is to simplify and accelerate the decision-making processes within organisations that are party to the PBC. The functions of the board typically include:

- Review and provide recommendations to the Principal in respect of all payment claims;
- Recommend to the Principal, changes to the performance criteria (only in isolated cases where performance measures are deemed inappropriate);
- Agree to benchmark performance criteria at the start of the contract; and,
- Agree rates and prices to apply to emergency work and out of scope work.

Recommendation:
It is recommended to include a management board as part of the governance structure for the PBC. .

5.4 PBC TERMS OF PAYMENT

All payments for this contract are on a lump sum basis. For the initial rehabilitation construction progress, payments are made on the basis of percentage of the lump sum for pre-defined milestones. For example, "first phase payment amounting to 20 percent of the planning and execution of construction, payable after the achievement of planning and execution of construction work reached 15 percent. The lump sum payments for maintenance work occur at three monthly intervals3". The payment terms of this contract are in accordance with standard PBC practice.

5.5 METHOD OF SPECIFYING PERFORMANCE

Kadar et al (2006) has demonstrated that the statistical processes used in the PBC performance specification makes a significant difference in terms of the outcome of the PBC contract. It is particularly important for the agency to consider the exact condition outcomes they desire before selecting the appropriate statistical technique for specifying Key Performance Measures (KPMs). One of the most common mistakes is to specify performance criteria using averages for measures that have unsymmetrical statistical distributions.

The KPM specification process is appropriate for the pilot implementation. It mainly focuses on addressing the occurrence of defects such as potholes and edge breaks within a specified time. Continuous condition measure specifications rely mostly on outlier performance (i.e. no rutting more than 20 mm) and an average outcome specification of no more than 10 mm for 5 percent of a 1 km length. Using such a specification overcomes statistical difficulties normally associated with PBCs.

The items specified were reviewed and it is believed that all relevant conditions items are specified. Specifications are also provided for any structures and other services within the road reserve such as lawn mowing. However, there should be specification defined for concrete curbs, which are currently missing from the tender document. The KPIs performance levels are further discussed in the next chapter.

5.6 RISK SHARING

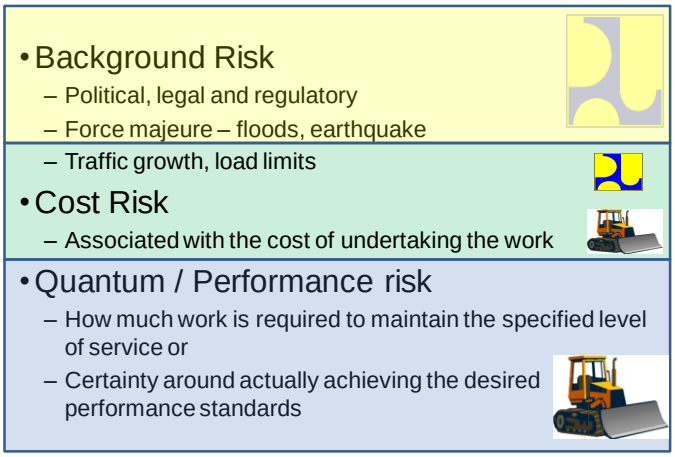
One of the main advantages that a PBC offers over traditional forms of contract is the transferring of additional risk to the contractor. Normally, contractors are willing to take on substantial risks in contracts provided that they have an influence on managing these risks. However, certain risks are not usually borne by contractors, for instance those associated with natural disasters, and even if the contractor agrees to carry such risks, then the contract values may increase drastically. The contractor effectively makes provision for contingency against these risks. There are two basic rules on the type of risks transferred to the contractors. These are (Greenwood et al, 2006a):

- the party who has the maximum influence on the outcome of a risk, has to carry that particular risk; and
- the type and quantum of risk transferred to the contractor should be balanced against the tender price expectations from the contractor. Therefore, more risk transferred will result in higher tender prices.

[3] Directly translated from contract document

The current DGH contract transfers too much risk to the contractor, especially as there is nervousness amongst Indonesia's contractors regarding the over-loading of trucks. In addition to that, some risk items that are not within the scope of the contract must be specifically mentioned, as it is not safe to assume that the contractors are fully aware of which risks they are responsible for. A recommended risk sharing framework is presented in Figure 11.

Figure 11: Recommended Risk Sharing Framework for Indonesia PBC contracts



The recommendation is that all background risk related to any governmental changes, whether political, legal and/or regulatory, is solely the responsibility of the DGH. Likewise all risk related to the condition performance and associated work input requirements are entirely the contractor's responsibility.

There should also be a risk sharing framework/mechanism between the DGH and the contractor on items such as exceptional traffic loading growth and high inflation rates. Although it is practical to expect the contractor to carry some growth/increase risk, any risk beyond expectation should be shared between the DGH and the contractor. Normally, the agency would choose growth levels much higher than expected. Should these values exceed, a proportional increase is applied to the lump sum prices.

Recommendation:

Recommendations related to risk sharing on the PBCs include:

a) All background risk should be specifically excluded from the contractor's responsibility. A mechanism of compensation for dealing with some of these events must be specified in the contract. The management board, in most cases, would be instrumental in these instances;

b) The contractors must put all estimates based on their assessment of current overloading and provide for that in their quantities of work and add a compensations framework for any growth beyond expected levels;

c) The contractor carries all risk related to the performance of the roads for the full duration of the contract term.

5.7 DATA COLLECTION DURING CONTRACT

5.7.1 Setting the Benchmark

During the tender phase all available data are provided to prospected contractors. In addition to that, the contractors are allowed to do as much additional data collection on the sites as they deem necessary, to estimate their work input requirement. The tender specifically excludes DGH responsibility for the data being 100 percent accurate.

It is thus natural that the tender process is completed with multiple versions of the same data items such as traffic loading. As part of good practice it is, therefore, important for the DGH and the successful contractor to establish a mutually accepted level of all data items during the initial stages of the contract. It is, therefore, a requirement to complete a full assessment of condition and traffic values during the onset of the contract.

5.7.2 Annual Surveys and Reporting

The contract currently specifies that all data collection during the contract is undertaken by the contractor with representation from the DGH during the data collection process. It is believed that this process is practical since it removes most of the potential for disputes if the data collection is undertaken by the DGH. Some of the aspects that should be kept in mind are:

- Allowance should be made for third party assessment/surveys should any dispute arise between the DGH and the contractor; and
- there must be a mechanism in the contract, perhaps even a KPI that ensures data collected by the contractor is transferred to the DGH in a format suitable for their national database.

5.8 PENALTY CLAUSES AND TERMINATION CLAUSES

The current document has appropriate penalty and termination clauses to safeguard against poor performance including:

- For specified tolerances, the contractor will receive a 3 percent penalty on the basis of the contract value; and,
- when the accumulated penalties exceed a total of 10 percent of the contract value, termination processes commence.

These penalty clauses are within the expected practices of PBC contracts. However, as opposed to the clauses for poor performance, the contracts lack any incentives for good performance. Consideration should be given to the introduction of the following incentivising clauses:

- For continuous good performance from the contractor. For example, certain penalties levied can be withdrawn after a period of good performance,;
- provisions for the contractors undertaking self-policing. For example, if they identify condition performance outside of specifications and are unable to address it within a specified time frame they should be able to record the incident themselves. Self-identification of out-of specification performance would then carry a lower penalty compared to incidents recorded by the DGH or their representative;

- where the contractor performance is exceptional, there can be a bonus mechanism. This could take the form of either additional monetary compensation or perhaps through an extension of the contract (an option to re-new the contract).

Recommendation:
The current penalty clauses should be adjusted in order to make provision for incentives for good performance.

5.9 UNDERPINNED QUANTITIES

It is doubtful that contractors tendering this first PBC tender would be able to tender within close range of the engineer's estimate. There should, therefore, be a stronger signal to indicate how much work should be undertaken during the initial rehabilitation component of the first year during the contract. Therefore, DGH could provide the contractor with indicative specimen rehabilitation designs and applicable quantity of works used for the estimate. It should be made clear though that the underpinned quantities may not be sufficient for achieving the specified performance (KPI). It remains the contractor's responsibility to ensure that the performance standards are met, even if that may imply increased rehabilitation for the first year.

Recommendation:
The current tender document should also include under-pinned quantities that specify the absolute minimum quantum of work for the first year of the contract.

CHAPTER 6: DISCUSSION ON KEY PERFORMANCE SPECIFICATIONS

6.1 CLASSIFICATION OF KPIS SPECIFICATIONS

The type of KPIs utilised in the contract document are:

- Non-Occurrence KPIs and Response Time KPIs – these KPIs are normally used for isolated defects against specification such as potholes, edge-break etc.;
- Continuous Condition KPI – Typically, this KPI specifies the over-all condition performance against possible deterioration modes such as roughness and rutting;
- Management KPIs that specifies only response time to certain contractual requirements.

The specified KPIs are further discussed in the subsequent sections.

6.2 NON-OCCURRENCE KPI'S AND RESPONSE TIME KPIS

The main KPI component of the PBC tender is centred on KPIs where the desired position is not to have defects such as potholes or shoulder drop-off. When a defect does occur, the contractor has a time limit for responding to the defect. A typical example of such a specification is given by:

"*The diameter of the maximum allowed for a single pothole is 15 cm. Maximum allowed amount of accumulated holes with an equivalent diameter larger than 10 cm in 1000 m of continuous sections are three holes*."[4]

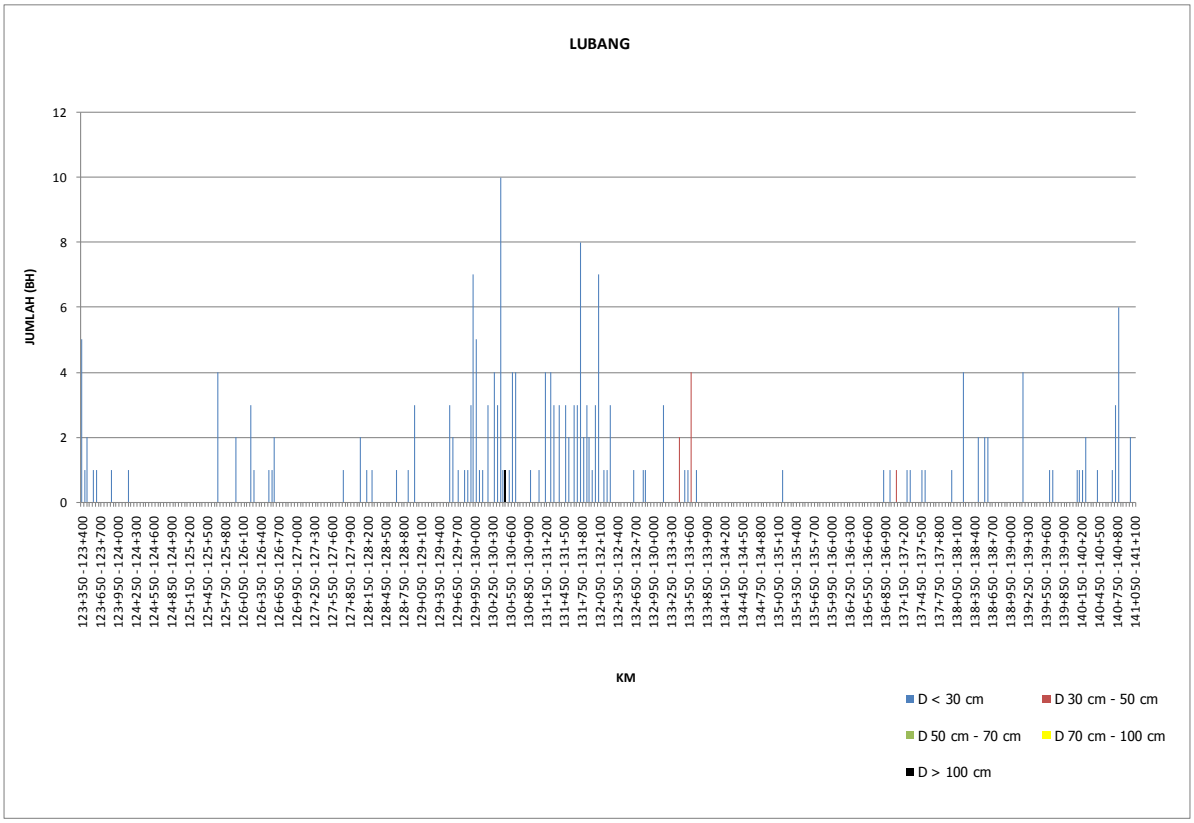
It has to be realised that most of these KPI specifications deal with defects that are associated with advanced pavement deterioration/failure and/or indications of poor drainage. For example, Figure 12 shows the number of potholes observed for the left-lane (increasing km) on a section on the Ciasem-Pamanukan PMC length. This road section displays advanced failures in the fast lane (flexible pavement) and would require a heavy rehabilitation to rectify the core problems. Therefore, this road does not currently comply with performance specifications.

In the context of the tender, these KPIs are appropriate as they encourage the contractor to consider an appropriate rehabilitation strategy at the on-set of the tender. In addition to that, it is an incentive for the contractor to pay attention to construction quality; otherwise these KPIs would become an issue during year three and four of the contract term. Therefore, these KPIs would be achievable if the contractor tender on the basis of an appropriate rehabilitation strategy and would be difficult to meet otherwise or as a result of poor construction quality.

No changes to the current KPI framework in this category are recommended.

[4] Translated extract from the DHG Tender Document

Figure 12: Number of Potholes for a section on the Ciasem Pamanukan PBC Road (left carriageway/increasing direction)



Recommendation:
During tender workshops/information meetings, DGH must emphasise to the contractors that the main drivers for the PBC and being a successful contractor are that: a) They decide on the appropriate maintenance strategy in year one of the tender; and, b) Improved work quality ensures good profit in a PBC.

6.3 CONTINUOUS CONDITION KPIS

Two continuous condition KPIs are specified namely, roughness and rutting. As highlighted, the format of these KPIs specifications is most appropriate for the Indonesia situation. It addresses most of the statistical challenges that were experienced by other PBC contracts such as those in Western Australia and New Zealand (Kadar et al., 2006).

The exact values of the KPIs are:

- For rutting - no rutting more than 20 mm and no more than 10 mm for 5 percent of a 1 km length; and,
- For roughness - average roughness 4 mm/km for a random selected road segment of 1 km.

6.3.1 Rutting

Rutting is an important KPI that controls the bearing capacity of flexible pavements and in particular the asphalt surfacing. The specifications are appropriate to ensure that the pavements are not in advanced stages of deterioration. None of the site visits has revealed any particular concerns regarding overall rutting levels. This is expected given the pavement types and designs used in these areas. However, isolated rutting does occur at sections that are at an advanced deteriorated state (See Figure 13).

Figure 13: Photo of a Failed Section on the Trengguli PBC Area (Rutting becoming visible)

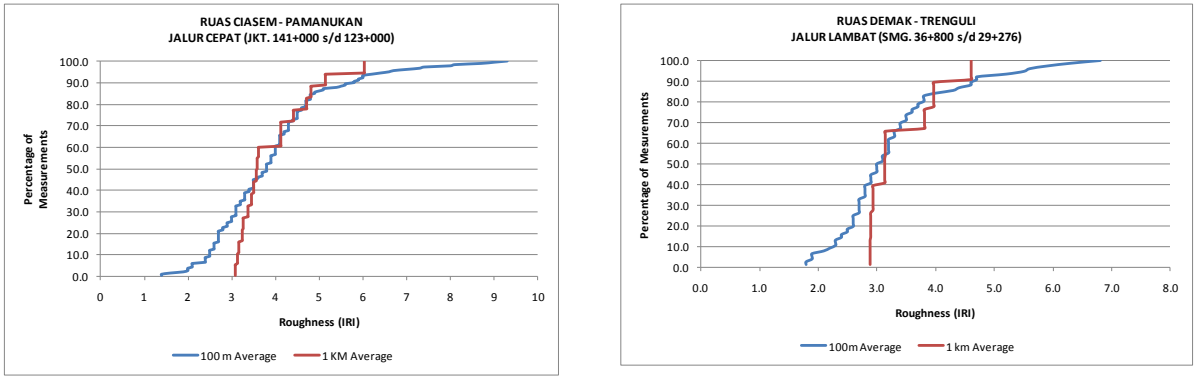
Therefore, it is believed that the rutting specification is at an appropriate level for these contracts. It should not be problematic for the contractor to achieve.

6.3.2 Roughness

Roughness is an important performance measure to monitor the road condition as it has a direct impact on road user costs and is a strong indicator of pavement deterioration. The roughness KPI for the DGH PBC contract is that the average roughness value of any 1 km length should not exceed 4 IRI.

Figure 14 illustrates the roughness for the worst sections on both pilot areas. The figures show the cumulative length of the lane (**fast lane in both cases)** within the respective roughness levels. The two lines indicate the 100 m roughness and 1 km roughness levels respectively. From the figures it can be observed that approximately 40 percent of the Pamanukan and 15 percent of the Trengguli lane length are outside of contract specifications (Note: these are the worst sections of both roads). It confirms the rehabilitation need that is required on both roads.

Figure 14: Example of Roughness of Worst Sections on Both Pilots



Also, it confirms that the specification per 1 km length is appropriate as it results in the same interpretation on both graphs. Also, addressing roughness levels should occur on longer lengths such as 1 km.

The level specified for the roughness is not that stringent, even for developing countries' standards. DGH could give consideration to reducing this requirement as one would hope to get a better performance achieved during the first 5 years of the contract. At current levels, this would be an easy specification to meet, if the contractor performs as per expectation, but hard to meet if the contractor tenders an unsustainable strategy.

6.4 FURTHER OBSERVATIONS

Further observations from the KPI review include:

- An appropriate distinction was made between the KPIs specified for rigid and flexible pavements;
- Sufficient provision has been made to specify the proper function of drainage structures;
- Practical provision has been made for allowable time for achieving KPIs
- The review revealed sufficient coverage of KPIs with the exception that provision should be made for the condition of concrete curbs.

CHAPTER 7: CONCLUSIONS

The technical unit of DGH, Bintek has requested interim support to prepare the bidding documents and draft contract for a pilot project for PBC on 30 kilometres of National Highway to be completed under this year's (2010) budget. Since the main activity is unlikely to begin before the end of August, IndII has agreed to field a special advisor to work specifically on the bidding documents and draft contract for the 30 km pilot project. This report has documented the outcome of the project that mostly involved the review of the PBC tender document and planned approach.

The two relevant pilot areas are:

- The Ciasem -Pamanukan section is approximately 21 km of road that stretches from STA 117+050 – 121+250 and STA 123+350 – 141+100. It is located east of Jakarta in the central northern part of Java Island; and,
- The Demak -Trengguli section is approximately 11 km of road that stretches from STA 24 + 800 – STA 35+800. It is located eastern part of Java Island, close to Samarang.

The review has revealed that Bintek has made significant progress with the tender document and processes. The tender document fulfils most of the criteria specified in standard PBC template document such as those released by the World Bank. However, the review has highlighted a number of practical recommendations that should enhance the value and the effectiveness of the PBC trials and at the same time be instrumental in receiving realistic tender prices.

During the review, the consultant worked closely with Bintek and this provided opportunities that resulted in:

a. recommendations being discussed and tested on the basis of Indonesian legislative and normal procedures; and

b. an immediate knowledge transfer took place.

Therefore, this report is a technical record of processes that have already been adopted within the next version of the tender documents. Specific recommendations on issues identified are detailed in the executive summary and the body of this report.

In order to sustain the good work that has been completed by Bintek and all technical experts who gave inputs to this process, it is recommended that the DGH is supported on a continuous basis to implement PBC in an effective manner. It is realized that the suggested process will have some limitations and room for improving on future contract. This continuous improvement process would only be effective if an official and robust monitoring and improvement cycle is put in place.

REFERENCE LIST

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Greenwood, I., Porter, T., Henning, T.F.P., Hajj, H & Latief, H. (2006b) Preparing Indonesia for Performance Based Maintenance Contracting. 22nd ARRB Conference – Research into Practice, Canberra Australia.

Hyman, W.A. (2009) *Performance-Based Contracting for Maintenance*. A synthesis of Highway Practice. NCHRP Synthesis 389. Transportation Research Board. Washington D.C.

Kadar, P., Henning, T.F.P. & Parkman, C.C. (2006) Effectiveness of Performance Indicators in Managing Road Networks, 22nd ARRB Conference – Research into Practice, Canberra Australia.

Paterson, W.D.O. and Harahap, G. *Application of Medium-Term Expenditure Framework & Performance-Based Budgeting in Directorate General of Highways Indonesia*. Indonesia Infrastructure Initiative Financed by Australian Agency for International Development (AusAID). Directorate-General of Highways, Ministry of Public Works, Indonesia.

ANNEXES

ANNEX A: PERFORMANCE-BASED TENDER PRE-QUALIFICATION TECHNICAL ASSESSMENT

Table A 1: Performance-based Contract Pre-qualification Assessment Sheet

KERANGKA EVALUASI PENILAIAN

TAHAP PRAKUALIFIKASI

NO.	KRITERIA	URAIAN		PENILAIAN		BATAS MINIMUM SKORING	NILAI MAKSIMUM SKORING	KETERANGAN
				LULUS/GUGUR	SKORING (%)			
1	ADMINISTRASI	a	Copy Sertifikat Badan Usaha (SBU)	Lulus/Gugur				
		b	Copy Surat Ijin Usaha Jasa Konstruksi (IUJK)	Lulus/Gugur				
		c	Copy Akte Pendirian Perusahaan	Lulus/Gugur				
		d	Copy Nomor Pokok Wajib Pajak	Lulus/Gugur				
		e	Copy bukti Pelunasan Pajak Tahunan Terakhir (SPT/PPh) dan Laporan bulanan PPh pasal 25 atau 21/pasal 23, 3 bulan terakhir.	Lulus/Gugur				
		f	Surat Dukungan Bank Minimal 20 %	Lulus/Gugur				
		g	Surat Perjanjian Kerjasama Kemitraan (Jika bermitra / KSO)	Lulus/Gugur				

NO.	KRITERIA	URAIAN		PENILAIAN		BATAS MINIMUM SKORING	NILAI MAKSIMUM SKORING	KETERANGAN
				LULUS/GUGUR	SKORING (%)			
		h	Copy Sertifikat Sistem Manajemen K3 (OSHAS) dan Mutu (ISO) (Tidak menyampaikan Gugur)	Lulus/Gugur				
2	KEUANGAN			**Lulus/Gugur**		**10.00**		
		a	Dukungan Bank (DB) ≥ 20% dari Nilai Paket	Lulus/Gugur		2.50		
		b	Sisa Kemampuan Keuangan (SKK) > 0,80 Nilai Paket	Lulus/Gugur		7.50		
3	TEKNIS		**Total Nilai Teknis < 42,50 dinyatakan GUGUR**					
		a	**Kemampuan Dasar (KD)**	**Lulus/Gugur**				
			KD = 2 NPt	Lulus				
			KD > 2 NPt	Lulus				
			KD < 2 NPt	Gugur				
			KD yang diperhitungkan hanya KD Kontraktor Utama saja (Lead Firm)					
		b	**Pengalaman Perusahaan *(Kontraktor Utaman + Kontraktor Mitra)***			**25.00**	**50.00**	
			1). Bidang Pekerjaan			**10.00**	**20.00**	
			Bidang, sub-bidang dan jenis sama		100.00			

NO.	KRITERIA	URAIAN		PENILAIAN		BATAS MINIMUM SKORING	NILAI MAKSIMUM SKORING	KETERANGAN
				LULUS/GUGUR	SKORING (%)			
			Bidang sama, sub bidang beda jenis pekerjaan sama		75.00			
			Bidang sama, sub-bidang dan jenisnya berbeda		50.00			
			Bidang, sub-bidang dan jenis tidak sama		0.00			
			2). Besarnya Nilai Kontrak			**10.00**	**20.00**	
			NPt > HPS		100.00			
			0,5 HPS ≤ NPt < HPS		50.00			
			NPt < 0,5 HPS		0.00			
			NPt yang dinilai adalah Kumulatif NPt Pekerjaan Jasa Kontruksi (Kontraktor Utama dan Kontraktor Mitra)					
			3). Status Penyedia Jasa (Lead Firm)			**5.00**	**10.00**	
			Sebagai Penyedia Jasa Utama/Lead Firm JO		100.00			
			Sebagai Anggota JO		50.00			
			Sebagai Sub Penyedia Jasa		0.00			
		c	**Personil (Semua Personil Inti u/ Jasa Pemborongan + Konsultansi)**			**10.00**	**20.00**	
			Pendidikan			**2.50**	**5.00**	

NO.	KRITERIA	URAIAN		PENILAIAN		BATAS MINIMUM SKORING	NILAI MAKSIMUM SKORING	KETERANGAN
				LULUS/GUGUR	SKORING (%)			
			Sarjana S1/S2/S3		100.00			
			Sarjana Muda/DIII atau setara		70.00			
			Pengalaman Kerja			**5.00**	**10.00**	
			≥ 7 Tahun		100.00			
			≥ 3 Tahun s/d < 7 Tahun		65.00			
			< 3 Tahun		0.00			
			Profesi/Keahlian			**2.50**	**5.00**	
			Sesuai dengan bidang dan sub-bidang paket pekerjaan		100.00			
			Tidak sesuai dengan bidang dan sub-bidang paket pekerjaan		0.00			
		d	**Peralatan (Kontraktor Utama + Kontraktor Mitra)**			**7.50**	**15.00**	
			Yang Dinilai hanya yg kondisinya ≥ 70%					
			Milik sendiri dengan bukti		100.00			
			Sewa beli dengan bukti		100.00			
			Sewa dengan bukti		50.00			

NO.	KRITERIA	URAIAN		PENILAIAN		BATAS MINIMUM SKORING	NILAI MAKSIMUM SKORING	KETERANGAN
				LULUS/GUGUR	SKORING (%)			
			Milik sendiri, sewa beli, dan sewa tanpa bukti		0.00			
		e	**Manajemen Mutu (Kontraktor Utama)**			**0.00**	**5.00**	
			Program Mutu ada, Sertifikat ISO dan K3 ada		100.00			
			Program Mutu tidak ada/tidak menyampaikan		0.00			
4	**AMBANG LULUS**		**Ambang Lulus (Passing Grade) minimal Nilai 60**			**60.00**		
			Penyedia Jasa yang memenuhi Nilai Ambang Lulus harus dilakukan penilaian terhadap kemampuan untuk melaksanakan paket pekerjaan dengan nilai Sisa Kemampuan Paket (SKP)					

ANNEX B: PERFORMANCE-BASED TENDER TECHNICAL ASSESSMENT

KERANGKA EVALUASI PENILAIAN

TAHAP PELELANGAN/SELEKSI

NO.	KRITERIA	URAIAN		PENILAIAN			MINIMUM SKORING	MAKSIMUM SKORING	KETERANGAN
				LULUS/GUGUR	SKORING				
					Skor	(%)			
1	**ADMINISTRASI**	a	Surat Penawaran Administrasi dan Teknis	Lulus/Gugur					
		b	Surat Penawaran Harga						Tidak sesuai dengan
		c	Jaminan Penawaran	Lulus/Gugur					yang disyaratkan
		d	Surat Kuasa (bila diperlukan)	Lulus/Gugur					**GUGUR**
		e	Surat Dukungan Peralatan dari agen resmi (bila diperlukan)	Lulus/Gugur					
		f	Surat Perjanjian Kerjasama Kemitraan	Lulus/Gugur					
			(Jika Contractor Led atau KSO)			-			
2	**TEKNIS**	**A.**	**METODE PELAKSANAAN PEKERJAAN**				**137.50**	**250.00**	
		1.	**Metode Pekerjaan Perencanaan**				**37.50**	**50.00**	
		a	**Pemahaman atas Layanan Perencanaan/Desain dalam KAK/TOR**				**7.50**	**10.00**	
			1. Pemahaman atas jasa layanan yang diperlukan					3.00	
			Baik (Good)			**100.00**			

NO.	KRITERIA	URAIAN		PENILAIAN			MINIMUM SKORING	MAKSIMUM SKORING	KETERANGAN
				LULUS/GUGUR	SKORING				
					Skor	(%)			
			Cukup (Sufficent)			**75.00**	**2.25**		
			Kurang (Deficient)			**50.00**			
			2. Pemahaman terhadap lingkup kegiatan					4.00	
			Baik			**100.00**			
			Cukup			**75.00**	**3.00**		
			Kurang			**50.00**			
			3. Pengenalan lapangan					3.00	
			Baik			**100.00**			
			Cukup			**75.00**	**2.25**		
			Kurang			**50.00**			
		b	**Kualitas Metodologi Perencanaan/Desain**				**15.00**	**20.00**	
			1. Ketepatan menganalisis Masalah dan Langkah Kerja					8.00	
			Baik			**100.00**			
			Cukup			**75.00**	**6.00**		
			Kurang			**50.00**			

NO.	KRITERIA	URAIAN		PENILAIAN			MINIMUM SKORING	MAKSIMUM SKORING	KETERANGAN
				LULUS/GUGUR	SKORING				
					Skor	(%)			
			2. Konsistensi antara Metodologi dengan Rencana Kerja					4.00	
			Baik			**100.00**			
			Cukup			**75.00**	**3.00**		
			Kurang			**50.00**			
			3. Apresiasi dan Inovasi					4.00	
			Baik			**100.00**			
			Cukup			**75.00**	**3.00**		
			Kurang			**50.00**			
			4. Kebutuhan Personil dan Jadwal					4.00	
			Baik			**100.00**			
			Cukup			**75.00**	**3.00**		
			Kurang			**50.00**			
		c	**Tanggapan terhadap KAK&TOR Perencanaan/Desain**				**7.50**	**10.00**	
			1. Data yang Tersedia					3.00	
			Baik			**100.00**			

NO.	KRITERIA	URAIAN		PENILAIAN			MINIMUM SKORING	MAKSIMUM SKORING	KETERANGAN
				LULUS/GUGUR	SKORING				
					Skor	(%)			
			Cukup			**75.00**	**2.25**		
			Kurang			**50.00**			
			2. Lingkup Pekerjaan					3.00	
			Baik			**100.00**			
			Cukup			**75.00**	**2.25**		
			Kurang			**50.00**			
			3. Produk Hasil Pekerjaan					4.00	
			Baik			**100.00**			
			Cukup			**75.00**	**3.00**		
			Kurang			**50.00**			
		d.	**Laporan Hasil Kerja**				**7.50**	**10.00**	
			Ada, Sesuai/Lengkap			**100.00**			
			Ada, Tidak Sesuai/Tidak Lengkap			**75.00**	**7.50**		
			Tidak Ada			**50.00**			
			Sub Total - 1 Skoring Teknis						

NO.	KRITERIA	URAIAN		PENILAIAN			MINIMUM SKORING	MAKSIMUM SKORING	KETERANGAN
				LULUS/GUGUR	SKORING				
					Skor	(%)			
	Lanjutan Evaluasi Teknis	2	**METODE PELAKSANAAN PEKERJAAN KONSTRUKSI**				50.00	100.00	
		a.	**Persyaratan Substantif Lingkup Pekerjaan**					50.00	
			– Substansi lingkup pekerjaan konstruksi, sesuai dengan yang disyaratkan			100.00			
			– Substansi lingkup pekerjaan konstruksi, kurang sesuai dengan yang disyaratkan			50.00	25.00		
			– Substansi lingkup pekerjaan konstruksi, tidak sesuai dengan yang disyaratkan			0.00			
		b.	**Metode Kerja**					50.00	
			– Urutan tahapan penyelesaian pekerjaan, sangat logis/wajar			100.00			
			– Urutan tahapan penyelesaian pekerjaan, kurang logis/wajar			50.00	25.00		
			– Urutan tahapan penyelesaian pekerjaan, tidak logis/wajar			0.00			
		3. METODE LAYANAN PEMELIHARAAN					50.00	100.00	
		a. Kegiatan Utama Layanan Pemeliharaan						50.00	
			– Kegiatan pekerjaan layanan pemeliharaan, sesuai dengan lingkup layanan			100.00			
			– Kegiatan pekerjaan layanan pemeliharaan, kurang sesuai dengan lingkup layanan			50.00	25.00		

NO.	KRITERIA	URAIAN		PENILAIAN			MINIMUM SKORING	MAKSIMUM SKORING	KETERANGAN
				LULUS/GUGUR	SKORING				
					Skor	(%)			
			– Kegiatan pekerjaan layanan pemeliharaan, tidak sesuai dengan lingkup layanan			**0.00**			
		a. Metode pencapaian Tingkat Layanan Pemeliharaan						**50.00**	
			– Kegiatan pekerjaan untuk mencapai tingkat layanan, sangat logis/wajar			**100.00**			
			– Kegiatan pekerjaan untuk mencapai tingkat layanan, kurang logis/wajar			**50.00**	25.00		
			– Kegiatan pekerjaan untuk mencapai tingkat layanan, tidak logis/wajar			**0.00**			
		B	**JADUAL PELAKSANAAN PEKERJAAN**				**85.00**	**100.00**	
		1	**Jadual Seluruh Penyelesaian Pekerjaan**					**30.00**	
			– Hubungan antar aktifitas kegiatan/pekerjaan, sangat logis/wajar			**100.00**			
			– Hubungan antar aktifitas kegiatan/pekerjaan, kurang logis/wajar			**50.00**	15.00		
			– Hubungan antar aktifitas kegiatan/pekerjaan, tidak logis/wajar			**0.00**			
		2	**Jadual Pekerjaan Perencanaan/Desain**					**20.00**	
			– Jadual pekerjaan perencanaan wajar (tidak mengakibatkan keterlambatan konstruksi)			**100.00**	20.00		

NO.	KRITERIA	URAIAN		PENILAIAN			MINIMUM SKORING	MAKSIMUM SKORING	KETERANGAN
				LULUS/GUGUR	SKORING				
					Skor	(%)			
			– Jadual pekerjaan perencanaan, kurang wajar (karena dapat mengakibatkan keterlambatan pekerjaan konstruksi)			**0.00**			
		3	**Jadwal Pekerjaan Pelaksanaan Konstruksi**					**30.00**	
			– Waktu pekerjaan konstruksi sesuai dengan yang disyaratkan			**100.00**	30.00		
			– Waktu pekerjaan konstruksi, lebih cepat dari yang disyaratkan			**100.00**			
			– Waktu pekerjaan konstruksi, lebih lambat dari yang disyaratkan			**0.00**			
		4	**Jadwal Pekerjaan Layanan Pemeliharaan**					**20.00**	
			– Waktu layanan pemeliharaan sesuai dengan yang disyaratkan			**100.00**	20.00		
			– Waktu layanan pemeliharaan, lebih cepat dari yang disyaratkan			**0.00**			
		C	**PENCAPAIAN KINERJA**				**140.00**	**200.00**	
		1	**Analisis Pencapaian Mutu dan Kinerja**					40.00	
			– Metoda analisis dalam pencapaian mutu & kinerja, sangat wajar/logis			**100.00**			
			– Metoda analisis dalam pencapaian mutu & kinerja, kurang wajar/logis			**50.00**	20.00		

NO.	KRITERIA	URAIAN		PENILAIAN			MINIMUM SKORING	MAKSIMUM SKORING	KETERANGAN
				LULUS/GUGUR	SKORING				
					Skor	(%)			
			– Metoda analisis dalam pencapaian mutu & kinerja, tidak wajar/logis			**0.00**			
		2	**Target Pencapain Mutu dan Kinerja**					80.00	
			– Target dalam pencapaian mutu & kinerja, sesuai dengan yang disyaratkan			**100.00**	80.00		
			– Target dalam pencapaian mutu & kinerja, kurang sesuai dengan yang disyaratkan			**25.00**			
			– Target dalam pencapaian mutu & kinerja, tidak sesuai dengan yang disyaratkan			**0.00**			
		3	**Metode Pengendalian Pekerjaan**					40.00	
			– Tersedianya rencana pengujian, monitoring dan evaluasi pekerjaan, sangat lengkap			**100.00**			
			– Tersedianya rencana pengujian, monitoring dan evaluasi pekerjaan, kurang lengkap			**50.00**	20.00		
			– Tersedianya rencana pengujian, monitoring dan evaluasi pekerjaan, tidak ada/lengkap			**0.00**			
		4	**Spesifikasi Pekerjaan**					40.00	
			– Spesifikasi Teknis sesuai NSPK/SNI yang telah ditetapkan			**100.00**			

NO.	KRITERIA	URAIAN		PENILAIAN			MINIMUM SKORING	MAKSIMUM SKORING	KETERANGAN
				LULUS/GUGUR	SKORING				
					Skor	(%)			
			– Spesifikasi Teknis > 50% sesuai NSPK/SNI dan <50% tidak sesuai NSPK, namun			**50.00**	20.00		
			– sudah melalui proses pengujian yang dapat dipertanggungjawabkan						
		D	**ORGANISASI PELAKSANAAN PEKERJAAN**				**100.00**	**200.00**	
		1	**Organisasi Tahap Perencanaan dan Pelaksanaan Konstruksi**				**60.00**	**120.00**	
			a. Jumlah dan Jadwal Personil					50.00	
			– Jumlah dan Jadual Personil, sesuai dengan lingkup pekerjaan			**100.00**			
			– Jumlah dan Jadual Personil, kurang sesuai dengan lingkup pekerjaan			**50.00**	25.00		
			– Jumlah dan Jadual Personil, tidak sesuai dengan lingkup pekerjaan			**0.00**			
			Sub Total - 2 Skoring Teknis						
			b. Kesesuaian Kualifikasi Personil					40.00	
			– Penempatan dan kualifikasi Personil sesuai dengan tugasnya			**100.00**			
			– Penempatan dan kualifikasi Personil, kurang sesuai dengan tugasnya			**50.00**	20.00		

NO.	KRITERIA	URAIAN		PENILAIAN			MINIMUM SKORING	MAKSIMUM SKORING	KETERANGAN
				LULUS/GUGUR	SKORING				
					Skor	(%)			
			– Penempatan dan kualifikasi Personil, tidak sesuai dengan tugasnya			**0.00**			
			c. Pengalaman Personil					30.00	
			– Pengalaman Personil sesuai dengan subbidang tugasnya			**100.00**			
			– Pengalaman Personil, kurang sesuai dengan subbidang tugasnya			**50.00**	15.00		
			– Pengalaman Personil, tidak sesuai dengan subbidang tugasnya			**0.00**			
		2	**Organisasi Tahap Layanan Pemeliharaan**				**40.00**	**80.00**	
			a. Unit Pengendali Layanan Pemeliharaan					60.00	
			– Jumlah Personil pengendali layanan pemeliharaan, sangat memadai			**100.00**			
			– - Jumlah Personil pengendali layanan pemeliharaan, kurang memadai			**50.00**	30.00		
			– Jumlah Personil pengendali layanan pemeliharaan, tidak memadai			**0.00**			
			b. Tugas dan Tanggung Jawab Personil					20.00	
			– Tugas, Tangung jawab & Wewenang Personil, diuraikan dengan jelas			**100.00**			

NO.	KRITERIA	URAIAN		PENILAIAN			MINIMUM SKORING	MAKSIMUM SKORING	KETERANGAN
				LULUS/GUGUR	SKORING				
					Skor	(%)			
			– Tugas, Tangung jawab & Wewenang Personil, tidak diuraikan dengan jelas			**50.00**	10.00		
		E	**DAFTAR PERALATAN YANG DIGUNAKAN**				**50.00**	**100.00**	
		1	**Daftar Peralatan, tahap perencanaan dan Pelaksanaan**					60.00	
			– Jumlah dan Komposisi Peralatan yang digunakan, sangat memadai			**100.00**			
			– Jumlah dan Komposisi Peralatan yang digunakan, kurang memadai			**50.00**	30.00		
			– Jumlah dan Komposisi Peralatan yang digunakan, tidak memadai			**0.00**			
		2	**Daftar Peralatan, tahap layanan pemeliharaan**					40.00	
			– Jumlah dan Komposisi Peralatan yang digunakan, sangat memadai			**100.00**			
			– Jumlah dan Komposisi Peralatan yang digunakan, kurang memadai			**50.00**	20.00		
			– Jumlah dan Komposisi Peralatan yang digunakan, tidak memadai			**0.00**			
		F	**GAMBAR - GAMBAR (GAMBAR DASAR)**				**50.00**	**100.00**	
			a. Kesesuaian Dengan Lingkup Pekerjaan					50.00	

NO.	KRITERIA	URAIAN		PENILAIAN			MINIMUM SKORING	MAKSIMUM SKORING	KETERANGAN
				LULUS/GUGUR	SKORING				
					Skor	(%)			
			– Gambar Dasar yang diusulkan sesuai dengan lingkup pekerjaan			**100.00**			
			– Gambar Dasar yang diusulkan, kurang sesuai dengan lingkup pekerjaan			**50.00**	25.00		
			– Gambar Dasar yang diusulkan, tidak sesuai dengan lingkup pekerjaan			**0.00**			
			b. Kesesuaian Dengan Kriteria Desain					50.00	
			– Gambar Dasar yang diusulkan sesuai dengan kriteria desain			**100.00**			
			– Gambar Dasar yang diusulkan, kurang sesuai dengan kriteria desain			**50.00**	25.00		
			– Gambar Dasar yang diusulkan, tidak sesuai dengan kriteria desain			**0.00**			
		G.	**BAGIAN PEKERJAAN YANG DISUBKONTRAKKAN**				**37.50**	**50.00**	
			a. Bobot Pekerjaan yang disubkontrakkan					25.00	
			– Bobot Pekerjaan yang disubkontrakkan ≤ 20 % dari total pekerjaan			**100.00**	25.00		
			– Bobot Pekerjaan yang disubkontrakkan > 20 % dari total pekerjaan			**0.00**			
			b. Jenis Pekerjaan yang disubkontrakkan					25.00	

NO.	KRITERIA	URAIAN		PENILAIAN			MINIMUM SKORING	MAKSIMUM SKORING	KETERANGAN
				LULUS/GUGUR	SKORING				
					Skor	(%)			
			– Jenis Pekerjaan yang disubkontrakkan, merupakan pekerjaan minor			**100.00**			
			– Jenis Pekerjaan yang disubkontrakkan, sebagian pekerjaan minor dan sebagian pekerjaan utama.			**50.00**	12.50		
			– Jenis Pekerjaan yang disubkontrakkan, merupakan pekerjaan utama			**0.00**			
		H	**AMBANG LULUS (PASSING GARDE) TEKNIS MINIMAL NILAI 700**						
			BAGI PENYEDIA JASA YANG MENDAPATKAN NILAI TEKNIS < 700 DINYATAKAN GUGUR DAN TIDAK DILANJUTKAN DALAM EVALUASI KEWAJARAN HARGA						
			Sub Total - 3 Skoring Teknis				**600.00**	**1,000.00**	
3	**BIAYA**	a	Surat Penawaran Harga	Lulus/Gugur					
		b	Rekapitulasi Daftar Kuantitas dan Biaya		Harga Penawaran Terkoreksi, Harga Wajar dan Kesesuaian Aritmatik serta tidak melebihi DIPA				
		c	Rincian Daftar Kuantitas dan Biaya						
		Penawaran Biaya, mencakup :							
			1. Penawaran Biaya (setelah koreksi aritmatik) untuk :						
			– Aspek Perencanaan/Desain						

NO.	KRITERIA	URAIAN		PENILAIAN			MINIMUM SKORING	MAKSIMUM SKORING	KETERANGAN
				LULUS/GUGUR	SKORING				
					Skor	(%)			
			– Aspek Pelaksanaan/Konstruksi						
			– Aspek Layanan Pemeliharaan (sesuai umur kontrak)						
			3. Preferensi Komponen Dalam Negeri						
			(sesuai Keppres No. 80 Thn 2003, Pasal 43 dan Penjelasannya Bab IV Point 4)						
		Catatan :							
		1)	Peserta Lelang harus melakukan perhitungan ***biaya yang wajar***, dan Panitia Pengadaan dapat melakukan koreksi seperlunya JIKA terdapat harga yang dinilai tidak sama antar peserta lelang untuk jenis bahan yang sama						
		2)	Peserta Lelang yang tidak dapat memenuhi item-item wajib (mandatory items) yang disyaratkan, **dinyatakan GUGUR**						
4	**PENILAIAN GABUNGAN/ AKHIR**	Perhitungan Penilaian Gabungan dilakukan berdasarkan Kombinasi Penilaian Teknis dan							
		Penawaran Biaya Terkoreksi dengan Rumusan sebagai berikut :							
			Total Penilaian Teknis x 10¹°						
			Harga Penawaran Terkoreksi						

NO.	KRITERIA	URAIAN	PENILAIAN			MINIMUM SKORING	MAKSIMUM SKORING	KETERANGAN
			LULUS/GUGUR	SKORING				
				Skor	(%)			
		Tujuan penilaian gabungan agar tercapai keseimbangan antara metode teknis yang ditawarkan dengan harga penawaran. Usulan calon pemenang adalah yang mempunyai Nilai Tertinggi hasil gabungan dan dibuktikan dengan pembuktian kualifikasi.						

ANNEX C: IMPROVED CONDITION AND COST SAVING EXPECTED FROM PBC

C. 1 Background

As part of the assignment, there has been a request from the Ministry of Finance (MoF) to show evidence of cost savings and/or level of service improvements typically achieved through the adoption of PBCs. Evidence has been compiled by means of a literature study and this section documents the main findings of the literature review.

The process of quantifying the cost saving for PBCs is not straightforward, as most of the benefits are institutional related and life-cycle cost savings which take time to evaluate. In addition it may actually result in a slight cost increase to maintain the road because of a higher standard of maintenance, compared to that achieved by a traditional approach to road maintenance.

C.2 Advantages of Performance Based Contracts

Although there are a number of reasons why authorities around the world have adopted PBCs, some of the typical benefits of adopting this contract style are[5] :

- potential reduction in cost, assuming a similar level of service is maintained;
- there could be a significant improvement in condition performance of the roads. Naturally in these instances, the over-all maintenance cost could be higher than the historical/traditional contracts;
- a transfer of some of the risk to the contractor;
- more innovation in both technical and managerial aspects;
- better integration between different services such as trenching for telecommunication and say road maintenance;
- enhanced asset management practices and processes;
- an ability to maximise opportunities that may result from the partnering approach between the contractor and asset owner;
- it builds a new industry;
- it can achieve benefits from the economy of scale; and,
- the contract forces an increase in skills within the agencies, consultants and contractors.

There are also some limitations or disadvantages associated with PBCs. In the Indonesian context, some of these may include:

- a longer procurements process;
- uncertainty associated with the long-term contracting relationship;
- challenges in mobilisation; and,

[5] Hyman, 2009

- uncertainty in some risk sharing aspects such as over-loading.

C.3 Level of Service Improvement

It is important to realise that not all PBC contracts aim at improving the over-all level of service. Some contracts, such as those in New Zealand, may actually aim at maintaining the current level of service or in some isolated cases, aim at a lower level of service. In this example, the principle objective would be to keep the level of service at current levels but at a reduced cost.

In most cases, however, an improved network condition may have been the incentive behind adopting performance based principles for maintenance. Examples of these and typical condition improvements are depicted in Table C1.

Table C 1: Increased Level of Service or Condition (based on Hyman, 2009)

Agency	Condition Improvement
District of Columbia	Year 1 condition rating went up from 20 to 80 out of 100 where the condition rating is a composite condition score of 0 to 100 and 100 means an excellent condition score)
Sydney, Australia	13% improvement in condition for the 10 year duration of the PBC contract
Argentina	Good to fair – increased from 59% to 94% Critical to poor – decreased from 41% to 6%
Uruguay	Very good – from 0 to 25% Regular condition –from 40 to 15% Bad condition –remained at 0% (**Note** categories good and poor remained at similar levels)

C.4 Areas of Cost Savings

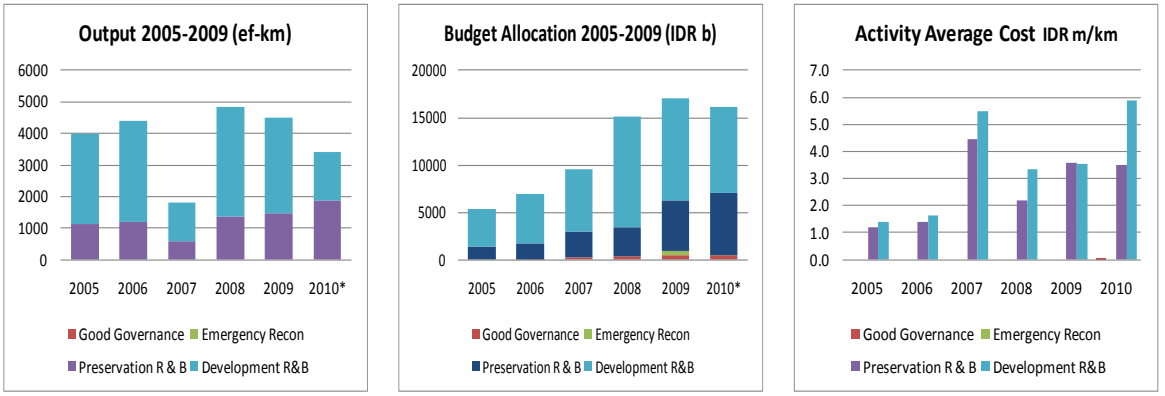
As mentioned earlier, the PBC concept is not necessarily aimed at providing cost savings as its objective but to secure long-term funding or provide a specific guaranteed performance level. However, there are definitely a number of areas where some cost savings could be expected and these are discussed in the following sections.

C.4.1 Efficiency Gains within the Agency

In their report, Paterson and Harahap (2010)[6] have identified a significant increase in budget allocation for road maintenance of the Indonesian National Road Network over the past five years. However, in terms of effective road length maintained, the length has reduced. (Refer toFigure C1)

[6] Expenditure Planning and Performance Based Budgeting in Directorate General of Highways

Figure C 1: RPJM1 2005-2009 Program Activities and Resource Use (Paterson & Harahap, 2010)



(a) Activity Outputs (b) Activity Budget Allocations (c) Activity Average Costs

It would therefore appear that there is an opportunity to improve on efficiency and reduce the overall cost of maintenance or to significantly improve the condition of the road network.

The PBC concept gives such an opportunity through some of the following strategies:

- There is a reduction in over-head costs related to managing a reduced number of maintenance contracts. A review of the DGH contract revealed that there are over 2,500 contracts managing the maintenance of 4,000 km of roads. Through the adoption of PBC, the number of contracts could be drastically reduced, resulting in freeing up some manpower that are currently needed for contract preparation, procurement and management of the contractors. In doing so, more time could be focused on other areas that are currently being deferred due to a lack of resources;
- A considerable effort goes into the monitoring, analysis, planning and budgeting of road maintenance projects. In some cases, there is also a substantial delay in funding approval, leading to delays in project executions. PBCs remove the need for this cumbersome planning cycle, since all maintenance work is planned by the contractor/consultant consortium. In addition to that, the long-term element of the PBC ensures that work can be planned in advance and funding is made available for the full duration of the contract;
- Currently, routine maintenance work is neglected due to an array of contributing factors, one being the shortage of staff/equipment. For example, a road could be performing acceptably well, but because of a blocked drainage system, which is not addressed, could fail rapidly,resulting in substantial and costly repairs. PBC gives the contractor full ownership of the road performance and as such they have vested interest in maximising the performance of the road. By reducing the risk for substantial failure, their profit margin is increased;
- Under normal/traditional maintenance contracts, there is some wastage due to multiple involvements from client staff, a consultant and lastly, the contractor. It is safe to assume that some duplication between the work of these parties takes place. In a PBC, only one party is responsible and considerable savings could be expected from professional services.

In New Zealand, savings of up to 17 percent were experienced in professional services (Hyman, 2009).

C.4.2 Direct Savings in Maintenance Cost

Where the required performance levels were close to the current road network condition, most of the PBCs have returned direct cost savings in the maintenance of the network. The sources of cost saving include:

- **Economy of scale** – with one contractor being responsible for larger networks and for longer contract terms, substantial savings could be realised due to less parties involved doing the same activities and better planning resulting in increased efficiency;
- **Improved work quality** – One of the largest cost heads in maintaining roads is poor work quality necessitating maintenance crews to return for follow-on maintenance work. In a PBC, the incentive for contractors is to perform work at a high quality standard, thus requiring them to repair a defect length of road only once during the contract term, with additional costs resulting from poor work standards being the full responsibility of the contractor. In traditional maintenance contracts, the contractors are paid every time they return to the same location for repairs and therefore there is no incentive to maintain a high quality in their repairs.;
- **Reduced life cycle costing** – The very nature of PBC is that the contractors will attempt to minimise their maintenance costs, whilst adhering to the performance specification. Therefore, the contractor will focus on investing in periodic maintenance to preserve the road performance. With traditional contracts, the tendency is to wait too long to undertake periodic maintenance and then pay a premium on more expensive maintenance options.
- **Preservation of the network** – Along the same lines as the previous point, contractors will focus on items that prevent failure of the roads such as deficient drainage. Keeping road pavement dry as far as possible is one of the major strategies to prolong its life. In the Indonesian PBCs, preserving adequate drainage is one of the performance measures that should ensure reduced maintenance costs.

With the factors mentioned above, tangible cost savings from PBC are possible and some examples of reported cost savings are listed in Figure C2.

Figure C 2: Reported cost saving for road maintenance work under PBC (Hyman, 2009)

Agency	Cost Savings
Virginia DOT (USA)	17% cost savings. Under traditional maintenance it cost $ 29,500 per mile Under PBC it costs $ 22,400 per mile
Alberta, Canada	28% reduction in costs Traditional style contracts cost $ 5,117/km PBC cost $ 3,705/km
New Zealand Transport Agency (NZTA)	30% decrease in professional services (consultants) and 17% decrease in direct maintenance costs Overall cost savings of 25% over conventional methods. (Most of these savings were estimated based on 10-year contracts)
Finland	7 to 10% savings for 3-year PBC and 13% for 7-year PBC