

カンボジア国
公共事業運輸省

カンボジア国
建設の品質管理強化プロジェクト
中間レビュー報告書

平成24年2月
(2012年)

独立行政法人国際協力機構
カンボジア事務所

カン事
JR
12-008

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公共事業運輸省

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序文

日本国政府はカンボジア国政府の要請に基づき、公共事業運輸省の建設品質管理の強化を目的として、平成 21（2009）年 5 月から 42 か月間の計画で「建設の品質管理強化プロジェクト」を実施しています。

今般、プロジェクト開始から約 2.5 か年が経過したことから、これまでに実施した活動の内容およびプロジェクト達成の見込み等について確認することを目的に中間レビューを実施いたしました。調査団は平成 23（2011）年 12 月 8 日～21 日まで、カンボジア側の公共事業運輸省のメンバーと合同評価チームを構成して現地調査を行い、その結果を合同評価レポートとしてミニッツに取りまとめ、署名交換を行いました。

本報告書は、上記調査の内容・結果を取りまとめたものであり、今後の協力に広く活用されることを目的としております。

最後に、本調査の実施に際しご協力を賜りました関係各位に対し、心より感謝申し上げます。

平成 24 年 2 月

独立行政法人国際協力機構
カンボジア事務所
所長 鈴木 康次郎

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1. ミニッツ（合同評価報告書）

写真



公共事業運輸省 (MPWT)



カウンターパートとの協議風景



パイロットプロジェクトサイト
(コンポンチャム州 71号線)



MPWT 試験所供与機材



専門家執務室



第2回 JCC (2011年12月21日)

略 語

ADB	アジア開発銀行	Asian Development Bank
AusAID	豪州国際開発援助庁	Australian Agency for International Development
CPs	カウンターパート	Counterparts
DPWT	州公共事業運輸局	Provincial Department of Public Works and Transport
EC	作業管理委員会	Executive Committee
JCC	合同調整委員会	Joint Coordination Committee
JICA	国際協力機構	Japan International Cooperation Agency
HEC	重機センター	Heavy Equipment Center
MEF	経済財務省	Ministry of Economy and Finance
M/M	議事録	Minutes of Meeting
MPWT	公共事業運輸省	Ministry of Public Works and Transport
NSDP	国家戦略開発計画	National Strategy and Development Plan
OVI	指標	Objectively Verifiable Indicator
PDM	プロジェクトデザインマトリックス	Project Design Matrix
PEAC	調達評価審査委員会	Procurement, Evaluation Award Committee
PO	活動計画表	Plan of Operations
PWRC	公共事業研究センター	Public Works Research Center
QC/QA	品質管理・品質保証	Quality Control and Quality Assurance
RAMP	道路資産管理プロジェクト	Road Asset Management Project
RID	道路インフラ部	Road and Infrastructure Department
RG	実施規定	Regulation
RGC	カンボジア王国	Royal Government of Cambodia
RS II	四辺形戦略フェーズ II	Rectangular Strategy II
SG	取扱要領	Standard Guideline
TCP	技術協力プロジェクト	Technical Cooperation Project
TOT	講師養成研修	Training of Trainers
WB	世界銀行	World Bank

評価調査結果要約表

I. 案件の概要																											
国名：カンボジア王国	案件名：建設の品質管理強化プロジェクト																										
分野：運輸交通	援助形態：技術協力プロジェクト																										
所轄部署：カンボジア事務所	協力金額（評価時点）：3.9 億円																										
協力期間	2009年5月～2012年10月 (42か月)	先方実施機関：公共事業運輸省（MPWT）																									
		日本側協力機関：国土交通省																									
1-1 協力の背景と概要																											
<p>公共事業交通省（MPWT）は持続可能かつ効率的な社会経済開発および貧困削減のために、これまでドナーおよび自国の資金を用いて道路や橋梁等の運輸交通インフラ整備・改修に取り組んできた。各国ドナー支援による道路整備は、施工監理のためのコンサルタントや請負事業者らによる品質管理がなされている。一方、自国予算による道路・協力の建設や維持管理においては、MPWT 内の道路インフラ部（RID）、重機センター（HEC）、州レベルの公共事業局（DPWT）が直営で実施しており、建設資材の規格確認や施工方法の確認等による品質管理が徹底されていないのが実情である。</p> <p>かかる状況からカンボジア政府は日本政府に対し、道路・橋梁建設における品質管理・保証（QC/QA）システムの構築を行なう技術協力プロジェクトの要請があった。これを受けて日本政府は、建設の品質管理のための抜本的な体制強化を行なうことを目的に「建設の品質管理プロジェクト」を実施することを決定した。</p>																											
1-2 協力内容																											
<p>(1) 上位目標： 「カンボジア公共事業運輸省が直営で実施する道路・橋梁の建設・維持管理の品質が向上し、持久する」</p> <p>(2) プロジェクト目標： 「プロジェクトが構築する品質管理・保証システムの適用によって MPWT が直営で実施する道路・橋梁工事の品質管理に関する能力が向上する」</p> <p>(3) アウトプット：</p> <ol style="list-style-type: none"> 1) 道路・橋梁建設の品質管理に関する実施規定、取扱要領が整備される 2) 完成図書（図面、報告書）の統合集中管理のためのシステムが構築される 3) 建設の品質管理向上のための研修が強化される <p>(4) 投入（評価時点）</p> <table border="0" style="width: 100%;"> <tr> <td>日本側：</td> <td>長期専門家派遣</td> <td>2名（68MM）</td> <td>短期専門家</td> <td>8分野（51.95MM）</td> </tr> <tr> <td></td> <td>機材供与</td> <td>123万米ドル</td> <td>ローカルコスト</td> <td>188,105米ドル</td> </tr> <tr> <td></td> <td>研修員受入れ</td> <td>7名</td> <td></td> <td></td> </tr> <tr> <td>カンボジア側：</td> <td>カウンターパート配置</td> <td>14名</td> <td></td> <td></td> </tr> <tr> <td></td> <td>土地・施設提供</td> <td>専門家執務室</td> <td>ローカルコスト負担</td> <td>115.2百万米ドル</td> </tr> </table>			日本側：	長期専門家派遣	2名（68MM）	短期専門家	8分野（51.95MM）		機材供与	123万米ドル	ローカルコスト	188,105米ドル		研修員受入れ	7名			カンボジア側：	カウンターパート配置	14名				土地・施設提供	専門家執務室	ローカルコスト負担	115.2百万米ドル
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II. 評価調査団の概要																											
調査者	<p>団 長： 小林雪治 JICA カンボジア事務所次長</p> <p>道路管理： 勝田穂積 JICA 国際協力専門員</p> <p>評価分析： 渡邊恵子 （財）国際開発高等教育機構（FASID）次長代理／主任研究員</p> <p>企画協力1： 江上雅彦 JICA カンボジア事務所 所員</p> <p>企画協力2： 鈴木恵子 JICA カンボジア事務所 企画調査員</p>																										
調査期間	2011年12月8日～2011年12月21日	評価種類： 中間レビュー																									

III. 評価結果の概要

3-1 実績の確認

3-1-1 アウトプット1： 道路・橋梁建設の品質管理に関する実施規定、取扱要領が整備される

成果は着実に進んでいるが、プロジェクト終了までに達成させるためには、残りの期間における集中的な活動が必要とされている。

指標	達成状況
緊急工事を除いて4年目(2013年)の初めから実施される直営で建設される道路・橋梁工事の100%に対して、すべての品質管理・保証システムが適用される。	<ul style="list-style-type: none">品質管理のための実施規定(RG)、取扱要領(SG)の第一版が英語及びクメール語で作成され(2010年8月)、2010年10月の第1回JCCで承認された。第1回目のパイロットプロジェクト2件の予算が承認され、そのうちの1件が2011年10月より開始されている。試験所向けの機材が計画どおり調達され、設置された。

3-1-2 アウトプット2： 完成図書(図面、報告書)の統合集中管理のためのシステムが構築される

成果は確実に進んでいるが、データベースおよび図書室の持続可能な管理運営を可能とするメカニズムの構築が必要とされている。

指標	達成状況
データベースシステムが構築され、同システムがMPWTスタッフによって活用される。	<ul style="list-style-type: none">データベースを構築し、過去のプロジェクトのうち入手可能な完成図書をデータ化し入力している。データベースの使用マニュアルは策定された。しかし、評価時点ではMPWT内部システムが完成されておらず、データベースが接続されていなかったため、幅広い活用までには至っていなかった。

3-1-3 アウトプット3： 建設の品質管理向上のための研修が強化される

活動は計画通りに進んでおり、プロジェクト終了までにアウトプットが達成される見込みである。しかし、残りの期間で技術的および財政的に持続可能かつ全国に広く普及するような研修体制の確立が求められる。

指標	達成状況
プロジェクトで策定した技術研修プログラムが担当する部署によって、MPWT内の研修プログラムとして組み入れられる。	<ul style="list-style-type: none">MPWT職員の能力および既存の研修に関する評価を実施した後、研修計画を2010年2月に策定した。中間レビュー(2011年12月)までに、TOTを1回実施し(2010年11月)、その後講師となったMPWT職員によりパイロットプロジェクトを実施する2つの州(コンポンチャム、カンダール州)で試験的な研修をそれぞれ1回実施した。また、州職員(DPWT)向けに実施されている既存のMPWT月例研修プログラムの2011年11月と12月のコースの中にプロジェクトで策定した「品質管理コース」を試行的に組み入れ実施した。既存の完成図書を基に、道路標準図集を策定した。

3-1-4 その他の特筆すべき活動

プロジェクトでは、上記 3 つのアウトプットを更に強化するために、日本人専門家による技術的なワークショップの開催、日本土木学会やカンボジア工科大学（ITC）と共催した共同セミナーの開催、カンボジアで実施中の無償資金協力案件（国道一号線改修計画、ネアックルン橋梁建設計画）の現場視察、MPWT 職員による論文集の作成および発表会の開催など実施した。

3-1-5 プロジェクト目標の達成度

プロジェクト目標に対する達成状況は以下の通りである。プロジェクト目標はプロジェクト終了までに達成の見込みはあるが、パイロットプロジェクトの実施を通じた SG、RG の改訂および適用など重要な活動が残っており、残りの期間で日本側およびカンボジア側両者からのおける最大限のコミットメントが必要となっている。

指標	達成状況
4 年目（2013 年）の初めから実施される直営で建設される道路・橋梁工事の 50% に対して、すべての品質管理・保証システムが適用される。	<ul style="list-style-type: none">・ 中間レビュー時点では品質管理・保証システム（SG と RG の第 2 版）が完成していないため指標の達成状況は測ることはできなかった。・ SG、RG を策定する過程で CP の能力向上が見られた。・ SG、RG を適用したパイロットプロジェクトを実施する過程でさらに CP の能力強化が必要である。

3-2 実施プロセス

プロジェクトの実質的な活動は短期専門家および CP の配置を待たなければいけなかったため、特にアウトプット 1 の活動の開始が遅れた。ほとんどの CP は他業務を兼ねていたためパートタイム CP としての配置であった。そのため、CP 会合など欠席も多く、最大限の努力は払っているもののプロジェクトの活動に参加できない場合も多かった。また、CP の離職、異動も多く、日本人専門家がその都度新しい CP に説明を要した。

CP と日本人専門家とのコミュニケーションは良好であり、プロジェクトの進捗状況、課題など情報共有が様々な機会を通じて取られていた。

3-3 評価結果の要約

(1) 妥当性

カ国では一層の経済成長を促すために運輸交通インフラの更なる整備が優先課題となっており、その実施には建設の品質の向上が不可欠である。その点で、プロジェクト目標・上位目標ともに、カ国の上位政策である四辺形戦略（フェーズ II）、5 年開発計画（NSDP）と整合している。また、道路や橋梁の維持管理コストが高まり国家予算を圧迫している中、建設の品質の向上は急務が急務となっている。本プロジェクトはこのような品質管理の必要性に対応しており意義も高く、MPWT のニーズとも合致している。また、日本政府の対カンボジア援助計画、JICA の援助実施方針にも整合している。従ってプロジェクトの妥当性は高い。

(2) 有効性

各アウトプットの実績から判断して、プロジェクト目標は達成される見込みである。本プロジェ

クトで初めて実施規定（SG）、取扱要領（RG）が明文化され、品質管理活動が標準化されたことは有効性が高い。SG、RG を適用することにより品質管理における一連の活動の中で契約者、実施者、監督者それぞれの役割が明確化され、また記録を残すことで問題が起きた時の原因分析に役立つようになった。更に、プロジェクトで策定した構造物の標準図集のデータベース化は今後の設計や改修に大いに活用できる。このような成果物の策定過程、そして講師となって州レベルの職員に研修を行うことによって、CP の品質管理活動の能力向上が図られている。

しかしながら有効性を確実にするためには、残りの期間で SG、RG はパイロットプロジェクトの実施を通じて第 2 版としてより実情に合わせたものに改訂していかなければならず、またプロジェクトで作成したデータベースおよび研修計画は持続的運用に向けたシステムを構築していく必要がある。

(3) 効率性

アウトプットは達成される見込みであるがいくつかの阻害要因も見られた。例えば、日本人短期専門家の調達および CP の配置の遅れ、CP の度重なる離職、異動（19 人中 9 人が違う時期に離職または異動）、パイロッププロジェクトの実施の遅れで成果が出る時期に遅れが生じている。今後作業の集中化などで補う必要がある。

供与機材の投入はほぼ計画どおり実施された。放射線型の特殊機材のみ通関に時間がかかり到着が 1 か月遅れたが、活動に影響はなかった。

(4) インパクト

SG、RG の第 2 版の策定およびその普及体制の確立など確定していない要素が多く、評価時点で上位目標の達成について判断することはできなかった。しかし、プロジェクトで上記体制を確立することができれば達成の可能性は高い。その一方で CP へのインタビューでは、本プロジェクトを通じて日本人専門家との協議、ワークショップ、本邦研修、論文執筆など様々な機会を通じて品質管理以外にも道路・橋梁に関する様々な知識や技術を習得しているという CP の能力強化のインパクトが見られた。また、SG、RG が MPWT に承認され直営工事に運用されることにより、本プロジェクトでターゲットとしていない政府関係の直営工事实施者（警察の施設部隊など）にも普及する可能性もある。なお、負のインパクトは発現していない。

(5) 自立発展性

プロジェクトで作成した SG、RG、データベース、標準図集、またその他必要な技術に関係者に普及するために、MPWT の既存の研修計画への組み込みにより自立発展性はある程度確保されている。また、本プロジェクトで適用した知識や技術は CP に伝わっており、彼らが今後継続的に関係者に普及していくことができれば技術的な持続性は担保できる。一方既存の研修は参加人数に限りがあり、早急に SG、RG の直営工事への適用を確実にするためには既存の研修以外に MPWT により実践的な普及体制を確立する必要がある。

データベースや図書室の持続的な運営管理については、データベースのアップデートや図書室の更なる運用を考慮し、誰が、いつ、どのように行うのかなど、組織的に運用システムを構築する必要がある。

財政面では、本プロジェクトにより品質管理活動を実施することによる費用の明確化ができ、経

済財務省との予算折衝がよりスムーズにいく可能性があり、適切な予算が配分される見込みがある。なお品質管理システムの普及にかかる研修などの予算を考慮する必要はある。試験所に供与した機材の維持管理については、試験所は技術的、財政的にも問題はない。

交通インフラの整備は未だカ国の優先課題であり、政策的な優先度は引き続き高い。

3-4 PDMの改訂

(1) 指標の変更：

プロジェクト目標、アウトプット1の指標が曖昧であり測定が難しかったため、下記のとおり変更した。また、それぞれの入手手段を提示した。

新しい指標と入手手段

	指標	入手手段
プロジェクト目標	1. プロジェクト終了までに、SGとRGが改訂され、2013年から始まる道路・橋梁の直営工事（定期モニタリングによる改修と新規工事）のうち、パイロット州（コンポンチャム、カンダール州）以外の3州で3つ以上のプロジェクトに適用されている。	1.1 直営工事実施者（DPWT、RID、HEC）に対し、公共事業局長から改訂されたSG、RGの適用を指示するレターのコピーおよびその合意返答文書 1.2 SG、RG適用対象プロジェクトの準備状況について実施者へインタビュー
	2. TOTを受けた講師を評価するとともに、2012年に実施した研修受講生が品質管理に関し、受講後のテストで70点以上を獲得する。	2.1 MPWT マネジメントレベルによる講師評価結果 2.2 受講後テストの結果
アウトプット1	プロジェクト終了までに、パイロットプロジェクトの実施からの教訓を取り入れたSG、RGの第2版が完成する。	1. SG、RGの第2版 2. MPWTからの省令

(2) 外部条件の追加：

アウトプットからプロジェクト目標、プロジェクト目標から上位目標への外部条件を新たに追加した。

- ① プロジェクト目標→上位目標： 直営工事に品質管理を確保するために適切な予算が配分される
- ② アウトプット→プロジェクト目標： MPWT内に統合内部接続システムが構築される

(3) 表現の変更：

プロジェクトの実態に即した言い方にするため「Standards, Regulations, Guidelines」という表現をしている箇所（プロジェクト目標、活動）を「Standard Guideline and Regulation」と修正した。

3-5 結論

プロジェクトは多少活動の遅れは生じているが、成果を着実に出示しており、プロジェクト目標は

プロジェクト終了までに達成の見込みが高い。また、各種研修やワークショップによりターゲットグループの MPWT 職員の品質管理活動の実施能力の向上が図られている。特に本プロジェクトの大きな成果の一つは、SG、RG の第一案を作成することにより品質管理活動の標準化に寄与した点であり、またその過程で関係者への能力向上を図った点である。しかしながら、パイロットプロジェクトの実施を通じて SG、RG を改訂していく必要があり、また、データベースや研修計画など各種プロジェクトで構築した成果の持続的運用を確実にするためのシステム作りなど、重要な活動が残りの期間に集中している。そのため、CP 側および日本側の更なる主体的な取り組みが必要となっている。

3-6 提言

<プロジェクト終了までに実施すべき提言>

- (1) RG、SG の改訂版が MPWT による承認を受け、速やかに州レベルに普及する体制を構築する。
- (2) RG、SG 改訂版作成におけるカンボジア側および日本側両方からの積極的な貢献、および RG、SG の内容の充実。
- (3) データベースおよび図書館運営の持続的な維持管理体制の確立。
- (4) 持続的かつ効果的な研修メカニズムの確立

3-7 教訓

本プロジェクトより以下の教訓が得られた。

- (1) プロジェクトのモニタリングおよび評価の基本となる PDM と PO は CP への周知を徹底させ、定期的な PDM 指標のモニタリングも実施すべきである。
- (2) 本プロジェクトでは短期専門家の調達の遅れから本格的な活動はプロジェクト開始 6 か月後となった。業務実施型の短期専門家の調達には時間がかかるため、JICA はプロジェクト活動のタイミングを十分考慮して前広に計画すべきである。

Summary of Mid-Term Review

I. Outline of the Project			
Country: Royal Government of Cambodia		Project Title: Strengthening of Construction Quality Control Project	
Issue/Sector: Transport		Cooperation Scheme: Technical Cooperation Project	
Division in Charge: JICA Cambodia Office		Total Cost : 390 million yen (as of Mid-Term Review)	
Period of Cooperation	May 2009 – October 2012 (42 months)	Partner Country's Implementing Organization: Ministry of Public Works and Transport (MPWT)	
		Cooperation Organization (Japanese side): Ministry of Land, Infrastructure, Transport and Tourism	
1-1 Background of the Project			
<p>In order to ensure the efficiency and sustainability of social and economic development and poverty reduction, the Ministry of Public Works and Transport (MPWT) has worked intensively on the rehabilitation and reconstruction of infrastructures such as roads and bridges with financial and technical support from development partners and/or national budgets. Regarding the construction projects from the development partners, international consultants have assured quality control by accommodating to the international standard. On the other hand, the national budget construction projects that were implemented by the governmental organizations under the MPWT such as the Road Infrastructure Department (RID), Heavy Equipment Center (HEC), and each provincial Department of Public Works and Transport (DPWT) have been inadequate and less effective in terms of quality control of construction. In those national budget projects, material testing and adequate construction procedure seem to be omitted in the development of national road network.</p> <p>Based on the above-mentioned backgrounds, the Royal Government of Cambodia (RGC) requested the implementation of the Technical Cooperation Project (TCP) to the Government of Japan in order to establish an adequate Quality Control and Quality Assurance (QC/QA) system for roads and bridges construction. In response to the request, the government of Japan decided to implement the project for Strengthening of Construction Quality Control (SCQC).</p>			
1-2 Project Overview			
(1) Overall Goal			
Quality and cycle of road and bridge construction and maintenance are improved.			
(2) Project Purpose			
Capacity of MPWT engineers in the quality control for road and bridge construction and maintenance undertaken by force account is improved through application of the Quality Control and Quality Assurance (QC/QA) system (Standards, Regulations, Guidelines, Trainings).			
(3) Output			
1) Standards, Regulations, Guidelines for quality control of road and bridge construction and maintenance are established.			
2) Centralized and integrated management system of completion documents such as drawing and reports of construction is established.			
3) Technical training lectured by PWRC lectures is consolidated by “Road Structure Standard Drawing			

Collections”.

(4) Inputs (as of Mid-Term Review)

Japanese side

- a) Personnel: Long-term Experts: 2 (68MM) Short-Term Experts: 8 areas (51.95MM)
 b) Equipment: US\$ 1.23 million c) Training in Japan: 7 CPs d) Local Cost: US\$ 188,105

Cambodia side

- a) Personnel: 14 CPs b) Office space: Expert office in MPWT c) Local Cost: US\$ 1.152 million

II. Evaluation Team

Members	Leader: Mr. Yukiharu KOBAYASHI (Senior Representative, JICA Cambodia Office) Construction Quality Control: Mr. Hozumi KATSUTA (Senior Advisor, JICA) Evaluation Analysis: Dr. Keiko WATANABE (Senior Researcher, FASID) Evaluation Planning 1: Mr. Masahiko EGAMI (Representative, JICA Cambodia Office) Evaluation Planning 2: Ms. Keiko SUZUKI (Project Formulation Advisor, JICA Cambodia Office)
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Period of Evaluation	8-21 December 2011	Type of Evaluation	Mid-Term Review
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III. Results of Evaluation

3-1 Achievement of Outputs

3-1-1 Output 1: Standards, Regulations, Guidelines for quality control of road and bridge construction and maintenance are established.

The Evaluation Team confirmed the steady progress being made in Output 1; however, the intensive efforts are expected to achieve its objective by the end of the Project period.

Objectively Verifiable Indicators (OVI)	Achievement
QC/QA system will be applied to 100% of projects of road and bridge construction/maintenance by force account which will be implemented from the beginning of the 4th year except emergency work.	<ul style="list-style-type: none"> • 1st edition of both Standard Guideline and Regulation (English and Khmer) have been formulated in August 2010 and approved by JCC in October 2010. • First batch of pilot project have been approved financially and one of them have started since October 2011. • Equipment for laboratory has been procured and installed.

3-1-2 Output 2: Centralized and integrated management system of completion documents such as drawing and reports of construction is established.

The Team observed the steady progress made under Output 2. For the rest of the Project period, a mechanism for sustainable use of database system and library management should be developed.

Objectively Verifiable Indicators	Achievements
Database system is completed and information of Database is utilized by MPWT staff by the end of the Project	A simple database system was developed and available as-built drawings of past projects were entered as electronic format. User manual was also formulated; however, it has not been connected to MPWT web site yet for wider use.

3-1-3 Output 3: Technical training lectured by PWRC lectures is consolidated by “Road Structure Standard Drawing Collections”

Most of activities under Output 3 have been implemented as planned and Output 3 is likely to be achieved by the end of the Project. It is expected, however, to establish an effective, efficient and sustainable mechanism for the technical trainings to disseminate Project outputs widely during the rest of the Project period.

Objectively Verifiable Indicators	Achievements
Technical training developed by the Project is incorporated into the conventional training program by Department of Personnel & Human Resources.	The training plan was prepared in February 2010 after assessing MPWT capacity needs and current training program. As of December 2011, a Training of Trainers (TOT) was conducted once in November 2010 followed by two pilot technical trainings in pilot provinces (Kandal and Kampong Cham). The training program was also incorporated into the conventional MPWT monthly training program for DPWT as trial basis in November and December 2011.

3-1-4 Other Activities to Contribute to the Outputs

The Project conducted several additional activities contributed to strengthen the above three Outputs. Those activities included Technical workshops held by Japanese experts, Joint seminar organized by Japan Society of Civil Engineering and Institute of Technology of Cambodia, Site observation to the on-going Japan’s infrastructure project (“Rehabilitation of National Road 1” and “Construction of Neak Loeung Bridge”), and Annual Technical Report and Seminar.

3-1-5 Achievement of Project Purpose

“Capacity of MPWT engineers in the quality control for road and bridge construction and maintenance undertaken by force account is improved through application of the Quality Control and Quality Assurance (QC/QA) system (Standard, Regulations, Guidelines, Trainings)”

The progress of the achievement of Project Purpose is as follows. The Project Purpose is likely to be achieved by the end of the Project; however, the critical activities including the revision of SG and RG after incorporation of lessons from the pilot projects have been still remained for the rest of the period. Therefore, the utmost efforts should be necessary from both Cambodian and Japanese sides to achieve the Project Purpose.

Objectively Verifiable Indicator	Achievement
Full implementation of QC/QA system for 50% of projects of road and bridge construction/maintenance by force account which will be implemented from the beginnings of the 4th year.	<ul style="list-style-type: none"> • It is not the stage to judge the achievement at the Mid-Term Review. • Through the process of formulation of 1st edition of SG and RG, it was observed the capacity improvement of CPs. • It should be strengthened more through conducting pilot projects applying SG and RG.

3-2 Implementation Process

Since the substantive activities of the Project had to be waited until the short-term experts and CPs were assigned, implementation of some activities especially under Output 1 have been delayed.

Most of the CPs were part-time since they have other heavy duties. Therefore, they sometimes could not attend meetings of the Project, although they tried to participate in the Project activities with their maximum efforts. Due to the unfortunate and unavoidable reasons, however, there were also frequent turnover of the CPs. Whenever the new CPs were assigned, the Japanese experts had to make efforts to explain the project from scratch.

The communication between CPs and Japanese experts has been made smoothly and information on the Project such as progress and issues was shared at regular meetings and through e-mails.

3-3 Evaluation Results by Five Criteria

(1) Relevance

The Project was well aligned with Cambodian overall development strategy of “Rectangular Strategy II (RSII: 2008) and the national five-year development plan (NSDP 2006-2010). The physical infrastructure development for transport is one of the Cambodia’s priority areas stated in both RSII and NSDP. As the increase in the maintenance cost of roads and bridges pressed the national budget, improvement of the capacity of MPWT on quality control was the urgent needs especially for force account projects which the quality control practices have not been made in an appropriate manner. In this regard, the Project is meaningful to meet the needs of MPWT. Furthermore, the Project was also in line with the Japan’s Assistance Policy for Cambodia (2004) and JICA’s Country-specific Implementation Plan (2007).

(2) Effectiveness

Assessing from the progress of each Output and results of interviews conducted during the Mid-term Review, the Project Purpose is most likely to be achieved within the Project period. One of the significant outputs from the Project is the production of SG and RG for force account projects, which clearly define the division of duties among Employer (Party A), Executor (Party B), Supervisor (Party C) and Inspector (Party D), since some responsibility had not been clearly articulated before. In addition, the documentation of records throughout the process of quality control by each Party in accordance with the contract documents contributes to ensure the quality as well as makes the trace of the problem possible. Furthermore, formulation of a collection of standard drawings also benefited to MPWT for designing and rehabilitation of constructions. Through these activities as well as conducting trainings to DPWT staff after TOT, capacities of MPWT staff have been upgraded.

However, in order to assure the effectiveness, it should make sure that the remaining important activities such as the revision of the SG and RG to be the 2nd edition after incorporating the lessons from the pilot projects, and the development of sustainable mechanism for database system and the technical training, have to be completed within the Project period.

(3) Efficiency

Some factors that affected efficiency were observed, although achievements of Outputs are foreseeable.

For example, the timing of the assignment of CP and procurement process of short-term experts, frequent turnovers of CPs (9 out of 19 CPs in total have been replaced), and the delays in implementation of pilot projects caused the production of outputs behind schedule. The intensive efforts are necessary to catch up for the remaining period.

In regard to the equipment provided by the Project was made in timely manner except the Nuclear Moisture Density Gauge. It arrived one month later due to the complex and tighter process of custom clearance. However, it did not affect the efficiency.

(4) Impact

It is early to judge the level of achievement of the Overall Goal, since there are still remaining important activities to be completed including revision of SG and RG and development of dissemination mechanism of project outputs. If that mechanism works well in a sustainable manner after the end of the Project, it is highly likely to achieve the Overall Goal.

On the other hand, some positive impacts were observed. Some CPs expressed that they have learned technical skills and knowledge not only on quality control of road and bridges but also on other issues such as safety control and Japanese experience of infrastructure development in general through discussion with Japanese experts, workshops, trainings in Japan, and writing papers. In addition, it is foreseeable that the revised SG and RG for force account projects in MPWT will be applied to other governmental executors who are not directly targeted in the Project such as Royal Cambodia Police.

(5) Sustainability

Sustainability of the project effect is ensured to a certain degree by incorporation of QC/QA training using outputs from the Project such as SG, RG, database system, and standard drawings into the conventional MPWT training plan. On the other hand, the conventional MPWT training has limited scope in its coverage of participants. The Project, therefore, needs to develop an additional training plan in effective and efficient way.

It is confirmed that most of knowledge and skills transferred through the Project activities have already been adopted in many of CPs. If those trained engineers under the Project remained and served to expand the knowledge and skills for all provinces, the technical sustainability will be ensured.

In regard to the sustainable management and maintenance of database and library, a proper mechanism including who is in charge, when it is updating, how is managed, should be developed and institutionalized.

Financial sustainability will be secured since the Project will clarify the estimate cost necessary to ensure the quality of construction including the laboratory test, field inspection and management cost through the implementation of the pilot projects. It will promote the systematic negotiation and smooth allocation of the budget. Besides, the budget for trainings on SG and RG should be estimated and needs to be allocated appropriately. Maintenance cost for the provided equipment for the laboratory will be secured since the laboratory has been autonomous since 1996 and financially stable.

Political aspects are formidable since upgrading physical infrastructure is still one of the high priority areas of RGC.

3-4 Revision of PDM

(1) Revision of OVI

Since Objectively Verifiable Indicators (OVI) of both Project Purpose and Output 1 are ambiguous and are difficult to measure, the Team revised them as follows with Means of Verification.

Revised OVIs and Means of Verification

	Objectively Verifiable Indicators	Means of Verification
Project Purpose	1. By the end of the Project, the revised SG and RG are applied to at least three force account projects of roads and bridges starting from 2013 (new construction or major rehabilitation under periodic maintenance) in three provinces except in the two pilot provinces (Kampong Cham and Kandal).	1.1 A copy of instruction letter from the Director General of Public Works of MPWT directing the application of the revised SG and RG to executors (DPWT, RID and HEC) and the confirmation from executors 1.2 Interview to the executors on the preparation of the projects
	2. Trainers received TOT are assessed and trainees participated in the annual technical training in year 2012 improve the knowledge level of quality control and score 70 at the post test.	2.1 Internal assessment of trainers by management levels 2.2 Result of training report
Output 1	By the end of the Project, the second edition of SG and RG are produced after incorporation of the lessons learned from the pilot projects.	1. Revised version of SG and RG 2. Prakas of MPWT

(2) Additional Important Assumptions

The Team proposed to add the following important assumptions.

- ① PP→OG : Appropriate budget to ensure the quality control is allocated for force account projects.
- ② Output→PP : Integrated intranet system in MPWT is established.

(3) Other minor changes in wording

The Team proposed to change wording of “Standards, Regulations, Guidelines” into “Standard Guideline and Regulation” under Project Purpose and Activities in accordance with the actual situation.

3-5 Conclusion

Despite of the some delays in commencement of the pilot projects as described above, the Project has been producing positive achievements in each Output. The Project is likely to achieve its expected objective by the end of the Project if the strong contribution and efforts will made by both Cambodian and Japanese sides in the remaining period. It is the very crucial period for the Project implementation. It is also noted the Project needs to make continuous efforts to reinforce the level of achievements.

One of the significant outputs from the Project is the establishment of SG and RG for force account projects, which defined responsibilities of the relevant Party. The documentation of records throughout the process of quality control by each Party in accordance with the contract documents which contributes to ensure the quality as well as to make it possible to trace the problems. The Project has surely contributed to upgrade operational and practical capacity to implement QC/QA activities.

3-6 Recommendations

The following recommendations are made for the remaining period of the Project by the Mid-Term Review Team.

- (1) It is recommended that SG and RG should be endorsed by MPWT as the official documents as soon as the second editions are finalized. After the authorization, the activities for dissemination to all relevant officials in provinces should be undertaken without delay.
- (2) It is recommended that proactive contribution to formulate and consolidate SG and RG from both Cambodian and Japanese sides should be made. The improvement of the contents of SG should be also considered.
- (3) Establishment of a sustainable database and library management systems should be made.
- (4) A sustainable and effective training mechanism should be developed.

3-7 Lessons Learned

- (1) The project should use PDM and PO regularly as the monitoring tools since they are the basis for monitoring and evaluation. The project should conduct periodic monitoring referring to these project management tools.
- (2) The vacant period of more than 6 months without assigning the substantial short-term experts or technical CPs affected the efficiency in the Project. JICA should consider the timing of procurement of short-term experts and plan well in advance before the project starts.

1章 評価調査の概要

1-1 調査団派遣の経緯と目的

本プロジェクトは3.5か年の協力期間で2009年5月に開始された。プロジェクト開始から約2.5か年が経過したことから、これまでに実施した活動の内容およびプロジェクト達成の見込み等について確認するために、「カ」国公共事業運輸省と合同で2011年12月8日～2011年12月21日まで中間レビューを実施した。本調査の主な項目・プロセスは下記の通り。

- (1) 合同評価を実施し、関係者との面談を通じ、プロジェクト期間中の投入・実績を確認するために必要な情報を収集する。
- (2) プロジェクト実施を促進、もしくは阻害した要因を検証する。評価5項目の観点から達成度、効果を総合的に検証する。
- (3) プロジェクト終了までに行うべきこと、及び上位目標達成に向けた終了後の必要措置について取りまとめる。
- (4) 実施中の類似案件や今後の案件形成の参考となる提言を取りまとめる。
- (5) 評価結果をまとめた合同評価報告書を作成する。
- (6) 上記報告書につき、ミニッツで合意する。

1-2 合同評価団構成

(1) カンボジア側

	氏名	所属
1	Mr. Samrangdy Nam	公共事業運輸省 公共事業研究センター 課長代理
2	Mr. Chao Sopheak Phibal	公共事業運輸省 道路インフラ部 計画・技術課 課長

(2) 日本側

	氏名	担当	所属	現地滞在期間
1	小林雪治	団長	JICA カンボジア事務所 次長	Resident
2	勝田穂積	品質管理	JICA 国際協力専門員	2011.12.11- 2011.12.21
3	渡邊恵子	評価分析	(財)国際開発高等教育機構 (FASID) 国際開発センター 研究部 次長代理	2011.12.8- 2011.12.22
4	江上雅彦	企画協力1	JICA カンボジア事務所 所員	Resident
5	鈴木恵子	企画協力2	JICA カンボジア事務所 所員	Resident

1-3 調査日程

現地調査期間は2011年12月8日から2011年12月21日とし、別添資料1. のAnnex 1に示すスケジュールで実施した。

1-4 主要面談リスト

(1) 公共事業運輸省 (MPWT)

H. E. Tauch Chan Kosal	Secretary of State
H. E. Kem Borey	Director General of Public Works
Mr. Koun Bunthoeun	Director, Public Works Research Center (PWRC)
Dr. Khun Sokha	Deputy Director, PWRC
Mr. Samrangdy Nam	Deputy Director, PWRC
Mr. Nin Menakak	Officer, PWRC
Mr. Phy Ratha	Officer, PWRC
Mr. Chao Sopheak Phibal	Chief of Office, Road and Infrastructure Department (RID)
Mr. Pou Manith	Chief of Office, RID
Mr. Ros Sreng	Chief of Office, RID
Mr. Laing Onit	Officer, RID
Mr. Hum Vuthy	Officer, RID
Mr. Sangva Piseth	Officer, RID
Mr. Kry Thong	Chief of International Unit of Public Works (Heavy Equipment Center)
Mr. Khun Srun	General Director of Laboratory of Building and Public Works
Mr. Meng Leang	Chief of Office, Laboratory
Mr. Sok Pounnaraiy	Officer, Airport Construction Department (ACD)
Mr. Uy Sophal	Officer, General Inspectorate
Mr. Ti Bunthoon	Deputy Director, Department of Personnel & Human Resources (DPHR)
Mr. Tak Rithisak	Chief of Office, HRPD
Mr. Pheng Sovicheano	Deputy General Director of Public Works, RAMP Project Manager
Mr. Sok Srun	Director, DPWT Kompong Cham
Mr. Chan Somardy	Deputy Director, DPWT Kompong Cham Province

(2) 日本大使館

玉光 慎一	一等書記官
大總 学	二等書記官

(3) 日本人専門家

桑野 忠生	チーフアドバイザー／道路建設・維持管理
石田 和基	業務調整／図書室運営管理
山内 将史	総括／道路工事契約／積算システム
弓田 和男	品質管理
井澤 衛	橋梁／道路構造物維持管理
前田 辰朗	材料および現場試験、機材管理

2章 プロジェクトの概要

2-1 プロジェクトの背景

公共事業運輸省（MPWT）は持続可能かつ効率的な社会経済開発および貧困削減のために、これまでドナーおよび自国の資金を用いて道路や橋梁等の運輸交通インフラ整備・改修に取り組んできた。各国ドナー支援による道路整備は、施工監理のためのコンサルタントや請負事業者らによる品質管理がなされている。一方、自国予算による道路・橋梁の建設や維持管理においては、MPWT 内の道路インフラ部（RID）、重機センター（HEC）、州レベルの公共事業運輸局（DPWT）が直営で実施しており、建設資材の規格確認や施工方法の確認等による品質管理が徹底されていないのが実情である。

かかる状況からカンボジア政府は日本政府に対し、道路・橋梁建設における品質管理・保証（QC/QA）システムの構築を行なう技術協力プロジェクトを要請した。これを受けて日本政府は、建設の品質管理のための抜本的な体制強化を行なうことを目的に「建設の品質管理プロジェクト」を実施することを決定した。

2-2 プロジェクトの概要

<上位目標>

カンボジア公共事業運輸省が直営で実施する道路・橋梁の建設・維持管理の品質が向上し、持久する。

<プロジェクト目標>プロジェクトが構築する品質管理・保証システムの適用によって MPWT が直営で実施する道路・橋梁工事の品質管理に関する能力が向上する。

<アウトプット>

- 1) 道路・橋梁建設の品質管理に関する実施規定、取扱要領が整備される
- 2) 完成図書（図面、報告書）の統合集中管理のためのシステムが構築される
- 3) 建設の品質管理向上のための研修が強化される

<活動>

成果1に向けた活動

- 1.1 建設の品質管理に関連する業務を担う部署にかかる現状の職務をベースラインとして調査する。
- 1.2 建設の品質管理にかかる基準、実施規程、取扱要領を構築するためのタスクフォースを設置する。
- 1.3 MPWT内で現行運用されている仕様と基準を調査・分析する。
- 1.4 建設の品質管理に係る各部署の職務を規定した実施規程案を策定する。
- 1.5 基準を実際に適用するための取扱要領を策定する。
- 1.6 基準、実施規程、取扱要領について、Joint Coordinating Committee（JCC）で承認を得る。

- 1.7 基準に照らして、不足している試験所の試験器具に係る調達計画を策定する。
- 1.8 試行工事（パイロットプロジェクト）を選定し、同試行工事の実施において、基準、実施規程及び取扱要領を適用する。
- 1.9 JCCで承認を得た基準、実施規程、取扱要領について、MPWT大臣の承認を得て、公式発表し、関係者に共有する。
- 1.10 基準、実施規程、取扱要領の運用状況をモニタリングし、評価する。

成果2に向けた活動

- 2.1 ドナー等の支援で、MPWTがこれまでに実施した道路・橋梁プロジェクトをリストアップする。
- 2.2 省内関係者、プロジェクト請負者、ドナー等が所有している竣工図書を図書室に集める。
- 2.3 収集した竣工図書を、路線別、構造別（道路、橋梁）、図書別（報告書、計算書、図面等）に分類し、竣工図書索引簿案を作成する。
- 2.4 竣工図書を電子データ化し、検索機機能の付いたデータベースを構築する。
- 2.5 MPWT図書室内の整備計画、運営管理計画の策定支援を行う。
- 2.6 MPWT内図書室所蔵の図書を整理し、同利用環境を整備する。
- 2.7 カウンターパートに対し、図書室運営管理に係る技術指導を行う。

成果3に向けた活動

- 3.1 MPWT内の既存の研修コースを調査・分析する。
- 3.2 技術面で追加すべき研修プログラムと実施計画案を策定する。
- 3.3 日本人専門家が中心となって主にPWRCスタッフを対象とした講師育成のための研修を実施する。
- 3.4 道路構造物標準図集策定のためのタスクフォースを設立する。
- 3.5 タスクフォースが、カンボジアの道路構造物の分類を行い、ドナー等の道路プロジェクトからカンボジアの道路構造物に適合した図面類を収集する。
- 3.6 収集した図面における、設計荷重、使用材料、構造、地質等の適合性を確認する。
- 3.7 道路構造物標準図集として編纂し、JCCの承認を得る。
- 3.8 試行研修のためにカリキュラムと教材を準備する。
- 3.9 PWRC講師が中心となって、編纂した道路構造物標準図集を活用し、検査員 (General Inspectorate)、実施監理担当者 (RID, HEC)、直営工事の場合の工事実施者 (各州DPWT, RID, HEC)、その他関係機関の職員を対象とした研修プログラムを企画し試行する。
- 3.10 試行した研修プログラム案について JCC で承認を得て、MPWT 省内の研修の一部として正式に組み入れる。
- 3.11 研修受講者に対するフォローアップ調査を行い、定着度合いを確認し、必要に応じてプログラム改善を支援する。

3章 評価手法

3-1 評価手法

本評価は JICA 評価ガイドラインに沿って評価 5 項目の観点から実施される。評価グリッドを基に、指標、既存資料のレビュー、質問票、関係者からの情報収集を通じて評価・分析を行った（評価グリッドについては別添 4 を参照）また、この中間レビューは「カ」側と「日」側双方による合同評価として実施した。

3-2 5 項目評価

本プロジェクトは以下に述べる「評価 5 項目（妥当性、有効性、効率性、インパクト、自立発展性）」の観点から評価される。各項目における評価の視点は下記の通り。

項目	主な視点
妥当性	プロジェクト目標や上位目標が受益者のニーズに一致しているか、問題や課題の解決策として適切か、相手国の開発課題との整合性を評価する。
有効性	プロジェクト目標の達成見込みがあるか、アウトプットはプロジェクト目標を達成するために十分かを評価する。
効率性	アウトプットの達成度は目標値に照らして適切か。アウトプットの達成度は投入（コスト）に見合っていたかを問う視点。投入はタイミング、質、量の観点から妥当であったかを検討する。
インパクト	上位目標は、投入・アウトプットの実績、活動の状況に照らして適切か。プロジェクト実施によってもたらされる、長期的、間接的な効果や波及効果、その他プロジェクト計画時に予期しなかったインパクトの有無を評価する。
自立発展性	援助が終了しても、プロジェクト目標、上位目標などプロジェクトが目指している効果は持続する見込みがあるかを検討する。

3-3 評価設問

前項で述べた評価 5 項目を基に、評価設問を設定する。PDMに基づき、指標の確認に必要な情報、収集方法、分析を行う。基本的な質問項目は下記の通り。

- (1) 投入の進捗、達成、見込みの確認、アウトプット、プロジェクト目標と上位目標の整合性

- (2) カウンターパート (MPWT、DPWT)のプロジェクト及びプロジェクトの過程への関与度合い。
- (3) プロジェクト実施によるカウンターパートの能力がどの程度向上したか。
- (4) 必要に応じ、PDM/PO のレビュー及び改訂。

3-4 データの収集方法

データ収集は既存資料のレビュー、及びコア・カウンターパート、日本人専門家等関係者へのインタビューを通じ行われた。

4章 プロジェクトの現状と実績

投入、アウトプット、プロジェクト目標の実績については以下のとおりである。

4-1 投入

日本側およびカンボジア側の投入は以下のとおりである。

4-1-1 日本側投入

(1) 日本人専門家

長期専門家2名((1)チーフアドバイザー／道路建設・維持管理、(2)業務調整／図書室運営管理)、業務実施型による短期専門家8名((1)総括／道路工事契約／積算システム、(2)品質管理、(3)研修／人材育成、(4)舗装、(5)土構造設計、(6)橋梁／道路構造物維持管理、(7)材料および現場試験、機材管理、(8)竣工図書管理システム)が派遣された。2011年12月までの短期専門家の人月数は、51.95であった。詳細は別添資料1.のAnnex 5-1を参照。

(2) カウンターパート研修(本邦)

評価時点までに2010年、2011年の合計2回本邦研修を実施し、合計7名のカウンターパートが参加した。詳細は別添資料1.のAnnex 6を参照。

(3) 機材

試験所およびデータベースシステム用機材が供与された。供与機材の合計額は123千米ドルであった。詳細な機材リストは別添資料1.のAnnex 5-2を参照。

(4) ローカルコスト

2011年9月時点で合計188,105米ドルが拠出された。詳細は別添資料1.のAnnex 5-3を参照。

4-1-2 カンボジア側投入

(1) カウンターパートの配置

MPWTにより、当初12名のCPとマネジメントチーム4名(プロジェクトディレクター、プロジェクトマネージャー、コーディネーター2名)が配置された。しかし、CPのうち4名が6ヶ月後には離職または留学などでプロジェクトから離れた。7名のCPが補充されたが、その後5名が再びプロジェクトから離職した。評価時点では、CP10名とマネジメントチーム4名の合計14名が配置されていた。CPの詳細なリストは別添資料1.のAnnex 5-4に添付。また、MPWTの組織図を別添資料1.のAnnex 8に添付した。

(2) プロジェクト費用負担

カンボジア側より、第1回目の2件のパイロットプロジェクト実施費用として合計115.2万米ドルが拠出された(コンポンチャム州41万2千米ドル、カンダール州74万米ドル)。

(3) 土地・施設

MPWT 省庁内に専門家執務室および必要な設備の提供があった。

4-2 アウトプットの実績

PDM 指標に基づく中間レビュー時点での各アウトプットの実績は以下のとおりである。

4-2-1 アウトプット 1

アウトプット 1: 道路・橋梁建設の品質管理に関する実施規定、取扱要領が整備される	
指 標	達成状況
緊急工事を除いて4年目(2013年)の初めから実施される直営で建設される道路・橋梁工事の100%に対して、すべての品質管理・保証システムが適用される。	<ul style="list-style-type: none">・品質管理のための取扱要領 (SG)、実施規定 (RG) の第1版が英語及びクメール語で作成され(2010年8月)、2010年10月の第1回 JCC で承認された。・第1回目のパイロットプロジェクト2件の予算が承認され、そのうちの1件が2011年10月より開始されている。・試験所向けの機材が計画どおり調達され、設置された。

アウトプットの着実な進展は見られるものの、CP や短期専門家がプロジェクト開始から6ヶ月を経て配置されたこと、パイロットプロジェクトの実施の遅れにより当初の時期よりアウトプットの産出が遅れており、残りの期間でアウトプット達成のために集中的な努力を必要としている。

プロジェクトは2つのタスクフォースを立上げ、一つは取扱要領 (SG) と実施規定 (RG) の策定¹、もう一つはMPWT 試験所の整備を実施した。

SG、RG を策定するタスクフォース1では、CP と日本人専門家との協働でSG と RG の英語版 (第1版) が策定され (2010年8月)、クメール語版がCP により翻訳された。CP は技術用語について英語とクメール語の対訳表も策定した。第1版のSG と RG は2010年10月に開催したJCC で承認された。SG、RG の策定過程でCP は専門家からの技術移転を受け、SG、RG の理解を深めていることがインタビューから明らかとなった。CP はアウトプット3で州レベルの公共事業運輸局 (DPWT) 職員向けの研修講師となることが期待されているため、SG、RG の理解の促進は有用であった。第1版のSG、RG は、パイロットプロジェクトを通じて検証され、第2版として現場に即した内容への改訂が必要となっているが、パイロットプロジェクトの実施が評価時点で6ヶ月以上遅れているため、改訂版の作成も計画より遅れることとなった。

パイロットプロジェクトはカ国の自己予算による直営工事 (道路・橋梁の整備、補修) の中からSG、RG を試験的に適用するものであり、2011年に第1回目の2件、2012年に第2回目の2~3件を実施予定である。第1回目のパイロットプロジェクトサイトは、コンポンチャム州71号線とカンダール州110号線の2件を選定し²、71号線については2011年10月に着工している。110号線については洪水により冠水している場所があるため着工は2012年1月になる予定である。パイロ

¹ プロジェクトは当初、基準 (Standards)、実施規定 (Regulations)、取扱要領 (Guideline) の3つを別々に策定する予定であったが、基準が存在すること、実際の運用上便利のように取扱要領 (Standard Guideline) と実施規定 (Regulation) の2つの策定をすることとした。

² 計画では、パイロットプロジェクトサイトとしてシェムリアップ州も挙げられていたが、シェムリアップ州に直営事業を行なう適当な案件がなかったため、対象は上記2州となった。

ットプロジェクトの実施の遅れの理由は以下3点からであった。第一に経済財務省との予算折衝に時間がかかったことである。パイロットプロジェクトにSG、RGを適用して、これまで実施していなかった土質調査など技術的な試験を行なった結果、設計変更が生ずることとなり、実際の予算が当初の予算申請額より大幅に高くなったため、経済財務省との予算交渉に時間がかかったことが挙げられる。第二に、コンポンチャムの工事予定地の一部がMPWTの他プロジェクト（RAMP）³の工事予定地と重複していることがわかり、両プロジェクト間の協議に時間を要した。第三に、2011年の大洪水により工事の着工が遅れたことが挙げられる。従って、SG、RGの第2版の作成は計画よりも遅れているが、2011年および2012年のパイロットプロジェクトが予定どおり進めば、第2版は2012年半ばには完成する予定であることを確認した。しかし、それにはこれまで以上にCPの主体的かつ積極的なプロジェクトへの参加が欠かせず、インタビューを通じて確認を行い同意が得られた。

一方、SG、RGを適用する過程で、直営工事では初めて施工計画書を作成することとなり、このようなプロセスを経ることが現場の状況に応じた必要な改修費用を正確に算出でき、施工の品質を保証するために不可欠であるとの認識がCP内に広まった。

もう一つのタスクフォースで実施している試験所の整備は、SG、RGを適用するために必要な機材が選定され、調達プロセスを経て2011年8月に機材が設置された。JICAで供与した機材は2種類の機材を除き既存の機材の入れ替えで新しい技術を必要とするものではなかったため、技術的な問題はないことが確認された。2種類の新しい機材（Blain Air Permeability Apparatus and Saybolt Viscosity）については専門家が使用方法について技術研修を実施した。

なお、現行PDMのアウトプット1の指標をより明瞭にするため、第6章「PDMの改訂」で指標の変更を提案した。

4-2-2 アウトプット2

アウトプット2: 完成図書（図面、報告書）の統合集中管理のためのシステムが構築される	
指標	達成状況
データベースシステムが構築され、同システムがMPWTスタッフによって活用される。	<ul style="list-style-type: none"> データベースを構築し、過去のプロジェクトのうち入手可能な完成図書をデータ化し入力している。 データベースの使用マニュアルは策定された。しかし、評価時点ではMPWT内部システムが完成されておらず、データベースが接続されていなかったため、幅広い活用までには至っていなかった。

成果は着実に出しつつあるが、データベースおよび図書室の持続可能な管理運営を可能とするメカニズムの構築が必要とされている。

プロジェクトではデータベースを構築し、入手可能な既存の竣工図書をデータ化し入力した。これらの情報は道路・橋梁の新設や改修に大変有用であるにもかかわらず、これまでMPWTの各部署や担当者個人、または支援ドナーが保管しているなど保管場所が統一されていなかった。プロジェクトでは支援ドナーに協力依頼レターを出して収集するなど最大限努力し、竣工図書を可能な限り

³ RAMP (Road Asset Management Project) は、ADB、WB、AusAIDが協調融資しているMPWTのプロジェクト。RAMPの目的は将来的に直営事業を外注するためのMPWTの能力の向上を目指している。

収集した。評価時点では、外部委託を通じて約 8,000 件の竣工図をデータ化しデータベースに入力していた。その中には MPWT が初めて入手できた中国やベトナムのローンによるプロジェクトの図面も含まれている。また、データベースのユーザーマニュアルも整備した。しかしながら、データベースのアクセスは評価段階で図書室に設置した PC に限られているため、MPWT の内部情報システムの確立と接続、更に、今後データベースのアップデート、維持管理など組織的にどう取組むのか明確にする作業が残っている。特に評価時点においてアウトプット 2 専任の CP は若手が 1 人しかおらず、情報処理や図書室運営についてあまり知見がないところ、情報の整理および維持管理をどのようにしていくのかを検討する際に MPWT 組織として取組む姿勢が必要である。なお、データベースに関し、2011 年 12 月 30 日にプロジェクトで予定している年次セミナーの場で MPWT 職員に広く宣伝する予定である。

図書室の整備に関しては、プロジェクトで一旦図書室の本や資料を整理したが、予期せずして他のプロジェクトに図書室の一部が占有されたため再度整理の必要がある。今後もプロジェクトで支援する必要があるが、図書室の使用マニュアルの作成、図書室への人員の配置など持続可能な図書室の管理体制等を CP と共に今後考慮していかなければならない。

4-2-3 アウトプット 3

アウトプット 3: 建設の品質管理向上のための研修が強化される	
指標	達成状況
プロジェクトで策定した技術研修プログラムが担当する部署によって、MPWT 内の研修プログラムとして組み入れられる。	<ul style="list-style-type: none"> ・MPWT 職員の能力および既存の研修に関する評価を実施した後、研修計画を 2010 年 2 月に策定した。 ・中間レビュー (2011 年 12 月) までに、TOT を 1 回実施し (2010 年 11 月)、その後講師となった MPWT 職員によりパイロットプロジェクトを実施する 2 つの州 (コンボンチャム、カンダール州) で試験的な研修をそれぞれ 1 回実施した。 ・また、州職員 (DPWT) 向けに実施されている既存の MPWT 月例研修プログラムの 2011 年 11 月と 12 月のコースの中にプロジェクトで策定した「品質管理コース」を試行的に組み入れ実施した。 ・既存の完成図書を基に、道路標準図集を策定した。

MPWT および DPWT 職員に対し質問票による能力ギャップ調査 (CGA) を実施し、研修ニーズを洗い出した。調査は 500 名に対し質問表を実施したところ 126 名の回答があった。研修ニーズと既存の MPWT 人材育成部が実施している研修内容を精査し、既存の研修計画に組み込む形で品質管理に関する研修計画案を策定した。

アウトプット 1 で SG と RG の第 1 版が完成した後、SG と RG を普及させるための講師養成研修のカリキュラムを策定した。講師養成研修ではプレゼンテーション技能を中心に、CP8 名に対しこれまで 1 回実施された。参加した CP は PWRC 職員のみならず RID、HEC、試験所など MPWT の他部署からの CP も参加し、それぞれの専門分野に合わせて SG、RG の研修講師となった。TOT を実施した後、講師となった CP により、試行的にパイロットプロジェクトの実施 2 州の DPWT 職員に対しそれぞれ 1 回研修を実施した。研修では、事前・事後テストを行ない DPWT 職員の研修効果を図り、それぞ

れで研修効果があったことが証明された。例えばカンダール州での研修では、研修前には理解度が参加者平均 4.56 ポイントに対し、研修後には 7.19 ポイントに上昇した。また、評価チームがコンポンチャム州の DPWT に現地視察をし、研修参加者へインタビューを実施したところ、品質管理研修の MPWT 講師は大変わかりやすく、内容も有益であった旨コメントがあった。MPWT マネジメントレベルからは、JICA の TC は初めてであるが、日常的に専門家と一緒に作業を行っているため、一人ひとりの能力向上に繋がっていると理解している。特に講師となり自分たちで教えるという作業で専門分野の知識が向上した。また、州の現場に行って研修を実施したのは初めてでありよい機会であったとのコメントもあった。

また、MPWT の既存の研修コースに品質管理コースを 2.5 日分入れて試行的に実施した。既存のコースは、MPWT 人材育成部が DPWT 職員向けに実施しているものであり、全 24 州から毎年 2-3 名を 15-18 ヶ月間、毎月 5 日間本部 (MPWT) に召集して様々な研修を受講させるものである。2011 年 11 月と 12 月分から合計 2.5 日分を品質管理コースに当て、TOT を受けた MPWT 講師により研修が実施された。プロジェクトによる評価では、研修参加者が品質管理コースを有益であると評していることをインタビューで確認した。TOT 研修および試行的な研修の実績詳細については、別添資料 1. の Annex-5-2 を参照。

アウトプット 3 では、SG、RG 普及のための研修体制整備に加え、「道路標準図集」の編纂を行なった。過去の図面を収集しデータベース化するとともに、過去の図面から様々な「標準図」を策定し、図集として編纂した。標準図集は、第 2 回 JCC (2011 年 12 月) で承認された後、上記研修にも教材として使用される予定である。

上記のように、活動は計画通りに進んでおり、プロジェクト終了までにアウトプットが達成される見込みである。しかし、残りの期間で技術的および財政的に持続可能かつ全国に広く普及するような研修体制の確立が求められる。また、新たな講師養成および講師の更なる能力強化についても考慮する必要がある。

4-3 その他特筆すべき活動

プロジェクトでは、CP の能力強化および上記 3 つのアウトプットを更に強化するため下記のような活動を実施した。

(1) ワークショップの開催

日本人専門家、日本の大学からの客員教授、コンサルタントなど様々な機会を通じて道路・橋梁に関しワークショップが開催された。テーマは、「チュロイ・チャンバ橋と日本の関係」、「ドラゴンホールの修理法」、「MPWT 内の過去の道路情報」、「災害防御のための迅速かつ低コストの舗装技術」などである。

(2) ワーキングペーパーの執筆

日本の道路・橋梁技術に関するレポートが日本人専門家により執筆された。

(3) 現地視察

(4) CP は、実施中の無償資金協力案件「国道一号線改修計画」や「ネアックルン橋梁建設計画」における現場視察を数回行い、日本のコンサルタントおよび施工業者による様々な段階における品質管理の実施状況を視察、意見交換を行なった。カンボジア・日本共同セミナーの実施

日本土木学会（JSCE）およびカンボジア工科大学（ITC）の共催によって2011年3月に橋梁技術に関する共同セミナーが開催され、約150名の参加を得た。

(5) 年次技術セミナーの実施

MPWT/DPWT 職員から技術ペーパーを集め、論文集を策定する準備をしている。25本のペーパーが集まり、年次技術セミナー（2011年12月30日実施予定）を開催し、発表会を予定しているなど、職員の技術向上を誘発する活動を実施している。

4-4 プロジェクト目標の達成度

プロジェクト目標：プロジェクトが構築する品質管理・保証システムの適用によってMPWTが直営で実施する道路・橋梁工事の品質管理に関する能力が向上する	
指標	達成状況
4年目（2013年）の初めから実施される直営で建設される道路・橋梁工事の50%に対して、すべての品質管理・保証システムが適用される。	<ul style="list-style-type: none"> ・中間レビュー時点では品質管理・保証システム（SGとRGの第2版）が完成していないため指標の達成状況は測ることはできなかった。 ・SG、RGを策定する過程でCPの能力向上が見られた。 ・SG、RGを適用したパイロットプロジェクトを実施する過程でさらにCPの能力強化が必要である。

プロジェクト目標の達成にはパイロットプロジェクトを通じてSGとRGが改訂され、第2版として承認され、全24州に普及されなければならないことから、達成状況は評価時点では測ることが出来なかった。しかしながら、評価チームは、アウトプットの産出に多少の遅れは生じているが、これまでの各アウトプットの実績から、今後プロジェクト終了までにカンボジア側および日本側が積極的に貢献すれば達成の見込みがあると判断した。

なお、現PDMの指標は曖昧であり、定量的に測定することが難しいため、代替案を提案した。第6章「PDMの改訂」に詳述した。

4-5 実施プロセス

プロジェクトの実施体制は、業務実施型の短期専門家およびカウンターパートが配置された2010年1月になってから本格的に整ったため、CPと共同で行なうSGとRGの作成およびパイロットプロジェクトの準備を行なうアウトプット1の活動の開始が遅れた。さらに、パイロットプロジェクトもアウトプット1の項に既述した理由により実施が遅れている。

ほとんどのCPは他業務を兼務しているため、フルタイムではなくパートタイムCPとして配置された。そのため、最大限の努力は払っているもののCP会合等への欠席も多く、プロジェクトの活動に参加できない場合も多かった。また、本プロジェクトでは品質管理業務を担当としているPWRC職員を中心にしているが、技術的なCPは他部署の職員も含まれているため、他部署のCPの動員がスケジュール的にも容易にならなかったという理由も指摘された。さらに、CPの離職や異動も頻繁にあった。カンボジア側は限られた人材の中で新しいCPの配置を行なったが、日本人専門家がその都度プロジェクトについて説明するなど、余分な作業が増えたと言える。

CPと日本人専門家とのコミュニケーションは良好であり、プロジェクトの進捗状況、課題など情報共有が行なわれていた。プロジェクトの進捗状況のモニタリングについては、毎週のCP会合、

タスクフォース会合、月例マネジメント会合、作業管理委員会（EC）、合同調整委員会（JCC）など定期的な会合を通じて行なわれている。CP 会合の議事録はフルタイムの CP によって作成され、欠席者も含め関係者全員に配布するなど、情報共有を常に行なっている。また、短期専門家が不在の場合でもメールなど様々な手段を通じて取られていた。しかしながら、PDM や活動計画表（PO）を活用したモニタリング方法について CP の理解が不十分な点も見受けられ、PDM の指標の達成状況のモニタリングが定期的になされていなかった。日本人専門家間の共通理解も促進するためにもこのようなモニタリングツールを活用することは有益である。

評価時点での各種定例会合のリストの詳細は別添資料 1. の Annex 7 を参照。

5章 評価結果

5-1 妥当性

以下を鑑み、妥当性は高いと言える。

カ国の上位政策である「成長、雇用、平等および効率のための四辺形戦略フェーズ II（RSII）」（2008）（RSII）では、インフラ開発は一層の経済成長を促すために「運輸交通インフラの継続的な復旧と建設」が必要であるとし、成長四辺形の一辺に位置づけている。また、5 ヶ年計画である国家戦略開発計画（NSDP：2006-2010）でも、特に運輸分野において適切で優先付けた道路の維持管理が必須であると強調している。運輸交通インフラの整備には、建設の品質の向上が不可欠であることから、プロジェクト目標・上位目標ともカ国の政策と一致している。

一方、道路や橋梁の品質管理は直営事業において適切に実施されておらず、道路・橋梁の整備延長が増加とともに維持管理コストが高まり国家予算を圧迫している中、MPWT の品質管理能力の向上が急務となっている。本プロジェクトはこのような品質管理能力向上の必要性に対応するなど意義も高く、MPWT のニーズとも合致している。

日本の対カンボジア援助計画（2004）では、「社会・経済インフラ整備推進と経済復興のための環境整備」を重点分野として置き、「国の開発の根幹となる社会・経済インフラ整備のニーズは依然として高い」としている。また、JICA の援助方針（2007）では、「他ドナーと協力して早期に道路ネットワークの改修を支援し、運輸ネットワークの有効活用および維持のための組織的な強化を通じて経済成長に寄与する」ことを挙げている。更に、JICA による「道路ネットワーク開発調査」（2006）では品質管理システムの設立を 2011-2015 年の中期ターゲットとして挙げている。このように日本の援助政策と本プロジェクトとの整合性も高い。

5-2 有効性

(1) プロジェクト目標の達成度

上記 4-4 で既述したとおり、中間レビュー時点では PDM の指標を基にプロジェクト目標の達成度は判断できなかった。しかし、評価チームは、SG と RG の第 1 版の作成、データベースを作成し、過去のプロジェクトの竣工図を入力、標準図集の策定など、各アウトプットから目に見える実績を出していることを確認した。更に、SG、RG や標準図集の策定過程、TOT の後講師となった MPWT 職員による DPWT 職員向け研修の実施や日本人専門家からの新しい技術的な知識の移転を通じて CP の能力を向上させていることもインタビューなどで確認できた。CP へのインタビューでは、日本人

専門家から品質管理の知識やスキルだけではなく、道路・橋梁に関する幅広い知識が得られたことが挙げられた。このように、プロジェクトは品質管理および品質保証活動を実施するための実践的な行政能力の向上に寄与していると言える。以上を鑑み、プロジェクト終了までにプロジェクト目標が達成される見込みは高い。

本プロジェクトの顕著なアウトプットの一つは、直営事業のための SG と RG が初めて明文化され、品質管理活動を標準化したことである。これにより、直営事業の施主 (Party A)、施工者 (Party B)、監督者 (Party C)、検査者 (Party D) のそれぞれの役割を明確化することができた。また、それぞれの Party が品質管理活動を実施する中で記録を残すことで品質を確かなものとし、また問題があった場合の原因分析に役立つようになった。実際に、コンポンチャム州のパイロットプロジェクトにおける Party B と Party C にインタビューしたところ、品質保証のためには SG と RG の適用が大変有用であると回答している。また、SG および RG を適用することはこれまでよりも追加的な作業が必要となるが、品質保証のためには今後も実施していくとの回答が得られた。なお、評価チームは、SG を更に内容的に充実させるため監督者 (Party C) および検査者 (Party D) に対する簡便な作業要領、およびカルバートに対する出来型管理の規格値やフォームの追加を提案した。

また、MPWT 職員のインタビューでは、プロジェクトで構造物の標準図集を策定しデータベース化したことが、MPWT にとって今後の建造物の設計や DPWT にアドバイスするために有用であると評価している。

しかしながら、有効性をより確実にするためには、プロジェクトの残り期間でパイロットプロジェクトを通じて SG と RG を第 2 版として改訂し、より実情に合わせたものにしていかなければならない。またプロジェクトで作成したデータベースおよび研修計画は持続的運用に向けたシステムを構築していく必要がある。従って、残りのプロジェクト終了までの期間は非常に重要且つ集中的な活動が必要であり、日本側およびカンボジア側両方からの主体的および積極的な参画が必須となっている。

5-3 効率性

アウトプットはプロジェクト終了までに達成される見込みであるが、いくつかの阻害要因も見られた。上述のとおり、短期専門家の調達および CP の配置の遅れや、CP の度重なる離職、異動があった。評価時点までに延べ 19 人の CP が配置されたが、そのうち 9 人が離職または異動した。配置された CP の中には 6 ヶ月間のみで担当を外れてしまう者も含まれた。新しい CP がその度に配置されたが、日本人専門家が再度最初から新しい CP にプロジェクトの説明をしなければならないという非効率が生じた。また、パイロットプロジェクトの実施の遅れで成果が出る時期に遅れが生じている。今後作業の集中化などで補う必要がある。

供与機材の投入はほぼ計画どおり実施された。放射線を用いる特殊機材のみ通関がより厳しく複雑になったため時間を要し到着が 1 ヶ月遅れたが、活動に影響はなかった。

5-4 インパクト

(1) 上位目標の達成見込み

SG、RG の第 2 版の策定およびその普及体制の確立など確定していない要素が多く、評価時点で「カンボジア公共事業運輸省が直営で実施する道路・橋梁の建設・維持管理の品質が向上し、持久する」という上位目標の達成について判断することはできなかった。しかし、プロジェクトで上記

体制を確立することができれば達成の可能性は高い。

(2) 他インパクトの発現

本プロジェクトで、日本人専門家との意見交換、ワークショップ、本邦研修への参加などを通じて、品質管理以外にも安全管理や日本のインフラ開発の経験など幅広く知識や技術を得ることができたと CP からの発言があり、CP に対する幅広い能力強化のインパクトが見られた。また、プロジェクトでは CP のみならず他 MPWT/DPWT 職員にも広く呼びかけて論文を集め論文集を作成し、また発表させる機会を与えるなど、知的刺激を与えている。

その他、SG、RG が MPWT に承認され直営事業に運用されることにより、本プロジェクトではターゲットとしていない政府関係の直営工事実施者（警察の施設部隊など）にも普及する可能性もある。なお、負のインパクトは発現していない。

5-5 自立発展性

(1) 政策面

経済発展のための交通インフラ整備の強化は引き続きカ国の優先開発課題であり、改訂版国家戦略開発計画（NSDP：2009-2013）においても「交通ネットワークは経済成長の原動力である」と記されているなど、政策的な優先度は高い。

政府としては、MPWT の下部組織である DPWT、RID、HEC が実施している直営事業を年々徐々に減少させ、民間企業に移行させていくことを方針としているが、どのようにいつまでに実施するといった明確な戦略はまだない。民間企業への移行は徐々に実施されるとしても、完全に移行させるためには相当の時間が必要であり、また、緊急工事の部分については政府の直営として残る予定である。従って、政策面においてプロジェクトの効果の持続が確保されている。さらに、民間委託を行う場合においても発注者側の品質管理に係る技術力の向上なしには困難である。

(2) 組織面

品質管理を担当する中心的な部署は PWRC であるが、プロジェクトでは MPWT の直営事業に関連する全ての部署および試験所も包括している。また、それぞれの部署から CP の配置をしているため、MPWT 全体の能力向上に繋がっている。一方、品質管理および品質保証システムの構築のために策定および整備した SG、RG、データベース、図書館、品質管理に係る研修プログラムの継続的な維持管理体制を組織的に制度化していく必要がある。プロジェクトの残りの期間で、それぞれのアウトプットの改訂や改善を、いつ、どの部署が、どのように実施するのか、組織的に明確化することが期待される。

(3) 技術面

プロジェクトで移転した知識やスキルはカンボジアの実情に合ったものであった。プロジェクトで技術移転を受けた CP がこのまま MPWT に残り、プロジェクトで得た知識や技能を各州に広める役割を担えば、技術的な持続性は確保されると考えられる。

品質管理・品質保証に関する研修プログラムは MPWT の年間研修計画に組み込まれる予定であるが、通常の MPWT 研修コースは継続的に実施されるものの、通常コースへの参加者は各州 DPWT から年間 2-3 人であり、そのうち公共事業の施工を担当するのは 1 人と限られている。そのため、プロ

プロジェクト効果の普及は通常研修システムを通じてある程度は確保されていると言えるが、その範囲は限られていると言わざるを得ない。従って、通常の研修プログラムとは別にプロジェクトで策定した SG、RG、データベース、標準図集、その他必要な技術を各州に普及する効果的かつ効率的な研修計画を開発する必要がある。技術的持続性を確保するためには、プロジェクトの中で今後研修カリキュラム、教材のアップデート、そして研修講師の持続的な育成なども考慮する必要がある。また、構築したデータベースや図書システムが簡単に MPWT や DPWT 職員にアクセスできるようになれば、組織的な技術能力向上に貢献することが期待される。

なお、試験所に供与された機材は 2 種類を除いてこれまで使用していた機材の入れ替えのため、運用上技術的な問題はない。新機種 2 種については日本人専門家から OJT により技術移転を受け実際に運用している。

(4) 財政面

道路維持管理および建設の国家予算は下表のとおり年々増加傾向にある。直営事業では、洪水および緊急工事の他には、大きく分けて日常維持管理、定期維持管理、新規建設の 3 つに分類されている。

道路維持管理および建設予算 (2007-2011)

単位: 百万米ドル

	2007	2008	2009	2010	2011
日常維持管理 (Routine Maintenance)	5.7	8.8	17.1	17.9	16.1
定期維持管理 (Periodic Maintenance)	12.2	14.3	13.3	15.0	26.6
新規建設 (New Construction)	8.9	12.0	45.2	45.2	50.0
洪水対策 (Flood)	2.4	2.4	-	-	-
緊急工事 (Emergency)	1.6	1.9	2.4	2.9	3.7
合計	30.9	39.3	78.0	81.0	96.3

出所: Road and Infrastructure Department, MPWT (2011)

今後もカ国の経済開発のニーズから道路・橋梁の新規建設は増えていくと見込まれ、その分維持管理費用も増していく傾向にある中、建設の品質管理能力を強化することにより、インフラ完成後の耐久性を向上させ、将来の維持管理コストを削減することが重要である。プロジェクトでは、パイロットプロジェクトを通じて技術的試験、現場視察、そして管理業務など品質管理に必要な経費を明確化するプロセスを確立させる。これにより、MPWT は予算配分の最終決定者である経済財務省と必要な予算措置について体系立てた交渉を行なうことができ、建設品質の確保に必要な予算配分が円滑に行なわれることが期待できる。一方、SG、RG を普及させるための研修予算の積算および配分を確実にすることが残りのプロジェクト期間で必要である。

試験所に供与した機材の維持管理コストについては、試験所が 2006 年より独立採算制を採っており下表のとおり十分な収益が得られている現状から大きな問題はないと言える。

MPWT 試験所予算

	2009	2010
収入	US\$ 175,000	US\$ 216,400
支出	US\$ 157,300	US\$ 198,200
収支	US\$ 17,700	US\$ 18,200

出所: MPWT Laboratory (Exchange rate: 1\$=4,100R)

6章 PDM の改訂

現行 PDM の内容をより明確にするため下記の改訂を提案し、別添資料 1 の M/D にて改訂事項を確認した。現行 PDM および改訂した PDM は別添資料 1. の Annex 3-1 と 3-2 に添付した。

(1) プロジェクト目標

評価チームは、現行 PDM のプロジェクト目標の指標が不明瞭であり、既述されている割合を測定することは難しく、入手手段を見直す必要があると判断したため、下記のとおり変更した。さらに、プロジェクト目標が「能力強化」であるため、能力強化を測る指標を追加した。

プロジェクト目標：プロジェクトが構築する品質管理・保証システムの適用によって MPWT が直営で実施する道路・橋梁工事の品質管理に関する能力が向上する		
	指標	入手手段
現行	4 年目（2013 年）の初めから実施される直営で建設される道路・橋梁工事の 50%に対して、すべての品質管理・保証システムが適用される。	1. 建設管理記録 2. 監督者記録 3. 検査記録
改訂版	1. プロジェクト終了までに、SG と RG が改訂され、2013 年から始まる道路・橋梁の直営事業（定期補修のうち規模の大きなものと新規工事）のうち、パイロット州（コンボンチャム、カンダール州）以外の 3 州で 3 つ以上のプロジェクトに適用されている。	1.1 直営工事実施者（DPWT、RID、HEC）に対し、MPWT 公共事業総局長から改訂された SG、RG の適用を指示するレターおよびその合意返答文書 1.2 SG、RG 適用対象プロジェクトの準備状況について直営工事実施者へインタビュー
	2. TOT を受けた講師を評価するとともに、2012 年に実施した研修受講生が品質管理に関し、受講後のテストで 70 点以上を獲得する。	2.1 MPWT マネジメントレベルによる講師評価結果 2.2 受講後テストの結果

(2) アウトプット 1

アウトプットの指標についてより明瞭且つ測定可能なものとするため、下記のとおり変更した。

アウトプット1: 道路・橋梁建設の品質管理に関する実施規定、取扱要領が整備される		
	指標	入手手段
現行	緊急工事を除いて4年目(2013年)の初めから実施される直営で建設される道路・橋梁工事の100%に対して、すべての品質管理・保証システムが適用される。	MPWTと契約相手(州公共事業運輸局、重機センター、その他の政府機関)との間で交わされた契約書
改訂版	プロジェクト終了までに、パイロットプロジェクトの実施からの教訓を取り入れたSG、RGの第2版が完成する。	1. SG、RGの第2版 2. MPWTからの省令(Prakas)

(3) 外部条件

評価チームは下記外部条件を新たに追加した。

レベル	追加の外部条件	理由
プロジェクト目標→上位目標	直営事業に品質管理を確保するための適切な予算が配分される	建造物の品質保証のためには、品質管理のための適切な予算配分が無ければ実現できないため。
アウトプット → プロジェクト目標	MPWT内に統合内部接続システムが構築される	データベースの幅広いアクセスを可能とするためには、MPWT内の内部接続システムの構築が欠かせないため。

(4) その他細部の変更

評価チームでは、プロジェクトの現状に合うように、下記の言い回しについて変更した。

現行	改訂版	理由
<p>(アウトプット3) PWRC職員による技術研修が「道路標準図集」の策定により強化される。(建設の品質管理向上のための研修が強化される) (Technical training lectured by PWRC lecturers is consolidated by “Road Structure Standard Drawing Collections”)</p>	<p>MPWT職員の講師による技術研修が実施される (Technical trainings are implemented by MPWT lecturers.)</p>	<p>技術研修を実施しているのは、PWRC職員だけではなく他のMPWT職員も講師となり実施しているため、PWRCをMPWTと訂正した。また、現行アウトプット3には、「道路標準図集」が研修を強化するものとして特記されているが、研修はSG、RGの説明など他にも重要な要素を含んでいるため特に言及しないこととした。</p>
<p>(プロジェクト目標) プロジェクトが構築する品質管理・保証システム(基準、実施規定、取扱要領及び研修)・・・</p>	<p>プロジェクトが構築する品質管理・保証システム(取扱要領、実施規定、研修、道路標準図)・・・</p>	<p>当初プロジェクトでは、基準(Standards)、実施規定(Regulations)、そして取扱要領(Guidelines)の3つを別々に策定する予定であったが、現状調査を実施</p>

(Capacity of MPWT engineers.. (Standards, Regulations, Guidelines, Training))	(Capacity of MPWT engineers.. (Standard Guideline, Regulation, Training, Standard Drawings))	し、取扱要領 (Standard Guideline) と実施規定 (Regulation) の2つを策定することとなったため実情に合わせた。また、道路標準図集は品質管理・保証システムの構築に重要であるため追加した。
アウトプット 1 の活動 1-2, 1-6, 1-8, 1-9, 1-10 中の 基準、実施規定、取扱要領 (“standards, regulations, guidelines”) の言い回し	「 取扱要領および実施規定 」 (Standard Guideline and Regulation) に変更	同上

7章 結論

プロジェクトは活動の遅れが多少生じているが、成果は着実に出している。

本プロジェクトの大きな成果の一つは、直営事業のための SG、RG を策定することにより品質管理活動の標準化に寄与する点であり、またその過程で関係者への能力向上を図っている点である。直営事業における品質管理を実施するそれぞれの Party の役割を明確化し、記録を残すことを規定したことは品質管理を保証することに貢献し、また問題が起きたときの原因分析にも有用となった。このようにプロジェクトは品質管理・品質保証活動を実施するための実践的な行政能力の向上に寄与している。

しかしながら、パイロットプロジェクトを通じて SG と RG を第2版として現場の実施状況に即した内容に改訂する作業や、データベースや研修計画など各種プロジェクトで構築した成果の持続的運用を確実にするためのシステム作りなど、重要な活動が残りの期間に集中している。今後残りの期間における日本側およびカンボジア側の主体的および積極的な取組みは不可欠である、プロジェクトはプロジェクト終了までに所期の目標を達成する見込みは高い。

8章 提言と教訓

8-1 提言

評価チームはプロジェクトの残りの期間に対し以下を提言する。

(1) プロジェクト期間内に SG と RG の改訂を行い MPWT が正式に適用させる

SG と RG が全ての直営事業に活用されるためには、MPWT が正式に適用させることが重要であるため、SG と RG の第2版が完成したらできるだけ早期に MPWT が SG と RG の適用を各州 DPWT に公文書

で通知する必要がある⁴。また、通知の翌年度から開始される直営事業に適用されるよう全州の DPWT の関係者に対し遅滞なく普及活動が実施されなければならない。

(2) SG および RG 策定および内容の充実のための双方からの主体的な貢献

現在、本プロジェクトはパイロットプロジェクトの結果を得ながら SG 並びに RG の改訂版を完成させていくという非常に重要な局面となっているため、MPWT はこの作業を最優先作業の一つと位置付けることが求められる。このため、CP ならびに日本人専門家が効果的で効率的にプロジェクトに参加し、積極的な活動を行えるような環境作りが必要である⁵。CP の参加を可能な限り促すためにも既存の会議の頻度、内容、意義づけ並びに時間についてレビューするのも一つのアイデアかと思われる。

評価チームとしては、また、SG の改善として監督者 (Party C) 並びに検査者 (Party D) に対する簡便な作業要領、およびカルバートに対する出来型管理の規格値やフォームの追加を提言する。

(3) データベースと図書室の持続的な維持管理体制の確立

完了プロジェクトの竣工図面を入れたデータベースシステムは特にそれらのプロジェクトの改修時期には MPWT/DPWT にとって大変有用なものである。このシステムは適切に維持管理されなければならない。データベースを持続的に管理するには、データの更新をどのように、いつ、誰が行うのかを明確にした仕組みを策定することが求められる。さらに、このための財政的な問題も検討されなければならない。

図書室は、書籍や資料の整理が依然必要であることに加え、プロジェクト後の図書室の持続的な維持管理のため、適切なスタッフの配置とともに管理のための仕組みを検討する必要がある。

(4) 持続的かつ効果的な研修メカニズムの確立

プロジェクトの成果 (RG、SG、データベースおよび標準図集) 並びにさらに必要とされる技術ノウハウを広めていくための継続的な研修の実施は、直営事業に対する品質管理を確実なものにするために重要である。研修の持続性は従来からある MPWT の研修に組み込むことで確保されるが、このことで対応できる範囲や量が限定的である⁶。したがって、評価チームとしては、既存の研修への組み込み以外に、プロジェクトが成果を普及させる効果的で効率的な研修計画を検討することを提言する。持続的な予算配分、研修講師の育成並びにスキルの向上策も検討するべきである。

8-2 教訓

(1) 定期的なモニタリングのためのプロジェクト管理ツール (PDM と PO) を参考にする

CP と日本人専門家間でその進捗をモニタリングし情報共有を行っていたものの、PDM や PO はモニタリングのツールとしてあまり参考にはされていなかった。PDM や PO はモニタリングや評価のベースとなるものであり、プロジェクトとしてはこれらを使い、定期的なモニタリングを実施する

⁴ 基本的には省令 (Prakas) による。

⁵ 主体者であるべき CP の参加の程度について、特に最近は限定的であることが日本人専門家ばかりでなくカンボジア側でもある程度認められている。他業務との兼ね合いがその原因として大きいと認識されている。

⁶ 現時点で考えられている案では 2 から 3 コマであり、カバーできる DPWT 職員の公共事業の施工担当者は各州 1 名のみである。

必要がある。

(2) 日本人専門家の派遣時期（JICA に対する教訓）

プロジェクトの実質的活動は業務実施契約の短期専門家が派遣されるまで事実上待たされた。長期専門家により事前準備は実施されたが、短期専門家並びに CP の配置がない 6 カ月以上の空白期間はプロジェクトの効率性を阻害した。JICA は業務実施型の短期専門家の調達のタイミングや計画をプロジェクトが開始される前に前広に検討する必要がある。

**MINUTES OF MEETING
BETWEEN
THE JAPANESE MID-TERM REVIEW MISSION
AND
THE MINISTRY OF PUBLIC WORKS AND TRANSPORT
ON
JAPANESE TECHNICAL COOPERATION PROJECT
FOR STRENGTHENING OF CONSTRUCTION QUALITY CONTROL**

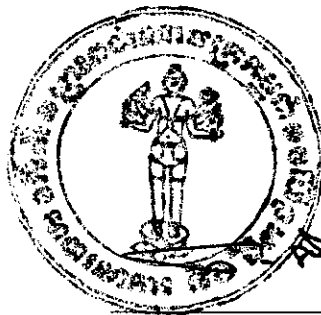
The Japanese Mid-term Review Team, organized by Japan International Cooperation Agency headed by Yukiharu KOBAYASHI, the Team Leader, had a series of discussions with the Cambodian authorities concerned for the purpose of reviewing the activities and jointly conducting the mid-term review on “the Project for Strengthening of Construction Quality Control” , and setting the future directions of the project.

As a result of these exercises, both Cambodian and Japanese parties came to an agreement on the evaluation results and recommendation as described in the attached Report.



小林 幸治

Mr. Yukiharu KOBAYASHI
Senior Representative,
Japan International Cooperation Agency,
Cambodia Office *cy*



Phnom Penh, Cambodia
December 21, 2011

H.E. Tauch Chankosal
Secretary of State,
Ministry of Public Works and Transport
The Royal Government of Cambodia *ET*

**THE PROJECT FOR STRENGTHENING OF
CONSTRUCTION QUALITY CONTROL**

MID-TERM REVIEW

Joint Report

21 December, 2011

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Abbreviations and Acronyms

ADB	Asian Development Bank
AusAID	Australian Agency for International Development
CPs	Counterparts
DPWT	Provincial Department of Public Works and Transport
EC	Executive Committee
JCC	Joint Coordination Committee
JICA	Japan International Cooperation Agency
HEC	Heavy Equipment Center
MEF	Ministry of Economy and Finance
M/M	Minutes of Meeting
MPWT	Ministry of Public Works and Transport
OVI	Objectively Verifiable Indicator
PDM	Project Design Matrix
PEAC	Procurement, Evaluation Award Committee
PO	Plan of Operations
PWRC	Public Works Research Center
QC/QA	Quality Control and Quality Assurance
RAMP	Road Asset Management Project
RCAF	Royal Cambodian Armed Forces
R/D	Record of Discussions
RID	Road and Infrastructure Department
RG	Regulation
RGC	Royal Government of Cambodia
SG	Standard Guideline
TCP	Technical Cooperation Project
TOT	Training of Trainers
WB	World Bank

1 Introduction

1-1 Objectives of the Evaluation

The review activities were performed with the following objectives:

- (1) To verify the accomplishment of the Project compared to those planned;
- (2) To identify obstacles and/or facilitating factors that have affected the implementation process;
- (3) To analyze the Project in terms of the five review criteria (i.e. Relevance, Effectiveness, Efficiency, Impact and Sustainability) with special focus on Relevance, Effectiveness and Efficiency;
- (4) To make recommendations on the Project regarding the measures to be taken for the remaining period; and
- (5) To extract lessons learnt so that similar projects could utilize the experience of the Project.

1-2 Members of the Joint Evaluation Team

(1) Cambodian Side

	Name	Job Title
1	Mr. Samrangdy Namu	Deputy Director, PWRC, MPWT
2	Mr. Chao Sopheak Phibal	Bureau Chief of Planning and Technical Office in RID, MPWT

(2) Japanese side

	Name	Mission	Job Title	Duration of stay
1	Mr. Yukiharu KOBAYASHI	Leader	Senior Representative, JICA Cambodia Office	Resident
2	Mr. Hozumi KATSUTA	Construction Quality Control	Senior Advisor, JICA	2011.12.11-2011.12.21
3	Dr. Keiko WATANABE	Evaluation and Analysis	Assistant Director/Senior Researcher Foundation for Advanced Studies on International Development (FASID)	2011.12.8-2011.12.22
4	Mr. Masahiko EGAMI	Evaluation Planning	Representative, JICA Cambodia Office	Resident
5	Ms. Keiko SUZUKI	Evaluation Planning	Project Formulation Advisor, JICA Cambodia Office	Resident

1-3 Schedule of the Evaluation Study

See Annex 1.

2 Outline of the Project

2-1 Background of the Project

In order to ensure the efficiency and sustainability of social and economic development and poverty reduction, the Ministry of Public Works and Transport (MPWT) has worked intensively on the rehabilitation and reconstruction of infrastructures such as roads and bridges with financial and technical support from development partners and/or national budgets. Regarding the construction projects from the development partners, international consultants have assured quality control by accommodating to the international standard. On the other hand, the national budget construction projects that were implemented by the governmental organizations under the MPWT such as the Road Infrastructure Department (RID), Heavy Equipment Center (HEC), and each provincial Department of Public Works and Transport (DPWT) have been inadequate and less effective in terms of quality control of construction. In those national budget projects, material testing and adequate construction procedure seem to be omitted in the development of national road network.

Based on the above-mentioned backgrounds, The Royal Government of Cambodia (RGC) requested the implementation of the Technical Cooperation Project (TCP) to the Government of Japan in order to establish an adequate Quality Control and Quality Assurance (QC/QA) system for roads and bridges construction.

In response to the request, the government of Japan decided to implement the project for Strengthening of Construction Quality Control (SCQC). The TCP policy is to make implementation agency strengthen the ability with their initiative behavior for future activities so that SCQC project team (project team) which composes of MPWT counterparts and JICA experts shall achieve an adequate the QC/QA system jointly.

2-2 Summary of the Project

The Project has been conducted based on the Project Design Matrix (PDM). Its main points are as follows:

<Overall Goal>

Quality and cycle of road and bridge construction and maintenance are improved.

<Project Purpose>

Capacity of MPWT engineers in the quality control for road and bridge construction and maintenance undertaken by force account is improved through application of the Quality Control and Quality Assurance (QC/QA) system (Standards, Regulations, Guidelines, Trainings).

<Outputs>

- 1) Standards, Regulations, Guidelines for quality control of road and bridge construction and maintenance are established.
- 2) Centralized and integrated management system of completion documents such as drawings and reports of construction is established.
- 3) Technical training lectured by PWRC lectures is consolidated by "Road Structure Standard Drawing Collections".

<Activities>

Activities for Output 1

- 1-1 To conduct the baseline survey on the current duties and capacity of each Department in MPWT related quality control of construction.
- 1-2 To set up Task Forces for the formulating draft standards, regulations and guidelines.
- 1-3 To study and analyze the currently applied specifications and standards.
- 1-4 To formulate the draft regulations determining each Department duties for assuring construction quality.
- 1-5 To formulate the guidelines for actual application of standards.
- 1-6 To be authorized the draft standards, regulations and guidelines by the JCC.
- 1-7 To formulate the procurement plan of laboratory equipment to meet the standards.
- 1-8 To select the pilot construction project and to apply the standards, regulation and guidelines.
- 1-9 To be officially authorized the standards, regulations and guidelines by the Minister of MPWT, and evaluate the application of the standards, regulations and guidelines.
- 1-10 To monitor and evaluate the application of the standards, regulations and guidelines.

Activities for Output 2

- 2-1 To list the past implemented construction projects of roads and bridges including development partners funded projects.
- 2-2 To collect the completion documents of construction at the MPWT library.
- 2-3 To categorize all completion documents by road route wise, structure wise and documental type wise.
- 2-4 To formulate the database with index for reference.
- 2-5 To support the making the library management and maintenance plan.
- 2-6 To arrange of books in the MPWT library and formulate the library management system.
- 2-7 To implement the technical guidance about library operation and management to the Cambodian counterparts

Activities for Output 3

- 3-1 To study and analyze existing training courses.
- 3-2 To re-design training program with additional technical contents.
- 3-3 To implement training of trainers.

- 3-4 To establish Task Force for the "Road Structure Standard Drawings Collections".
- 3-5 To categorize the road structures and collect ideal road structure drawings from past projects
- 3-6 To confirm the worthiness of those road structures in terms of design load, material used, structure, and the actual types of road foundation in Cambodia.
- 3-7 To compile road structure drawings into the "Road and Bridge Structure Standard Drawing Collections" and to be authorized by JCC.
- 3-8 To prepare the curriculum and materials for pilot training.
- 3-9 To implement pilot training courses for the staff of RID, HEC, DPWT, General Inspectorate and other personnel concerned.
- 3-10 To be authorized the contents of the pilot training courses by JCC and to officially incorporate into the training course of MPWT
- 3-11 To implement follow-up survey for participants in order to confirm the degree of understanding and application to actual construction, and to improve the contents of training if necessary.

3 Methodology of Evaluation

3-1 Evaluation Method

Evaluation method is accordance with JICA Guideline for the Project Evaluation. The evaluation items together with indicators, interviews, and necessary information and data sources are summarized in an evaluation grid attached in Annex 4.

The evaluation study was done by cooperated manner between Japanese evaluation team and Cambodian evaluation team.

3-2 Five Criteria for the Evaluation

The Project is evaluated from the view of the following "five criteria"; relevance, effectiveness, efficiency, impact and sustainability. The viewpoints of each criteria are as follows;

Criteria	Viewpoints
Relevance	To see the validity of the Project Purpose and Overall Goal with aspect of the development policy of both Governments and the needs of beneficiaries of the Project.
Effectiveness	To see if Project Purpose is being achieved as expected as a result of the project's Outputs, benefiting to the target group

Efficiency	To see if the timing, quality and quantity of inputs are appropriate for the degree of achievement on the Outputs, using the resources effectively.
Impact	To see the direct effects and indirect effects in the long run extended by the project from both positive and negative aspects, even with the ones not expected when it was planned
Sustainability	To examine the current extent to what the achievement of the project is sustained or expanded after the project is completed, focusing on institutional, financial and technical aspects.

3-3 Evaluation Questions and Indicators

Based on the five evaluation criteria described in the previous section, evaluation questions are summarized in the evaluation grid. It also compiles the information on indicators used for evaluation, methods to collect, sources and criteria for analysis of the indicators defined in PDM.

The basic questions are as follows:

- Progress, Achievement and Prospect of Inputs, Activities, Outputs, Project Purpose and Overall Goal
- Level of involvement of C/P (MPWT, DPWT) to the Project (Project Process)
- Level of improved capacity of C/P by the project
- Review and revising PDM/PO, if necessary

3-4 Data Collection Methods

Data are collected by document review, questionnaires to the counterparts and interviews to both the personnel directly implementing the Project and the other related personnel of the Project. The list of interviewees is attached in Annex 2.

4 Achievement of the Project

Achievements of the Inputs, Outputs, Project Purpose and Overall Goal are described below.

4-1 Inputs

Inputs provided by both sides are as follows.

4-1-1 Japanese Side

- (1) Japanese Experts

Two Long-term experts ((1) Chief advisor/Road construction and maintenance, (2) Project Coordinator/Library management) and eight short-term experts have been dispatched as attached Annex 5-1. Total person-months of short-term experts as of December 2011 amounted to 51.95 since the beginning of the Project. Fields of expertise of short-term experts are; (1) Team Leader/Contract management, (2) Quality Management, (3) Training/HRD, (4) Pavement Engineering, (5) Geotechnical Engineering, (6) Bridge/Road Structure Engineering, (7) Construction management/Material Testing, and (8) System management.

(2) Training of Cambodian Counterpart Personnel in Japan

Two counterpart trainings in Japan were conducted; one in 5-21 July 2010 and another in 6-25 November 2011. Totally seven (7) counterparts were participated in the trainings. The detailed list of participants is as shown in Annex 6.

(3) Equipment

Necessary equipment for laboratory and Library and Database system has been procured. The total cost for equipment was around US\$ 1.23 million. The detailed list of equipment is attached as Annex 5-2.

(4) Local costs

A total amount of US\$ 188,105 was provided to supplement a portion of local expenditure as of September 2011. Details of the local costs are attached as Annex 5-3.

4-1-2 Cambodian Side

(1) Assignment of Counterpart Personnel

Initially, a total of 12 staff was assigned as the Counterparts (CPs) by MPWT besides Project Director, Project Manager and two coordinators as a management team. However, 4 of them were left after 6 months. 7 new CPs were assigned later, however, 5 CPs were left since then. As a result, currently 10 CPs and 4 member of management team are working as Project counterparts as of December 2011. A list of CPs is shown in Annex 5-4. An organization chart of MPWT is also attached in Annex 8.

(2) Cost sharing of Operational Expenses

A total of US\$ 1.152 million has been provided from Cambodia side for conducting two pilot projects for 2011 (US\$ 412 thousand for Kampong Cham and US\$ 740 thousand for Kandal) since beginning of the Project.

(3) Provision of Facilities for Project Operations

The MPWT secured an office space in the MPWT building for the Japanese Experts.

4-2 Achievement of Outputs

According to the PDM, the level of achievement of Output as of the Mid-term Review is shown below.

4-2-1 Output 1

Output 1: Standards, Regulations, Guidelines for quality control of road and bridge construction and maintenance are established.	
Objectively Verifiable Indicators (OVI)	Achievement
QC/QA system will be applied to 100% of projects of road and bridge construction/maintenance by force account which will be implemented from the beginning of the 4th year except emergency work.	<ul style="list-style-type: none"> • 1st edition of both Standard Guideline and Regulation (English and Khmer) have been formulated in August 2010 and approved by JCC in October 2010. • First batch of pilot project have been approved financially and one of them have started since October 2011. • Equipment for laboratory has been procured and installed.

Although the Team confirmed the progress being made in Output 1, it needs to be further strengthened. The team found that the full-fledged activities have started only after the assignment of the CPs and dispatch of the short-term experts. Both assignments were made nearly six months after the Project have started. Accordingly, some delays in the timing of producing outputs were observed compared to the original plan.

The Team also suggested the alternative indicator of Output 1 to be more measurable since it was difficult to measure the level of achievement by the indicator set in the PDM. The proposed indicator is stated in the below section of "Revision of PDM".

Under Output 1, the Project formulated two taskforces. Taskforce 1 is in charge of establishment and application of Standard Guideline (SG) and Regulation (RG)¹. Taskforce 2 is in charge of improvement of MPWT Laboratory in terms of equipment and Laboratory staff.

The Project formulated the 1st edition of both SG and RG in English and Khmer under taskforce 1-1 and they were approved by 1st JCC in October 2010. SG and RG were jointly drafted by CPs and the Japanese experts. In addition, drafted SG and RG were translated into Khmer by CPs and CPs developed an English-Khmer bilingual glossary of technical terminology as attachment of SG. Throughout this formulation process, CPs enhanced their knowledge and understanding on SG and RG. This was also effective since CPs were expected to be lecturers on SG and RG to the provincial staff in DPWT after the training of trainers (TOT) under Output 3.

The first edition of SG and RG have to be reviewed and modified through their application

¹ Initially, the Project planned to formulate Standards, Regulations and Guideline separately. However, since the "Standards" have been existed but not the operational guideline, the Project decided to produce Standard Guideline and Regulations.

in conducting pilot projects. However, the commencement of the pilot projects was delayed for more than 6 months compared to the original plan. Two pilot project sites were selected in Kampong Cham and Kandal provinces for 2011. Construction in Kampong Cham has been started in the late October 2011; however, Kandal site will be starting in January 2012. The reasons of delay are as follows.

Firstly, the process for approval of final budget took long time. The preliminary estimation cost had been approved; however, it found that the actual cost would be much higher than the initial estimation after preparation of a work execution plan by conducting laboratory tests in accordance with SG/RG. The reason behind of cost difference was that it was the first time for MPWT to prepare a work execution plan for force account which includes technical test. It was, however, confirmed that the preparation process of work execution plan according to SG and RG enhanced the construction quality. Second reason of delay was that it took some time to coordinate with Road Asset Management Project² (RAMP) since a part of construction site of the pilot project on R71 in Kampong Cham was found to be overlapped with the construction site of RAMP. Thirdly, due to the flood in 2011, the commencement of construction has been further delayed. With delay of the commencement of the 1st pilot projects, the production of revised version of SG and RG became behind the schedule.

The Project is preparing for the 2-3 other pilot project sites in 2012 in the above two provinces³. If the planned pilot projects go smoothly, the second edition of SG and RG are expected to be produced in the middle of 2012 after incorporated the lessons from the pilot projects.

Most of the equipment for laboratory was procured and installed in August 2011 after surveying the current situation and verifying the needs to apply SG and RG under the taskforce 2. Equipment procured by JICA was not new to the laboratory staff except two equipment (Blain Air permeability Apparatus and Saybolt Viscosity), for which the Japanese experts conducted trainings.

4-2-2 Output 2

Output 2: Centralized and integrated management system of completion documents such as drawing and reports of construction is established.	
Objectively Verifiable Indicators	Achievements
Database system is completed and information of Database is utilized by MPWT staff by the end of the Project	A simple database system was developed and available as-built drawings of past projects were entered as electronic format. User manual was also formulated; however, it has not been connected to MPWT web site yet for wider use.

² RAMP is the MPWT project co-financed by ADB, WB and AusAID. The objective of the RAMP is to build capacity of MPWT to manage the outsourcing of force account projects.

³ The Project decided not to conduct a pilot project in Siem Reap province which was originally included as a project site since there was not appropriate force account project site.

The Team observed the steady progress made under Output 2, but it needs to be further strengthened for sustainable use of database system and library management.

The Project developed a basic simple database system. The Project collected as-built drawings and reports of completion documents at the MPWT library as accessible as possible. This kind of information is very useful for MPWT to design new projects and rehabilitation. It was scattered in many project offices in MPWT or in the hands of the supported donors and the Project made maximum effort to collect them. It was the first time that MPWT collected as-built drawings of loan projects from China and Vietnam. The Project is still trying to collect information by requesting donors.

Up to December 2011, around 8,000 as-built drawing has been converted as electronic format and entered into the database by the outsourcing companies. A user manual was also developed but the database has not been widely used by MPWT staff yet since the system has not been connected by MPWT intranet. The database can be accessible through the PC installed in the library. The Project is planning to announce the system at the Annual Seminar held on 30 December 2011 by CP of this Output. However, it is necessary to set up the mechanism for updating and maintenance of the system, which is under consideration.

Other activity under Output 2 is to formulate the management system of MPWT library. The Project sorted out the books and documents.. Additional arrangement is still necessary in the library due to unexpected occupancy by another project and the Project will support for this. The development of a guideline on usage is underway. In addition, in order to maintain the library in a sustainable manner, appropriate mechanism for management should be sought including allocation of the appropriate staff in charge.

4-2-3 Output 3

Output 3: Technical training lectured by PWRC lectures is consolidated by “Road Structure Standard Drawing Collections”.	
Objectively Verifiable Indicator	Achievements
Technical training developed by the Project is incorporated into the conventional training program by Department of Personnel & Human Resources.	The training plan was prepared in February 2010 after assessing MPWT capacity needs and current training program. As of December 2011, a Training of Trainers (TOT) was conducted once in November 2010 followed by two pilot technical trainings in pilot provinces (Kandal and Kampong Cham). The training program was also incorporated into the conventional MPWT monthly training program for DPWT as trial basis in November and December 2011.

The Project firstly conducted Capacity Gap Assessment (CGA) through questionnaire to

500 MPWT and DPWT staff to identify the areas and needs of training. 126 staff replied the questionnaire. After analyzing the results of CGA and comparing the current MPWT training program under the Department of Personnel & Human Resources, the Project developed a draft of Training Plan on quality control management and sought the possibility to incorporate the curriculum on quality control management into the conventional training program.

After the development of the 1st edition of SG and RG from the Output 1, the curriculum of lecturing SG and RG was developed. TOT was conducted for 8 MPWT CPs especially on presentation skills. The trainers are not only PWRC staff but CPs in other departments of MPWT CPs such as RID, HEC and Laboratory also became trainers depending on their expertise to teach in the areas of SG/RG. Then the two trial technical trainings on SG and RG were conducted in pilot project sites in Kandal and Kampong Cham by the MPWT trainers. Such a delivery lecture is the first trial for MPWT. The Project conducted the pre- and post-test to assess the level of understanding of the DPWT participants. The result showed positive in both trainings such as the average score increased from 4.56 to 7.19 in the case of Kandal province. The participants from Kampong Cham also commented at the interview by the Mid-term Review Team that the training was very effective for them to understand SG and RG and the MPWT lecturer was informative.

Another form of trial training was implemented twice under the conventional training program in MPWT. Department of Personnel & Human Resources has monthly training program for 15-18 months for DPWT staff every year. The same 2-3 DPWT officers from each province come to MPWT to take 5-day training every month. In the month of November and December in 2011, 2.5 days in total were allocated for the training on SG and RG by the MPWT lectures who have received TOT. According to the assessment by the Project, the participants of this conventional training found the SG/RG training useful.

The list of TOT and trial trainings is shown in the Annex-5-2.

The Project also established a taskforce to compile structure drawings of the past projects and established standard drawings. At the time of the Mid-Term Review, it was confirmed that the past drawings have been added into the Database which was established under Output 2 and a draft of standard drawings has been completed.. Standard drawings are expected to be approved by the 2nd JCC held in December 2011 and utilized as one of training materials for the future training.

The Team confirmed that the progress made in Output 3 is positive and the activities under Output 3 were almost on schedule. However, the Team also noted the effective and efficient mechanism to ensure both technical and financial sustainability of the training should be established. The sustainable supply of trainers and upgrading their skills also should be considered.

4-3 Other Activities to Contribute to the Outputs

The Project conducted several additional activities which were not included in the PDM

but to improve the CP's capacity to enforce the expected three Outputs.

(1) Conducting Workshops

Workshops were held and presentations were made to CPs on issues relating to road and bridges by the experts, a visiting professor and contractors from Japan. The topics included; "Chroy Changva Bridge and Connection with Japan", "How do we treat Dragon Holes", "Past road condition data in MPWT", "Low cost and rapid pavement technology to help refuge from disaster" and so on.

(2) Working reports

Working reports were produced on Japanese experience on roads and bridges by the Japanese experts.

(3) Site Observation

CPs observed different stages of actual implementation of quality control and construction supervision at the on-going Japan's Grant Aid projects of "Rehabilitation of National Road 1" and "Construction of Neak Loeung Bridge".

(4) Joint Seminar

Cambodia-Japan Joint Seminar on Bridge and Engineering was organized in May 2011 by the Project in cooperation with the Japan Society of Civil Engineering and Institute of Technology of Cambodia (ITC). About 150 people were attended the seminar.

(5) Annual Technical Report and Seminar

In order to upgrade technical capacity of MPWT/DPWT staff members, the Project is preparing to publish a report calling papers from the staff members. More than 25 papers have been submitted and the Project is going to hold a seminar on 30 December 2011.

4-4 Achievement of Project Purpose

Project Purpose	Capacity of MPWT engineers in the quality control for road and bridge construction and maintenance undertaken by force account is improved through application of the Quality Control and Quality Assurance (QC/QA) system (Standard, Regulations, Guidelines, Trainings)	
	Objectively Verifiable Indicator	Achievement
	Full implementation of QC/QA system for 50% of projects of road and bridge construction/maintenance by force account which will be implemented from the beginnings of the 4th year.	<ul style="list-style-type: none"> · It is not the stage to judge the achievement at the Mid-Term Review. · Through the process of formulation of 1st edition of SG and RG, it was observed the capacity improvement of CPs. · It should be strengthened more through conducting pilot projects applying SG and RG.

The Team was not able to measure the level of achievement of the Project Purpose at the

time of the Mid-Term Review. It is depending on the production and approval of revised SG and RG after implemented the several pilot projects, one of which has just started one month before (Output 1). In addition, the dissemination of the knowledge and skills on SG and RG should be completed to relevant staff members in all 24 DPWT for application of SG and RG (Output 3).

However, the Team assumed that the Project Purpose is likely to be achieved by the end of the Project if the strong contribution and efforts were continuously made by both Cambodian and Japanese sides. Despite the some delays in commencement of the pilot projects, as described above, the Project has been producing positive achievement in each Output.

The Team proposed a revised OVIs since the original OVI is ambiguous and difficult to measure. It is indicated in the below section of "Revision of PDM"

4-5 Implementation Process

As stated above, due to the delay of the procurement process of Japanese short-term experts and assignment of CPs, the structure of the Project has established only in January 2010, which made some delays in the activities especially those under Output 1 including the preparation of the pilot projects. Implementation of pilot projects were also delayed due to the reasons described in Output 1.

Most of the CPs are not full-time and were assigned as part-time since they have other heavy duties. Therefore, they sometimes could not attend meetings of the Project, although they tried to participate in the Project activities with their maximum efforts. Due to the unfortunate and unavoidable reasons, however, there were also frequent turnover of the CPs. Cambodia side made every effort to allocate the CPs who could take over the tasks from the limited number and skill of MPWT staff members.

The communication between CPs and Japanese experts has been made smoothly and information on the project was shared at the frequent meetings, or through e-mails. The minutes of the meetings were prepared by the full-time CPs and shared to all CPs who could not attend the meetings.

Monitoring the progress of activities has been regularly conducted in the form of weekly CP meetings, periodical taskforce meetings, monthly management meetings, Executive Committees and Joint Coordination Committee. The list of the meetings held as of the time of the Mid-Term Review is attached as Annex 7. The Team found, however, that the Plan of Operations (PO) has not been frequently shared to monitor the progress and the levels of achievement of indicators in the PDM were not reviewed periodically.

5 Evaluation Results by Five Criteria

5-1 Relevance

The relevance of the Project is high based on the following points.

The Project was well aligned with Cambodian overall development strategy of “Rectangular Strategy for Growth, Employment, Equity and Efficiency Phase II (RSII) (2008)” and five-year development plan of “National Strategic Development Plan (NSDP) (2006-2010)” at the time of Ex-ante Evaluation. The physical infrastructure development for transport is one of Cambodia’s priority areas stated in both RSII and NSDP. The government identifies infrastructural development as one of four growth rectangles, which states “Further Rehabilitation and Construction of the Physical Infrastructure” in RSII. NSDP also emphasizes that the appropriate and prioritized road maintenance is indispensable. With the maintenance cost pressed the increase in the national budget for MPWT, improvement of the capacity of MPWT on quality control was the urgent needs especially for force account project which the quality control practices have not been made in an appropriate manner.

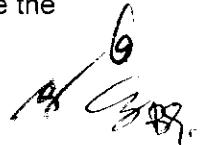
The Project is also in line with the Japanese policy and strategies. The Japan's Assistance Policy for Cambodia (2004) sets “Improvement of Social and Economic Infrastructure and Conditions for Economic Progress” as one of priority areas. It also stipulates that socio-economic infrastructure that forms the foundation of the country’s development still needs to be significantly improved”. In addition, JICA stipulates that “(JICA) will assist the rehabilitation of road network as soon as possible by collaborating with other donors, and contribute to its economic growth through institutional development for maintaining and assuring effective use of the traffic network” in its Country-specific implementation Plan (2007). Besides, the Road Network Development Study by JICA (2006) recommended that the quality control system should be established in the mid-term target (2011 to 2015).

5-2 Effectiveness

(1) The Achievements of the Project Purpose

As explained in the 4-4, it is not the stage of judging the achievement of the indicator of Project Purpose in PDM at the time of the Mid-term Review. The team has, however, confirmed the progress made to achieve the Project Purpose noted as above achievement of Outputs. The progress includes the developments of the 1st editions of SG and RG, database system for the relevant drawings of completion projects, and standard drawings. The capacity of MPWT staff also improved through the process of formulation of SG, RG and standard drawings, conducting trainings to DPWT staff after TOT, and receiving technical knowledge from the Japanese experts. At the interview, some of MPWT CPs expressed that they learned new skills and knowledge from the Japanese experts not only on quality control but also other technical knowledge on roads and bridges.

The Project surely contributed to upgrade operational and practical capacity to implement quality control (QC) and quality assurance (QA) activities. One of the significant outputs from the Project is the production of SG and RG for force account projects, which clearly define the



division of duties among Employer (Party A), Executor (Party B), Supervisor (Party C) and Inspector (Party D), since some responsibility had not been clearly divided before. In addition, the documentation of records throughout the process of quality control by each Party in accordance with the contract documents contributes to ensure the quality as well as makes the trace of the problem possible.

Both Party B and Party C of the pilot project in Kampong Cham also expressed the effectiveness of the SG and RG to ensure the quality at the interview by the Team. In addition, the interview revealed their willingness to apply the SG procedure to ensure the quality despite of the additional tasks.

The Team also suggested that the Project consider the improvement of SG such as including simple procedure manuals or guidelines for supervisors (Party C) and inspectors (Party D), and as-built control chart and as-built control forms for culvert.

The Team also confirmed by the interview to MPWT CPs that the formulation of a collection of standard drawings also benefitted to MPWT when they conducted design or gave advice to DPWT.

In light of the above, the remaining activities until the end of the Project are very important to achieve the Project Purpose, especially the modification of SG and RG by incorporation of lessons from the pilot projects. To that end, the utmost efforts and strong contribution is essential by both Cambodian and Japanese sides.

5-3 Efficiency

Some factors that affected efficiency were observed, although achievements of Outputs are foreseeable. As stated above, the timing of both short-term experts and assignment of CPs were delayed. In addition, although mostly due to unforeseeable and unavoidable reasons, many CPs left the Project. Up to the Mid-Term Review, 19 CPs were assigned in total and 9 of them have left for different timing. Some of them worked only for 6 months. Whenever the new CPs were assigned, the Japanese experts had to make efforts to explain the project from scratch.

In regard to the input of the equipment provided by the Project was made in timely manner except the Nuclear Moisture Density Gauge. It arrived one month later due to the complexity process and tighter regulation of importing those radioactive apparatus especially after Fukushima plant accident.

Although the above factors made some delays in some of the activities, the Team confirmed the steady progress in producing expected outputs. However, the Project has to make intensive efforts in the remaining period.

5-4 Impact

- (1) Achievement of the Overall Goal

As well as the Project Purpose, it is early to judge the level of achievement of the Overall Goal, "Quality and cycle of road and bridge construction and maintenance are improved". The Project will establish a mechanism to disseminate the Project outputs nationwide. If that mechanism works well in a sustainable manner after the end of the Project, it is highly likely to achieve the Overall Goal.

(2) Other impact observed

Some positive impact was observed through the interviews to CPs. Some CPs expressed that they have learned technical skills and knowledge not only on quality control of road and bridges but also on other issues such as safety control and Japanese experience of infrastructure development in general. Those improvements were obtained through the exchange of ideas and discussions with the Japanese experts and the participation in the trainings in Japan. In addition, the Project stimulated CPs technical knowledge and motivation by publishing papers collected from CPs and relevant MPWT officers and giving the opportunity to present them. This kind of activities consolidated the CPs' capacity.

It is also foreseeable that the revised SG and RG for force account projects in MPWT will be applied to other governmental executors who are not directly targeted in the Project such as Royal Cambodia Police.

No negative impact has been observed.

5-5 Sustainability

(1) Policy Aspects

Upgrading physical infrastructure is still one of the high priority areas of RGC. It is also highlighted in the revised NSDP (2009-2013) that "transport network is a Prime Mover of economic growth".

The force account projects done by the provincial department (DPWT), RID and HEC are expected to be reduced year by year and gradually those works will be contracted out to the private companies, although such strategy and the numeric target year have not been officially stated in any of papers. Even so, it takes long time to be realized and some portion of force account done by the government offices will remain, especially for emergency works. In this regard, the political sustainability of the Project effects will be ensured for a long period.

(2) Organizational Aspects

PWRC has the central role of the quality control but all departments under General Department of Public Works and the laboratory are related to force account, thus CPs were mainly assigned from these departments. The Project is producing many outputs to ensure QC/QA such as formulation of SG/RG, database, management of library, and designing a training program. These outputs have to be continuously upgrading and updating to fit the

situation. In order to do that, a proper mechanism including who is in charge, when it is updating, how is managed, should be developed and institutionalized.

(3) Technical Aspects

It is confirmed that most of knowledge and skills transferred through the Project activities are appropriate and timely in the context of the Cambodia and it has already been adopted in many of CPs. If those trained engineers under the Project remained and served to expand the knowledge and skills for all provinces, the technical sustainability will be ensured.

The training program on QC/QA will be incorporated into the conventional annual MPWT training program. The conventional course will conduct continuously; however, it limits the scope of participants. Participants are only 3 DPWT officers from each province and officer in charge of Public Works is only one of them. In this regard, technical sustainability will be ensured but with limited scope. The Project, therefore, needs to develop a training plan to instruct SG/RG, database, and standard drawings to relevant provincial officers in effective and efficient way. Updating training curriculum and materials as well as a mechanism to produce trainers have to be sought to ensure the technical sustainability.

Furthermore, if the established database as well as the library were easily accessible to MPWT/DPWT staff members, it will contribute to individual and institutional technical capacity building.

Equipment provided to the laboratory has been utilized without any technical problem since they were not new to the laboratory staff except two new equipment, for which the Japanese experts conducted OJT.

(4) Financial Aspects

The national budget for road maintenance and construction has been increasing as below table. In the force account, there are mainly three categories; Routine Maintenance, Periodic Maintenance and New Construction other than emergency and flood works.

Budget Record for Road Maintenance and Construction (2007-2011)

Unit: US\$ million

	2007	2008	2009	2010	2011
Routine Maintenance	5.7	8.8	17.1	17.9	16.1
Periodic Maintenance	12.2	14.3	13.3	15.0	26.6
New Construction	8.9	12.0	45.2	45.2	50.0
Flood	2.4	2.4	-	-	-
Emergency	1.6	1.9	2.4	2.9	3.7
Total	30.9	39.3	78.0	81.0	96.3

Source: Road and Infrastructure Department, MPWT (2011)

It is anticipated that more new construction and maintenance of roads will be conducted to meet the needs of the country. The Project will clarify the estimate cost necessary to ensure the quality of construction including the laboratory test, field inspection and management cost

through the implementation of the pilot projects. It will promote the systematic negotiation and smooth allocation of the budget.

In addition, necessary budget for trainings on SG and RG should be estimated and needs to be allocated.

Maintenance cost for the equipment for the laboratory will be secured since the laboratory has been autonomous since 1996 and financially stable. The revenue and expenditure of 2009 and 2010 is shown in the below table.

Budget of MPWT Laboratory

	2009	2010
Revenue	US\$ 175,000	US\$ 216,400
Expenditure	US\$ 157,300	US\$ 198,200
Balance	US\$ 17,700	US\$ 18,200

Source: MPWT Laboratory (Exchange rate: 1\$=4,100R)

6 Revision of PDM

The following modification of PDM should be done to clarify the meaning of the narrative summary and the indicators should be measurable. The original and revised PDM are attached as Annex 3-1 and 3-2.

(1) Project Purpose

The Team found that the current OVI in the PDM for the Project Purpose is ambiguous and difficult to measure quantitatively. Besides, the means of verification will not be applied yet at the completion of the Project. In addition, the level of capacity of target has to be also measured. In this regards, the Team proposed to change the OVI and means of verifications as follows;

Project Purpose : Capacity of MPWT engineers in the quality control for road and bridge construction and maintenance undertaken by force account is improved through application of the Quality Control and Quality Assurance (QC/QA) system (Standard, Regulations, Guidelines, Trainings)		
	Objectively Verifiable Indicators	Means of Verification
Before	Full implementation of QC/QA system for 50% of projects of road and bridge construction/maintenance by force account which will be implemented from the beginnings of the 4th year.	1. Construction management records 2. Supervising Records 3. Inspection Records
After	1. By the end of the Project, the revised SG and RG are applied to at least three force account projects of roads and bridges starting from 2013 (new construction or major rehabilitation under periodic maintenance) in	1.1 A copy of instruction letter from the Director General of Public Works of MPWT directing the application of the revised SG and RG to executors (DPWT, RID

	three provinces except in the two pilot provinces (Kampong Cham and Kandal).	and HEC) and the confirmation from executors 1.2 Interview to the executors on the preparation of the projects
	2. Trainers received TOT are assessed and trainees participated in the annual technical training in year 2012 improve the knowledge level of quality control and score 70 at the post test.	2.1 Internal assessment of trainers by management levels 2.2 Result of training report

(2) Output 1

The Team also suggested the alternative indicator of Output 1 to be more measurable since it was difficult to measure the level of achievement by the indicator set in the PDM.

Output 1: Standards, Regulations, Guidelines for quality control of road and bridge construction and maintenance are established.		
	Objectively Verifiable Indicators	Means of Verification
Before	QC/QA system will be applied to 100% of projects of road and bridge construction/maintenance by force account which will be implemented from the beginning of the 4th year except emergency work.	1. Contract between MPWT and contractor (DPWT, HEC, other government organization)
After	By the end of the Project, the second edition of SG and RG are produced after incorporation of the lessons learned from the pilot projects.	1. Revised version of SG and RG 2. Prakas of MPWT

(3) Important Assumptions

The Team proposed to add the following important assumptions.

Level	Additional Imp. Assumption	Reasons
Project Purpose → Overall Goal	Appropriate budget to ensure the quality control is allocated for force account projects.	The budget allocation to conduct activities to ensure the quality is essential.
Output → Project Purpose	Integrated intranet system in MPWT is established.	For wider and easy access of the database is depending on the setting up of integrated internal system in MPWT

(4) Other Minor changes

The Team proposed the following changes of wording in accordance with the actual situation.

Before	After	Reasons
<p>(Output 3) Technical training lectured by PWRC lectures is consolidated by "Road Structure Standard Drawing Collections".</p>	<p>Capacity of MPWT is improved through technical trainings conducted by MPWT lecturers and utilizing "Road Structure Standard Drawings" Collections"</p>	<p>The expression of Output 3 does not make sense. The technical trainings are not conducted only by PWRC lecturers. TOT was conducted for MPWT officers from different departments. Besides, the training uses other developed important materials than Standard Drawings, so it does not need to mention.</p>
<p>(Project Purpose) Capacity of MPWT engineers. (Standards, Regulations, Guidelines, Training)</p>		<p>Initially, the Project planned to produce Standards, Regulations and Guidelines separately. Instead, the Project produced the Standard Guideline and Regulation. Standard Drawings was added since it is also important to ensure QC/QA.</p>
<p>Wording of "standards, regulations, guidelines" in the Activities 1-2, 1-6, 1-8, 1-9, 1-10 under Output 1</p>	<p>"Standard Guideline and Regulation"</p>	<p>Same as above</p>

7 Conclusion

Despite the some delays in commencement of the pilot projects as described above, the Project has been producing positive achievement in Outputs. The Project is likely to achieve its expected objective by the end of the Project if the strong contribution and efforts will made by both Cambodian and Japanese sides in the remaining period. It is the very crucial period for the Project implementation. It is also noted the Project needs to make continuous efforts to reinforce the level of achievements.

One of the significant outputs from the Project is the establishment of SG and RG for force account project, which define responsibilities of relevant Party. The documentation of records throughout the process of quality control by each Party in accordance with the contract documents which contributes to ensure the quality as well as to make it possible to trace the problems. The Project has surely contributed to upgrade operational and practical capacity to implement QC/QA activities.

However, there are some issues to be considered in order to secure the maximum achievement of the Project Purpose and enhance the sustainability of Project effect. The Team prepared following recommendations to be implemented.

8 Recommendations and Lessons Learned

8-1 Recommendations

The following recommendations are made for the remaining period of the Project by the Mid-Term Review Team.

(1) Revision and Endorsement of SG and RG within the Project period

It is recommended that SG and RG should be endorsed by MPWT as official documents as soon as the second editions are finalized. The authorization is very important for SG and RG to be spread to all force account projects. After the authorization, the activities for dissemination to all relevant officials in provinces should be undertaken without delay in order for them to apply them to the new force account projects in the following year.

(2) Proactive contribution to formulate and consolidate SG and RG from both sides

Currently, the Project is moving to the very important stage when the finalization of revised versions of SG and RG will be made based on the results of the pilot projects. SG and RG are fundamental documents to ensure the quality control of roads and bridges, therefore, it is recommended to put it in one of the high priority tasks in MPWT. To that end, it is necessary to establish favorable situation where both CPs and the Japanese experts can make proactive contribution to and participation in the Project effectively and efficiently. The review of the frequency, content, modality, and duration of existing meetings will be one of the ideas for that.

The Team also recommends that the Project consider the improvement of SG such as including simple procedure manuals or guidelines for supervisors (Party C) and inspectors (Party D), and as-build control chart and as-build control forms for culvert.

(3) Development of a sustainable database management and library management

The database system which entered the drawings of completion projects will be very useful for MPWT/DPWT especially at the time of the rehabilitation of those Projects. The system has to be maintained and managed properly. In order for the sustainable database management, it is recommended that the Project formulate a mechanism which clarifies how, when, and who is in charge for updating these database. In addition, the financial issues should be considered for this.

Library still needs to be rearranged with books and documents. The Project should continue to support for this. In addition, in order to maintain the library in a sustainable manner even after the Project completion, an appropriate mechanism for management should be sought including allocation of the appropriate staff in charge.

(4) Development of a sustainable training mechanism

Continuous implementation of trainings for dissemination of Project outputs (SG, RG, database system and standard drawings) as well as additional technical knowledge is

important to ensure quality control to the projects by force account. The sustainability will be secured by incorporating into the conventional MPWT training, however, the scope and coverage is very limited. To that end, the Team recommends the Project consider the development of an effective and efficient training plan to disseminate the Project outputs. The sustainable budget allocation and supply of trainers and upgrading their skills also should be considered.

8-2 Lessons Learned

(1) Referring to project management tools (PDM and PO) for periodical monitoring

Although the Project monitored the progress and shared the information between CPs and the Japanese experts, it was found that PDM and PO were not frequently referred to as monitoring tools. The project should use PDM and PO since they are the basis for monitoring and evaluation and the project should conduct periodic monitoring referring to these project management tools.

(2) Timing of the input of Japanese Experts

The commencement of essential project activities had to be waited until the short-term experts were dispatched. The preparatory activities were done by the long-term experts; however, the vacant period of more than 6 months without assigning the short-term experts or technical CPs affected the efficiency in the Project. JICA should consider the timing of procurement of short-term experts and plan well in advance before the project starts.

Schedule for Strengthening of Construction Quality Control Mid-Term Review

No	Date	D	Schedule	
1	8	T	0905	Ms. Watanabe arrives at Phnom Penh
			1400	Meeting with JICA
			1500	Interview with H.E. Kem Borey
			1600	Project Briefing from Mr. Kuwano, Chief Advisor
2	9	F	0900	Interview with Mr. Koun Bunthoeun
			1000	Interview with Mr. Samrangdy Nam
			1500	Courtesy with H.E. Tauch Chankosal, MPWT
			1630	Interview with Dr. Khun Sokha
3	10	S		Drafting Documents
4	11	S		Drafting Documents Mr. Katsuta arrives at Phnom Penh
5	12	M	0830	Interview with Kuwano Leader @JICA)
			1000	Interview with Ishida Expert @JICA)
			1400	Interview with short-term experts @JICA)
			1600	Courtesy call to EoJ
6	13	T	0830	Interview with Mr. Chao Sopheap Phibal
			0930	Interview with Mr. Phy Ratha
			1030	Interview with Mr. Hum Vuthy
			1430	Group Meeting with Mr. Sok Pounnaraiy, Mr. Meng Leang, Mr. Laing Onit, Mr. Kry Thong, Mr. Uy Sopha, Mr. Pou Manith (RID), and Mr. Ros Sreng (RID)
	1630	Interview with Mr. Pheng Sovicheano		
7	14	W	AM	Site Visit of Construction of National Road No. 71 and Interview with DPWT Kampong Cham (Mr. Chan Somardy, Deputy Director) at the Construction Site (Accompanied by Mr. Pou Manith)
			1500	Workshop with MPWT
8	15	T	0830	Interview with Mr. Nin Menakak
			PM	Internal Meeting
9	16	F	0900	Visit Public Works Laboratory of MPWT (Meeting with Mr. Srun, to see the Equipment supported by the Project)
			1500	Interview with Mr. Ti Bunthoon, Deputy Director, Department of Personnel and Human Resource
10	17	S		Drafting Document
11	18	S		Drafting Document
12	19	M		Drafting Document
			1600	Report to EOJ
13	20	T	0930	Meeting with MPWT on JER/MM
				Document Confirmation
14	21	W	0830	JCC (H.E. Tram Iv Tek)
			1400	Report to JICA Mr. Katsuta leaves
15	22	T		Ms. Watanabe Leaves

List of Interviewees

<MPWT>

Name	Post
H.E. Tauch Chan Kosal	Secretary of State
H.E. Kem Borey	Director General of Public Works
Mr. Koun Bunthoeun	Director, Public Works Research Center (PWRC)
Dr. Khun Sokha	Deputy Director, PWRC
Mr. Samrangdy Nam	Deputy Director, PWRC
Mr. Nin Menakak	Officer, PWRC
Mr. Phy Ratha	Officer, PWRC
Mr. Chao Sopheap Phibal	Chief of Office, Road and Infrastructure Department (RID)
Mr. Pou Manith	Chief of Office, RID
Mr. Ros Sreng	Chief of Office, RID
Mr. Laing Onit	Officer, RID
Mr. Hum Vuthy	Officer, RID
Mr. Sangva Piseth	Officer, RID
Mr. Kry Thong	Chief of International Unit of Public Works (Heavy Equipment Center)
Mr. Khun Srun	General Director of Laboratory of Building and Public Works
Mr. Meng Leang	Chief of Office, Laboratory
Mr. Sok Pounnaraiy	Officer, Airport Construction Department (ACD)
Mr. Uy Sophal	Officer, General Inspectorate
Mr. Ti Bunthoon	Deputy Director, Department of Personnel & Human Resources (DPHR)
Mr. Tak Rithisak	Chief of Office, HRPD
Mr. Pheng Sovicheano	Deputy General Director of Public Works, RAMP Project Manager
Mr. Sok Srun	Director, DPWT Kompong Cham
Mr. Chan Somardy	Deputy Director, DPWT Kompong Cham Province

<Japanese Experts>

Mr. Tadao Kuwano	Chief Advisor / Road Construction and Maintenance
Mr. Kazuki Ishida	Project Coordinator / Library Management
Mr. Masafumi Yamauchi	Contract Management
Mr. Kazuo Yumita	Quality Management
Mr. Mamoru Izawa	Bridge and Road Structure Engineering
Mr. Tatsuro Maeda	Construction Management / Material Testing

Project Design Matrix (PDM)

- Project Name: The Strengthening of Construction Quality Control Project
- Project Term: May 11, 2009 - Oct 31, 2012
- Project Implementation Agency: Public Works Research Center (PWRC), Ministry of Public Works and Transport (MPWT)
- Target Group: Public Works Research Center (PWRC), Road Infrastructure Department (RID), Heavy Equipment Center (HEC), Department of Public Works and Transport (DPWT) (Kandal, Kampong Cham, Laboratory)

(December 01, 2011)

Overall Goal	Narrative Summary	Objective Verifiable Indicators	Means of Verification	Important Assumptions
<p>Quality and Cycle of road and bridge construction and maintenance are improved.</p> <p>Object Purpose Capacity of MPWT engineers in the quality control for road and bridge construction and maintenance undertaken by force account is improved through application of the Quality Control and Quality Assurance (QC/QA) system (Standards, Regulations, Guidelines, Trainings).</p> <p>Outputs Output Standards, Regulations, Guidelines for quality control of road and bridge construction and maintenance are established.</p> <p>Output/Centralized and integrated management system of completion documents such as drawing and reports of construction is established.</p>	<p>Large scale defects will not be found on the Defect Liability Inspection in the force account construction projects of MPWT.</p> <p>Full implementation of QC/QA system for 50% of projects of road and bridge construction/ maintenance by force account which will be implemented from the beginnings of the 4th year.</p> <p>QC/QA system will be applied to 100% of projects of road and bridge construction/ maintenance by force account which will be implemented from the beginning of the 4th year except emergency work.</p> <p>Database system will be completed, information of data will be updated</p> <p>Technical training to be formulated in the project will be incorporated into the training program by Dept. Personnel & Human Resources.</p>	<ol style="list-style-type: none"> 1. Inspection record of Defect Liability 2. Site observation 1. Construction management record 2. Supervising record 3. Inspection record 	<ol style="list-style-type: none"> 1. Force account system will remain at least by the end of terms of cooperation. 2. Budget for pilot projects is allocated without any delay. 1. Reports and drawing of past projects are collected before project begins. 2. Reports and drawing of finished projects are submitted to the person in charge at the project periodically. 1. Trained engineers continue to work 2. Targeted DPWT staff adopts Standards, Regulations and Guidelines without any delay. 3. Budget for capacity development training by MPWT is secured. 	
<p>Activities 1-1. To conduct the baseline survey on the current duties and capacity of each Department in MPWT related quality control of construction. 1-2. To set up Task Force (TF-1, 2) for the formulating draft standards, regulations and guidelines. 1-3. To study and analyze the currently applied specifications and standards. 1-4. To formulate the draft regulations determining each Department duties for assuring construction quality. 1-5. To formulate the guidelines for actual application of standards. 1-6. To be authorized the draft standards, regulations and guidelines by the JCC. 1-7. To formulate the procurement plan of laboratory equipment to meet the standards. 1-8. To select the pilot construction project and to apply the standards, regulation and guidelines. 1-9. To be officially authorized the standards, regulations and guidelines by the Minister of MPWT, and evaluate the application of the standards, regulations and guidelines. 1-10. To monitor and evaluate the application of the standards, regulations and guidelines. 2-1. To list the past implemented construction projects of roads and bridges including development partners funded projects. 2-2. To collect the completion documents of construction at the MPWT library. 2-3. To categorize all completion documents by road route wise, structure wise and documental type wise. 2-4. To formulate the database with index for reference. 2-5. To support the making the library management and maintenance plan. 2-6. To arrange of books in the MPWT library and formulate the library management system. 2-7. To implement the technical guidance about library operation and management to the Cambodian counterparts. 3-1. To study and analyze existing training courses. 3-2. To re-design training program with additional technical contents. 3-3. To implement training of trainers (PWRC lecturers). 3-4. To establish Task Force (TF-3) for the Road Structure Standard Drawings Collections. 3-5. To categorize the road structures and collect ideal road structure drawings from past projects. 3-6. To confirm the workability of those road structures in terms of design load, structure, and the actual types of road foundation in Cambodia. 3-7. JCC. 3-8. To prepare the curriculum and materials for pilot training. 3-9. To project and implement pilot training courses for the staff of RID, HEC, DPWT, General Inspectorate and other personnel concerned. 3-10. MPWT. 3-11. To implement follow-up survey for participants in order to confirm the degree of understanding and application to actual construction, and to improve the contents of training if necessary.</p>	<p>(Inputs from Japanese side)</p> <ol style="list-style-type: none"> 1. Dispatching Japanese experts <ul style="list-style-type: none"> (1) Long-term experts (2) Short-term experts Project Coordinator/ library management Leader/ Contract management Quality management • Training/ Human Resource Development Payment engineering • Geotechnical engineering Bridge/ Road structure engineering • System management Material testing • Construction management <p>Provision of machinery and equipment</p> <p>(1) Laboratory equipment (2) Equipment for library and Database system</p> <p>Counterpart training in Japan</p> <ul style="list-style-type: none"> • JFY2010: 3 trainees • JFY2011: 4 trainees • Budgetary allocation for project activities • JFY2009: US\$ 52,621.08 • JFY2010: US\$ 101,940.65 • JFY2011: US\$ 29,782.86 (as of September 2011) <p>(Inputs from Cambodian side)</p> <ol style="list-style-type: none"> 1. Assignment of personnel <ul style="list-style-type: none"> • Project director (Director General of Public Works) • Project manager (Director of PWRC) • Coordinator: 2 persons (Deputy Director of PWRC) • Technical counterparts: 11 persons Provision of budgeting and facilities Budget for the pilot project <p>(PWRC, HEC, RID, AIC, Laboratory)</p>	<ol style="list-style-type: none"> 1. Contract between MPWT and contractor (DPWT, HEC, other government organizations) 1. List of database contents 2. The number of users 3. The number of record of updating 1. Annual training plan of Dept. of Personnel & Human Resources 2. Record of training 3. Training curriculum and textbooks 	<ol style="list-style-type: none"> 1. Project counterparts continue to work in the counterpart agencies. 2. Trained engineers of road and bridge construction/ maintenance continue to work in their agencies. 3. In case, where counterparts or trained engineers are promoted or reassigned, project turn over and replacement shall be done by DPWT and/or MPWT. <p>Pre-condition</p> <ol style="list-style-type: none"> 1. The RGC allocates budget for the project without any major delay. 2. Budget for pilot project is allocated without any delay, and sites for the pilot projects are identified and implement in cooperation with MPWT. 3. Counterparts are allocated properly and in cooperation with them. 	

Project Design Matrix (PDM)

ANNEX 3-2

- * Project Name: The Strengthening of Construction Quality Control Project
- * Project Term: May 11, 2009 - Oct 31, 2012
- * Project Implementation Agency: Public Works Research Center (PWRC), Ministry of Public Works and Transport (MPWT)
- * Target Group: Public Works Research Center (PWRC), Road Infrastructure Department (RID), Heavy Equipment Center (HEC), Department of Public Works and Transport (DPWT) <Kandal, Kampong Chan, Laboratory

Narrative Summary		Objective Verifiable Indicators	Means of Verification	Important Assumptions
<p><Overall Goal> Quality and Cycle of road and bridge construction and maintenance are improved.</p>	<p>Large scale defects will not be found on the Defect Liability Inspection in the force account construction projects of MPWT.</p>	<p>1. Inspection record of Defect Liability 2. Site observation</p>	<p>1. Appropriate budget to ensure the quality control is allocated for force account projects.</p>	
<p><Project Purpose> Capacity of MPWT engineers in the quality control for road and bridge construction and maintenance undertaken by force account is improved through application of the Quality Control and Quality Assurance (QC/QA) system (Standard Guideline, Regulation, Training, Standard Drawings).</p>	<p>1. By the end of the Project, the revised SG and RG are applied to at least three or major construction projects of roads and bridges starting from 2013 (new construction or major rehabilitation under periodic maintenance) in three provinces except in the two pilot provinces</p> <p>2. Trainers received TOT are assessed and trainees who participate the annual technical training in year 2012 improve the knowledge level of quality level and score 70 at the post test.</p>	<p>1. A copy of instruction letter from the DG of Public Works directing the application of the revised SG and RG to executors (DPWT, RID, HEC) and the confirmation from executors</p> <p>2. Interview to the executors on the preparation of the project</p> <p>1. Internal assessment of trainers by management levels</p> <p>2. Result of training report</p>	<p>1. Force account system will remain at least by the end of terms of cooperation.</p> <p>2. Budget for pilot projects is allocated without any delay.</p>	
<p><Output 1> Standard Guideline and Regulation for quality control of road and bridge construction and maintenance are established.</p>	<p>By the end of the Project, the second edition of SG and RG are produced after incorporation of the lessons learned from the pilot project.</p>	<p>1. Revised version of SG and RG 2. Prakes of MPWT</p>	<p>1. Force account system will remain at least by the end of terms of cooperation.</p> <p>2. Budget for pilot projects is allocated without any delay.</p>	
<p><Output 2> Centralized and integrated management system of completion documents such as drawings and reports of construction is established.</p>	<p>Database system is completed, and information of Database system is utilized by MPWT staff.</p>	<p>1. List of database contents 2. The number of users 3. The number of record of updating</p>	<p>1. Integrated intranet system in MPWT is established.</p>	
<p><Output 3> Technical trainings are implemented by MPWT lecturers.</p>	<p>Technical training to be formulated in the project will be incorporated into the conventional training program by Dept. Personal & Human Resources.</p>	<p>1. Annual training plan of Dept. of Personal & Human Resources 2. Record of training 3. Training curriculum and textbooks</p>	<p>1. Trained engineers continue to work. 2. Budget for capacity development training by MPWT is secured.</p>	
<p><Activities></p> <p>1-1. To conduct the baseline survey on the current duties and capacity of each Department in MPWT related quality control of construction.</p> <p>1-2. To set up Task Force for the formulating draft standard guideline and regulation.</p> <p>1-3. To study and analyze the currently applied specifications and standards.</p> <p>1-4. To formulate the draft regulations determining each Department duties for assuring construction quality.</p> <p>1-5. To formulate the guidelines for actual application of standards.</p> <p>1-6. To be authorized the draft standard guideline and regulation by the JCC.</p> <p>1-7. To formulate the procurement plan of Laboratory equipment to meet the standards.</p> <p>1-8. To select the pilot construction project and to apply the standard guideline and regulation.</p> <p>1-9. To be officially authorized the standard guideline and regulation by the Minister of MPWT, and evaluate the application of the standard guideline and regulation.</p> <p>1-10. To monitor and evaluate the application of the standard guideline and regulation.</p> <p>2-1. To list the past implemented construction projects of roads and bridges including development partners funded projects.</p> <p>2-2. To collect the completion documents of construction at the MPWT library.</p> <p>2-3. To categorize all completion documents by road route wise, structure wise and documental type wise.</p> <p>2-4. To formulate the database with index for reference.</p> <p>2-5. To support the making the library management and maintenance plan.</p> <p>2-6. To arrange of books in the MPWT library and formulate the library management system.</p> <p>2-7. To implement the technical guidance about library operation and management to the Cambodian counterparts.</p> <p>3-1. To study and analyze existing training courses.</p> <p>3-2. To re-design training program with additional technical contents.</p> <p>3-3. To implement training of trainers (PWRC lecturers).</p> <p>3-4. To establish Task Force (TF-3) for the "Road Structure Standard Drawings Collections".</p> <p>3-5. To categorize the road structures and collect ideal road structure drawings from past projects.</p> <p>3-6. To confirm the worthiness of those road structures in terms of design load, material used, structure, and the actual types of road foundation</p> <p>3-7. To compile road structure drawings into the "Road and Bridge Structure Standard Drawing Collections" and to be authorized by JCC.</p> <p>3-8. To prepare the curriculum and materials for pilot training.</p> <p>3-9. To project and implement pilot training courses for the staff of RID, HEC, DPWT, General Inspectorate and other personnel concerned.</p> <p>3-10. To be authorized the contents of the pilot training courses by JCC and to officially incorporate into the training course of MPWT.</p> <p>3-11. To implement follow-up survey for participants in order to confirm the degree of understanding and application to actual construction, and to improve the contents of training if necessary.</p>	<p>(Inputs from Japanese side)</p> <p>1. Dispatching Japanese experts</p> <p>(1) Long-term experts</p> <ul style="list-style-type: none"> * Chief Advisor/ Road construction and maintenance * Project Coordinator/ Library management <p>(2) Short-term experts</p> <ul style="list-style-type: none"> * Leader/ Contract management * Quality management * Training/ Human Resource Development * Pavement engineering * Geotechnical engineering * Bridge/ Road structure engineering * System management * Material Testing * Construction management <p>2. Provision of machinery and equipment</p> <p>(1) Laboratory equipment</p> <p>(2) Equipment for Library and Database system</p> <p>3. Counterpart training in Japan</p> <ul style="list-style-type: none"> * JFY2010: 3 trainees *JFY2011: 4 trainees (plan) * JFY2009: US\$ 59,621.08 * JFY2010: US\$ 101,940.65 * JFY2011: US\$ 29,782.68 (as of September) <p>(Inputs from Cambodian side)</p> <p>1. Assignment of personnel</p> <ul style="list-style-type: none"> * Project director (Director General of Public Works) * Project manager (Director of PWRC) * Coordinator: 2 persons (Deputy Director of PWRC) * Technical counterparts: 11 persons (PWRC, HEC, RID, AIC, Laboratory) <p>2. Provision of budgeting and facilities</p> <p>3. Budget for the pilot project</p>			
			<p>Pre-condition</p> <p>1. The Rec allocates budget for the project without any major delay.</p> <p>2. Budget for pilot project is allocated without any delay, and sites for the pilot projects are secured, and implement in cooperation with DPWT.</p> <p>3. Counterparts are allocated properly and in cooperation with them.</p>	

6

Mid-Term Review: Evaluation Grid: Achievement of the Project

(Achievement)		Questions	Necessary Data	Information Sources	Means
Topics					
Input	Was the input from the Cambodia side provided as planned? (Counterparts, offices, project cost, etc.)	Input Record (C/P Allocation, office, cost)	Input Record, Progress Report, PDM/PO	Document Review Questionnaire Interview	
	Was the input from the Japanese side provided as planned? (Experts, counterpart training, equipment, project cost, etc.)	Input Record (Expert M/M, Field, timing, period, equipment, cost.)	Input Record, Progress Report	Document Review Questionnaire Interview	
Achievement of "Output"	(Output 1) "Standards, regulations, Guidelines for quality control of road and bridge construction and maintenance are established."	(PDM indicator) QC/QA system will be applied to 100% of projects of road and bridge construction/maintenance by force account which will be implemented from the beginning of the 4th year except emergency work	- Current situation of application of QC/QA system (standard guideline (SG) and regulations (RG)) - Issues for application of SG and RG - Opinion from CP and experts	CP, Experts	Interview
		1.2 Have SG and RG been formulated? If so, when? (English and Khmer)	Developed RG and SG (English and Khmer)	CP, Experts	Document Review Interview
		1.3 Have the pilot projects been implemented?	Current situation of pilot project	CP, Experts	Interview
		1.4 Has the equipment for laboratory been provided?	Situation of procurement of equipment Situation of training for laboratory staff (No. of training, No. of participants, opinion from the participants)	CP (laboratory), Experts	Interview
		1.5 Have JCC and EC been held on schedule?	Record of JCC and EC	Progress Report, Minutes of JCC/EC, CP, Experts	Document Review Interview
(Output 2) "Centralized and integrated management system of completion documents such as drawing and reports of construction is established" has been achieved?	(PDM Indicator) Database system will be completed, information of Database system will be utilized by MPWT staff and data will be updated.	List of database contents The number of users The number of record of updating	CP, Experts,	Questionnaire Interview Observation	
	2.2 The operational manual for database been formulated	Operational Manual (English/Khmer) Training situation for Operator and Administrator Maintenance situation Any issues on database	CP, Experts,	Questionnaire Interview	

Topics	Questions	Necessary Data	Information Sources	Means
(Output 3) Technical training lectured by PWRC lecturers is consolidated by "Road Structure Standard Drawing Collections" has been achieved?	(PDM Indicator) Technical training to be formulated in the project will be incorporated into the training program by Dept. Personnel & Human Resources (DPHR)	Annual training plan of DPHR Policy and direction of MPWT on training (DPHR)	CP, Experts	Questionnaire Interview
	3.2 How many Trainers have been produced by the project?	Target of no. of trainers? Record of TOT (times, participants, period) Views and comments from participants Training manuals	Training reports, CP (PWRC), Experts	Questionnaire Interview
	3.3 How many trainings were conducted by the PWRC trainers?	Training records (times, participants, period) Views and comments from participants	Training Report, CP, Experts	Document Review Interview
	3.4 Collection situation of Drawings	How these collected drawing are utilized for actual training and pilot projects?	CP, Expert	Questionnaire Interview
Achievement of "Project Purpose"	(PDM Indicator) Full implementation of QC/QA system for 50% of projects of road and bridge construction/maintenance by force account which will be implemented from the beginnings of the 4th year	Construction management record Supervision record Inspection record	CP, Experts	Questionnaire Interview
	By the end of project period, "Capacity of MPWT engineers in the quality control for road and bridge construction and maintenance undertaken by force account is improved through application of the Quality Control and Quality Assurance (QC/QA) system (Standards, Regulations, Guidelines, Training)" has prospect to achieved?	To what extent the relevant MPWT engineers has been upgrade their Capacity to conduct QC/QA system?	Degree of attainment of CP on implementation of QC/QA system Capacity gap Views and comments from CP	CP, Experts

5
8/2/03

(Implementation Process)

Topics	Questions	Necessary Data	Information Sources	Means
Activities	Have the "Activities" of the Project been implemented as planned throughout the project period?	Progress of the "Activities"	Progress Report, Experts, CP	Document Review Questionnaire Interview
Transfer of Technology	Was there any problem in the process of transfer of technology from the Japanese experts?	How the transfer of technology has been carried out by each expert and its effect	Progress Report, Experts, CP	Document Review Questionnaire Interview
Project Management	What kind of monitoring system does the project has (Who is in charge and how often?)	Monitoring methods, Feedback system, How the results of monitoring is used?	Progress Report, Experts, CP	Document Review Questionnaire Interview
	How the monitoring results have been feedbacked to the project. What was the decision-making process in revision of activities and direction, selection of staff, etc?	Decision-making process and its challenges	Progress Report, Minutes of JCCs/ECs, Experts, CP	Document Review Questionnaire Interview
Ownership	How the communication among Japanese experts (including with short-term experts) were made?	Method of communication (frequency, timing, style)	Experts	Interview
	How did the experts and Cambodian CP make the coordination, consultation, guidance each other?	Frequency, style and contents of communication	Experts, CP	Interview
	Did the Japanese partner organization (JICA Cambodia office and Headquarters) support the project well? Was the communication good?	Frequency, style and contents of communication, How they reacted to the change of the plan	Experts, JICA Office	Interview
	Do the Cambodia project counterparts (MPWT technical staff) actively participate in the project management?	Ownership and participation of the MPWT staff (number of CP, level of participation and style and contents of participation)	Progress Report, Experts, JICA Office	Document Review Questionnaire Interview
Counterparts	Has the Cambodia side input (budget, personnel, facilities and equipment) to the project been appropriate?	Implementation, responsiveness on changes of the Plan of Operation, approaches for joint problem solution, method of developing working relationship	Progress Report, Experts, CP	Document Review Interview
	Do the Cambodia project members take active participation in the project activities?	mode and methodologies of project implementation, responsiveness on changes of the Plan of Operation, approaches for joint problem solution, method of developing working relationship	Progress Report, Experts, CP	Document Review Interview
Counterparts	Were the Counterparts appropriate for the project activities in terms of their expertise and position?	Allocation of CP, Expertise Positions	CP Allocation, Progress Report, Experts, CP	Document Review Questionnaire Interview
	How many times did the counterparts change? What were the reasons for transfer/resignation? Was there any problem due to the transfer? How did the project deals with these problems?	Periodical allocation of CP	CP Allocation, Progress Report, Experts, CP	Document Review Questionnaire Interview

Mid-Term Review: Evaluation Grid "The Strengthening of Construction Quality Control Project"

5 Criteria	Topics	Questions	Information/Data to be collected	Information Sources	Means
1. Relevance	1.1 Needs	Is the Project Purpose relevant to the needs of Cambodia's social needs?	Issues and needs of Cambodia on quality of road/bridge construction and maintenance	CP, Expert, Other donors (WB, ADB)	Document Review Interview Questionnaire
		Is the Project Purpose relevant to the needs of the target group (MPWT technical staff) ?	Issues and problems of target groups on quality of road/bridge construction and maintenance	Target Group (MPWT technical staff)	Questionnaire Interview
	1.2 Priority	Is the Project Purpose aligned with the development plans and strategies of Cambodia? Is the Project Purpose aligned with Japan's country assistance policy and strategy for Cambodia?	National development policy (NSPD, RSI), Infrastructure Sector development plan Japan's development assistance policy, JICA's assistance policy for Cambodia and priority areas	National development policy (NSPD, RSI), Infrastructure Sector development plan, CP ODA Charter, Country Assistance Policy to Cambodia, JICA's assistance policy for Cambodia	Document Review Document Review
2. Effectiveness	1.3 Strategy	Has the project taken an appropriate approach to achieve the Project Purpose? (Project purpose, selection of target group and CP institution, donor coordination, coordination with other Japan's assistance)	Process of the selection of CP, target group and CP institution, coordination mechanism with other relevant donors (ADB, WB)	CP, DPWT, Experts	Interview
		Did Japan have comparative advantage in this technical area? (Has Japan accumulated technical know-how in this area? Has Japanese experienced been utilized?)	Experience and achievement of JICA's assistance in similar areas	Project document, JICA report in the similar areas, Expert, CP	Interview
	2.1 Achievement of the Project Purpose	Will the Project Purpose be achieved by the end of the Project based on the inputs, outputs and the progress of the activities?	Project performance, Degree of achievement of the Project Purpose		
	2.2 Causality	Were three Outputs only prerequisites for the achievement of the Project Purpose? Are there any other Outputs that would have been necessary for achievement of the Project Purpose? Have the changes in outputs influenced achievement of the Project Purpose?	Consequences between the Output and the Project Purpose	PDM, Progress report, Experts, CP	Document Review Interview
		To what extent "important Assumptions" from Outputs to Project Purpose were relevant to achievement of the Project Purpose? Was any influence caused by important Assumption?	- policy status of forth account system in MPWT - Situation of Budget allocation for training and pilot project - Turn over Situation of staff who have received training	Progress Report, Experts, CP (Financial department, HRD)	Questionnaire Interview
		Are there any factors contributed to achievement of the Project Purpose?	Contributing factors	Progress Report, Experts, CP	Document Review Interview Questionnaire

5 Criteria	Topics	Questions	Information/Data to be collected	Information Sources	Means
		Are there any factors impeding achievement of the Project Purpose?	Impeding factors	Progress Report, Experts, CP	Document Review Interview Questionnaire

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5 Criteria	Topics	Questions	Information/Data to be collected	Information Sources	Means
3. Efficiency	3.1 Achievement of Outputs	Will Output 1~3 be most likely to be achieved by the end of project? To what extent achievement has been produced by each output?	Achievement of Output 1~3 Record of Activities and achievement of Output 1~3		
	3.2 Causality	To what extent "important Assumptions" from the Activities to the Outputs were relevant to achievement of the Outputs? Was any influence caused by important Assumption?	- Turn over situation of CP and the reasons - Assignment of supplementary staff after resignation/transfer of CP	Progress Report, Experts, CP	Document Review Interview Questionnaire
	3.3 Input	Were the inputs from the Cambodian side appropriate in terms of contents (CP personnel, facilities, etc) and timing? Were the inputs from the Japanese side appropriate in terms of contents (experts, equipment, project cost) and timing?	Record of inputs (CP personnel: areas of fields, number, position), equipment, facility, training) Record of inputs (Experts: areas, number, equipment, project cost), Timing and cost, Difference from the Plan	Progress Report, Experts, CP Progress Report, PO, Experts, CP	Document Review Interview Questionnaire Document Review Interview Questionnaire
	3.4 Others	Were the Activities carried out timely? When there was a delay in Input which need to carry out the activity, how the Project deal with these situation? Do you think that the current project management system has worked well for the project in terms effectiveness and efficiency? Has the Project produce any synergistic effect in cooperation with other initiatives done by Japan, other development agencies, or Cambodia? Are there any other factors particularly contributing/impeding to the Project efficiency?	Record of Activities (Difference from the Plan) Response when the problem happened Project management system (number of CP, experts, areas, positions) Synergistic effect, if any Cooperation effect with Japan's other initiative (Grant Aid, Other TC project, Volunteer Programme) Synergistic effect with RAMP Contributing/impeding Factors	Progress Report, PO, Experts, CP Progress Report, Experts, CP Progress Report, Experts, CP, MPWT staff who is in charge of RAMP Progress Report, Experts, CP	Document Review Interview Questionnaire Document Review Interview Questionnaire Document Review Interview Questionnaire

5 Criteria	Topics	Questions	Information/Data to be collected	Information Sources	Means
4. Impact	4.1 Achievement of Overall Goal	Will the Overall Goal be achieved within 3-4 years after the end of the Project based on the result of inputs, outputs and activities, and achievement of the project Purpose?	- Prospect to achieve Overall Goal (Quality and Cycle of road and bridge construction and maintenance are improved.)	Experts, CP	Interview Questionnaire
	4.2 Contributing/O bstrutive factors	Are there any factors that would contribute to achievement of the Overall Goal?	- Examples of Contributing/Impeding Factors	Experts, CP	Interview Questionnaire
		Are there any factors that would impeding achievement of the Overall Goal?	Achievement, Effect of Important Assumptions, Contributing factors	Experts, CP	Interview Questionnaire
	4.3 Causality	Is the consequence from the project purpose to the Overall Goal logically designed?	Structure of the Project (PDM), Effect of Important Assumptions, Contributing/Impeding factors	PDM3, Progress Report	Interview Questionnaire
	4.4 Positive Impact	Has the Project produced any positive and negative impact on resettlement policy, regulations and strategies?	Examples	Experts, CP, JICA	Interview Questionnaire
		Has the Project produced any positive and negative impact on other donors' projects?	Examples	Experts, CP, JICA	Interview Questionnaire
		Was there any influences to other than the target group?	Examples	Experts, CP, JICA	Interview Questionnaire
		Was there any positive impacts other than above?	Examples	Experts, CP, JICA	Interview Questionnaire
	4.5 Negative Impact	Has the Project produced any unexpected negative impacts? If so, what are the reasons? Has the project taken any measures for those negative impacts?	Examples Countermeasures from the Project again negative impacts	Experts, CP, JICA	Interview Questionnaire

5 Criteria	Topics	Questions	Information/Data to be collected	Information Sources	Means
5. Sustainability	5.1 Political and institutional aspects	Will the political support on infrastructure development from the Cambodian government be maintained even after the end of the Project?	- Policy and strategies of the Cambodian government on infrastructure development	Current Policy papers (RS II), Experts, CP, JICA	Document Review
		How is the direction of forth account system in infrastructure development?	- Direction of forth account system	Experts, CP, JICA	Interview
	5.2 Organizational and financial aspects	Is there a clear mechanism in MPWT to renew regulations and standard guidelines? (office in charge and Budget)	Direction and policy of MPWT	CP, Experts, JICA	Interview
		Is there a clear mechanism in MPWT(PWRC) to continue the training to DPWT?	Direction and policy of MPWT (PWRC)	CP, Experts, JICA	Interview
		Is there a mechanism to maintain and update database of documents even after the end of the Project? (Budget, Staffing, Decision making process)	Direction and Policy of MPWT Maintenance mechanism of information management	CP Experts, JICA	Interview
	5.3 Technical aspects	Has the MPWT embraced sufficient level of ownership of the Project?	policy decision, staffing, budget	CP, Experts, JICA	Interview
		Is there enough technical skills and knowledge in MPWT to revise and update the regulations and standard guidelines? (appropriateness of technical level, social & cultural consideration, etc.)	How the regulations and standard guideline are utilized by the MPWT staff Which office of MPWT is in charge?	Progress Report Experts, CP	Interview
		Is there enough technical skills and knowledge in MPWT to update and maintain the document database alone? (appropriateness of technical level, social & cultural consideration, etc.)	How the update of database is conducted Which office of MPWT is in charge?	CP, Experts	Interview
		Is there enough technical skills and knowledge in MPWT to collect and maintain the "road structure standard drawing collections" alone? (appropriateness of technical level, social & cultural consideration, etc.)	How the collect of drawing is conducted Which office of MPWT is in charge?	Progress Report Experts, CP	Interview
		Are the trained trainers by ToT able to perform as lecturers to DPWT without assistance by Japanese experts?	How the trained skills are utilized	CP, Experts	Interview
5.4 Social, Cultural and Environmental	Is equipment provided by the Project maintained by MPWT without any technical difficulties?	How the equipment is utilized and maintained	Progress Report Experts, CP	Interview	
	Should the Project have been more concerned with the socially vulnerable groups (the poor, women, etc)? Has there been any instances that such lack of concerns hinder the achievements of impacts?	Examples of impeding factors	CP, Experts, JICA	Interview	
5.5 Other aspects	Are there any factors hindering ensuring sustainability?	Examples of impeding factors	CP, Experts, JICA	Interview	

No.	Name	Field	Term	2009				2010				2011				2012			
				JFY2009				JFY2010				JFY2011				JFY2012			
				II	III	IV		I	II	III	IV	I	II	III	IV	I	II	III	
5	Mr. Yoshitaka NODA	Pavement Engineering	2010/1/4 ~ 2010/3/4 2010/5/23 ~ 2010/6/14 2010/9/5 ~ 2010/10/7 2011/1/5 ~ 2011/2/17 2011/11/1 ~ 2011/11/26																
6	Mr. Tomohiko NAKAMURA	Geotechnical Engineering	2009/12/1 ~ 2010/1/7 2010/6/1 ~ 2010/7/7 2010/12/10 ~ 2011/1/8 2011/5/17 ~ 2011/6/15 2011/10/3 ~ 2011/11/1																
7	Mr. Mamoru IZAWA	Bridge/ Road Structure Engineering	2010/2/4 ~ 2010/3/20 2010/7/1 ~ 2010/8/14 2010/10/24 ~ 2010/12/7 2011/5/3 ~ 2011/6/16 2011/7/20 ~ 2011/8/31 2011/10/2 ~ 2011/10/9 2011/12/8 ~ 2011/1/3																
8	Mr. Tatsuhiro MAEDA	Construction Management / Material Testing	2010/1/5 ~ 2010/3/5 2010/5/16 ~ 2010/7/14 2010/12/1 ~ 2011/1/19 2011/2/8 ~ 2011/2/28 2011/8/1 ~ 2011/8/15 2010/1/20 ~ 2010/3/5 2010/6/20 ~ 2010/7/7 2011/2/7 ~ 2011/2/27																
9	Mr. Shuichi YASHIRO	System Management																	

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LIST OF THE PROVISION EQUIPMENT

(as of December 6, 2011)

NO	ITEM	QTY.	MODEL	MANUFACTURER	Amount (US\$)	Installation Place	Purchased Date
<JFY 2010>							
1	Distillation Apparatus	1	TA-378	Feesia macross	2,260.97	Laboratory	2011/6/10
2	High Pressure Triaxial Machine						
2-1	100kN Motorized Compression Machine for both CBR and Unconfined Compression Test	1	TS-461	Feesia macross	27,158.78	Laboratory	2011/6/10
2-2	20kN Proving Ring	1	PRC-20KN	Feesia macross	1,921.48	Laboratory	2011/6/10
2-3	Dial Gauge 20mm~0.01mm	2	DG-17	Feesia macross	244.42	Laboratory	2011/6/10
2-4	Dial Gauge Support	1	S-62	Feesia macross	142.58	Laboratory	2011/6/10
2-5	Surcharge Weight	4	S-54	Feesia macross	119.48	Laboratory	2011/6/10
2-6	Penetration Piston	1	S-52	Feesia macross	114.07	Laboratory	2011/6/10
2-7	Adaptor Ring	1	S-49	Feesia macross	69.25	Laboratory	2011/6/10
3	Multispeed Motorized Compression Device						
3-1	100kN Motorized Compression Machine for Marshall Test	1	TS-461	Feesia macross	27,158.78	Laboratory	2011/6/10
3-2	35kN Proving Ring	1	A-12	Feesia macross	1,921.48	Laboratory	2011/6/10
3-3	Flow Meter	1	A-13	Feesia macross	287.88	Laboratory	2011/6/10
3-4	Test Head	1	A-15	Feesia macross	750.94	Laboratory	2011/6/10
4	Laboratory Motorized Unconfirmed Apparatus						
4-1	Dial Gauge 20mm~0.01mm	2	DG-17	Feesia macross	244.42	Laboratory	2011/6/10
4-2	20kN Proving Ring with Spherical Seat	1	PRC-20KN	Feesia macross	3,530.64	Laboratory	2011/6/10
4-3	φ10 x 20 cm Mold	5	TC-207c	Feesia macross	346.25	Laboratory	2011/6/10
5	Accessories for Mortar Compression						
5-1	50kN Proving Ring	1	PRC-50KN	Feesia macross	2,091.23	Laboratory	2011/6/10
5-2	Loading Attachment	1	.		2,091.23	Laboratory	2011/6/10
5-3	Three-gang Mortar Mold	1	C-48	Feesia macross	507.87	Laboratory	2011/6/10
5-4	Tamping Rod	1	C-49	Feesia macross	114.07	Laboratory	2011/6/10
6	Blain Air permeability Apparatus						
6-1	Blain Air permeability Apparatus	1	TC-521	Feesia macross	1,466.57	Laboratory	2011/6/10
6-2	Thermometer (-20~50°C)	1	G-23a	Feesia macross	17.65	Laboratory	2011/6/10

NO	ITEM	QTY.	MODEL	MANUFACTURER	Amount (US\$)	Installation Place	Purchased Date
6-3	Standard Cement	1 set	-		149.37	Laboratory	2011/6/10
7	Soil Analysis Sieve Set						
7-1	Stainless Sieve, 200mm dia. 75mm	2 pcs	TG-101	Feesia macross	146.66	Laboratory	2011/6/10
7-2	Stainless Sieve, 200mm dia. 53mm	4 pcs	TG-101	Feesia macross	293.32	Laboratory	2011/6/10
7-3	Stainless Sieve, 200mm dia. 37.5mm	3 pcs	TG-101	Feesia macross	219.99	Laboratory	2011/6/10
7-4	Stainless Sieve, 200mm dia. 26.5mm	4 pcs	TG-101	Feesia macross	293.32	Laboratory	2011/6/10
7-5	Stainless Sieve, 200mm dia. 19mm	3 pcs	TG-101	Feesia macross	219.99	Laboratory	2011/6/10
7-6	Stainless Sieve, 200mm dia. 13.2mm	5 pcs	TG-101	Feesia macross	219.99	Laboratory	2011/6/10
7-7	Stainless Sieve, 200mm dia. 9.5mm	3 pcs	TG-101	Feesia macross	366.65	Laboratory	2011/6/10
7-8	Stainless Sieve, 200mm dia. 4.75mm	5 pcs	TG-101	Feesia macross	366.65	Laboratory	2011/6/10
7-9	Stainless Sieve, 200mm dia. 2.36mm	3 pcs	TG-101	Feesia macross	219.99	Laboratory	2011/6/10
7-10	Stainless Sieve, 200mm dia. 2mm	3 pcs	TG-101	Feesia macross	219.99	Laboratory	2011/6/10
7-11	Stainless Sieve, 200mm dia. 1.18mm	3 pcs	TG-101	Feesia macross	215.91	Laboratory	2011/6/10
7-12	Stainless Sieve, 200mm dia. 0.6mm	3 pcs	TG-101	Feesia macross	219.99	Laboratory	2011/6/10
7-13	Stainless Sieve, 200mm dia. 0.425mm	3 pcs	TG-101	Feesia macross	215.91	Laboratory	2011/6/10
7-14	Stainless Sieve, 200mm dia. 0.3mm	3 pcs	TG-101	Feesia macross	215.91	Laboratory	2011/6/10
7-15	Stainless Sieve, 200mm dia. 0.15mm	3 pcs	TG-101	Feesia macross	215.91	Laboratory	2011/6/10
7-16	Stainless Sieve, 200mm dia. 0.075mm	8 pcs	TG-101	Feesia macross	586.64	Laboratory	2011/6/10
7-17	Pan	4 pcs	TG-102	Feesia macross	233.56	Laboratory	2011/6/10
7-18	Cover	5 pcs	TG-103	Feesia macross	190.10	Laboratory	2011/6/10
8	Analytical Balance						
8-1	Electronic Analytical Balance (capacity: 210g, readability: 1mg)	1 unit	GX-200	A&D	1,173.26	Laboratory	2011/6/10
8-2	Electronic Analytical Balance with Battery (capacity: 12kg, readability: 1g)	3 unit	EK-12Ki	A&D	2,566.50	Laboratory	2011/6/10
8-3	Electronic Analytical Balance (capacity: 31kg, readability: 1g)	1 unit	GP-32K	A&D	1,969.01	Laboratory	2011/6/10
9	Saybolt Viscosity						
9-1	Automatic Saybolt Viscosimeter	1 unit	TA-376	Feesia macross	5,230.78	Laboratory	2011/6/10
9-2	Saybolt Thermometer (ASTM 17C, 19~27°C)	1 pc	G-288a	Feesia macross	149.37	Laboratory	2011/6/10
9-3	Saybolt Thermometer (ASTM 18C, 34~42°C)	1 pc	G-288b	Feesia macross	131.72	Laboratory	2011/6/10
9-4	Saybolt Thermometer (ASTM 19C, 49~57°C)	1 pc	G-288c	Feesia macross	179.25	Laboratory	2011/6/10

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NO	ITEM	QTY.	MODEL	MANUFACTURER	Amount (US\$)	Installation Place	Purchased Date
9-5	Saybolt Thermometer (ASTM 20C, 57~65°C)	1 pc	G-288d	Feesia macross	179.25	Laboratory	2011/6/10
9-6	Saybolt Thermometer (ASTM 21C, 79~87°C)	1 pc	G-288e	Feesia macross	179.25	Laboratory	2011/6/10
9-7	Saybolt Thermometer (ASTM 22C, 95~103°C)	1 pc	G-288f	Feesia macross	156.16	Laboratory	2011/6/10
10	Marshall Compaction						
10-1	Asphalt Compaction Machine	1 unit	TA-352	Feesia macross	5,703.34	Laboratory	2011/6/10
10-2	Filter Paper (φ100mm)	10 set	S-66	Feesia macross	88.30	Laboratory	2011/6/10
10-3	Sample Extruder for Marshall Mold	1 pc	TS-225	Feesia macross	1,982.59	Laboratory	2011/6/10
10-4	Marshall Mold	20 pcs	A-15	Feesia macross	3,422.00	Laboratory	2011/6/10
11	Density/ Moisture Gauge						
11-1	Nuclear Moisture Density Gauge	1 unit	Model 3440	Troxler	15,616.30	Laboratory	2011/7/27
11-2	Sand Density Apparatus	3 unit	TS-120	Feesia macross	1,833.21	Laboratory	2011/6/10
12	Compaction Mold (φ100mm)	2 pcs	S-41	Feesia macross	672.18	Laboratory	2011/6/10
13	Desktop Computer	1 unit	D9 C2D E7500	DELL	542.00	Library	2010/11/30
	Dell OptiPlex F77D9 C2D E7500						
14	Server	2 unit	T310 QC E3440	DELL	4,380.00	Library	2010/11/30
	Dell Power Edge T310 QC E3440						
15	UPS			ProLink			
3-1	(capacity) 2200VA	1 unit	-		770.00	Library	2010/11/30
3-2	(capacity) 500VA	1 unit	-		31.00	Library	2010/11/30
16	Software						
4-1	Windows 7 Professional	1 set	-	Microsoft	155.00	Library	2010/11/30
	(Licensed) Win Pro 7 32-bit English 3pk DSP 3 OEI DVD						
4-2	Windows Office 2007	1 set	-	Microsoft	183.00	Library	2010/11/30
	(Licensed) Office Home and Business 2010 32-bit/x64 English						
4-3	Acrobat 9.0 Standard	1 set	-	Adobe	500.00	Library	2010/11/30
	(Licensed) Professional 9 Win IE AOO						
4-4	Anti Virus Software	1 set	-	Symantec	25.00	Library	2010/11/30
	(Licensed) Norton 360™ Version 4.0 Premier Edition						
17	Color Digital Copier	1 unit	iRC-2550i	Canon	7,185.00	Library	2010/5/10

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Overseas Activities Cost


	JFY 2009				TOTAL
	1 st Quarter	2 nd Quarter	3 rd Quarter	4 th Quarter	
Miscellaneous	0.00	11,271.51	10,778.08	13,589.01	33,981.02
Air Fare	0.00	0.00	379.00	3,060.00	3,439.00
Travel Allowance	0.00	50.00	1,335.00	315.00	1,700.00
Fees and Honorarium (non-staff)	0.00	1,157.00	1,675.00	9,011.48	11,843.48
Refreshments	0.00	0.00	0.00	0.00	0.00
Contract with Local Based Consultant	0.00	0.00	0.00	0.00	0.00
TOTAL	0.00	12,478.51	14,167.08	25,975.49	52,621.08

	JFY 2010				TOTAL
	1 st Quarter	2 nd Quarter	3 rd Quarter	4 th Quarter	
Miscellaneous	8,550.76	7,824.26	13,451.29	13,487.71	43,314.02
Air Fare	0.00	0.00	0.00	0.00	0.00
Travel Allowance	485.00	190.00	50.00	114.00	839.00
Fees and Honorarium (non-staff)	2,075.00	3,385.00	4,975.92	5,623.50	16,059.42
Refreshments	0.00	0.00	159.50	4,070.00	4,229.50
Contract with Local Based Consultant	2,250.00	0.00	0.00	0.00	2,250.00
TOTAL	13,360.76	11,399.26	18,636.71	23,295.21	66,691.94

	JFY 2011				TOTAL
	1 st Quarter	2 nd Quarter	3 rd Quarter	4 th Quarter	
Miscellaneous	7,963.13	11,335.05			19,298.18
Air Fare	0.00	0.00			0.00
Travel Allowance	162.00	110.00			272.00
Fees and Honorarium (non-staff)	5,205.00	5,007.50			10,212.50
Refreshments	0.00	0.00			0.00
Contract with Local Based Consultant	0.00	0.00			0.00
TOTAL	13,330.13	16,452.55	0.00	0.00	29,782.68

List of Contract with Outsourcing

No.	Content	Contractor	Contract Amount (US\$)	Contract Term
1	Implementation of the electric data interchange from completion documents (A1 size)	JNS Co., Ltd.	9,720.00	03/02/2010 ~ 03/26/2010
2	Implementation of a need survey in MPWT about Database management system	Cam Info Services	2,250.00	03/11/2010 ~ /30/2010
3	Implementation of the electric data interchange from completion documents (A3 size)	JNS Co., Ltd.	20,800.00	05/12/2010 ~ 08/19/2010
4	Build the Database management system	Cam Info Services	6,240.00	06/18/2010 ~ 01/31/2011

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List of Counterpart Personnel at QCQCP

(as of December 1, 2011)

No.	Name	Position	Term	2009				2010				2011				2012		
				JFY2009		JFY2010		JFY2010		JFY2011		JFY2011		JFY2012		JFY2012		
				II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	
<Management>																		
1	H.E. Kem Borey	Director General, PW	2009/8/1 ~ 2012/10/31															
2	Mr. Koun Bunthoeun	Director, PWRC	2009/8/1 ~ 2012/10/31															
3	Dr. Khun Sokha	Deputy Director, PWRC	2010/1/1 ~ 2012/10/31															
4	Mr. Samrangdy Nam	Deputy Director, PWRC	2010/1/1 ~ 2012/10/31															
<Part-time Counterpart>																		
1	Mr. Sang Sinaveth	PWRC	2009/10/1 ~ 2011/10/31															
2	Mr. Nin Menakak	PWRC	2009/10/1 ~ 2012/10/31															
(Output 1-1)																		
1	Mr. Chao Sopheak Phibal	RID	2010/1/1 ~ 2012/10/31															
2	Mr. Phim Phirun	GI	2010/1/1 ~ 2010/6/30															
3	Mr. Sok Pounnaray	ACD	2010/1/1 ~ 2012/10/31															
(Output 1-2)																		
1	Mr. Meng Leang	Laboratory	2010/2/1 ~ 2012/10/31															
(Output 2)																		
1	Mr. Phy Ratha	PWRC	2010/7/1 ~ 2012/10/31															
2	Ms. Om Yoeum	PWRC	2010/7/1 ~ 2011/3/31															
3	Mr. Ky Sokly	PWRC	2011/6/1 ~ 2011/9/30															
4	Mr. Thann Vuthira	PWRC	2011/6/1 ~ 2011/9/30															
(Output 3-1)																		
1	Mr. You Dara	RID	2010/1/1 ~ 2011/7/31															
2	Mr. Sok Sambo	PWRC	2010/1/1 ~ 2010/6/30															
3	Mr. Mr. Laing Onit	RID	2010/12/1 ~ 2012/10/31															
(Output 3-2)																		
1	Mr. Hou Makara	ACD	2010/1/1 ~ 2010/6/30															
2	Mr. Kry Thong	HEC	2010/1/1 ~ 2012/10/31															
3	Mr. Uy Sophal	GI	2010/1/1 ~ 2012/10/31															
4	Mr. Kong Sophal	PWRC	2010/1/1 ~ 2010/6/30															
5	Mr. Hum Vuthy	RID	2010/7/1 ~ 2012/10/31															
6	Mr. Khun Soth	PWRC	2011/8/15 ~ 2012/10/31															
(Party C for Pilot Project)																		
6	Mr. Nou Rethy	for Kandal	2011/5/1 ~ 2012/4/30															
6	Mr. Bou Veasna	for Kandal	2011/5/1 ~ 2012/4/30															
6	Mr. Pou Manith	for Kampong Cham	2011/5/1 ~ 2012/2/28															
6	Mr. Ros Sreng	for Kampong Cham	2011/5/1 ~ 2012/2/28															

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List of Training Course in the Project

1. Project Counterpart Training in Japan

No.	Name	Department	Position
<JFY 2010>			
(Title) Enhancing the Construction Quality Control			
(Term) July 5 ~ 21,2010 (19 days)			
1	Mr. Chao Sopheak Phibal	Road Infrastructure Department (RID)	Bureau Chief
2	Mr. Uy Sophal	General Inspectorate (GI)	Inspector
3	Mr. Sang Sinaveth	Public Works Research Center (PWRC)	Government Officer
<JFY 2011>			
(Title) Enhancing the Construction Quality Control			
(Term) November 6 ~ 25,2011 (20 days)			
1	Mr. Kry Thong	Heavy Equipment Center (HEC)	Chief of Intervention Unit
2	Mr. Bou Veasna	Public Works Research Center (PWRC)	Deputy Chief
3	Mr. Laing Onit	Road Infrastructure Department (RID)	Government Officer
4	Mr. Min Menakak	Public Works Research Center (PWRC)	Government Officer

2. Training of Trainers (TOT)

No.	Date	Title	No. of Participants	Content
1	Nov 3, 2010	Training of trainers	8 C/P's	The expert gave a lecture about a telling presentation skill to the project counterparts, and each project counterparts practiced at how to lecture.

3. Trial Training Course at DPWT

No.	Date	DPWT	No. of Lecturers	No. of Participants	Content
1	Nov 24, 2010	Kandal	4 C/P's	16	To let the trainees of TOT program have experience of delivering lecture, and to disseminate the Standard Guideline and Regulation among the staff of Kandal and Kampong Cham, DPWT as a pilot case.
2	Feb 8, 2011	Kampong Cham	6 C/P's	21	

4. Implementation of Technical Seminar

No.	Date	Title	No. of Participants	Content
1	Mar 30, 2011	Cambodia-Japan Joint Seminar on Bridge Engineering	188	The purpose of the seminar is to exchange mutual technical experiences between Cambodian and Japanese researchers and to introduce Japanese bridge regulations to Asian countries. In order to exchange mutual information, 5 lecturers from JSEC, 3 lecturers from ITC and 1 lecturer from MPWT were invited and enthusiastic discussion was held.

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List of Each Meeting

1. Joint Coordinating Committee Meeting (JCC)

No.	Title	Date	Agenda
1	The 1 st JCC Meeting	Oct 13, 2010	<ul style="list-style-type: none"> ◇ Opening Remarks (Minister H.E. Tram Iv Tek) ◇ Project Brief (H.E. Tauch Chankosal) ◇ Explanation of the 1st edition of Standard Guideline & Regulation ◇ Discussion/ Comments ◇ Closing Remarks (Minister H.E. Tram Iv Tek)

2. Executive Committee Meeting (ECM)

No.	Title	Date	Agenda
1	The 1 st EC Meeting	Jan 6, 2010	<ul style="list-style-type: none"> ◇ The Project Structure / Concept of the Project Activities ◇ The Project Work Plan ◇ Report of the Outline of Basic Survey in MPWT ◇ Allocation of the Project Counterparts ◇ Discussion/ Comments
2	The 2 nd EC Meeting	Jun 4, 2010	<ul style="list-style-type: none"> ◇ Project Concept ◇ Progress Report & Activities Plan on Year 2010 ◇ Others ◇ Discussion/ Comments
3	The 3 rd EC Meeting	Sep 1, 2010	<ul style="list-style-type: none"> ◇ Progress Report (Jun ~ Aug) ◇ Explanation of the 1st edition of Standard Guideline & Regulation ◇ Others ◇ Discussion/ Comments
4	The 4 th EC Meeting	Dec 9, 2010	<ul style="list-style-type: none"> ◇ Opening Remarks ◇ Presentation <ul style="list-style-type: none"> - Progress of the Project - Plan of the Pilot Project - Training of Trainers (TOT) and the Pilot Training - Standard Drawing ◇ Others ◇ Discussion/ Comments
5	The 5 th EC Meeting	Aug 4, 2011	<ul style="list-style-type: none"> ◇ Opening Remarks ◇ Presentation <ul style="list-style-type: none"> Progress of the project <ul style="list-style-type: none"> - General - Output 1-1 - Output 3-1 - Output 3-2 ◇ Others ◇ Discussion/ Comments

3. Project Management Meeting (PMM)

No.	Title	Date	Agenda
1	The 1 st PM Meeting	Aug 10, 2009	<ul style="list-style-type: none"> ◇ Explanation of Concept of JICA Technical Cooperation Project ◇ Confirmation of the Project Concept ◇ Allocation of the Project Counterparts ◇ Others

2	The 2 nd PM Meeting	Dec 22, 2009	<ul style="list-style-type: none"> ◇ Outline of Project Activities ◇ The Project Work Plan ◇ Report of the Outline of Basic Survey in MPWT ◇ Allocation of the Project Counterparts ◇ Others
3	The 3 rd PM Meeting	Feb 12, 2010	<ul style="list-style-type: none"> ◇ Report of the Progress Activities <ul style="list-style-type: none"> - Output 1-1 - Output 1-2 - Output 2 - Output 3-1 ◇ Project Counterpart Training in Japan <ul style="list-style-type: none"> - Tentative Schedule - Procedures ◇ Others
4	The 4 th PM Meeting	Mar 1, 2010	<ul style="list-style-type: none"> ◇ Report of the Progress Activities <ul style="list-style-type: none"> - Output 1-1 - Output 1-2 - Output 2 - Output 3-1 ◇ Project Counterpart Training in Japan ◇ Schedule on the 2nd EC Meeting and the 1st JCC Meeting ◇ Others
5	The 5 th PM Meeting	May 21, 2010	<ul style="list-style-type: none"> ◇ Report of the Progress Activities <ul style="list-style-type: none"> - Output 1-1 - Output 1-2 - Output 2 - Output 3-1 ◇ Schedule on the 2nd EC Meeting ◇ Each Activities Plan on JFY 2010 ◇ Others <ul style="list-style-type: none"> - Proposal for the Annual Technical Seminar in MPWT - Plan for the Unit System for the Project Counterparts
6	The 6 th PM Meeting	Jun 28, 2010	<ul style="list-style-type: none"> ◇ Procedure for the Application of the 1st Draft of Standard Guideline & Regulation ◇ Observation the Pilot Project Site ◇ Allocation of the Additional Counterpart <ul style="list-style-type: none"> - One(1) for the Database Management System - One(1) for the Library Staff Related to the Project - Replacement of the Three(3) Counterparts ◇ Others
7	The 7 th PM Meeting	Aug 9, 2010	<ul style="list-style-type: none"> ◇ Comments on the 1st Draft of Standard Guideline & Regulation ◇ Schedule on the 3rd EC Meeting and the 1st JCC Meeting ◇ Others
8	The 8 th PM Meeting	Sep 30, 2010	<ul style="list-style-type: none"> ◇ Preparation of the 1st JCC Meeting ◇ Others <ul style="list-style-type: none"> - Selection of the Pilot Project Sites for Year 2011 - Provision of the Donated Equipment - Person in Charge for the Database Management System - Condition of the MPWT Library
9	The 9 th PM Meeting	Dec 3, 2010	<ul style="list-style-type: none"> ◇ Report of the Progress Activities

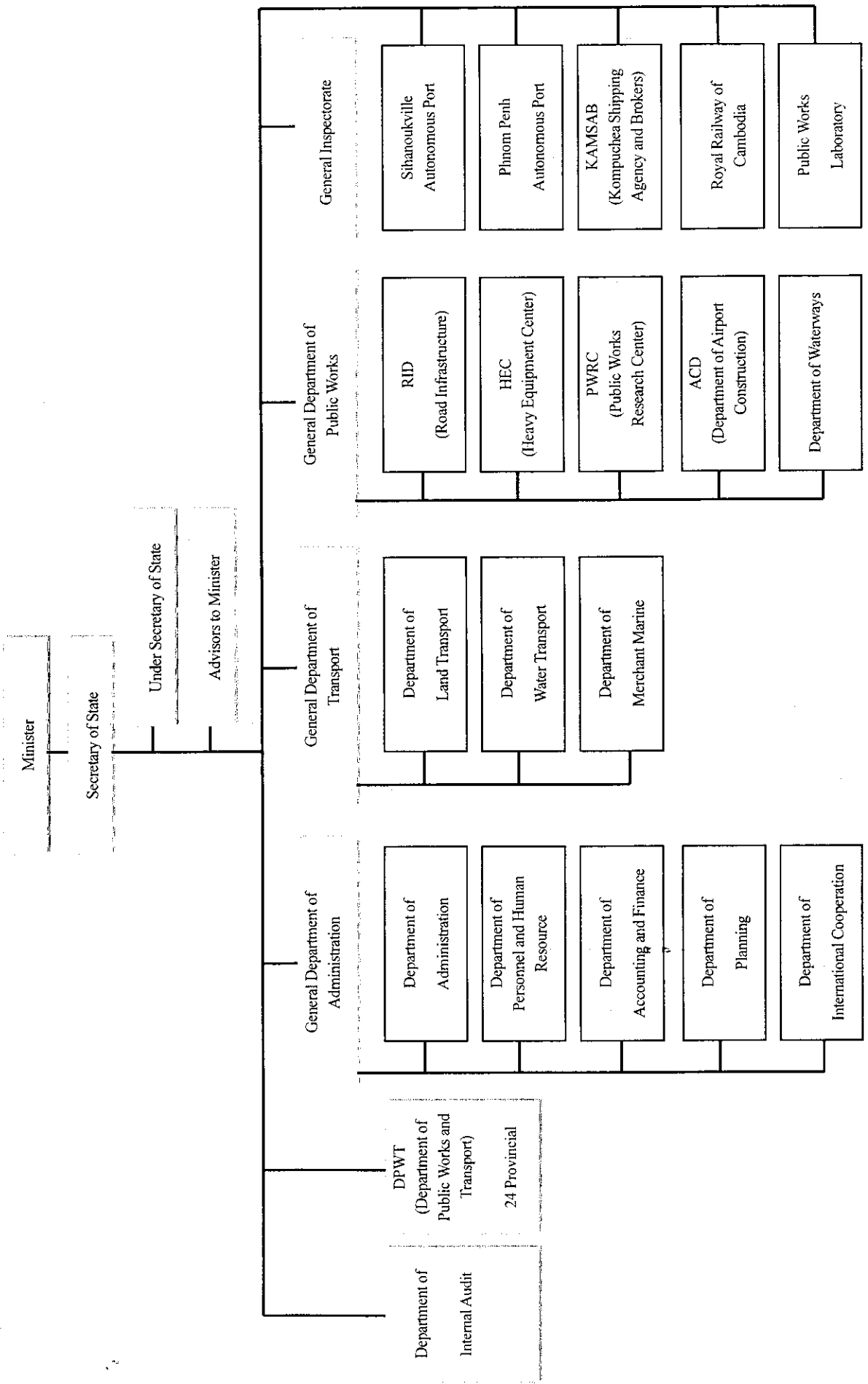
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			<ul style="list-style-type: none"> - Output 1-1 - Output 1-2 - Output 2 - Output 3-1 - Output 3-2 <ul style="list-style-type: none"> ◇ Schedule on the 4th EC Meeting ◇ Concerning the Pilot Project Year 2011
10	The 10 th PM Meeting	Feb 10, 2011	<ul style="list-style-type: none"> ◇ Progress Report (December ~ February) ◇ Contents of the 5th Executive Committee Meeting ◇ Concerning the Pilot Project in 2011 ◇ Seminar (Cambodia-Japan Joint Seminar on Bridge Engineering/ Annual Technical Report) ◇ Others
11	The 11 th PM Meeting	Jun 7, 2011	<ul style="list-style-type: none"> ◇ Progress Report (March ~ May, 2011) ◇ Schedule of the EC meeting and JCC meeting in Year 2011 ◇ Others

4. Project Counterpart Meeting

No.	Title	Date		Agenda
1	JFY 2009 <1 st ~ 9 th >	January	15, 22	<ul style="list-style-type: none"> ◇ Report of the Progress Activities <ul style="list-style-type: none"> - Output 1-1 - Output 1-2 - Output 2 - Output 3-1 - Output 3-2 ◇ The Required Agenda ◇ Others
		February	2, 12, 19, 26	
		March	5, 12, 26	
2	JFY 2010 <10 th ~ 44 th >	April	2, 9, 23	
		May	12, 21, 28	
		June	11, 17, 25	
		July	2, 16, 30	
		August	6, 13, 20, 27	
		September	10, 17,	
		October	1, 15, 25	
		November	2, 12, 19, 26	
		December	3, 20, 27	
3	JFY 2011 <45 th ~ 63 rd >	January	10, 18, 28	
		February	11, 21	
		March	3, 14	
		April	4, 28	
		May	10, 20, 30	
		June	10, 24	
		July	5, 15, 26	
		August	4, 16, 29	
		September	16, 22	
		October	7, 18, 25	
		November	4, 18	

Organization Chart on Ministry of Public Works and Transport(MPWWT)



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