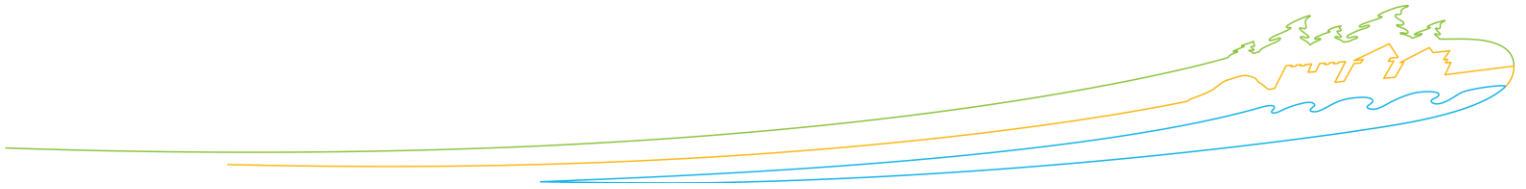




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Audit of Twinning the TransCanada Highway Project

Mountains Parks

Final Report

March 2012

Office of Internal Audit and Evaluation

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Her Majesty the Queen of Canada, represented by
The Chief Executive Officer of Parks Canada, 2012
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EXECUTIVE SUMMARY

Parks Canada Agency (PCA) is responsible for the administration and the maintenance of highways and transit routes that pass through national parks. As the two-lane Trans-Canada highway (TCH) represented one of the main bottlenecks in the road network between Vancouver and Calgary, investments were made to complete the twinning from the Castle interchange to the border of Alberta with British Columbia.

The audit of the TCH twinning project aimed to provide senior management with the assurance that the project's management control framework is adequate to ensure compliance with TBS and Parks Canada financial and contracting policies and practices. The audit also intended to ensure that adequate risk management, monitoring and reporting mechanisms were in place to mitigate risks inherent to the project.

The audit focused on the twinning of the sections of the TCH that were funded through Budget 2009 and through the Gateways and Border Crossings Fund (GBCF).

The audit methodology included a review of relevant documentation, interviews with PCA staff involved in the contracting process, the project management and the financial processing of payments. Interviews were also conducted with third parties private consultants (herein "owner engineers"). Contracts for the twinning of the sections under the scope of this audit were reviewed as well as a sample of payments transactions. The audit fieldwork was conducted between September 12th and November 14th 2011.

The present audit was planned and conducted in accordance with the internal audit standards of the Government of Canada.

The audit work demonstrated that adequate controls are in place for contract awarding, project management and payment processes. However, opportunities for improving the Management Control Framework of the project were identified, especially with regard to the oversight function and project documentation.

Table 1: Audit Report Rating Summary

Ref.	Management Process	Rating
8.1	Management control framework	Moderate Improvements Needed
8.2	Contract awarding process	Controlled
8.3	Project management	Minor Improvements Needed
8.4	Financial controls	Minor Improvements Needed

Below is the list of recommendations to the Director, Highway Service Center:

Table 2 : Internal Audit Recommendations Summary

1	The Director, Highway Service Center must formally establish steering or oversight arrangement, or an alternative body, as the replacement of the old steering committee and retain minutes of discussions and decisions related to the project.
2	The Director, Highway Service Center must ensure that an internal communication protocol is established and documented.
3	The Director of Highway Service Center must ensure that PCA staff involved in site visits document their observation on a consistent manner.
4	The Director, Highway Service Center must develop a strategy to cope with the possibility that the project would not be completed by March 31 st 2014.

1 INTRODUCTION

Parks Canada (PCA) was provided 100M\$ under the Gateways and Borders Crossing Funds (GBCF) for completion of the twinning of the Trans Canada Highway (TCH) between the Castle Interchange and the already twinned section of TCH east of Lake Louise. In addition, PCA was provided with an additional 130M\$ (\$80M from Budget 2009 and \$50M from previously approved funding) to complete the twinning of the remaining 9km to the village of Lake Louise and to the Alberta border with British Columbia. Twinning the TCH is intended to increase the efficiency of traffic flow (i.e., reduce bottlenecks) the safety and security of the National Highway System in the road network in Western Canada.

The conduct of this audit was included in Parks Canada's 2010-2011 Internal Audit plan, which was approved by the Chief Executive Officer (CEO) in July 2011.

2 CONTEXT

Banff National Park (BNP) was established as Canada's first national park in 1885 and was designated as part of the Rocky Mountain Parks World Heritage in 1984. It is Canada's most visited national park with an estimated 3 to 3.5 million person-visits per year¹.

PCA is responsible for administering highways and transit routes that pass through national parks. The Agency has an obligation to keep highways open and operating safely while minimizing ecological impacts. The TCH passes through BNP for a distance of 82km. Previous twinning projects (i.e., over 5 phases) have resulted in 73 km of twinning. Along the remaining two-lane section of the TCH in the Banff National Park, annual average daily traffic was estimated to be approximately 8000 vehicles compared to an estimated 7000 vehicles for similar routes in Alberta. More importantly, from late spring into the fall, daily traffic is estimated to be on the order of 14000 vehicles per day. Traffic volume combined with the conflict between slower moving park visitors and faster-moving commercial through traffic (18% of all traffic), has resulted in this section of the TCH becoming a serious chokepoints between Vancouver and Calgary.

During the first five phases of the TCH twinning project, completed in 2009-2010, PCA and Public Works and Government Services Canada (PWGSC) delivered collaboratively the contracting and project management activities related to the TCH twinning construction. For phases 6 and 7 of the project, PCA was assigned both contracting and project management responsibilities and was exempted for the *Common Services Policy*. Also, the PCA's delegation of authority to enter into contracts was increased through an amendment to the *Contracting Policy*. The expected completion date for the TCH twinning project is March 31st 2014.

The agreement between PCA and Transport Canada for the TCH twinning project outlined the following targets:

- a reduction of the number of collisions involving human fatalities by 40%,
- a reduction of the wildlife mortality due to collisions by 80%,

¹ Between 2004 and 2009, as per Banff National Park business plan 2010-2011 to 2014-2015

- an improvement of the understanding of species-specific responses to crossing structures and,
- a decrease of the travel time along the TCH.

3 LEGISLATIVE AND POLICY FRAMEWORK

Parks Canada Agency has the authority for the establishment, maintenance, administration and use of roads, streets, highways and other infrastructures within its parks and the responsibility to ensure that they are open and safe for public use under the *Canada National Parks Act* (s.c.2000). Since the abrogation of the *TransCanada highway Act* in 1992, PCA is responsible for the recapitalization of the infrastructure already in place. However, the Government of Canada is responsible to support PCA in financing major improvements and developments. PCA's management of infrastructure is based on its *Asset Management Directive*, which provides guidance and assigns roles, responsibilities and authorities to Agency's stakeholders.

The Treasury Board (TB) *Contracting Policy* guides the acquiring of construction and professional services. Procurement of such services is also governed by the TB *Procurement Review Policy*. The PCA's "contracting and procurement file organization guidelines" provides a specific methodology to file the documentation related to a contract. For the construction phases under the scope of this audit, an exception to the TB *Common Services Policy* was granted to PCA in order to facilitate the management of the contracting activities, mainly for the selection of private sector architectural and engineering professionals.

The TCH twinning project is managed based on the TB *Project Management Policy*, and files are organized based on the "Project Management File Organization Standard" drafted by PCA in 2009.

Financial management of the project is governed by the *Financial Administration Act*. Payments are approved according to PCA's *Instrument of Delegation*. Verification of payments is performed according to PCA's *Statistical Sampling for Account Verification*.

As any major infrastructure project, the twinning of the TCH in the mountain parks was required to comply with the *Canadian Environmental Assessment Act*. Given the highly sensitive ecosystems in which the twinning construction was done, the project management was also required to comply with the following set of environmental legislations: *Fisheries Act*, *Navigable Waters Protection Act* and *Migratory Birds Act*.

4 OBJECTIVES AND SCOPE

The objectives of the audit are to provide senior management with assurance that:

- an adequate Management Control Framework is in place to ensure compliance with TB and PCA policies, regulations and agreements;
- appropriate monitoring and reporting mechanisms exist and are implemented to provide adequate and accurate information for decision-making;
- an adequate Risk Management Framework to the TCH Project is in place and allows PCA to mitigate the inherent risks of the Project.

The scope of the audit involved a review of contracts supported with GBCF and Budget 2009 funds. It focused on project management practices and expenditures related to the project. The audit mainly covers the phases 6 and 7 of the TCH twinning, which started in 2008. Phases one to five of the project are not included in the scope of this audit.

5 METHODOLOGY

The audit criteria were developed in four distinct categories:

- The management control framework;
- The contract awarding process;
- The project management practices;
- The financial controls.

The audit methodology included the following activities:

- In-depth review of the documents that constitute the legal and control framework;
- Interviews with key members of Parks Canada's TCH project team at the Western and Northern Canada Service Center in Calgary, the Highway Service Center (HSC) and at the project site;
- Interviews with private sector engineers who were hired to manage the project;
- On-site observation of monitoring and surveillance activities;
- Review of relevant documentation, particularly, contracting files, project files, reports to senior management, evidence of monitoring activities (construction and wildlife preservation); and
- Review of a sample of payment transactions and their supporting documentation.

In total, 74 payment transactions were selected from the Western and Northern service center.

Based on the list of contracts (16) received, two to three progress payments were selected for each contract. Mostly, the first and last payment plus another intermediate progress payment were selected. Samples were chosen based on the value of the payment, timeliness and appearance of subsequent modification (JV, reversal of transaction, corrections).

Transactions for which no reference was made in the project documentation were also selected as part of the sample such as damage claims, legal services, Parks contributions and other miscellaneous items.

Fieldwork was completed between September 12th and November 14th, 2011.

Preliminary observations were presented to the Director, Highway Service Center at the end of the site visit.

Our observations and recommendations were made in accordance with the Audit Reporting Rating System described below:

Table 3 : Audit Reporting Rating System

RED	Unsatisfactory	The current controls are not functioning or are nonexistent. Management measures must be taken immediately to rectify the situation.
ORANGE	Significant improvements required	Controls in place are weak. Several major issues have been noted that could jeopardize the accomplishment of program/operational objectives. Management measures must be taken immediately to correct the deficiencies related to the controls.
YELLOW	Moderate improvements required	Some controls in place are functioning. However, important problems, which require attention, were noted. These problems could jeopardize the achievement of program goals or operational objectives.
BLUE	Minor improvements required	Many of the controls are functioning as intended. However, some minor changes are necessary to improve the efficiency and effectiveness of the control environment.
GREEN	Controlled	Controls are functioning as intended and no further action is necessary at this time.

6 STATEMENT OF ASSURANCE

The present audit was planned and conducted in accordance to the Government of Canada's standards for internal auditing.

7 AUDIT OPINION

The audit work demonstrated that adequate controls are in place for contract awarding, project management and payment processes. However, opportunities for improving the Management Control Framework of the project were identified, especially with regard to the oversight function and project documentation.

8 OBSERVATIONS AND RECOMMENDATIONS

8.1 MANAGEMENT CONTROL FRAMEWORK

YELLOW	Moderate Improvements Needed	Some controls are in place and functioning. However, important issues were noted and need to be addressed. These issues could impact on the achievement or not of program/operational objectives.
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A series of documents approved between 2004 and 2009 describe the governance structure of the project. This consisted of a steering committee composed of PCA and PWGSC executives, sub-committees for consultations, communications, environmental assessment and design & construction and a stakeholder advisory committee composed of 12 different groups of interest.

In order to determine whether the management control framework in place is adequate to ensure compliance with TB and PCA regulations, policies and agreements, and that appropriate monitoring and reporting mechanisms exist and are implemented to provide adequate and accurate information for decision-making, the following criteria were used:

C1	The Project Governance Structure in place complies to federal government requirements and with PCA policies and guidelines.
C2	The reporting structure in place allows all stakeholders to have accurate and timely information for decision making.

8.1.1 Governance Structure

Steering Committee

This committee operate as described up until the fall of 2007. When PCA obtained the approval for increased contracting authorities in 2008, the original steering committee gradually ceased to function and was replaced by a PCA based governance processes. Currently, management reports that the steering/oversight function is provided informally by VP Operations western & Northern Canada (VP ops), Executive Director of Mountain Parks, and the HSC director. Although this arrangement has been in place for at least four years, the original governance structure continues to be referred in various documents. The VP ops, Executive Director and HSC management have regular weekly meeting to discuss a variety of issues. The state of progress or other issues with the project is reportedly discussed when there is a need (i.e., it is not a standing item). There are no minutes or other records of the content of the discussion or of decisions taken where relevant, so it is impossible to conclude on the extent of oversight provided by this group. There is evidence of communication to the CEO by senior management overseeing the project (e-mails, briefing notes) at various points in time and evidence that executive management committee is made aware for example of when all the funds allocated to the project for a particular year will not all be spent and will be rolled over into the upcoming year.

Subcommittees

In addition to the steering committee, the project governance structure includes various subcommittees responsible for:

- consultations and communications;
- environmental assessments and;
- design and construction.

None of these subcommittees are in place. Instead the project team assigned the responsibilities to individual employees. A public relations and communications officer is responsible for external communications and relations related to the project. An environmental surveillance officer is assigned to monitor compliance with laws and regulations on construction sites, to provide awareness session to contractors and employees and to supervise implementation of environmental mitigating measures. Finally, a project manager oversees the design and construction aspects of the project, assisted by a project engineer. Although the objectives of subcommittees were respected, the decision to assign responsibilities to individuals instead of setting up formal subcommittees was not documented. However, the mitigation measure in place to fulfill the sub-committees responsibilities is considered acceptable.

Stakeholder advisory committee (SAC)

The TCH twinning project governance structure includes a stakeholder advisory committee which consists in representatives of different groups (e.g., environment, first nations, transportation industry, tourism industry, park user association, RCMP etc.) who have interest in the project.

During the design stage, this committee's input was critical. At that stage, the SAC met regularly. Supporting evidence of such meeting (e.g. Agenda and meeting minutes), is available on site. Now that the project is at the construction phase, the committee is only called upon when an issue requires their attention. The meetings are coordinated by the public relations and communications officer and meeting minutes were documented and available. As the construction work is moving to British-Columbia, representatives of provincial organizations will change.

Recommendations

1. The Director, Highway Service Center must formally establish steering or oversight arrangement, or an alternative body, as the replacement of the old steering committee and retain minutes of discussions and decisions related to the project.

Management Response

Agree: The Director, Highway Service Center (HSC), has received verbal direction that the Executive Management Committee (EMC) will fulfil the oversight function. The director will have access to EMC through the executive Director of the Mountain Parks and in turn to the Vice President Operations West and North who sits on EMC. The Director HSC will prepare a formal report to submit to EMC at the end of this construction season to inform them of the progress of the projects and to seek decisions or guidance as required. One of the pieces of guidance requested will be the frequency that EMC requires a formal report and if the TCH Twinning will be standing item on their agenda. The report will include a risk assessment.

The Director HSC will continue to report on the projects as required to the Vice President Operations West and North on the weekly call that he has with all the PCX

in the West and North. The Director HSC can also set up communication at any time with the Executive Director Mountain Parks and Vice President Operations West and North on request to obtain short notice direction.

The Director HSC will ensure that decisions that may change the direction of the project are documented.

8.1.2 Roles and Responsibilities

Roles and responsibilities

In such a large project, clear definition of roles and responsibilities of each stakeholder is essential to the effective delivery of business. Roles and responsibilities should be clearly documented in corporate documentation, agreements, contracts, call-ups against standing offers, job description or any other type of documentation.

Official roles and responsibilities clearly state that PCA is responsible for the design, the contracting activities, the construction, and the project management and that PWGSC is only involved by providing consulting services. A memorandum of understanding has been put in place and detail the funding involvement of Transport Canada. Standing offers and call-ups clearly define that the owner engineers (defined in the glossary) are responsible to supervise construction sites and for quality and quantity assurance. Responsibilities of contractors are clearly stipulated in the tendering documents as well as in the contracts. The project team develops detailed organizational charts for every contract to ensure that the lines of reporting are understood. These organizational charts are included in the project files. Finally, for major contracts, pre construction meetings are organized in order to ensure that PCA's project team, owner engineers and contractors are fully aware of their roles and responsibilities.

8.1.3 Communication

Internal communication

In large-scale construction projects such as the TCH twinning, effective communication channels and appropriate documentation of information are critical to facilitate the coordination of the project and to ensure appropriate record keeping and retention of corporate knowledge.

Owner engineers organize weekly construction site meetings with contractors. Coordination and monitoring of the work progress, and discussion of significant issues are the main topics. Due to an extended leave of absence, attendance of PCA's representative is not consistent, which is not aligned with the requirements stated into the approved federal government documents. Minutes are recorded by the owner engineers and are filed at their site office. They are communicated electronically to PCA's project manager for further discussion at the project management weekly conference call. These calls represent the main communication channel between owner's engineers and PCA's project team. Finally, the owner engineer's project director has frequent phone calls with PCA's project manager about specific issues.

Within the PCA project team, communications are mainly verbal and no record of the monitoring activities, conversations about specific topics or of inspections done by PCA employees are kept. Since the project team is relatively small considering the span of this

project, lack of documentation of internal communications increases the risk that corporate project information might not be available in case of temporarily leave or sudden departure of employees. Information sharing within the PCA project team would also be increased by proper documentation of communications.

Recommendation

2. The Director, Highway Service Center must ensure that an internal communication protocol is established and documented.

Management Response

Partial agreement: There is an existing communication protocol based on the HSC chain of command and accountability directives that are part of everyday project management in HSC. This process is not documented and could not be shown to the auditors. The Director HSC will document an internal communication process specific to the TCH Twinning process.

External communication

Proper communication is essential to get external stakeholders' input about the project, inform the public of upcoming road closures, detours to prevent accidents, road congestion and to increase awareness about the project and its objectives.

As indicated previously, a public relations and communications officer has been assigned to the TCH twinning project. By coordinating stakeholder advisory committee meetings, preparing web updates, information bulletins, briefing notes and speaking points for media relations, participating in the organization of press conferences and special events, the officer communicates valuable information to external stakeholders and the public.

8.1.4 Project Performance MeasurementPerformance measurement and reporting on project objectives

As mentioned in the agreement between PCA and Transports Canada, key objectives of the TCH twinning project are to improve motorist safety with a target of reducing number of fatal collisions by 40%, reduce environmental impacts of highway operations with a target to reduce wildlife-traffic conflicts by 80%, and increase habitat connectivity through a better understanding of species-specific responses to crossing structures and finally to increase efficient movement of people and goods by decreasing the travel time along the TCH. Effective controls should be in place to measure impacts of the twinning of the TCH and to determine if the objectives of the project are achieved.

A contribution agreement is in place with the Miistakis Institute to create and implement a wildlife monitoring and research plan. The objectives of the plan are to facilitate road ecology, monitoring and research along the TCH through BNP with the ultimate goals of reducing wildlife collisions, improving both habitat connectivity and the genetic interchange for key species. The Miistakis Institute provides quarterly report (financial and narrative) highlighting any significant changes they observe. An annual report that includes more specific information about the project is also provided. At the end of the agreement (2014/03/31), the Miistakis Institute will provide a comprehensive final narrative report.

Resource conservation specialist from the Banff field unit and Kootenay, Yoho, Lake Louise field unit maintain detailed statistics about incidents involving vehicles and animals. Statistics were provided by both field units and revealed a significant decrease in the number of fatalities due to wildlife vehicles collisions since 2005.

The average travel time along the TCH can be evaluated through mathematical models that can be applied by transportation specialists. At the time of the examination phase of the audit, a tendering process in place to award a contract for the analysis and assessment of the achievement of the project's objective. The selected firm will regroup all the information available about the project's objectives and provide a comprehensive report to PCA upon completion of the project.

8.2 CONTRACT AWARDING PROCESS

GREEN	Controlled	Controls are functioning as intended and no additional actions are necessary at this time.
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To determine whether an adequate contracting management framework for TCH Project is in place and allows PCA to comply with rules and regulations and to mitigate the risks inherent to the project, we used the following audit criteria:

C3	Competitive Tendering and Bid Selection Process is adequate and in compliance with TBS and PCA policy.
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8.2.1 Contracting and cost overruns mitigation strategy

A twofold contracting strategy was used for phases 6 and 7 of the TCH twinning project covered under the scope of this audit. Due to limited engineering resources for this type of project, a design-built approach was used for some parts of the project. For other portions, building contracts were issued while the design was performed by PCA officials with the participation of the owner engineers. Owner engineers for project management and monitoring were hired through call ups against standing offers.

Construction contracts for this project are unit price based. Prime cost sum amounts have been included in contracts in order to mitigate the risk of cost overruns. The "prime cost sum" is used to cover construction work planned for which it's impossible to accurately determine the cost at the stage of the "Request for proposals" (RFP). The project team also planned provision for a contingency amount for the entire project.

From an Agency perspective, road building and restoration represent a significant investment. As road work was required on some TCH adjacent roads within the limits of the mountain parks, these pieces of work were included in contracts for TCH in order to generate economies of scale and save on project administration. Audit work did not reveal any occurrence where authorities would have been exceeded. A process is in place to ensure that charges related to the non TCH work are transferred to the appropriate cost center (see section [8.4.1](#)).

8.2.2 Tendering

Effective tendering procedures and appropriate documentation allow the Agency to contract for services or goods in a timely fashion and ensure that the deliverables are acceptable.

TCH construction contracts were awarded through MERX. Evidence of communication that aimed to ensure compliance to tendering rules and processes between project management and the contracting office were observed in the contract files. Detailed statements of work are not always included in contracting files since they are very large documents. However, they were available to bidders through MERX and paper copies were maintained in the project file. Questions about the statements of work were submitted to the contracting office and relayed to the project team for clarification. Answers were posted on MERX to ensure fairness towards all bidders. Questions and answers are also documented in the contract file. Project presentation and site visits were organized for potential bidders for large and more complex contracts in order for them to have a better understanding of the working environment prior to submitting a proposal.

In cases where received bids vary of more than fifteen percent of the government estimate, a justification should be provided by the project team to determine the reason for the variation and identify potential cost estimation improvement opportunities. Contracting file review revealed three instances where no justification was attached to the contract file. In these instances, the bids received were lower than expected. According to contracting staff interpretation, the justification is mandatory for bids over the government estimated project costs but when bids are lower than the estimate cost, they don't always seek a justification. Regarding the three exceptions noticed, the Project Manager reported that the economic down turn, paired with the timing of the RFP, resulted in large saving (i.e. more than 15% of the original government estimate for this project).

8.2.3 Evaluation of proposals

Clear and consistent bids receiving, opening and evaluation processes should be in place and compliant with the contracting policies, procedures and other requirements. Unless very specific technical requirement exists, construction contracts are selected on the "lowest bidder" basis. In cases where a design-build approach is used, a full evaluation of the bids should be performed by the selection committee.

Bid receiving

A bids receiving process should be in place to guarantee openness and transparency to all bidders interested in a contract. Bids should be opened at the specified date and time by two PCA officials. Public openings can be organized.

The specifications about bid openings are clearly indicated in the MERX posting. A bid opening form was attached to all contract files reviewed. However, four forms were not signed by the two PCA officials who attended the bid openings. When public openings occurred, a log of attendees' names is attached to the file, which is a good practice. Bids envelopes were attached to all the contract files reviewed.

Evaluation of proposals

Tendering documentation clearly stipulated that TCH construction contracts were evaluated on the basis of the bid amounts. Unit price table items are entered into a summary spreadsheet to validate all bids amounts before a recommendation for contract awarding is sent to the project team. Summary spreadsheets and recommendation for contract awarding were attached to all the reviewed files. Based on the documentation reviewed, all construction contracts were awarded to the lowest bidders.

A more thorough bid evaluation process took place for design-build contracting processes. An evaluation committee comprised of members of the project team, a PCA senior procurement and contracting officer and PWGSC representatives evaluated the bids on the technical and mandatory aspects of their proposals. After a request for clarifications was sent to the bidders, a second round of evaluation took place where proposed prices were rated as well. The bidders that obtained the best rating score were selected. Bid evaluations by each member of the committee were documented and attached to the project file.

8.2.4 Contract and Supporting Documentation

The contracting documentation should explicitly detail requirements and clauses to protect the Agency in case of non-performance of a contractor. Standards documents vetted by the legal services should be used. Depending on the type of contract, the requirements for supporting documentation may vary and contracts should be approved according to the PCA *“Instrument of Delegation”*. Contracting files should be organized as per the PCA’s *“Contracting and Procurement File Organization guidelines”*.

Contract & General clauses

For the twinning project, PCA was granted the authority to enter into construction contracts up to 50M\$. Contracts for less than 5M\$ could be authorized by a senior contracting officer. For contracts that exceeded this authority, CEO’s approval is required. Proper authorization compliant with the PCA delegation of authorities was observed for all contracts.

PCA contracting documents refer to the invoicing method detailed in the PWGSC *“Standard Acquisition Condition and Clauses”* (SAAC manual). For consulting and construction activities, suppliers must submit progress payment request along with appropriate supporting documentation. Clauses that detail the terms of payment and the right of the Agency to audit contractor’s books and records are also included in the SACC manual. Contracts file review showed compliance with this aspect of the TBS *Contracting Policy*.

Documentation

PCA *“Contracting and Procurement File Organization guidelines”* lists all documents that are required to be kept in the contract file. Contracts files review revealed that all mandatory documentation was on file.

Risk management

Contractors are required to provide PCA with certificates of insurance as well as performance bonds. These documents give the Agency recourse in case a contractor does not deliver the agreed upon pieces of work. Originals of both required documents were present in every contract file reviewed. Originals of the *Workers Compensation Board* (WCB) certificate were also on file.

The Agency holds five percent of all progress payment requested as required by the SACC manual. This is a common practice within the construction industry. Holdbacks are released upon presentation of the “*certificate of final completion*” along with a statutory declaration, which confirms that the work was completed. Holdbacks were kept for each payment that was audited.

8.3 PROJECT MANAGEMENT PRACTICES

BLUE	Minor Improvements Needed	Many of the controls are functioning as intended. However, some minor changes are necessary to make the control environment more effective and efficient.
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In order to determine if appropriate monitoring, reporting and risk management mechanisms exist and are implemented to provide adequate and accurate information for decision-making and to allow PCA to mitigate the risks inherent to the project, we used the following audit criteria:

C4	Adequate controls and processes are in place for the design phase of the project.
C5	Adequate controls and processes are in place for the construction phase of the project.
C6	The project is actively monitored by the Project Authority and terms and conditions are enforced.
C7	Controls are applied to ensure all requirements are met before project close out (if applicable).
C8	Project files contain all required mandatory documentation and organisation is compliant with PCA standards.

8.3.1 Planning and Design

In addition to being critical to the user’s safety and security, planning, design and cost estimation are crucial elements of sound project management of large construction projects. Documentation of the planning, design and cost estimation, definition of roles and responsibilities, effective challenging process and appropriate approval mechanisms are important control elements of a well-designed planning and design process.

As the project was at the construction phase at the time of the audit, no planning and design activities were underway. Management used two design approaches for the TCH twinning project.

In design-build contracts, the design is performed by the bidders. Two rounds of evaluation are done to ensure that the design is compliant with the very detailed request for proposals before it is accepted and the contract is awarded. Challenge of the design is done through requests for

clarification that are sent to the bidders between the two rounds of evaluations. The whole process is fully documented. Approval of the design is done through the awarding of a contract.

For the second approach PCA officials are involved in every step of the planning and the design process. Technical aspects of the project are sometimes developed in partnership with owner's engineers and/or PWGSC. PCA engineers are supported by owner's engineer and/or PWGSC for the technical aspects of the design. PCA's approval of the design is required at the final stage.

Costs estimates must be developed prior to the request for tendering. They are based on economic indicators, past contracting experiences and industry models. PCA officials are responsible to establish cost estimates for most contracts. Large and complex contract costs estimation is usually performed by the owner engineers reviewed by the project team and must be approved by HSC director. While there is no formal challenge process, cost estimates would be challenged before being approved, if required.

8.3.2 Construction Phase

During the construction phase of the project, a robust control framework is necessary to ensure timely delivery of the project within budget. Proper planning, provision of sufficient and competent human resources, hands-on project coordination, and compensating measures for security and environmental impacts are some elements of sound project management.

The interviews revealed that there is no national approach in place to guide PCA's project managers and ensure consistency in the management of large scale projects. By developing common tools, templates and forms, PCA would facilitate the day-to-day work of Project Managers and increase efficiency in their practices. Few tools are available on the Mountain Parks intranet. They were locally developed and not nationally approved. Tools are outdated (2005) and not easily accessible to all staff.

The project team has developed project charters for each contract under the TCH project. These project charters do not require specific approval and are not updated regularly since these documents are mainly used to manage relationship with external partners such as PWGSC. For this project, contractors must provide the owner's engineers with detailed project plans that are update on a regular basis.

The Agency is in the process to update existing project management standards, tools and guidance to implement a National approach related to the management of large scale projects.

Human Resources

It was expected that PCA would hire additional engineering personnel to coordinate and monitor activities related to the project. Given the scarcity of experts in the area, the project team chose to outsource this function of the project management to owner engineers instead. As a result, although no new employees were hired specifically for the project, competent and sufficient resources are available to adequately manage the project. Competency requirement of owner engineers has been evaluated with tight criteria outlined in each call up against the standing offers. The environmental surveillance officer, the contracting officer and the public relations and communications officers are indeterminate PCA employees temporarily assigned to the project. Audit tests demonstrated that the current staffing is sufficient for the conduct of the project.

In terms of internal project management capacity, the interviews demonstrated that the key positions are not well supported by a succession plan to cope with the possibility of a sudden departure, especially at the project leader level. This situation increases the responsibility, accountability and pressure on the project team. Consequently, the Agency may be at risk of losing important corporate knowledge or facing delays in the project in case of extended absence of key members of the team. However, the residual risk is limited at this stage of the project (end as March 31st 2014) and by the fact that PCA decided to outsource the daily supervision to owner engineers.

Traffic control measures

Contractors are responsible for the development of traffic safety plans, which must be approved by the owner's engineers. Before approving the plans, owner engineers review them and ensure compliance with the industry standard traffic plans. If they make recommendations, contractor must implement them. As part of their project coordination activities, owner engineers verify that the signage installed on construction sites by the contractors is sufficient and appropriate to ensure the safety of the TCH users. A specific process is also in place to track and record incidents that occur on the construction sites. There is no requirement to make PCA aware of minor incidents although reports are maintained by the owner engineers.

Measures for environment protection and wildlife defence

A whole series of controls have been developed to minimize the impacts of the twinning on the ecosystems of the mountain parks, especially on wildlife.

The main component of the strategy to mitigate the impacts on wildlife is the crossing structures, either overpasses or underpasses. Fencing was installed all along the TCH twinned sections to divert wildlife to crossing structures and was adapted to the observed reactions of the different species during the course of the project. Fish habitats and water courses modified as a result of the twinning have been restored.

The environmental surveillance officer provided training sessions to the construction workers to make them aware of the implications of working in protected areas.

A plan is in place for the rehabilitation for Mannix pit, from which construction materials are drawn. Work camps and trailer offices have been installed in the park to limit the vehicle traffic caused by the movement of the workers.

Project file

A combined filing system exists for the project documentation. General project information, including contractual, financial and project management information was observed in the project binders maintained by the project team. Documentation of monitoring and surveillance activities is maintained by the owner engineers and will be transferred to PCA when the project is completed. Information was thoroughly documented, well-organized and respected PCA's *Project Management File Organization Standard*.

8.3.3 Monitoring and Project Close out

Monitoring activities are essential to effectively and efficiently achieve the objectives of a construction project. Regular site visits, robust quantity and quality assurance processes, active monitoring of the effects of the twinning on the environment and wildlife, evaluation of the

efficiency of the crossing structures and a solid process to document any changes to contracts are the basic element of the monitoring framework for the TCH twinning.

Progress reporting

Contractors provide the owner's engineers with regular progress reports that detail advancement of the work and list specific issues. Reports are filed by the owner engineers and are easily accessible for consultation by PCA officials. A formal process is in place to approve work that is not included in the specific contracts. Contract change notices are submitted by the contractors to the owner's engineers and ultimately change orders are prepared and approved by PCA.

Site visits

As mentioned in section [8.3.2](#), project coordination and monitoring responsibility was assigned to owner engineers. The call-ups under which their services are contracted detail their specific roles and responsibilities, which include being present on site regularly. Since all sites are systematically toured everyday by the owner engineer's personnel, no formal planning of the sites visits is necessary. All observations are documented and filed at the owner engineers premises.

Where issues are identified, they are communicated to the project team at the weekly conference call. The environmental compliance officer formally documents all observations and incidents made while touring the construction sites. However, there is currently no systematic site visits performed by the PCA engineering employees. When visits occur, either by the project manager or by engineering personnel, there is no mechanism to internally document observations or issues. In order to ensure the proper corporate knowledge conservation, to facilitate communications, to increase awareness in the event of significant issues and to support PCA's position in case of a dispute, observations made by PCA officials and conversations with contractors and owner engineers should be documented.

Recommendation

3. The Director of Highway Service Center must ensure that PCA staff involved in site visits document their observation on a consistent manner.

Management Response

Agree: The Director, Highway Service Centre will ensure that observations from site visits are clearly documented and stored in the relevant project files. A template will be developed to ensure common reporting standards.

Quality & quantity control and assurance processes

Contractors are responsible to apply quality control on the deliverables. The responsibility for quality assurance lies with the owner engineers, who ensure that the finished products are compliant with the requirement set out in the request for proposals. Surveys and audit spot checks are the means of assessing quality. About 10% of the shipments, elevation and offset of completed section of the road and other components of the project are verified for quality assurance. Through the "approval to proceed" control mechanism, owner engineers ensure that a new piece of work is not undertaken until a formal approval is given. A formal dispute resolution process is in place in case the results of the quality assurance and quality control do not come to the same conclusions.

Proofs rolls are used to measure solidity of built structures and results are documented and filed. In some cases, quality of manufactured products that enter in the construction is inspected at the supplier's premises. Controls are in place to ensure that merchandise arriving to the construction sites is in fact what was previously inspected. Given the remoteness of the construction sites, such process is a good practice since shipping costs for structures and materials are significant. In addition, delays in the delivery of materials that do not conform to expectations could have an impact on the project's delivery schedule.

Equipment used by the owner engineers to perform quality assurance is regularly calibrated and is compliant with provincial regulations.

Quantities of materials are measured through a scale ticket process. Scale tickets are printed out from a computer and attendant at the pit must sign off on it. Validation at the delivery site is then made by another owner engineer's representative. Those tickets are ultimately used for reconciliation when requests for progress payments are submitted by the contractors.

Documentation of monitoring activities

Along with every meetings minutes, all monitoring activity reports are filed by the owner engineers and will be remitted to PCA once the project is completed. Many types of reports were observed at their office during the field work.

Monitoring of twinning environmental impacts

In addition to the monitoring activities discussed in section [8.1.4](#), the following controls have been put in place. The environmental surveillance officer performs sites tours and monitors any events involving environment and wildlife related to the twinning project. Monitoring activities are logged in detail and are available to the project team, for consultation, along with pictures of the observed conditions.

Project close out

Currently, the close out of projects/contracts is based on the final certificate of completion, which must be submitted along with a progress payment request. Owner engineers sign off on the certificate to attest that the work was completed. Once the entire TCH twinning project is fully completed, a close out report will be prepared by the owner engineers in collaboration with PCA officials and attached to the project file.

8.4 FINANCIAL CONTROLS

BLUE	Minor Improvements Needed	Many of the controls are functioning as intended. However, some minor changes are necessary to make the control environment more effective and efficient.
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To determine whether financial process in place allows for timely processing of payments to owner engineers and contractors and whether controls are adequate to ensure compliance with policies, we applied the following audit criteria:

C9	Financial controls under Project Management responsibility are appropriately and timely applied.
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C10 Financial controls under finance officer responsibility are appropriately and timely applied.

8.4.1 Budgeting and Reporting

As it is considered one of the largest infrastructure project ever undertaken by PCA, TCH twinning project's progress and financial forecasting must be closely monitored to ensure that the project will be completed on time and within budget. Proper reporting to senior management would allow for quick reaction in case a major issue comes up or resource reallocation becomes necessary.

Internal Order structure

An internal order structure has been set out in the financial system STAR based on the sources of funding for each specific sections of the TCH twinning project. Expenditures are coded against these internal order numbers to make reporting easier.

Financial reporting

Formal reporting mechanisms have been developed by the project team in order to keep senior management aware of the progress of the work and the financial situation of the project. There are three relevant reports:

- "TCH forecasts reports" provide detailed financial forecasts for all pieces of work for the TCH twinning.
- "Quarterly financial reports" highlight actual and forecasted expenditures for all projects under the HSC responsibility including TCH construction work.
- A monthly "Report on financial situation" provides a snapshot of the financial situation and provides explanation of the variances between forecasts and actual expenditures.

These reports are prepared by the TCH project team and approved by the director, HSC. The amounts reported are rolled-up into the HSC monthly variance reports, which are forwarded to the office of the Vice-President, Operations, Western and Northern Canada along with copies of the original reports.

As per the agreement signed for the GBCF, the Agency should be providing quarterly reports to Transports Canada detailing project's expenses, achievements, timelines and budgets. Audit testing revealed that cash flow reports are not sent quarterly but on a request basis. The same agreement stipulates that financial surplus should be returned to Transports Canada at the end of the project. However, mechanism to return such funds is not clearly defined. Conversation will take place between PCA and Transports Canada officials to determine how to handle the situation.

Budget 2009 Risk Management

The project is mostly in line to be completed within timelines but concerns were raised about significant increased surplus forecasts that were presented in the recent monthly variances reports to EMC. This increase is mainly due to one contractor that has encountered considerable delays. Although it's still reasonable to believe that the project will be completed on time, there is a risk that extensions may be needed.

Because funds allocated to PCA under the budget 2009 expire after March 31st 2014, project delays beyond that date could result in significant financial impacts for the Agency (i.e., payments beyond that date would have to be financed from the Agency's operating budget).

At this time, there is too much uncertainty and potential risk to predict the amount of work that may have to be completed after that date, if any.

Recommendation

4. The Director, Highway Service Center must develop a strategy to cope with the possibility that the project would not be completed by March 31st 2014.

Management Response

Agree: The Director, Highway Service Centre will continue to review the project on a quarterly basis and assess the risk that the project may not be completed on schedule. The current risk of extending beyond the March, 2014 date is assessed as low. Progress and risk will be monitored by the project team and, if needed, additional actions will be taken, or authority sought to take action. The progress and risk assessment will be formally presented to the Steering Committee on a quarterly basis.

Operations and Maintenance funding strategy

Significant investments have been made in the TCH infrastructure through the various twinning project phases over the years. However, the Agency will not be able to get additional funding for the maintenance and operations of the TCH. Consequently, the HSC has to finance the maintenance and operations of the twinned TCH through its operations budget.

An analysis of the situation has been done to ensure that HSC will be able to fully deliver its maintenance responsibilities (snow clearance, repairs, lawn mowing, paving, maintenance of built structures etc.) for the mountain parks without affecting the security of the parks users and creating a chronic deficit in its budget. However, this analysis is not documented.

At the reporting stage of the Audit, the HSC maintenance operations have already been modified to absorb the additional lanes of highway. It was decided, within the project budget, to fund the acquisition of one snow plow, and this equipment is now in service. In addition, it was decided to decrease the area of operation of the Lake Louise HSC team, in order for them to be able to direct their resources to the new lanes on the TCH. The Jasper HSC team extended their zone for Highway 93 North into the former Lake Louise area. This was done at no substantial additional cost as efficiencies have been gained by adjusting sections according to varying snowfall amounts and weather conditions.

The next step is to acquire one or two towed plows that will allow one operator to clear two lanes of highway at once, thereby increasing efficiency. This equipment will be used on the twinned sections of the TCH. It will be acquired within the next two years as part of the Budget 05 HSC Heavy Fleet Replacement project.

HSC will refine how expenses are tracked for the new sections of highway with a view to clearly identify the actual costs to operate and maintain the new sections of highway.

8.4.2 Payment of expenditures

Payment requests for construction work are submitted to the HSC offices either by mail or electronically by contractors. A thorough review is performed by the HSC personnel to ensure that all supporting documentation (statutory declaration, *Workers Compensation Board* certificate and/or invoices) are attached to the request. Verification of the amounts requested is performed and holdbacks are calculated. Once PCA officials are assured that the payment request is accurate, it is forwarded to the owner engineers. The amounts are then reconciled with the results of the quality and quantity assurance testing that is performed by the owner engineers. If the amounts correspond, the owner's engineers recommend the payment by signing a "request for progress payment" form which is returned to HSC personnel for payment.

Progress payments requests related to consulting charges for engineering services are also submitted to the HSC. An in-depth review of the amounts claimed is performed to ensure that fees claimed are accurate and legitimate.

Once the HSC personnel is assured that all amounts claimed are accurate and legitimate, a delegated signing authority approves payments under section 34 of the *Financial Administration Act*. Payment documentation is sent to the Finance group where a final verification is performed before the payment is released.

The audit team found clear evidence that these review activities took place.

All payments were accompanied with the required supporting documentation and were properly and timely approved by a PCA delegated official. Holdbacks were appropriately withheld for all transactions reviewed and no miscalculation was observed. The review of the 74 transactions did not reveal any significant breaches to the payment issuance system in place for the TCH project.

No recommendation

Appendix A. APPLICABLE LEGISLATIONS AND POLICIES

Laws and Regulations

Parks Canada Agency Act

Financial Administration Act

Canada National Parks Act

Fisheries Act

Migratory Birds Act

Navigable waters Act

Treasury Board policies

Policy on Project Management

Common Services Policy

Contracting Policy

Procurement Review Policy

PCA Policies, directives, standards and guidelines

Asset Management Directive

Procurement and Contracting file organisation standards

Project Management file organisation standards

Instrument of delegation

Appendix B. LIST OF ACRONYMS

ACRONYM	SIGNIFICATION
BNP	Banff National Park
CEO	Chief Executive Officer
EMC	Executive Management Committee
GBCF	Gateways and Borders Crossings fund
HSC	Highway Service Center
PCA	Parks Canada Agency
PWGSC	Public Works and Government Services Canada
RFP	Request for proposals
SOW	Statement of Work
TB	Treasury Board
TCH	Trans Canada Highway

Appendix C: Glossary

Contractors	Company with which the PCA contracted for the performance of the road and structures construction work.
Design Build	Method to deliver a project (Construction) in which the design and construction services are contracted by a single entity known as the design–builder or design–build contractor.
MERX	Tool on which all business (contract) opportunities from all levels of government including the Federal and Provincial Governments as well as the MASH sector (Municipal, Academic, School Boards and Hospitals) from across Canada are posted daily.
Owner Engineer	Representative of the commissioning company of a construction or engineering project. It refers to the personnel involved in technical due diligence.
Proof rolls	Proof rolling is a method in construction of ensuring that earthwork or the base has no unstable areas using a number of proof rolling equipment such as rollers. It is also a method of determining whether certain areas of sub grades meet the compaction requirements
Steering Committee	An advisory Committee usually made up of high level stakeholder and / or experts who provide guidance on key issues related to a project.
Unit Price Table	Table that details the fixed price for each completed unit of work as agreed upon in the contract.