

# Public Infrastructure Engineering Vulnerability Committee

## TERMS OF REFERENCE

October 2005

### 1 PREAMBLE

There is consensus that climatic change is occurring and is affecting engineering works which, in the case of buildings and infrastructure, have life spans of up to several decades. Indications are that the climatic environment of these works will undergo profound modifications during this period, which could call into question the role and current standards of design.

The Inter-Governmental Panel on Climate Change (IPCC) defines vulnerability as the degree to which a system is susceptible to, or unable to cope with, adverse effects of climate, including climate variability and extremes. It is a function of the character, magnitude and rate of climate change variation to which a system is exposed, its sensitivity and its adaptive capacity. The vulnerability of public infrastructure will vary according to the type of infrastructure and the level of risk that can be tolerated by the users of that infrastructure. Such information will be an important input to a risk assessment framework to develop and prioritize adaptation strategies for specific works and specific regions.

There is a need to provide a regional assessment of the vulnerability of Canada's existing and future public engineering infrastructure to the impacts of climate change. It would provide a national and regional picture of the vulnerability of different types of buildings and infrastructure such as dams, water and wastewater systems, pipelines, roads, bridges and other engineering works that encompass urban and rural areas and all representative regions of Canada.

The federal government, through Natural Resources Canada, has committed itself to deliver a national scale assessment of climate change impacts and adaptation in Canada by the end of 2006. In the case of engineering infrastructure, there is considerable uncertainty in how to best define and assess its vulnerability to climate change. There will be a need to consult with engineers, scientists and communities. It will require a broad understanding of vulnerability needs including identification of the regional distribution and magnitude of risks. It will be necessary to assess other external factors to develop holistic approaches that adapt for climate change while responding to other environmental, social and financial factors. Ultimately, it will require innovative, yet practical methods that enable effective prioritization and decisions on adaptation measures for areas and types of infrastructure that have the greatest vulnerability.

This effort will require assembling the scientific and engineering expertise together with those who make decisions concerning investments in public infrastructure at all levels (orders) of government. The Canadian Council of Professional Engineers (CCPE) has established a national committee called the Public Infrastructure Engineering Vulnerability Committee, or PIEVC, to serve as the mechanism for the engineering profession to focus attention on this issue and bring together stakeholders.

Each type of infrastructure has its own vulnerabilities and issues. Expertise is often infrastructure specific. PIEVC may, where necessary, establish a number of infrastructure-specific expert working groups (EWGs) involving engineers, scientists and decision-makers to provide access to the technical expertise and innovation that will be needed to address this issue. The PIEVC will facilitate the development and operation of EWGs and coordinate their work towards the national goal of vulnerability assessment and adoption of best practices.

## **2 DEFINITIONS**

### ***Public Infrastructure***

For the purposes of this project, public Infrastructure is defined as those physical facilities, networks and assets operated for the collective public benefit including the health, safety, or economic well-being of Canadians, whether operated by government and/or non-government agencies.

### ***Engineering Vulnerability to Climate Change***

For the purposes of this study, engineering vulnerability to climate change is defined as the level of risk of destruction, disruption or deterioration of engineered public infrastructure resulting from changes in the climatic conditions used to establish the engineering design and operational elements and tolerances for the public infrastructure.

## **3 VISION**

PIEVC will spearhead initiatives that will provide clear guidance to Canada's professional engineers to support the design, construction, maintenance and regulation of safe, reliable and financially sustainable public infrastructure in Canada to meet the challenges of a changing climate.

## **4 MISSION STATEMENT**

PIEVC will lead a national assessment of the engineering vulnerability of Canadian public infrastructure to climate change in order to develop policies and tools to aid Professional Engineers in their day-to-day practice of designing, constructing, operating and maintaining public infrastructure. In these activities PIEVC may assist government agencies in developing regulations and policies necessary to address Canada's climate change vulnerability.

## **5 OBJECTIVES**

The specific objectives of PIEVC are:

- To develop the Terms of Reference for a national assessment of the vulnerability of public infrastructure to the impacts of climate change and to oversee the execution of the project;
- To set up and manage the infrastructure expert working groups and report on their work as required;
- To review the recommendations from the infrastructure expert working groups and advise on responses and follow-on work that is required;
- To facilitate the development and/or inclusion of specific best engineering practices that adapt to climate change impacts in appropriate documentation.

## 6 STATUS AND AUTHORITY

The Public Infrastructure Engineering Vulnerability Committee (PIEVC) will operate in partnership with the CCPE and will report on its work to the CCPE. It will have an annual budget established through a contribution agreement between Natural Resources Canada and the CCPE. The CCPE shall provide Secretariat services to PIEVC.

Several infrastructure expert working groups (EWGs) may be formed to assist PIEVC in its work. These groups will operate as subcommittees that will report to, and take direction from, the PIEVC. The working groups have separate Terms of Reference. The PIEVC shall refer to the EWGs for technical information and advice on priorities, and shall ensure there is no duplication of work amongst the working groups, with other external groups such as InfraGuide, CSA as well as the PIEVC itself.

A Resource and Support Group (RSG) will be established to facilitate the work of the PIEVC. The RSG will take its direction from the PIEVC and will have a separate Terms of Reference. The RSG will be managed through the Secretariat operated by the CCPE. The RSG will comprise senior technical and policy staff working within the departments of the PIEVC members. The RSG members will provide a focus and technical support base for the activities of their respective PIEVC members. They will generally be more flexible in their scheduling and availability than would be expected of the PIEVC membership. The RSG may also include members with additional technical expertise that do not have representation on the PIEVC. The primary focus of the RSG will be to ensure that PIEVC objectives and deliverables are prepared in support of their respective PIEVC members to facilitate timely decision-making at the PIEVC level.

The CCPE will operate a Secretariat who will provide day-to-day technical and management services in support of the PIEVC, the RSG and the various EWGs. The Secretariat will report directly to the CCPE.

The PIEVC may approve any expenditure that is within its authorized budget. It may invite outside experts to its teleconference meetings and may engage them professionally, within the limits of its budget and with proper notification and reporting to the CCPE.

The functions and responsibilities of the PIEVC include:

- Developing the terms of reference for a national study of the vulnerability of public infrastructure to climatic change and overseeing the study;
- Defining and classifying categories of public infrastructure that are vulnerable to climate change;

- Liaison with the EWGs and communicating their work to the CCPE and other stakeholders as required;
- Reviewing and advising on documentation that may include proposals, draft policies and procedures, technical papers and so forth;
- Reviewing and advising on existing codes, standards and guidelines;
- Reviewing and advising on the need for, and development of, new codes, standards and guidelines;
- Consulting within the member's constituencies as well as with other experts and appropriate stakeholder groups as required;
- Making recommendations to the CCPE regarding potential sources of funding to support the national vulnerability assessment; and
- Periodically reporting to the CCPE.

The PIEVC shall meet in person once yearly, normally in Ottawa, and between two and four times per year, by teleconference. On behalf of the PIEVC, the Secretariat shall submit an annual report on PIEVC activities to the CCPE.

## **7 DELIVERABLES**

The deliverables from this committee in its initial three-year term shall include:

- Finalized terms of reference for the national vulnerability study
- Completed national vulnerability study
- Information on best engineering practices, tools (policies, processes) and technology as they apply to climate change adaptation
- Inventory of work ongoing in Canada on public infrastructure vulnerability
- Establishing a network of key players in climate change adaptation work in Canada
- Promulgation of appropriate policies, guidelines and standards about climate change adaptation for Canada's professional engineers

The mandate and overall progress of the committee will be reviewed three years from the date of its first meeting.

The PIEVC shall review its terms of reference at least annually.

## **8 MEMBERSHIP AND ORGANIZATION**

The PIEVC membership shall consist of up to twenty members that provide a balanced regional and sectoral representation.

At least annually, the PIEVC shall review its membership to assess:

- The balance of regional, sectoral, representation; and
- The skills and experience necessary to successfully execute the work of the committee.

At any time, PIEVC may address any imbalances or gaps by recommending changes to the membership of PIEVC or to the RSG and/or EWGs.

PIEVC members and their designates are acting as representatives of their respective organizations.

PIEVC shall strive to operate and make decisions by consensus.

The term of initial membership shall be three years, and may be renewed annually for up to three additional years.

The PIEVC shall be supported by a Secretariat operated by the CCPE. A senior member from CCPE staff will manage the secretariat services needed to support the work of the committee.

The PIEVC Chair and the CCPE Secretariat will be responsible for planning, organizing and documenting committee meetings and agendas.

The PIEVC may invite outside experts to participate in its meetings and may also invite observers. These participants shall have no vote.

PIEVC will reimburse travel and accommodation expenses for non-Federal Government members of PIEVC for attendance at PIEVC face-to-face meetings.

PIEVC will not pay honorariums for participation in PIEVC activities.

## **9 COOPERATION**

The PIEVC will maintain awareness of ongoing work on climate change adaptation in Canada. Where appropriate, PIEVC may nominate individuals to represent its interests on committees and activities that have congruent objectives. These representatives will act as liaison between PIEVC and other organizations that are conducting work relevant to the objectives of PIEVC.

- PIEVC will identify where there are common interests in pursuing work on climate change vulnerability and shall nominate members selected from PIEVC, RSG, or the EWGs to participate in committees and initiatives that are congruent with the objectives of the PIEVC.
- When the PIEVC is unable to identify nominees for these committees and activities, the PIEVC may request that the Secretariat work with the CCPE to identify nominees from within the CCPE or its constituent organizations.
- The PIEVC will make every effort to ensure that initiatives of the PIEVC and its subsidiary committees do not duplicate work conducted by other organizations in Canada.

## **10 APPROVAL**

Approved by PIEVC: Thursday, October 6, 2005