Specifying Certification is a Critical Part of The National Building Code
Which is Even More Important Now in an Age of Climate Change
Climate change has already had far-reaching impacts on our above and below ground infrastructure and can put its performance and reliability at risk. This trend is likely to accelerate in the coming decades. The main threats to infrastructure assets are many, but include first and foremost damage or destruction caused by extreme weather events. These threats have led to Infrastructure Canada’s Climate-Resilient Buildings and Core Public Infrastructure Initiative. Led by the National Research Council of Canada (NRC) this “ground-breaking work focuses on integrating climate resiliency into building and infrastructure design, guides, certification and codes”.

According to Infrastructure Canada “this initiative is intended to develop capacity in Canada’s construction industries to adapt to the increasing demands on our built infrastructure attributed to climate change. It is driving innovation and providing partners with the science-based knowledge and tools they need to make sound decisions about how to design, operate, and maintain their infrastructure assets. This supports Infrastructure Canada’s commitment to outcome-based programming. The work undertaken by the NRC and the Canadian Construction Industries will contribute to an infrastructure landscape that can keep Canadian communities safer from extreme weather and the effects of climate change”.

When it comes to purchasing certified building and above and below ground infrastructure products, value comprises a system that provides the right durability and resilience to safely and sufficiently service needs for its entire lifecycle. So how do you as an owner, agency, or specifier achieve good value for your investment?

We know that specifying products that meet the right building code standard is a minimum first step. Specifying products that meet a certification program built on superior quality assurance processes and results, above and beyond the minimum building code standards, is a wise and value-adding step to protect your investment, manage risk, and provide safety assurance to your end users, taxpayers, and/or service community.
Background
In late 2017, Canada’s two leading precast concrete associations, the Canadian Precast/Prestressed Concrete Institute (CPCI) and the Canadian Concrete Pipe and Precast Association (CCPPA) announced a new joint venture to establish an independent entity for administering, enhancing and expanding a third-party certification program for prestressed and non-prestressed precast concrete manufacturing facilities across Canada.

CPCI and CCPPA recognized the benefit for owners, contractors, and the precast concrete industry by combining the strengths of two well-established plant certification programs, CPCI Certification Program for Structural, Architectural and Specialty Products and Production Processes (CPCI Certification) and the Plant Prequalification Program for Precast Concrete Drainage Products (PPP), into the new Canadian Precast Concrete Quality Assurance (CPCQA) Certification Program.

The CPCQA Certification Program is an impartially-operated, not-for-profit corporation, governed by its own Board of Directors, advised by a new multi-stakeholder Quality Assurance Council (QAC), and managed by an independent Managing Director.

The Accredited Certification Organization (ACO) engineering firms contracted to provide the plant auditing services reports directly to the QAC, which is a diverse group comprised of representatives from provincial and municipal levels of government, consulting and architectural firms, precast concrete manufacturers, and other industry experts.

Why Certification?
Communities rely on construction professionals to design and build infrastructure systems that are safe and durable throughout the system’s service life. The systems must be built and must perform as designed, otherwise safety, along with the probability of a construction project’s success, can be adversely affected. Knowing that there is always some degree of risk associated with any project, the key aspect of lowering that risk is through quality assurance.

Quality assurance is generally defined as an ongoing system of knowledge, programs, activities, people, inspections, tests, documentation, and assessment, with the primary goal of ensuring projects meet their intended design and specifications. Quality control is therefore a subset of quality assurance.

Certification helps ensure the essential components of a quality assurance system are present and functioning properly, resulting in the highest probability of reducing risk, meeting specifications, and completing a successful project. Therefore, the primary purpose of a certification program is to help ensure that products are manufactured in accordance with specifications and community expectations.

In other words, certification helps ensure “as-designed becomes as-built” and should be considered by every designer as a means of reducing risk.

Since it is impossible for a designer to observe or inspect all the materials, components, and construction methods associated with a project, it is vital that other procedures are in place to provide assurance that the project is built as expected.
And... Why CPCQA?

Here are some of the many ways that owners have indicated that specifying CPCQA supports their goal of delivering top value for their project dollar:

**CPCQA Fundamentals for Structural / Architectural Precast Plants**

The national and provincial building codes require conformance to the standard CSA A23.4 for precast concrete materials and construction when it comes to structural and architectural precast concrete.

CPCQA is a nationally recognized and accepted certification program that provides an independent third-party certification of conformance to the CSA A23.4 standard.

The CPCQA certification program requires precast concrete manufacturers to meet the requirements of the latest editions of CSA Standard A23.4 and the PCI Quality Control Manuals MNL-116 and 117 (US equivalent), with the more stringent requirements being the governing criteria.

Manufacturers are audited to all the requirements in CSA A23.4, as well as the applicable material and production requirements in CSA A23.1 and CSA A23.2 that apply to precast concrete.

Certified plants are audited annually with at least two unannounced audits. Strict compliance with published standards is necessary to maintain certification. Certification confirms a manufacturer’s capability to produce quality products and systems.

**CPCQA = National Standards + Industry Best Practices + Superior Quality Assurance Processes**

For all public building and infrastructure projects, there is a building code that governs, and that code more often than not refers to product standard requirements according to CSA Standards (or a provincial / more local standard of which CSA Standards are the foundation).
In designing and executing a certification program founded on excellence, CPCQA’s program includes the minimum required by the relevant standards PLUS it raises the bar above those minimums and asks that all plants achieve additional mandatory industry best practices through special advisories embedded in the certification process.

CPCQA certification program audits check, at an instance in time, that a precast plant is capable of:

- Meeting the minimum requirements of the noted standards,
- Meeting additional industry best practice requirements relevant to that type of precast,
- Operating with superior quality assurance practices integrated through the production process.

**CPCQA Product Range... more than just Structural / Architectural... Drainage Products as well!**

As an owner / agency / specifier, how nice would it be to take the time to get familiar and confident with the value and assurance delivered by one certification program and be able to specify it across a full breadth of precast concrete products?

This is now possible with CPCQA.

No other certification program in North America offers this type of depth or breadth of product certification:

- Concrete Pipe CSA A257, ASTM C14, ASTM C507, ASTM C76, AWWA C302;
- Manholes CSA A257, ASTM C478, OPSS 1351;
- Box Sections CSA A23.4, OPSS 1821, ASTM C1433,
- Headwalls OPSD 804.030, 804.040
- Septic Tanks CSA B66
- CSA A23.4 - Precast concrete - Materials and construction, all categories (Architectural, Bridge, and Commercial)
- PCI MNL 116 (US) - Manual for Quality Control for Plants and Production of Precast and Prestressed Concrete Products.
- PCI MNL 117 (US) - Manual for Quality Control for Plants and Productions of Architectural Precast Concrete Products.
- PCI MNL 135 (US) – Tolerance Manual for Precast and Prestressed Concrete Construction.

For municipal agencies / specifiers – have no fear. Municipal Engineers Association is represented on the QAC and all elements of precast potentially specified by municipalities fit within the breadth of our program, including but not limited to curbs, planter boxes, retaining walls, stairs/steps, reinforced Earth Wall Precast panels, utility boxes/vaults, and water valve chambers.
Excellence in Auditing and Technical Advice

Understand what you are auditing. Coach for continuous improvement.

Too often in the realm of audits, auditor roles get reduced to that of “check-list readers”. However, real value in quality assurance auditing is achieved when:

• The auditor has in-depth industry experience and is capable of visually identifying program requirements in action in a facility without auditee-guidance, and
• The auditor knows what best industry practices look like in reality in a precast concrete facility and can coach/teach a facility team how to reach them.

CPCQA is proud to have engaged auditing firms highly capable of delivering on these two noted and truly differentiating qualities in precast concrete certification and who are recognized industry-wide for their ongoing commitment to providing objective and impartial precast plant auditing services.

Kassian Dyck & Associates, Consulting Engineers (www.kdassociates.com) was established in 1994 and has extensive experience with precast concrete. Their experienced professional engineers have wide-ranging, directly applicable industry expertise and audit precast manufacturing facilities throughout Canada.

PROCHK Engineering Inspection Inc., (PEI; prochkeng@gmail.com) is a Canadian engineering service company providing engineering services across Canada since 2008. The PEI team has more than 75 years combined experience in Quality Assurance, Construction Materials Testing/Inspection, Precast Concrete Engineering/Manufacturing, Civil, Environmental, Water and Waste Water Engineering and Construction.

Furthermore, CPCQA has also contracted a notable Technical Advisor to its program. With over 25 years of precast design, inspection, and certification experience, Dean Frank Associates, LLC (www.deanfrank.com) provides consulting in the areas of quality management systems, auditing/assessment, training and certification both domestically and internationally.

Audit & Auditor Impartiality

CPCQA has taken additional steps to ensure auditor objectivity, including but not limited to:

The audit-pre-payment policy of the program ensures that neither auditee nor auditor are influenced financially.

The ‘unannounced’ audit practice provides assurance that an auditor is getting a snap shot of typical of operations while auditing.

Additional in-plant audit time required before any product category or product standard addition.
Multi-Stakeholder Advisory Council

To have a program truly based on the highest level of industry best practices, you need to draw on their representative body of knowledge from across the AEC industry.

CPCQA’s Quality Assurance Council is a clear example of an industry expert cross-section. Program content is designed by and vetted through a multi-stakeholder council; the current makeup of which is highlighted in the table on Page 9.

The CPCQA Quality Assurance Council’s role includes:

1. Establishing auditing criteria and grading standards for the Program;
2. Providing administrative review to ensure that Program requirements are administered uniformly and are followed by all manufacturers;
3. Developing, reviewing and approving all literature related to the Program;
4. Initiating and overseeing ACO policies and manuals;
5. Making recommendations to the Board on the qualification standards and requirements for plant pre-qualification and certification applications;
6. Making recommendations to the Board on the qualification standards and requirements for accreditation of Accredited Certification Organizations.
The By-Laws of the organization also have specific seats assigned to categories of QAC members such that the representation remains balanced to represent the various areas of expertise that will contribute to an ongoing superior certification program founded on excellence and integrity.

CPCQA Quality Assurance Council

<table>
<thead>
<tr>
<th>COMPANY</th>
<th>CATEGORY</th>
<th>PROV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lafarge Precast</td>
<td>Producer</td>
<td>MB</td>
</tr>
<tr>
<td>Andrea Boddy Consulting</td>
<td>CPCQA</td>
<td>ON</td>
</tr>
<tr>
<td>ProChk Engineering</td>
<td>ACO</td>
<td>ON</td>
</tr>
<tr>
<td>Municipal Engineers Assoc</td>
<td>Municipal</td>
<td>ON</td>
</tr>
<tr>
<td>Dean Frank Associates LLC</td>
<td>Vice Chair</td>
<td>US</td>
</tr>
<tr>
<td>Strescon</td>
<td>Producer</td>
<td>NS</td>
</tr>
<tr>
<td>Saskatchewan Ministry of Highways</td>
<td>Government</td>
<td>SK</td>
</tr>
<tr>
<td>M.E. Hachborn Engineering</td>
<td>Engineer</td>
<td>ON</td>
</tr>
<tr>
<td>HGS Consulting</td>
<td>Engineer</td>
<td>ON</td>
</tr>
<tr>
<td>Kassian Dyck Associates</td>
<td>ACO</td>
<td>AB</td>
</tr>
<tr>
<td>Forterra Pipe and Precast</td>
<td>Producer</td>
<td>ON</td>
</tr>
<tr>
<td>Alberta Ministry of Transportation</td>
<td>Government</td>
<td>AB</td>
</tr>
<tr>
<td>Québec Ministère des Transports</td>
<td>Government</td>
<td>QC</td>
</tr>
<tr>
<td>Lafarge Holcim</td>
<td>Chair</td>
<td>ON</td>
</tr>
<tr>
<td>City of Oakville</td>
<td>Municipal</td>
<td>ON</td>
</tr>
<tr>
<td>Ministry of Transportation Ontario</td>
<td>Government</td>
<td>ON</td>
</tr>
<tr>
<td>Con Cast Pipe</td>
<td>Producer</td>
<td>ON</td>
</tr>
<tr>
<td>Bridge Check Canada</td>
<td>Engineer</td>
<td>ON</td>
</tr>
<tr>
<td>Manitoba Infrastructure</td>
<td>Government</td>
<td>MB</td>
</tr>
<tr>
<td>New Brunswick Transportation and Infrastructure</td>
<td>Government</td>
<td>NB</td>
</tr>
<tr>
<td>Royal Architectural Institute of Canada</td>
<td>Architect</td>
<td>ON</td>
</tr>
<tr>
<td>Knelsen – Precast Div</td>
<td>Producer</td>
<td>AB</td>
</tr>
<tr>
<td>The Prestressed Group</td>
<td>Producer</td>
<td>ON</td>
</tr>
</tbody>
</table>

CPCQA Quality Assurance Council (QAC) is an independent council. The council provides a formalized process that allows the QAC to create auditing and grading standards and apply them in a uniform and impartial manner. This reflects a true consensus of the precast concrete industry, government, the construction industry and its professionals.
Continuous Feedback and Addressing Client Concerns

CPCQA has two key client groups – the owners / agencies / specifiers who specify the program and the precasters who participate.

Both of these groups have formal methods for providing feedback to the Quality Assurance Council on the program. Addressing this feedback is a formal part of the QAC agenda at each of their three annual meetings.

If you are an owner or specifier and have a concern on the quality of the precast concrete from a CPCQA certified plant, the CPCQA website offers a Quality Concern Reporting Form that can be completed and submitted to the Managing Director of CPCQA at QACAdministrator@precastcertification.ca. All concerns are kept confidential within the Quality Assurance Council (QAC). They are discussed and addressed directly with the involved parties. CPCQA also appreciates receiving any suggestions / questions / concerns directly from the owner / specific community.

After each audit, plants are provided a post-audit survey. This survey provides feedback on an auditor’s consistency and impartiality and also collects any suggestions that the precaster may have regarding the program. This survey data is collected and reviewed by both the QAC and the CPCQA board two times per year.

The Program is Growing

Our program is not the cheapest available certification program.

Our program is not the easiest and fastest way for a precaster to attain certification.

But our program is growing because of its proven significant, consistent and reliable value to all stakeholders.

Precasters that realize the importance of committing to superior quality assurance practices through their operation are signing up every day. These precasters want to deliver consistent, superior quality to their clients. They want their operations audited to prove that they are capable of not only meeting minimum standards, but also capable of production methods that go beyond the minimums and follow industry best practices and superior quality assurance processes. These are the precasters that will support your best bang for your buck goals.
Helpful Specification Guide
Available for free download at:
https://www.precastcertification.ca/en/certification_specification/

Certification Validation and Online Certified Plant Lists
All certified plants are issued annual detailed certificates. For further validation value to owners / agencies, detailed information about certified plants is actively updated and securely maintained online by CPCQA in the certified plant listings, as follows:
https://www.precastcertification.ca/en/certified_plants/architectural-structural/

For more information, please visit www.precastcertification.ca/en/ or contact CPCQA directly at QACAdministrator@precastcertification.ca or 888-749-5123

Authors:
Dean Frank - Technical Advisor, CPCQA; Dean Frank Associates, LLC
Wayne Kassian - Canadian Certification Services; Kassian, Dyck & Associates
Dean Coffin - Canadian Certification Services; PROCHK Engineering Inspection Inc
Andrea Boddy - Managing Director, CPCQA; Andrea Boddy Consulting

Specifying Certification is a Critical Part of The National Building Code
Which is Even More Important Now in an Age of Climate Change
Specifying Certification is a Critical Part of The National Building Code

Which is Even More Important Now in an Age of Climate Change