Project Name:	Beton Mobile WINS- 3 OF 6 PROJECTS	**Start Date:**	2020-03-31
Project Number:	2010	**Completion Date:**	2020-07-31

Project Details:

Scientific or Technological Objectives:

Measurement	Current Performance	Objective	Has results?
Durability (x)	(not set)	(not set)	No
air (x)	(not set)	(not set)	No
slump (x)	(not set)	(not set)	No
temperature (x)	(not set)	(not set)	No
density / compression) (x)	(not set)	(not set)	No

The case examined 14 specific projects over a period of 3 taxation years. Ultimately 6 of these projects were found to be eligible

[71] Exhibit AI-1, which is a table detailing the expenses incurred in respect of each project.

[415] [THE JUDGE] I conclude that the activities carried out by BMQ in the context of projects B 10 18, B 11 04, B 11 07, B 12 01, B 12 03 and B 12 07 are SR&ED activities.

7) Project B-10-18: Develop a light self-compacting mortar for mobile concrete mixer
9) Project B-11-04: Analysis of the influence of binders and additives on the performance of self-placing concrete
10) Project B-11-07: Developing an ultra-fast setting mortar for installation in a marine environment
11) Project B-12-01: Development of fast-setting latex-free concrete
13) Project B-12-03: Development of quick-setting latex concrete screed
14) Project B-12-07: Development of repair product for roller compacted concrete

[6] Mr. Jacques Bertrand testified at the hearing. He is an engineer and also one of the founders of BMQ; he was president of BMQ at the relevant times. Gérard Dubé, engineer at BMQ, also testified at the hearing.

[7] The Canada Revenue Agency ("CRA") research and technology advisers ("CRT") , namely Mr. Cédric Durban, who examined the projects for the 2010 taxation year, and Mr. Karim Mimoune, who reviewed projects for the 2011 and 2012 taxation years, also testified. Mr. Durban obtained a doctorate in mechanical engineering in 1997. Mr. Durban began his career as a private consultant in SR&ED; in 2009, he joined the CRA and was working as a CRT with the CRA at the time of the audit. Mr. Mimoune holds a doctorate in mechanical engineering and has worked as CRT at the ARC since 2002.

A. EVIDENCE - CONTEXT OF PROJECTS
1) Business operated by BMQ
[10] Mr. Bertrand is an engineer by training and has been practicing this profession since 1967. He has worked for many years in the field of civil engineering for large projects such as James Bay and Churchill Falls, in which concrete was widely used. He also worked on the construction of the Montreal metro.

[11] Mr. Bertrand and two partners founded BMQ in 1979. Mr. Bertrand testified that at the time, there was a lack of companies capable of meeting the demand for smaller projects, or for more specific projects or for repairs.

[12] BMQ operates as a concrete supplier in the field of prepared and specialized concrete. This company is a leader in this field. Its clients are entrepreneurs who work for public or private construction sites. Most of BMQ's turnover comes from contracts in the public sector. Usually, before the awarding of a contract to BMQ, and particularly when a contract is awarded in the public sector, the concrete mixture to be supplied by BMQ to the contractor is pre-approved by the client and by the contractor, since concrete must meet minimum industry standards.

[13] BMQ supplies fresh concrete using mobile concrete mixers and not “drum concrete mixers”or conventional concrete mixers, which allows it to offer its customers innovative solutions and products to meet the various needs of these in the context of the realization and repair of concrete structures.

Field of Science/Technology:

Civil Engineering (2.01.01)

Project Name:	Beton Mobile WINS- 3 OF 6 PROJECTS	**Start Date:**	2020-03-31
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Project Details:

Intended Results:
Work locations:
Key Employees:
Evidence types:

Scientific or Technological Advancement:

Uncertainty #1: Technological uncertainty

2) Concrete
[16] Concrete is made up of several inputs: cement, sand, stone and drinking water. Various adjuvants can be added, such as entrained air, superplasticizers, colloidal agents and latex. These additives are added to give concrete certain characteristics, such as better resistance or better durability.

[17] BMQ has the recipes for around 300 concrete mixes and develops 15 to 20 per year. According to Mr. Bertrand, the possible combinations of the various inputs are extremely numerous since there are six or seven cements, 100 types of stones, a very large number of types of sand, and 500 to 1000 different additives. The dosage of each of these inputs can also be subject to variations.

[18] A concrete mixture must meet certain standards to be used on public worksites. For example, standard 3101 of the Specifications and General Specifications of the Ministère des Transports du Québec ("MTQ") must be reached. According to Mr. Bertrand, even when inputs have been known for a long time, the needs of the industry change and BMQ seeks to make new mixtures accordingly. In addition, minimum standards are evolving. Standard 3101 is reviewed annually and CSA (Canadian Standards Association) standards are reviewed every five years. For example, Mr. Bertrand explained that the compressive strength standards went from 35 megapascals to 50 megapascals between the 60s and today. In addition, BMQ does not necessarily limit itself to meeting the standards and may seek to improve products even when they already meet the minimum standards. Each concrete mixture must reach certain thresholds, and around twenty tests must be carried out in the laboratory for the mixture to be approved for use on a public site. These tests are aimed, for example, at checking the compressive strength, the chipping resistance and the permeability to chlorine ions.

[19] In addition, other tests are carried out directly on a site before pouring concrete. These tests are carried out while the concrete is still in the plastic state, that is to say while it is still in liquid form. This is an air test, a slump test and a temperature test, which take about ten minutes to do, and a compression / density test, i.e. taking samples in cylinders, which takes about fifteen minutes to do.

3) Research
[20] Mr. Bertrand testified that BMQ has been doing research and development since the end of the 1980s, either to create new products or to improve existing ones. New products are developed either at the request of customers or because industry standards have changed. Sometimes a project can be launched directly by the company, because it always seeks to remain competitive. Both Mr. Bertrand and Mr. Dubé and also Mr. Fournier (the master mechanic of BMQ) can decide to start a project.

[21] With regard to the approach followed by BMQ in the context of the various projects, Mr. Bertrand explained that the company works regularly with the MTQ and various universities. The starting point for a project is usually bibliographic research and discussions with colleagues, industry and university professors. However, the results of studies carried out in places like the United States are not necessarily directly transferable to Quebec, where winter must be taken into account to determine if a concrete is durable; Also, it must be taken into account that the concrete mixture is prepared in a mobile concrete mixer. Then, the hypotheses are fixed: for Mr. Bertrand, the hypotheses are the characteristics sought in a mixture, or, according to Mr. Dubé,

Technology or Knowledge Base Level:

Benchmarking methods & sources for citings:

Benchmark Method/Source	Measurement	Explanatory notes
Internet searches	20 sites / articles	

Patent searches	2 patents
Competitive products or processes	3 products
Similar prior in-house technologies	1 products / processes
Suppliers	3 products
Queries to experts	4 responses

Activity #1-1: Activity 1 (Fiscal Year 2020)

Methods of experimentation:

The case involved examination of 14 separate projects. 6 were deemed eligible & 8 ineligible.

We will examine the successful projects independently in projects 2011-2017.

OVERVIEW OF RESEARCH METHODOLOGY

[22] Subsequently, BMQ begins to test and continues the project if it looks promising after the first tests. BMQ has a laboratory with equipment - such as a balance, sagging cones, an air meter, cylinders, a washing tub, a cold room and a small mixer - to do certain tests. In the laboratory, the concrete is prepared as in a conventional concrete mixer. If a mixture is satisfactory, it must then be checked whether the results are similar when the mixture is produced in the mobile concrete mixer and whether the mixture meets the standards. BMQ uses its own concrete mixers to do this. Durability tests, like those of compressive strength, are carried out by independent laboratories.

[23] The direction research will take will then depend on the characteristics sought. For example, a specific adjuvant can be considered at the start of a project to achieve a certain standard. Mr. Dubé explained that, despite his expertise, he does not always find the solution to a problem on the first try. In addition, BMQ must redo the standard tests (air, slump, temperature and density / compression) to check if the standards are always met each time an element is modified in a mixture.

[24] Two stages must be successfully completed for a mixture to be satisfactory for BMQ. First, the standard air, slump, temperature, and density / compression (cylinder) tests are done in the laboratory; if the results are acceptable, this will be followed by chlorine ion permeability tests, chipping tests and freeze-thaw tests. If at the first stage the results are not satisfactory, BMQ will try to determine the causes and reformulate the mixture to then repeat the tests.

[25] The second step consists in calibrating the mobile concrete mixer and pouring the mixture to carry out the same tests again to ensure that the mixing in the mobile concrete mixer has not affected the characteristics of the mixture. According to Mr. Dubé, three people are required to carry out a test: a mobile concrete mixer operator, a technician qualified for taking samples and himself. Mr. Dubé testified that it took approximately two to three hours to calibrate the mobile concrete mixer.

[26] The analysis of the results is largely carried out by Mr. Bertrand and Mr. Dubé. A meeting with the employees involved in a project, including the technicians who operate the mobile concrete mixer and take samples, is convened when test results are received by the company, because these employees can have an idea about the causes of the failure of a test and must be made aware of the progress of a project.

[27] A project ends either when the objective is reached, or if the objective is not reached and no solution is envisaged to overcome the difficulties.

Results:

i) For the taxation year ending January 31, 2010: $ 3,521 for salaries, $ 427 for materials and $ 360 for costs of subcontractors;

ii) For the taxation year ending January 31, 2011: $ 37,668 for salaries, $ 2,520 for materials and $ 3,425 for costs of subcontractors;

iii) For the taxation year ending January 31, 2012: $ 44,192 for salaries, $ 4,433 for materials and $ 9,204 for subcontractor costs.

DOCUMENTATION:
[28] No report is written at the end of each project. However, Mr. Dubé completes Form T661 Request for Scientific Research and Experimental Development Expenses (“Form T661”) and submits it to the CRA. This form contains a description of the progress that BMQ has attempted to achieve, the obstacles that had to be overcome and the steps taken to implement a project.

[29] Mr. Bertrand explained that, during the years in dispute, he was personally involved in research activities with regard to the conception, design and development of research plans and that he attended conferences related to projects. He also personally participated in field tests, in laboratory at BMQ, as well as in universities.

[30] With regard to expenses, Mr. Dubé testified that, generally, the date, time and a brief description of the tests carried out within the framework of a project are noted in a notebook. Mr. Dubé admits that the notes kept will not necessarily be understandable for another civil engineer, but he is able to understand them and consult his computer files to determine what was done in a project.

[31] Each month, documents relating to a project, such as handwritten notes and emails, are given by the employees to Mr. Dubé, who compiles the hours of work spent on each project in BMQ's computer system. Only employees paid according to hours worked fill out time sheets, which excludes Mr. Bertrand, Mr. Dubé and Mr. Fournier. To calculate the hours spent working on a research project, Mr. Bertrand indicates the time he has spent on a project and gives it to Mr. Dubé, who compiles the hours. Mr. Dubé testified at the hearing that he rounded up the hours indicated on the time sheets.

TIMING OF EVENTS:

DATES OF THE HEARING: April 8, 9, 10, 11 and 12 and May 29, 30 and 31, 2019

REASONS FOR JUDGMENT BY: The Honorable Justice Dominique Lafleur

DATE OF JUDGMENT: December 11, 2019

Conclusion: