

Docket: 2018-4287(IT)I

BETWEEN:

ATELIER BÉTON INC.,

Appellant,

and

HER MAJESTY THE QUEEN,

Respondent.

[OFFICIAL ENGLISH TRANSLATION]

Appeal heard on October 19, 20 and 21, 2020, at Montréal, Quebec

Before: The Honourable Justice Réal Favreau

Appearances:

For the appellant:

Yves Hamelin

Counsel for the respondent:

Renaud Fioramore-Beaulieu

JUDGMENT

The appeal from the reassessment dated September 5, 2017, concerning the appellant's 2015 taxation year is dismissed without costs in accordance with the attached reasons for judgment.

Signed at Montréal, Quebec, this 27th day of January 2022.

“Réal Favreau”

Favreau J.

Translation certified true
on this 2nd day of March 2022.

Michael Palles

Citation: 2022TCC2
Date: 20220127
Docket: 2018-4287(IT)I

BETWEEN:

ATELIER BÉTON INC.,

Appellant,

and

HER MAJESTY THE QUEEN,

Respondent.

[OFFICIAL ENGLISH TRANSLATION]

REASONS FOR JUDGMENT

Favreau J.

[1] This is an appeal from a reassessment made under the *Income Tax Act*, R.S.C. 1985, c. 1 (5th Supp.), as amended (the “Act”), by the Minister of National Revenue (the “Minister”) dated September 5, 2017, concerning the appellant’s 2015 taxation year.

[2] By this reassessment, the Minister disallowed the appellant’s deduction of \$63,134 claimed as scientific research and experimental development (“SR&ED”) expenditures, as well as the investment tax credit (the “ITC”) of \$23,822 for the 2015 taxation year.

[3] The SR&ED expenditures and the ITC claimed by the appellant concerned the following projects:

- (a) the development of portable modular concrete panels; and
- (b) the improvement of a process for mixing and pouring concrete.

[4] To establish the amount of the deductible SR&ED expenditures and the amount of the ITC for the appellant’s 2015 taxation year, the Minister relied on the following assumptions of fact:

- (a) the appellant is a company incorporated on January 1, 2008, under the Quebec *Companies Act*, Part 1A, CQLR c. C-38;
- (b) the appellant is a company specializing in the development of different concrete products for various commercial and residential applications, such as panels, boards, floors, bathroom tools, etc.;
- (c) the appellant's fiscal year ends on December 31;
- (d) the appellant elected to use the proxy method of calculating its qualified SR&ED expenditures for ITC purposes for its 2015 taxation year;

Development of portable modular concrete panels

- (e) the objective of the project claimed by the appellant was to manufacture transportable concrete panels, the thickness of which was to be reduced by half compared to those manufactured in the conventional manner, while ensuring these new panels are produced
 - i. without warping;
 - ii. without generating fractures;
 - iii. with a compressive strength equal to or greater than that of panels made with conventional concrete;
 - iv. with superior physical properties in terms of quality of finish, porosity and mechanical strength;
- (f) in carrying out this project, the appellant encountered technical uncertainties with respect to the choice of the following:
 - i. proportions of ingredients for the concrete mix;
 - ii. chemical additives;
 - iii. types of fibres to obtain the desired surface finish and mechanical properties such as weight, porosity, compressive strength;
 - iv. method of panel manufacturing;
- (g) in attempting to resolve the above-mentioned technical uncertainties, the appellant used a trial-and-error approach (deduction), involving the testing and experimentation of

- i. different concrete mix formulations by applying different types of chemical additives and fibres, such as nylon, metal, cardboard, glass sand, etc.;
- ii. a basic formulation using a new type of very thin fibre purchased in Japan;
- iii. different preparation methods;

(h) the work claimed by the appellant also includes the following:

- i. the making of a polymer mould for approximately 100 casts;
- ii. modifications to the mould;
- iii. addition of a standard cure sheet;
- iv. watering during curing;
- v. demoulding time;
- vi. application of a mould release agent;
- vii. addition of a sealant to prevent warping after a period of three weeks;
- viii. reduction in thickness to minimize internal stresses;

(i) the appellant has in no way identified or encountered any limitation in current technology and/or science for the development of concrete mixes and methods of manufacturing concrete panels;

(j) the current state of science or technology, in the field of civil engineering, was sufficient to overcome the technical uncertainties encountered by the appellant;

(k) in its test log, the appellant made observations, for each of the tests, that do not demonstrate any measurements, hypotheses or analysis of a scientific or technological nature regarding, among other things, the following:

- i. warpage as a function of time;
- ii. the method of incorporation of unknown compounds;

- iii. the relationship between the science or technology underlying the development of concrete panels and the unsatisfactory results of these tests;

(l) the appellant has made no attempt to

- i. generate information or discover knowledge that contributes to the understanding of the scientific relationship or technology underlying the development of concrete panels;
- ii. advance any technology or science underlying the development of concrete panels;

Improvement of a concrete floor mixing and pouring process

(m) the objective of the project claimed by the appellant was to improve the mixing and pouring process for polished concrete floors in order to reduce the visibility of aggregates while

- i. maintaining a compressive strength of 30 to 50 MPa;
- ii. eliminating cracking;
- iii. controlling the appearance of surface aggregate, surface colour and uniformity, etc.;

(n) the appellant encountered uncertainties of a technical nature with respect to the selection of the following:

- i. proportions of ingredients for concrete mix design to achieve a polished, crack-free surface with good colour;
- ii. chemical additives;
- iii. the casting method to achieve the desired appearance and mechanical properties;

(o) in attempting to resolve the above technical uncertainties, the appellant used a trial-and-error approach involving, among other things, the following:

- i. the development of
 - different concrete formulations by changing the percentage of ingredients;

- a concrete recipe with few surface aggregates;
 - ii. the modification of the formulation by adding the following:
 - superplasticizer additive;
 - fly ash;
 - shrinkage reducer;
 - iii. testing of different formulations and casting processes in the laboratory;
 - iv. testing of the formulation and pouring of concrete at a commercial site;
- (p) the appellant has not identified or encountered any limitation in the current technology and/or science for the development of a new mixing and pouring process for polished concrete floors;
- (q) the current state of science or technology, in the field of civil engineering, was sufficient to overcome the technical uncertainties encountered by the appellant.
- (r) for each of the tests, the appellant made observations that do not demonstrate any measurement, hypothesis, or analysis
- i. that is scientific or technological in nature;
 - ii. that pertains to the relationship between the science or technology underlying the concrete floor mixing and pouring process and the unsatisfactory results of these tests;
- (s) the appellant made no attempt to
- i. generate information or discover knowledge that contributes to the understanding of the scientific relationships or technology underlying the concrete floor mixing and pouring process;
 - ii. advance any technology or science underlying the mixing and pouring of concrete floors.

[5] Mr. Frédéric Tremblay, president and owner of the appellant, testified at the hearing. Mr. Tremblay holds a bachelor's degree in history and geography education and a bachelor's degree in administration. He is the son of a cement applicator.

[6] Mr. Tremblay started his company in 2005 by manufacturing concrete countertops.

[7] In February 2014, Mr. Tremblay hired a chemical engineer, Mr. Benjamin Bousquet, a French national, as a consultant. Mr. Bousquet was, with Mr. Tremblay, the main contractor for the appellant's research and development activities. In July 2015, Mr. Bousquet became a full-time employee of the appellant and remained there until July 2016. In July 2016, Mr. Bousquet ceased to be an employee of the appellant but continued to work for the company as a consultant. Mr. Bousquet unfortunately passed away in 2017 following an accident in Colombia.

[8] In 2015, the appellant made its first SR&ED and ITC claim in respect of its two research projects, namely the portable modular concrete panels and the mixing and pouring process for polished concrete floors (terrazzo).

[9] The appellant filed its SR&ED claim using the T-661 form and its ITC claim using Schedule 31 to its T2 income tax return. The appellant filed additional information on March 29, 2017, including a summary of the tests for the panel project, a summary of the experimental conditions per test for the floors, a summary of the expenses per project (salaries, materials consumed, subcontracting, etc.), a description of tasks for each employee involved in the research activities, and invoices for materials and for diamond polishing and sanding of floors.

[10] On April 24, 2017, officials of the Canada Revenue Agency ("CRA") visited the appellant's shop and discussed the research projects with Mr. Tremblay. The CRA's SR&ED Review Report was signed on June 5, 2017, and the appellant's claim was disallowed. Hence, this dispute.

[11] In his testimony, Mr. Smith provided valuable and extensive information regarding the technical challenges faced by the appellant in its two research projects and the methods used by the appellant to solve them. In so doing, Mr. Tremblay demonstrated his knowledge and experience in the field of concrete.

[12] Regarding the modular panel project, Mr. Tremblay recalled that the objective of the project was to manufacture portable concrete panels that were half the thickness of conventionally manufactured panels, and that were free of warping, did not generate fractures, and had a compressive strength equal to or greater than that of panels manufactured with conventional concrete. The desired panel size was 4 feet by 8 feet, having a thickness of ¼ inch.

[13] To achieve its objective, the appellant carried out the following work, among others:

- the development of different concrete mix designs;
- the development of formulations using different types of fibres, such as nylon, metal, cardboard, glass sand, etc.
- the development of a formulation using a new type of very thin fibre purchased in Japan;
- tests with different types of mixtures with different fibres and different chemical additives to find recipes to obtain the desired characteristics in terms of finish quality, porosity and mechanical resistance, without warping and without cracking of the panels;
- tests with different types of moulds and different demoulding and concrete treatment techniques to avoid efflorescence.

[14] In developing the panels, the appellant encountered the following technical problems which are also described in the CRA's SR&ED Review Report:

- the choice of ingredient proportions for the concrete mix;
- the choice of chemical additives;
- the choice of fibre types to obtain the desired surface finish and mechanical properties, such as weight, porosity, and compressive strength;
- the choice of the panel manufacturing method.

[15] With respect to the project of mixing and pouring of polished concrete floors, the technological objective was to improve an existing process of mixing and pouring of polished concrete floors in order to reduce the visibility of aggregates to 1 mm, while increasing the compressive strength from 30 to 50 MPa.

[16] In order to achieve these objectives, the appellant faced two major challenges:

- (a) developing a mixing and casting process so as to reduce cracking to zero; and
- (b) determining chemical and physical parameters to control the appearance of surface aggregates and to better control the colour and uniformity of the surface.

[17] In 2015, the appellant completed the following work, among others, which is described in the CRA's SR&ED Review Report:

- the development of different concrete formulations by changing the percentage of ingredients;
- the development of a concrete recipe with low surface aggregate;
- the modification of the formulation by adding an additive which is a superplasticizer;
- the modification of the formulation by adding fly ash;
- the modification of the mix design by adding a shrinkage reducer;
- formulation tests and concrete pouring tests on a commercial site;
- the analysis of the results obtained in the laboratory and at a commercial site.

[18] In carrying out its research activities, the appellant encountered the following technical problems also described in the CRA's SR&ED Review Report:

- the choice of proportions of ingredients for forming the concrete to achieve a polished, crack-free surface with good colour;
- the choice of chemical additives;
- the choice of pouring method to obtain the desired appearance and mechanical properties.

[19] In his testimony, Mr. Tremblay insisted that the research activities for both projects were not carried out by trial and error as claimed by the CRA. According to him, the appellant adopted a systematic approach in carrying out its work, as evidenced by the experimental test sheets prepared by Mr. Bousquet for the modular panels and by himself for the polished concrete floors.

[20] For each hypothesis, a concrete formulation was identified, chronologically, and evaluated from specific moulds prepared according to a methodology whose conditions met both basic techniques and experimental modifications. After each test, the results, conclusions and follow-up activities were noted by hand.

[21] In his testimony, Mr. Tremblay also referred to the fact that in the modular panel project, there was no documentation on the approach to be taken and consultations with concrete formulation specialists proved to be unsuccessful.

According to Mr. Tremblay, the recognized knowledge in the field of concrete technology was not sufficient to determine the physical and chemical parameters necessary to obtain thinner, yet stronger, portable modular panels. In the case of the polished concrete floor project, there was indeed a large technical knowledge base for solving problems in the concrete sector, but little of it was related to the development of a new composite material from a process and a combination of products with unknown properties. Often the technical knowledge in this area was the result of research conducted in academia that was not publicly available owing to confidentiality agreements with companies or that could only be accessed through licensing at a cost that would be prohibitive for a company of the appellant's size.

The expert

[22] The respondent mandated David Migneault to assess whether the work performed by the appellant in the context of its two research projects during the period from January 1, 2015, to December 31, 2015, constituted SR&ED. Mr. Migneault was recognized as an expert in chemistry related to the manufacture of concrete products, such as those manufactured by the appellant.

[23] Mr. Migneault testified that he carried out his mandate objectively and independently and stated that he never saw, or took into account, the report of the CRA's research and technology advisor.

[24] In his view, neither of the appellant's two research projects fits the definition of research and experimental development in subsection 248(1) of the Act because the five questions set out in the leading case of *Northwest Hydraulic Consultants Ltd. v. The Queen*, 1998 CanLII 553 (TCC), namely,

Q1: Was there scientific or technical uncertainty?

Q2: Were hypotheses specifically aimed at reducing or eliminating that uncertainty formulated?

Q3: Did the overall approach taken accord with a systematic investigation or research, including the formulation and testing of hypotheses through experiment or analysis?

Q4: Did the overall approach adopted aim to achieve a scientific and technological advancement?

Q5: Was a detailed record of the hypotheses tested, and results kept as the work progressed?

must be answered in the negative for both projects.

[25] More specifically, with respect to the modular panel project, Mr. Migneault made the following comments:

- the panel that the appellant is seeking to develop is a larger version than the one it already had in its available products (fibre-reinforced “concrete” panels measuring 2’ x 4’ and $\frac{1}{2}$ or $\frac{3}{4}$ of an inch thick);
- with the materials available, including admixtures, publicly available knowledge of curing, and experience gained by the appellant in developing previous products, the appellant could obtain a panel at the target size of 4’ x 8’ with a thickness of $\frac{1}{2}$ to $\frac{3}{4}$ of an inch;
- at each stage of its work, the appellant proceeded by applying known solutions to solve the technical problems encountered, without making hypotheses intended to address an uncertainty;
- owing to the lack of resources, the appellant did not examine the possible causes of its failures;
- the appellant did not produce records of the bending strength of its panels;
- the series of tests to determine the amount of fibre is found in the experiment sheets without each test described being accompanied by quantitative measurements of the effect of adding fibre to the cement formula, and the types of fibre are not identified in those tests;
- the type of cement used in the tests is indicated in the records but varies throughout the tests between three types and a combination of two of them without any explanation of the objective in making those changes, with one exception;
- the appellant did not attempt to find the cause of the moulds’ lack of durability;
- no quantitative measurements were reported in the project description or in the experiment sheets;

- the methods of measuring mechanical resistance (in compression and bending) were not identified and the values were not reported;
- for several tests, the formulation (quantity of cement, water and fibres) is not provided. In most cases, only the amount of cement (in terms of pockets) is given.

[26] Regarding the proposed mixing and pouring process for polished concrete floors, Mr. Migneault made the following comments:

- concrete floors, even polished ones, are not a new product on the market. This field is regulated. Public knowledge and existing standards provided sufficient information to develop a manufacturing process or to improve this type of product;
- from the initial formulation established by what is known in the field, the appellant then formulated informed hypotheses to achieve the desired characteristics of the product, polished concrete floors;
- the problems encountered were technical in nature. Some of the problems were solved by solutions known in the field: the use of a shrinkage reducing agent and curing sheets to reduce surface cracks. Other solutions, such as the addition of fly ash causing undesirable staining, were simply bypassed or abandoned;
- for this project, the type of client used is not indicated anywhere. Looking at the invoices, most of the cement purchased for the projects is a specialized type of cement for exterior structural repairs;
- the type of water used in the tests is not indicated;
- there are several possible causes for the bleeding observed during the first test: too much water, improper handling after pouring, or a setting time too long for cold weather. Only one cause was explored: water reduction;
- in order to increase the fluidity of the concrete, the appellant decided to add a superplasticizer. Superplasticizers have the property of making the concrete more fluid (plasticizing effect) and increasing the strength of the concrete (compressive strength) owing to the water reduction allowed by their use. The use of the product designed for this purpose gives the expected result and does not constitute an advance;

- in tests Nos. 5 and 6, fly ash is added to reduce cracks. An invisible colouration develops as it dries. The appellant did not investigate the cause of the problem and decided to simply remove the ingredient from the product formulation;
- in test No. 7, fly ash was removed from the formulation and replaced with a shrinkage reducing agent, a product known to also decrease cracking;
- the cement used primarily (FA-56) appears to contain an air entrainer (foaming agent). The shrinkage reducer will reduce this effect but is not sufficient on its own, hence the use of the curing sheet. Therefore, the problems of cracks on the surface of the concrete and pores observed were solved with solutions that are known in the field and do not represent an advance;
- for the reproducibility tests carried out, experimental sheets are not provided and no results are reported;
- the appellant acknowledges that, owing to the lack of resources, not all possible causes of the failures were examined;
- the type of superplasticizer used, naphthalene type, is a second-generation concrete plasticizer with intermediate water reduction capacity. Third generation water reducers were available at the time. They offer superior water reduction while increasing the compressive strength of the concrete. This type of concrete is referred to as UHP (Ultra High Performance) concrete and is used by the appellant today. The appellant has increased its knowledge base of the products available on the market and of concrete handling. This is a learning curve and does not constitute an advancement;
- the work was intended to support the appellant's learning in the manufacturing of an existing product on the market, i.e., polished concrete floors;
- although a record exists (the experiment sheets), it does not contain any hypotheses, nor does it contain all the measurements needed to establish a cause-and-effect relationship in the parameters explored;
- several important measurements, such as setting time, time between pours, surface hardness measurement and concrete strength (compressive strength) are not reported or are missing.

[27] Mr. Migneault heard Mr. Tremblay's testimony at the hearing, but the technical information provided by Mr. Tremblay was not sufficient to convince him that the appellant's research projects were eligible for the SR&ED program.

Issue

[28] The issue is whether the activities carried out by the appellant in the two research projects in dispute constitute SR&ED within the meaning of the Act. If the activities carried out by the appellant in respect of either of the two projects qualify as SR&ED, then it will be necessary to determine whether the expenditures incurred by the appellant in connection with one or both projects are deductible expenditures under section 37 of the Act, as well as qualified expenditures for the purposes of calculating the ITC under subsection 127(5) of the Act.

Burden of proof

[29] The onus is on the appellant to show, on a balance of probabilities, that (1) the research activities meet the definition of SR&ED and (2) the expenditures incurred by the appellant are deductible SR&ED expenditures under section 37 of the Act and qualified expenditures for the purpose of calculating the ITC. Strong documentary evidence is generally required for this purpose but is not mandatory.

[30] The research expenditures claimed by the appellant for the 2015 taxation year have been audited by the CRA and are not admitted by the respondent.

The law

[31] The term "SR&ED" is defined in subsection 248(1) of the Act in the following manner:

Scientific research and experimental development means systematic investigation or search that is carried out in a field of science or technology by means of experiment or analysis and that is

- (a) basic research, namely, work undertaken for the advancement of scientific knowledge without a specific practical application in view,
- (b) applied research, namely, work undertaken for the advancement of scientific knowledge with a specific practical application in view, or
- (c) experimental development, namely, work undertaken for the purpose of achieving technological advancement for the purpose of creating new, or

improving existing, materials, devices, products or processes, including incremental improvements thereto,

and, in applying this definition in respect of a taxpayer, includes

(d) work undertaken by or on behalf of the taxpayer with respect to engineering, design, operations research, mathematical analysis, computer programming, data collection, testing or psychological research, where the work is commensurate with the needs, and directly in support, of work described in paragraph (a), (b), or (c) that is undertaken in Canada by or on behalf of the taxpayer.

but does not include work with respect to

(e) market research or sales promotion,

(f) quality control or routine testing of materials, devices, products or processes,

(g) research in the social sciences or the humanities,

(h) prospecting, exploring or drilling for, or producing, minerals, petroleum or natural gas,

(i) the commercial production of a new or improved material, device or product or the commercial use of a new or improved process,

(j) style changes, or

(k) routine data collection; (*activités de recherche scientifique et de développement expérimental*)

(1) Analysis

[32] In *Northwest Hydraulics Consultants Ltd. v. Canada*, [1998] T.C.J, No. 340 (QL), Justice Bowman (as he then was) formulated, on the basis of the Information Circular 86-4R3 of May 24, 1994, entitled “Scientific Research and Experimental Development”, five criteria to determine whether the work constitutes SR&ED. These criteria must all be met in order for the research to qualify as SR&ED. The criteria are set out in question form in paragraph 24 above and are part of the questions that the expert retained by the Minister of Justice Canada was asked to answer as part of his mandate.

(1) Was there scientific or technical uncertainty?

[33] In light of the testimonies and the documentary evidence submitted, I am of the opinion that neither of the appellant's research projects involved any scientific or technological uncertainty allowing it to describe its experimental development work as SR&ED.

[34] The appellant adopted standard practices to resolve the technical difficulties encountered at each stage of the development of its products.

[35] As Justice Lafleur aptly stated in *Béton Mobile du Québec Inc. v. The Queen*, 2019 TCC 278:

... creating a new product using techniques, procedures and data that are generally accessible to competent professionals in the field is not SR&ED even if there is doubt concerning the way in which the objective will be achieved. In other words, the mere fact that a product does not exist does not necessarily support the inference that its development involves technological or scientific uncertainty (*Flavor Net Inc. v. The Queen*, 2017 TCC 179 (*Flavor Net*), paragraph 38) (para. 43).

(2) Hypotheses

[36] In *Northwest Hydraulics Consultants Ltd., supra*, Justice Bowman described at paragraph 16 a five-stage process for determining whether this second criterion has been met. The five steps are as follows:

- (a) the observation of the subject matter of the problem;
- (b) the formulation of a clear objective;
- (c) the identification and articulation of the technological uncertainty;
- (d) the formulation of an hypothesis or hypotheses designed to reduce or eliminate the uncertainty;
- (e) the methodical and systematic testing of the hypotheses.

[37] The evidence clearly demonstrated that this criterion was not met by the appellant in respect of its two research projects. The appellant did not conduct any systematic testing of the causes of the technical problems encountered at each stage of its research projects.

(3) Scientific method

[38] In determining whether this criterion has been met, it is necessary to consider whether the procedures adopted accord with established and objective principles of scientific method, characterized by trained and systematic observation, measurement and experiment, and the formulation, testing and modification of hypotheses (see para. 16 of *Northwest Hydraulics Consultants Ltd., supra*).

[39] The analysis of the evidence reveals that the Appellant did not adopt a scientific method in carrying out its research activities in connection with its two projects. Rather, the appellant proceeded to solve its technical problems by trial and error without attempting to understand or solve the problems associated with the technology used.

(4) Technological or scientific advancement

[40] The appellant succeeded in developing modular concrete panels and polished concrete floors that met the desired characteristics, but the appellant did so by using known technologies to solve the technical problems encountered. The overall approach taken was not intended to achieve a scientific or technological advancement.

(5) Detailed record

[41] Based on the evidence filed, the documentation (the experiment sheets) submitted by the appellant with respect to its two research projects is clearly insufficient. The clarifications provided by Mr. Tremblay in his testimony, albeit useful, cannot remedy this shortcoming.

Conclusion

[42] Based on the analysis of the five criteria set out above, I conclude that the activities carried out by the appellant in the course of its two research projects are not SR&ED.

[43] Accordingly, it is not necessary to consider whether the expenses claimed by the appellant with respect to said research projects are deductible expenses under section 37 of the Act and eligible expenses for the purpose of calculating the investment tax credit under subsection 127(5) of the Act.

[44] For these reasons, the appellant's appeal for the 2015 taxation year is dismissed without costs.

Signed at Ottawa, Canada, this 27th day of January 2022.

“Réal Favreau”

Favreau J.

Translation certified true
on this 2nd day of March 2022.

Michael Palles

CITATION: 2022 TCC 2
COURT FILE NO.: 2018-4287(IT)I
STYLE OF CAUSE: ATELIER BÉTON INC.
AND HER MAJESTY THE QUEEN
PLACE OF HEARING: Montréal, Quebec
DATE OF HEARING: October 19, 20, 21, 2020
REASONS FOR JUDGMENT BY: The Honourable Justice Réal Favreau
DATE OF JUDGMENT: January 27, 2022

APPEARANCES:

Agent for the Appellant: Yves Hamelin
Counsel for the Respondent: Renaud Fioramore-Beaulieu

COUNSEL OF RECORD:

For the Appellant:

Name: None

Firm:

For the Respondent: François Daigle
Deputy Attorney General of Canada
Ottawa, Canada