



# Research & Development

## A Tax Credit Case Study

### Manufacturing Systems Integrator

BBB Engineering is a family-run controls and systems engineering firm specializing in the design, programming, and installation of large conveyor and sortation systems for retail distribution centers. The Company is located in central Tennessee with offices in New Jersey and California. To successfully design and install these systems under fixed-price contracts, BBB relies on the wide-ranging expertise of its staff, which consists of systems engineers, controls engineers, software engineers, installation techs, electricians, and project managers. In 2019, the company's CPA recommended that ATS review its activities to see if there was

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### R&D Research Analysis

Diligentiam visited the Company's headquarters and New Jersey office to conduct multiple days of interviews and documentation gathering as part of its analysis. It was found that the Company provides various services for its clients, including controls engineering, full system design and integration, warehouse control software (WCS) development, and service maintenance. Many of the company's projects required some variation of all services except the latter. All of this work was done under fixed-price contracts.

Diligentiam found that BBB's projects required them to overcome multiple levels of uncertainty. From mechanical design and layout to PLC and WCS programming, BBB had to evaluate alternative design options at each step of the process. Additional uncertainty would be faced when attempting to install the system in a live environment, requiring further testing to correct deficiencies. Diligentiam also found that the Company's commitment to experimentation and problem solving was represented by the fact that it employed an internal R&D department dedicated toward exploring new technologies and utilized an in-house test loop conveyor system to prove concepts.



# R&D Credit Findings:

Having reviewed project activities and employee hours, Diligentiam found that substantially all of the engineering time at BBB would constitute a QRE. It also found that a fraction of other personnel involved in project development and support qualified as research. The resulting tax credits are highlighted in the following table:

<b>Year</b>	<b>Total Revenues</b>	<b>Total Qualified Wages</b>	<b>Qualified Material</b>	<b>Federal R&amp;D Credit</b>
<b>2015</b>	<b>\$22,505,663</b>	<b>\$2,476,682</b>	<b>N/A</b>	<b>\$247,668</b>
<b>2016</b>	<b>\$29,311,614</b>	<b>\$3,063,987</b>	<b>N/A</b>	<b>\$306,399</b>
<b>2017</b>	<b>\$29,958,478</b>	<b>\$3,379,256</b>	<b>N/A</b>	<b>\$337,926</b>
<b>2018</b>	<b>\$44,270,253</b>	<b>\$3,955,990</b>	<b>\$53,797</b>	<b>\$353,239</b>
<b>2019</b>	<b>\$48,855,956</b>	<b>\$4,409,155</b>	<b>\$36,845</b>	<b>\$378,536</b>

**Total Net R&D Tax Benefit: \$1,157,897**

**Total ROI with Diligentiam: 15:1**



# Qualified Research Activities:

- **Concept design and evaluation pre-contract award**
- **Systems engineering & layout design**
- **Throughput and rate calculations**
- **Throughput simulation**
- **Analysis of alternative system concepts**
- **Development of PLC architecture**
- **PLC programming**
- **Development of WCS architecture**
- **WCS software development**
- **Development of HMI architecture and logic**
- **Design and fabrication of panels**
- **Testing PLC code on in-house panels and test loop**
- **Development of wiring schematics**
- **Problem solving during mechanical/electrical installation**
- **Startup testing**
- **PLC revisions during startup**



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## Diligentiam

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