



# PROJECT WORK PLAN

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## AE CONSULTANTS - PASADENA RECPLEX

Project Plan for Krista Hancock  
Projects Engineer, AE Consultants

Prepared by: Jillian Butt, Matthew Doyle,  
Matthew Alexander, Ryan Coady

Engineering 8700 – Civil Design Project  
Instructor: Dr. Bruneau



*February 4<sup>th</sup>, 2013*



**Bravo Consultants**

Memorial University  
of Newfoundland

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St. John's, NL  
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February 4<sup>th</sup>, 2013

Krista Hancock  
AE Consultants  
341 Freshwater Road, Suite 202  
St. John's, NL  
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Subject: Pasadena Recplex

Dear Ms. Hancock;

Please find the enclosed Project Work Plan for the engineering design and construction of the Pasadena Recplex. The work plan has been prepared to facilitate the completion of the project within the prescribed deadlines.

The enclosed work plan outlines the tasks required as well as the methodology Bravo Consultants will use to complete the Recplex design. Information on expected deliverables and risks associated with the project are also included.

Should you have any questions regarding this work plan, Bravo Consultants would be pleased to discuss them with you.

Regards,  
Bravo Consultants

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Jillian Butt

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Matthew Alexander

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Ryan Coady

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Matthew Doyle

Attached: Pasadena Recplex Project Work Plan  
CC: Dr. Bruneau

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*Statement of Qualifications*

## 1.0 Project Description

The Pasadena Recplex is located in the town of Pasadena, Newfoundland. AE Consultants have hired Bravo Consultants to complete the design work of this fitness center, as well as a cost estimate of the design. Figure 1 shows the location of the Recplex



Figure 1: Aerial View of Project Location

The project consists of a one story building with three main fitness rooms; a gymnasium with full size basketball court, a multipurpose room with curtain walls and an area for change rooms. Figure 2 shows the basic layout of the building. The gymnasium is standard size of roughly  $730 \text{ m}^2$  while the other two main sections are  $360 \text{ m}^2$ . All three main structures are joined by a hallway, with the overall building in the shape of a Y.

Since the main areas of the building are large and square in shape, the client requires a cost comparison of pre-engineered buildings versus conventional steel. This will allow the client to make a decision on which construction method they should use to provide the most economic solution.



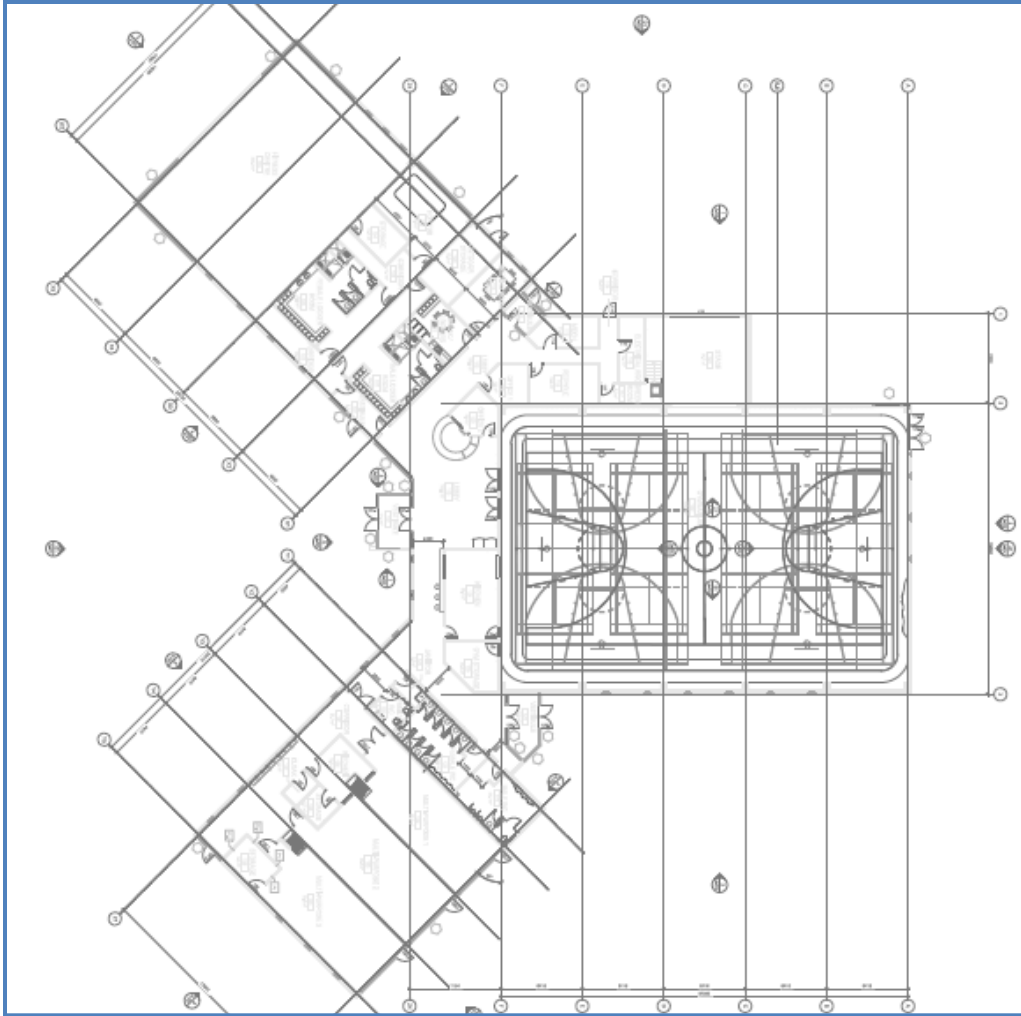


Figure 2: Main Floor Architectural Drawing

## 2.0 Project Requirements

Bravo Consultants will work directly with the engineers at AE Consultants to design a new Recplex center for the town of Pasadena. In order to achieve the desired result, the client has listed the following requirements:

- Design of the concrete foundations and slab on grade.
- Design a conventional steel structural frame to resist all possible loading on the building.
- Calculate the snow, wind, seismic and all other dead/ live loads on the designed structural frame, to ensure the building will withstand all elements.
- A class “C” estimate is to be conducted upon the completion of the frame design.

- A comparison to pre engineered building options for the Recplex will be required after the conventional steel estimate is prepared for comparison.
- Throughout the term weekly updates/ meetings with regards to the group's progress are required. As well as, at the end of the term a report containing all deliverables, including drawings of specific design elements, along with the group's recommendations from comparison to the pre engineered building.

## 3.0 Methodology

### 3.1 Project Approach

AE consulting has contracted Bravo Consultants to design a one storey building, which will house a gymnasium, a fitness centre, and a multi-purpose area. Bravo consultants have also been tasked with determining whether a conventional construction design or a combination of pre-eng buildings approach should be used. To determine the best option Bravo Consultants will prepare a cost estimate for the conventional construction option and get a quote from a pre-eng building fabricator to compare the prices.

When performing the estimate for the conventional construction method Bravo consultants have decided to split the estimate into four parts representing the three main parts of the building and the area that connects them. The three main building sections are the gymnasium, fitness centre, and multi-purpose area. This will allow Bravo Consultants to compare each part of the building separately with its pre-engineered counterpart.

### 3.2 Organization and Roles

To perform the required work in an efficient manner, Bravo Consultants has assigned roles to each member of the group. Although roles have been assigned, each group member will be expected to partake in each aspect of the project as well as overall quality control. This strategy encourages a learning environment and equal experience. The roles have been based mostly on previous work experience and can be seen below.



**Jillian Butt:**  
Project Manager  
Group Management  
Preparation of Deliverables  
Cost Estimating



**Matthew Alexander:**  
Project Engineer – Design  
Steel Design  
Project Scheduling  
Cost Estimating



**Ryan Coady:**  
Project Engineer – Drafting  
AutoCAD Drafting  
Steel Design  
Quantity Take Offs



**Matthew Doyle:**  
Project Engineer – Estimating  
Cost Estimation  
Steel Design  
AutoCAD Drafting

Bravo Consultants will meet several times throughout a normal work week to discuss the group's overall progress and assign tasks as they develop. Several individuals may be assigned to work on the same task if it is deemed too much for one individual. Bravo consultants will also meet weekly or bi-weekly with the client, AE Consulting.

### **3.3 Client Interaction**

Bravo Consultants main contact with AE consulting is Krista Hancock, with whom Bravo will have regular meetings either weekly or bi-weekly, tentatively scheduled for Wednesdays at 2:00 pm in the AE Consulting offices. The Client has supplied initial architectural drawings as well as a Geotechnical report, and stated that they will offer assistance as needed with respect to the design. The purpose of the meetings will be to inform the client of our progress and express any concerns. It will be the responsibility of Bravo Consultants to record the meeting minutes and send them to the client. The client may also be contacted via email for minor concerns.

### **3.4 Design Principles and Codes**

While performing all of the design requirements for the project, Bravo Consultants will make sure to adhere to all applicable design practices, codes, and standards. The following codes and standards will be used to assist in the design of the project.

- National Building Code of Canada, 2010
- CAC Concrete design Handbook, 3<sup>rd</sup> Edition
- CISC Handbook of Steel Construction, 10<sup>th</sup> Edition

If any other relevant engineering texts are used during the design process the client will be informed.

### **3.5 Cost Estimating Strategy and Level of Accuracy**

Bravo Consultants will prepare a class C estimate for the project (both the conventional steel design and pre-eng options), as was initially requested by AE consulting. A class C estimate is an indicative estimate with a required level of accuracy, which will be based on experience and information gained from the client. The quantity of materials to be used for the project will be determined after each step in the design process, making the preparation of a cost estimate after the design process has been completed more efficient. RSMeans will also be used in the determination of material unit prices as required.



### 3.6 Desired Outcomes

Bravo Consulting aims to provide AE Consulting with a high quality design of both options requested in a quick and professional manner. Upon Completion of the project, Bravo will have prepared a final report with a recommendation based on our findings for the Pasadena Recplex Fitness Centre design option. Also included will be other deliverables as specified in section 3.7 below.

### 3.7 Reporting and Deliverables

After meeting with the client to discuss the scope of work, Bravo Consultants has determined that the following requirements:

- All relevant Structural Calculations
- Structural Drawings
- Quantity Take Off (Both Options)
- Cost Estimate (Both Options)
- Final Report
- Final Presentation

### 3.8 Troubleshooting

Upon discovering any problems during the design process Bravo Consultants will attempt to resolve the issue independently. However if its determined that the issue will require external assistance Bravo will either look to the engineering faculty or the client to resolve it. Who Bravo contacts for assistance will depend on the nature of the problem.

## 4.0 Tasks

The Pasadena Recplex Project requires eight primary tasks to be completed by Bravo Consultants by the end of the term, which include: Layout of Steel Structure, Layout of Roof Trusses, Calculation of Loads, Design of Concrete Structure, Cost Estimation, Comparison to Pre Engineered Building, and Drafting.

## **4.1 Layout of Steel Structure**

Using the architectural drawings locate the load bearing walls and determine the location of columns for the structure.

## **4.2 Layout of Roof Trusses**

From the column locations the truss layout can be determined for the structure's roof spans.

## **4.3 Calculation of Loads**

In order to determine the sizes of the columns, girders, beams, trusses, and lateral bracing members the critical loading situations must be determined. The lateral bracing members and columns will depend on the governing scenario of wind or seismic for the chosen project site. The trusses, beams, girders, and columns depend on the vertical load situations which will be the critical combination of snow, live, and dead loads.

## **4.4 Design of Concrete Foundation**

The concrete foundation and flooring will then have to be designed based on the loads calculated in the above task, in order to properly support the structure/ loads.

## **4.5 Cost Estimation**

A Class "C" Estimation is required for the project, thus once all the structural elements have been designed a full quantity takeoff must be completed and matched with an RS Means data base for pricing per material unit.

## **4.6 Comparison to Pre Engineered Buildings**

The three main structures for the recplex could be constructed as pre engineered buildings instead of conventionally designed, however the Mezzanine section of the building will still be required to be designed and built conventionally.

## 4.7 Drafting

Upon completion of the structural design, structural engineering drawings will be required to submit to the client AE Consultants.

## 4.8 Task Matrix

The following matrix shows the primary tasks, sub tasks, allocation, duration and resources required to complete the Recplex project:

Primary Task	Sub Task	Allocation of Personnel	Duration	Resources Required
Layout of Steel Structure	Determine Load Bearing Walls	Ryan Coady, Matthew Alexander	1 Day	Steel Handbook
	Place Columns Accordingly	Ryan Coady, Matthew Alexander	1 Day	Steel Handbook
Layout of Roof Trusses	Design Truss Layout	Matthew Alexander	1 Days	S- Frame, Steel Handbook
Calculation of Loads	Snow Loads	All	1 Day	Course Notes (8705), NBC 2005
	Wind Loads	Matthew Alexander, Matthew Doyle	2 Days	Course Notes (8705), NBC 2006
	Seismic Loads	All	2 Days	NBC 2005
	Dead Loads	All	1 Day	NBC 2006
	Live Loads	All	1 Day	NBC 2007
	Design Members	Ryan Coady, Matthew Alexander	4 Day	Steel Handbook
Design of Concrete Foundation		All	5 Days	Concrete Design Handbook
Cost Estimation	Quantity Takeoff	Jillian Butt, Matthew Doyle	3 Days	Excel
	RS Means Estimation	Jillian Butt, Matthew Doyle	1 Day	RS Means
Comparison to Pre Engineered Buildings	Determine size of buildings required	Matthew Alexander	1 Day	
	Determine if different connections required	All	1 Day	Can AM
	Results of comparison and recommendation	All	1 Day	
Drafting		Ryan Coady	3 Days	Auto CAD

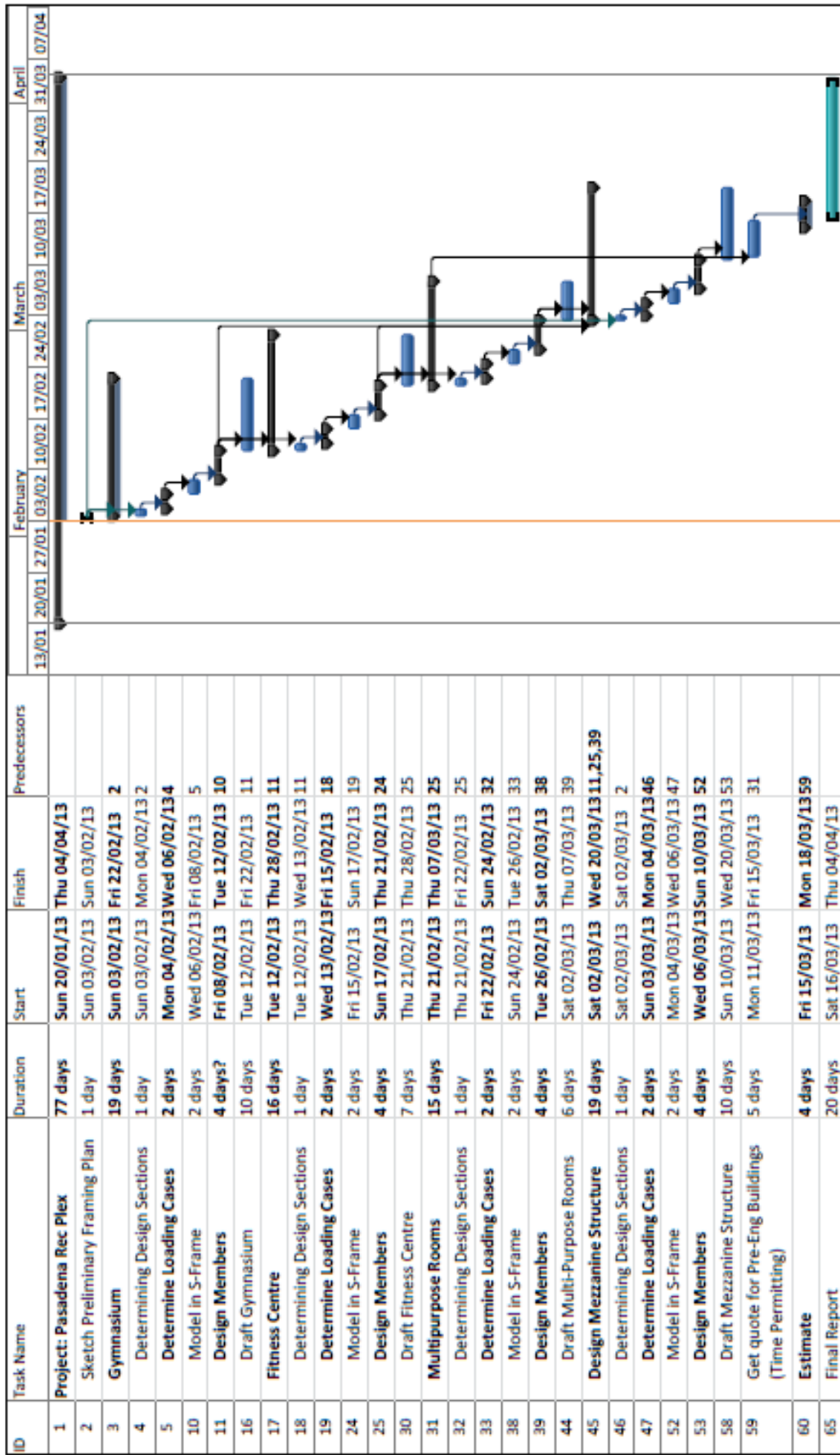
## 5.0 Project Schedule

A project schedule has been prepared for the Pasadena Recplex using Microsoft Project 2010 for use throughout the duration of the project. This schedule is based on the scope stated above where each task will be completed in their scheduled order but the task durations are rough estimates subject to fluctuations as the project progresses. Bravo Consultants initial schedule is

The work schedule starts on February 3, 2013 and runs until April 4, 2013 when the final presentations take place. Each of the three major parts of the building (Gymnasium, Fitness Centre and Multipurpose Rooms) will be designed separately and the mezzanine structure will be done once those are complete. Also following the design of the three major components a quote for a pre-engineered structure will be sought out and a comparison will be made between a conventional steel structure and a pre-engineered structure. The project report will be started once the design is complete and is scheduled to take up to 20 days. Finally, the completion of the design and drafting for the entire structure is scheduled for March 20, 2013 which leaves 15 days for any unexpected delays which may need to be dealt with while the report is being written.

The schedule will be followed and updated within Microsoft Project 2010 on a weekly basis to accommodate any changes in scope or change in anticipated task durations. Progress and any changes will be reported weekly in hard copy on Mondays at the regularly scheduled progress meeting.

Our current schedule is shown on the following page.



Task	External Milestone	Manual Summary Rollup
Split	Inactive Task	Manual Summary
Milestone	Inactive Milestone	Start-only
Summary	Inactive Summary	Finish-only
Project Summary	Manual Task	Deadline
External Tasks	Duration-only	Progress



## 6.0 Project Costs

Costs associated with the completion of this project are as follows:

- Plotted drawings - \$3.00 per 24"x36" sheet
- Printing and binding - \$30.00
- Log Books – 4 ea. @ \$6.00

**Total:           \$36.00 + Drawings**

## 7.0 Deliverables

Several deliverables are required for this project, either for the client or as a requirement of the course. Initially, a project plan and schedule is required, as well as meeting agendas and minutes. Once the project is complete, the client requires structural design drawings of the conventional steel option, as well as quantity take offs, and a class C estimate of this option. They also requested a cost estimate for pre engineered building sections. These requirements will be compiled into a final report and presentation.

Items will be delivered personally by one or more of the Bravo Consultants team to the AE Consultants main office on Freshwater Road, St. John's.

## 8.0 Project Risks

Bravo Consultants are committed to providing a high quality product and minimizing risk in all projects. With extensive planning and constant communication with both client and instructor, risks should be minimal. The foreseeable risks are as follows;

- Communication can be a risk between group members as well as with the client or instructors. This is minimized by frequent group and client meetings, as well as a weekly meeting with the instructors of this course.
- Not being able to have a site visit, due to the project location, will harm visualization. This will be countered by using map software.
- Computer software could cause delays depending on familiarity and availability.
- Lost time could occur due to weather delays and scheduling conflicts for team members (ie. Course examinations)

## 9.0 References

National Building Code of Canada 2010, (Ottawa: National Research Council of Canada, 2010)

Handbook of Steel Construction, (Canada: Canadian Institute of Steel Construction, 2010)

Concrete Design Handbook, (Canada: Canadian Standards Association, 2006)

Architectural drawings provided by AE Consultants



# **Appendix A**

## **Statement of Qualifications**



# STATEMENT OF QUALIFICATIONS



**BRAVO CONSULTANTS**

ENGI 8700

Faculty of Engineering and  
Applied Science

Memorial University of  
Newfoundland

St. John's, NL

A1B 3X5

**Our Mission** is to provide value through teamwork and dedication to achieve our client's expectations. At Bravo Consulting, we focus on providing innovative solutions while valuing our clients' civil and structural needs.

**We are** a team of senior civil engineering students From Memorial University of Newfoundland and Labrador who honour teamwork and take pride in our work. We have been working together as a team for over 3 years which has challenged us to adapt our roles in order to complete various projects.

## What we do

- Structural Design and Analysis
- Civil and Earthworks Design
- Project Estimating
- Project Management
- Drafting



Long Harbour Processing Plant, NL

## Our Experience

- Wuskwatim Hydroelectric Generation Project (Wuskwatim, MAN)
- Long Harbour Processing Plant (Long Harbour, NL)
- Pan Am Aquatics Centre (Scarborough, ON)
- Billy Bishop Pedestrian Tunnel
- SBM Atlantia (Houston, Texas, USA)
- Marine Service GmbH (Hamburg, Germany)
- Jeanne d'Arc Basin
- Business Park (Fort MacKay, AB)





**Jillian Butt** is a team leader who brings organization and attention to detail to each of Bravo Consultants projects. The majority of Jillian's experience is in hydro construction; estimating, cost analysis and field engineering, as well as compiling tender packages. Notable past experiences include:

- Completed quantity estimating and subcontractor quotes for a hydro dam tender package in northern Ontario
- Cost monitoring and analysis of the Long Harbour Processing Plant
- Field engineer for an earthfill dam in Wuskwatim, MAN.



**Matthew Alexander** has a diverse working experience that includes design of temporary earth retention structures, storm and sanitary sewer design, estimating and drafting. He has demonstrated through his experience an ability to learn and an attention to detail that enables him to solve problems effectively. Notable past experiences include:

- Estimating for Pan Am Aquatics Centre, Scarborough, ON
- Monitoring review, interpretation and field testing for Billy Bishop Pedestrian Tunnel
- Design of shaft adjacent to live train tracks, Toronto, ON



**Matthew Doyle** has completed work terms in structural design and analysis, project estimation and consulting. His work experience and technical knowledge provide many benefits and make him an asset to any project. Notable past experiences include:

- Structural design and analysis for SBM Atlantia in Houston, Texas, USA
- Project Estimation for several projects in Calgary, AB
- Engineering consultancy for Marine Service GmbH in Hamburg, Germany



**Ryan Coady** has worked throughout many sectors of civil engineering, including structural design, project management, estimating, drafting, and design. His ability to analyze the client's needs and draft the required designs is an asset to Bravo Consultants. Notable past experiences include:

- Lead statistical analyst of Jeanne d'Arc Basin's hydrocarbon potential
- Drafting and project coordination for the development of a new business park in Fort MacKay, AB
- Project management, drafting, and estimating for renovation projects in St. John's, NL



# Bravo Consultants

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