

Mott Electric GP

WATTS NEW

ISSUE 05 · April 2014



President's Message

Every day we read and hear of the promise of economic development throughout BC and how thousands of workers will be needed to complete proposed projects.

It makes for an interesting study and at times optimistic reading but as contractors, we tend to stay focused a little closer to the ground. Consulting with all the special interests groups doesn't play into the opportunities and challenges for our tasks at hand. We stay engaged and supportive of the projects that will keep our work force steady and employed long term.

Although, not all will agree, our livelihood depends on a vibrant, well-paid marketplace that includes those hot topics such as coal ports, pipelines, bulk loading, hydro projects etc. Those in turn fuel the need for commercial and residential projects and the accumulation of all this work will fund schools and hospitals etc.

So with a vein of optimism, I believe that the promise of work through 2014 to 2016 is gaining momentum and we can look forward to a reasonably high volume of construction work. Engineering is very busy, interest rates are low and developers are finding new ways to engage the buying public.

We are presently in a slower than normal pace but with the volume of breaking ground now and into 2015, it will not be long before we will be doing what we do best, wiring and wirelessing

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(MTI) with the best-trained employees in the industry. As we serve those clients that truly appreciate a quality, on time product in return for a decent wage and to ensure long-term viability for our employees and our company.

I ask for your patience over the next few months as we get our share of the above-mentioned projects.

Enjoy the summer in the best place in the world!

Danny Mott



Metrotower 3, Burnaby: Mott Electric did the complete electrical installation on the 27 storey office tower. Tenant electrical fit out is in progress on 6 floors. The 3 year project will be completed this year.

MANAGER'S CORNER:

Howard Smith, Manager Tennant Services, Vancouver



Cologix's 15,000 square foot data centre at 1050 West Pender was built to meet pent up demand and create a more efficient on-ramp to global networks and clouds.



1075 West Georgia Project: Equipment ready to be unloaded, and later being flown up to the 27th floor by a 475 foot crane.



1075 West Georgia Project: Single conductor cables from the secondary side of one of the transformers to the 600V distribution.

Cologix

Cologix operates data centres in Dallas, Columbus, Minneapolis, Toronto, Jacksonville, and Montreal and recently opened its second location in Vancouver after Mott Electric completed an installation of 200 IT cabinets. Cologix is the only data centre provider in Vancouver that focuses exclusively on colocation and interconnection.

The Cologix project saw us fit 15,000 square feet of space with 200 IT cabinets; complete with redundant 750KW UPS's and 1000KW generators. The job had some physical challenges. All the equipment had to be installed in the basement of the building, so it took some creativity. Our crew did an outstanding job.

Foreman Rick Corness Jr. said, "The job was much different than what the downtown crews are used to. The demo started in the beginning of October and the main contract was completed at the end of February. We crewed up to 19 guys at the job's peak and worked in 2 teams. We brought in guys from the Burnaby office with years of experience in this type of work - which definitely paid off. I would like to thank the entire crew for having a great work ethic and sticking through until the end. Special thanks go out to Jamie Rogers who was the B Foreman on site. His experience and expertise definitely played a huge role in how the job turned out." Corness Jr. adds, "Many of the guys had not seen this kind of work before and it was a great learning experience for us all!"

1075 West Georgia

Our downtown team just completed an eight-month High Voltage Equipment Upgrade on the 27th floor of 1075 West Georgia. Gord Denham was the Project Manager/Estimator. "There was no elevator access which complicated things. While the building was fully occupied and functional, we had to remove three oil filled transformers, four HV load break switches, the 600V distribution, the old MCC and then move in the new equipment – up to the 27th floor. We had to cut out a section of concrete wall to make an opening large enough to accept the equipment. Then we hired ProTech Industrial Movers who erected a 475 foot crane to lift the old equipment out and bring the new equipment up."

"We had two very tricky shutdowns. We replaced three transformers with two," said Denham. "During the first shut down we transferred the load onto an existing transformer, isolated some of the HV distribution and made a temporary 600V distribution. Then we could remove most of the old equipment. After the new equipment was tested and commissioned, we transferred the load to it. On the second shut down the load went to one of the new transformers. Then the remaining transformer came out with the old HV equipment." He adds, "We assembled the last transformer, terminated and swapped the loads. Now both transformers carry their respective loads."

Denham credits Henry Siemens, Ian Collins, Rasti Maymandi, Rick Corness Jr., James Kennedy and the rest of the crew. "Henry Siemens guided me through the process, so I can look at the next project and know that this is actually possible."

Amazon

Project Manager/Estimator Grace Kao worked with site foreman Bryce Fraser and assistant site foreman Scott Robin and their crew on a project for Amazon that wrapped up in March 2014. "Initially we provided them with three electrical budgets," said Kao. "We had two floors of tenant improvements including remove and relocate existing suspended fluorescent fixtures in the open ceiling concept, and provide new custom suspended fixtures in meeting rooms."

"For three and a half months we worked at each floor plan with two different addresses: 768 Seymour (Building C Plan) is a typical T-Bar ceiling with a concrete floor; and 555 Robson (Building A & B Plan) is an open ceiling with a raised floor plan. We faced challenges with the fire alarm systems, because no drawings were provided, no one knew about the systems and their engineering consultant was in Seattle. So, we worked with the building fire alarm supplier (Viking Fire Protections)," said Kao.

"Another challenge was we had to bring 4-4" conduits for the communication cables up from the 2nd floor to 3rd floor. The floor was 41" thick and one scan wouldn't do the job. We had to scan the top and bottom in order to core. But thanks to our crew we got it completed and the client was happy with our work," said Kao. "Now I am working to secure another Amazon project at TELUS Garden with GBS."

MANAGER'S CORNER (cont'd)

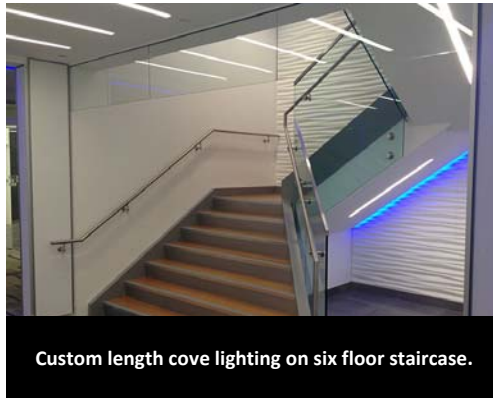


KPMG

Stephanie Phelps continues with nine floors of work for KPMG, including some of the latest LED and lighting control systems. She estimated the job and is the Project Manager.

"This is quite a large project for the Tenant Improvement Division, it's not often we're involved in a project that spans over four years to complete. We started in September of 2012 and we are about half done," said Phelps.

"This is a LEED Platinum project including a new Server Room, Cafeteria, and a six floor internal staircase. "The building is fully occupied so we are completing one floor at a time. We are working with brand new technologies. Every light fixture on the project is LED and we are using an innovative new 'nLight' lighting control system that utilizes Cat5e network cabling, and includes daylight harvesting, and occupancy sensors," said Phelps.

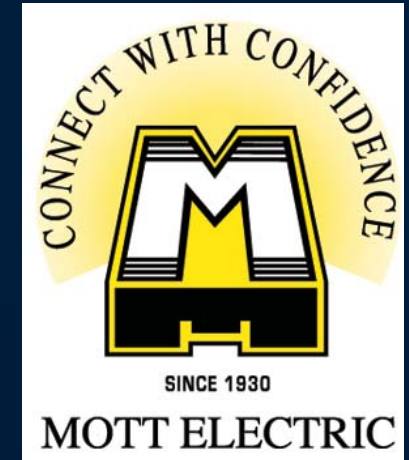


"Time is our biggest obstacle. All the lighting is new and high end, so the lead / manufacturing times are long, and the schedule per floor is quite short for the work involved. We are installing custom length cove lighting. These all need to be site measured, documented, and ordered in exact lengths - down to the millimeter." She adds, "They must fit precisely, around corners and at odd angles. There was a huge learning curve, especially on the network lighting controls. But as the job progresses we're getting more efficient, and more familiar with the technologies."

Phelps said, "Shawn Newcombe is our foreman on this project. He has been absolutely phenomenal. He works long hours – whatever it takes to get the job done. He's had a lot of great ideas, and has taken the time and initiative to learn a lot of new technologies. It's not every day we learn how to program lighting systems from a laptop computer, but on this job, that is the norm." She adds, "I also want to recognize Jay Hughes, an apprentice who's been with us on this project since day one. He's been a huge asset, especially his work on the nLight system."

"Thank-you to you and your team for your hard work on Amazon Phase 1. Your efforts were greatly appreciated."

Dav Szeto, Principal at GBS Construction Managers Ltd.



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Who's New?

Burnaby Office:

Shelly Houle, Accounting and Administration; **Pete Joseph**, Project Manager / Estimator; **Murray Davisson**, Project Manager / Burnaby Service

MTI:

Keith Messner, Estimator / Project Manager; **Elisha Mott**, Project Coordinator

Downtown Office:

Mike Murray, Estimator / Project Manager

Safety Climate Tool Perception Survey



Mott Electric GP and the BC Construction Safety Alliance are working together with the Health & Safety Laboratory on a new joint venture in safety. On April 11, 2014, 147 completed surveys were gathered from Mott employees in all divisions. The survey results will be used to improve the overall performance of the company's health and safety program.

"The Safety Climate Tool Perception Survey is another company initiative which supports our MOTTIVATION to continue as the best electrical

contractor in the Lower Mainland," said General Manager, Graham Trafford. "The Health and Safety Laboratory, which is based in the United Kingdom has refined the survey over the last few years and today it is being used by many companies who have improved health and safety for their employees."

Data from each level of the company will be analyzed to identify how Management, Project Managers, Foreman and Workers perceive health and safety in eight different categories:

- 1) Resources for health and safety
- 2) Accidents and near miss reporting
- 3) Organizational commitment
- 4) Health and safety oriented behaviors
- 5) Health and safety trust
- 6) Usability of procedures
- 7) Engagement in health and safety
- 8) Peer Group attitude

"The survey was completely anonymous and the data collected will help us to see where we are and what we need to do in order to protect our most valuable resource - which is everyone who works for Mott Electric," said Trafford.

Mott Electric GP is the first company in British Columbia to use the survey. The BC Construction Safety Alliance will review the results and consider promoting the survey to other companies in the province.

"Our management team will go over the data and work with each level of the company to create an action plan, which will be communicated via email, meetings, pay-stub notices and Joint Occupational Health and Safety minutes." He added, "Our goal is to build a stronger health and safety program to protect our workers by reducing injuries, and improve communication, participation, and a stronger commitment to safety, company wide."

Safety First!

Perry Harvey, Health and Safety Coordinator

Fall Protection Training:

**Monday May 12, 2014: 8:00 am to 4:30 pm
at the Tillicum Office Training Room**

Mott Electric GP is offering Fall Protection Training to all employees who use a fall protection system, including: temporary guardrails, fall restraint, fall arrest, or other safe work procedures at heights.

This full day course will cover the following topics:

- Fall accident statistics
- Governing bodies and regulations
- Dynamics of falling
- Fall protection systems
- Fall protection planning
- Fall arrest system components
- Clearance & freefall calculations

- Harness fitting
- Equipment care and inspection
- Suspension trauma
- Rescue principles

Course material will be energetically delivered and includes hands on activities, video analysis and student participation. Training is valid for three years. The day starts at 8:00am and goes to 4:30pm and includes lunch.

REGISTER TODAY!

Contact Perry Harvey:

778-231-0170 or email: pharvey@mottelectric.com

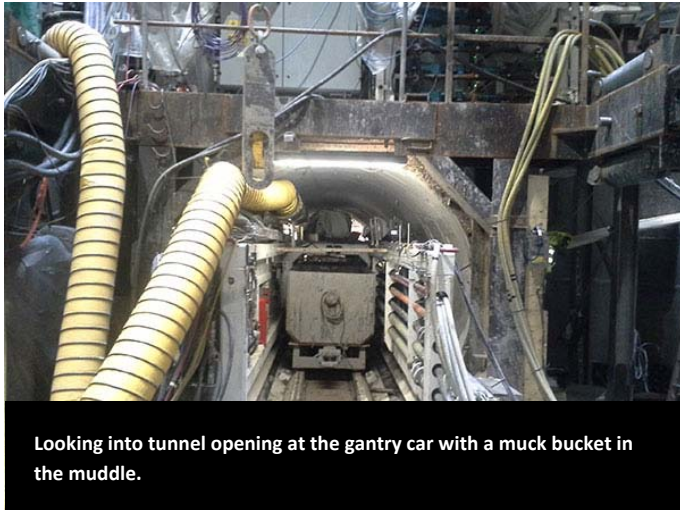
Fall Protection Training is a must attend course for all employees who work at heights.

Think Safety First!

Featured Project: Port Mann Water Main Crossing

Project Manager: Brian McNeill

Brad Andrews, Site Foreman, submitted contents for this article.

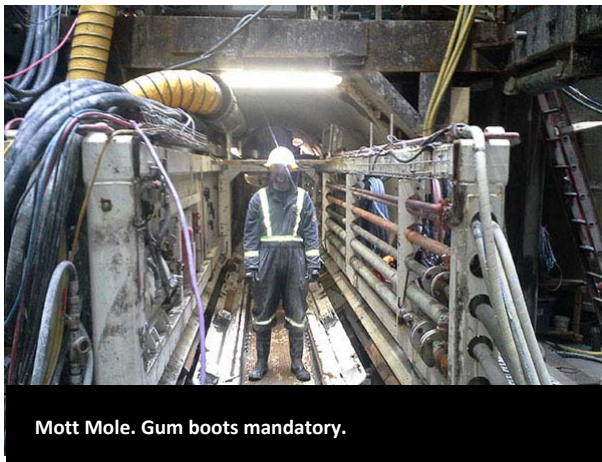


Looking into tunnel opening at the gantry car with a muck bucket in the middle.

For two and a half years Mott Electric has been getting deeper into the muck. How deep? Fifty-five meters - below the Fraser River!

The Port Mann Water Main Crossing is ranked as the third most difficult tunneling project in Canada and fifth in the world. These projects are measured based on the amount of water pressure that is forced onto the Tunnel Boring Machine (TBM). The TBM is a soft ground machine which is known as an EPB Earth Pressure Balance. The project comes with no blueprints.

Tunnels are usually drilled through mountains where the TBM is set up on the ground but with this project the TBM will be lowered 45 meters below sea level before it starts working. Because there is no plan we have to understand what the client wants and figure out how to build it. "The process changes every step of the way," said Brad Andrews, Site Foreman.



Mott Mole. Gum boots mandatory.

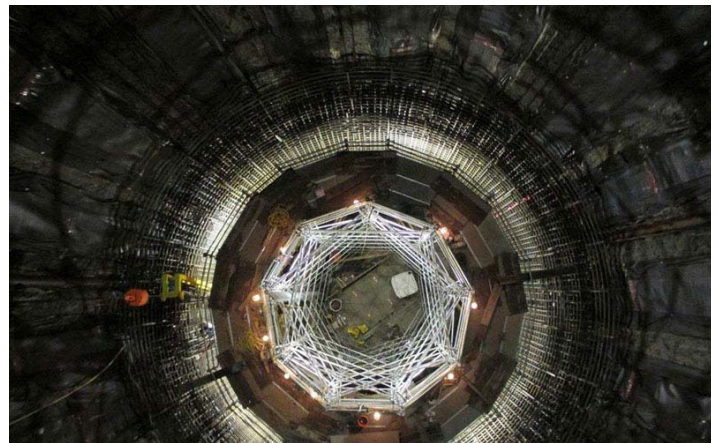
Quotable Quotes

"A ship is safe in a harbour. But that is not what ships are for."

"Whatever you are - be a good one!"

"Hold the vision. Trust the process."

"Welcome complicated problems. In them are your most powerful opportunities."



Constellation "Port Mann". The shaft with climbing deck lit at night.

After 36 months we are only half way done...

The project will take six years to complete and over the last 36 months two shafts have been under construction: one on each side of the river.

A special cutting head that drills rectangular holes is used. These holes are called panels. The head burrows through the muck and the drilled out material is replaced with a mixture of bentonite and water to prevent collapsing. Then the cutting head was pulled out and a series of 8" steel pipes were connected and shoved to the bottom. 50 MPA concrete was pumped into the pipe after more than 50 "basketballs" were inserted. The balls were pushed to the bottom into the thick bentonite mixture and became their pour break level. The mixture was then sucked up and as it was sent to a holding pond, it was replaced with concrete to keep the panel from collapsing.

After the panels had been finished the job of scooping out the muck began. This took a couple months before the bottom was reached and the shaft was created. A "plug" of 50 MPA concrete and tons of 35m rebar was installed at the bottom to lock the panels and stop the artesian effect.

Commercial divers install rebar...

All this was done while the shaft was filled with water. Commercial divers did the entire rebar installation in zero visibility. Initially lights were attached to their shoulders, but because the water was so dirty they didn't help with visibility. The divers were lowered into the shaft in a man basket and could work for only 45 minutes before they were lifted up to the surface where they had to be re-pressurized in a hyperbaric chamber. Andrews points out, "They spent an hour and a half in the chamber slowly coming back to sea level atmosphere. Electricians can get burned... with these guys - their brains could explode!"

Featured Project (cont'd)



Building the shaft liner - climbing deck not yet installed.



We built a mini shrine to St. Barbara, the patron saint of miners.



Cutting head is lowered down the shaft - 155 tons on the hook.

Once the construction shaft had been completed the water could be sucked out, filtered and discharged back into the Fraser River. Now the shaft liner is being built with 35m rebar joined with threaded couplings and spaced with 57m rebar. It is 6 rows high and 6 rows deep. Each row is 1 meter wide and 1 meter deep. "The shaft liner has been a challenge to build because it works off a climbing platform and requires power for lights and tools," said Andrews. "A conduit was installed on the panel, behind the shaft liner. To do this a special self-supporting mining cable was pulled from the bottom up to the top! We had to leave 75m of slack figure-eighted at the bottom, which would be connected, to the climbing deck. This was done while standing on a forming deck locked in place by only 10 metal teeth!"

When the liner is completed another plug will be poured and the shaft level will be raised up to a depth of 45 meters, which is the launch platform for the TBM. "This is where the fun begins," said Andrews.

10 sections will be lowered into the shaft...

The vertical shaft of the TBM has a diameter of 13m. The TBM works horizontally and is 90m long and is 3.3m in diameter. In order to get the entire TBM to its working depth it is segmented like a train. Each section is 6m long. It consists of 10 sections that will be lowered down the vertical shaft one at a time to the horizontal working platform. Each section has to be moved into the tunnel behind the cutting head to create room for the next section to be lowered down and connected. The tunnel is 1100 meters long.

The TBM operates at 4160v with a 600v emergency backup generator. The TBM will have trailing cables from the 2 electrical rooms on the surface. As the TBM cuts its path it removes earth but it will also install metal mesh and shoot Shotcrete onto the tunnel. Then interlocking blocks will be installed around the entire surface area of the tunnel completing it. Andrews adds, "When the TBM reaches the other side of the river at the Coquitlam shaft it will be lifted out piece by piece and we will be ready for the next phase of the project: installing metal pipe. But that's two years away!"

Andrews said, "When the project is finished you'll be able to walk into the tunnel on the Surrey side and come out in Coquitlam. That is until it is filled with drinking water for the Fraser Valley."

Unique problems...

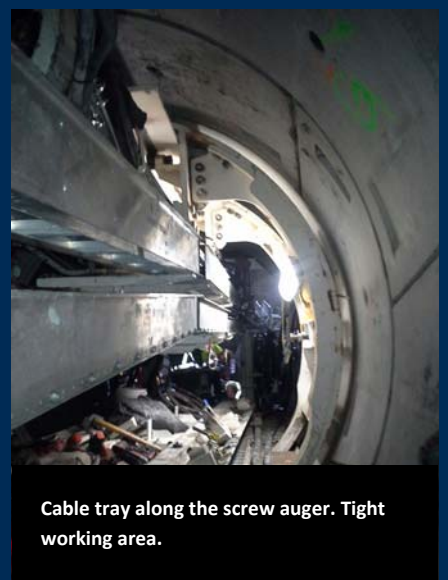
There were countless problems and breakdowns. "On the first breakdown the operators handed me an operations manual... it was all in German," said Andrews. "This led to many calls to Germany then finally an English manual was sent from the manufacturer."

"At 55 meters down the de-rocker/de-sander was clogging, burning up motors." He adds, "It turned out the cutting head had found a 10 foot round log that was left behind over 30 million years ago when the Pitt glacier scraped through the Fraser Valley!"

"I am lucky to be working on this project. I am only one of maybe a few hundred people in the world who get to do this kind of work," said Andrews. "This project will take a total of 5 years to complete. Mott Electric will be the only contractor in BC to have experience on a job like this."



The segments are landed and staged for install under the screw auger.



Cable tray along the screw auger. Tight working area.