

Modular Construction

Improving Efficiency and
Productivity in Building Construction

Canada Arizona Business Council



9/16/2016



Custom Complex Structures (CCS Modular)

Canada North Group

- Canada North Group began operations in 1990
- Oilfield service company – Catering and Workforce Housing
- Have provided up to 7000 meals per day to clients
- Clients include – CNRL, Cenovus, Trans Canada, Encana, Husky, Enbridge, Shell, Talisman, etc.
- First Nation Partnerships include, Primco Dene, Big Stone Cree, Heart Lake, Loon River and Onion Lake
- Business Awards – Alberta C of C Best Aboriginal Practices, and Oil and Gas 2nd Place – Best Accommodation

CampCorp USA (CCS Modular)

- CampCorp Structures in Canada opened June 2009. Edmonton Plant 2011.
- US Plant opened in July 2012
- US Plant has produced in excess of 700 modules
- Modules spread over approximately 30 projects
- US Plant employees – 140 (at peak)
- Rebranded- Custom Complex Structures (CCS)
- To Date, CCS is a certified manufacturer in Arizona, California, New Mexico, and Nevada
- Commercial Construction/Custom Residential

Permanent Modular Construction (PMC)

- Modular Construction Dates back over 300 years
- Greener – Faster – Smarter
- Same building codes and standards as conventional builds
- End product is generally stronger and more durable
- Significantly reduced construction cycle time
- Greatly reduces site and surrounding area disruption
- Eliminate most weather delays
- Improved worker safety

Key PMC Sectors

- Health Care (Hospitals – Senior Care)
- Housing/Dormitories (Student – Athletes)
- Hospitality Industry (Hotels)
- Retail (Starbucks – Tim Hortons- Fast Food)
- Office Buildings
- Any and All Repeatable Design Structures
- Structures now up to 8 stories
- Workforce housing

Construction Industry Inefficiency

- Little or no change in methodology in over 50 years
- Industry looking for ways and means to improve.
- NIST and National Research Council Identified;
- 5 Opportunities for Breakthrough Improvements
- “ Greater use of prefabrication, preassembly, modularization, and off-site fabrication and processes”
- \$611 Billion Dollar industry (4.4% GDP)
- Modular or Prefabricated construction makes up 3%
- 1% increase means additional \$6.11B to the Modular Industry.

Site Built Inefficiencies

- 25%-50% waste in coordinating labor, and managing, moving, and installing materials.
- \$15 B per year losses due to Interoperability. (Building Information Modeling. “BMI”)
- Transactional costs between \$4 B - \$12 B in dispute and claim resolution.
- Weather delays: Safety Issues: Environmental Issues: (air quality, materials waste)
- Inspections. QA/QC

Improved Efficiency with Modular Technologies

MODULAR CONSTRUCTION SCHEDULE



SITE BUILT CONSTRUCTION SCHEDULE



Modular Construction Advantages

- Modular build costs typically 16% to 25% lower.
- Construction Cycle Time reduced by up to 45%
- Construction site management savings
- Less Site Security Costs
- Less Environmental Management Cost (dust/traffic)
- Fewer change orders during construction cycle
- 25% schedule reduction = \$5.81 SF Average Savings
- 50% schedule reduction = \$10.93 SF Average Saving
- Earlier revenue generation from completed project



Net-Zero Energy (NZE)

- **Relies on renewable sources**
- Produces as much energy as it uses annually
- Starts with an energy-conscious design
- Many features work without an energy source
 - Large expanses of windows can produce heat through passive solar gain
 - Angled smaller windows permit more light while limiting heat loss
 - Passive ventilation systems can pull cool air up from the lower levels

Technologies used to achieve net-zero status

- Solar panels
- heat recovery systems
- geothermal heating
- wind turbines
- Building/Instrument heat



CCS Manufacturing Plant



Peace River Lodge

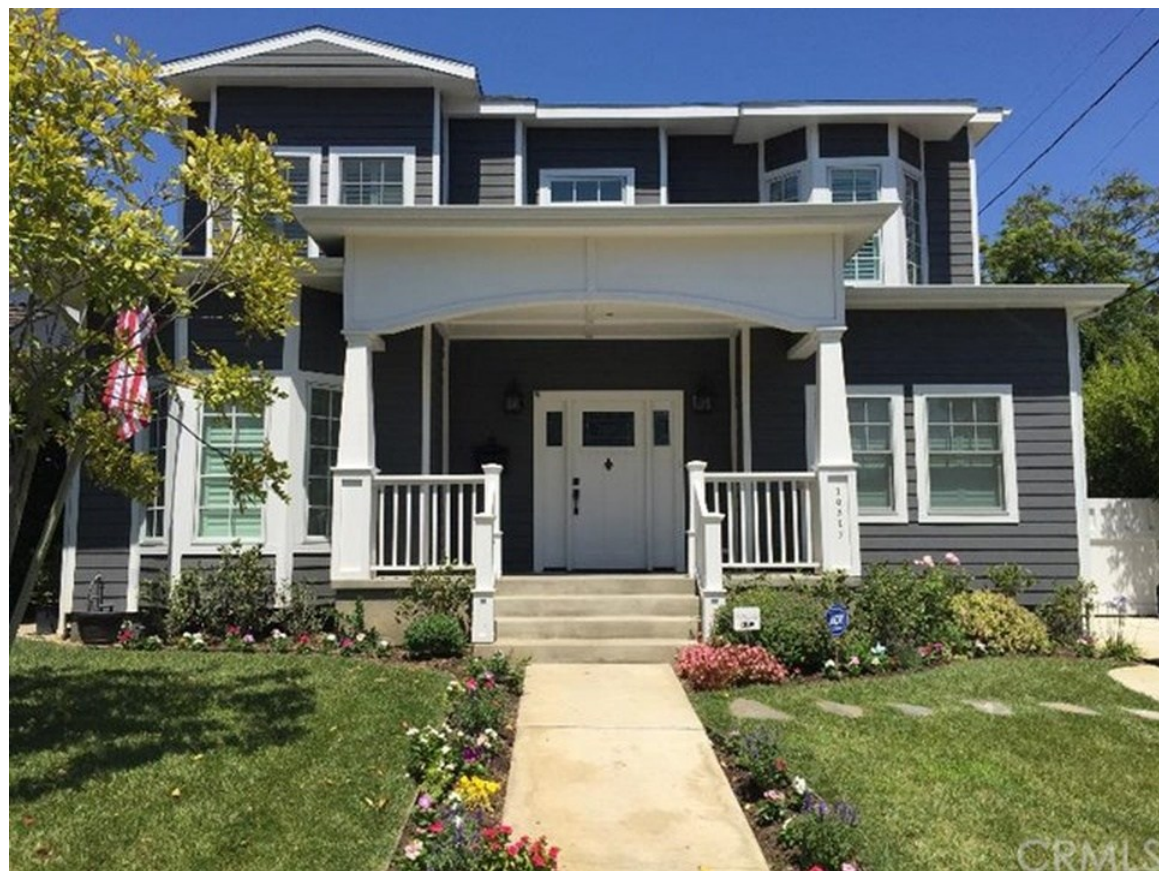
288 suite lodge, currently building phase 2



Kirby South
Manufacturing of
Heavy Duty Tires for the
Construction Industry



CCS Optimum Aerial Design









Q&A

