



Canadian
GeoExchange
Coalition

Coalition
canadienne
de l'énergie
géothermique

***Frequently Asked Questions
and Guidelines Concerning
CGC Training, Accreditation
and Certification for
GeoExchange in Canada***

(April 2008)





The CGC Global Quality GeoExchange™ Program®

A step by step program schematic from training and accreditation of individuals, qualification of firms and system certification

STEP 1—TRAINING FOR INDIVIDUALS

- ◆ Training is required for all **individuals** directly involved in the design or installation of a geoechange system.
- ◆ There are **three distinct** training course modules currently available in Canada:
 - ⇒ Training for system installers: **Canadian GeoExchange™ Coalition Installers' Course®**
 - ⇒ Training for residential designers: **Canadian GeoExchange™ Coalition Residential Designers' Course®**
 - ⇒ Training for commercial designers: **Canadian GeoExchange™ Coalition Commercial Designers' Course®**
 - ⇒ *And one additional course available in late FY 2008-9, Training for vertical loop installers: **Canadian GeoExchange™ Coalition Drilling, Well Construction and Loop Installation Course®***
- ◆ Courses details are available on CGC website at www.geo-exchange.ca

STEP 2—APPLICATION FOR INDIVIDUAL'S ACCREDITATION

- ◆ CGC **training certificates or equivalent are required** to apply for each and any individual's accreditation.
- ◆ Please **read** the accreditation application forms *carefully* (a different application form is available for installers, residential designers and commercial designers) for all the rules and conditions pertaining to accreditation
- ◆ For installer training equivalency and recognition of experience in the geoechange industry, please **read carefully** the **CGC Clarification Statement on CGC Global Quality GeoExchange™ Program®** **AND** the Installer Training Equivalency Criteria for Accreditation Under the **Global Quality GeoExchange™ Program®** as issued on May 30th 2007.
- ◆ Every individual interested in participating in the CGC Global Quality GeoExchange™ Program® **MUST** apply for accreditation.

STEP 3—APPLICATION FOR COMPANY QUALIFICATION

- ◆ Companies (including sole proprietorships) hiring CGC accredited individuals for vertical loop installation, system installation or design, either as full time employees or as subcontractors, must be qualified under the **CGC Global Quality GeoExchange™ Program®**. For most companies, this will only be a simple formality.
- ◆ However, company qualification is an important step to ensure **quality installation** and **consumer protection**:
 - ⇒ It allows the CGC to verify the credentials of the companies/contractors who will ultimately provide the consumers with a guarantee on their geoechange system.
 - ⇒ It will allow the CGC to screen out of the **CGC Global Quality GeoExchange™ Program®** companies/contractors that have been found guilty of various professional malpractices and/or breached CGC's Code of Conduct.
 - ⇒ Etc.
- ◆ Qualification of companies will allow CGC to recognize the highest quality workmanship, and highest ethical standard and screen out companies only interested in short terms gains and benefits.
- ◆ Company/contractor qualification is also an important step in the CGC management of the consumer complaint mechanism.

STEP 4—APPLICATION FOR SYSTEM CERTIFICATION

- ◆ A **CGC Certified GeoExchange™ System** is a geoechange system on which CGC accredited system installers and designers have been involved.
- ◆ A **CGC Certified GeoExchange™ System** is a geoechange system that follows CAN/CSA C-448-02 at a minimum.
- ◆ A **CGC Certified GeoExchange™ System** is a geoechange system that fully satisfies all relevant municipal, provincial and federal regulations.
- ◆ A **CGC Certified GeoExchange™ System** is a geoechange system that meets CGC Certification Guidelines.
- ◆ A **CGC Certified GeoExchange™ System** is the condition to access many utilities incentive programs, as well as provincial and federal grants programs if and when available.

Q1

What's the difference between training, accreditation, qualification and certification?

Why all the terms?

The different terms all form part of the **Global Quality GeoExchange™ Program®**. There are four major steps within this national initiative:

Training for individuals means that individuals may register and attend one or more of the three training courses (choosing according to their area of specialty and requirements), and take the examination. Three CGC courses – for **system installers, residential system designers, commercial system designers** are currently available. Please see Appendix B for more details.

Accreditation of individuals is achieved by those who successfully complete training with a passing mark on the examination, and apply for accreditation. A different accreditation is available for systems installers and designers. Accreditation requires:

- ◆ a passing mark on the relevant CGC examination
- ◆ satisfactory work on up to five previous geexchange systems
- ◆ credit references if and where appropriate
- ◆ proof of adequate insurance and liability coverage if and where appropriate
- ◆ assent to the CGC Code of Conduct, etc.,
- ◆ and is valid for two years.

Company Qualification means that companies hiring CGC accredited individuals for vertical loop installation, system installation or design, either as full time employees or as sub-contractors, have had their credentials verified and offer the highest quality of workmanship, at the highest ethical standards. Qualification allows CGC to screen out fly-by-night firms and firms interested in making sales rather than executing quality work.

Certification of systems is completed once an application for certification has been approved by CGC. Certification means that the system has been designed by an accredited designer, installed by an accredited installer, and any borehole work has involved a CGC Qualified Drilling company. For a system to be certified it must follow all guidelines within CSA Standard C-448-02, use ISO/CSA-approved equipment, and engage such best practices as delivering an 'As built' book to the project owner, clearly labelling all piping and valves, be verified and inspected as necessary to ensure the system is in compliance with all provincial regulations, etc. Much of this is covered in initial training

Q2

How is CGC training program different?

Vertical loop installers, system installers, and system designers are the three main components of the workforce in the geexchange industry. Very often, those three functions will be performed by three different individuals, although it is not rare that one individual will carry forward two or even the three functions. For the CGC, it was important that the training program put in place reflects this market reality.

Until the CGC training program was deployed, only one basic introductory training course was available. Ranging from half day to three days, none of those, either in Canada or in the United States had the scope or the depth to support a growing industry in a meaningful and sustainable manner. The quality program is a comprehensive effort to ensure better trained professionals deliver quality work more consistently.

Q3

Why and how have the CGC courses been developed?

CGC has developed its courses as part of a national quality initiative. This initiative is the CGC's response to over a decade of stakeholder requests to "raise the bar" in available training and in the consistency of quality of work delivered by geexchange practitioners.

These three new CGC courses – for **system installers, residential system designers, commercial system designers** respectively – as well as the course for loop installers to be finalised, are part of the first national training and quality initiative based on Canadian climate, geology, and CSA Standards (C-448-02, principally).

The course training materials are the product of over eighteen months of effort from CGC staff, with contributions from about fifty of the industry's top professionals and critical ongoing support from the federal and many provincial governments. The courses have gone through six drafts before release and are thoroughly revised at least once a year.

Q4

Why does industry want and/or need to raise the bar in terms of training and accreditation?

Financial assistance programs are put in place by utilities and government to help grow a renewable energy industry or increase energy efficiency. These programs are built around a variety of economic and performance criteria with the objective of transforming markets. They are generally meant to reduce customer energy bills while providing some form of economic value to energy distributor and governments.

Over the years, those programs have been tightly connected to the availability of qualified work forces and reputable firms / companies. Despite efforts to run those programs as smoothly as possible, it takes no effort to document horror stories of customers being fooled by unscrupulous firms and serious companies being forced into bankruptcies because of aggressive marketing campaign by competitors more interested in selling subsidies than selling quality and reliable work.

In the geoexchange industry, this happened in Europe in many countries during the 1970s. Unfortunately, no lessons were learned and it happened again in the 1980s. Every time subsidies were available, it seemed that the geoexchange industry would live a golden age. Every time subsidies disappeared, so did dozens of fly by night, unqualified companies that left behind hundreds of poor installations. Every time this happens, the concerned technology goes into oblivion, only kept alive by a handful of serious companies who pick up the pieces and keep the industry alive until the next subsidy round. It happened in Canada in the early 1990s. And it has happened in the United States as well.

The goal of the **Global Quality GeoExchange™ Program®** is to ensure that these fly by night companies will be kept out of the geoexchange industry. At the same time, those who are serious about their endeavour will be welcomed as well trained and accredited professionals working for trustable companies. To play with us, both companies and individuals have to show their professionals intent, before and during their participation in the program.

Real Life Situation – Case 1

Letter received by CGC in January 2007

Hi,

I don't know if this is the right place for this, but I thought that you should know.

We have had a residential geothermal system installed at our home in March 2006 by a company called [OLD COMPANY NAME WITHELD]. They are now called [NEW COMPANY NAME WITHELD].

After a series of problems, our system is now about to crash as the EWT (entering fluid temp) is at 26.3 F and the exiting fluid temp is at 22.3 F, which are extremely low temps for this time of the year. We have a 4 ton [BRAND NAME WITHELD] heat pump coupled to a Slinky style horizontal loop buried in 5 ft deep trenches designed to heat our 1400 Sq/ft home. We are now having to upgrade our electrical panel to install an auxiliary electrical back-up.

I realize that this particular company may not be a member of your organization, but I would certainly feel better if you would investigate their credentials and history, if they do apply for membership in the future. We have put in a complaint with the better business bureau of BC where you could find more details about our case history (case # WITHELD).

We are believer in the technology but our experience with this company has been a nightmare, culminating in the complete system failure of the installation. It is our hope that a Made in Canada certification process will help prevent this type of "fly by nighter" operators from ever operating in Canada.

Thank you,

*(Name of customer withheld)
British Columbia*

Under the CGC **Global Quality GeoExchange™ Program®** :

- ⇒ This geoexchange system would have been installed and designed by CGC accredited professionals. Therefore, CGC would have verified both the training and professional experience of the installer and the designer involved on this job.
- ⇒ Providing it meets all the CGC quality requirements, it would have been certified, confirming the design, installation and commissioning are CSA 448 compliant.
- ⇒ This company, whose installer is accredited by an *international* organisation, would have had to attempt to register for CGC Qualification. This means reference checks, including analysis of the complaints record of the company (under the old and the new names) at the better business bureau of BC.
- ⇒ Both the customer and the company would have benefited from the CGC dispute resolution mechanism and arbitration.

Q5

Can anyone take a CGC course? What prerequisites are there?

Recognizing that some people may want to take CGC course only to acquire more technical knowledge about geoechange technology, anyone can take the CGC course.

Remember that all provincial licensing & permit regulations must be respected in order to work in the field or receive CGC accreditation.

Q6

Why do I need to or why should I take the CGC course in my specialisation?

CGC's courses are about providing quality assurance to the consumer and about describing and delivering industry best practices when designing, installing vertical loops or installing geoechange systems. CGC members and partners understand that for the geoechange industry to continue growing rapidly, consistently high quality of training, and system design & installation, is a top industry priority.

Further, Canadian incentive programmes increasingly refer to and require Canadian training and accreditation as developed by the CGC. Several levels of government have examined the CGC training materials and accreditation mechanisms and have decided to refer to this new Canadian industry standard.

Those already engaged in quality assurance measures – such as the well developed regional or national distributor - understand that provincial governments, banks, insurance companies, and international partners all desire to work with one national quality framework for Canada.

Taking the CGC course and supporting the **CGC Global Quality GeoExchange™ Program®** will in the longer term lead to higher quality field work in Canada, and is therefore crucial to the long term growth of the industry.

Q7

What if I have already taken other installer training manufacturer, CETAF, IGSHPA™, etc.)?

Given the variety of training initiatives available in the market and the wide variance in their content and quality control mechanism, the CGC announced in December 2006 that in future it will only recognize trainings which are harmonized with CGC training. Several manufacturers and organisations have since expressed their desire to harmonize their training with CGC training. **It is the responsibility of organizations to inform their potential registrants of this policy. It is also the responsibility of those other organizations to contact the CGC to discuss partial or full harmonization.**

Recognizing that experienced and knowledgeable professionals have been successfully working in the industry, and that elements of currently available trainings have merit, CGC has developed training upgrade seminars for those who have successfully passed other installer trainings and/or have significant current experience in the field. These upgrade seminars are developed and adapted as needed and on a case by case basis.

Having equivalent training is the first step in earning CGC accreditation. Therefore, those who have taken non-CGC courses before January 1st, 2007, and who want to become accredited, will need to take either the full CGC course or one of the upgrade seminars in their specialty – installation, drilling, or design. All those seeking equivalency with CGC training must at a minimum take and pass the CGC examination.

Please refer to **Appendix A** of this document for the CGC Training Equivalency Criteria.

Q8

Ok, I want to register and take CGC courses. How do I do that?

Please check www.geo-exchange.ca for the latest training course details, registration forms, and links, or contact us via fax or phone.

Q9

How does CGC accreditation differ from other programs?

It is important for the CGC that field work is performed by well-trained professionals. **A three day introductory training whether CGC's or another training, is not by itself sufficient to be awarded any CGC accreditation.**

To be awarded CGC accreditation, loop installers, system installers and residential designers have to prove they have received the appropriate training (either CGC courses or recognised equivalencies) **and** also prove they have positive field experience backed by customer references and manufacturer's or distributor's favourable recommendations.

There has never been and there is currently no other geoexchange accreditation program anywhere in North America that has such diversified and high level training requirements while verifying industry-relevant professional experience. If you are interested in becoming a CGC Accredited System Installer or a CGC Accredited Residential Designer, please carefully read and complete the appropriate application form(s).

Q10

Do I have to join the CGC to get accredited or take courses?

Will I become a member of CGC automatically at some point in this process?

Absolutely not. Compulsory membership in an organization is not a guarantee of your professional qualifications or ability. Compulsory membership in an association, particularly for professional accreditation purposes, can be seen as a form of market manipulation.

Quality is in the entire industry's interest, and CGC is about delivering value to the entire industry, not individual companies.

Forcing members to join would not be about the value CGC provides in government relations, industry infrastructure and information for the public and members.

To discuss why and how to become a CGC member, please call Ted Kantrowitz, at extension 34 or see www.geo-exchange.ca.

Q11

Why should I seek CGC accreditation?

CGC accreditation is all about recognising that you have been properly trained by knowledgeable, experienced trainers. In addition, CGC Accreditation also means that you are a recognised professional with all the appropriate permits, licenses and authorisations to work in the geoexchange industry in the province where the application is received. Finally, CGC accreditation tells others - customers, potential business partners, and financiers among others—that you as an individual are committed to the highest standard of work and ethics.

Q12

I am new to this business. How do I become accredited?

The first step is to take appropriate CGC training course(s). Then you may fill-in an application form for the accreditation you are seeking.

Those who are new in the business are required to work with their distributors and be supervised on their first system installations or designs.

No accreditation will be awarded without this professional supervision done by a CGC accredited professional.

Q13

What if I have years of experience or multiple installations in the technology but no formal training?

Please see **Appendix A** for the CGC Installer Training Equivalency Criteria.

For loop installers and designers, please consult the appropriate accreditation forms for further details.

Q14

I am already accredited by an international organization. Why do I need CGC accreditation?

A CGC-trained individual **does not receive automatic installer accreditation**. CGC accreditation is based on real life experience and verification of licences authorizing an individual to perform professional work on a geexchange system in the province / territory concerned.

Simple affiliation or accreditation with other national / international organization is deemed insufficient in Canada for the **Global Quality GeoExchange™ Program®**.

CGC's full programme goes well beyond the basic introductory training for installers offered by other organizations. CGC offers extensive quality-controlled training for system installers as well as designers. Specialised training for loop installers will be available in late 2008-9.

Q15

Where can I apply for accreditation, certification, etc?

At this date, CGC has published all the necessary forms for individuals to become accredited as an installer and / or as a designer and to work in compliance with the **Global Quality GeoExchange™ Program®**. Please consult the accreditation form for system installers and/or residential designers for specific prerequisites for each professional.

CGC will publish forms to apply for CGC Loop Installer Accreditation once Loop Installer training is finalised and delivered. Make sure you are on our emailing list and check our website regularly – www.geo-exchange.ca – to ensure you have the latest information and the most up-to-date application forms.

Real Life Situation – Case 2

IN HOT WATER

Julie Matthews, Global News Edmonton
July 12, 2007

Just being able to get hot water or turn on the air conditioning was a luxury for Shannon Evans and her family not long ago. To save money in an environmentally friendly way, they had a geothermal system installed in 2003. [...] But this one sits, dismantled, in the basement after Shannon says they had nothing but problems with the contractor and the installation. "It was winter time. We had no heat a lot of the time, no hot water. We have three kids. He'd come back and get it working and say "This is normal, this is something that happens."

But it kept happening for years. Then one day, they smelled smoke and looked inside the system. Shannon says she could see blue sparks and at the bottom, a big blue flame. The family called another contractor [NAME WITHELD]. He took one look and knew something wasn't right. He recommended pulling the system out, or at least getting the city or safety inspectors involved.

*Inspectors had major safety concerns and ordered the unit shut down. **No permits for the heating system were obtained from the City of Red Deer for the Evans job. And the original contractor wasn't licensed in Red Deer to do electrical work.** Global News Edmonton contacted the contractor and he called the problems with the Evans' system, as well as the civil lawsuit they've started against him - frivolous. He told Global to talk to his lawyer.*

*[CONTRACTOR NAME WITHELD] put in a new geothermal system for the family, that is now working great. **He says many consumers are getting hurt by the lack of regulations in the industry. Special certification is available, but it's not mandatory for contractors. Installers say municipalities and homeowners should insist on it.***

The Evans family didn't do their homework and doubt they will ever recover the \$50,000 they lost on this ordeal. They hope others can learn from the nightmare. Shannon says she wouldn't wish this on anybody.

National safety standards have been developed for geothermal systems, but it is up to each province to adopt them. As of September, they will be part of Alberta's building code. Officials hope this will better educate inspectors and contractors and protect consumers.

Here are some tips for when hiring a contractor:

- ◆ Get recent references, and call them.
- ◆ Check qualifications.
- ◆ Check with the city for permits.
- ◆ Get everything in writing.

End of broadcast

Under the CGC **Global Quality Geo-Exchange™ Program®** :

- ⇒ Before delivering a CGC installer accreditation, CGC would have verified if the installer was licensed to do electrical work in Red Deer.
- ⇒ CGC would have verified that all construction permits were obtained prior to certifying the geox-change system.
- ⇒ Both the customer and a CGC accredited individuals and qualified firms would have benefited from a formal complaint mechanism and neutral arbitration.
- ⇒ Municipalities have started to require CGC qualified firms / companies and CGC accredited professionals in their permitting process.

Q16

Why is it necessary for a firm to qualify, if it employs CGC accredited specialists?

Firms, whether registered as individuals or sole proprietor, partnership or corporation are, in the normal course of a business transaction involving a geexchange system, the responsible legal entity that will provide the supervision of professional employees or subcontractors, warranties, quality assurance. They are also expected to carry professional liability insurance as well as have a positive business practices record.

Customers want their geexchange system designed and installed by professionals. They also want quality service, not for a month, not for a year, but for the next 10 and 20 years. They are looking for quality service **and reliability** which is unsurpassed in the industry.

CGC Qualified companies demonstrate they stand above the rest. They employ and subcontract work to CGC Accredited professionals. They want a strong national geexchange industry, and they provide customers the quality service customers want and deserve.

Q17

What about drilling companies and ground loops? Who needs to be accredited, or what's the program quality mechanism for drillers?

Though a well drilled for geothermal heat shares many characteristics with other types of wells, drilling, grouting and/or trenching properly is not the same job as water, oil, or other types of well drilling. Many conventional groundwater protection practises are followed, and CGC recognises that many drilling companies are competent to follow provincial regulations regulating geexchange. CGC intends to work with partners over 2008-9 to develop specialised training and accreditation modules for all types of loop installation.

Currently under the quality program, drilling companies must be CGC Qualified® to complete a CGC Certified System®. Qualification ensures that highly ethical drilling firms which hold proper verified provincial qualifications, are involved in the quality work required. CGC's Global Quality GeoExchange Program® requires CGC Accredited Installers to verify boreholes and to ensure that borehole reporting forms and records are properly completed.

Real Life Situation – Case 3

Letter received by CGC in June 2007

Hello

There is a less-than-honorable contractor in southern Ontario who is preying on families who pursue a geothermal installation. We are trying to broadcast this problem. Environment Canada suggested that we let you know about our story.

Our experience with [COMPANY NAME WITHELD] over the past 12 months has been very disappointing and expensive, one that we would like to help others avoid. [...] [NAME WITHELD] met us at our home. He came across as being very knowledgeable about the technology and the installation process and gained our trust. We signed a contract on May 31, 2006 to have a 5 ton ground source heat pump with air handler installed and 5 vertical holes drilled in a 6 week time frame. We paid the deposit requested, \$6,500. The cheque was immediately cashed.

On July 13, 2006 [NAME WITHELD] arrived on short notice in a rented truck and, unexpectedly, delivered a 6 ton heat pump (larger than specified without discussion or explanation). We assumed that he was bringing equipment to start the installation. He showed us a laminated picture of a compact drilling platform that was being built for him as he spoke. He promised that as soon as this new rig was tested in the Barrie area, it would be used on our project and cause minimal damage to our landscape. He requested a second cheque of \$5,500 which we gave him. On August 21, 2006, he responded to our follow up phone call and advised that it would be at least three weeks before he would get to our job. We've had no communication from him since then. Our e-mails and phone calls including voice mails are unanswered.

We were far too patient. Finally, on February 5, 2007, we contacted [NAME WITHELD], the manufacturer of the heat pump gathering dust in the back of our garage, and were advised that [NAME WITHELD] is no longer their agent. [NAME OF MANUFACTURER WITHELD] directed us to [NAME WITHELD] of Kitchener for installation services. We did that, have decided to proceed, and are very happy with our experiences with [NAME WITHELD].

Meanwhile, we expect that [NAME WITHELD] is still out there taking substantial deposits from families in the GTA, possibly elsewhere. It's a shame that people who are willing to make a major expenditure that will help our environment are being victimized. The last thing that we want to see happen is that the community, both contactors and clients, be discouraged from installing ground source heat pumps.

[...] Is there anything else we can do that you can suggest for the protection of the community?

[NAME OF CUSTOMER WITHELD]

Under the CGC Global Quality GeoExchange™ Program® :

- ⇒ This company, whose owner is accredited by an international organisation, would have had to register for firm qualification. This means reference checks, including analysis of the complaints record of the company would have been performed. Reference checks would have also been required from the pump supplier / manufacturer.
- ⇒ As a CGC qualified firm, the business practices described in this real life situation (significant deposits requested) would not have been accepted as it goes against the commercial regulations applicable in Canada.

APPENDIX A

Installer Training Equivalence Criteria for Accreditation Under the Global Quality GeoExchange™ Program®¹

During the multi-year transition to Canada's new, rigorous quality assurance initiative, CGC has consistently recognised that competent and ethical industry professionals have been at work in the GeoExchange™ field. These professionals, trained by manufacturers, distributors, or other groups, may have varying degrees of competence and/or familiarity with regional conditions, best practises, and regulations. Proven successful work experience is a key part in assessing an individual's requirements for further training.

The CGC seeks to recognise trained and experienced professionals on a consistent and fair basis. CGC's objective is to ensure that industry participants are fully and currently trained in Canadian best practises, standards, procedures, and regulations. The following two sections define what requirements installers with previous training will need to satisfy to be considered CGC-trained or equivalent:

A. Training taken between after February 1st 2002 and January 1st 2007²

The following applies to all training programs offered in Canada

GeoExchange™ Work Experience	Total Systems Installed within Last Three Years³	References Required	Required Training
Less than 3 years	Any	N/A	CGC Training Certificate, or recognised equivalent ⁴
Between 3 years and 5 years	Less than 20	Three (3), including at least one from a CGC member who is a distributor or manufacturer, or CGC instructor	One-day workshop, and passing mark on CGC examination
	20 and more	Two (2), including at least one from a CGC member who is a distributor or manufacturer, or CGC instructor	Passing mark on CGC examination
More than 5 years	Less than 20	Written confirmation of practical experience from distributor or manufacturer	One-day workshop, and passing mark on CGC examination
	20 and more	Written confirmation of practical experience from distributor or manufacturer	Passing mark on CGC examination

B. Training taken before February 1st 2002

For those who took training before February 1st, 2002, proven successful work experience and recommendations will be assessed on a case by case basis at the time applications are received for CGC Installer Accreditation. All individuals, as a minimum, will have to demonstrate their knowledge of CSA 448 Series 02 and obtain a passing mark on CGC examination.

GeoExchange™ Work Experience	Total Systems Installed within Last Three Years²	References Required	Required Training
More than 5 years	Less than 20	Written confirmation of practical experience from distributor or manufacturer	One-day workshop, and passing mark on CGC examination
	20 and more	Written confirmation of practical experience from distributor or manufacturer	Passing mark on CGC examination

C. Training taken after January 1st 2007

As announced many times in the past, as of January 1st 2007, CGC does not recognize, partially or fully, any other training program unless a training agreement is in place with CGC to ensure: (1) that training approach and material is fully compatible with the Canadian regulatory environment, (2) that trainers are experienced geoexchange installers and designers and, (3) that the partner organisation will fully respect and comply with CGC Code of Conduct.

¹ Issued May 30, 2007. Revised July 20, 2007.

² CSA 448 Series-02 was adopted in February 2002. Professionals need to demonstrate their knowledge of the current Canadian standard.

³ Documentation of installations is required to prove that the installer has fully participated in the work. Customer testimonials with current contact information, payroll receipts with the job and installer's name clearly marked, cancelled cheques to the installer, are acceptable forms of proof.

⁴ CGC has signed Memorandums of Understanding with major manufacturers & distributors to incorporate national CGC training in to existing training. Under these arrangements, manufacturer training is recognised as CGC-equivalent. Installers should contact their distributor to check whether an agreement exists.

APPENDIX B

CGC Training Program

Canadian GeoExchange™ Coalition Installers' Course®

For: Individuals who are involved in the installation of geoechange systems but who will not necessarily be engaged in the design of the system itself. The persons or individuals who should take this course usually belong to a trade or technical profession and are authorized or required by law to perform certain duties on a geoechange site / project. Depending on the province, this person is a driller, an electrician, a plumber, an HVAC or a refrigeration specialist, who usually belongs to a trade or technical profession and is authorized or required by law to perform certain duties.

Cost: CAN\$ 995 + applicable taxes

Duration: Three (3) Days

Prerequisites: None; strongly recommended: previous R/HVAC experience



Canadian GeoExchange™ Coalition Residential Designers' Course®

For: Individuals who are involved in the design of residential-sized geoechange systems but who will not necessarily be engaged in the installation of the system itself. The persons or individuals who should take this course usually belong to a trade or technical profession and are authorized or required by law to perform certain duties on a geoechange site / project. Depending on the province, this person is a driller, an electrician, a plumber, an HVAC or a refrigeration specialist, who usually belongs to a trade or technical profession and is authorized or required by law to perform certain duties.

Cost: CAN\$ 695 + applicable taxes

Duration: Three (3) Days

Prerequisites: Canadian GeoExchange™ Coalition Installers' Course® – passing grade



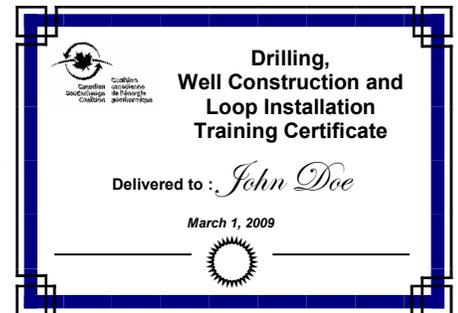
Canadian GeoExchange™ Coalition Drilling, Well Construction and Loop Installation Course®

For: Individuals who are involved in the installation of vertical or horizontal geoechange loops and who are engaged in the installation and grouting of the vertical ground loop. The persons or individuals who should take this course usually belong to a trade or technical profession and are authorized or required by law to perform certain duties on a geoechange site / project. Depending on the province, this person is a driller, a plumber, a construction worker, a refrigeration specialist, who usually belongs to a trade or technical profession and is authorized or required by law to perform certain duties.

Cost: TBD

Duration: Two (2) Days

AVAILABILITY: TBD, late 2008



Canadian GeoExchange™ Coalition Commercial Designers' Course®

For: Individuals who are involved in the design of commercial-sized geoechange systems but who will not necessarily be engaged in the installation of the system itself. The persons or individuals who should take this course are registered professional engineers or individuals required by law to perform certain duties on a geoechange site / project. This person will be a member of the provincial engineering association and / or a registered Professional Engineer and authorized or required by law to perform duties in commercial HVAC system design. This is a high level theoretical course. If you do not have the required academic background, you may not be able to follow this course.

Cost: CAN \$ 1595 + applicable taxes

Duration: Four (4) Days

Prerequisites: Canadian GeoExchange™ Coalition Installers' Course® – passing grade



A *Training Certificate* is issued for every course taken and when examination is passed with success