



MONTHLY

News and Views from the Connecticut Association of Home Inspectors, Inc.

December 2007

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Meeting Dates

December - No Meeting

Jan 12 *CT Law Seminar*

Jan 23 *Septic Systems – Brad Korth, Korth Engineering*

Feb 27 *Water Analysis - Maryellen Diluzio, EnviroTech*

Mar 26 *Inspection Safety - Daniel Friedman*

Apr 23 *Radon Mitigation Systems - Jay Dockendorff, RSA Laboratories*

May 23 *Wood Destroying Insects - John O'Brien, Mastershield*

Holiday Inn
201 Washington Ave
North Haven
(203) 239-6700

The Electrical Inspection

By Bernie Caliendo

Probably the most hazardous element of the inspection. Safety and precaution must be implemented to avoid shocks, burns, fires and even death. The electrical inspection should start at the **Service Entrance, Service Drops (Service-Entrance Cable) – (SEC)**. Are the power lines overhead? If so, are there any obstructions or hazardous conditions such as being in contact with tree limbs, too low to the ground where they could be touched by someone or come in contact with a vehicle while hanging too low over a driveway? Are the lines hanging over a roof where a contractor or homeowner could come in contact with them while cleaning gutters or working on a roof? Are they in contact with objects such as gutters or downspouts? The feeders from the street should have an insulated connector attaching the lines to the house and they should loop down below the entry into the weather head to avoid any water going into the cable and into the meter. This loop should drop down 12 inches. ALWAYS, if you are setting up a ladder to inspect a roof, be aware of all electrical lines at all times! The service cables may be underground and inspecting the conduit is important to note any cracks, damage or an open unsealed joint in the conduit. This could lead to water entry and a very dangerous condition which should be reported.

The next area to inspect is the **meter** and the connecting **feeder cables**. The meter may be found on the exterior or the interior and, when inspecting multiple family or condo units, may be found in a common area. The feeder cables should be inspected for their condition on the exterior unless they are enclosed by conduit. Many different cable types have been used over the years and taking a closer look to observe any fraying, punctures, cracks on the jacketing or poor seal entering the meter box should be reported. Determining the cable size will help you determine if everything is compatible. There are a number of ways to determine the size and type of wire:

- Placing a cable gauge on the cable and recording the information from the gauge.
- Reading the labeling or embossing on the cable jacket.
- Observation of the cable inside the panel box.

Never, Never, Never break power company seals, remove a meter or open a meter box!

There are also a number of ways to determine the service size available by the utility meter base.

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President's Corner

Bernie Caliendo

By now the effects of the CE audit has set in. You have either complied with the requirements, are coughing up \$250 and scrambling to find additional credits, or have decided to throw in the towel. Some of you have learned an expensive lesson. When we announce at our seminars to make sure you sign in and don't forget your certificates of attendance at the end of the seminar, we mean it! During the 2005-2007 CE cycle CAHI supplied over 50 hours of home inspection credits, including bus trips and all-day seminars (all free to members), and sponsored 3 CT Law Seminars. Please note that you only need 1 law seminar every cycle and, if you attended more than 1, you cannot use an extra law seminar to make up home inspection credits.

This past June we scheduled an extra law seminar for those who needed it and could not find one elsewhere. This seminar takes the same amount of time, effort, coordination and costs to produce. For the low number of attendees, it was not worth it to CAHI. We are going back to the original schedule of one law seminar every January. Take it this January 12th in case an unexpected conflict in your schedule in '09 pops up.

We already have a full schedule of speakers lined up into next summer. Check out our web site to learn more.

A couple of items about our web site:

- * Our "Members Forum" is being under utilized! Login and check it out. Post a new topic or post a response to a current one. We have over 110 registered users with only 5 to 10 members using it. There are a few good topics and comments posted, but few use this free-to-members private and anonymous benefit. This could be an excellent learning tool. So... please use it!
- * If any of your information on our web site is incorrect or you change something, please let us know and we will bring it up to date. E-mail CAHI at info@ctinspect.com with your corrections or changes. This is where potential clients can find your contact info.

Before I end, I want to highly compliment our membership for the generous donation to the late Bob Bowen's daughters' fund in which CAHI purchased \$3000 worth of savings bonds for Sydney and Jordan.

As the holiday season is upon us, I wish you all a safe, holy, happy and family-orientated season. As I celebrate Christmas, I wish Merry Christmas to all and hope whatever faith you practice you wish everyone your particular greeting.

Have a happy and prosperous New Year!

Bernie



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- Small circular meter base usually feeds a 60 amp, fuse type service panel.
- Small, square meter base is usually a 100 amp service.
- Large rectangular or square meter base indicates a 200 amp service.

The most common service sizes, types and ratings are:

| Copper | Aluminum & Copper-clad Aluminum | Maximum Load |
|--------|------------------------------------|--------------|
| (AWG) | (AWG) | (amps) |
| 6 | 4 | 60 |
| 4 | 2 | 100 |
| 2 | 1/0 | 125 |
| 1 | 2/0 | 150 |
| 2/0 | 4/0 or 2 sets of 1/0 | 200 |

Your cable size, meter size, panel box and main disconnect should all be compatible with each other. If not, call it out in your report! You should observe antioxidant grey paste on all aluminum wires feeding the main disconnect.

Moving on to the **Main Panel Box, Sub-panels & Wiring:**

Before you touch the metal panel box, make sure it is not energized. This could be a shocking experience. Carefully remove the cover and observe the conditions only. Keep your fingers out of the box. Do not trip breakers or pull or poke at wires. Breakers that are tripped do not activate. They may be off for some reason, only report it. Any breaker that jumps out at you (cover is holding the breaker in place) is probably the wrong brand than the box and should be called out. Open breaker slots and box knockouts should all have appropriate covers and all wiring should have the appropriate cable connectors. If you are observing a fused system, you may not be able to observe the size of the main cartridge fuses to determine compatibility with the service and load. Older fuse type systems were usually 60 amp services and you may run into 2, 3, 4, 5 or more sub-panels where you really should recommend an upgrade. 60 amp systems are pretty much antiquated for the requirements and demands of today's electrical needs. There are 100 amp rated fuse panels and, if everything is compatible, they should be fine. Breaker panels, as well as fused panels, should all have the appropriate sized fuse/breaker for the appropriate sized wire conductors.

You should call out any double tapping of 2 circuits on 1 breaker or fuse. Double tapping breakers do exist. However, the same gauge conductors must be present (i.e. #12 wire on one side and #14 on the other is unacceptable. Double tapped stacking, where 2 wires are double tapped onto a single wire breaker, should be called out to be evaluated).

There are different types of wires that have ratings for allowable ampacities. Determining this other than knowing whether the cable is rated for interior, exterior or underground use is well beyond the expertise and requirement of home inspectors. However, you should be identifying whether the wiring is BX (metal jacketed) type, Romex (non-metallic) type or other older non-metallic type, wiring in conduit, or knob and tube. Knob and tube should be carefully inspected for any signs of cracked or broken off insulation. Is it live and is it covered by house insulation such as in an attic? Knob and tube wiring is still in use and is still acceptable. However, some insurance companies will not write a home owners policy if they know it is present in the home. Be aware that in newer construction you will see color coded branch circuit wiring cables.

Wire sizes and load capabilities are:

| Copper | Aluminum | Rating |
|--------|----------|--------|
| (AWG) | (AWG) | (amps) |
| 14 | 12 | 15 |
| 12 | 10 | 20 |
| 10 | 8 | 30 |
| 8 | 6 | 40 |
| 6 | 4 | 50 |

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You should not see a #16 or smaller wire in a panel other than a door bell transformer wire. Make sure the wire size is compatible to the breaker or fuse size.

Grounding:

The main panel grounding buss bar should be grounded. Grounds are normally seen on the interior and/or exterior and are a conducting connection that connect to earth or connect to a conducting body that serves in place of earth. Interior grounding on metal water piping should have the connection no further than 5 feet from the entry into the building. Grounds connected to a water meter piping should be seen on the street side with a bonding jumper connection to the house. Make sure it looks like a good connection. You should not see excessive rust, corrosion or the connector and piping painted.

Bonding:

Bonding is the permanent joining of metallic parts to form an electrically conductive path that will ensure electrical continuity and the capacity to conduct safely any current likely to be imposed. The connection at the water meter is not a ground but a bonding and should have a bonding jumper connecting the piping from the street side to the house sides of the meter. The main panel box should be bonded to the grounding buss bar. All metallic appliances should be bonded. The bond creates a path from any metallic non-current carrying equipment to ensure electrical continuity and the capacity to conduct any fault current likely to be imposed to ground. We won't discuss types and sizing of electrodes and conductors here as inspectors are not looking for code violations but should be looking for safety issues.

Homes with single strand aluminum branch circuit wiring were and are a concern in homes built in the late 50's and 60's. When the price of copper sky rocketed, savings were seen in using aluminum. The problems with aluminum dealt with chemical reactions and corrosion issues. Two problems existed. One was with dissimilar metal connections. Aluminum to copper and aluminum to brass. Most outlet terminals and lighting sockets are brass and brass is made mostly from copper. The other problem dealt with pure aluminum wire which oxidizes when the insulation is cut back and the bare wire is exposed to air. Both reactions coat the wire surface with a layer that increases resistance to current and generates heat. The biggest problem was by the generation of heat causing house fires. There are aluminum terminal

switches and outlets manufactured for this purpose along with dissimilar metal connections for splicing copper to aluminum. Since you have to go beyond what an inspector is required to do, if you see single strand aluminum wiring on branch circuits in the panel box and the conductors appear too small, recommend they be further evaluated by a licensed electrician for safety. As the industry went along, they learned that the aluminum wiring should have been sized at a larger gauge than copper. Dissimilar metal wiring today must have the special cross connection connecting devices installed.

Outlets and Switches:

We still find 2 slot outlets present in older homes. Outlets are required to be randomly tested during an inspection. If you find an outlet that is a grounded outlet (3 slot) but tests as an open ground, call it out. Changing outlets for convenience to accommodate 3 pronged grounded plugs on appliances is unacceptable and should be reported. Outlets in wet and potentially wet areas need to have GFCI protection inside and outside the home. A GFCI outlet or breaker is an easy fix provided a working ground wire is connected. Look for outlets that have a ground adaptor connected with a refrigerator or portable air conditioner plugged in where the ground is open. Report this. Switches should be turned on to see if the lighting works. Switches should not be located in a shower or tub area. Exposed light bulbs should not be installed over wet areas (above shower areas or above tubs) nor should they be located in closets. Bulbs in closets should have protective covers installed or recessed lighting. Lighting fixtures above showers and tubs should be approved type over wet areas and have water tight sealed covers. Pull chain switch type lighting should have a recommendation to be changed to a non-metallic type for safety in wet and potentially wet areas (i.e. over plumbing fixtures, unfinished basement lighting).

Our responsibility is not to inspect for code compliance but to look for deficiencies, safety and hazardous conditions, and recommend evaluation, repairs and upgrades where justified.



Last Notice! Last Chance! SIGN UP NOW!

CONNECTICUT LAW SEMINAR

Saturday, January 12th
8:30 – 11:30 am

Holiday Inn
201 Washington Ave
North Haven

Anyone who has attended our law seminars in the past and has heard our featured speaker, Kent Mawhinney, realizes he is the most informative and well received presenter on the required 3-hour CT Law course in the state today! Guest speaker Bernie Caliendo will give a brief overview of the new regulation that is moving along and, if adopted, will change the plumbing section of the Standards of Practice. He will also talk about a new legislative proposal on changing the continuing education requirements for home inspectors.

CAHI sponsors this course only once a year each January. We have entered a new CE cycle, so don't wait until June 2009 and be stuck trying to find a provider. This CT Law course is not available every month by any provider. Get it in your continuing education portfolio for license renewal now!

CAHI provides the best deal in the state. \$99 for everything! Early time, a weekend date, continental breakfast and refreshments at the breaks, conference room setting, attendance certificates which meet the minimum requirements as set forth by the Home Inspection Licensing Board, free parking and easy on-off access to I-91 (exit 12 from north & south, take a right off either exit, the Holiday Inn is on the left).

Two ways to register:

- **Sign-up and pay on CAHI's web site:** www.ctinspect.com. Click on "Special Events" and select "Law Seminar". Fill out the form, click on check-out, fill in the credit card information (this is a secure page) and you're done.
- **US Mail:** Send your name, address and phone/email with a check for \$99 made out to CAHI. Mail to: CAHI Treasurer, 75 Pond View Circle, Beacon Falls, CT 06403

This course is open to everyone (members, non-members, inspectors, interns, trades people, etc). Home inspector interns are not required to complete this seminar during their internship. However, information at this seminar is invaluable to all and some content may be of help for the required CT Law Exam and Home Inspector Exam before licensure. CAHI recommends interns attend. Knowledge is the basis of your expertise.

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01/12/07 CONNECTICUT LAW SEMINAR

Fee \$99.00

Name: _____

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The Licensing Board meetings are held at 9:30 am, Department of Consumer Protection, Room 117, 165 Capitol Avenue, Hartford.

The public is always welcome (continued on page 8)

E-mail Bernie Caliendo for the latest meeting schedule at bsurehomeinspect@juno.com