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

CAHI MONTHLY NEWS

July 2021 Volume 14, Issue 07

Presidents Corner

I hope you all had a great 4th of July. Half of 2021 is behind us! Six months ago, we were entering the year with uncertainty regarding the pandemic. Now we were able to celebrate the 4th of July with our family and friends. Restrictions from the state are at a minimum and home inspections are back to normal…well almost. The process is back to normal with buyers in full attendance and Realtors close behind adding their two cents. However, the mindset is very different.

If you remember back in March of last year when the pandemic hit and the state shut down, there was a lot of information to process. Essential vs. non-essential, masks, no masks, put your mail in the garage for three days, wipe all your groceries down, etc. etc. As the world processed this situation and the information that was being disseminated, we began to decipher it all to make headway instead of running around like lost sheep. The Real Estate market that developed during this time frame has changed in a similar way. In past newsletters we have noted the rise of the "walk and talks", the waving of inspection contingencies, the term "for informational purposes only" and of course the waving of the home inspection completely. For a good while every home had fifteen minute showings, multiple offers in minutes, most well over list price. The inspection was often a buy or walk situation. However, I am seeing a bit of a change in the market, at least for me. Some local inspectors have seen similar changes. First of all, I am working with less New Yorkers. The influx was driving the market hard but for now it has slowed in my day to day activities. I have been noticing more Realtors suggesting some type of negotiation for bigger ticket items. That gives our clients the ability to actually use our findings to their advantage, as intended. The change is slight but a change none the less. We will see how things play out.

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MONTHLY MEETINGS – Details & Info

CAHI's regular monthly meetings are held at the Best Western located at 201 Washington Ave (RT 5), North Haven. Meetings are also broadcast via Zoom. Meetings are still free to members but RESERVATIONS are a MUST. Reservations can be made at our CAHI website.

Most meetings are on the fourth Wednesday of the month from 7-9pm. Guests are always welcome! Guests may attend 2 free monthly meetings to experience our presentations, meet our members, and receive a CE attendance certificate.

Joining CAHI may be done at anytime of the year through our Membership Page.

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Meeting Dates!

July 28th

Flat and Metal Roofs

Presented by Landmark Exteriors

August 25th

NO MEETING

Sept 22th

Electrical

Presenter - Tim Mikloiche

Presidents Message Continued:

On the legislative front bill 6600 “AN ACT CONCERNING SMOKE DETECTION AND WARNING EQUIPMENT IN ALL RESIDENTIAL BUILDINGS” has been passed and will become law. A copy of the bill has been included in this newsletter. I have been in touch will Bill Stanley, CAHI member and the chairman of the state home inspection licensing board. He has been in contact with the head of the DCP legal division to determined how we proceed since the additional reporting required by HB 6600 to be defined by regulations have yet to be written.

As written in the bill: (6) establish a minimum and uniform standard for a home inspection. The minimum and uniform standard for a home inspection shall include a requirement that a home inspector report on the presence of smoke detection and warning equipment and specify where such equipment is located, the total number of such equipment, whether the home inspector is able to test such equipment, and whether the home inspector is able to verify that such equipment was less than ten years old.

The interpretation of the highlighted lines are where my concerns lie. Since the minimum and uniform standards for a home inspection have yet to be defined and written, we should proceed with reporting on this subject as we have been. When more information can be had, I will pass it along to the membership.

Bill 846 which allows the state to train home inspectors to assist local building departments in performing municipal building inspections passed into law as well. This will also require further development before it is actually implemented. It was discussed by the board that CAHI may want to present a position statement to the membership. I will keep you posted.

There are a lot of things going on in our nation and in our world currently that question the makeup and constitution of our great country. Remember the 4th of July represents the birth of a nation, the United States of America, that got their independence from the British empire and is therefore a day to celebrate the creation of this country. Our history, no matter how questionable it may have been to some, is the path that has led to this day and time. History cannot be changed, but the future can be. I have never been one to look at what is behind me, always looking to improve what is ahead of me.
Stan

> *““Then join hand in hand, brave Americans all! By uniting we stand, by dividing we fall.”*
> — **John Dickinson**

Notice to membership

Woody Dawson, long time member, current board member and past president of CAHI is recovering from surgery at the Hartford Hospital. When last checked he is in the process of being released to his home.

From the membership and the board, our best wishes for a speedy recovery go out to Woody!

Stan

General Assembly

Amendment

January Session, 2021

LCO No. **9167**

Offered by:
REP. HORN, 64th Dist.
REP. PAOLILLO, 97th Dist.
REP. HOWARD, 43rd Dist.

To: Subst. House Bill No. **6600** File No. 392 Cal. No. 305

"AN ACT CONCERNING SMOKE DETECTION AND WARNING EQUIPMENT IN ALL RESIDENTIAL BUILDINGS."

Strike everything after the enacting clause and substitute the following in lieu thereof:

"Section 1. Section 29-292 of the general statutes is repealed and the following is substituted in lieu thereof (*Effective July 1, 2021*):

(a) (1) The State Fire Marshal and the Codes and Standards Committee shall adopt and administer a Fire Safety Code and at any time may amend the same in accordance with the provisions of section 29-292a. The code shall be based on **[**a**]** nationally recognized model fire **[**code**]** <u>and life safety codes</u> and shall be revised as deemed necessary to incorporate advances in technologies and improvements in construction materials and any subsequent revisions to the **[**code**]** <u>model fire and life safety codes</u> not later than eighteen months following the date of first publication of such revisions<u>,</u> **[**to the code,**]** unless the State Fire Marshal

14 and the committee certify that a revision is not necessary for such
15 purpose. The [regulations in said] code shall provide for reasonable
16 safety from fire, smoke and panic therefrom, in all buildings, structures
17 and areas adjacent [thereto] to such buildings and structures, except in
18 private dwellings occupied by one or two families and upon all
19 premises. [, and] The code shall [include provision for (A)] require (1)
20 carbon monoxide detection and warning equipment in [(i)] (A) new
21 residential buildings not exempt under [regulations adopted pursuant
22 to this subsection] the code and designed to be occupied by one or two
23 families for which a building permit for new occupancy is issued on or
24 after October 1, 2005, and [(ii)] (B) all public or nonpublic school
25 buildings, and [(B)] (2) smoke detection and warning equipment in [(i)]
26 (A) residential buildings designed to be occupied by [two] one or more
27 families [, (ii) new residential buildings designed to be occupied by one
28 family for which a building permit for new occupancy is issued on or
29 after October 1, 1978, requiring equipment complying with the Fire
30 Safety Code, and (iii) new residential buildings designed to be occupied
31 by one or more families for which a building permit for new occupancy
32 is issued on or after October 1, 1985, requiring equipment capable of
33 operation using alternating current and batteries] when a smoke
34 detection and warning system is installed or replaced, and (B) new
35 residential buildings designed to be occupied by one or more families
36 for which a building permit for new occupancy is issued on or after July
37 1, 2021, requiring in buildings described in subparagraphs (A) and (B)
38 of this subdivision, equipment capable of operation using any power
39 source permitted in the standards adopted in the code.

40 (2) [Said regulations] The Fire Safety Code shall [provide the
41 requirements for markings and literature which shall accompany such
42 equipment sufficient to inform the occupants and owners of such
43 buildings of the purpose, protective limitations and correct installation,
44 operating, testing, maintenance and replacement procedures and
45 servicing instructions for such equipment and shall require that smoke
46 detection and warning equipment which is installed in such residential
47 buildings shall be capable of sensing visible or invisible smoke particles,

48 that the manner and location of installing smoke detectors shall be
49 approved by the local fire marshal or building official, that such
50 installation shall not exceed the standards under which such equipment
51 was tested and approved and that such equipment, when activated,
52 shall provide an alarm suitable to warn the occupants, provided] require
53 each hotel, motel or inn [shall] to install or furnish [such] smoke
54 detection and warning equipment which, when activated, shall provide
55 a visible alarm suitable to warn occupants, in at least one per cent of the
56 units or rooms in such establishment having one hundred or more units
57 or rooms and to install or furnish at least one such visible alarm in
58 establishments having less than one hundred units or rooms. [, it shall
59 install or furnish at least one such alarm.]

60 [(3) Said regulations shall (A) provide the requirements and
61 specifications for the installation and use of carbon monoxide detection
62 and warning equipment and shall include, but not be limited to, the
63 location, power requirements and standards for such equipment and
64 exemptions for buildings that do not pose a risk of carbon monoxide
65 poisoning due to sole dependence on systems that do not emit carbon
66 monoxide; (B) provide the requirements for testing and inspecting
67 carbon monoxide detection and warning equipment installed in public
68 or nonpublic school buildings and shall include, but not be limited to,
69 the frequency with which such equipment shall be tested and inspected;
70 (C) require that, for a public or nonpublic school building, (i) any carbon
71 monoxide detection equipment installed in any such building meet or
72 exceed Underwriters Laboratories Standard Number 2075, or (ii) any
73 carbon monoxide warning equipment installed in any such building
74 meet or exceed Underwriters Laboratories Standard Number 2034; (D)
75 require the installation and maintenance of such detection or warning
76 equipment to comply with the manufacturer's instructions and with the
77 standards set forth by the National Fire Protection Association; and (E)
78 prohibit, for public and nonpublic school buildings for which a building
79 permit for new occupancy is issued on or after January 1, 2012, the
80 installation of any battery-operated carbon monoxide warning
81 equipment or any plug-in carbon monoxide warning equipment that

82 has a battery as its back-up power source.]

83 (b) (1) No certificate of occupancy shall be issued for any residential
84 building designed to be occupied by [two or more families, or any new
85 residential building designed to be occupied by] one or more families,
86 [for which a building permit for new occupancy is issued on or after
87 October 1, 1978,] unless the local fire marshal or building official has
88 certified that such building is equipped with smoke detection and
89 warning equipment complying with the Fire Safety Code and State
90 Building Code.

91 (2) No certificate of occupancy shall be issued for any (A) new
92 residential building not exempt under [regulations adopted pursuant to
93 subsection (a) of this section and designed to be occupied by one or two
94 families for which a building permit for new occupancy is issued on or
95 after October 1, 2005] the Fire Safety Code, or (B) public or nonpublic
96 school building for which a building permit for new occupancy is issued
97 on or after January 1, 2012, unless the local fire marshal or building
98 official has certified that such residential or school building is equipped
99 with carbon monoxide detection and warning equipment complying
100 with the Fire Safety Code and State Building Code.

101 (c) (1) No municipality, local or regional board of education, or
102 supervisory agent of a nonpublic school, and (2) no employee, officer or
103 agent of such municipality, board of education or supervisory agent
104 acting without malice, in good faith and within the scope of his or her
105 employment or official duties shall be liable for any damage to any
106 person or property resulting from the failure to detect carbon monoxide
107 within a public school building, provided carbon monoxide detection
108 equipment is installed and maintained in accordance with the
109 manufacturer's published instructions and with the [regulations
110 established pursuant to this section] Fire Safety Code.

111 Sec. 2. Section 20-491 of the general statutes is repealed and the
112 following is substituted in lieu thereof (*Effective July 1, 2021*):

113 (a) The commissioner, with the advice and assistance of the board,

114 shall adopt regulations, in accordance with the provisions of chapter 54,
115 to: (1) Establish such qualifications for the licensing of home inspectors
116 as the commissioner finds necessary for the public interest; (2) establish
117 an application process for persons seeking a license as a home inspector;
118 (3) establish continuing education requirements and standards of
119 professional and ethical conduct for home inspectors; (4) publish a code
120 of ethics for home inspectors; **[**and**]** (5) establish such reasonable rules
121 and regulations as the commissioner may deem necessary or desirable
122 to carry out and enforce the provisions of sections 20-490 to 20-495a,
123 inclusive; and (6) establish a minimum and uniform standard for a home
124 inspection. The minimum and uniform standard for a home inspection
125 shall include a requirement that a home inspector report on the presence
126 of smoke detection and warning equipment and specify where such
127 equipment is located, the total number of such equipment, whether the
128 home inspector is able to test such equipment, and whether the home
129 inspector is able to verify that such equipment was less than ten years
130 old.

131 (b) The commissioner, with the advice and assistance of the board,
132 shall adopt regulations, in accordance with the provisions of chapter 54,
133 to: (1) Establish the requirements for obtaining a permit as a home
134 inspector intern; (2) establish application procedures for persons
135 seeking a permit as a home inspector intern; (3) prescribe rules and
136 standards concerning the supervision of home inspector interns by
137 licensed home inspectors; and (4) adopt such reasonable regulations as
138 the commissioner may deem necessary or desirable to carry out and
139 enforce the provisions of sections 20-490 to 20-495a, inclusive. Such
140 regulations shall require, as a condition of receiving a permit as a home
141 inspector intern, that the applicant enroll in and complete a board-
142 approved training program which may include a home study course.

143 (c) The commissioner shall establish rules concerning hearings on any
144 matter under the provisions of sections 20-490 to 20-495a, inclusive.

145 Sec. 3. Section 29-291a of the general statutes is repealed and the
146 following is substituted in lieu thereof (*Effective July 1, 2021*):

147 (a) The State Fire Marshal, in coordination with the advisory
148 committee established under subsection (b) of this section and in
149 accordance with the provisions of section 29-291e, shall adopt and
150 administer a State Fire Prevention Code based on a nationally
151 recognized fire [prevention] code. The code shall be used to enhance the
152 enforcement capabilities of local fire marshals and for the purposes of
153 prevention of fire and other related emergencies. The code shall be
154 revised as deemed necessary to incorporate any subsequent revisions to
155 the nationally recognized fire code not later than eighteen months
156 following the date of first publication of such revisions. The code shall
157 include provisions for oil burners, flammable and combustible liquids,
158 gas equipment and piping, liquefied gas and liquefied natural gas, [and]
159 hazardous chemicals, and processes and activities that occur in all
160 buildings and structures regulated by the code and the areas adjacent to
161 such buildings and structures.

162 (b) There is established an advisory committee consisting of nine
163 persons appointed by the State Fire Marshal. The State Fire Marshal
164 shall appoint two members selected from a list of individuals submitted
165 by the Codes and Standards Committee from the membership of said
166 committee and seven members representing local fire marshals, deputy
167 fire marshals and fire inspectors selected from a list of individuals
168 submitted by the Connecticut Fire Marshals Association.

169 (c) The State Fire Marshal may issue official interpretations of the
170 State Fire Prevention Code, including interpretations of the applicability
171 of any provision of the code, upon the request of any person. The State
172 Fire Marshal shall compile and index each interpretation and shall
173 publish such interpretations at periodic intervals not exceeding four
174 months.

175 Sec. 4. Section 29-291c of the general statutes is repealed and the
176 following is substituted in lieu thereof (*Effective July 1, 2021*):

177 (a) When the State Fire Marshal or a local fire marshal ascertains that
178 there exists in any building, or upon any premises, a condition that

179 violates the State Fire Prevention Code or Fire Safety Code, the State Fire
180 Marshal or local fire marshal shall order such condition remedied by the
181 owner or occupant of such building or premises. Any such remedy shall
182 be in conformance with all building codes, ordinances, rules and
183 regulations of the municipality involved. Such owner or occupant shall
184 be subject to the penalties prescribed by subsection (e) of this section
185 and, in addition, may be fined fifty dollars a day for each day's
186 continuance of each violation, to be recovered in a proper action in the
187 name of the state.

188 (b) Upon failure of an owner or occupant to abate or remedy a
189 violation pursuant to subsection (a) of this section within a reasonable
190 period of time specified by the State Fire Marshal or the local fire
191 marshal, the local fire marshal shall promptly notify, in writing, the
192 prosecuting attorney having jurisdiction in the municipality in which
193 such violation or condition exists of all of the relevant facts. The local
194 fire marshal may request the chief executive officer, any official of the
195 municipality authorized to institute actions on behalf of the
196 municipality in which the hazard exists or the State Fire Marshal, to
197 apply to any court of equitable jurisdiction for an injunction against
198 such owner or occupant for the purpose of closing or restricting from
199 public service or use the place or premises containing the violation or
200 condition until the violation or condition has been remedied, or the State
201 Fire Marshal may apply for such an injunction without such request.

202 (c) The State Fire Marshal or any local fire marshal empowered to
203 enforce the State Fire Prevention Code or Fire Safety Code may, as an
204 alternative to issuing an order pursuant to subsection (a) of this section,
205 give the owner or occupant a written citation for any violation of the
206 **[**State Fire Prevention Code**]** applicable code. No such citation may be
207 issued if the owner or occupant has been previously issued a citation for
208 the same violation by the State Fire Marshal or the local fire marshal
209 within six months prior to the current violation. Such citation shall
210 contain the name and address, if known, of the owner or occupant, the
211 specific offense charged and the time and place of the violation. The
212 citation shall be signed by the State Fire Marshal or local fire marshal

213 and shall be signed by the owner or occupant in acknowledgment that
214 such citation has been received. The State Fire Marshal or local fire
215 marshal shall, if practicable, deliver a copy of the citation to the owner
216 or occupant at the time and place of the violation or shall use some other
217 reasonable means of notification. Any person who is issued a citation
218 for violation of any provision of the State Fire Prevention Code or Fire
219 Safety Code in accordance with this subsection shall be fined not more
220 than two hundred fifty dollars.

221 (d) If a local fire marshal issues a citation pursuant to subsection (c)
222 of this section, the state shall remit to the municipalities in which the
223 violations occurred ninety per cent of the proceeds of the fine and shall
224 remit to the State Treasurer the remaining ten per cent. If the State Fire
225 Marshal issues a citation pursuant to said subsection, the state shall
226 remit to the State Treasurer the entire proceeds of the fine. Each clerk of
227 the Superior Court or the Chief Court Administrator, on or before the
228 thirtieth day of January, April, July and October in each year, shall
229 certify to the Comptroller the amount due for the previous quarter
230 under this subsection to each municipality served by the office of the
231 clerk or official.

232 (e) In addition to the fine prescribed in subsection (a) of this section,
233 any person who violates any provision of the State Fire Prevention Code
234 or Fire Safety Code shall be fined not less than two hundred dollars or
235 more than one thousand dollars or be imprisoned not more than six
236 months, or both.

237 Sec. 5. Section 29-296 of the general statutes is repealed and the
238 following is substituted in lieu thereof (*Effective July 1, 2021*):

239 The State Fire Marshal may grant variations or exemptions from, or
240 approve equivalent or alternate compliance with, particular provisions
241 of **[**any regulation issued under the provisions of section 29-292**]** the Fire
242 Safety Code or State Fire Prevention Code where strict compliance with
243 such provisions would entail practical difficulty or unnecessary
244 hardship, or is otherwise adjudged unwarranted, provided any such

245 variation or exemption or approved equivalent or alternate compliance
246 shall, in the opinion of the State Fire Marshal, secure the public safety.
247 Any application for a variation or exemption or equivalent or alternate
248 compliance received by a local fire marshal shall be forwarded to the
249 State Fire Marshal by first class mail **[**within**]** or electronic mail not later
250 than fifteen business days **[**of**]** after receipt by such local fire marshal
251 and shall be accompanied by a letter or electronic message from such
252 local fire marshal **[**that shall include comments on**]** regarding the merits
253 of the application.

254 Sec. 6. Subsection (b) of section 29-305 of the general statutes is
255 repealed and the following is substituted in lieu thereof (*Effective July 1,*
256 *2021*):

257 (b) Each local fire marshal shall inspect or cause to be inspected, at
258 least once each calendar year or as often as prescribed by the State Fire
259 Marshal pursuant to subsection (e) of this section, in the interests of
260 public safety, all buildings and facilities of public service and all
261 occupancies regulated by the Fire Safety Code or State Fire Prevention
262 Code within the local fire marshal's jurisdiction, except residential
263 buildings designed to be occupied by one or two families which shall be
264 inspected, upon complaint or request of an owner or occupant, only for
265 the purpose of determining whether the requirements specified in said
266 codes relative to smoke detection and warning equipment have been
267 satisfied. In the case of a school building, each local fire marshal shall
268 submit a written report to the local or regional board of education
269 documenting each such inspection.

270 Sec. 7. Subsection (c) of section 29-306 of the general statutes is
271 repealed and the following is substituted in lieu thereof (*Effective July 1,*
272 *2021*):

273 (c) If the local fire marshal or a local police officer determines that
274 there exists in a building a risk of death or injury from (1) blocked,
275 insufficient or impeded egress, (2) failure to maintain or the shutting off
276 of any fire protection or fire warning system required by the Fire Safety

277 Code or State Fire Prevention Code, (3) the storage of any flammable or
278 explosive material without a permit or in quantities in excess of any
279 allowable limits pursuant to a permit, (4) the use of any firework or
280 pyrotechnic device without a permit, or (5) exceeding the occupancy
281 limit established by the State Fire Marshal or a local fire marshal, such
282 fire marshal or police officer may issue a verbal or written order to
283 immediately vacate the building. Such fire marshal or police officer shall
284 notify or submit a copy of such order to the State Fire Marshal if such
285 marshal or officer anticipates that any of the conditions specified in
286 subdivisions (1) to (5), inclusive, of this subsection cannot be abated in
287 four hours or less from the time of such order. Upon receipt of any such
288 notification or copy, the State Fire Marshal shall review such order to
289 vacate, and after consultation with the local fire marshal or local police
290 officer, determine whether to uphold, modify or reverse such order,
291 with any further conditions the State Fire Marshal deems appropriate to
292 protect any person from injury. A violation of such order shall be subject
293 to the penalties under section **[**29-295**]** 29-291c, as amended by this act.

294 Sec. 8. Section 29-310 of the general statutes is repealed and the
295 following is substituted in lieu thereof (*Effective July 1, 2021*):

296 (a) The Commissioner of Emergency Services and Public Protection
297 shall thoroughly investigate the cause, circumstances and origin of all
298 fires or explosions to which **[**his**]** the commissioner's attention has been
299 called, in accordance with the provisions of this part, by reason of which
300 any property has been destroyed or damaged, or any person injured or
301 killed, and shall especially examine and decide as to whether such fire
302 was the result of carelessness, design, an incendiary device or any other
303 criminal act. **[**He**]** The commissioner may take the testimony under oath
304 of any person supposed to be cognizant of or to have means of
305 knowledge in relation to the matters as to which an examination is being
306 made, and shall cause the same to be reduced to writing and filed in
307 **[**his**]** the commissioner's office; and if, in **[**his**]** the commissioner's
308 opinion, there is sufficient evidence to warrant that any person should
309 be charged with the crime of arson or any other crime, **[**he**]** the
310 commissioner shall forthwith submit such evidence, together with the

311 names of the witnesses and all other information obtained by [him] the
312 commissioner, to the proper prosecuting officer. [He] The commissioner
313 may, in any investigation, issue subpoenas for the purposes of
314 summoning and compelling the attendance of witnesses before [him]
315 the commissioner to testify. [He] The commissioner may administer
316 oaths or affirmations to witnesses before [him] the commissioner, and
317 false swearing therein shall be perjury. [He] The commissioner, or a
318 designee, may, in the performance of his or her duties, enter [, by himself
319 or his assistants,] into and upon the premises or building where any fire
320 or explosion has occurred and premises thereto adjacent in accordance
321 with the provisions of section 29-311.

322 (b) Whenever it comes to [his] the commissioner's knowledge or to
323 the knowledge of any local fire marshal that there exists in any building
324 or upon any premises combustible material or flammable conditions
325 dangerous to the safety of such building or premises or dangerous to
326 any other building or property, or conditions that present a fire hazard
327 to the occupants thereof, the State Fire Marshal, or any local fire marshal,
328 obtaining such knowledge, shall order such material to be forthwith
329 removed or such conditions remedied by the owner or occupant of such
330 building or premises, and such owner or occupant shall be subject to the
331 penalties prescribed [by] in section [29-295] 29-291c, as amended by this
332 act, and, in addition thereto, shall suffer a penalty of one hundred
333 dollars a day for each day of neglect, to be recovered in a proper action
334 in the name of the state.

335 Sec. 9. Section 29-313 of the general statutes is repealed and the
336 following is substituted in lieu thereof (*Effective July 1, 2021*):

337 (a) No fire extinguishing agent used in a fire extinguisher or fire
338 extinguishing device may contain an active ingredient having a level of
339 toxicity equal to or greater than the vapors of carbon tetrachloride or
340 chlorobromomethane or the thermal decomposition products resulting
341 therefrom.

342 (b) No fire extinguisher or fire extinguishing device containing an

343 active agent having a level of toxicity equal to or greater than the vapors
344 of carbon tetrachloride or chlorobromomethane or the thermal
345 decomposition products resulting therefrom shall be used or installed
346 for use in any school bus or motor vehicle used for the transportation of
347 passengers for hire. The owner or operator of any such bus or vehicle
348 who violates any provision of this subsection shall be fined not more
349 than two hundred dollars or imprisoned not more than three months,
350 or both.

351 (c) Any person who sells, offers for sale or gives to another any fire
352 extinguisher or fire extinguishing device, containing or designed to
353 contain an active agent having an ingredient prohibited by subsection
354 (a) of this section shall be subject to the penalties prescribed **[**by**]** in
355 section **[**29-295**]** 29-291c, as amended by this act.

356 Sec. 10. Section 29-314 of the general statutes is repealed and the
357 following is substituted in lieu thereof (*Effective July 1, 2021*):

358 Any person who sells, offers to sell or displays for sale any portable
359 fire extinguisher or any flame-proofing or fire retardant coating or
360 compound, unless such fire extinguisher, coating or compound has been
361 tested, listed and rated as satisfactory for its intended purpose by a
362 nationally recognized testing laboratory acceptable to the State Fire
363 Marshal and, in the case of a fire extinguisher, unless such fire
364 extinguisher contains no active agent having an ingredient prohibited
365 by section 29-313, as amended by this act, shall be subject to the penalties
366 prescribed in section **[**29-295**]** 29-291c, as amended by this act.

367 Sec. 11. Subsection (b) of section 29-251c of the general statutes is
368 repealed and the following is substituted in lieu thereof (*Effective July 1,*
369 *2021, and applicable to appointments made on and after said date*):

370 (b) There is established the Code Training and Education Board of
371 Control which shall promote code training and education. No funds
372 shall be expended for the purposes listed in subsection (a) of this section
373 without prior approval of the Code Training and Education Board of
374 Control. The board shall consist of seven members as follows: (1) **[**Three**]**

375 Four members of the [Building Code Training Council] Codes and
376 Standards Committee, one each of whom shall be appointed by the
377 speaker [,] and majority leader [and minority leader] of the House of
378 Representatives [,] and the president pro tempore and majority leader
379 of the Senate, (2) [three members] one member of the Fire Marshal
380 Training Council, [one each of whom] who shall be appointed by the
381 [president pro tempore, majority leader and] minority leader of the
382 [Senate] House of Representatives, (3) one member of the Building Code
383 Training Council, who shall be appointed by the minority leader of the
384 Senate, and [(3)] (4) one architect, engineer, landscape architect, interior
385 designer, builder, contractor or superintendent of construction doing
386 business in this state, who shall be appointed by the Commissioner of
387 Administrative Services. The members of the board shall continue in
388 office for the term of three years from the first day of July next
389 succeeding their appointment. Vacancies on the board shall be filled by
390 the original appointing authority for the balance of the unexpired term.

391 Sec. 12. Section 29-297 of the general statutes is repealed and the
392 following is substituted in lieu thereof (*Effective July 1, 2021*):

393 (a) The board of fire commissioners or, in the absence of such board,
394 any corresponding authority of each town, city or borough, or, if no such
395 board or corresponding authority exists, the legislative body of each
396 city, the board of selectmen of each town or the warden and burgesses
397 of each borough, or, in the case of an incorporated fire district, the
398 executive authority of such district shall appoint a local fire marshal and
399 such deputy fire marshals, fire inspectors and other fire code inspectors
400 or fire investigators as may be necessary. In making such appointment,
401 preference shall be given to a member of the regular or volunteer fire
402 department of such municipality. Each local fire marshal shall be sworn
403 to the faithful performance of his or her duties by the clerk of the town,
404 city, borough or fire district and shall continue to serve in that office
405 until removed for cause. Such clerk shall record his or her acceptance of
406 the position of local fire marshal and shall report the same in writing to
407 the State Fire Marshal within ten days thereafter, giving the name and
408 address of the local fire marshal and stating the limits of the territory in

409 which the local fire marshal is to serve.

410 (b) The board of fire commissioners or, in the absence of such board,
411 any corresponding authority of each town, city or borough or, if no such
412 board or corresponding authority exists, the legislative body of each
413 city, the board of selectmen of each town or the warden and burgesses
414 of each borough or, in the case of an incorporated fire district, the
415 executive authority of such district may, upon the death, disability,
416 dismissal, retirement or revocation of certification of the local fire
417 marshal, and in the absence of an existing deputy fire marshal, appoint
418 a **[**deputy fire marshal**]** person who holds a fire marshal certification
419 issued pursuant to section 29-298 as the acting fire marshal for a period
420 not to exceed one hundred eighty days.

421 Sec. 13. Section 29-303 of the general statutes is repealed and the
422 following is substituted in lieu thereof (*Effective July 1, 2021*):

423 The fire chief or local fire marshal with jurisdiction over a town, city,
424 borough or fire district where a fire, explosion or other fire emergency
425 occurs shall furnish the State Fire Marshal a report that shall include (1)
426 all the facts relating to its cause, its origin, the kind, the estimated value
427 and ownership of the property damaged or destroyed, and (2) **[**the name
428 of each firefighter who was (A) present at such fire, explosion or other
429 fire emergency, and (B) exposed to heat, radiation or a known or
430 suspected carcinogen as a result of such fire, explosion or other fire
431 emergency, including the duration of each such firefighter's exposure,**]**
432 and (3) such other information as called for by the State Fire Marshal on
433 forms furnished by the State Fire Marshal, or in an electronic format
434 prescribed by the State Fire Marshal. The fire chief or fire marshal may
435 also submit reports regarding other significant fire department response
436 to such fire or explosion, and such reports may be filed monthly but
437 commencing January 1, 2008, such reports shall be filed not less than
438 quarterly.

439 Sec. 14. Section 29-231 of the general statutes is repealed and the
440 following is substituted in lieu thereof (*Effective from passage*):

441 The provisions of this chapter shall not apply to: (1) Boilers under
442 federal control; (2) portable boilers used in pumping, heating, steaming
443 and drilling in the open field; (3) portable boilers used solely for
444 agricultural purposes; (4) steam heating boilers, hot water heaters and
445 hot water heating boilers, when used in private homes or apartment
446 houses of not more than five families; (5) hot water heaters approved by
447 a nationally recognized testing agency that are equipped with adequate
448 safety devices, including a temperature and pressure relief valve, (A) (i)
449 having a nominal water capacity of not more than one hundred twenty
450 gallons and a heat input of not more than two hundred thousand British
451 thermal units per hour, **[**and**]** (ii) used solely for hot water supply
452 carrying a pressure of not more than one hundred sixty pounds per
453 square inch and operating at temperatures of not more than two
454 hundred ten degrees Fahrenheit, **[**provided such heaters are**]** and (iii)
455 not installed in schools, day care centers, public or private hospitals,
456 nursing or boarding homes, churches or public buildings, as defined in
457 section 1-1, or (B) (i) having a nominal water capacity of not more than
458 ten gallons and a heat input of not more than twenty thousand British
459 thermal units per hour, and (ii) installed in any occupancy; (6) antique
460 or model boilers used in public, nonprofit engineering or scientific
461 museums and operated for educational, historical or exhibition
462 purposes having a shell diameter of less than twelve inches and a grate
463 surface area of less than one square foot; and (7) public service
464 companies, as defined in section 16-1.

465 Sec. 15. Sections 29-291b and 29-295 of the general statutes are
466 repealed. (*Effective July 1, 2021*)"

This act shall take effect as follows and shall amend the following sections:		
Section 1	*July 1, 2021*	29-292
Sec. 2	*July 1, 2021*	20-491
Sec. 3	*July 1, 2021*	29-291a
Sec. 4	*July 1, 2021*	29-291c
Sec. 5	*July 1, 2021*	29-296
Sec. 6	*July 1, 2021*	29-305(b)

Sec. 7	*July 1, 2021*	29-306(c)
Sec. 8	*July 1, 2021*	29-310
Sec. 9	*July 1, 2021*	29-313
Sec. 10	*July 1, 2021*	29-314
Sec. 11	*July 1, 2021, and applicable to appointments made on and after said date*	29-251c(b)
Sec. 12	*July 1, 2021*	29-297
Sec. 13	*July 1, 2021*	29-303
Sec. 14	*from passage*	29-231
Sec. 15	*July 1, 2021*	Repealer section

Interesting Finds While Inspecting

By Al Dingfelder

Found in a Butler's Pantry of house built in 1830.
Lever arm indicates some type of press. Any ideas?

Found during inspection; hanging in a hallway. I seek my spiritual advice elsewhere but this was interesting.

All right, this sticker was on a wall at stairs to a basement. Looks like it never detected carbon monoxide. When were these things marketed? Did they work?

BY ROB CORBO

Trade-offs: Making Retirement Savings Work

In the two previous articles in this series, I established the importance of saving for retirement. I identified traditional and Roth IRAs as viable investment vehicles for retirement savings, and exchange traded stock index funds as providing the best returns on investment for IRAs. I highlighted the importance of compounding, dollar cost averaging, and low investment fees in maximizing retirement savings. But I didn't address how we are going to get the money to make the necessary regular, uninterrupted contributions of up to $6,000 a year, year in and year out for our construction careers. That's $500 a month. That's substantial money for self-employed folks and small businesses.

The best way to generate money for retirement is from the fruits of your labor. If your market will bear it, add $3 to your hourly rate (assuming 2,000 work hours a year) to generate $6,000 a year to fund your annual IRA contribution. If $3 is too much, then try $2, or $1. If you can't raise your rate, though, or you can, but want additional funds to open a spousal IRA (see "The Future Is Now: Making Retirement Savings Work," Mar/21), you may need to make trade-offs to find the cash—give up something to accomplish something else.

In business, there are always choices to make, priorities to establish, decisions to make, and goals to achieve. You don't choose to run a construction business unless you are strong and capable, used to sacrifices and trade-offs. In this article, we will examine how to fund retirement contributions by finding dollar trade-offs in business and household expenses. I will emphasize the need to spend wisely to achieve your retirement goals while remembering that a dollar not invested in retirement today is many more dollars lost in the future.

SETTING PRIORITIES

Finding money for retirement contributions from business or household funds means examining spending and establishing priorities. For this article, retirement is our number one priority, but in reality, growing your business and providing a solid family life are just as important. So, I am not going to suggest taking the kids' milk money to finance retirement, but how about your own milk money? Does carrying your lunch to work every day make you a tightwad? Not if it's a trade-off; to free up dollars to spend elsewhere, eat dinner leftovers instead of buying lunch. By carrying your lunch to work, you can save $8 a day or $160 a month. Over 30 years, if you compound a monthly contribution of $160 annually at 5%, you accrue $127,563. Hello! Lucky for me, I like leftovers.

In spite of the impressive amount of money $8 a day can become in retirement, I have spent many years' worth of lunch savings on traveling with my daughter to various national parks. A week's vacation with her is as important to me as a well-financed retirement. What isn't a priority for me is a store-bought lunch every day. Find your "store-bought lunch" and trade it off to achieve your retirement goal (or take your kids on a vacation, or buy them a drum set).

Every now and then, I punch up the company's accounting program and look at the profit and loss statement for the previous 20 years. Seeing that we spent $83,000 to rent a 10x25-foot storage facility to house business supplies and equipment prompts me to consider sacrificing the personal use of my two-car garage to save $350 a month. Gasoline costs amounting to $86,000 might lead me to consider a more fuel-efficient vehicle. For many small construction companies, vehicles are the largest capital expenditure. Trade off a new truck with all the bells and whistles but low fuel efficiency for one that's more modest with high fuel efficiency, or for a modest pre-owned truck that will cost you less for fuel and loan interest. (Paying loan interest, often a necessary evil, is the opposite of compounding savings interest; it subtracts from rather than adds to your future savings.)

> How are we going to get the money to make the necessary regular, uninterrupted contributions of up to $6,000 a year, year in and year out for our construction careers?

One beauty of many pre-owned pickups is that they were leased by folks not in the trades and therefore haven't seen heavy use. One trade-off my business made was buying a used five-year-old F550 super duty diesel dump truck from Hertz Equipment Rentals. Concerned the F550 might have been beaten up, we first rented it for a week to see how it performed. To improve the deal, Hertz gave us the truck's maintenance and repair records and agreed to take a credit card. We had the money, less than half of the truck's original purchase price, but used a credit card with a 0% interest rate promotion for 12 months to pay for the truck. We got a great truck for a good price and had money to apply to other areas of the business.

Examples of trade-offs are endless. The "carry your lunch" example shows how much a small amount of money, pocket change, can compound. Small trade-offs and sacrifices at work or at home can help you achieve your retirement goal. Larger trade-offs, like buying

a used truck instead of a new one, can get you there faster.

It's for you to decide what trade-offs are worth pursuing to achieve your goals. Two useful online tools for determining the worth of a trade-off are the compounding interest calculator at investor.gov, which shows you the potential reward of dollars saved from a trade-off, and the loan interest calculator at calculator.net, which shows the true cost of a purchase made with a loan. Quoting Einstein again (as I did in the two previous articles), "Compounding interest is the eighth wonder of the universe. He who understands it, earns it; he who doesn't, pays it." Use the compounding interest calculator to see "who earns it" and use the loan interest calculator to see "who pays it."

If you have extra money and want to supercharge your children's retirement, you can put them on the payroll, teach them the value of work, and establish a Roth IRA in their name. The federal government allows children of any age to work in businesses owned by their parents (except mining, manufacturing, or hazardous jobs). To be clear, I am suggesting office work. Start them at age 10 emptying the office trash and vacuuming the office floor. Keep them on the company payroll until they are 17 and have them end their construction career working with an accounting program or even working in the field, if it's safe (and allowed in your state). The more skills they can master, the better life will be. Just $40 a week will earn them $2,000 a year, which they can contribute to an IRA for eight years, for a total of $16,000. There are no federal income taxes on $2,000 of earnings in a year. Get out your compounding interest calculators and figure a $16,000 investment at 5% compounded annually for 50 years ($183,478 when they turn 67). That's in addition to their own retirement savings from age 18 to 67.

So, pocket change can become a pot of gold. A few trade-offs and you can change the course of your family's fortunes. But once you make sure you will have money to finance your retirement, you also have to make sure you'll be around to spend it. In this age of COVID-19, I would be remiss not to say that building up your immune system should be a priority. Trade off the pack of smokes a day ($8) and the case of beer a week ($24) and add years to your retirement—as well as the money to pay for the extra years. (Cue up Adam Ant: "Don't drink, don't smoke, what do you do?")

Rob Corbo, a frequent contributor to JLC, *is a building contractor based in Elizabeth, N.J.*

Extreme Heat Precautions and Safety Tips

If you are exposed to high temperatures and humidity for too long, you sweat heavily, and don't drink enough fluids, your natural cooling system may fail. The result may be a heat-related illness.

Heat-related illnesses include:

Heat Cramps:
Heat cramps are muscle pains or spasms-usually in the abdomen, arms, or legs-that may occur in association with strenous activity. Heat cramps may also be a symptom of heat exhaustion. If you have heart problems or are on a low-sodium diet, seek medical attention for heat cramps.

Heat Exhaustion:
Heat exhaustion is a milder form of heart-related illness that can develop after several days of exposure to high temperatures and inadequate or unbalanced replacement of fluids. Elderly people and those with high blood pressure, and those working or exercising in a hot environment are most prone to heat exhaustion.

Heat stroke:
Heat stroke is the most serious-heart related illness. It occurs when the body becomes unable to control its temperature: the body's temperature rises rapidly, the sweating mechanism fails, and the body is unable to cool down. Body temperature may rise to 106 degrees or higher within 10 to 15 minutes. Heat stroke can cause death or permanent disability if emergency treatment is not provided.

For more information go to the Centers of Disease Control and Prevention: Extreme Heat, http://emergency.cdc.gov/disasters/extremeheat/

The Connecticut Department of Emergency Services and Public Protection offer the following tips during extreme high temperatures:

- Slow down, and avoid strenuous activity.
- Wear lightweight, loose-fitting, light-colored clothing. Light colors will reflect heat and sunlight and help maintain normal body temperature. Protect your face with a wide-brimmed hat.
- Drink plenty of water regularly and often, even if you don't feel thirsty.
- Limit intake of alcoholic beverages. They can actually dehydrate your body.
- Eat well-balanced, light, regular meals.

- Stay indoors as much as possible.
- If you do not have air conditioning, stay on your lowest floor, out of the sun. Electric fans do not cool the air, but they do help evaporate sweat, which cools your body.
- Go to a place where you can get relief from the heat, such as air conditioned schools, libraries, theaters, shopping malls, and other community facilities that may offer refuge during the warmest times of the day.
- Cover windows that get morning or afternoon sun with drapes, shades, awnings or louvers. Outdoor awnings or louvers can reduce the heat that enters a home by up to 80 percent
- Avoid too much sunshine. Sunburn slows the skin's ability to cool itself. If you are outside, use sunscreen with a high SPF (Sun Protection Factor) rating.
- Never leave children or pets alone in a closed vehicle.
- Do not leave pets outside for extended periods. Make sure pets have plenty of drinking water.
- Check on family, friends, and neighbors regularly.

Additional Resources:

FEMA – Extreme Heat: http://www.ready.gov/heat

Connecticut Department of Public Health, Heat Safety Precautions – https://portal.ct.gov/DPH/Communications/Crisis-and-Emergency-Risk-Communication/Extreme-Heat

If a city/town has opened a designated cooling center, we will list the site location and hours on our website at the following link. If we do not have any listings available, please note that city/town libraries, senior centers and other public locations are good places to cool off.

Color-Coding the Jobsite

BY RICK MILLS

As a project manager, I am responsible for distributing information about a project to other team members in the most effective way possible to bring the job to a successful conclusion. A big part of that is going to each team member or trade individually to find out what is needed to meet that goal. When compromises have to be made along the way, a good project manager can assess the situation and determine the direction that's needed to keep everyone on track. The key to this process is good communication.

Keeping in mind the old saying "a picture is worth a thousand words," a good project manager takes advantage of marked-up plans, spec sheets, and mock-ups to create a "picture" to get everyone on the same page. Sometimes that picture becomes muddied when notes are added to a set of plans, so to distinguish my notes, I use a color that most trades don't carry, such as magenta or teal. When someone sees a note or marking in that distinctive color on a set of marked-up plans or on site, they know it was from me.

Questions always arise and there may be times I am unavailable to answer them because I'm not on site or I'm in a meeting. The markings and information that I've added to the jobsite documentation are often enough to answer those questions without my involvement, or at least keep the job moving until I become available. But information can get buried in the plans or be misinterpreted, so I like to take the color-coding strategy a step further and mark the jobsite too.

At the start of each job, I assign each trade a color, typically one that corresponds to those used by Miss Utility or Dig Safe **(1)**. That way, if someone sees a red marking on a subfloor or ceiling joist, for instance, they know that it relates to the electrical trade. I use dark blue markings to indicate water lines, and green ones to mark DWV lines. Not all of the colors I use correspond to Dig Safe, though. For example, I use light blue paint to mark HVAC-related items, and a unique color—like magenta—for anything else that doesn't involve a trade (like door swings).

Typically, I am the only one marking with colors, unless a sub is proposing a penetration through the exterior envelope for me to approve, in which case they can mark that.

FOUNDATION

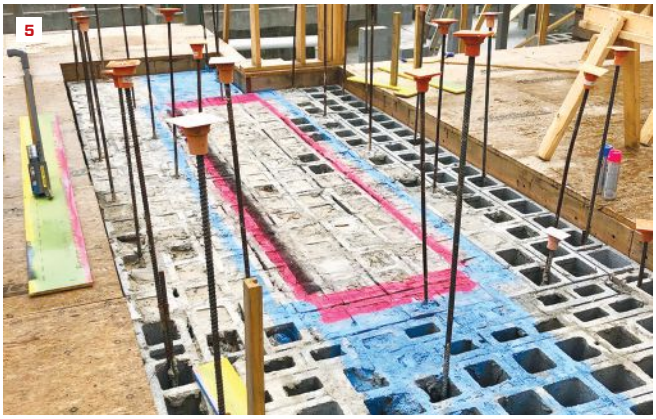
I start at the foundation; the less that's left to chance or to someone else's interpretation, the better, even when the situation may seem straightforward. I often think that I'm talking about one thing with a trade, but when we go to the specific location to discuss the detail, we find that we've been talking about two different things. Mistakes or misinterpretations are much less likely to happen when there's a visual reference that indicates exactly

Photos by Rick Mills

APWA Uniform Color Code

RED	ELECTRIC
YELLOW	GAS, OIL, STEAM
ORANGE	COMMUNICATIONS
BLUE	POTABLE WATER
PURPLE	RECLAIMED WATER
GREEN	SEWER/DRAINAGE
PINK	SURVEY MARKS
WHITE	PROPOSED EXCAVATION

Using a color scheme based on a typical utility locating service chart (above) and a unique and distinctive color for his own notes, the author marks up plans as well as other elements on the jobsite so that each trade can quickly identify who is responsible for what **(1)**.



The author cuts appropriately sized PVC pipe sleeves to route utilities through the foundation wall and marks them with paint **(2)**; coordinating marks on the wall indicate to the masons the courses where the sleeves should be installed **(3)**. After the footings for the steel columns have been poured, the author marks them with a stenciled number that the fabricator uses to identify each member. The plywood template is marked with bolt hole locations and other information, and is also given to the steel fabricator **(4)**. To help differentiate the elements in a complex fireplace installation, the author marked up the block foundation with several different colors prior to installation of the firebox (in the area outlined in red) **(5)**.

where a pipe, a footing, or something else needs to be installed.

For example, we like to place PVC sleeves through the foundation wall for the trades to use later for rough-in. I typically review the details with the different trades on site to determine the best locations (unless it is obvious). Then, when the masons are working on a section near any of those locations, I provide the color-marked sleeves and stay close by to make sure the masons put the sleeves where I want them **(2, 3)**.

FRAMING

During the framing stage, I use stencils to clearly label steel locations so that when the fabricator delivers the steel, everyone knows exactly where it is supposed to go. This simple step can pay huge dividends throughout a build **(4, 5)**.

Also during the framing phase—before the first-floor ceiling joists are installed, especially if they are truss joists or TJI for a second floor above—I like to have a good sense of the lighting layout, whether that comes from a lighting manufacturer or an interior designer, or we provide our own. Once I have a layout, I mark all the recessed can lighting locations on the subfloor below with spray paint and a stencil (using red to indicate it's an electrical item).

The framers know to reference this subfloor layout when installing the floor joists above. Sometimes, joists need to be shifted to accommodate the lighting; most subfloors, depending on type and thickness, can be supported by joists spaced wider than 16 inches on-center, if necessary (we always consult a structural engineer before making any changes). Moving joists later or telling clients that they can't have a light where they wanted it because it's not feasible to move the framing is something we want to avoid whenever possible.

As the interior walls go up, the author marks duct path locations on the top plates that coordinate with holes in the steel beams to ensure that joists do not get installed in those locations **(6)**. A simple way to make sure that floor and ceiling joists are installed in their proper orientation is to mark the ends with a single color (in this case, the color doesn't represent a utility) **(7)**. Marking the location of a linear HVAC diffuser (in blue) and pockets for window shades (in yellow) on the subfloor helps the homeowners visualize their positions overhead **(8)**.

During this phase, it's also helpful to know the duct layout as well as supply and return locations, especially if ducts will be run though the floor system. Marking the duct layout helps alert the framers where joists cannot be located, and where they will need to make adjustments to the layout **(6, 7)**.

Of course, we all know (and expect) that clients and designers will change their minds, so some re-work or adjustment is inevitable down the road.

ROUGH-IN

Before we shift into full rough-in, I mark on the subfloor any additional elements in the ceiling that other trades need to know (think of the subfloor as the reflected ceiling plan). These can include can lights, decorative lights, HVAC grills, shade pockets and shade locations against the windows, as well as all door swings (helpful when you're placing switch boxes). I also like to mark shower drains **(8, 9)**.

Visual aids. It can be helpful to provide a physical representation as a stand-in for a future architectural detail. This can be as simple as a 1x4 fastened to the wall framing to represent a countertop height. For a free-standing tub, a mock-up can quickly be fabricated out of scrap plywood to help properly position it as well as items that surround it **(11)**.

To represent cabinet locations, I often cut leftover 1x4 or 2x4 stock to the length of the cabinet run (with countertop overhang accounted for) and screw it to the wall at finished counter height off the finished floor. Then I mark it with the cabinet layout, including sink centers and appliance locations.

I know most cabinet suppliers are willing to come in and lay everything out on the floor, but their marks tend to become hard

In this shower area, the green paint marked on the subfloor indicates the location for a linear drain; it overlaps the yellow marking for a shade pocket that was later eliminated from the plans **(9)**. In the kitchen, a 2x4 fastened to the wall at countertop height and marked with the cabinet layout provides a convenient visual reference for clients and a precise layout reference for tradespeople **(10)**. A free-standing full-scale mockup of the planned tub was built to help the homeowners visualize different locations for the tub within the bathroom space prior to plumbing rough-in **(11)**.

to see or disappear altogether. Plus, no one likes to lay out cabinets working from their hands and knees. Most important, working from the physical set point established by the stock screwed to the wall allows for the accurate placement of fixtures such as backsplash outlets, pot fillers, wall sconces, and under-cabinet lighting, instead of leaving it to the trades to guess where they should go **(10)**.

Labeling with stencils—I buy inexpensive sets on Amazon—is a great way to provide clarity on a project. I use them to match up window numbers with rough openings. On a recent project with a ducted mini-split HVAC system, I also used stencils to mark and label all the indoor and outdoor systems so the electricians would know which unit needed which size wires pulled to it and the associated breaker sizes.

CLIENT COMFORT

Taking these steps brings clarity to the project, not only for the trades that will be installing these items, but especially for the client. Clients like to walk through projects on the weekend, and color-coding the jobsite helps them to see where things will be located (which saves on texts and emails with questions).

My system also helps acquaint clients with the project as a whole, allowing them to get comfortable with the decisions they've made about things like lighting layout and door swings. If they see something they didn't notice on the plans, they can let you know of changes they want to make before doors are ordered or wires have been connected to light fixtures. It makes for an easier and more expedited rough-in process.

On our projects, we don't like to leave much to chance and try to think through as many details as possible. Bringing those details to life is key, and this is where a marking system can really pay off. It's the key to a project turning out well and to limiting painful changes at crunch time when you are trying to complete a job.

Rick Mills is a senior project manager for Jackson Andrews Building + Design, in Virginia Beach, Va. Follow Rick and his company on Instagram @rick.jacksonandrewsbuilding and @jacksonandrewsbuilding.

Photo: Tim Healey

A Builder's Guide to Breathable Indoor Air

Homes need more ventilation than U.S. building codes require

This spring, I met up virtually with Bill Hayward, CEO of Hayward Lumber and the founder and originator of the Hayward Score (see "The Hayward Score: A Rating of Home and Human Health," page 37). Earlier this year during a conference, Bill had characterized the COVID-19 pandemic as a "trigger point," much like the energy crisis of the 1970s had been for energy-efficient housing. This new crisis has triggered a growing interest in indoor air quality and occupant health. As we all have learned a great deal more than we ever thought we would about respirable droplets, air circulation, and the spread of airborne contaminants, homeowner awareness of health, air quality, and ventilation has caught fire and is beginning to ignite a new set of demands. Advanced ventilation systems and home performance may finally be getting equal, if not greater, attention from homebuyers than granite countertops and luxury appliances.

And perhaps this is the time we will finally align ventilation codes with building science. Since 2012, we have seen strong alignment between building science and the air-sealing and insulation requirements of model building codes. But ventilation requirements feel like the poor relations nobody wants to invite for dinner. The Chapter 15 ventilation requirements of the International Residential Code are not clear to all builders, and certainly not well understood by code officials, so they aren't enforced and education is sparse. Exceptions to this do exist in multifamily construction where there tends to be a higher concern for the potential liability surrounding occupant health among developers and municipalities. There are also exceptions among a core segment of the JLC readership that serves a very demanding clientele. But in most single-family new construction and whole-house remodeling, we seem to be mostly building tight but not ventilating right.

Change will likely only happen when it is driven by customer demand, and that is precisely what Bill's "trigger point" is all about. To dig into the implications of this for builders, we brought Mark LaLiberte, co-founder of Construction Instruction and a frequent speaker on building science–based building practice, into the conversation to begin to formulate some clear, health-driven best-building principles. —Clay DeKorne

Bill Hayward: The pandemic certainly raised awareness of the health dimensions of our homes, and indoor ventilation especially. The lack of ventilation in homes is something that has

developed gradually, and the amount of ventilation in homes is perhaps at an all-time low, since homes have gotten tighter without enough attention to controlled ventilation. A big part of the problem is that the ventilation standards referenced in the building codes are not health-based.

The first ASHRAE ventilation standard came out in 1973 and called for significantly lower airflow rates than we had seen in ventilation codes earlier last century when recommendations were based primarily on health concerns. The justification for the lower ventilation rates was driven by energy concerns [1973 also brought the OAPEC oil embargoes] and by research on controlling odors. Because of some of the justifications used in the development of the standard, you often hear it called an "odor-based" standard (see "A Short History of Established Home Ventilation Standards," page 38). This continues today: The required ventilation rate in the U.S. building code is not a health-based number.

It's time for that to change. We didn't know anything about aerosols in the country a year ago. And it took until early this year for the EPA to get more specific about ventilation guidance. Ventilation is evolving in schools that are reopening ... and in restaurants. As things are opening up, people are concerned about going back in, about what's in our air, and the last place it will spill to is a deeper discussion of the air in residential housing.

BREATHABLE AIR

BH: In the past, we have heard a lot about IAQ. But I think right now, for most of us, it's not that complicated. It's more just "I need fresh air." IAQ tends to get associated with all kinds of technical specs, but right now people are saying simply, "I just need to breathe fresh air."

Health Effects Tied to Buildings

	Percentage of Respondents
Trouble Sleeping	30%
Disturbed Sleep	32%
Allergies/Sneezing	41%
Dry Eyes	22%
Moodiness/Agitation	25%
Depression	27%
Cough/Shortness of Breath	47%
Extreme Fatigue	32%
Foggy Thinking	24%
Memory Loss	17%

Source: Hayward Score Data

This table shows the percentage of all 80,000+ respondents to the Hayward Score self-reporting health symptoms that may be connected to their homes. Shown is only a selection of the 23 medical symptoms covered by Hayward Score data. Note that among the selected symptoms, a number demonstrate a clear connection to cognitive functions.

This focus on breathable air is propelling healthy homes into mainstream building. A good example of how builders are starting to change the paradigm is provided by Randy Noel, a homebuilder in the Greater New Orleans area. Randy, a former CEO of the NAHB, responded in his local market to customers asking about healthier indoor air, for home offices, for bigger spaces with families at home, and last year he entered the Parade of Homes with a home certified by Wellness Within Your Walls. It's still a long shot for a lot of production builders to ask what's in the indoor air. High-end custom builders have been having these conversations for years, but seldom with anything near the immediacy that they are now. Everywhere people are concerned. So the question is: Do we need to come at these discussions with a lot of technical recommendations or with just "I want to breathe good air"?

It's not complicated: Start with a tight building shell and a stand-alone ventilation system with energy recovery. When you have airtightness combined with energy-recovery ventilation, the house doesn't fill up with dust and dirt. If you are a production builder, could you sell that? Yes. And it's peacefully quiet inside. Can you sell that? Definitely. Builders can't sell airtightness. They probably can't sell IAQ. But we can show a customer 1) no dust and dirt; 2) it's quieter; and 3) oh, by the way, it's better for your health—you don't feel your allergies, and it affects health and longevity and mental alertness (see "Health Effects Tied to Buildings," left). When you show all that, the customer is likely to respond with, "Yes. I'd like all three of those."

A tight shell and balanced energy-recovery ventilation is a simple equation to get you there, but success from a builder's perspective requires one person to take charge of optimizing the heating/cooling systems with balanced ventilation, airtightness, and the thermal boundary, including windows.

STAND-ALONE VS. INTEGRATED SYSTEMS

Mark LaLiberte: Agreed. This may be simpler than we think if we can boil it down to some basic systems. A balance between energy use and health is found when we combine a tight, high-performance shell, so we gain control over thermal gains and losses, with stand-alone ventilation—a system that delivers balanced supply and exhaust air streams with energy recovery, and that runs continuously. When this is the default, everything gets a lot simpler.

Integrated systems, particularly in hot, humid climates, are problematic. We have huge problems right now in the Southeast with houses being ventilated with conventional supply-side or exhaust-only ventilation raising indoor relative humidity in buildings that can't properly dehumidify. So we've got condensation on clothes dryer vents and bath fan ducts and on recessed lighting fixtures. This argues for a stand-alone energy-recovery system that can help pull out some of that moisture. The basic system starts with being able to run a fan continuously to move air throughout the house. And with energy recovery, you're able to at least extract the moisture from the incoming air in hot, humid climates and reintroduce that to the outdoors.

In the work we just finished at CI [Construction Instruction],

we kicked the ventilation rates up, validated fan performance, and showed that you can ventilate at 140 cfm and consume only 23 watts of electricity, recover about 85% of the energy in whichever stream you want, and reject 40% of the moisture from incoming air.

Builders need to know that the cost of ventilation with energy recovery is substantially lower than it has ever been. And I think that's the prime choice. And it's often the simpler choice. The project that we're working on in the Southeast is with a large national builder. They were running a supply-only ventilation system, taking in 60 to 100 cfm of outdoor air and running it through 500-watt, 70-pint dehumidifiers, and then introducing that air to the return side of the furnace on the air-conditioning side. This uses additional electricity and dumps dry air into the system before it hits the evaporative coil, wasting the potential of the coil to take out any of the moisture. If the builder chooses to run an energy recovery system instead, they will have a reduced need for dehumidification. In a lot of climates, dehumidification may not be needed at all. But in regions with high summer dew points, an ERV and a dehumidifier may be needed if you are selecting a higher ventilation rate.

BH: Getting the right amount of air in the house starts with putting in a stand-alone ERV that runs continuously. We breathe constantly so you want to deliver constant airflow throughout the house. An integrated system with a variable-speed fan that is turned down to low and is pumping 150 cfm so the air is mixing throughout the house *might* be OK. To my knowledge, no one has done a careful study comparing the air delivery of integrated vs. stand-alone systems, so I can only give my best WAG, but I'd wager an integrated system can deliver just 40% of what a stand-alone system can deliver. Why would you go with 40% when you can deliver fresh air everywhere in the house?

My preference is always a dedicated, stand-alone ERV. We have units that run at 80% to 90+% efficiencies. These can recover up to 90% of the heat and up to 60% of the humidity. This humidity control makes sense in most parts of the country to keep indoor humidity levels comfortable. Most of the industry is still saying that HRVs are generally needed everywhere except in hot, humid zones, but we are finding that ERVs make much more sense for most of the U.S. These units are a little more expensive, but you can eliminate the bath fans, saving some money and eliminating the extra penetrations through the roof. You now have 24/7 air moving with no cycling on and off, so you're getting the air needed for good health. And it's cheaper to run because you aren't relying on a higher wattage fan in an air handler to move fresh air throughout the house.

CONTROLLING AIRFLOW

ML: ASHRAE Standard 62-2013 provides the minimum performance criteria we should all be starting from. This is a little better than code (see "Ventilation Code Simplified," page 39). But it is still a minimum. More ventilation is good for human occupancy and the best way to provide a baseline *plus* more ventilation is to use a strategy that provides adequate flow, is quiet and efficient, and allows homeowners to engage with it as ventilation needs arise.

An example of when occupants need to control the system is when there are more people in the house, or when they get new furniture or new rugs, paint rooms, that sort of thing. If we can have ancillary support from an IAQ monitor that says "you need more air today because the PM2.5 counts are high," or that otherwise tells the occupants that they should be concerned about the VOC mix, that will certainly improve the ventilation. This level of

THE HAYWARD SCORE: A RATING OF HOME AND HUMAN HEALTH

Bill Hayward developed the Hayward Score to, as he puts it, "harness the power of consumer demand" to improve housing. It's a simple questionnaire that anyone can take for free. You log in at haywardscore.com and answer 50 questions about your house. It takes about 10 minutes.

The survey starts with questions about the materials and configuration of the home to assess its general characteristics and systems, its location, and its proximity to environmental hazards like busy roads and gas stations or dry cleaners and such. There are questions about moisture, including ones about the presence and use of ventilation fans, and indoor conditions, such as where occupants store cleaning and personal care products and other household chemicals. And then there are a range of questions about health symptoms that occupants feel may be related to their homes. These can't provide an absolute causal link between symptoms and the home, but when matched up with the presence of pests and environmental factors inside and outside the home, as well the use habits around bath fans and range hoods (or the lack thereof), Hayward Score can draw correlations and suggest improvements to indoor conditions that could alleviate the health symptoms if those conditions are in fact the cause. This all gets rolled up into an overall score and presented with a customized five-page report that gives clear action items, so participants can take steps to improve conditions aimed at transforming the indoor air quality and ultimately their health.

Hayward Score keeps in touch with participants, sending them periodic emails to help them keep up their progress and improve their score. In the process, Hayward Score gets feedback not only on how houses are improving but also on how occupant health may be improving. From this, Hayward Score is able to capture a lot of data on the link between homes and the health of occupants. It tracks 23 medical symptoms and is now the largest study on health and housing ever created, assessing more than 80,000 homes and counting. While the Hayward Score is provided to the homeowner, it proves to be a good tool for building professionals to point their clients to, as many of the improvements suggested by the report (such as installing whole-house or point-source ventilation and addressing leaks, mold, or other building failures) are often beyond the scope of DIY. —*C.D.*

A SHORT HISTORY OF ESTABLISHED HOME VENTILATION RATES

Source	Minimum Airflow
ASHVE[1] Recommendation-1895[2]	30 cfm (14 L/s) per person
ASHVE Guide and Handbook-1925[3]	10 cfm (4.7 L/s) per person
Yaglou, Riley, Coggins-1936[4]	17 cfm (8 L/s) per person
ASHRAE[5] Standard 62-1973[6]	5 cfm (2.5 L/s) per person in non-smoking spaces; 10.6 cfm (5 L/s) per person in smoking spaces
ASHRAE Standard 62-1989	15 cfm (7.5 L/s) per person
ASHRAE Standard 62.2[7]-2003[8]	7.5 cfm (3.5 L/s) per person + .01 cfm/sq ft (.05 L/s/m2) of occupiable area
CEN[9] Standard 13779 -2007	Lowest class: 10.6 cfm (5 L/s) per person; highest class: 42 cfm (20 L/s) per person
ASHRAE Standard 62.2-2013[10]	7.5 cfm (3.5 L/s) per person + 0.03 cfm/sq ft. (.15 L/s/m2) of occupiable area

1. American Society of Heating and Ventilation Engineers
2. Cf. "The History of Ventilation and Temperature Control," by John E. Janssen (ASHRAE Journal, Sep/1999). These ASHVE recommendations were based on studies by J. Billings, author of Ventilation and Heating (1893) and a physician concerned with reducing the transmission of disease, especially tuberculosis, in enclosed spaces.
3. According to Janssen, by 1925, 22 US states had ventilation codes that required a minimum of 30 cfm (14 L/s) per occupant of outdoor air. However, many heating engineers were either concerned by the energy impacts of reconditioning so much incoming outdoor air, or were inclined to view ventilation as more of a comfort concern than a health issue. Both concerns argued for reducing ventilation rates, and in response, ASHVE published "A Code of Minimum Requirements for Heating and Ventilation of Buildings" in the 1925 ASHVE Handbook and Guide.
4. Yaglou, et. al. was a more comprehensive study of work begun by Lemberg, Brandt and Morse who studied ventilation rates needed to control odors in buildings. The Yaglou study correlated minimum ventilation rate with net air space per occupant, setting the stage for ventilation codes based on occupant response, and underpinning the push to base ventilation rates on comfort control rather than health concerns. Cf. "Challenges in Developing Ventilation and Indoor Air Quality Standards: The Story of ASHRAE Standard 62" by Andrew Persily (Build Environ 2015, National Institute of Building Standards).
5. American Society of Heating, Refrigerating, and Air Conditioning Engineers (the name changed following the 1959 merger of the ASHVE with ASRE, the American Society of Refrigerating Engineers).
6. In addition to requiring this minimum flow rate, the Standard recommended from 7.5 cfm (3.5 L/s) to 21.2 (10 L/s) per person ventilation air flow.
7. ASHRAE split the Standard to address commercial requirements (62.1) separately from residential requirements (62.2).
8. "Per person" is defined in the Standard here by the number of occupants expressed as the number of bedrooms plus one (assuming two people in the master bedroom and one in others).
9. European Committee for Standardization
10. This rate remains in the most current iteration, ASHRAE 62.2-2019

occupant engagement must be based on knowledge of what is in their environment. But for the most part, the system should be set to run continuously at the baseline without occupant intervention.

BH: Ventilation, in my opinion, is the builder's best friend because it is helping them reduce risk. When I talk to production builders in particular, and we mention risk management, the light goes on. One thing you taught me years ago, Mark, is that you can't control occupant behavior. They don't run the bath fans, they don't run the range hood. They fill the place up with moisture and then the builder gets claims for humidity condensing on surfaces.

Occupants don't know what they're doing, especially with a sophisticated system like an ERV. Most people, including people that we train, don't pay attention to their ERV. So when somebody hits the "boost" button, it stays on boost for too long. Or they say, "I want to save a little energy, so I'm going to turn it off at night." But that is exactly the time you need it! On the other hand, if I put in a system that runs 24/7, I don't run into problems because I forgot to turn it back on. I'm mitigating elevated chemical exposure from new construction (ventilation is about the only way to cost-effectively remove concentrations of harmful chemical off gassing from materials, and it's virtually impossible to eliminate all chemicals from building materials), I'm mitigating moisture problems, and I've got a healthier indoor environment—all that just totally makes sense for the homeowner *and* for the builder.

Occupants have their needs—to breathe fresh air—but the house also has needs: To remain stable and to age well, a house needs a consistent source of fresh air, as well as consistent levels of temperature and humidity. Of all the ways to provide ventilation, I'd rather put in a dedicated system that delivers the right amount of fresh air throughout the entire house and leave it running. I want to give occupants some control. But from a builder's standpoint, you don't want occupants to be able to turn it off for periods of time and then have them come back to the builder and say, "Well, my daughter's having trouble breathing at night."

We also know that once you set the building up, someone may drill a hole to install cable or some other future modification, and now it's not working. An instrument can help you manage those changes. In my experience, once you give somebody an IAQ monitor on their phone, they quickly become knowledgeable about it.

ML: We want to have both the system running at a baseline and homeowner engagement. You can't smell most of the harmful contaminants—an odor-based standard is not going to provide good health. So we have to count on something to tell me that my particulate count is too high. If you look at cooking, for example, you will go from a count of zero to 100 in a matter of 20 minutes. The average consumer probably has no idea that turning on the stove had that big of an impact. But if they watch a gauge all of a sudden go into the red zone, then they're going to turn the hood on.

I remember when Whirlpool did a study where it installed a wall control that showed energy consumption in real time. When people would walk out the door, they would look at it and ask, "Why is it in the red?" And they'd run downstairs and find all the lights were on, that sort of thing. The wall control was a way to activate awareness.

For us to become activated around ventilation, we need to pay attention to several practical things about an ERV system: proper equipment selection; proper sizing; envelope performance (insulation, air-sealing, windows with a low U-value); system controls that maintain a health-based ventilation rate; and education that allows occupants to rationally engage with that system. But none of this is Fifth Element stuff. This is right now. And we can do it affordably.

A good example is what Gord Cooke is doing with 16 builders in the Toronto greater metro area, all building to net zero. Gord has been able to demonstrate that the increased cost, including ventilation and energy recovery in every house, has been between 5% and 10% at the most, and in some cases finding neutral cost. This group is working to specific outcomes—net zero—and so they are able to work with clients

to say "take this out and add this here" to arrive at the outcome. When a builder can do that over and over, always aiming at their modeled benchmark, who would make a choice to go back to the other way? No one; otherwise, they lose the edge of what allows them to demonstrate to customers what makes them different and better.

Gord's example aims at an energy outcome. It includes ventilation because that is critical to building performance. But I think the work you are doing, Bill, comes at it from health, and as you say, that creates urgency that is going to move the industry faster toward a higher building standard. We need a solid health-based outcome.

A HEALTH-BASED VENTILATION STANDARD

BH: The advantage of coming from the perspective of personal health is that we're much more engaged with it than we are with energy. We naturally tend to be more concerned about health than energy because the impacts seem so much more serious for ourselves, and for children. The trigger event of 2020 began to draw a bright line around health and home. If home is our safe haven, it better be safe. Is it? Maybe not, if our ventilation standards are based on comfort and energy control instead of health factors.

Jillian Pritchard Cooke, of Wellness Within Your Walls, brings the dichotomy into sharp focus: In a recent workshop, she compared the annual savings generated by EnergyStar—about $17 billion per year on average—to the estimated cost of environmental diseases in children, which was in excess of $76 billion in 2008. The vast difference in social cost between $17 billion and $76 billion is an impact that should help reframe priorities around a ventilation standard.

For me, the current standards are not high enough if we are to address health as a primary concern. I run my home at about 30 cfm per person. That's around what old health-based codes called for, but I do it because I'm reading the instruments and want to keep the air in my home below the World Health Organization's maximum, which is 500 TVOC [total volatile organic compounds] parts per billion. The ventilation rate in my home is a lot higher than the baseline of ASHRAE 62.2-2013, but it's not as high as the recommendations in a Harvard University cognition study that found that people think clearer, sleep better, and have higher workplace productivity rates when the ventilation rate is closer to 40 cfm per person in office buildings. For homes, the correct number is between 20 to 30 cfm per person. Really, once you have a tight, well-insulated shell and a stand-alone continuous system with energy recovery, you can set it at any level that is appropriate to the customers' needs. We can do this with dedicated ERVs without having an outsized effect on energy use in the home. The energy impact has been driving ventilation rates down for the last 48 years. But that is no longer relevant with the efficiency of today's ERVs. We are ready for a complete shift in how we ventilate homes.

Health does create urgency. Everyone wants to be healthier, live longer, spend less money on health care, and be free to make life decisions that aren't encumbered by health restrictions. This is something builders can sell, not just to make money but to do the right thing. If you make homes healthy, you make them energy efficient as well because you can't control the air inside until you control the envelope. Usually the line for the last 20 years among energy-conscious builders has been the opposite: "If you make it energy efficient, you will see all these other benefits like better indoor air." But building owners don't care enough about energy to spend the money needed. If we come at it from the direction of health, we create an urgency to make that investment. And then your company is in the business of making people healthier and happy, even improving conditions for everyone on the planet by driving a lower impact on resources and energy, and driving a market for less toxic materials, less industrial pollution. The impacts go out like ripples in a pond from the simple act of making better homes.

VENTILATION CODE SIMPLIFIED

For installing a stand-alone, continuous whole-house ventilation system, the International Residential Code (IRC) follows ASHRAE Standard 62.2-2010 and offers two methods to determine the required airflow in cubic feet per minute (cfm). Note that the IRC does allow whole-house ventilation systems to operate intermittently according to rate factors defined in Table M1507.3.3(2), but if you are following the arguments put forward in this article, continuous ventilation offers the best performance for both the building and the health of the occupants.

Formula. The required flow rate for whole-building ventilation can be calculated as follows:

Ventilation rate in cfm =
floor area / 100 + (number of bedrooms + 1) x 7.5

Prescriptive table. Another way to determine the baseline airflow rate is to use the prescriptive table (right).

Minimum Continuous Whole-House Ventilation (cfm)

Floor Area (sq ft)	Number of Bedrooms				
	0 to 1	2 to 3	4 to 5	6 to 7	> 7
< 1,500	30	45	60	75	90
1,501 to 3,000	45	60	75	90	105
3,001 to 4,500	60	75	90	105	120
4,501 to 6,000	75	90	105	120	135
6,001 to 7,500	90	105	120	135	150
> 7,500	105	120	135	150	165

Table M1507.3.3(1) of the International Mechanical Code is referenced in Chapter 15-Exhaust Systems of the International Residential Code.

Indoor Air Quality Brochure

Healthy Homes: Indoor Air Quality

How to Discover if You Have a Problem with:

- **Mold**
- **Carbon Monoxide**
- **Radon**
- **Asbestos**
- **Formaldehyde**
- **Household Chemicals**
- **Allergens that can worsen asthma**

People spend most of their time indoors, with much of this being spent at home. However, your home's air can contain a variety of pollutants such as chemicals in oven cleaner and cigarette smoke, and different types of mold. In some cases, the levels of these pollutants can be high enough to increase the risk for health effects. Children's risks for developing asthma are greater in homes that are damp or where there are smokers. Poor air quality may be obvious - you may notice bad smells or see smoke. However, other dangers, such as carbon monoxide or radon, are not obvious and require testing to detect.

This fact sheet provides information on the most common indoor air pollutants and lets you know where you can get more information.

Mold and Moisture

Mold in the home is not a new issue, but recent news stories have increased concerns over mold. Mold requires moisture to grow. When household materials such as carpeting, fabric, sheetrock, or wood become damp, mold can grow and release spores. When inhaled, these spores can cause irritation and allergic reactions. Musty smells may signal mold, mildew or rot. Keep water from entering your home by maintaining the roof, checking and cleaning drainage systems regularly (down spouts and gutters), and repairing any damage to exterior siding. The basement may need a dehumidifier and bathrooms should have a ventilation fan. Quick action is needed following flooding or plumbing leaks. Carpets and furniture that are wet for over 24 hours will grow mold. To prevent mold growth, dry out any water-soaked or damp material within 24 hours. Items wet longer than that, may need to be discarded. Hard (non-porous) surfaces that water cannot seep into, can be cleaned with warm soapy water (see EPA mold fact sheet www.EPA.gov/iedweb00/pubs/moldresources.htm).

Identifying mold/moisture problems does not need to be complicated. Look for obvious signs of water damage (stains, warping of wood) and mold growth (musty odor; often looks fuzzy, velvety and discolored - green, brown or black). Sometimes mold occurs in hidden areas (inside walls or air ducts) if these areas had been wet in the past. Many home inspectors are now experienced at looking for mold/moisture problems. Air testing is not recommended: the results are usually not clear because mold spores are everywhere and there are no air quality standards for mold. (see "Mold in the Home: Health Concerns" at www.ct.gov/dph/mold).

Carbon Monoxide (CO)

CO poisoning is a serious health risk that can easily be prevented. Carbon monoxide builds up in the blood and can cause headache, dizziness, nausea, and death. CO is produced by anything in your home that burns fuel. Furnaces that are not properly tuned up or vented are the most common source of CO. Other sources include portable (e.g., kerosene or propane gas) heaters, gas grills, back-up generators and cars.

The following precautions are very important when running these devices:

- Never operate a portable gas heater, gas grill or back-up generator in the home or garage. This has been a major problem after storms that cause power outages.
- Do not use a gas oven to heat your home
- Do not leave a car running inside an attached garage.
- Furnaces should be checked and cleaned annually, making sure that the furnace is ventilated properly to the outside.

Despite these precautions, CO can still occur in any house without warning. It is strongly recommended that all homes be equipped with at least one **carbon monoxide alarm**. The alarms are available at most hardware stores. If you suspect CO poisoning in your home, leave the house immediately and call your local fire department. (See "Carbon Monoxide:The Quiet Killer" at http://www.ct.gov/dph/co).

Radon

Radon is a naturally occurring radioactive gas that can enter a home when it is present in bedrock and soil. Elevated levels can increase the risk of lung cancer. It is recommended that all homes be tested for radon and those above the action level (4 picocuries per liter or 4pCi/L) in the lowest occupied area have a radon removal system installed. Testing devices are available at hardware stores. A list of firms that remove radon is available from the Connecticut Department of Public Heath Radon Program (860) 509-7367 or on its website: www.ct.gov/dph/radon

Asbestos

Asbestos is present in many homes built prior to 1970. The mere presence of asbestos does not present a major health risk. However, it should be checked to ensure that it will not release asbestos fibers. Long-term inhalation of asbestos fibers can increase the risk of lung cancer. The most common place for asbestos in older homes is the insulation around pipes and boilers in the basement. This insulation usually looks like white plaster/ fabric wrapping. If the asbestos is in good condition (no rips, tears, breaks) it is not likely to release fibers and does not need to be removed. Such material should be inspected periodically to assure good condition. If remodeling or plumbing work requires asbestos insulation to be disturbed, the asbestos must be removed by a licensed company prior to the work. Asbestos may also be present in floor tiles and exterior siding. In these cases, the asbestos is in a solid form and should not release fibers unless damaged. For information on which companies are licensed to inspect and clean up asbestos, call the Connecticut Department of Public Heath Asbestos Program at (860) 509-7367 or visit its website: www.ct.gov/dph/asbestos

Formaldehyde

Formaldehyde is a common indoor air pollutant due to its presence in many consumer products (plywood, carpeting, clothing and some insulation products). High levels of formaldehyde can be irritating to the eyes, nose and throat. Homes with large amounts of new formaldehyde-containing products may have elevated levels. When possible, "air out" products (carpets, particleboard furniture) prior to use or ventilate areas that have been remodeled until any odors go away. When purchasing plywood or particleboard, ask for grades that emit lower amounts of formaldehyde. Urea formaldehyde foam insulation (UFFI) was once a problem in some Connecticut homes. It is no longer a health concern because its use was discontinued many years ago and what remains in homes no longer releases formaldehyde. For more information go to: http://www.ct.gov/dph/ieq.

Household Chemicals

Household cleaning products, personal care products, pesticides, paints, glues, hobby products and solvents can release potentially harmful chemicals into the air. In certain cases, these chemicals may cause irritation to eyes, nose, or throat or increase the risk of long-term health effects. Some ways you can reduce exposure to these chemicals include:

- Use household products according to directions (e.g., do not spray near face; wear protective gloves).
- Decrease use of products with harmful chemicals and find alternative, safer products.
- Purchase products in small quantities or only the amount needed so that there will be little left over. Use the least amount of chemical product (e.g., pesticides) possible.
- Provide adequate ventilation. Open windows and doors to increase natural ventilation. Using bathroom and kitchen exhaust fans that are vented outside can lower pollutant levels. Install local exhaust over workbench if hobbies or home repairs involve frequent use of chemicals.
- Keep paints, cleansers, pesticides and other household chemical products in a separate, well-ventilated area that is out of the reach of children. Consider keeping children out of the area where chemical-containing products are being used.

For more information on pesticides call the U.S. EPA at 1-800-858-PEST. For information on indoor air pollution and chemical products contact the EPA Indoor Air Hotline 1-800-438-4318.

Tobacco Smoke

Secondhand smoke, also known as environmental tobacco smoke (ETS) is an indoor hazard to non-smoking residents, especially children. It is highly recommended that people not smoke in the presence of children. ETS is a known irritant that can trigger asthma attacks and increase the risk of respiratory infections and lung cancer in non-smokers.

Allergens, Biological Pollutants and Asthma

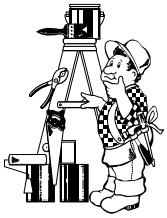
Typical household dust can contain allergens such as pet hair/dander and insect remains (dust mites, roaches). These biologic pollutants can cause respiratory problems and asthma attacks. Pet hair and dander can be reduced by regular vacuuming with a HEPA vacuum. Wood floors are easier to keep clean of biological pollutants than carpets.

Dust mites are microscopic insects commonly present in homes. Control of dust mites requires frequent cleaning. The following are added precautions for asthmatics:

- Encase mattress and pillows in dust proof zippered covers
- Wash all bedding once a week in hot water

- Remove carpeting from the bedroom
- Avoid steamcleaning; it wets carpets.
- Use a HEPA filter on vacuum cleaner.
- Reduce moisture and keep humidity below 50%

Other Indoor Air Issues



Remodeling precautions:

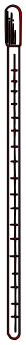
Construction within the home may release lead paint, asbestos, mold spores and dust.

To prevent indoor air pollution from remodeling:

- Identify where lead paint, asbestos and mold exist before remodeling.
- Use low-dust practices: mist surfaces before sanding and cover the floor and furnishings with plastic sheeting; use barriers to contain dust in the work area.

- Provide ventilation.
- Allow paints and glues to dry completely before re-entering the area.

Visit the Connecticut Department of Public Heath website to learn more about these specific precautions.



Mercury Spills:

Mercury thermometers and blood pressure gauges contain enough mercury that, if broken, can release mercury into the air. Rapid cleanup is important to prevent this potential exposure. Visit the Connecticut Department of Public Heath website www.ct.gov/dph/mercury to learn about proper cleanup procedures.

Replace old mercury thermometers with newer types that do not contain mercury. Discard your old thermometers by bringing them to your town's chemical waste collection day.

How useful are air cleaners/filters? Air filters may remove some pollutants from the air, but have limitations. They are usually not the best way to fix an indoor air problem. Filters must be properly sized for a given area. No single filter removes all types of pollutants. NOT recommended are "ozone generators." Their ability to clean air is questionable and they produce ozone which can be toxic and dangerous for asthmatics. (see "Indoor Air Facts No.7 - Residential Air Cleaners" at www.epa.gov/iaq/pubs/airclean.html or call the EPA Hotline at (800) 438-4318).

When should I have the air in my home tested? In general, air testing is not the best way to identify an indoor air quality problem. A thorough visual inspection is often able to identify sources of indoor air pollution that should be eliminated. Air testing usually provides data that raises more questions than answers. This is because there are no standards for indoor air pollutants and because most pollutants are normally present in homes at very low levels. Companies that do indoor air testing are not certified. However, if you want to have your home's air tested, you can go to the American Industrial Hygiene Association's website: www.aiha.org/consultants consumers/html/consultantslist.asp. They publish a list of consultants who specialize in indoor air quality.

For general information on indoor air, call or go online:

Connecticut Department of Public Health
(860) 509-7740
www.ct.gov/dph/ieq

EPA Indoor Air Hotline (800) 438-4318
www.epa.gov/iedweb00

Developed by:
Connecticut Department of Public Health
410 Capitol Avenue MS #11EOH
PO Box 340308
Hartford, CT 06134-0308
(860) 509-7740
www.ct.gov/dph

Fact sheet revised 5/2017

United States
CONSUMER PRODUCT SAFETY COMMISSION

Cove Appliance Recalls Dishwashers Due to Fire Hazard

Recalled Cove Appliance 24-inch built-in dishwasher

Name of product:
Cove Appliance 24-inch built-in dishwashers

Hazard:
The heating element in the dishwasher can fail to properly shut off and can overheat, posing a fire hazard.

Remedy:
Repair

Recall date:
June 16, 2021

Units:
About 42,000

Consumer Contact:
Cove Appliance toll-free at 888-651-9376 from 8:30 a.m.to 5 p.m. CT Monday through Friday, e-mail at support@coveappliance.com or online at coveappliance.com/recall or at www.coveappliance.com and click “learn more” in the safety recall section for more information.

Recall Details

Description:
This recall involves Cove Appliance 24-inch built-in residential dishwashers model numbers DW2450 and DW2450WS. The recalled dishwashers have serial numbers 20000100 through 20044445. The model number, serial number and date code are printed on the product rating plate located inside the dishwasher. “Cove” is printed on the outside of the door and on the far right side of the control panel, located on the top of the unit’s door.

Remedy:
Consumers should immediately stop using the recalled dishwashers, unplug them from their power source, and contact Cove Appliance to schedule a free repair. Cove Appliance will install a second thermal protection device and replace the dishwasher’s heating element.

Incidents/Injuries:
The firm has received five reports of burning smells, flames and smoking inside the dishwashers. No injuries have been reported.

Sold At:
Home appliance stores nationwide from February 2018 through May 2021 for between $2,400 and $2,500.

Manufacturer(s):
Cove Appliance Inc., of Madison, Wis.

Manufactured In:
United States

Recall number:
21-151

United States
CONSUMER PRODUCT SAFETY COMMISSION

Non-Contact Voltage Testers Recalled by Klein Tools Due to Shock Hazard

Recalled Klein Tools Non-contact Voltager Testers NCVT-1

Name of product:
Klein Tools Non-Contact Voltage Tester Model NCVT-1

Hazard:
The on/off button can remain depressed during the power on or power off cycle, causing the tester to work improperly. Consumers testing electrical sources could fail to be warned of the presence of live voltage if the tester is not properly operating, posing a shock hazard to the users.

Remedy:
Replace

Recall date:
June 9, 2021

Units:
About 1,690,000 (In addition, about 67,800 were sold in Canada.)

Consumer Contact:
Klein Tools at 800-527-3099 from 7 a.m. to 6 p.m. CT Monday through Friday, email at ncvt1support@kleintools.com or online at www.kleintools.com and click on “Safety Recall Information” at the bottom of the page for more information.

Recall Details

In Conjunction With:

Description:
This recall involves Klein Tools Non-Contact Voltage Testers with model numbers NCVT1 and date codes ending H7. The product was also sold separately and in kits. The following model numbers are involved in the recall, all bearing date codes ending in H7.

Model Number	Description	Retail Price (U.S. $)
NCVT1	Non-Contact Voltage Tester	16.97
NCVT1SEN	Non-Contact Voltage Tester with Sensormatic Tag	16.97
NCVT1EP	Non-Contact Voltage Tester (Econo. Pack - Bubble Bag)	16.97
NCVT1A	Non-Contact Voltage Tester (Asian Packaging)	16.97
NCVT1E	Non-Contact Voltage Tester (European Packaging)	16.97
69149	KIT, 3PC, Multimeter Test Kit (Retail Clam Shell)	39.97
80018	KIT, 4PC, Residential Electrical Tool Kit (Poly-Bag & UPC Label)	49.99
80023	KIT, 3PC, Home Inspector Moisture Meter Kit, (Poly-Bag & UPC Label)	59.99
MPZ00001	KIT, 2PC, Pliers + NCVT1 Tester (Clam Shell)	51.72
MPZ00052R	KIT, 3PC, Stripper/Cutter + NCVT1 Tester + RT210 GFCI Tester (Retail Clam Shell)	67.42

The meters have a yellow body housing with a tinted gray tip and have a black pocket clip/battery cap on the back. The part/model numbers are written on the top of each unit above the brand name KLEIN TOOLS and date codes are printed on the bottom of the unit under the brand name. The product is rated CAT IV and measures voltage up to 1,000 Volts.

Remedy:
Consumers should immediately stop using the recalled non-contact voltage testers and contact Klein Tools for instructions on receiving a free replacement tool.

Incidents/Injuries:
Klein Tools has received two reports of incidents of the voltage tester not working properly, including one shock injury.

Sold At:
The Home Depot stores and industrial distributors, electrical wholesalers and some hardware stores nationwide from January 2020 through March 2021 for about $17 (for units sold separately) and about $40-$68 (for kits).

Importer(s):
Klein Tools, of Lincolnshire, Ill.

Manufactured In:
China

Recall number:
21-150

Contact CAHI c/o

James Enowitch
34-3 Shunpike Rd. #236
Cromwell, CT 06416

Email: info@ctinspectors.com

Web: www.ctinspectors.com

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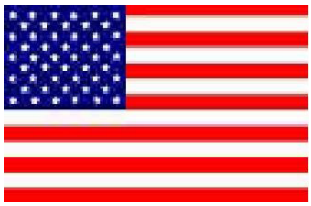

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The Licensing Board meetings are held at 9:30 am
Dept of Consumer Protection
165 Capitol Avenue. Hartford

The public is always welcome.

Published by: Larry Ruddy
Larryhp@cox.net