

MODULE 2: CONDUCT A HOME ASSESSMENT



CONDUCT A HOME ASSESSMENT



Practice identifying health-related hazards based on the 8 Principles/Keep-its.



Explain practical techniques for conducting home assessments.



Correctly fill out assessment tool in the field.



Conduct an onsite assessment.



WELL, WHAT DO YOU KNOW?

DEVELOP AN ACTION PLAN



- List the 8 Keep-Its (without peaking)
- Explain what is meant by the “active puppy” approach to home inspections.
- T or F: Mold is killed by cool temperatures?
- List three most problematic pests.
- List 4 signs of cockroaches.
- Define frass.
- Name the one keep-it that overlaps most heavily with every other keep-it.
- Name the 3 mechanical systems that are key to keeping it climate-controlled.



Goal: Identify Hazards



Resident
Interview



Sampling/
Testing



- 1. Dry
- 2. Clean
- 3. Pest-Free
- 4. Ventilated
- 5. Safe
- 6. Contaminant-Free
- 7. Maintained
- 8. Climate Controlled

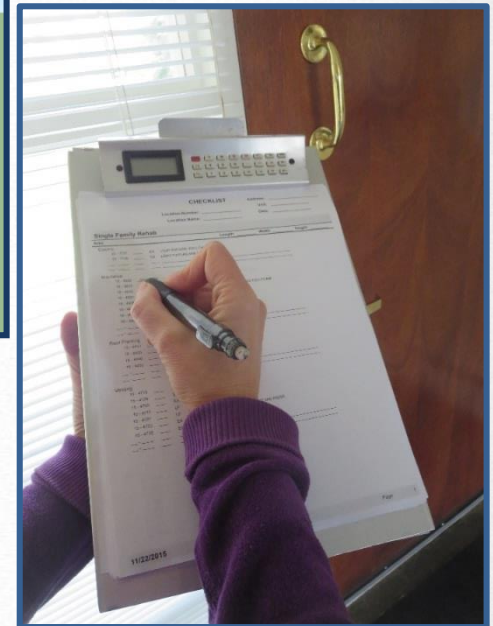
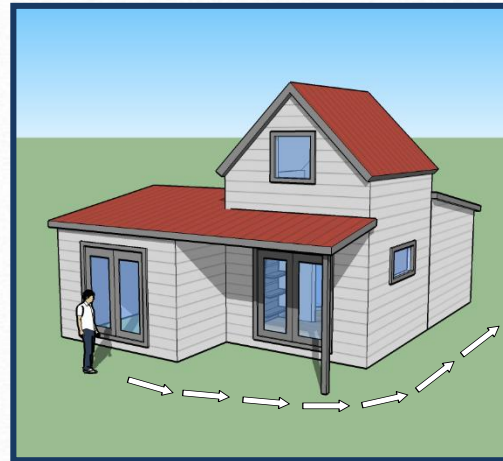


Building
Assessment



HOME INSPECTIONS: THE ACTIVE PUPPY APPROACH

1. Survey outside.
2. Survey inside.
3. Inspect outside.
4. Inspect inside.

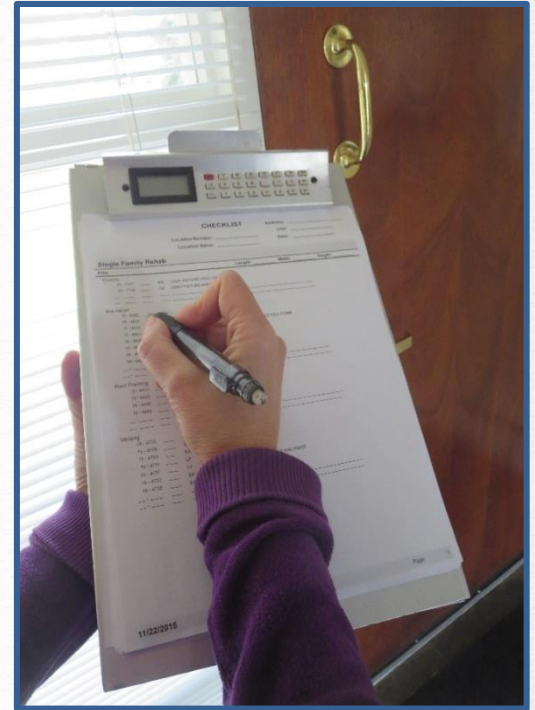


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JUST HAVE A SYSTEM!

- If you are consistent in your approach, you'll be less likely to miss something.
- You may even have a standard system within a room.



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SMALL GROUP ACTIVITY: IDENTIFY THE KEEP-ITS



1. Identify a Scribe and a Spokesperson.
2. For your assigned Keep-It, list the deficiencies typically associated with it.
3. Then identify at least one solution for each deficiency.
4. Transfer the information to the chart paper.
5. Be prepared to report out



INDIVIDUAL ACTIVITY: IDENTIFYING HAZARDS



- View images related to 8 Keep-Its.
- Identify and record deficiencies related to each image.
- For each deficiency, suggest a corresponding solution.
- Add any notes (E.g., additional information needed)



Keep It



1. Dry

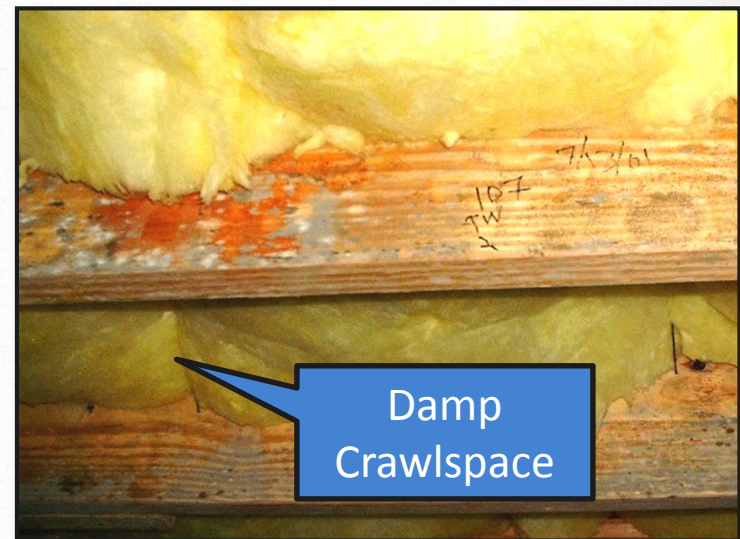
Common Sources of Water & Moisture Problems

- Ground Water Intrusion: basements, crawl spaces, slab on grade foundations
- Roof and building envelope leaks
- Ice dams
- Plumbing leaks
- Condensation in wall, floor and ceiling cavities
- Moisture generated by residents, day-to-day activities
- Others?



MOLD

- Feeds on organic materials
 - Wood, paper, sheetrock
- Thrives in warm, moist environments
 - 40° F to 100° F
 - 70% RH humidity
 - Excess moisture: flooding, roof and plumbing leaks
- Is NOT killed by cold



1) Groundwater



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2) GROUNDWATER



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3) CRAWLSPACE



CRAWLSPACE: SOLUTION



4) CEILING BENEATH ATTIC



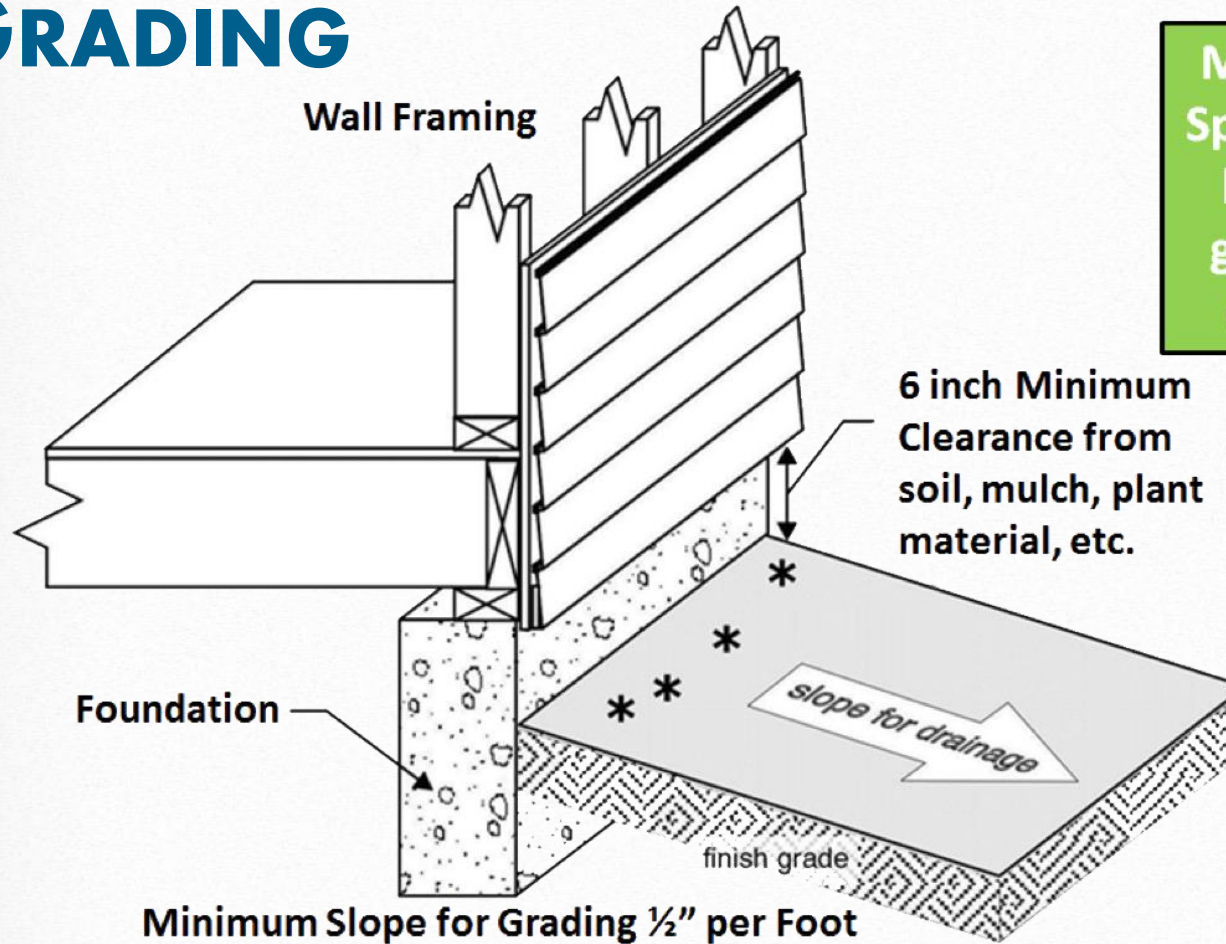
5) CEILING BENEATH BATHROOM



6) BATHROOM



STORM WATER MANAGEMENT (SWM): GRADING



Maintain a
Splash-Zone
between
grade and
cladding

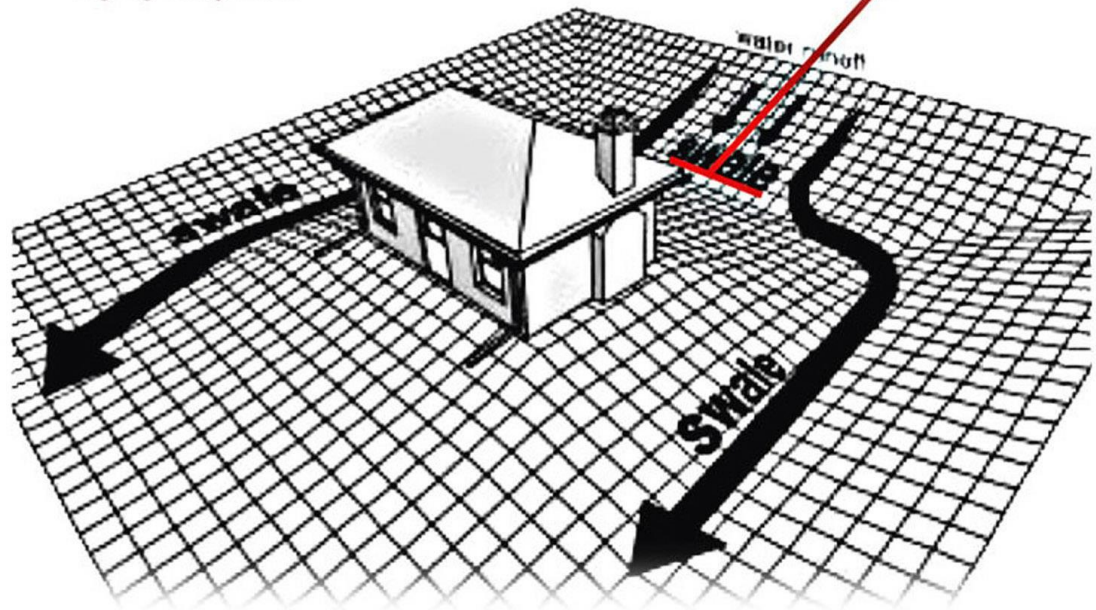


STORM WATER MANAGEMENT: SWALES

EPA Indoor Air PLUS | MOISTURE CONTROL 1.1
www.epa.gov/indoorairplus

Highlights by EPA

Where setbacks limit space to less than 10 feet, provide swales or drains designed to carry water from foundation

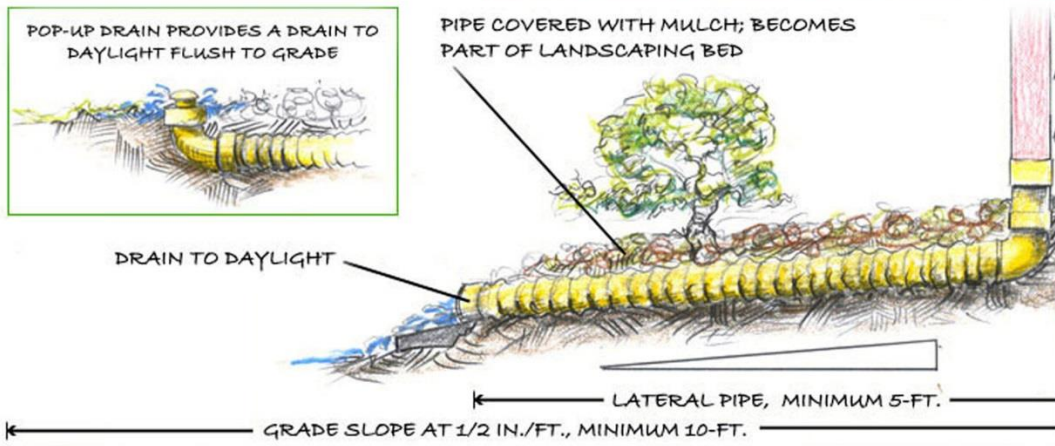
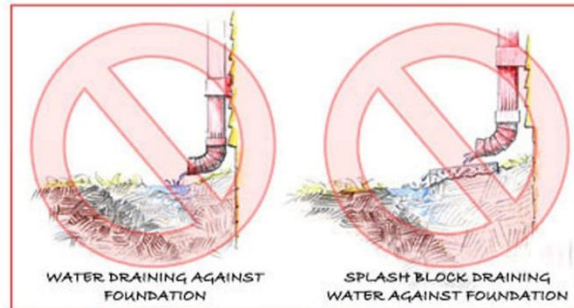


BUILDING SITE DRAINAGE



SWM: DOWNSPOUT OUTLET OPTIONS

EPA Indoor Air Plus | MOISTURE CONTROL 1.1
www.epa.gov/indoorairplus



INSTALLATION OF ABOVE-GRADE DRAINS FROM GUTTERING



SWM: DOWNSPOUT OUTLET OPTIONS



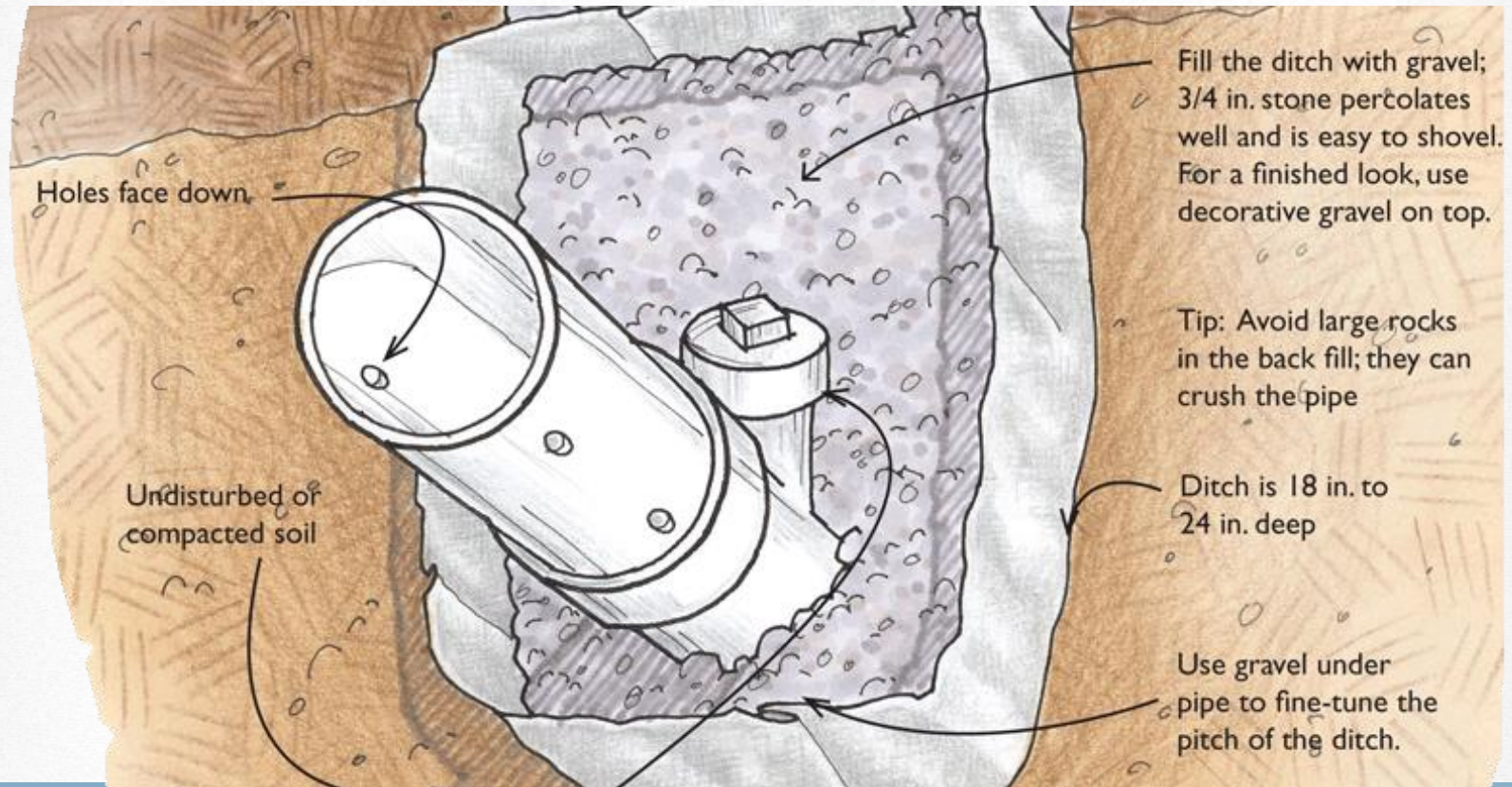
SWM: DOWNSPOUT OUTLET OPTIONS



SWM: DOWNSPOUT OUTLET OPTIONS

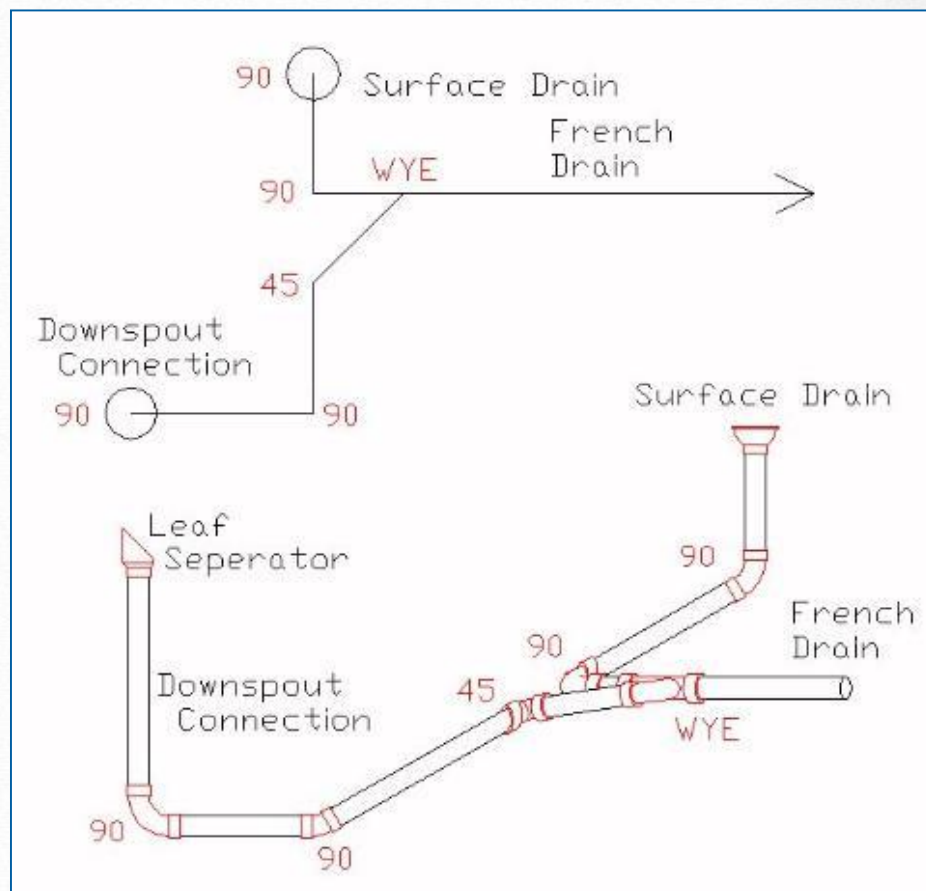


THE IDEAL DRAIN LEADER FOR SITES WITH GRADING PROBLEMS

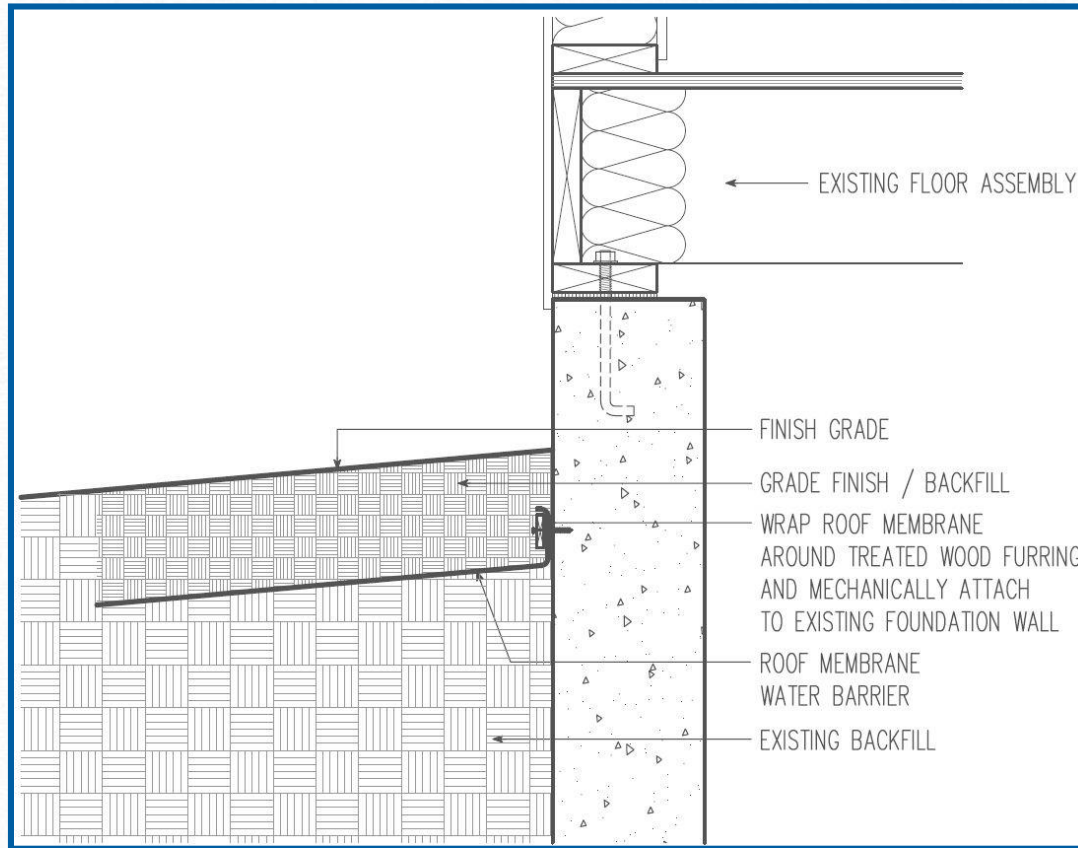


SWM: DRAIN LEADER

- AKA: French Drain
- Purpose: Move water away from house to point where it can safely percolate into soil



EXTERIOR RETROFITTED SUB-GRADE MEMBRANE WATERPROOFING



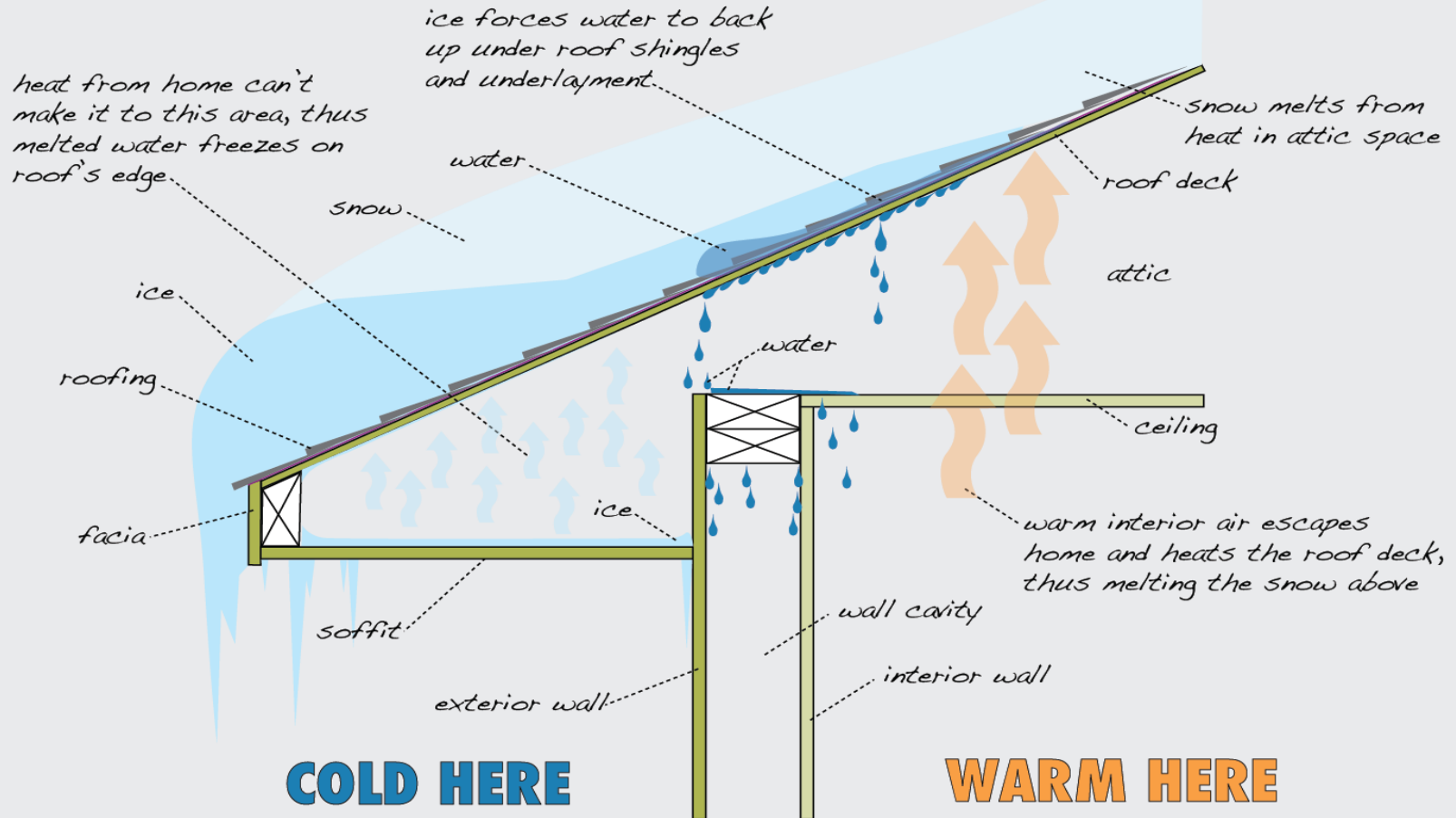
Those (dam\$%d) Ice Dams



ANATOMY OF AN ICE DAM

Illustration by Steve Kuhl, The Ice Dam Company

www.theicedamcompany.com



1515 South 5th Street, Hopkins, MN 55343

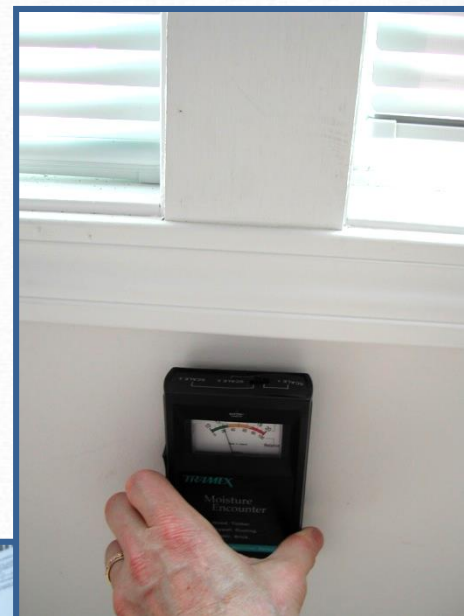
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7) WINDOWS



WINDOWS: SOLUTION



MOISTURE METER

- Measures the % of water in a material
- Can confirm existence of water leak or moisture problem
- Can “map” moisture levels to identify the source.
- \$100 - \$450.

Mini-Ligno S/DC \$140



KEEP IT



2. Clean

- **Cleanability is Key**
- Horizontal surfaces are the highest priority
- Then walls, ceilings and finishes
- Look for signs of wear that affect cleanability
- And don't forget to educate the resident!

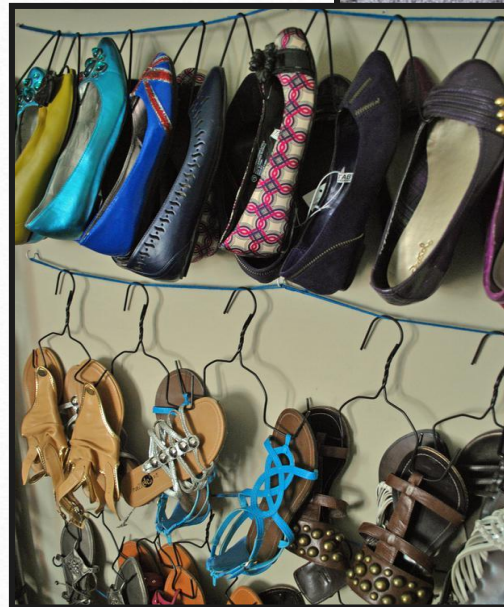
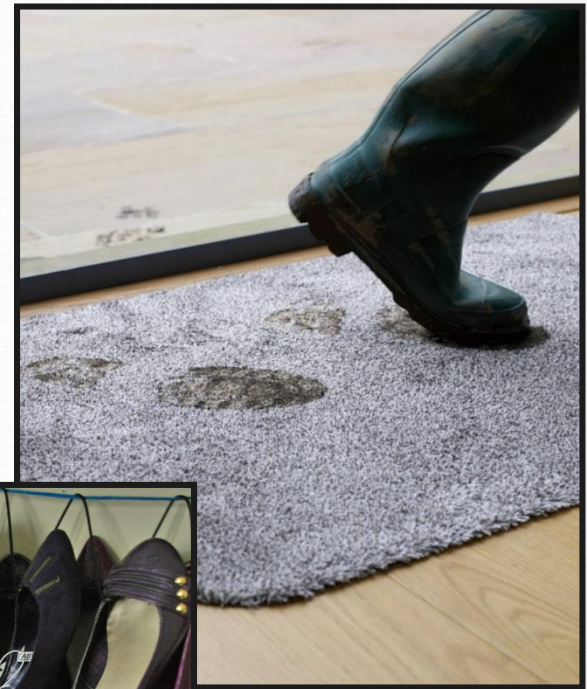


EDUCATE RESIDENTS ABOUT..

- Clutter
- Harborage



CLEANABILITY



©Jayne Windham: Livable Housing Inc.



CLEANABILITY: FLOORING VS CARPETS



CLEANABILITY: FLOORING VS CARPETS



KEEP IT



3. Pest-Free

- Trigger asthma & allergies
- Cause infection from bites
- Transmit disease
- Contaminate food
- Can lead to the (appropriate or inappropriate) use of pesticides



8) PESTS



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HOW DO WE KNOW IF WE HAVE A PROBLEM?

- Ask the occupants.
- Look for visible signs.
- “Sniff” for odors.
- Take a census.
- If you see the actual pests you likely have a huge problem!



THE PESTIEST OF PESTS!

- Cockroaches
- Rodents: mice and rats
- Bed Bugs



SIGNS OF COCKROACHES:

- Live cockroaches
- Cockroach parts and shed skins
- Frass
- Egg cases



SIGNS OF COCKROACHES: LIVING PROOF



American Cockroaches



German Cockroaches

SIGNS OF COCKROACHES: WHERE THEY LIVE

- Anywhere!
- Where there's water, food, and harborage
- In cracks and crevices where their bodies touch surfaces above and below



SIGNS OF COCKROACHES: SHED SKINS AND PARTS



**German cockroaches
on a sticky trap**



**Brown banded
cockroaches
by a door hinge**



SIGNS OF COCKROACHES: FRASS



Under a cabinet shelf



Behind the wall clock



9) PESTS



10) PESTS



11) PESTS



KEEP IT



4. Ventilated

- To control moisture
- To dilute toxic consumer products
- To dilute toxic building material emissions
- To dilute emissions from biological sources
- To dilute tobacco smoke and cooking contaminants



SIGNS OF VENTILATION ISSUES



- Mold
- Odor

AREAS OF VENTILATION PROBLEMS

- Kitchen
- Bathroom
- Laundry room



TEST FAN PERFORMANCE



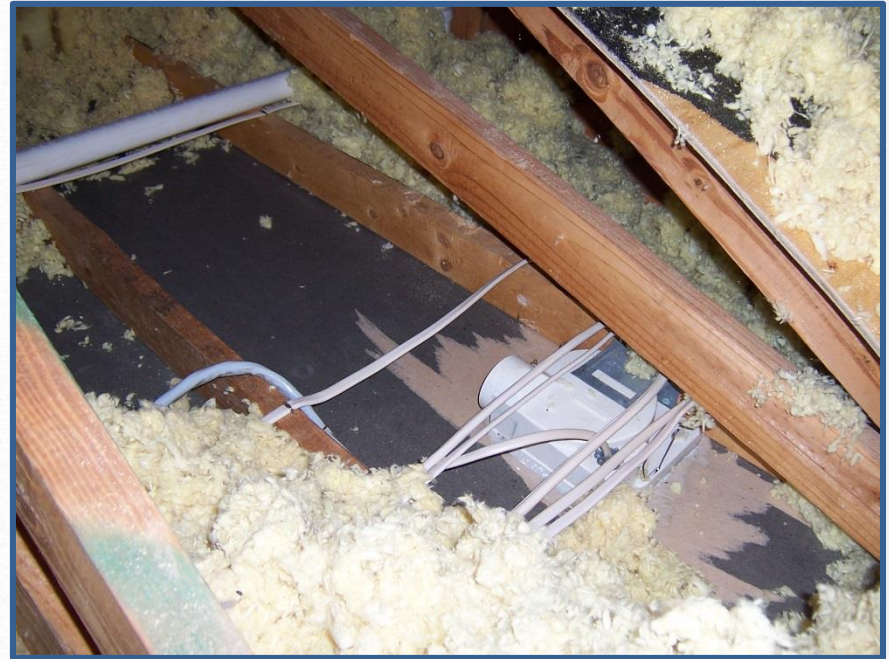
One sheet double-ply = about 25 CFM

Two sheets = about 50 CFM

Copy paper = at least 90/100 CFM



12) EXHAUST FANS



DUCT SIZE & MATERIAL

TABLE 7.1 PRESCRIPTIVE DUCT SIZING REQUIREMENTS (FROM ASHRAE 62.2)

Duct Type	Flex Duct				Smooth Duct			
Fan Rating (cfm at 0.25 in. w.g.)	50	80	100	125	50	80	100	125
	Maximum Allowable Duct Length (ft)							
Diameter, (in)	Flex Duct				Smooth Duct			
3	X	X	X	X	5	X	X	X
4	70	3	X	X	105	35	5	X
5	NL	70	35	20	NL	135	85	55
6	NL	NL	125	95	NL	NL	NL	145
7 and above	NL	NL	NL	NL	NL	NL	NL	NL

This table assumes no elbows. Deduct 15 ft of allowable duct length for each turn, elbow, or fitting. Interpolation and extrapolation in Table 7.1 is not allowed. For fan rating values not listed, use the next higher value. This table is not applicable for fan ratings > 125 cfm.

NL = no limit on duct length of this size.

X = not allowed, any length of duct of this size with assumed turns and fittings will exceed the rated pressure drop (0.25 in w.g.).

Note: water gauge (w.g.) is the same as water column (w.c.)



13) RECIRCULATING RANGE HOOD



14) VENTED RANGE HOOD

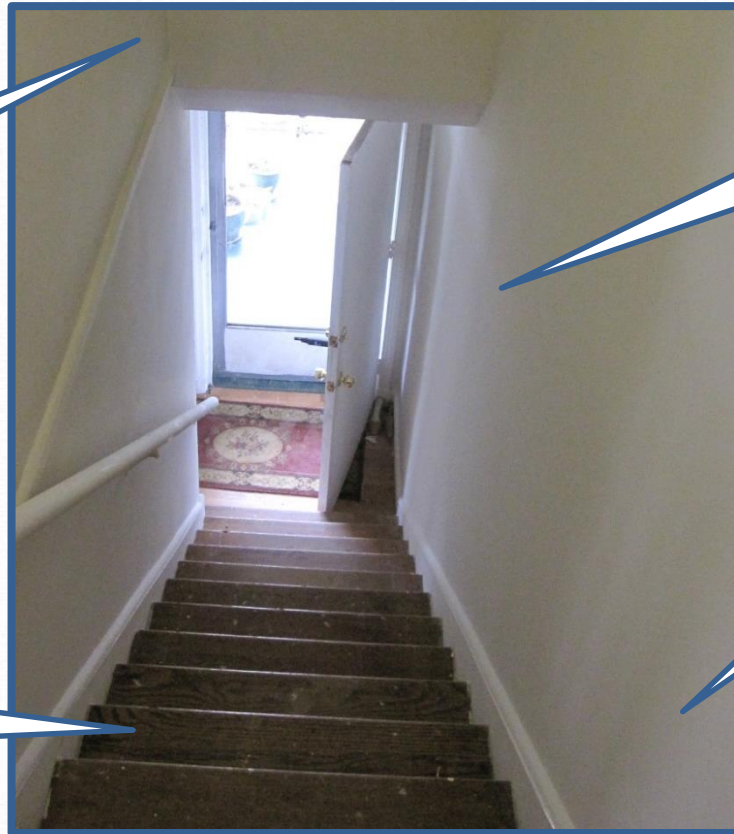


KEEP IT

15) STAIRWELL



5. Safe



Lighting?

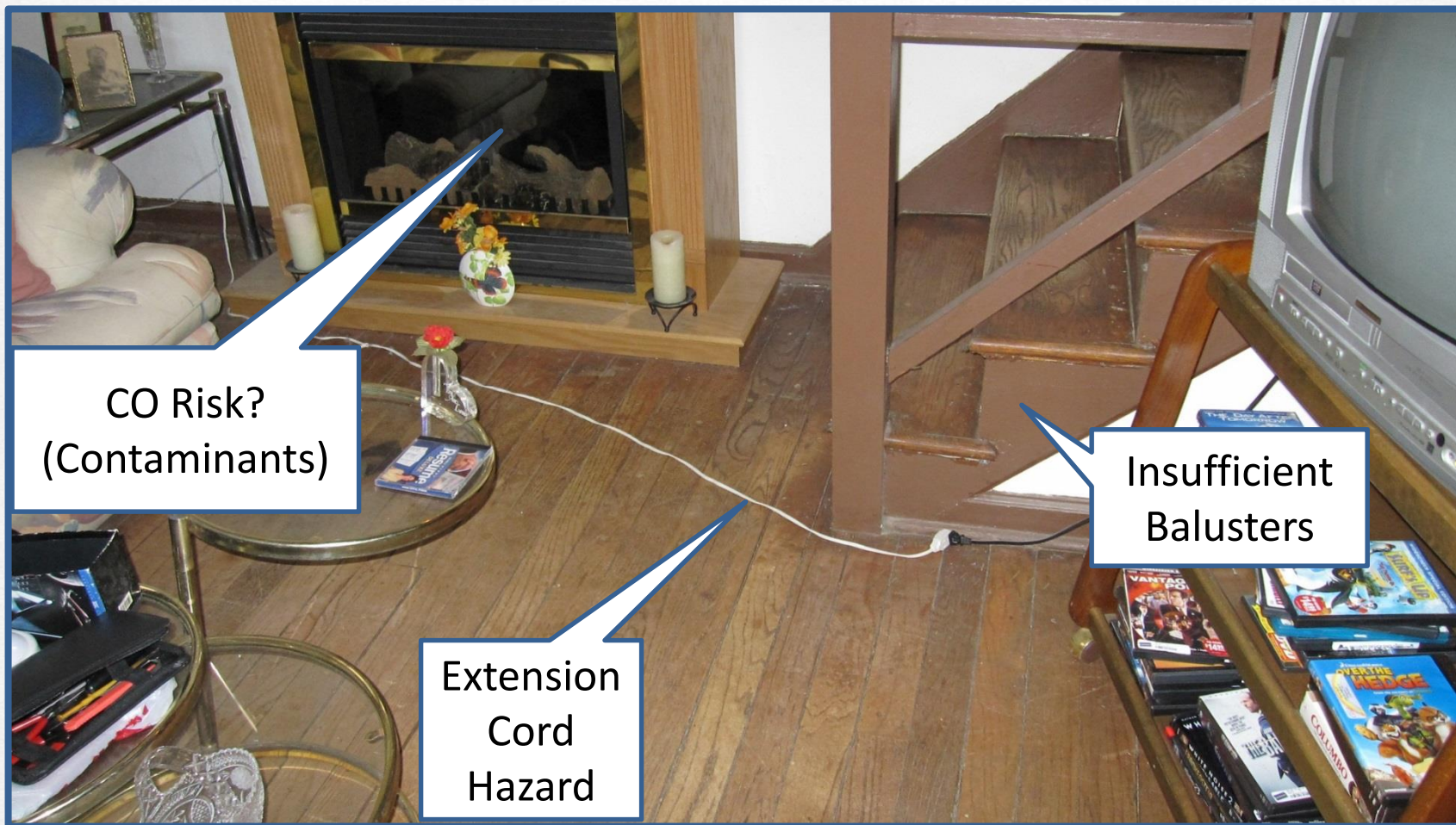
Does the door open fully?

2 handrails may be better.

Slippery rug?



16) FAMILY ROOM



CO Risk?
(Contaminants)

Insufficient
Balusters

Extension
Cord
Hazard



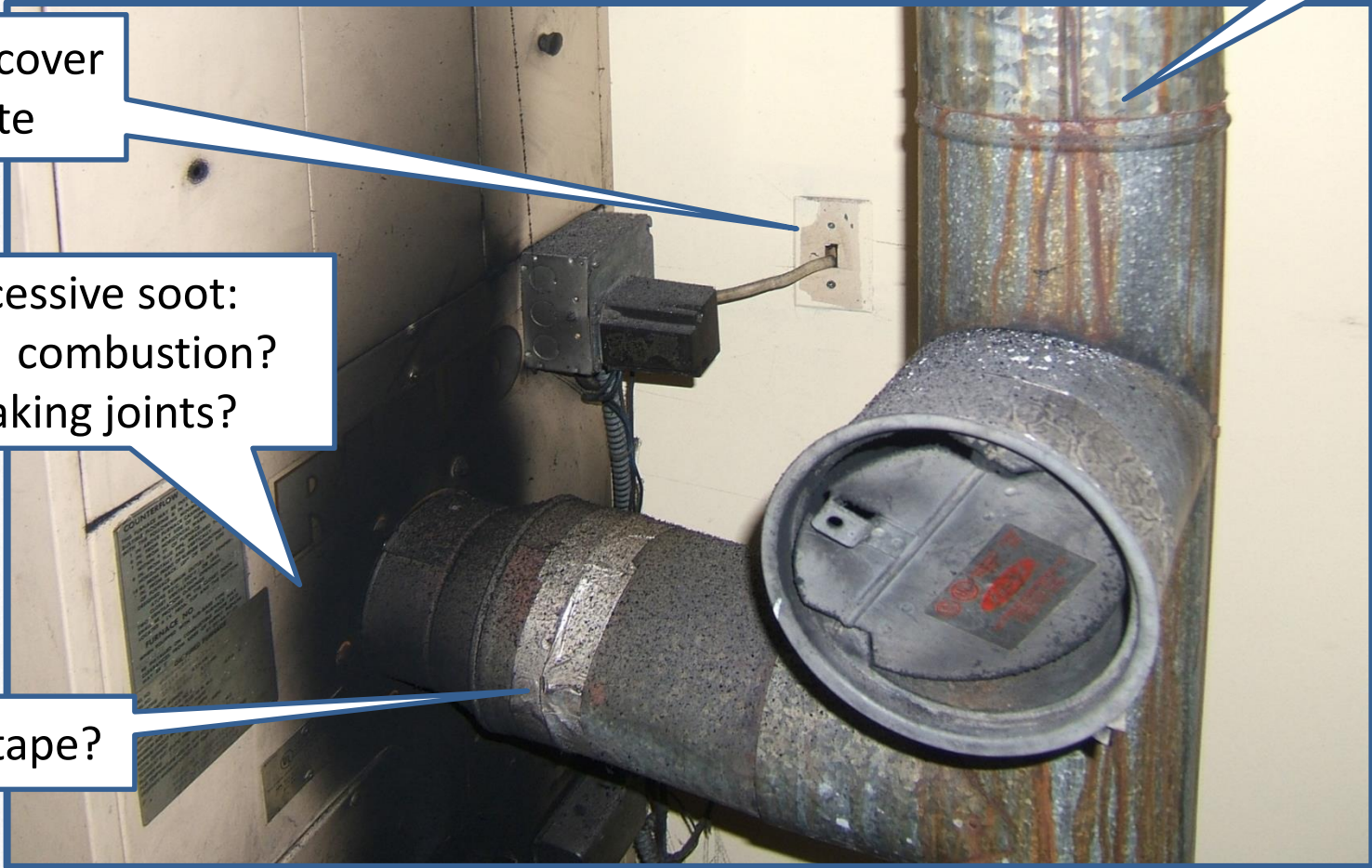
17) HEATING/COOLING SYSTEM

Corrosion

Illegal cover plate

Excessive soot:
Poor combustion?
Leaking joints?

Duct tape?



18) ELECTRICITY

Electrical cable
chaffing on
edge of siding

Pest
superhighway



BATHROOM SAFETY

- Grab bar placement
- Outside shower controls



RAMP SAFETY



KEEP IT



6. Contaminant-Free



AVOID CONTAMINANTS!

- Use low VOC paints, caulks and sealants
- Avoid installing products with formaldehyde
- Use lead-safe work practices (LBP testing)
- Know how to recognize and handle asbestos
- Clean: Remove contaminants in household



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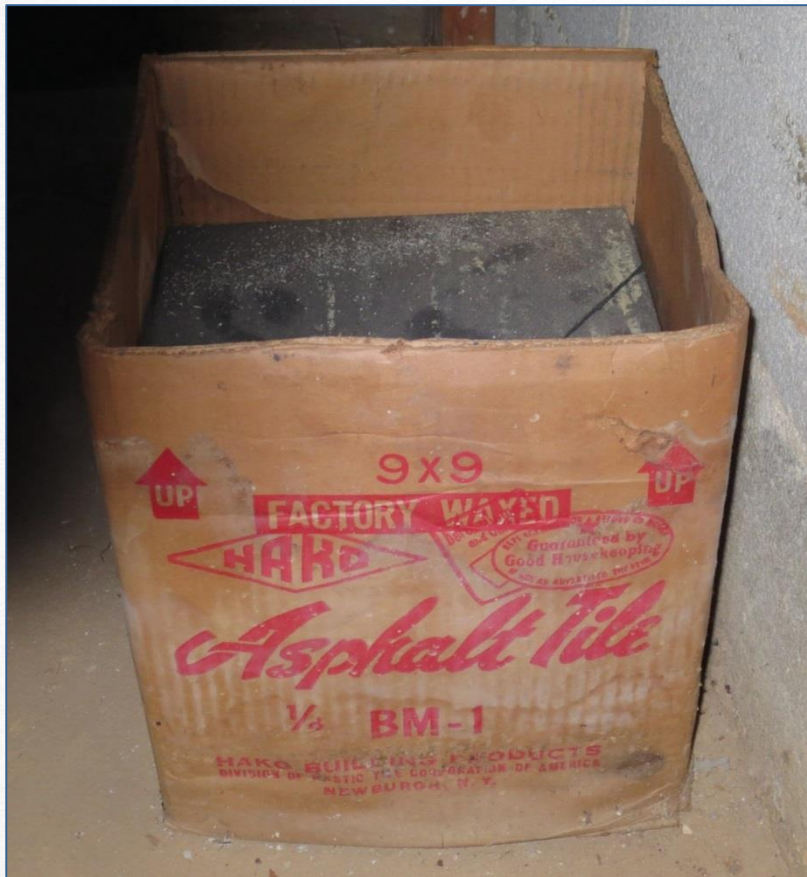


CONTAMINANTS: ASBESTOS

- Use banned in 1977
- Still found in old products, vinyl tiles, insulation



CONTAMINANTS: ASBESTOS TILES



- Almost always 9 X 9
- Easy to spot compared to the standard 12 X 12 Vinyl Composition Tiles (VCT)



MORE WAYS TO AVOID CONTAMINANTS!



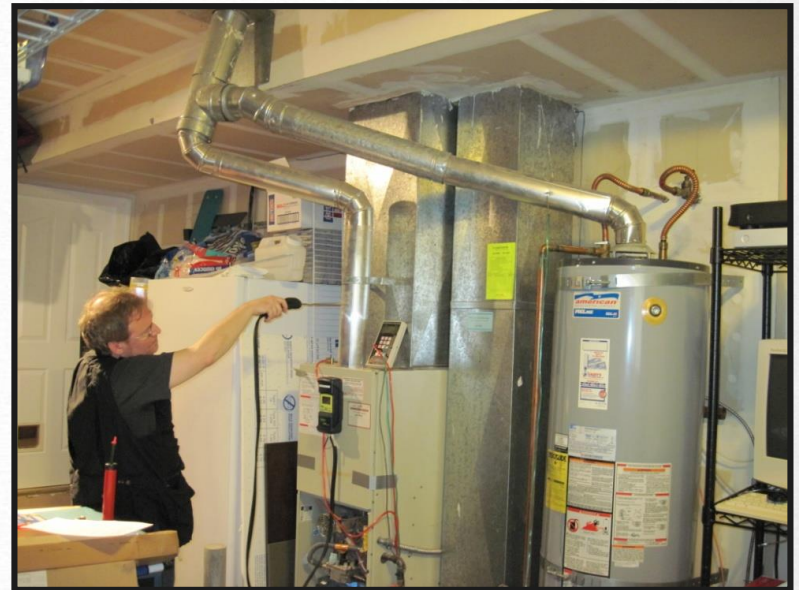
- Radon: Test and address
- CO: Install and maintain up-to-code alarms
- ETS: Educate Residents
- Atmospherically vented appliances: Combustion Appliance Zone Testing (CAZ)



CAZ TESTING

BPI Certified Combustion Appliance Zone Testing (CAZ)

1. Gas pipe leakage
2. Combustion efficiency
3. Spillage
4. Draft
5. CO



Draw & Flue Gas Testing



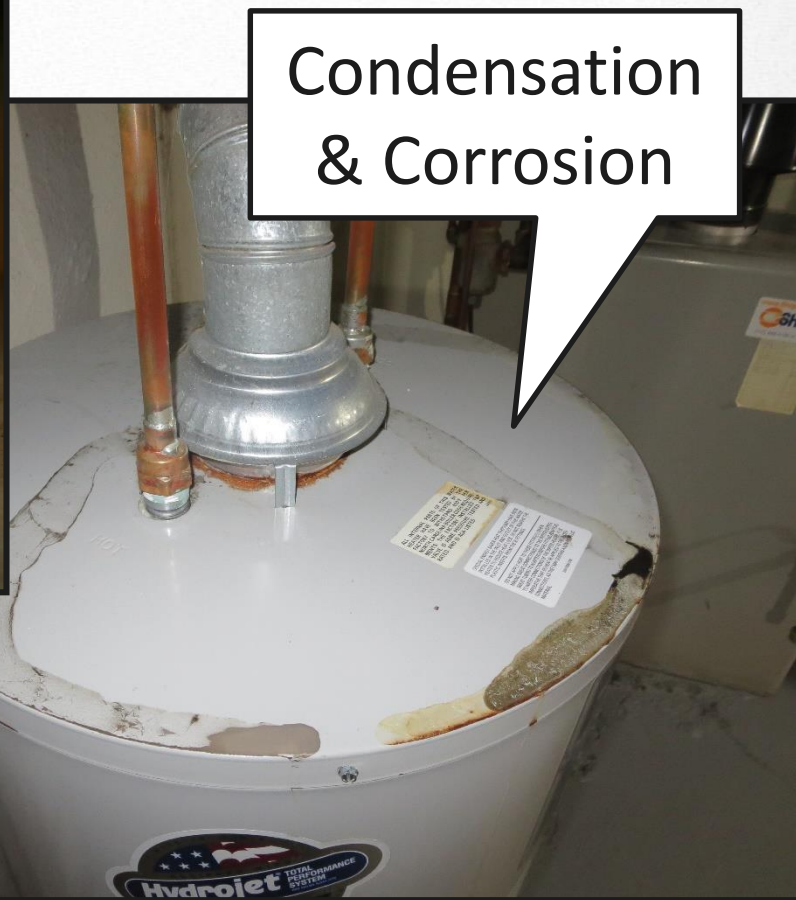
Gas Leak Testing



VISUAL CUES FOR BACKDRAFTING



Flue Connection



Condensation & Corrosion



CO DETECTORS/ALARMS

10 year Lithium Ion Battery



Plug-In



10 YEAR
ELIMINATES
LOW BATTERY
CHIRPS

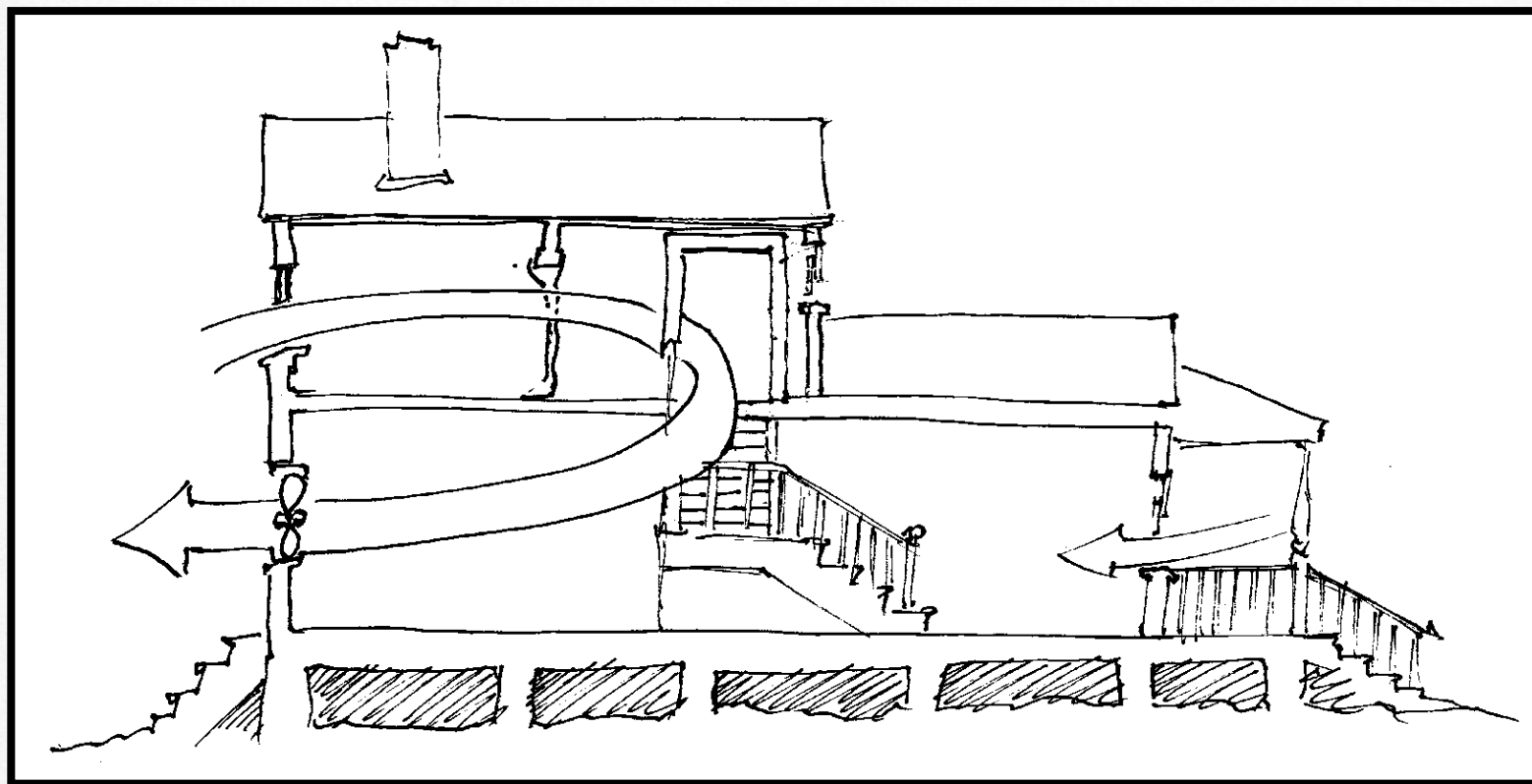


10 year
Battery with
Display
30PPM +

10 YEAR
ELIMINATES
LOW BATTERY
CHIRPS



ASSESS FOR MECHANICAL VENTILATION & FUNCTION



KEEP IT

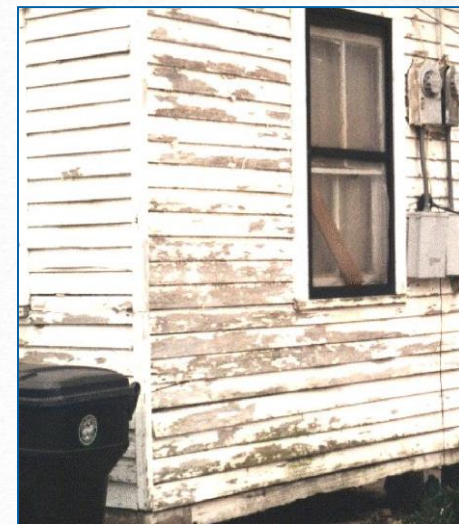


7. Maintained

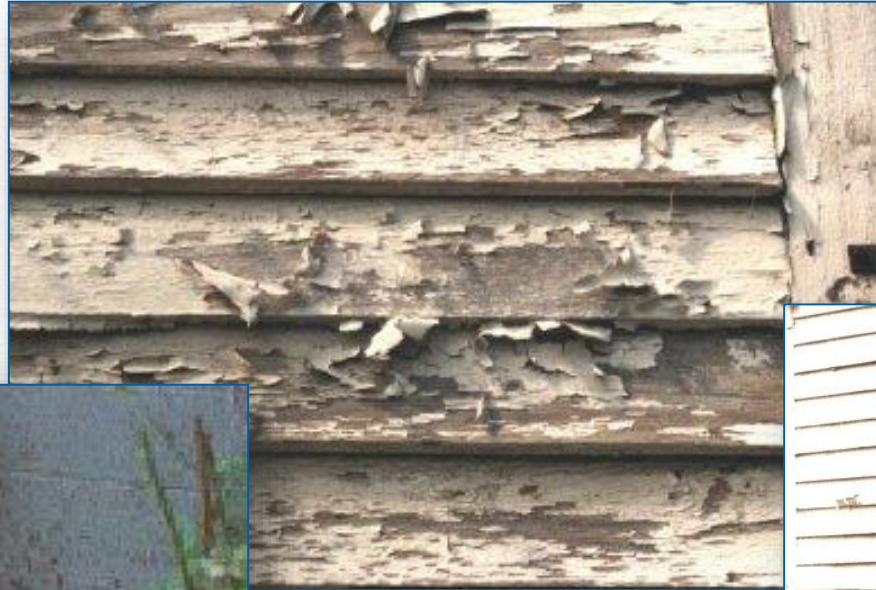
- Inspect
- Clean
- Lubricate mechanical appliances
- Repair
- Replace
- Organize



18) PAINT



PEELING PAINT OUTSIDE



LEAD: AGE OF HOUSING MATTERS

Year House Was Built	Percent of Houses with Lead-Based Paint
Before 1940	87 percent
1940-1959	69 percent
1960-1978	24 percent
All US Housing Stock	40 percent



KEEP IT



8. Climate Controlled

Climate-control Systems:

- Heating
- Cooling
- Ventilation
- House as a System



INFRARED THERMOMETER



Extech Mini Infrared
Thermometer - (8:1) - \$70

- Affordable thermal infrared camera
- ~\$60 - \$250
- Instantaneous, digital reading
- Helps to identify materials that are moist, (since condensation of moisture results in cooling)



REVIEW: CAN YOU...

List the 8 Keep-Its (without peaking)

-  1. Dry
-  2. Clean
-  3. Pest-Free
-  4. Ventilated
-  5. Safe
-  6. Contaminant-Free
-  7. Maintained
-  8. Climate Controlled



REVIEW: CAN YOU...

Explain what is meant by the “active puppy” approach to home inspections?

- Survey Outside
- Survey Inside
- Inspect Outside
- Inspect Inside



REVIEW: CAN YOU...

True or false: mold is killed by cool temperatures?

False



REVIEW: CAN YOU...

List the three most problematic pests?

- Cockroaches
- Rodents
- Bed bugs



REVIEW: CAN YOU...

List the four signs of cockroaches?

- Live cockroaches
- Cockroach bodies and parts
- Frass
- Egg cases



REVIEW: CAN YOU...

Define frass?

- Cockroach poop



REVIEW: CAN YOU...

Name the one-keep that overlaps most heavily with every other keep-it?

Keep It Maintained



REVIEW: CAN YOU...

List the three mechanical systems that are key to keeping it climate-controlled?

- Heating
- Cooling
- Ventilation



SMALL GROUP ACTIVITY: ONSITE VISIT DEBRIEFING



- Work in small groups.
- Identify the top 5 hazards for each room.
- Identify the top 5 hazards for the house as a whole, explaining:
 - ◆ What the health risk(s) is/are
 - ◆ If the health risks are acute or chronic
 - ◆ The ranking, from most to least serious

