Find your house on the Major Defect Timeline Click on the summary hyperlink for more information





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How to use this Home Buyers Guide

- 1. This guide is designed for use on your electronic device.
- 2. For best results download and save this PDF file to your device. This will keep it handy when looking at prospective homes.
- 3. For full functionality of the hyper-links open the PDF in Adobe or whatever software you use to read your PDF documents.
- 4. Then, using the date the home was built, use the color wheel to see what issues were common during that time frame.
- 5. Quickly eliminate defects that do not pertain to your home and zeros in on defects that require closer inspection.
- 6. Each defect is Hyper-linked to its own page with an explanation of the issue, followed by a page showing exactly what to look for.

This is, by no means, a comprehensive list of defects that can be found during a home inspection. But hopefully by utilizing this guide you can spot expensive defects before spending time and money on a more compete Home inspection.

Click the QR Code to download the PDF file









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DECK FASTENER CORROSION

Before 2003 all pressure treated (PT) wood used for structural deck supports i.e. deck joists and support beams was treated with an arsenic based preservative. This changed in the year 2003 when the composition of PT lumber was changed to eliminate the arsenic component and the copper component was increased. This worked well as a preservative, but had devastating effects on the fasteners of the day.

Prior to 2003 nails, screws and connector plates in use were made of steel. This reacted with the elevated copper in the new pressure treated wood and caused accelerated rust and decay of the fasteners. These compromised nails fastened PT ledgerboards to the house, Joists to the ledgerboard and staircases to the rim joists. Decks failed left and right.

The building industry and housing inspectors took notice and instituted changes to the building practices that corrected the defect. The utilization of hot-dipped galvanized nails and connectors solved the problem. Nevertheless, initially, many builders ignored the changes because "we've always done it this way", so for a year or two bad fasteners were still used.

But 2004 codes had changed, building inspectors check more often and most "permitted and inspected" decks were safe.

For a deeper dive check out these sources:

PT-Lumber-Causes-Steel-Corrosion.pdf (ggashi.com)

Fighting Fastener Corrosion | JLC Online

7 Important Things to Know About Pressure-Treated Wood — Bob Vila

CLICK HERE : TO SEE WHAT TO LOOK FOR





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So if your prospective home was built in this time period or the deck was added in this time frame, an inspection of the fasteners is a must. There are two types of decks "free-standing" and "attached-to-the-home". The major concern is with the raised attached deck as they pose the greatest potential for catastrophic failure.

Locate the "ledgerboard". This is the board that attaches the deck to the home. The nails and or connector brackets here may exhibit signs of rust and corrosion. If the nail heads show corrosion the nail shank will have lost its ability to resist shear forces. When a deck falls down it is usually due to shear force



Look for rusted bolt on the ledgerboard (the plank that connect the deck to the house)



Look for rusted joist hanger and nails. The dissimilar metals iron in the steel connectors and copper in the lumber creates a galvanic reaction which causes corrosion





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EIFS (EXTERIOR INSULATION FINISHING SYSTEM)

Around 1997 thru 1980 building material suppliers came out with a new product for cladding homes. EIFS is also known as synthetic stucco. It looks, for all appearances, just like traditional stucco, but there are huge differences. Traditional stucco is a 3 coat system and being about 1-1/2" thick it fairly trouble free. Synthetic stucco, on the other hand, may be as thin at 1/8' thick.

The major part of EIFS is a layer of insulation board. This gives the home's exterior a certain insulation value. Over this insulation board is sprayed a synthetic stucco product. The problems began with the promise of the system being "water-tight". Systems were installed without proper attention to flashing and water management once water inevitably got inside the walls. Once this happened the "water-tightness" of the system worked against it and would not let the water drain out. When this happened the walls and substrate started to rot. Ironically, the exterior synthetic stucco would still looked great.

The problems were eventually corrected and modern EIFS were re-designed with water drainage systems. Essentially a perforated plastic finishing strip at the bottom of the walls to allow water to escape. Do not confuse this problematic cladding with traditional 3 coat stucco.

CLICK HERE : TO SEE WHAT TO LOOK FOR

Resources for a deeper dive:

Exterior insulation finishing system - Wikipedia

BSD-146: EIFS - Problems and Solutions | buildingscience.com

What Is EIFS? Pros, Cons, History, and More (angi.com)





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Identify synthetic stucco vs. traditional stucco (1) pushing on the wall—EIFS will have a slight give vs 3 coat being rock solid (2) EIFS will sound hollow when thumped (3) look at an unfinished area i.e. underside of a wall or a loose sconce light—if you see foam board it is EIFS. Also, since EIFS is synthetic it will usually be crack free, whereas traditional stucco will have hairline cracks.

Look for tell tale stains where gutters abut up to the walls, open cracks and seams around windows, bulges and visible damage to the EIFS cladding. Inside the home look for water stains and damage around the interior window frames and casings. Also, water damage to the wood flooring, baseboards or carpeting. With visible damage the next step would be invasive moisture testing to confirm internal water damage.

Damaged substrate



Water stains below improper gutter end



How EIFS are constructed







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"PB" Water distribution pipes

Homes built from 1975 to 1995 may have used Polybutylene "PB" plastic water lines to distribute water around the home, instead of the more common copper pipe.

This product was easier to work and cheaper than more traditional water distribution pipes. Unfortunately, the composition of the polybutylene reacted with chlorine in City water. Over time this led to cracks in the pipe material usually around the fasteners and fittings. Since the water lines are under pressure these failures tended to be catastrophic.

Polybutylene Pipe is somewhat rare as most have already been replaced. Rare as it is, if you find it in your home, you know you will have an issue that could fail at any time. The only remedy, replacing the affected lines, can be an expensive repair depending upon the extent of the plumbing involved.

CLICK HERE : TO SEE WHAT TO LOOK FOR

Here is some addition resource:

Common EIFS failures, and how to prevent them (bdcnetwork.com)

BSD-146: EIFS - Problems and Solutions | buildingscience.com

Water Intrusion Concerns: EIFS Isn't What It Used to Be | Envista Forensics





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The most common types of distribution lines found in homes are the familiar copper pipe, galvanized steel pipe, CPCV plastic pipe and newer PEX plastic pipe. Copper and galvanized are readily identifiable by their coloration, CPVC is ridged white plastic, whereas PEX, which comes in blue, red or white, will have the words "PEX" stamped on the lines.

"PB" pipe is usually grey in color with a circular clamping ring at the fittings. Look for a stamp "PB2110" on the pipe. This stamp is the definitive identifier. PB will always have this stamp somewhere on the line.

Grey Polybutylene pipe with PB2110 label



PB pipe with copper crimps



Different pipe types

BACK







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Aluminum house wiring

During the Vietnam War Years (1965-1975) copper came into short supply. Builders started using solid core aluminum (as opposed to stranded aluminum) for the home's branch circuits. Electricity comes into the house via the circuit breaker box (service box) and branches out (branch circuits) to various parts of the house i.e. lights, outlets, appliances.

While aluminum wiring is capable of conducting electricity, it does have notable disadvantages compared to copper, such as increased size for equivalent conductivity and greater susceptibility to fatigue and connection issues.

Serious issues with outlets, fixtures and junction boxes requires examination by a licensed electrician knowledgeable in aluminum wiring. The best practices remedy is whole-house re-wiring. Not an inexpensive proposition.

The best course of action, should you find yourself interested in a home of this era, is to have the home and electrical system inspected by a competent Home inspector familiar with this issue.

The home insurance industry is also aware of this issue. Getting home-owner's insurance can be a challenge when the home has aluminum wiring.

CLICK HERE : TO SEE WHAT TO LOOK FOR

A deeper dive:

How to Recognize Aluminum Electrical Wiring Hazards & how to make aluminum wiring safe (inspectapedia.com)

CPSC Safety Recommendations For Aluminum Wiring In Homes | CPSC.gov

Aluminum Wiring - Code Check





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Unfortunately, aluminum wiring is not something diagnosed by a layman. The definitive diagnosis is having a home inspector remove the service panel's deadfront (not something an untrained person should do—its called a "deadfront" for a reason). Inside the panel, the ends of the wiring are all exposed as they enter the various breakers or are attached to the neutral and ground bars. The wiring jackets are also readily readable inside the service box and will be stamped "AL". Important: not all aluminum or aluminum appearing wiring is at issue.

- Large size (gauge) wires #6 and #8 connecting say an electric range (OK)
- Incoming power lines #00 (OK)
- Stranded wire (OK)
- "tinned" copper wire (old style wiring) (OK)
- Aluminum wire with a cloth jacket (old style wiring) (OK)



Outlet shorted out due to a failure of the aluminum to copper connection. As this connection failed, the aluminum wire became disconnected



Inside an open service panel all the wire tips are expose as they make their various connections. This is an easy way for a home inspector to identify alumi-







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Federal Pacific Stab-loc Electric Panel

Homes built from 1950 to 1985 may have a very dangerous electric service panel installed manufactured by Federal Pacific. It is very distinctive with its red circuit breakers and prominent red Federal Pacific label on front.

The issue with these panels, other than being obsolete and therefore cannot be repaired, is the breakers will not reliably trip when called upon to do so. The company was sued and promptly went out of business leaving behind thousands of these defective boxes installed. The lawsuit contended that during the testing of the circuit breakers, the Federal Pacific Company cheated in order to obtain the Underwrites Laboratories (UL) approval. Since this issue is well documented and the risks severe sometimes obtaining homeowners insurance can be challenging should the insurance company discover this type of service panel is installed.

There is a host of information available with a google search. Do not fall victim of the comment that "its been there for 50 years without a issue". Most breakers never trip, but when a short circuit occurs they are expected to operate properly without causing a fire. The solution to this issue is the replacement of the Federal Pacific breaker box with a new modern service box. Most of the time this is a straight-forward albeit time-consuming process for an electrician, somewhere in the range of \$2,000 to \$3,000.

CLICK HERE : TO SEE WHAT TO LOOK FOR

More Info:

Federal Pacific Breakers: What to Know (angi.com)

FPEJudgement8-15-02.pdf (inspectapedia.com)

2024 Federal Pacific Breaker Panel Recall: You Should Know (homeinspectioninsider.com)





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Most of these panels are found in the basement underneath the main incoming service lines and meter. Nevertheless, be on the lookout for other locations such as a garage sub panel.

This is the only service box that has red tipped breakers



Distinctive Logo on the front







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Galvanized Steel Incoming Water Pipe

Most homes have a copper water service pipe. This is the pipe that brings City water into the home and is connected to the water meter. Another type of water service mostly found in new homes is plastic pipe. Both copper and plastic have no issues associated with them.

Galvanized, however, is problematic. This is because galvanized steel has a finite lifespan (approx. 75 years). Being steel it simply rusts out. Galvanized steel pipe has the unusual property of rusting from the inside out. The corrosion builds up, slowly choking off water flow and pressure. Once this corrosion is advanced enough it breaks through the exterior and starts to leak.

This process can all be witnessed inside the basements as many homes still have galvanized steel distribution pipes delivering water to the home's fixtures. Poor water flow and pressure is noticeable, brown rusty water from taps and spigots, and rust through and corrosion usually at the pipes joints and fittings.

Unfortunately, all this and more is happening underground and out-of-sight if you happen to have galvanized steel incoming water service. Leaks may go undetected because it occurs before the water meter, but small leaks eventually get bigger.

If it fails it will create an emergency situation; loss of incoming water service and flooding albeit usually outside the home. Often the service line will run under the street as the water main is usually on one side of the street or another (fire hydrants are an indicator of the main). Repairs are usually very expensive. So it pays to identify this issue early.

CLICK HERE : TO SEE WHAT TO LOOK FOR

More reading:

Making sense of GRR for LCRR: How galvanized service lines factor into Inventory requirements | BlueConduit Galvanized Steel Water Pipes: What you should know (newpipesinc.com) Galvanized Iron Water Supply Piping, & Galvanized Drain Piping (inspectapedia.com)





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Fortunately galvanized steel is not too common. Most copper is pretty easy to identify. Scratch it; if it looks like a penny you have copper. Also copper fittings will be soldered or a "thread-less" compression fitting (like on example #3). #4 plastic is readily identified and #1 Lead we cover in another section. #2 is galvanized steel, and has threaded connections. It is also the only one that is magnetic. It is hard to scratch but will show the color of a nickel. Your first clue is the presence of a threaded elbow or coupling fitting.

Look on the "Street" side of the water meter



Different types of incoming water service lines







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Clay sewer pipes connecting your home to the City sewer

In most homes built before the 1980's there is a good chance the sewer lateral (the sewer line that connects your home to the City main sewer line) is constructed partially or completely using segmented clay pipe. The other common sewer materials, PVC plastic or cast iron pipe, are welded together; PVC using an adhesive and cast iron using poured lead. Both of these are fairly impervious to tree roots.

Segmented clay pipe consisted of 2 to 3 foot sections that are hubbed together. This allows the clay pipe a certain amount of flexibility that can help prevent cracks. These hubs, however, allow tree roots access to a nutrient rich water source. If the roots are not mechanically removed periodically, they will grow into a mass, choke off flow and eventually create a blockage.

The good news is clay pipe is fairly robust at 1" thick. With regular maintenance (mechanical cleaning at least once a year) it can be a controllable issue. When the line is properly sloped at 1/4" per 1 foot of line, the line self-scours and is relatively clean. If the clay pipe is damaged, especially on the roof section of the pipe, then cave-ins are a potential problem. Modern remedies now include a fiberglass liner, however, this is not an inexpensive solution.

There is really only one way to know the condition of the sewer lateral. A video examination of the line. If you are looking at a home built prior to the 80's, get one done in conjunction with your home inspection so you know what your are up against.

CLICK HERE : TO SEE WHAT TO LOOK FOR

Some further reading:

Private Sewer Laterals, June 2014 (epa.gov)

Sewer Pipes Guide: PVC, ABS, Clay, Iron, & Orangeburg (thespruce.com)

Sewer Line Repair and Replacement (thisoldhouse.com)





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THIS IS WHAT TO LOOK FOR

Here are some typical still photos taken that would come with a video sewer examination and report.



Clean, well sloped clay pipe. Note the obstruction free joint



Clay pipe with root mass partially blocking the pipe





Clean PVC plastic pipe. Note the purple primer an indicator of a properly constructed PVC joint

BACK

Clean and well sloped cast Iron pipe. Note the joint here is welded with a mixture of oakum (a fiber material) and sealed with liquid lead





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Fuses instead of breakers in the Service Panel

Many older homes have what are considered obsolete fuses instead of modern breakers in the service panel. Fuses, in and of themselves, are not a problem other than the nuisance of replacing a blown fuse rather than simply re-setting a breaker. Replacing blown fuses can be complicated as well, as there are differing sizes, bases and types. Often the correct fuse is not at hand when you need it.

Also, the panel boxes they are installed in, are undersized. Old 60 amp electric service is used, as opposed to the more modern 100 or 200 amp service. Older homes had fewer circuits and appliances to run and, therefore, could get away with a 60 amp service. Modern homes demand more electric power. An updated kitchen alone can require have a dozen electrical circuits.

Fuse box service panels usually have only a handful of fused circuits. What is revealed when the panel front is removed is usually overloaded circuits. When you can not expand the number of fuses, conductors are doubled and tripled up under one fuse.

If a remodel or addition is in your future or a home inspection shows an overloaded service box, the proper remedy is updating with a modern circuit breaker service panel. An estimated cost, for a home serviced by a minimum of 100 amps, is between \$2,000 and \$3,000.

CLICK HERE : TO SEE WHAT TO LOOK FOR

Additional Info:

Old fuse panel: 60 amps or 100 amps? - Structure Tech Home Inspections

How to Replace a Blown Fuse in a fuse panel (inspectapedia.com)

Fuse Box Replacement Cost In 2024 – Forbes Home





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Here are some examples of fused service panels and a modern breaker service panel. Also an overloaded fuse panel

Example of a fuse panel. The orange fuses are 20 amp and the blue are 15 amp fuses. 220v fuses for, say a dryer, are below in the "pull outs"

Example of an overloaded fuse box. Note multiple conductors attached to the fuses.

Example of a modern circuit breaker panel. Simply reset a breaker if it trips.











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Lead Incoming Water Service

Many homes, primarily in Saint Paul, built up until the 1930's can have incoming water service pipes constructed from lead. Lead was easy to work with, bent easily and was corrosion resistant. Unfortunately, the harm done by drinking water through lead pipes was recognized as early as the Roman Era. The most serious effects are on developing children.

Saint Paul has the largest remaining network of lead service lines. The SPRWS (Saint Paul Regional Water Services) keeps tabs on these lines. One of the things SPRWS does to their water supply is a treatment that creates a protective patina on the inside of their water lines, thus forming a barrier between the water and the lead pipes.

There is also an initiative to replace all the lead water lines within 10 years at no cost to the home owner. You can have the tap water tested for free by SPRWS. Also, you can simply drink bottled water.

Nevertheless, if you have vulnerable people in your household i.e. pregnant, infant and young children consider the risks of waiting for the replacement .

CLICK HERE : TO SEE WHAT TO LOOK FOR

Additional resources:

Saint Paul Announces \$14.5 Million Investment to Replace Lead Pipes | Saint Paul Minnesota (stpaul.gov)

Lead Free Poster Final Final_11_06 (stpaul.gov)

More than a dozen St. Paul homes found to have high lead levels (twincities.com)





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Lead incoming water service pipes are very easy to identify. Lead is very soft and scratches easily revealing a pewter colored material. It is also NON-magnetic. But its most definitive identification is its connector. Lead pipe sections are connected by "wiping" which consists of wrapping and melting lead sheets around the connection forming a smooth swollen joint.

Oddly enough, that when some lead lines are replaced with copper service lines this lead connector is left intact. I have contacted SPRWS and haven't received an answer as to why this portion of the lead line is left intact. I can only surmise that its effects are minimal.





Lead service line right before the water meter



Lead connector on new copper water line

