How to be a successful house buyer

怎样避免买房中的常见错误?

- David Sha-Five Star Realty Group LLC
- Licensed Broker/Realtor, Investment specialist
- Member of St. Louis, Missouri and National Association of Realtors
- B.S. and M.S. In Building Structural Engineering
- Licensed Professional Engineer in MO and IL
- Over 20 years building experience
- Phone: 314-456-6699
  Email: dsha@FiveStarRealtyGroupLLC.com

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How to be a successful house buyer

怎样避免买房中的常见错误？

Goals of this Seminar

1. To Share my over 20 years building experience as a licensed broker and a licensed structural engineer with regular house buyers.
2. To Educate house buyers how to avoid costly mistakes in house buying.
3. To explain what are building failures, why do failures happen and how to fix them.

How to be a successful house buyer

怎样避免买房中的常见错误?

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买房前的准备工作

Preparation before buying

1. Goal setting

- Owner occupant

House Locations, house style, school districts, price etc.

- Investment house

House Locations, C**ash flow(profit greater than expenses)**, price etc.

2. Why you need a buyer's agent?

*By law, Seller's agent always has seller's best interest in mind.

*By law, the buyer's agent has to represent your best interest no matter who pays the commission.

You get free representation!

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买房前的准备工作

Preparation before buying

3. Why you need Pre-approval letter or proof of funds
   * To know your buying power.
   * To make buying process smoothly
   * To get it from Mortgage brokers or Banks

4. Locations and school districts
   * Missouri Department of Elementary and Secondary Education website

http://mcds.dese.mo.gov/guidedinquiry/District%20and%20School%20Information/Missouri%20School%20Directory%20by%20County.aspx

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买房前的准备工作

Preparation before buying

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Preparation before buying

5. Do your own research

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And Click on Useful Links Tag

- Useful Links
- St. Louis Association of REATORS
- http://www.stlrealtors.com/template-working/site/
- St.Louis City Tax Website
- http://stlouis-mo.gov/data/address-search/index.cfm
- St. Louis County Tax Website
- http://revenue.stlouisco.com/ias/
- St. Charles County Tax Website
- http://assessor.sccmo.org/assessor/index.php?option=com_assessordb&Itemid=49
- Jefferson County Tax Website
- http://www.jcao.org/myinfo.htm
- School Districts information website
- http://mcds.dese.mo.gov/guidedinquiry/District%20and%20School%20Information/Missouri%20School%20Directory%20by%20County.aspx
- www.zillow.com

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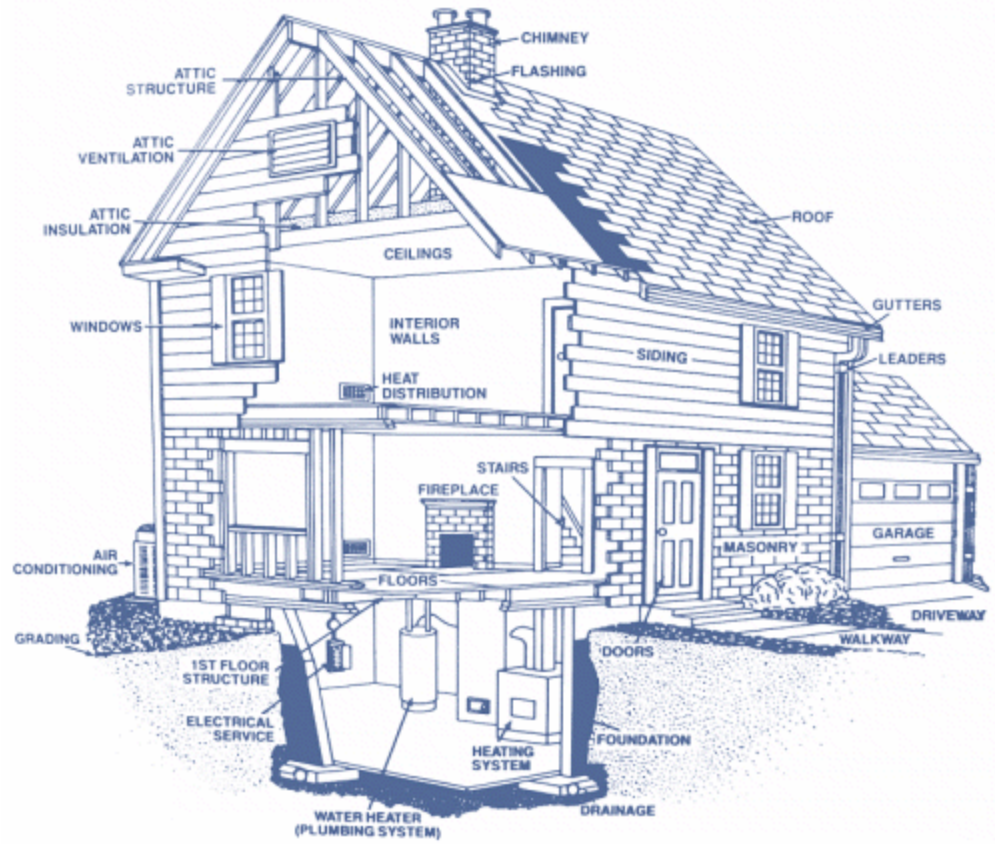
买房前的准备工作

Preparation before buying

Why do we need a house inspection?



A Typical 3D House View

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买房前的准备工作

Preparation before buying

Why do we need a house inspection?

* Hundreds of elements, numerous systems.

You need to know what you are buying.

* Roof and Exterior walls
* Basement, Foundation, Crawlspace & Structure
* Heating and Cooling system
* Plumbing system
*Electrical system
* Fireplace
* Attic, Insulation & Ventilation
* Doors, Windows & Interior

买房前的准备工作

Preparation before buying

Why do we need a house inspection?

Exterior elements that affect the house

1.Water (Rain, snow and hails)

2. Wind/Earthquake

3. Fire

4. Wood eating insects such as termites etc.

*House conditions go down the hill from day one after it was built.

*You need to know what you are buying!

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买房前的检查

How to inspect house **yourself**?

Inspection goals

1. To find major building defects early
2. Save your time and money$$
3. **Not** to replace regular home inspection or other inspections before house purchase.

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How to inspect house **yourself**?

房屋检查要点**(Inspection Main Points)**

1.房屋地势和环境(Site,Grading&Surrounding)

2. 地下室和地基(Basement and Foundation)

3.楼板(Floor joists/beams)

4.外墙(Exterior walls)

5.屋顶(Roof)

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How to inspect house **yourself**?

房屋的地势 (House Site,Grading) 风水？

1.洼地(low grade)

2.陡坡地(Steep sloping grade)

3.平地和坡度小的坡地(Flat /Gentle slope grade)

那一种好？(Which one is best?)

Answer :

3.平地和坡度小的坡地 (Flat Grade or gentle slope grade)

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How to inspect house yourself?

- Why?
- Stable foundation
- No retaining Wall needed
- low maintain

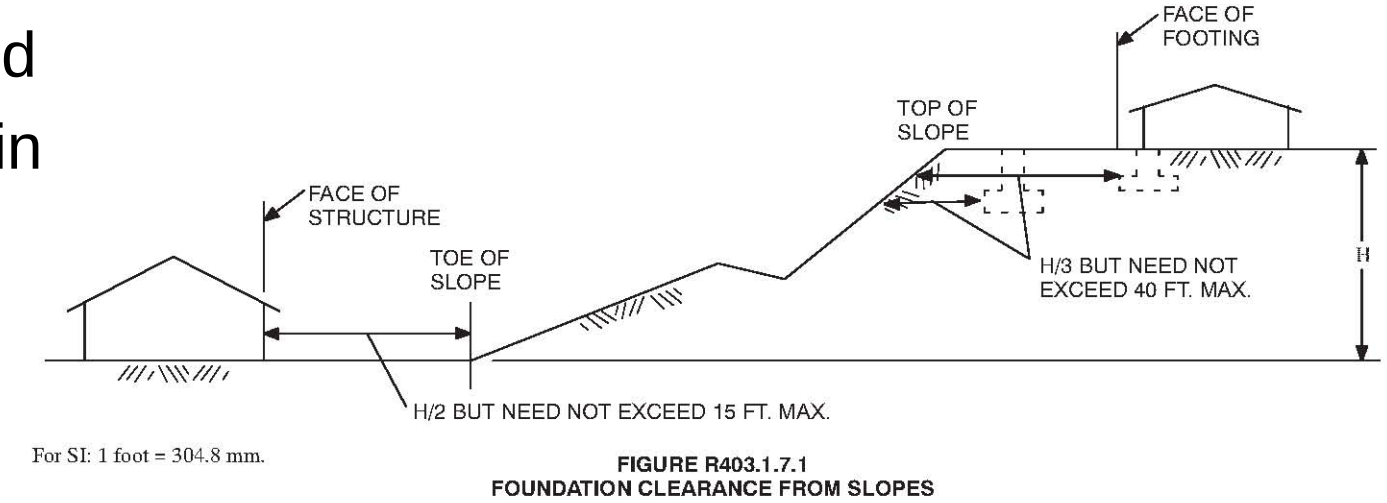

FIGURE R403.1.7.1
FOUNDATION CLEARANCE FROM SLOPES

International Residential Code(IRC) 2009

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How to inspect house Yourself?

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买房前的检查
How to inspect house?

House Surroundings

1. Tree roots to damage the foundation
2. Tree branches to damage the roof
3. Cutting/trimming tree fee

买房前的检查
How to inspect house?

- Basement/Foundations(房屋的地基)

1.Full or Partial Basement 地下室(部分地下室）

2.Crawl Space（半地下室）

3.Slab on grade（无地下室）

Q: Which is the best? 那一种好?

Anwser: 1.Full or Partial Basement, use for storage, ease to repair MEP systems, easy to sell

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How to inspect house?

Basement wall type

1. Concrete Wall
2. CMU Block Wall
3. Stone or Brick Wall

Q: Which one is the best?

A: 1 .Concrete Wall, better strength, not prone to leak.

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How to inspect house?

Common Basement/Foundation Problems

1. 渗水(Leaking or wet basement)
2. 纵向裂缝(Vertical Cracks)
3. 横向裂缝(Horizontal Cracks)
4. 斜向及台阶状裂缝(Diagonal & Step Cracks)
5. 墙体倾斜凸入(Wall Caving in)
6. 不均匀沉降(Differential settlement)

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How to inspect house?

混凝土砌块墙渗水
CMU wall leaking

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How to inspect house?

混凝土砌块墙
横向裂缝 (Horizontal Crack in CMU wall)

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How to inspect house?

现浇混凝土墙

纵向裂缝

(Vertical crack in cast in place concrete wall)

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How to inspect house?

现浇混凝土墙
纵向裂缝
(Vertical crack in cast in place concrete wall)

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How to inspect house?

混凝土砌块墙
台阶状裂缝
Step Crack in CMU wall

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How to inspect house?

现浇混凝土墙

斜向裂缝

Diagonal crack in concrete wall corner

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买房前的检查
How to inspect house?

混凝土砌块墙

墙体倾斜凸入

CMU wall “bowing” towards inside

买房前的检查
How to inspect house?

- How to deal with basement/foundation problems?

1. Vertical Crack
2. Horizontal Crack
3. Diagonal and Step Cracks
4. Differential Settlements

How does it happen, which one is structural crack/failure?

买房前的检查
How to inspect house?

- How to deal with basement/foundation problems?

1. Vertical Crack)

- Caused by temperiture and shrinkage, nonstructural crack.
- Might need to repair with Epoxy resin if crack widens.
- A few of them might be caused by indifferential settlements.

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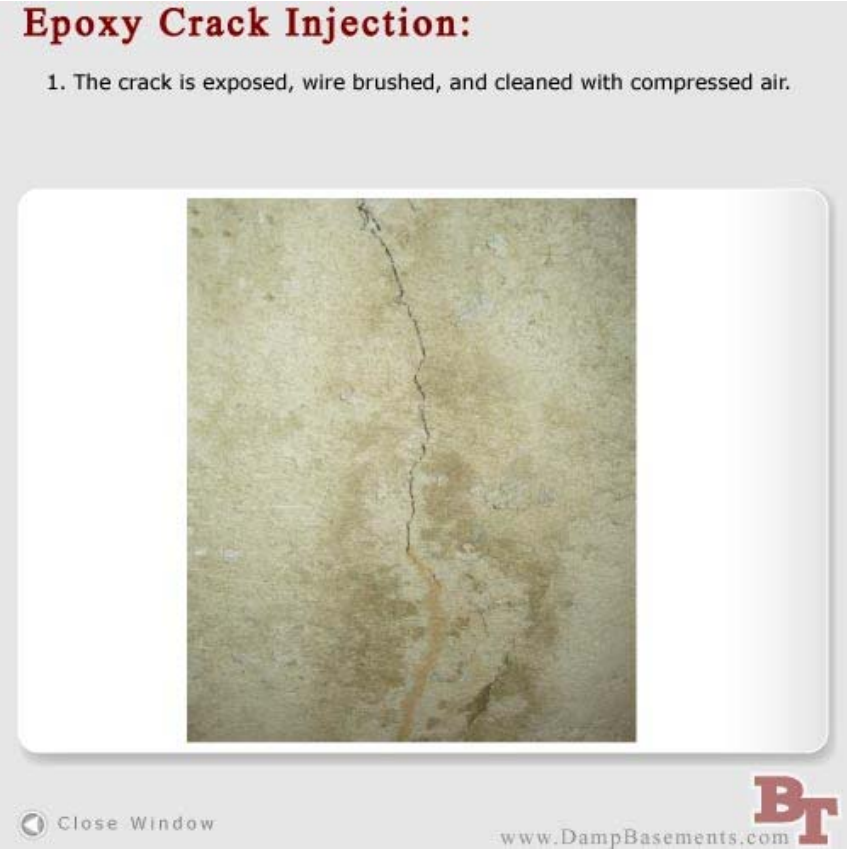
How to inspect house?



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How to inspect house?

Epoxy Crack Injection:

3. The entire crack surface is covered with epoxy thixotropic paste, creating an inside dam to contain the liquid epoxy during injection. Once the epoxy thixotropic paste has hardened the injection phase begins by injecting a 2 part low or mid viscosity epoxy through the surface posts and into the actual body of the crack.

Close Window

www.DampBasements.com

Epoxy Crack Injection:

4. Injection is continued from port to port from bottom to top. Crack injection is complete when the epoxy begins to flow from the top of the crack.

Close Window

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How to inspect house?

Epoxy resin repair Video

How to Repair Cracks in Concrete Walls

http://www.youtube.com/watch?v=TSogjFQPksc&feature=pyv&ad=2656754844&kw=concrete%20crack%20repair&gclid=CLLQ9qr-nKUCFQFoKgodrxjKIQ

买房前的检查
How to inspect house?

- How to deal with basement/foundation problems?

2. Horizontal Crack

- Caused by lateral force overstress due to failed outside wall drainage system
- Formed by wall “bowing” towards inside Typical Structural crack/failure

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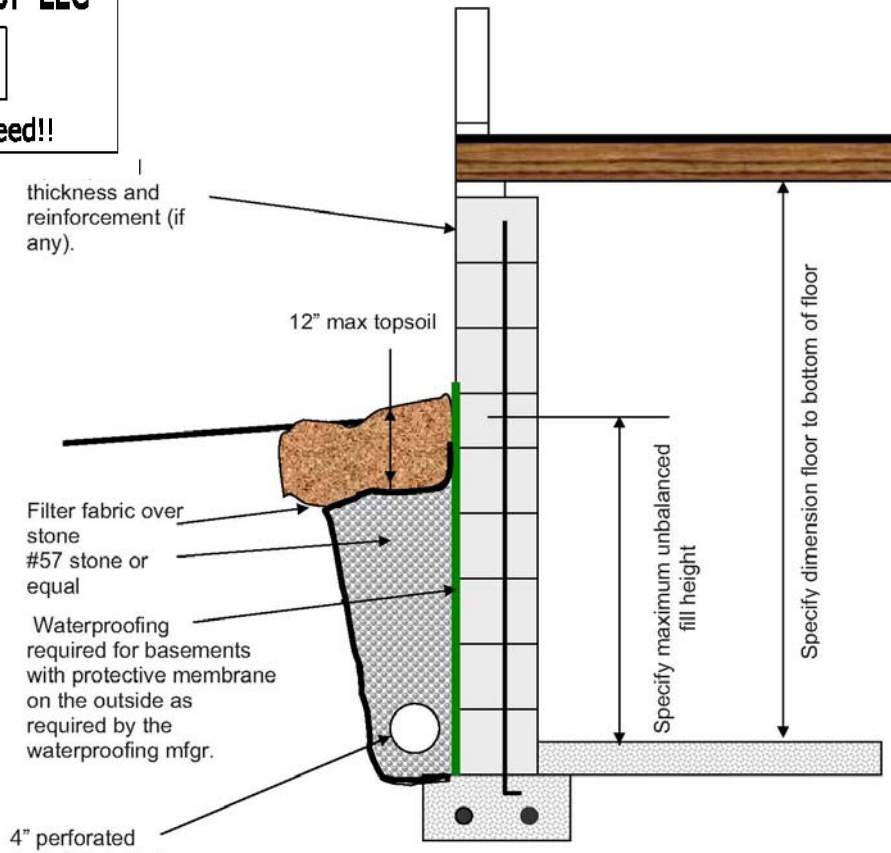

EXAMPLE SKETCH SHOWING MINIMUM INFORMATION REQUIRED ON A DRAWING FOR "GRANULAR FILL DESIGN AND FOUNDATION WALLS RETAINING MORE THAN 4 FEET OF UNBALANCED FILL"

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How to inspect house?

How to repair?

1. install Helitcal tieback system

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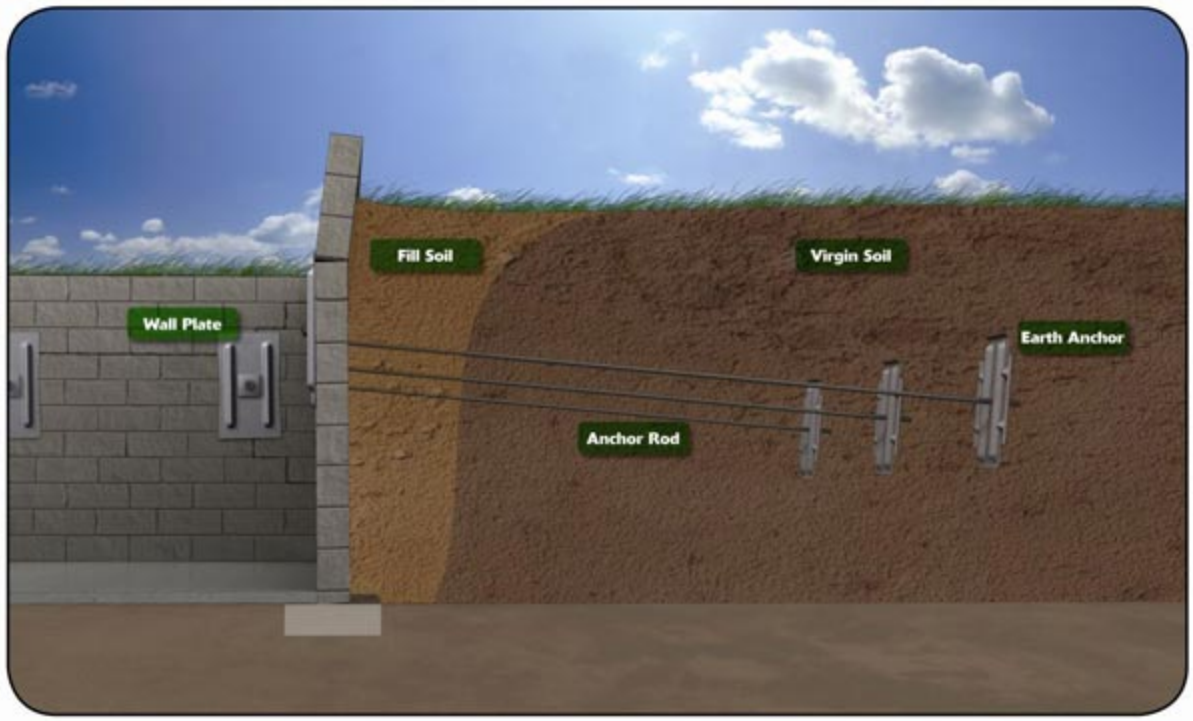
买房前的检查

How to inspect house?

How to repair?

2. Install Wall Anchor system



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买房前的检查

How to inspect house?

How to repair?

Wall Anchor Installation Steps:

Step 1: Sod is carefully removed and an earth anchor hole is augured.

Step 2: A small hole is drilled through the wall and a rod is driven out.

Step 3: An earth anchor is installed and attached to the rod.

Step 4: A wall plate is attached and tightened, seating the earth anchor.

Step 5: The hole is backfilled and the sod is replaced.

Step 6: Anchors can be tightened all intervals and straighten the wall over time.

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How to inspect house?

3. Steel beam to reinforce basement wall

Steps to a Safe & Secure Basement Wall

Step 1: Basement wall height is measured, and the PowerBrace steel beam is cut to the appropriate height.

Step 2: The top of the steel beam is fastened and secured to the floor joists.

Step 3 : The PowerBrace beam is plumbed.

Step 4: The bottom of the steel beam is anchored to the concrete floor.

Step 5: The PowerBrace System can be tightened at intervals for possible wall improvement.

Step 6 : Reinforced foundation walls !

买房前的检查

How to inspect house?

- How to deal with basement/foundation problems?

3. Diagonal & Step Cracks

- occurs at corner of house, chimney and windows
- Some of cracks are structural cracks due to differential settlements.
- Install mechanical piles to repair
- Some of them might be non-structural cracks that might be repaired by Epoxy Resin.

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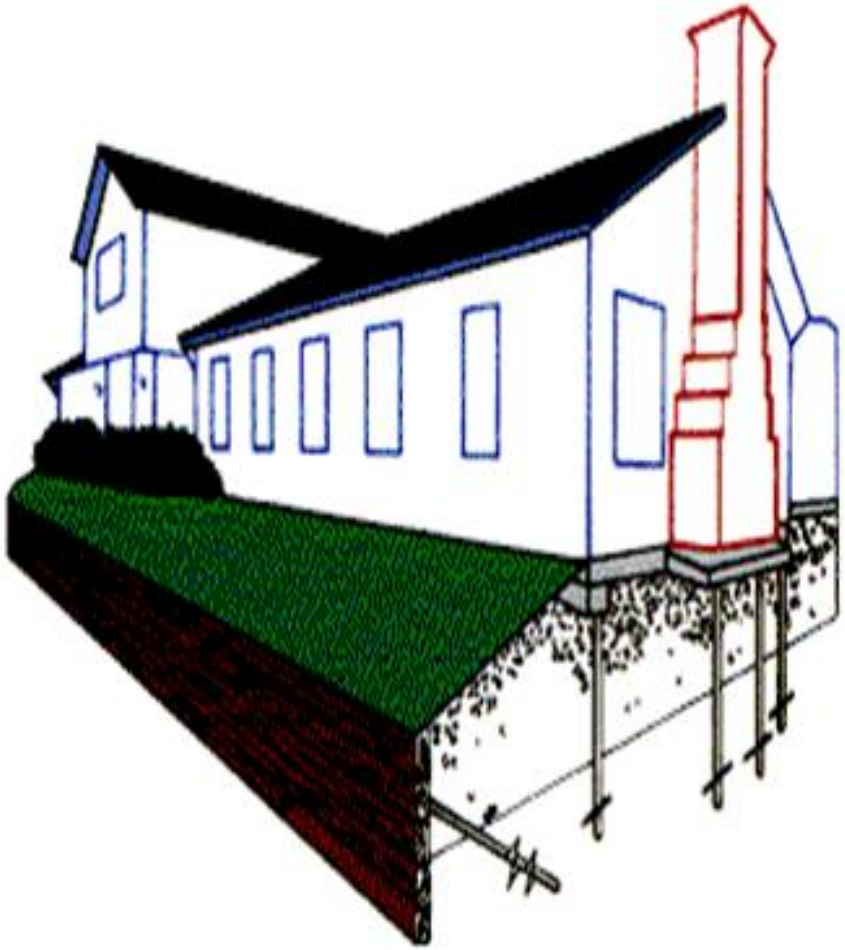
How to inspect house?

- Use Mechanical pier such as Helical pier to repair



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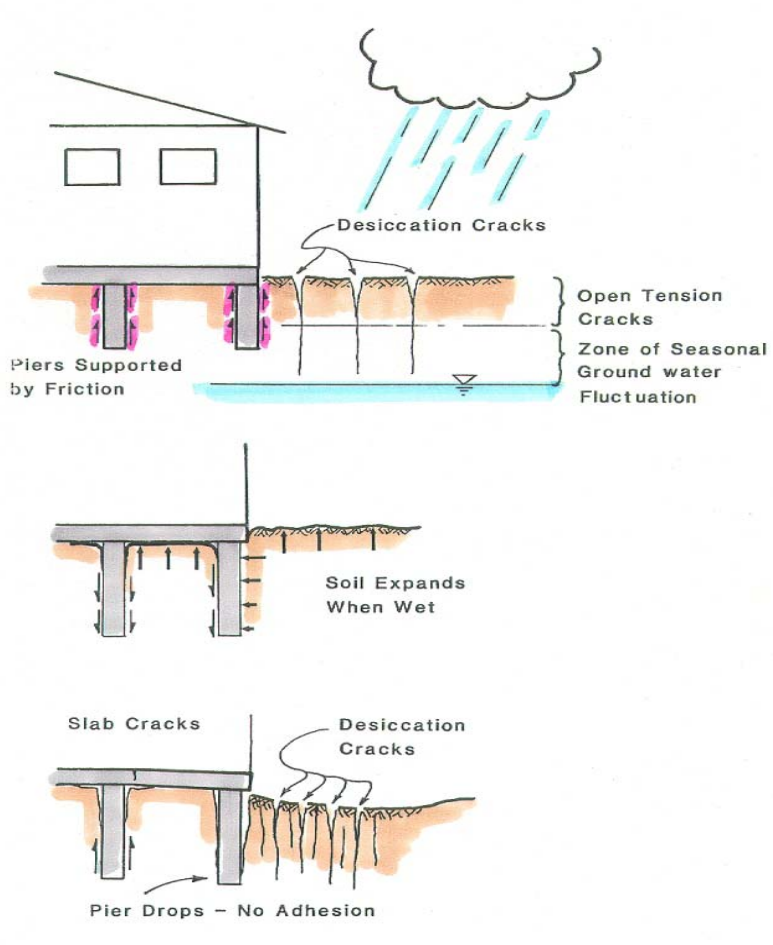
买房前的检查
How to inspect house?

- How to deal with basement/foundation problems?

4. Differential Settlements

- Expansive soils underneath or around foundations
- Foundation partially bear on uncompacted fills
- Install mechanical pier



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买房前的检查
How to inspect house?

- Helical pier installment Video

“Residential Solutions using helical piering”

http://www.youtube.com/watch?v=liBfc8EOVBE&feature=related

买房前的检查
How to inspect house?

- How to prevent cracks in basement and foundation?
- About 30-50% residential foundation and basements had some kinds of cracks.

1.Old and Current International Residential code(IRC) utilizes plain concrete or masonry basement walls.

2.Current International Residential code(IRC) utilizes less restricted reinforcing requirements for reinforced concrete or masonry basement walls.

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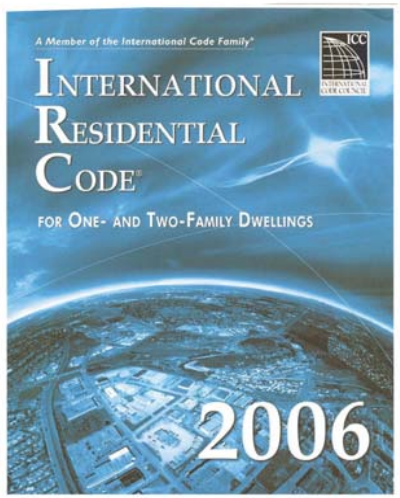
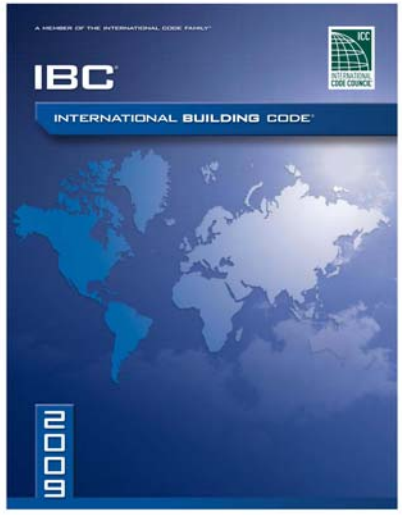
买房前的检查
How to inspect house?

- How to prevent cracks in basement and foundation?
- International residential code(IRC)
- International Building Code(IBC)





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买房前的检查
How to inspect house?

INTERNATIONAL RESIDENTIAL CODE 2003-TABLE R404.1.1(1)
PLAIN CONCRETE AND PLAIN MASONRY FOUNDATION WALLS

MAXIMUM WALL HEIGHT (feet)	MAXIMUM UNBALANCED BACKFILL HEIGHT[c] (feet)	PLAIN CONCRETE MINIMUM NOMINAL WALL THICKNESS (inches)			PLAIN MASONRY[a] MINIMUM NOMINAL WALL THICKNESS (inches)		
		Soil classes[b]					
		GW, GP, SW and SP	GM, GC, SM, SM-SC and ML	SC, MH, ML-CL and inorganic CL	GW, GP, SW and SP	GM, GC, SM, SM-SC and ML	SC, MH, ML-CL and inorganic CL
5	4	6	6	6	6 solid[d] or 8	6 solid[d] or 8	6 solid[d] or 8
	5	6	6	6	6 solid[d] or 8	8	10
6	4	6	6	6	6 solid[d] or 8	6 solid[d] or 8	6 solid[d] or 8
	5	6	6	6	6 solid[d] or 8	8	10
	6	6	8[g]	8[g]	8	10	12
7	4	6	6	6	6 solid[d] or 8	8	8
	5	6	6	8[g]	6 solid[d] or 8	10	10
	6	6	8	8	10	12	10 solid[d]
	7	8	8	10	12	10 solid[d]	12 solid[d]
8	4	6	6	6	6 solid[d] or 8	6 solid[d] or 8	8
	5	6	6	8	6 solid[d] or 8	10	12
	6	8[h]	8	10	10	12	12 solid[d]
	7	8	10	10	12	12 solid[d]	Footnote e
	8	10	10	12	10 solid[d]	12 solid[d]	Footnote e
9	4	6	6	6	6 solid[d] or 8	6 solid[d] or 8	8
	5	6	8[g]	8	8	10	12
	6	8	8	10	10	12	12 solid[d]
	7	8	10	10	12	12 solid[d]	Footnote e
	8	10	10	12	12 solid[d]	Footnote e	Footnote e
	9	10	12	Footnote f	Footnote e	Footnote e	Footnote e

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square inch = 6.895 Pa.

a. Mortar shall be Type M or S and masonry shall be laid in running bond. Ungrouted hollow masonry units are permitted except where otherwise indicated.

b. Soil classes are in accordance with the Unified Soil Classification System. Refer to Table R405.1.

c. Unbalanced backfill height is the difference in height of the exterior and interior finish ground levels. Where an interior concrete slab is provided, the unbalanced backfill height shall be measured from the exterior finish ground level to the top of the interior concrete slab.

d. Solid grouted hollow units or solid masonry units.

e. Wall construction shall be in accordance with Table R404.1.1(2) or a design shall be provided.

f. A design is required.

g. Thickness may be 6 inches, provided minimum specified compressive strength of concrete, *fc*, is 4,000 psi.

Plain concrete or masonry basement walls are allowed in IRC code

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How to inspect house?

Greater rebar spacing (40 inches) are allowed in reinforced concrete and masonry basement wall per IRC code

INTERNATIONAL RESIDENTIAL CODE 2003-TABLE R404.1.1(2)
REINFORCED CONCRETE AND MASONRY[a] FOUNDATION WALLS

MAXIMUM WALL HEIGHT (feet)	MAXIMUM UNBALANCED BACKFILL HEIGHT[e] (feet)	MINIMUM VERTICAL REINFORCEMENT SIZE AND SPACING[b, c] FOR 8-INCH NOMINAL WALL THICKNESS		
		Soil classes[d]		
		GW, GP, SW and SP soils	GM, GC, SM, SM-SC and ML soils	SC, MH, ML-CL and inorganic CL soils
6	5	#4 at 48″ o.c.	#4 at 48″ o.c.	#4 at 48″ o.c.
	6	#4 at 48″ o.c.	#4 at 40″ o.c.	#5 at 48″ o.c.
7	4	#4 at 48″ o.c.	#4 at 48″ o.c.	#4 at 48″ o.c.
	5	#4 at 48″ o.c.	#4 at 48″ o.c.	#4 at 40″ o.c.
	6	#4 at 48″ o.c.	#5 at 48″ o.c.	#5 at 40″ o.c.
	7	#4 at 40″ o.c.	#5 at 40″ o.c.	#6 at 48″ o.c.
8	5	#4 at 48″ o.c.	#4 at 48″ o.c.	#4 at 40″ o.c.
	6	#4 at 48″ o.c.	#5 at 48″ o.c.	#5 at 40″ o.c.
	7	#5 at 48″ o.c.	#6 at 48″ o.c.	#6 at 40″ o.c.
	8	#5 at 40″ o.c.	#6 at 40″ o.c.	#6 at 24″ o.c.
9	5	#4 at 48″ o.c.	#4 at 48″ o.c.	#5 at 48″ o.c.
	6	#4 at 48″ o.c.	#5 at 48″ o.c.	#6 at 48″ o.c.
	7	#5 at 48″ o.c.	#6 at 48″ o.c.	#6 at 32″ o.c.
	8	#5 at 40″ o.c.	#6 at 32″ o.c.	#6 at 24″ o.c.
	9	#6 at 40″ o.c.	#6 at 24″ o.c.	#6 at 16″ o.c.

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm.

a. Mortar shall be Type M or S and masonry shall be laid in running bond.

b. Alternative reinforcing bar sizes and spacings having an equivalent cross-sectional area of reinforcement per lineal foot of wall shall be permitted provided the spacing of the reinforcement does not exceed 72 inches.

c. Vertical reinforcement shall be Grade 60 minimum. The distance from the face of the soil side of the wall to the center of vertical reinforcement shall be at least 5 inches.

d. Soil classes are in accordance with the Unified Soil Classification System. Refer to Table R405.1.

e. Unbalanced backfill height is the difference in height of the exterior and interior finish ground levels. Where an interior concrete slab is provided, the unbalanced backfill height shall be measured from the exterior finish ground level to the top of the interior concrete slab.

买房前的检查

How to inspect house?

Solutions:(If you are building a New House)

1. Design as commercial building basement /foundation walls- more rebars in walls per International Building Code(IBC).
2. Remove/remediate any Expansive soils below or around foundation.
3. Remove any un-compacted fills below foundations
4. Keep water drain away from the basement and foundation walls.

买房前的检查

How to inspect house?

House foundation repair cost estimates

Per Repair Estimates

Inspection and report by a structural engineer **- $300 – $800**

Detailed soil report by geotechnical engineer**- $500 – $2,000**

Simple Poured Concrete Crack repair **- $300 – $600**

Steel or Concrete Reinforcement Piers (per Pier cost) **- $1,000 – $2,000**

Install tieback system to straighten foundation walls- **$600-$1000** per tieback

Average Total Cost

Underpinning of a house, per corner **- $3,500 – $5,000**

Moderate foundation damage, base price **- $8,000 – $12,000**

Moderate foundation damage, average maximum cost **- $20,000 – $30,000**

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买房前的检查
How to inspect house?

- 楼板(Floor joists/beams)

1. Visual inspect for defects if floor joists/beams are exposed.

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买房前的检查
How to inspect house?

2.Use a level to inspect for levelness if floor joists/beams are concealed.

3. Open and close doors to see if doors can be easily open and close.

Uneven floor and stuck doors may indicate possible sagging joists/beams below or possible settled foundations

买房前的检查
How to inspect house?

- Exterior walls

1. Clay masonry brick wall
2. Stone brick wall)
3. Vinyl siding
4. Hardboard siding

Q: Which one is best?

Anwser: 1 and 2 Looks better, Lasts longer,insulates better

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买房前的检查
How to inspect house?

- Exterior walls

1. Clay masonry brick wall)

- Looking for cracks and loose mortar joints, cracks might indicates foundation settlement.

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买房前的检查
How to inspect house?

- Exterior walls)

1. Clay masonry brick wall)

- Observe if the brick wall is plumb. Tilting or bowing of wall might indicate foundation sentlement or failure.

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买房前的检查
How to inspect house?

- Exterior walls)

2 Vinyl siding).

Looking for cracks and holes in the surface, the siding might need to be replaced.

买房前的检查
How to inspect house?

- Roof

  Sagging roof
- Too many layers of roof shingles(should not exceed 2 layers)
- Cracked or broken roof joists/beams)

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买房前的检查
How to inspect house?

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买房前的检查
How to inspect house?

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How to inspect house?

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买房前的检查
How to keep termites out

Pencil-wide mud foraging tubes on foundation walls, piers, sills, joists, etc.

Winged "swarmer" termites

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买房前的检查
How to keep termites out)

Termite damaged wood stud wall

买房前的检查

How to keep termites out

- Be aware that termite damage is rarely covered by homeowner insurance
- Termites need wood and water to survive
- Eliminate building wood contact with the ground
- Repair any interior and exterior water leaks
- Keep grade dry near the foundation/basement wall
- Reduce humidity in crawl spaces, install vents and 4-6 ml polyethylene sheeting over about 75 percent of the soil surface

买房前的检查

- Never store firewood, lumber or other wood debris against the foundation or inside the crawl space
- Use mulch sparingly(2-3 inches), especially if you already have termites or other conducive conditions
- Have the structure treated by a professional pest control firm

Let’s see a Video on how to keep termites out!

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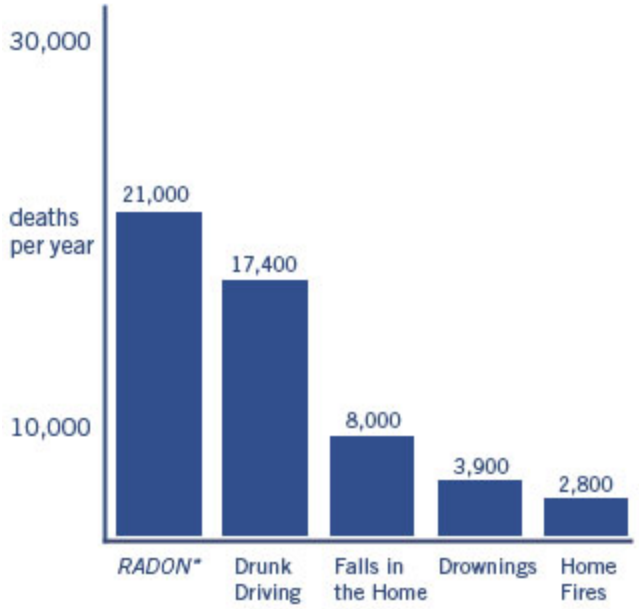
买房前的检查

Radon test

Radon is a radioactive gas that has been found in homes all over the United States. It comes from the natural breakdown of uranium in soil, rock and water

and gets into the air you breathe.



买房前的检查

Radon test

Nearly 1 out of every 15 homes in the United States is estimated to have an

elevated radon level (4 pCi/L or more).

A variety of methods can be used to reduce radon in homes. Sealing cracks and other openings in the foundation is a basic part of most approaches to radon reduction. EPA **does not** recommend the **use of sealing alone** to limit radon entry.

In most cases, a system with a vent pipe(s) and fan(s) is used to reduce radon. These "sub-slab depressurization" systems do not require major changes to your home. Similar systems can also be installed in homes with crawl space. These systems prevent radon gas from entering the home from below the concrete floor and from outside the foundation.

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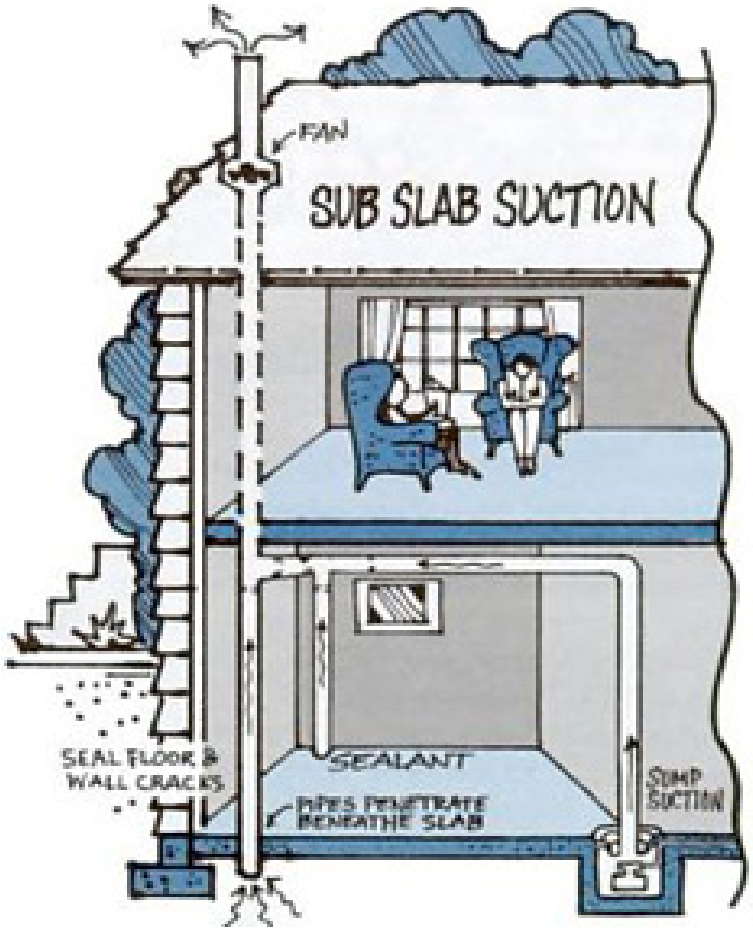
Radon Mitigation system



买房前的检查

Summary:

1. Goal Setting
2. Get a good Buyer Agent
3. Get Pre-approval letter/proof of funds
4. Know the locations and school districts
5. House inspection main points

   1) Site, Grading and Surrounding

      Avoid steep grading, trees

   2) Basement and foundation leaking, cracks and settlements (Avoid Structural Cracks- All Horizontal and some Diagonal cracks and settlements).

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Summary:(con't)

3) Floor joists and beams (observe flatness of the floor and defected joists and beams)

4) Exterior walls(Know different type of walls and Avoid cracks and tilting walls)

5) Roof (observe sagging roof)

6) Termite finding and prevention

7) Radon testing

买房前的检查

Questions now??

Or later:

Phone: 314-456-6699

Email David Sha:

dsha@FiveStarRealtyGroupLLC.com

Thank You!