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Slab On Grade Flooring

Flooring

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Slabs and Flooring

- Problems due to
 - Flooring failures
 - Wood
 - Vinyl/tiles
 - Mold and smells

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Slabs and Flooring No.2

Capillary Rise

- Wicking upward from footing / foundation
- Beware connecting wet soil to moisture sensitive materials via foundations

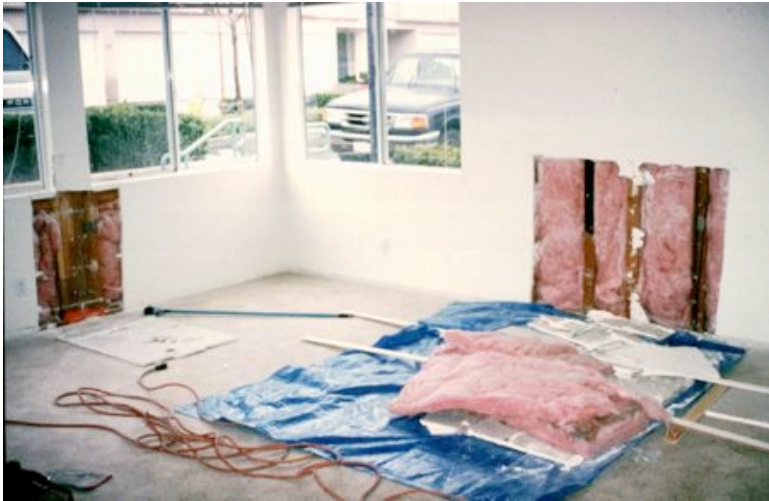


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Slabs and Flooring No.3

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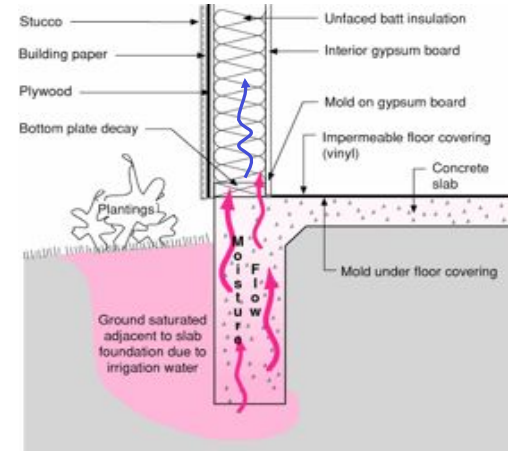
Slabs and Flooring No.4



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Slabs and Flooring No.5

Problems

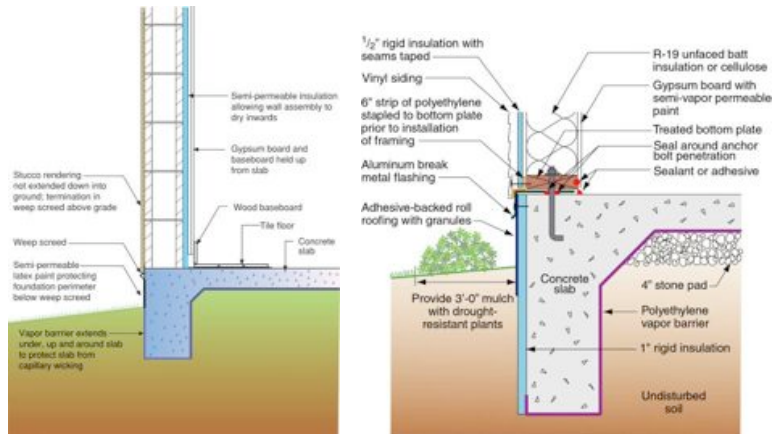


“Works” with carpet, does not with impermeable flooring

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Solutions



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Slabs and Flooring No.8

An insulated slab w/poly & break



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Slabs and Flooring No.9

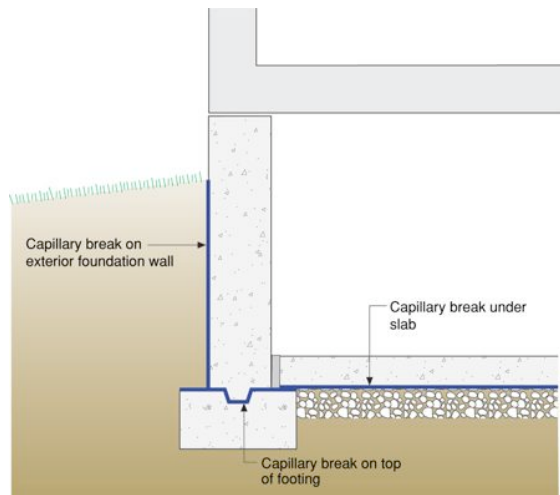
Sand over poly = stupid

- Built in moisture
- Construction water
- Perimeter leaks



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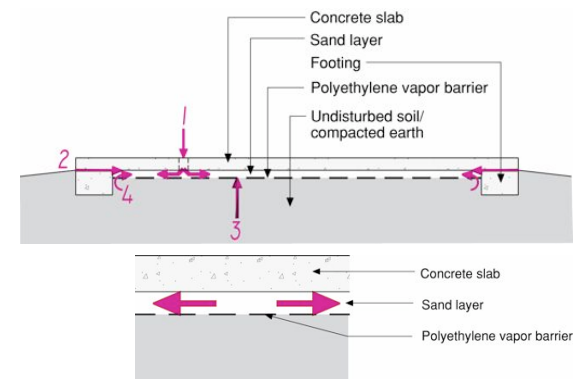
Slabs and Flooring No.10



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Slabs and Flooring No.11

Wetting sand sub-slab

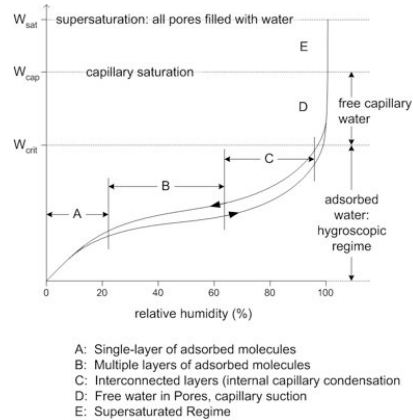


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Slabs and Flooring No.12

Moisture Storage

- RH vs MC
- Concrete poured at 8-10% Dry to touch 2-4%



Solid wood on radiant floors

- Dry slabs, flat slabs



Flooring on slabs

- Something that keeps coming up
 - Flooring on slab on grades
 - Concrete on metal decks
- Changes in flooring
 - More VCT, vinyl, ceramic (less permeable)
 - Water based adhesives
 - Slower drying concrete
 - Faster construction cycles



Adhesive failure

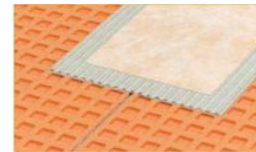
- Latex based floor adhesives
 - Start as emulsions, dry to form latex film
 - Won't break down when re-wetted
 - High alkalinity + moisture causes failure

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Slabs and Flooring No.17

Isolation sheet - Tiles

- Vapor barrier, flexible shear isolation
- Use unmodified mortar
- drying



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Ceramic tile / Stone cracking

- Shear Isolation membranes or coatings



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Slabs and Flooring No.21



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Slabs and Flooring No.22



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Slabs and Flooring No.23

Adhesive Failure: Resilient Flooring

- VCT and sheet vinyl are vapor barriers
- Adhered with latex based adhesives
- Must protect from alkali / moisture

- Sol'n: alkali resistant sheets and coatings

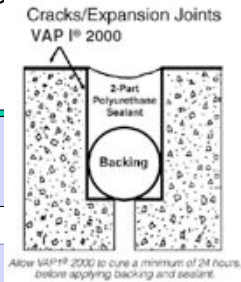
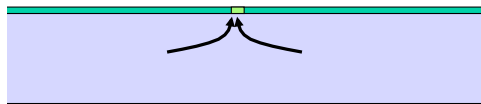
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Slabs and Flooring No.24

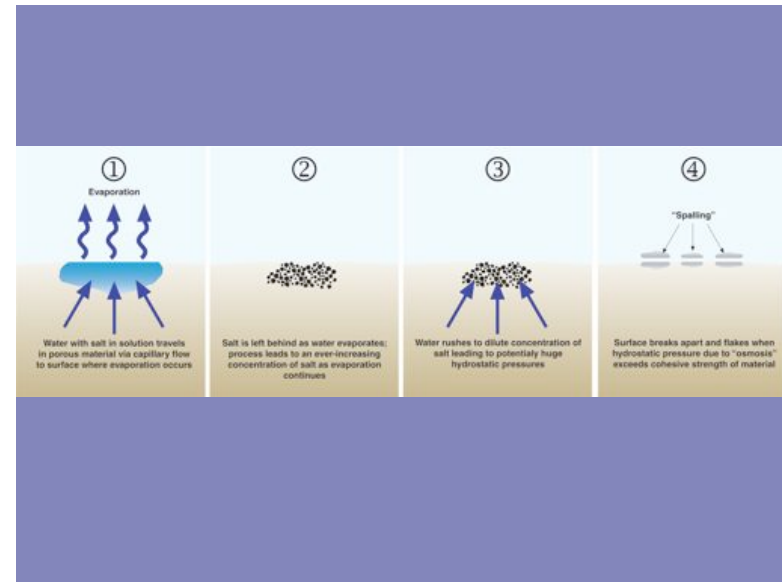
Epoxy

e.g.: Aquafin Vaportight Coat
Koester Vap I 2000
Sinak VECT-R

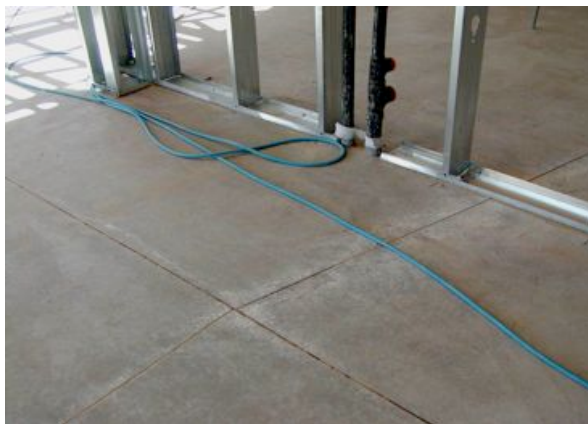
- Epoxy coating can be the vapor barrier
- Small holes/joints allow water to evaporate
- Epoxy floor coatings
 - Formation of silicate crystals at drying interface
 - Require moisture and free alkali's



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Ceramic Tile Crack Reflection

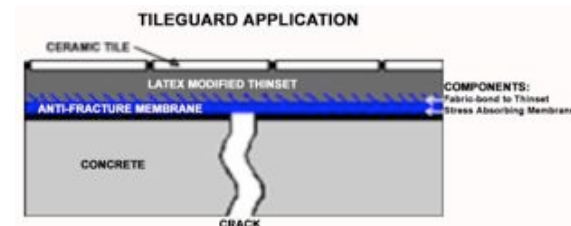


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Weak Shear planes (and low perm)

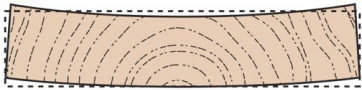
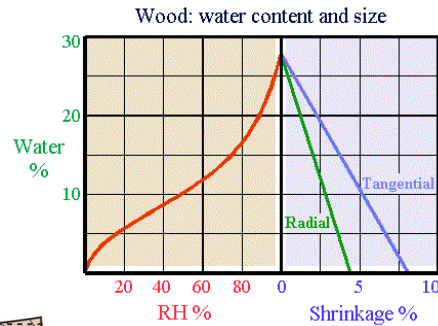
- AFM Protecto wrap
- Polygard Tileguard
- Bostik MVP (not for VCT)



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Slabs and Flooring No.28

Wood: RH vs MC

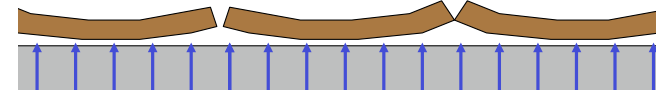


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Slabs and Flooring No.29

Wood flooring

- Cupping and cracking
 - Due to internal moisture gradients
 - Moisture gradients caused by wetting/drying
 - Wood movement occurs in vapor regime
 - Often moisture rises from below through untreated wood
 - Poly under slab, dry concrete



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Slabs and Flooring No.30

Wood floor – built-in moisture solutions

- Maintain stable RH (not vapor pressure)
- Reduce absorption on all 6 sides of wood
 - Seal back with impermeable coatings
- Slow drying rate / reduce rate of moisture supply
 - coat concrete with impermeable coating
 - Special vapor tight adhesives (e.g. Bostik BST)
- Use engineered wood (less cross grain)
 - Don't get wood movement

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Slabs and Flooring No.31

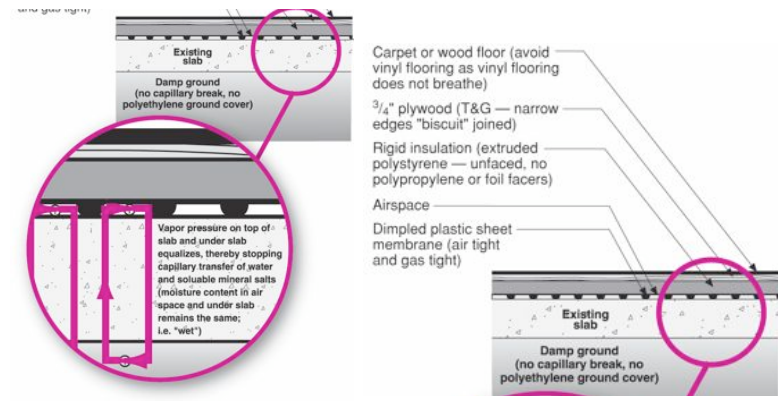
Basement Floors

Concrete alone fine but when you finish...

- Comfort (cold and hard)
- Water under finish flooring
- Water condensing on top (summer)
- Solutions
 - Install finish over small amount of insulation
 - Install vapor barrier on top of concrete
 - Either very tough / durable (heavy duty)
 - Or must be adhered (epoxy)

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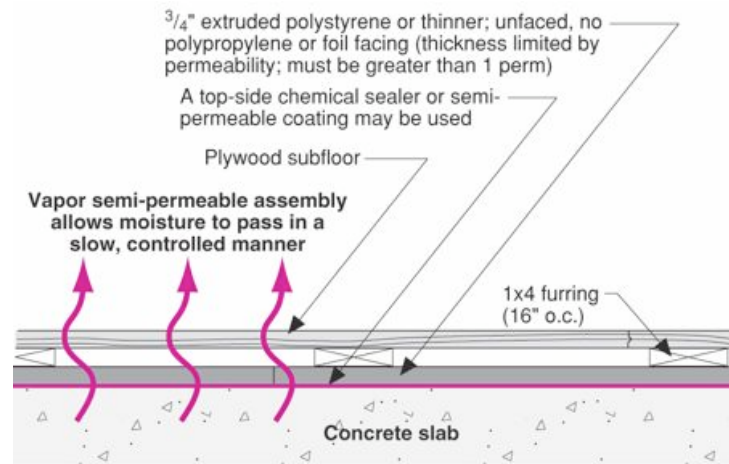
Slabs and Flooring No.32



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Slabs and Flooring No.34

Wood Floors on Slabs



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Slabs and Flooring No.36



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Slabs and Flooring No.37

Solutions

- Dry slabs, not just cure them!
- Vapor barrier under slab
 - Stop soil moisture by diffusion
- Capillary break
 - Stop capillary wicking
 - Sheet goods, crushed stone, air gap
- Insulation
 - Keep slab warmer
 - Insulation also can be vapor retarder cap break

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Slabs and Flooring No.38

Flooring & Moisture

- Moisture Sources
 - Soil liquid and vapor
 - Built in moisture (concrete flooring adhesives)
 - Interior air vapor
 - Interior floods & plumbing leaks
- Transport Mechanisms
 - Capillary (from soil up)
 - Diffusion (from soil)
 - Air movement (from interior humidity)

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