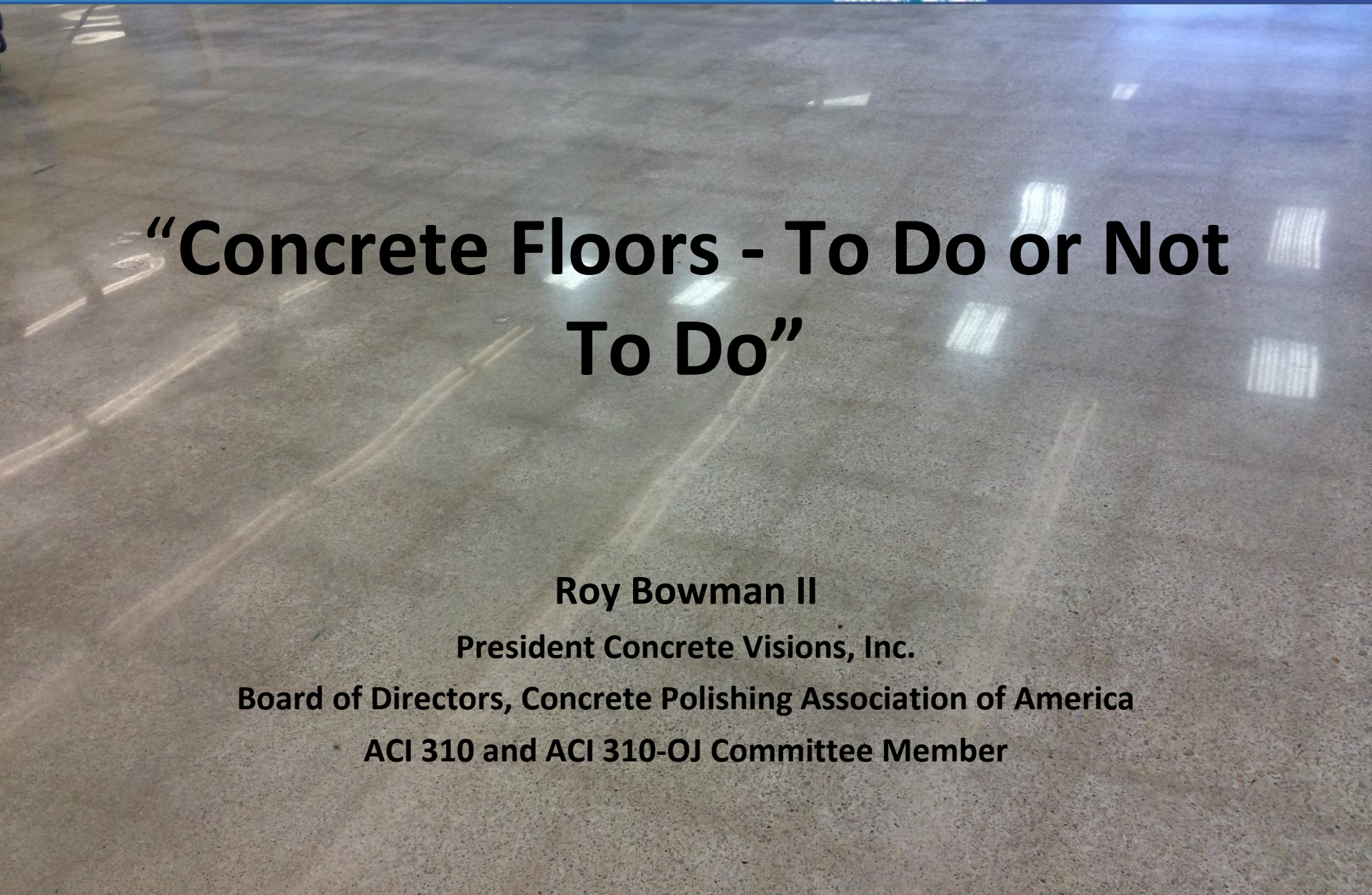
Energy & Store Development Conference

E+SD 2014

September 7-10, 2014
St. Louis Union Station Hotel
St. Louis, MO

FMI®

THE VOICE OF FOOD RETAIL



"Concrete Floors - To Do or Not To Do"

Roy Bowman II

President Concrete Visions, Inc.

Board of Directors, Concrete Polishing Association of America

ACI 310 and ACI 310-OJ Committee Member

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Definition of Polished Concrete

The act of changing a concrete floor surface, with or without aggregate exposure, until the desired level of finished gloss is achieved by using one of the following classifications.

Bonded Abrasive Polished Concrete

Burnished Polished Concrete

Hybrid Polished Concrete

Four Visual Facets of Polished Concrete

1 - Color

2 - Aggregate Exposure

3 - Level of Sheen

4 - Natural Characteristics

1 - Five Ways to COLOR Concrete

- Integral Color
- Reactive Acid Stain
- Pigmented Micro Stains
- Shake on Color
- Dye

Integral Color

- The color is added into the concrete mix Prior to placement
- Typically costs several dollars more per cubic yard
- The troweling / finishing process can greatly affect the finished color
- Generally lightens when ground past the cream finish
- Color not affected by UV light or moisture

Reactive Acid Stain

- The color is achieved through chemical reaction with the calcium hydroxide in the concrete.
- Typically a very thin layer of color.
- Not environmentally friendly
- Must be coated to maintain colorant.
- Generally requires waxing to maintain clear coat.
- Has trouble with walk off and moisture issues.

Pigmented Micro Stains

- The color is achieved by bonding pigments to the near wear surface of the floor
- Opaque color compared to dyes
- Requires creating surface voids in the concrete that get filled with pigment
- Difficult to repair if worn through
- Requires higher level of proficiency to install than dyes.

Shake on Color

- The color is achieved by broadcasting and troweling.
- Typically very durable.
- Limited Colors
- Can have uneven thicknesses
- One of the most technically challenging floors to polish.
- If worn or ground through nearly impossible to repair.
- UV Stable product

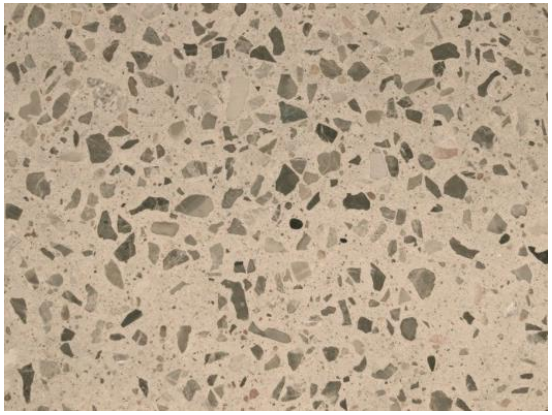
Nano Particle Dye

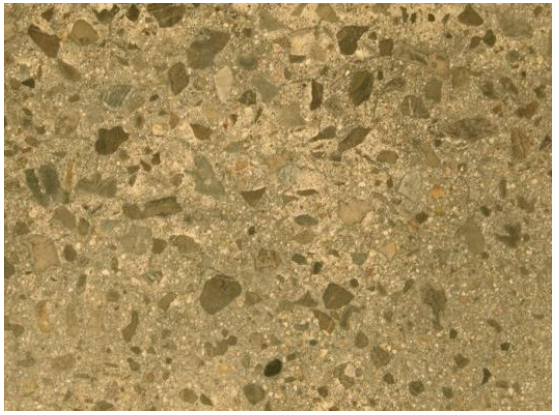
- The color is achieved by filling the capillaries with tiny particles of dye that stick to the sides of the pores.
- Easiest to apply of coloring methods.
- Environmentally friendly.
- Can be subject to UV issues.
- Multitude of colors.
- Requires above average skills to repair.

2 - Aggregate Classes

- Class A - Cream Finish
- Class B - Salt and Pepper Exposure
- Class C - Medium Aggregate Exposure
- Class D - Large Aggregate Exposure

Class A is the most difficult to uniformly achieve.





3 - Levels of Sheen

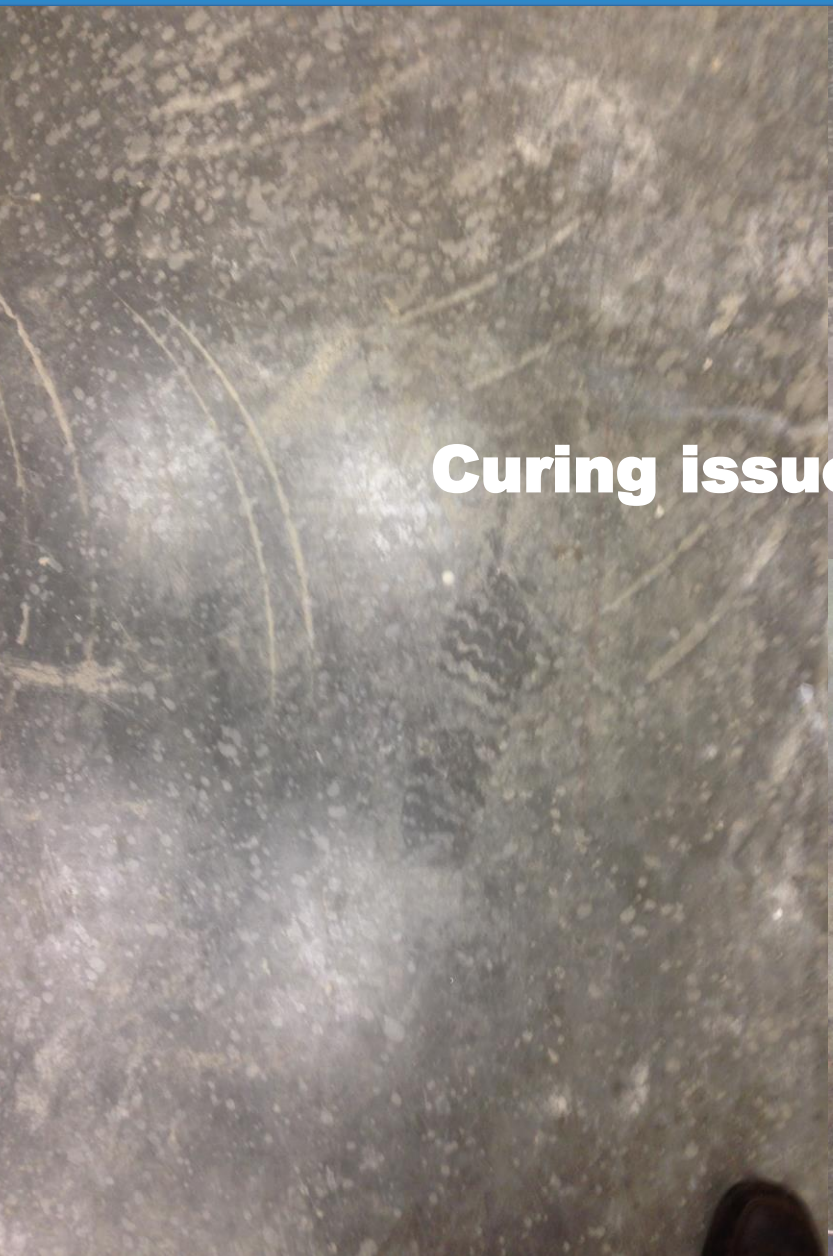
- Level 1 - Flat / Ground
- Level 2 - Satin / Honed Finish
- Level 3 - Semi Polished
- Level 4 - Highly Polished

4 - Natural Characteristics

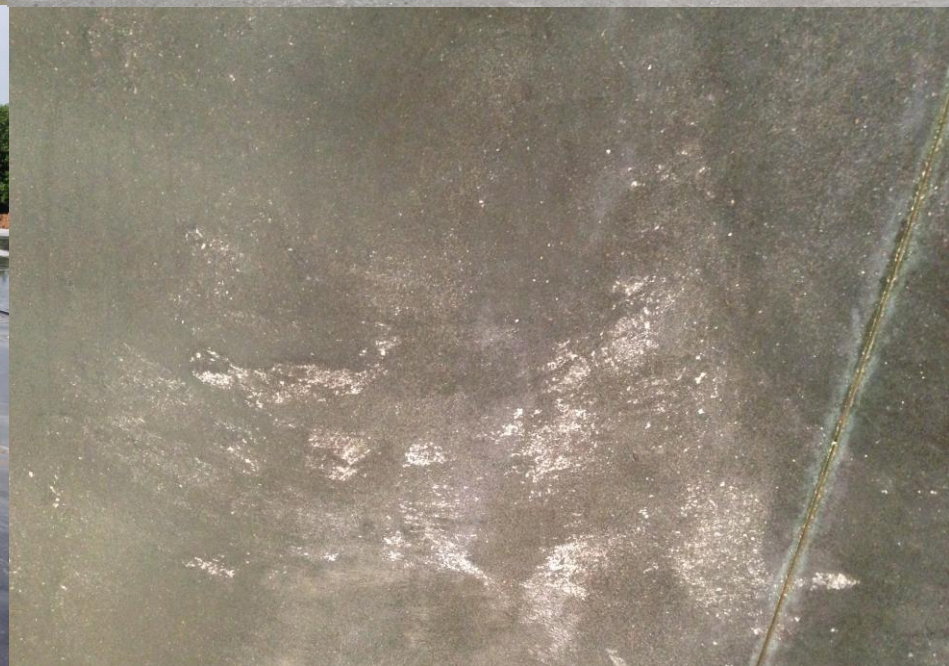
(Anything that is part of the substrate prior to polishing)

- Cracks
- Color variations
- Curing Marks
- Patches
- Stains
- Dings and Chips
- Foot Prints
- Aggregate Voids
- Troweling Marks
- Various Aggregate
- Patterns left by floor Coverings

Curing issues before polishing



Results of improper cure application after polishing



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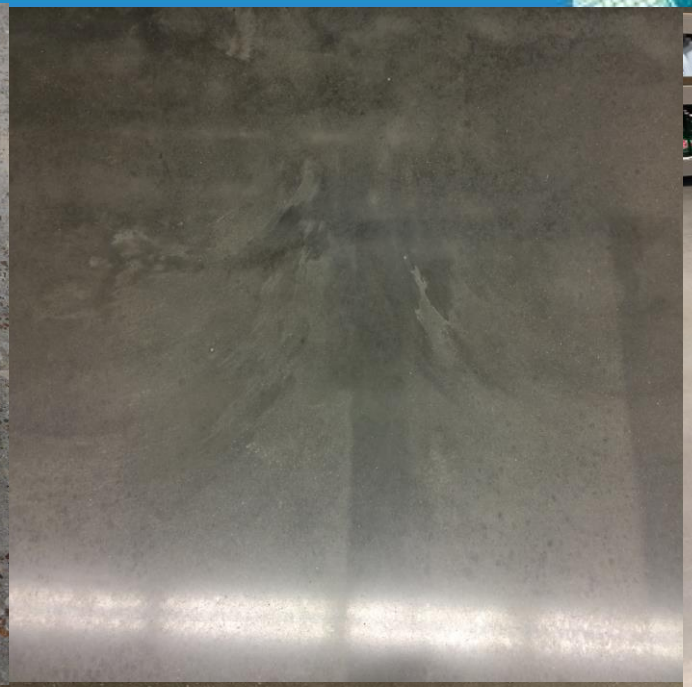


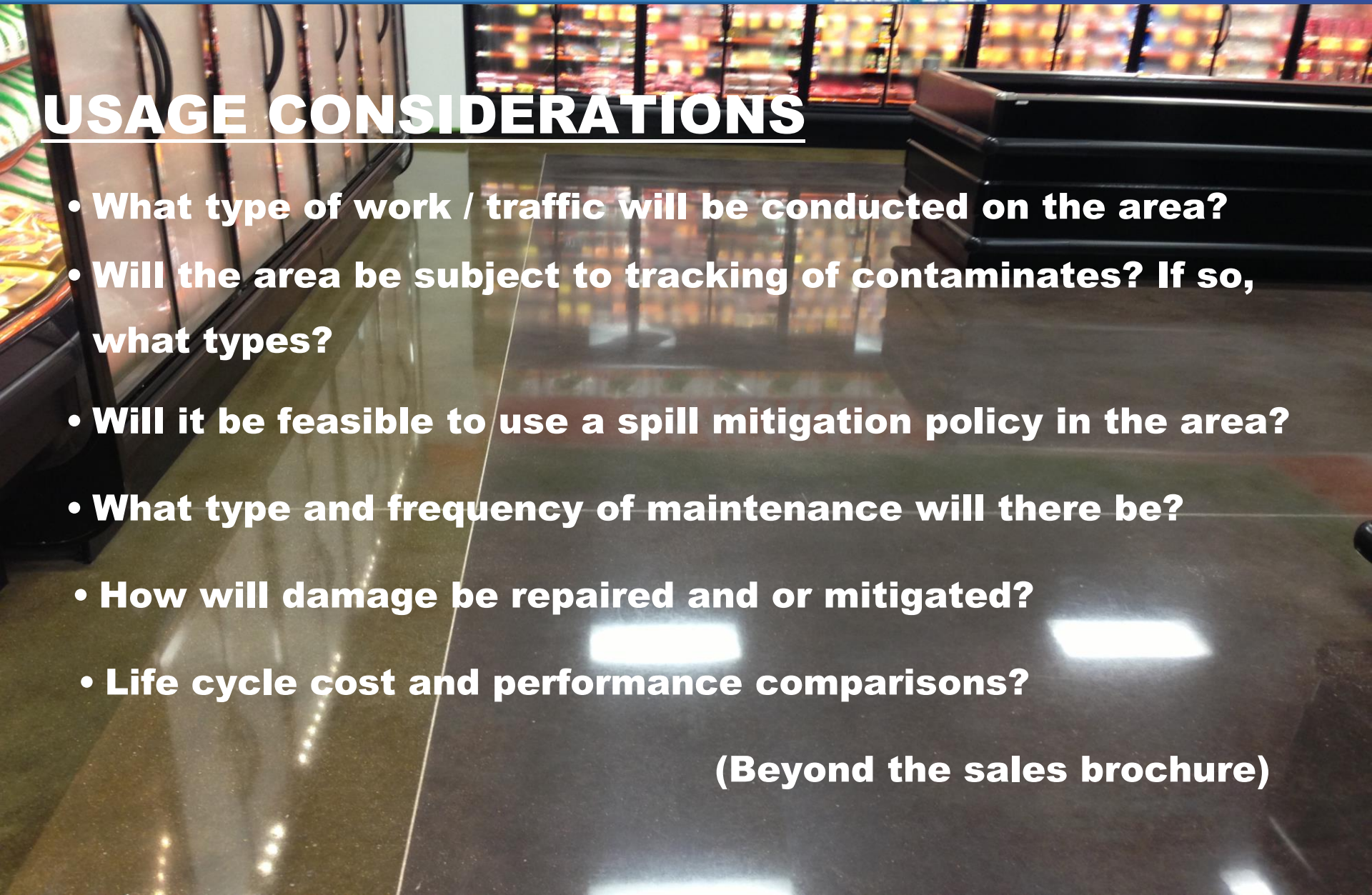
Best Places to Use Polished Concrete

- Sales Floor
- Docks
- Some Specialty Shops

Places to Consider Not Using Polished Concrete

- Deli & Kitchens
- Restrooms
- Bakeries
- Meat and Produce Prep Areas

Note: Although there are many good places to utilize polished concrete, it does have "limitations". Some limitations can be mitigated thru various chemical treatments, however, It is important to note this can increase the level of maintenance required.



USAGE CONSIDERATIONS

- What type of work / traffic will be conducted on the area?
- Will the area be subject to tracking of contaminates? If so, what types?
- Will it be feasible to use a spill mitigation policy in the area?
- What type and frequency of maintenance will there be?
- How will damage be repaired and or mitigated?
- Life cycle cost and performance comparisons?

(Beyond the sales brochure)

HOW TO GET A GREAT FLOOR

New Slabs

- Start with mix design and finishing Techniques
- Require suitable FF and FL numbers
- Curing methods can make or break your expectations
- Joint layout and column knock outs (when to fill)
- Require mockups
- Vapor barriers
- Reinforcing
- Communication, Communication, Communication

Note: It all starts with the specification and controlling variables. A polishing contractor should be able to polish most concrete, however as there are limitations to polished concrete, there are sometimes limitations within concrete (new and old) that a contractor may not be able to overcome. This is where understanding the “Visual Facets of Polished Concrete” really comes in handy.


CONCRETE FLOOR PROTECTION PLAN
ATTENTION:
THE CONCRETE SLAB ON THIS PROJECT WILL STAY EXPOSED AS THE FINISHED FLOOR! ALWAYS KEEP THE SLAB CLEAN AND OBSERVE THE FOLLOWING:
ONLY DRINKING WATER IS ALLOWED WITHIN BUILDING
NO FOOD IS ALLOWED WITHIN BUILDING
NO PIPE CUTTING OVER SLABS
NO WELDING OR BRAZING WITHOUT FLOOR PROTECTION
NO FORKLIFT OR SCISSOR LIFTS WITHOUT DIAPERS OR NON MARKING TIRES
INSPECT TIRE & REMOVE EMBEDDED DEBRIS THAT MAY SCRATCH SLAB
CLEAN MUD FROM SHOES PRIOR TO ENTERING ONTO SLAB
GET AUTHORITY FROM PROJECT SUPERINTENDENT TO OPERATE EQUIPMENT ON SLAB
STORE MATERIALS AND EQUIPMENT IN DESIGNATED AREAS
CHARGE EQUIPMENT IN DESIGNATED AREAS

HOW TO GET A GREAT FLOOR

Existing Slabs

- Any environmental concerns with previous flooring
- Previous floor coverings leaving “Ghosting Lines”
- Old Trenches and or patches
- Extreme characteristics and colorants
- Generally more high and low spaces (No FF numbers)
- Aggregates, will grinding to them mitigate the ugly spots
- Will the facility be able to remain open****
- Old concrete may need extra treatments to become suitable
- Joints

**** When planning an open remodel you should address the possibility of tainting food substances. Typically it is best to not use solvent based products if possible.

OTHER CONSIDERATIONS

- Specify for your intended outcome
- Performance vs Prescriptive specs
- Pre-qualify the contractors
- Pre-qualify system to be installed
- Require mockups
- Require testing, minimum FF, DOI, and Gloss
- Communications
- Pre-Polish Floor Protection

This is not pre-polishing floor protection

WHERE IS THE ROI??

Costs per Square Foot	Installed Cost	Annual Maintenance	Years Average Life	Replacement Costs	Total Expense Over 20 years	Cost Per Square Foot per Year
Vinyl Sheet Flooring	$2.72	$1.39	9	$3.43	$38.14	$1.91
Vinyl Tile Flooring	$1.23	$1.47	15	$1.60	$32.76	$1.64
Ceramic Mosaic Tile	$6.48	$1.22	20		$30.88	$1.54
Quarry Tile	$5.78	$0.58	20		$30.18	$1.51
Cement Terrazzo	$8.50	$0.46	20		$20.10	$1.01
Granite-Glaze	$6.50	$0.46	20		$20.10	$1.01
Polished Concrete	$2.50	$0.17			$ 5.90	$ 0.30

Product	Installed Cost	Annual Maintenance Cost	Expected Life	Ten Year Life Cycle Cost
Polished Concrete	$1.50 - $4	$0.25	10+ Years	$4 - $6.50
Polished Concrete w/ Stain/Dyes	$2.50 - $5	$0.25	10+ Years	$5 - $7.50
Acrylic Coating	$0.20	$1.50	6 - 12 Mos	$5.10 (min)
Epoxy Coating	$1.50 - $5	$0.50	1 - 5 Years	$16.50 - $20
Urethane Coating	$0.75 - $2	$1.50	2 - 9 Years	$15.75 - $17
Sheet Vinyl	$3 - $5	$1.50	9 Years	$18 - $25
Vinyl Composition Tile	$1.50 - $4	$1.50	10+ Years	$16 - $20
Carpet	$2.50	$1.50	5 - 10 Years	$17.50 - $20
Ceramic Tile	$7 - $8	$1.50	10+ Years	$22 - $23
Cement Terrazzo	$12	$0.70	10+ Years	$19
Epoxy Terrazzo	$13	$0.50	10+ Years	$18

maintenance
of 10,000 square foot floor

Seal Hard Floor: $153,000

Vinyl Floor: $375,000

30 Year Savings: $222,000

LIFE CYCLE COMPARISON	Polished Concrete	VCT
Materials plus installation at 0 year	$3.50	$1.25
VCT removal cost after 11 years		$0.35
VCT reinstalled (materials plus installation) after 11 years		$1.35 (inflation)
Cost of floor covering system for 22 years	$3.50	$2.95
Cost of cleaning and maintenance for 22 years	$12.63	$37.93
Cost of cleaning and maintenance for 11 years	$6.31	$18.96
Total LIFE CYCLE COST for 22 years	**$16.13**	**$40.88**
Total LIFE CYCLE COST for 11 years	**$9.81**	**$21.91**

Flooring Option:	Installed Cost	Annual Maintenance Cost	Life Expectancy	10 YR Life Cost
Acid Stained Concrete	$2.00 - $6.00	$1.75	5+ years	$21.50 - $29.50
Ceramic Tile	$5.00 - $7.50	$1.50	10+ years	$20.00 - $22.50
Terazzo	$12.00 - $18.00	$0.70	10+ years	$19.00 - $24.00
Carpet	$1.00 - $2.50	$1.50	5+ years	$17.00 - $20.00
Vinyl Tile (VCT)	$1.50 - $4.00	$1.50	10+ years	$16.50 - $19.00
Polished Concrete	**$1.75 - $6.00**	**$0.25**	**10+ years**	**$ 4.25 - $ 8.50**

CUTTING THROUGH THE HYPE

- The cost of installation and maintenance can vary greatly, therefore the national charts are basic at best.
- Typically polished concrete costs 1.5 -2X that of vinyl tile installed.
- The savings is in the lowered maintenance costs.
- Improper maintenance will drastically increase costs.
- Maintenance for Polished concrete should be equal or less than daily tile maintenance.
- Be sure to factor in the cost of spill mitigation and repair

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NATIONAL AVERAGE INSTALLED COST PER SQUARE FOOT

Prices are approximations only. Actual prices will vary based on competitive bidding, local labor costs and job conditions. Estimated prices include material and labor figured on a 500-square-foot (46.45 square meter) open-area installation without any specific cuttings or special subfloor preparation. Contact your flooring contractor for final pricing.

Products	Thickness	US Dollars	Canadian Dollars
BBT®			
Migrations®	1/8 in. (3.2 mm)	$2.75 – $3.50	$2.75 – $3.75
Striations BBT®	1/8 in. (3.2 mm)	$3.00 – $3.75	$3.25 – $4.00
VCT			
Raffia™	1/8 in. (3.2 mm)	$2.75 – $3.50	$3.00 – $3.75
ChromaSpin™	1/8 in. (3.2 mm)	$2.50 – $3.25	$2.75 – $3.75
Excelon® Stonetex®	1/8 in. (3.2 mm)	$2.50 – $3.25	$2.75 – $3.75
Arteffects®	1/8 in. (3.2 mm)	$2.50 – $3.25	$2.75 – $3.75
Excelon® Companion Square®	1/8 in. (3.2 mm)	$2.50 – $3.25	$2.75 – $3.75
Standard Excelon® Imperial® Texture Rave®	1/8 in. (3.2 mm)	$1.75 – $2.50	$2.00 – $3.00
Standard Excelon® Imperial® Texture	1/8 in. (3.2 mm)	$1.75 – $2.50	$2.00 – $3.00
Standard Excelon® MultiColor™	1/8 in. (3.2 mm)	$1.75 – $2.50	$2.00 – $3.00
Feature™ Tile – Black	1/8 in. (3.2 mm)	$2.75 – $3.25	$3.00 – $4.00
Feature™ Tile – Colors	1/8 in. (3.2 mm)	$3.25 – $3.75	$3.50 – $4.50

This Screen shot is from Armstong tiles website

DOING THE MATH

Cost of VCT installed for 50000 SqFt = $87,500.00
Cost of 3-5 coats initial wax = $25,000.00
Cost to Strip and Wax 2x year = $22,000.00
Cost of daily cleaning x 365 = $33,500.00
Cost of burnishing Bi Annually = $5,000.00
Total year 1 = $173,000.00

Polished Concrete Installation = $125,000.00
Cost of daily cleaning x 365 = $33,500.00
Estimated acidic repairs = $2,000.00
Total year 1 = $160,500.00

First year savings	$12,500.00
Second year savings	$35,500.00
Third year savings	$35,500.00
Fourth year savings	$35,500.00
Fifth years savings	$10,500.00

Total 5yr savings = $129,500.00

Assumes $3500.00 Annual repairs

Assumes a touch up at year 5

Note: These numbers are a compilation we have gathered from retailers and floor maintenance companies. They may not reflect the current prices for the above services in any specific market.
The polished concrete and tile install are both assumed to be the most basic products. (No Frills)

30 Minute Repair


Re-furbished and jazzed up!!


Before


After


BEFORE


AFTER


Before


MEAT SUBSTITUTES
ORGANICS
After

???'s