

Questions 70 to 76 → Planning and development codes

### Question 72

In Chicago, there is a non profit organization that went in parking lots and placed pervious concrete and the flooding stop. After 3 years it got plugged but it hadn't failed because of the lack of maintenance.

Leed is getting less popular because of issues with designs, accessibility and performance. In Chicago they are trying to go away from the "leed".

China project: "sponge city"

2020 → 20% of the area of a city should be

2030 → 80% of the area should be a "sponge" → a lot of retro fit should be done. Is it going to be payment or something else used to achieve the goal? In the cities will basically be the pavements and roofs.

Funding? Private-public partnerships. For the new areas there are already packages to follow but the retro fit is what will be difficult to achieve.

80% of the water for the 20% of the probability of storm.

Pervious pavements are great solutions for retrofits in existing pavements.

How deep should go the excavation to fit this pervious structure. 1 foot of drain stone, prevent water going to the sides and a drain from the top.

Pervious structure for sidewalks are great to avoid roots damaging the structure.

Potential market? Double or triple of what is right now? → not easy questions for a small group.

### Question 74

**Is there adequate guidance regarding use of permeable hardscape for other than roads (sidewalks, etc) and including permeable hardscape/pavement into active transportation and complete street projects? If not, how to develop?**

Vancouver → bike paths are a main concern and we are wondering if permeable pavements are "not comfortable" to ride.

Shrinkage in permeable pavement is less so that allow bigger slabs, joints can be extended to 15 foot.

Complete street concepts, there is a lot to do regarding permeable hardscape/pavement/

Chicago → including porous concrete between the border and the sidewalk

Using the same type of pavement but different surface finish with different colors. Paint pavement.

All this technologies could be use towards the complete street projects.

Option of the double layer: pervious pavement and pavers. Avoid issues of two technologies.

Can be utilize in the complete street. There is no appropriate guidance, this industry should lead a more aggressive strategy to allow these technologies to be known. This will be lead by industry more than public agencies.

Who would be doing these designs? Landscape architects? Yes. Government consultants. Civil Engineers take this responsibility in the cities.

Regional board of water quality.

Another pavement surface for complete cities: porous rubber.

### **Question 31 Project Level Design Issues**

**Is there adequate guidance regarding retrofitting impermeable pavement and hardscape to become fully permeable? If not, what needs to be done to develop it?**

A city in Chicago did a fringe along the border with permeable pavement and it work perfectly for 3 years until the program of sweeping streets end.

Ditches converted into bike paths using pervious pavement and still getting storm water out.

Geotechnical investigation? Overdesign instead of designing to the detail (which is closer to fail). It will probably be more expensive but it will work better.

Not a lot of good governments in retrofitting.

Find projects were we can do it and document.

\$225/cy for pervious and \$100 for conventional concrete.

Most of the time the pervious pavement is done by dry batch, although it could also be produced by wet batch.

### **Question 51. Construction standards and issues.**

Pilot projects → good for learning. Make them small and choose them wisely.

### **Question 63. Asset Management**

Is there sufficient information regarding how long environmental benefits last? If not, how to develop?

Depends on maintenance. Flow rate of this structures are great and it will work even after some clogged.

We know that we have information that tell us flow capacity is still good even when its clogged but we don't have a lot of information when things like that environmental effects such as cleaning, also how does a clogged pavement react to temperature changes, and any effects over time.

In industry we try to react to our customers request. Industry is just responding to needs but not going to solve for things such as environmental impacts related with permeable pavements. This type of funding should be lead by users, governments more than industry.