

August 24, 2010

Grace UMC Parking Lot Project  
Questions and Answers for Grace Members

Considerations of use of permeable paving materials instead of asphalt for Grace UMC parking lots has generated interest amongst members, particularly in light of potential long term savings, improved lifetime appearance, and mitigation of pollution and storm water runoff. The following are questions that have come up that may be of general interest.

**Background**

**1. How old are our parking lots?**

- Grace has three lots – the Upper, Main, and Lower Lots. The Upper and Main Lots were last paved with asphalt in 1989 and are due for resurfacing. The Lower Lot, closest to the West Dupage River, was surfaced around 1995 and will be due for resurfacing within five years.

**2. Why are we thinking of changing from asphalt to a permeable surface?**

- Asphalt surfaces, though commonly used for parking lots and roadways, are actually fairly toxic and require quite a bit of maintenance. Asphalt is a petroleum-based material, often with coal tar additives, that release gases as they age and are leached out by rain water running over the surface. Asphalt is actually a very viscous fluid, like tar, that expands and contracts with temperature, developing cracks and buckles from frost heave and summer heating during an annual cycle. This leads to an unsightly appearance of cracks and pot holes requiring maintenance and repair every couple of years. Permeable surfaces are made of very hard concrete pavers with gaps that allow water to percolate into the ground below. They are less subject to frost heave and surface disruption, thus maintaining a stable surface and appearance longer and reduce toxins and direct storm water runoff into our waterways.

**3. How toxic are our asphalt parking lots?**

- According to the Conservation Foundation, a non-profit watershed protection organization headquartered at McDonald Farm on 87<sup>th</sup> St in Naperville, parking lots are second only to roadways as sources of pollution for our waterways. Pollution comes from hydrocarbon-based asphalt and tars used for paving as well as heavy metal debris and oil from automobiles, washed overland into our groundwater and river system. Since Grace is only 300 feet from the West Dupage River, we are a high potential contributor. Though our biggest traffic load is on weekends, the many other activities facilitated at or by Grace during the week contribute significantly.

**4. How did this project get started?**

- Grace Trustees have been concerned about a major parking lot resurfacing project for several years. This effort will be expensive and will require a capital campaign. We had become aware of use of permeable pavers (permeable interlocking concrete pavers – PICP) being used at Morton Arboretum, Naperville Park District sites, and the City of Warrenville, and investigated the motives and pros and cons. Permeable surfaces were claimed to have much lower cost of maintenance, much better, appearance over a much longer life cycle, and would be a great environmental

benefit. When it was recognized that the significant cost of changing from asphalt to a permeable surface could be assisted with EPA funding under the Clean Water Act of 1974, Grace Trustees authorized a project to prepare a business analysis and, if appropriate, an application for a Grant.

### Economics

#### 5. **How do costs compare between Asphalt and PICP's?**

- Costs for both asphalt and PICP's were compared using numbers quoted to the Trustees for maintenance, and the experience of Dennis Michaels, Public Works Superintendent for the Village of Lisle. For the Main and Lower Lots, asphalt maintenance averages about \$23K each year for crack filling, minor patching, seal coating and striping. Every 15-20 years, the asphalt surface must be milled off and replaced with a new layer for a cost of \$133K. PICP's don't crack and, because of the texture of the concrete pavers, they retain striping much longer than asphalt. Maintenance is on the order of \$1900 per year. Installation of pavers, with the support of an EPA grant, would be \$408K (45% of a total project cost of \$908K). After installation, maintenance involves sweeping and periodic "re-chipping" to replace pea gravel that fills the gaps between pavers. The business case indicates we would break even at 15 years by going with PICP's and over a 50 year life save approximately \$650K.

#### 6. **Where does the Illinois EPA money come from to award Grants?**

- The **Clean Water Act** is the primary federal law in the United States governing water pollution. Commonly abbreviated as the **CWA**, the act established the goals of eliminating releases to water of high amounts of toxic substances, eliminating additional water pollution by 1985, and ensuring that surface waters would meet standards necessary for human sports and recreation by 1983.
- The principal body of law currently in effect is based on the **Federal Water Pollution Control Amendments of 1972**, which significantly expanded and strengthened earlier legislation. Major amendments were enacted in the **Clean Water Act of 1977** and the **Water Quality Act of 1987**.
- Illinois receives an apportionment of the Federal funding to be distributed within the state, and each year goes through a process of accepting grant applications, reviewing them, and awarding funding support for selected projects.
- **Is Grace, as a church, eligible for Federal funding?** – Grace UMC is a member of the Naperville community just like any other organization, business, or residence, receiving municipal and state services with expectations that we will act responsibly with respect to the common interest. Federal funding for the Clean Water Act is intended to be accessible to all community members who have an appropriate opportunity to contribute to Clean Water objectives. The funding may not be used for supporting faith-related programs, however, as that would be a violation of "Church and State". The funding is made available with the very real goal of making up front investments for a clean environment to avoid much more costly future health issues and environmental disaster mitigation.

### Permeable Interlocking Concrete Pavers – PICP's

#### 7. **How well do permeable pavers hold up over time?**

- **Differential settling** – with a proper base, generally required to support an 80,000 lb fire engine for a facility like Grace, the surface should do very well. We have estimated the possibility of base repair required after 25 years due to ground water effects, but that would apply to an asphalt surface as well. The oldest installation of PICP’s in the Chicago area is at Dominican University outside of Chicago, now ten years old.
  - **Snow removal** – experience for local PICP installations indicates normal snow plowing can be done on permeable surfaces without fear of snagging bricks and pulling them up. Pavers are tapered on their edges to avoid nicking. Some locations use rubber snow plow blades instead of steel to avoid problems. The snow plow service for GUMC has indicated they can use a rubber snow plow blade if we wish at no extra charge.
  - **Plant growth between bricks** – there is a need to keep the PICP surface clean of debris and avoid washing out of debris from landscaping onto the pavers, This can clog up the spaces between the bricks and impede drainage. With installation of PICPs sources of drainage on to the surfaces will be reviewed and mediated as needed. Street cleaning service providers are now including sweeping and “rechipping” services for PICP roadways and parking lots, including vacuuming, sweeping, and replacement of chips to top up the fill between bricks. This would be part of the maintenance for PICP surfaces.
  - **Strength of the Pavers** – the pavers used for permeable surfaces are generally made of concrete that as much three times stronger than that used for concrete driveways or curbing. They are rated for a fifty year life. PICP surfaces are not susceptible to cracking like asphalt. With their greater strength they are also less susceptible to caustic erosion from salt like we sometimes see in our driveways after a hard winter. This benefit is further enhanced by the fact that snow melt quickly permeates through the surface and doesn’t pool and form ice as is often seen with asphalt.
- 8. Will we have trouble with wheel chairs or high heels on PICP surfaces?**
- Early installations of permeable paving around the Chicago area, such as Morton Arboretum, Kane County Cougars, and Dominican University, were less desirable for walking and wheel chairs than the newer ADA approved designs. The newer designs have much flatter upper surfaces, and the gaps for water infiltration are narrow slots along the bricks rather than larger squares. Examples are at Whole Foods Market on 75 th St, Warrenville Road in Warrenville, and Winding Creek Park on Bailey Rd. Whole Foods Market says they have barely had any complaints from pedestrians or those with wheeled carts over the last five years. We would plan an extra step to ensure comfort and safety at Grace by constructing pathways across our parking lots to the church that have closely fitted bricks with no gaps at no extra cost for installation.

## **Project Planning**

### **9. What will be included in the project?**

- We would plan to do our most heavily used lots, the Lower Lot closest to the river, the Main Lot at the front of the church, and the Rear Lot and drive connecting the two. This is an area of approximately 100,000 sqft. Asphalt would be stripped off and any inadequate rock and gravel base would be replaced. Our curbing is good all

around, so we expect to only need a boundary along the SW edge of the Lower Lot closest to the river where trenching would be installed. We would expect to add trenching also the lower end of the rear drive where it goes down past the LightHouse building. Several of our landscaped islands and parking lot boundaries may need to be adjusted to allow for overflow runoff and minimize wash of sediments on to the permeable surface.

**10. When would we expect a decision to be made on this project?**

- An application has been submitted to the Illinois EPA at the end of July 2010. The IEPA review and approval process goes through the remainder of the year with grants awarded around March of the following year. We will not be able to do a permeable pavement project if we do not get a grant, since costs of ripping out the asphalt to put in PICP's would be too great. Either way, however, our parking lots need major repair, and we will be planning for a parking lot project for 2012 together with a capital campaign to enable replacement of our 30 year old air conditioning system (~\$550K) and for roof repairs (~\$200K). We expect a capital campaign to be launched for this work in 2011 and projects to be conducted in 2012.

**11. How can more be learned about the pro's and con's of this idea?**

- A presentation was given in late July for Grace members during 9:30 and 11:00 Sunday services. This will be repeated on Sunday, September 26, 2010. Members are encouraged to attend to ask questions and learn more about the overall concept.

**12. Who will make the decision on this project?**

- Grace Trustees are responsible for maintaining Grace capital assets, facilities, and grounds. They will assess the merits of this idea, the economic feasibility, and the best interests of Grace membership in considering whether to go ahead or not. If we do not get a grant from the Illinois EPA, we will not plan to do a permeable surface project, but we will still have a need to resurface Grace parking lots. Trustees will recommend an appropriate project to the Church Council. Every effort will be made to apprise Grace members of considerations and solicit feedback and input to accurately get a measure of member interests.

**13. In summary, why would this be considered a "good idea"?**

- we are motivated by three factors
  - **Reduce Cost** - reduce maintenance and life cycle cost for Grace parking lots
  - **Look Good** - improve overall appearance of Grace grounds over time
  - **Do Good** - fulfill environmental stewardship goals of UMC Principles for water quality
- Economic evaluation indicates that permeable pavement is more economical in the long run and will save Grace money. Permeable pavement is much less prone to break up from seasonal effects and will look good over most of the life of the surface. Our proximity to the West Dupage River and our UMC obligations for water quality stewardship drive us to minimize direct Stormwater discharge into the river and be as clean as possible.