City of Shoreview
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September 25, 2009
An Honest Assessment
Previous Pavement
Woodbridge Neighborhood

Road Reconstruction Project

- Direct discharge into lake
- 1 catch basin N. end of project area
- Storm sewer
- Width 16 to 22 feet
- No curb and gutter

Approx. 3800LF of asphalt roadway

- Adjacent to Lake Ovasso
- Fully developed - homes 1950 - present
- Residential neighborhood
Projected Improvements

- Served by City water
- Extend watermain to properties not
- Misc. Repairs to sanitary sewer
- Install storm sewer collection system
- Install concrete curb and gutter
- Remove and replace roadway
Design Challenges

- Stormwater management
- Stormwater management
- Stormwater management
Challenges

Stormwater Management

- Land not available for treatment pond
- Easement for additional outlet pipe difficult
- Site sloped from north to south
- Pipe located on north end of project
  - Only one easement available for outlet
  - Preferred eliminating discharge
    - B nutrient removal prior to discharge
    - At minimum treat stormwater for sediment
  - Lake Owasso - Grass Lake Watershed
trees along road edge

- Trench excavation would affect established

- Required discharge pipe to lake

- $$$, potential maintenance and odor issues

- Underground tank needed for treatment

- Transfer water to north end

and discharge to Lake Owasso

Basins, underground piping, treatment, catch basins, conventional collection system - catch

Options Evaluated #1

Stormwater Management
Options Evaluated #2
Stormwater Management

- Least expensive initial capital cost
- Trees along road edge
- Trench excavation would affect established
- Enough storage for 10-year storm
- Due to ROW, limitations could not provide
- Overflow pipe to lake required
- Sandy soil suited for infiltration
- Piping
- Collection system w/infiltration – catch basins and underground infiltration

Options Evaluated #2
Stormwater Management

- Least expensive initial capital cost
- Trees along road edge
- Trench excavation would affect established
- Enough storage for 10-year storm
- Due to ROW, limitations could not provide
- Overflow pipe to lake required
- Sandy soil suited for infiltration
- Piping
- Collection system w/infiltration – catch basins and underground infiltration
then underground infiltration piping is more capital cost – approximately 10% more initial capital cost in climates

- No long term data on durability in northern
- Excavation less affect on established trees
- Storm sewer available in excess of 10-year
- Discharge pipe to lake not required
- Eliminates stormwater collection infrastructure
- Sandy soil suited for infiltration
- Permeable concrete with rock storage layer

Options Evaluated #3
Stormwater Management
and Installers

- Strong relationship with industry, suppliers
- 2007 installed 900-foot x 12-foot alley

Past City Experience

- Low volume traffic

Location of the Neighborhood

- Reduce affect on character of neighborhood

Underground pipes not required

Elimination of discharge pipe to lake

Selection of Previous Concrete
Concrete Contindued

Selection of Previous

- Coastal control maintenance schedule
- Placement techniques
- Advancements in mix designs and
- Hydraulic design important

Project site was relatively flat

Soil type good for infiltration

Concrete Continued
MARCH 2009
EXHIBIT 2
TYPICAL STREET SECTION

CITY PROJECT NO. 09-01
RECONSTRUCTION
WOODBRIDGE NEIGHBORHOOD
CITY OF SHOREVIEW

Shoreview
Largest public street project in US to date

Last section placed August 31

First section of concrete placed July 7

Concrete Supplier - Cemstone

Concrete Installer - North County

General - Vet

Started in June

Project awarded in May, construction
• Installed automatic rain gauge on site
  • Plan to test water every 6 months
  • Tests prior to construction
  • Completed two rounds of water quality
  • Monitor quality and level
  • Installed 3 wells on site & 1 well off site
  • MN Dept of Health
  • In conjunction with Ramsey Conservation
  • Ground water monitoring wells

Initiation
Monitoring the Effect of
- Length of service life
- Cracking
- Ride quality
- Surface durability
- Pavement performance - Long term
- Monitoring pipe in rock drainage layer
- Rain gauge
- Visit site during rain events

Monitoring Performance of the Permeous Concrete
• Schedule of cleaning is in progress
• Some areas require deeper cleaning
• In-field testing with epoxy and coating
• City is currently testing street sweepers – occurs in 1-inch
• In-field testing shows clogging typically
• Handle some clogging
• Infiltration rates of 300–500 in/hr – can

Mainenance Issues

Keeping the surface pores clean
Use different winter maintenance philosophy – experiment with salt usage

Educating Residents
- Sent out flier with info on how they can help to keep the surface clean
- On-site open house to answer questions and provide information about the street

Signage throughout the project area with information about the pavement

Experiment with crack filling in the future
Conclusion

BMP toolbox should include pervious concrete in their design and stormwater professionals management. Effective solution to stormwater pervious concrete is a viable and cost-effective alternative.