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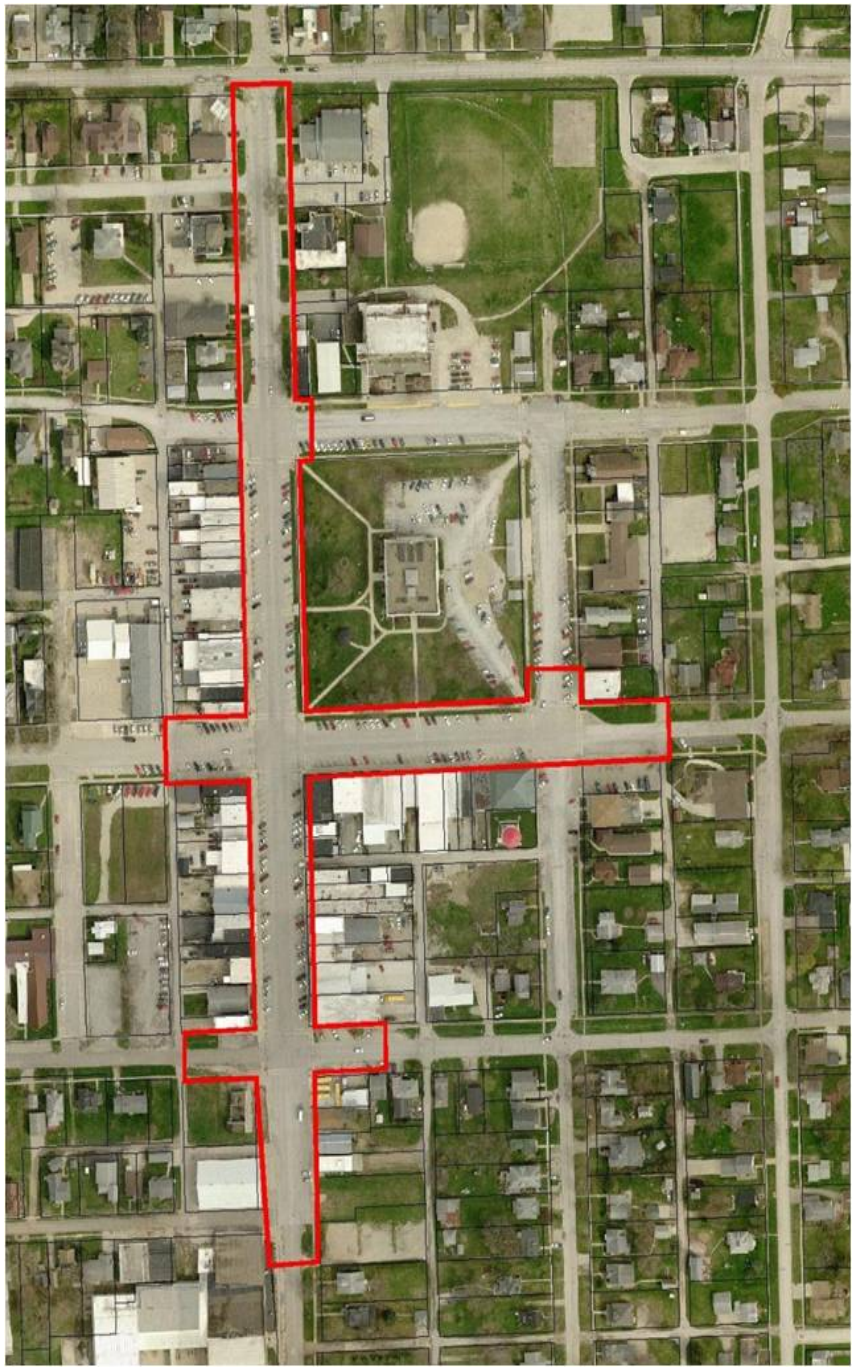
Iowa Green Streets Pilot Project
West Union, Iowa

Turkey River Watershed Management Authority

June 27th, 2013



Project Timeline

- Central business district reconstruction
- First cost estimate prepared in 2004
- Original concept for Standard Type Construction – PCC Street and Sidewalk – storm sewer system
- $4.5 million estimated construction cost was deemed unaffordable by City – on hold until 2008
- Green Pilot designation by State of Iowa, one of two communities in State – design and financial assistance, plus general project support

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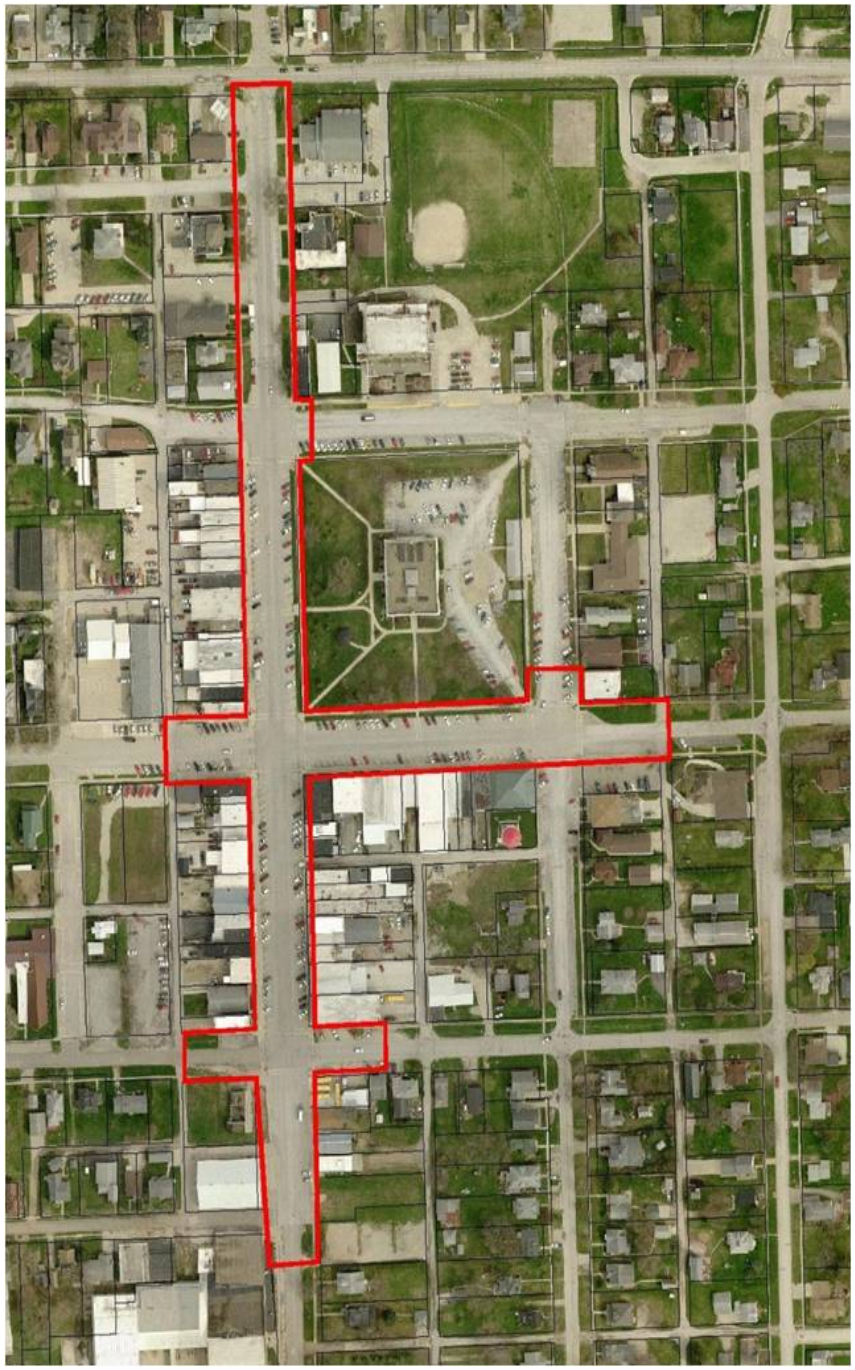

Project Timeline

- Visioning meeting took place in June, 2008 – brainstorming session for any and all project concepts – permeable pavers, geothermal district heating and cooling, deicing system, back-in angle parking, totem pole in center of intersection!!

- Storm water management was a priority.

- Not all items stuck! District heating and cooling system did. Deicing and totem pole did not.

- Grant writing started in late 2008, design in 2009

- Secured grants to allow project to be constructed, 2009-2010

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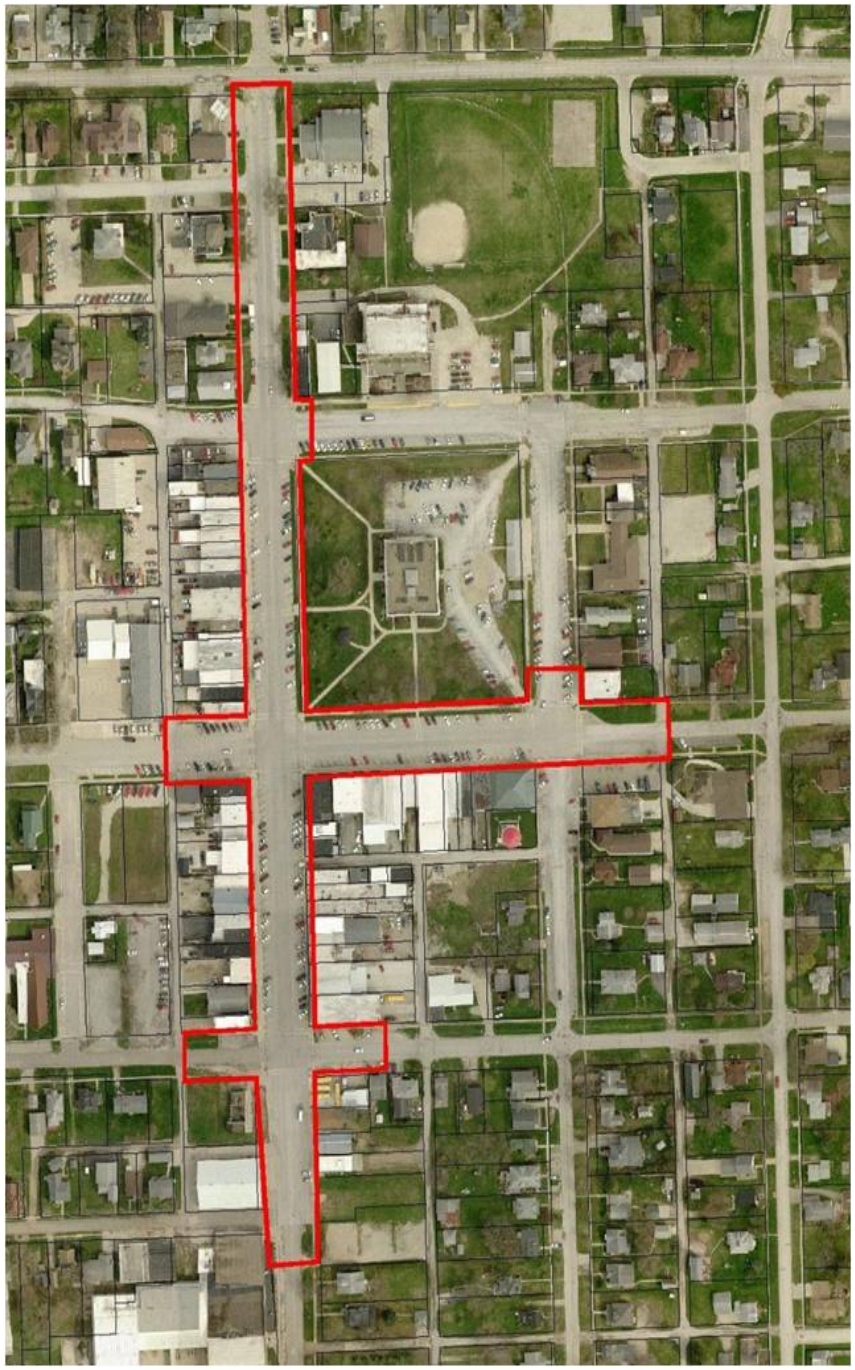

Project Timeline

- Bid letting in July 2010.
- Started construction in October 2010.
- Project Completion in June 2013.

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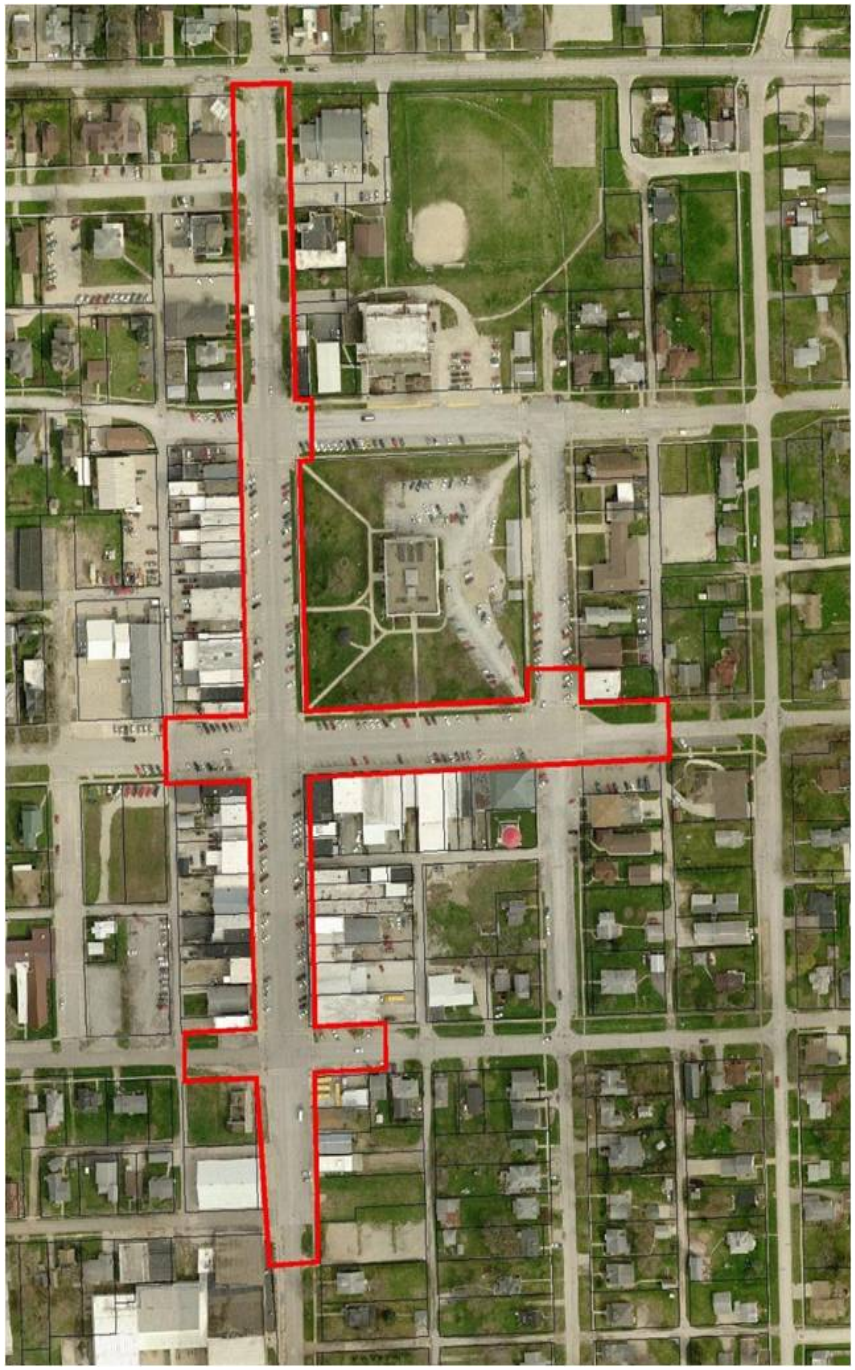

Final Project Extents

- 3,000 LF of Street Reconstruction
- 6,000 LF of Sidewalk Reconstruction
- 4,000 LF of New Water Main
- 1,500 LF of New Sanitary Sewer Main
- District Geothermal Heating/Cooling
- 132 Vertical Wells – Courthouse Square
- 7,500 LF of New Geo. Distribution Lines
- LED Street Lighting
- 30,000+ tons of crushed stone

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Project Goals

- Replace failing infrastructure in a sustainable way
- Storm water as a resource vs. nuisance
- Energy efficiency
- Improve accessibility – pedestrian friendly
- Local craftsmanship

Project Goals - Storm Water

- Significantly reduce peak runoff rate
- Infiltrate storm water
- Cleanse runoff – filtering effect of crushed stone base
- Cleanse runoff – bioretention - vegetation
- Cool runoff – summer – discharges to trout stream
- Reduce storm drainage infrastructure
- Improved winter performance – reduced sanding

Funding

- $10,000,000 project
- 15 grants, funding $7,500,000
- $2,500,000 City funding

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Funding Sources - Grants

- Iowa Great Places – 2009 and 2010
- IDOT – RISE
- CDBG
- Watershed Improvement Review Board (WIRB)
- IDALS – IJOBS
- IJOBS
- IDNR – IJOBS
- Main Street – IJOBS
- Main Street – Challenge
- EPA Climate Showcase
- Department of Energy
- Keep Iowa Beautiful
- Trees Forever – Alliant Energy

Funding Sources – Non Grant

- Fayette County
- Main Street West Union
- Revenue Bonds – Water and Sanitary Sewer
- General Obligation Bond

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Original Brick Placement - 1914

PREPARING AND HAND BRICKING the streets of West Union around 1914. Work was done by Sweeney Brothers.

- Flint pavers – mfg. near Des Moines
- Pavers placed on 1.5” sand setting bed over 8” concrete
- Many of laborers from Austria
- Residents of West Union helped haul pavers from railroad

- Asphalt overlay of bricks in 1962 – all bricks in place at start of project
- Reused a portion in new project as a historic tie-in

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Pre-Project Conditions

- Asphalt Over Original Brick
- Steep Cross Slopes
- Minimal Storm Sewer System

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Pre-Project Storm Water Runoff Downtown West Union

High runoff – especially at downstream ends of central business district

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Pre-Project Winter Conditions

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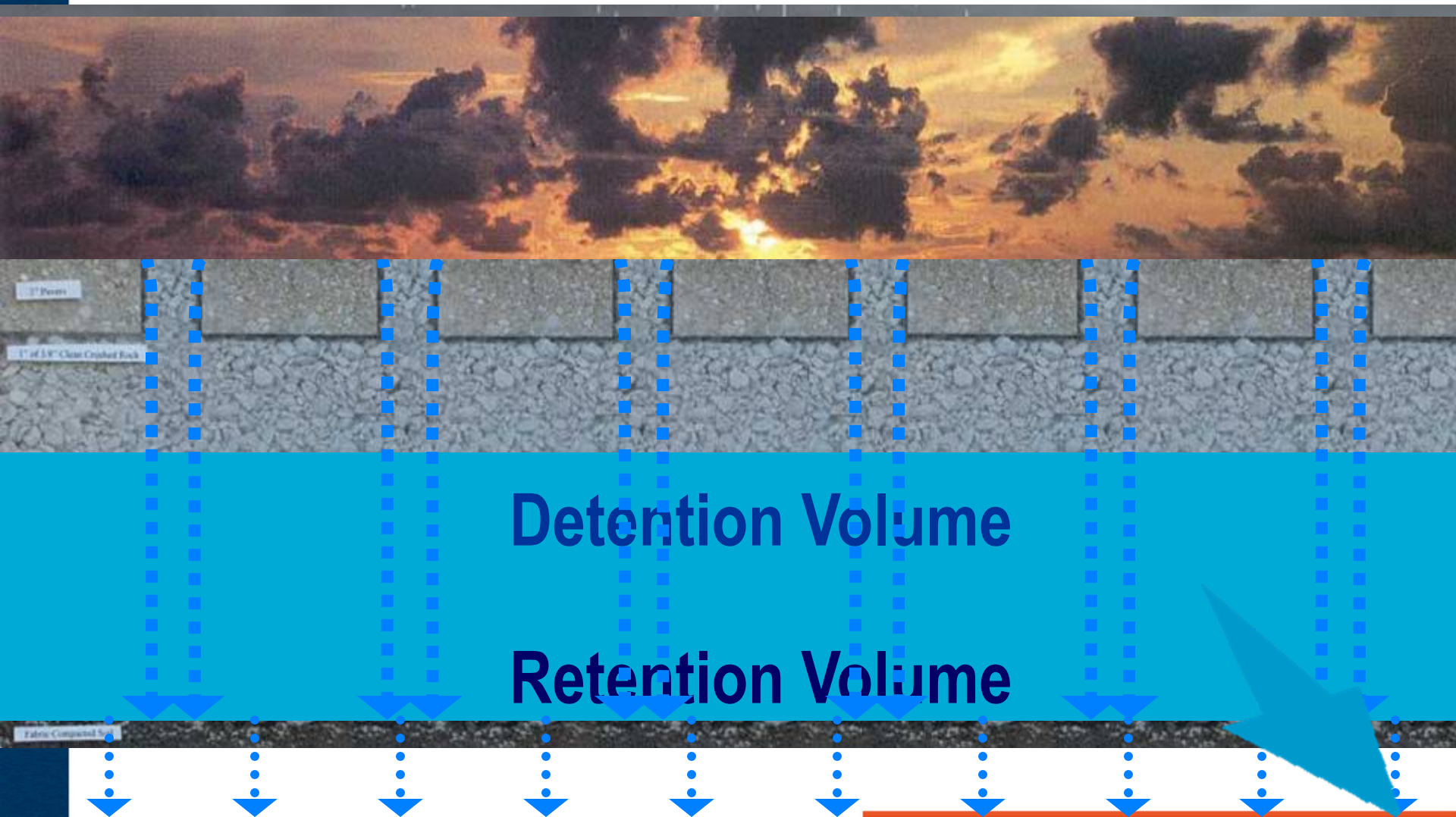
Permeable Pavement:
Infiltration (Retention) and Detention Capacity



Surfacing Removal

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Utility Placement

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Excavation Complete

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Fabric and Geogrid Placement

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Stone Base Profile

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Grading – Stone Base Placement

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Finish Grading Prior to Setting Bed Placement

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Paver Placement

Palletized Pavers

Mechanical Paver Placement

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Joint Fill Placement

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Coal Vaults Under Sidewalks

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Previous Blocked in Basement Openings

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Sidewalk Grading - Liner

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Sediment Control During Construction

Crushed Stone Check Dams

Sediment Berm With Inlet &
Crushed Stone Filter

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Bioretention Construction

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Finished Bioretention

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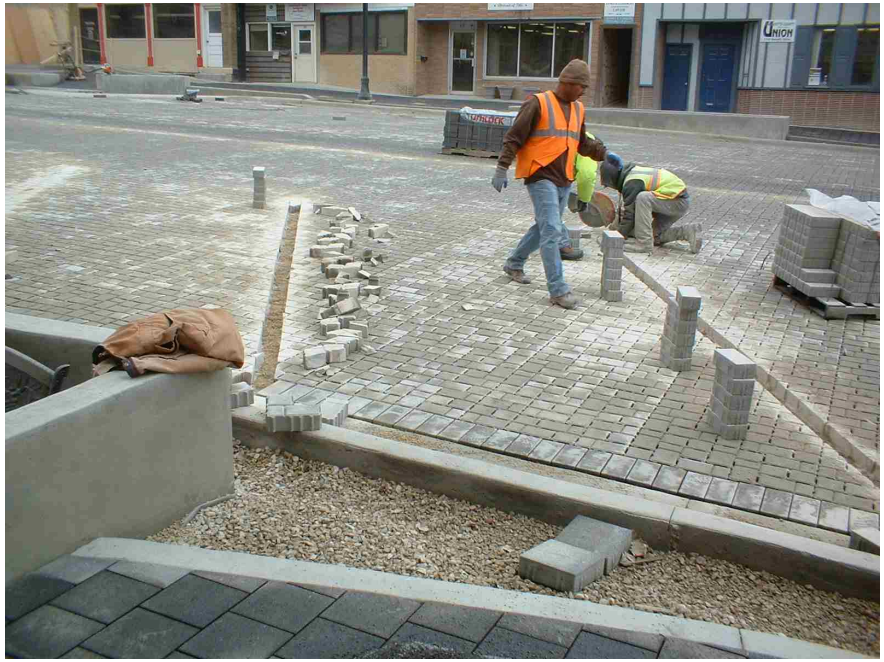
No More Painting!



High Contrast (White) Pavers Cut In for Parking Stripes and Accessibility Symbols

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Paver Infiltration - 350 gpm

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Project Results - Storm Water

- Significantly reduce peak runoff rate – successful
- Infiltrate storm water – not so much
- Cleanse runoff – filtering effect of crushed stone base – analysis this year
- Cleanse runoff – bioretention - vegetation – successful
- Cool runoff – successful, analysis this year
- Reduce storm drainage infrastructure – successful
- Improved winter performance – reduced sanding tradeoffs

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Finished Project

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Additional Storm Water Management - Green Roof

- Chamber of Commerce building
- Tray system
- Required minor structural reinforcement
- Reduces runoff
- Low maintenance
- Increased insulation

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Permeable Paver Private Parking

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