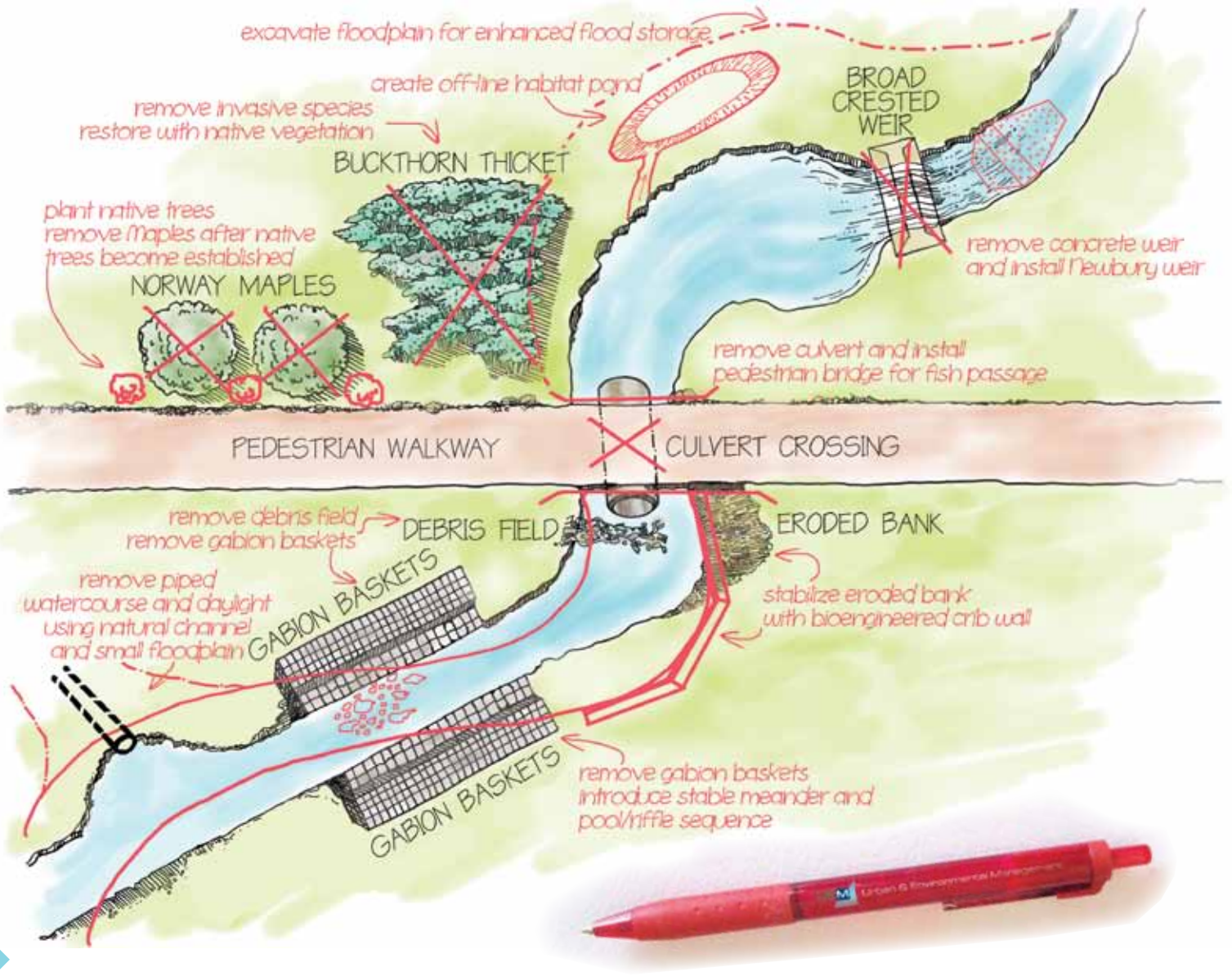
URBAN & ENVIRONMENTAL MANAGEMENT

WATER RESOURCES

Specializing in Fluvial Geomorphology and Natural Channel Design



UEM's Water Resources experts blend the functional with the aesthetic, implementing innovative solutions that protect and complement the surrounding environment.

We believe that natural solutions to water resources management are more sustainable and cost-effective and afford more protection to the community.

UEM

Exceptional People ■ Exceptional Service

Explore the scope of UEM's Water Resources Services . . .

WHAT IS THE PRACTICE OF "WATER RESOURCES"?

The practice of Water Resources addresses issues relating to precipitation, infiltration, groundwater, runoff, aquatic habitat, and stream and lake management, as well as the management of fresh water sources, drinking water, wastewater, stormwater, and climate change. UEM's Water Resources Team includes planners, scientists, engineers, and designers with complementary skills to address the full scope of Water Resources issues.

WHAT IS UEM'S APPROACH TO WATER RESOURCES ISSUES?

Water resources issues require examination of the surrounding natural drainage systems, plant life, animal species, ecosystems, and regulatory framework. We routinely consult with the community, stakeholders, and regulatory agencies. This knowledge is used to marry the design lessons of the past with our current knowledge of the surrounding environment. A solution that is designed to nature's standards mitigates negative impacts, reduces risk to surrounding lands and infrastructure, lowers maintenance costs, and increases longer-term stability. UEM is uniquely qualified to provide these solutions. Our multi-disciplinary approach combines traditional engineering design, bioengineering and natural channel design, fluvial geomorphology, and the latest in geospatial analysis techniques.

Fluvial Geomorphology . . . applies the science of the physical and chemical processes that shape landforms (geomorphology), to the deposits and landforms of rivers, creeks, and streams (fluvial elements). We carefully consider the conveyance of water and sediment, energy profiles, and the erosion of stream beds, banks and flood plains (alluvium and rock). This allows us to understand the forces that have shaped a watercourse, predict future conditions, and develop plans to stabilize and enhance the affected features.

Natural Channel Design . . . combines our understanding of fluvial geomorphic principles with the natural heritage of a site to develop stabilization, restoration, and enhancement plans and designs for streams, creeks, and rivers. We work with nature to develop designs that are geomorphically stable and that will provide habitat for native aquatic and riparian species.

WHAT SETS UEM APART?

It's our people. It's our attention to detail, our experience, and the ability and confidence to consider innovative solutions.

UEM's Water Resources Team draws from an unmatched combination of skills to provide expertise from conceptual stages through planning, community consultation, approvals, detailed design, contract administration, construction observation, and post-construction monitoring.

Our expertise extends beyond traditional applications. We specialize in non-traditional areas, including rural and agricultural drainage, Species at Risk (SAR), landfill leachate and stormwater management, constructed wetland development, industrial stormwater and runoff management, and stormwater treatment and quality.

We understand the science of aquatic ecosystems and the applicable legislation, and we consider this knowledge in the design and implementation of solutions for water resource issues. Whether dealing with a typical water issue or a more complex situation, UEM's Water Resources experts strive to implement practical, cost-effective, and sustainable solutions.

Beaver Creek, Fort Erie, ON
ABOVE: pre-construction
BELOW: post-construction
Showing new off-line habitat pond two years after construction.

Nith River near Paris, ON
ABOVE: pre-construction
BELOW: post-construction
Showing J-hook vanes constructed to reduce bank erosion and provide enhanced fish habitat.

HOW CAN UEM HELP?

UEM's Water Resources professionals can assist your organization with:

1 Aquatic Ecosystems
- Fluvial geomorphic assessment (stability, meander risk, etc.)
- Natural channel design, restoration, alignment & stabilization
- Bioengineering
- "Daylighting" buried, piped or concrete channels
- Habitat creation, protection, mitigation & enhancement
- Species at Risk (SAR)
- Micro-drainage analysis

2 Urban Stormwater Management
- Stormwater pond design
- Stormwater quality management
- Natural channel design
- Natural treatment system design
- Sediment and erosion control

3 Rural Stormwater Management & Drainage
- Landfill stormwater management
- Agricultural drainage and drain design
- Public meetings
- Industrial stormwater management
- Stormwater quality management
- Treatment wetland design

4 Compliance & Approvals
- Community consultation
- Regulatory and compliance assessments
- Treatment objectives development
- Annual performance reports
- Environmental assessment and approvals
- Liaison with regulatory and other agencies

5 Monitoring
- Flow monitoring
- Climate monitoring
- Post-restoration monitoring
- Photo monitoring

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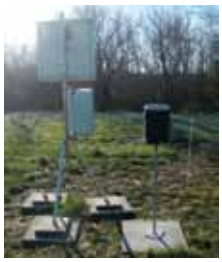

URBAN & ENVIRONMENTAL MANAGEMENT INC.

Complementing traditional planning and engineering with innovative specialty services to take projects and clients to the next level of excellence.

This is UEM. Exceptional.

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