The Watch Factory: A Case Study in Low Impact Development and Community Involvement

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- Watch Factory is over 150 years old
- Employed 4000 workers by 1900
- Considered premier watch maker in the world
- Major tenant moved out in 2004
- In 2007 First Republic Corporation of America, owner of the property, formed joint venture with Berkeley Investments, Inc. of Boston to redevelop the site
Site Location

The site is located on the banks of the Charles River, upstream of Moody Street dam.
Watch Factory Design Team

Developer - Berkeley Investments

- Bruner Cott – Architect
- BSC Group – Civil/Site Engineers and Permitting
- Richard Burke Associates – Landscape Architects
- Haley and Aldrich – Geotechnical Engineers
- Charles River Watershed Association – Advisory Role
Massachusetts Watersheds

28 Distinct Watersheds
Charles River Watershed

- 80 miles
- 20 dams
- 308 mi²
- 35 towns
- Over 1 million residents
- Mean annual flow ~ 450 cfs
Benthic algae, Bellingham, MA
Floating algae, Cochrane Dam, 2005
Summer 2006 Toxic Algae Bloom

WARNING

Toxic algae currently present in water
May be hazardous to health
Pets and people avoid direct contact
with algae and water
For more information please see:
www.mass.gov/dph/ceh
2007 Nutrient TMDL Results

- P loads must be reduced by 53% overall
- Main source of P in the watershed is stormwater runoff
- To achieve required reductions, each land use type must reduce loads
  - Commercial, industrial, high density residential: 65% reduction in annual P load
- Waltham’s P reduction target: 63%
Sources of P

- Natural
  - Plant decay
  - Wildlife
  - Erosion

- Human caused
  - Sewage (illicit connections and CSOs)
  - WWTF effluent
  - Erosion
  - Stormwater runoff

Emerald Necklace, 2007
Controlling P

- Reduce stormwater runoff volume
- Reduce stormwater flow rates
- Increase infiltration
- Use BMPs that eliminate fines and filter stormwater
- LID, Green Infrastructure
Controlling P on site with BMPs

- Source Controls
- Infiltration
- Biofiltration
- Filtration
City of Waltham: 36% impervious

Waltham Watch Factory site, Charles River, Waltham
Existing Conditions

- Twelve acre site
- 80% of site covered by buildings and pavement
- Drainage system up to 100 years old
- Many drain pipes routed under buildings toward river
- Video of drain lines determined many pipes broken or plugged
Existing Conditions

View across river

View from Brown Street Lot
Existing Conditions

- Catch basins provided minimal protection of water quality
- Drainage outfalls discharged stormwater directly into river
Redevelopment Phasing Plan

- **Phase 1**
  175,000 SF of office space

- **Phase 2**
  96 loft apartments, restaurant and café

- **Phase 3**
  90,000 SF of office space
Stormwater Strategy

- Redevelopment Project
- Reduction in impervious area
- CRWA recommends reduction in phosphorus
- Infiltration trenches and raingardens selected as LID techniques in Phase 1
- Water quality structures installed prior to discharge to river
- Porous Pavement parking lot selected as LID technique in Phase 2
Infiltration Trench - Sections
Brown Street Parking Lot
Brown Street Parking Lot
Infiltration Trench – Before and After

Stormwater runoff drains to city’s system
No groundwater recharge

- Stormwater flows across grass, screening pollutants
- Stormwater infiltrates into trench, recharging groundwater
- Stormwater flow is attenuated
Brown Street Parking Lot
Raintank Installation

- Rain tanks provided from tenant within Watch Factory
- Rectangular shape maximizes stormwater storage volume
- Filter fabric prevents sediment clogging
- Raintanks allow for hand installation
Raingardens – Office Court

Existing condition
roof runoff was channeled to drain system and discharged directly into river

Finished condition
roof runoff was directed via runnels into raingarden
Raingardens – Office Court

- Downspout directs roof runoff into raingarden
- Plants absorb stormwater, soil screens pollutants
- Stormwater overtops into raised catch basin
Stormwater infiltrates downward through the rain garden. The top layer is peastone, then rain garden planting soil, then a sand and gravel layer, then crushed stone. An 8” subdrain pipe discharges stormwater from the bottom of the rain garden into the drainage system.
Porous Pavement Parking Lot

- Phase 2 construction to create porous pavement parking lot
- Proposed grades to be as steep as 10%
- Value engineering reduced crushed stone layer from stepped design to uniform 12” layer

Existing conditions – Prospect Street Lot
Porous Pavement Section (27” total thickness) includes:

- 4” porous asphalt over
- 4” ¾” crushed stone over
- 12” bank run gravel over
- 3” 3/8” pea gravel over
- 4” ¾” crushed stone