

CAPITOL REGION WATERSHED DISTRICT
GRANT AGREEMENT
WITH CITY OF ST. PAUL

Re: Payne-Maryland Development Stockholm Tree Planting Engineering Design
Cost-share related to the Engineering Design of Stockholm Tree Planting Method
Included Exhibits: Special Grant Application Letter dated February 25, 2011

THIS AGREEMENT is entered into this ____ day of November, 2011, by and between the City of St. Paul, hereinafter referred to as the "City", and the Capitol Region Watershed District, hereinafter referred to as the "District".

WITNESSETH:

WHEREAS, the District has an approved Watershed Management Plan which includes funding for implementing Best Management Practices throughout the Watershed District; and

WHEREAS, the District has adopted and approved the 2011 Budget and Workplan which include funding for Special Projects and Grants; and

WHEREAS, the District and the City have worked cooperatively to develop a project approach that is acceptable to both parties; and

WHEREAS, the District and the City have a desire to provide a demonstration of the Stockholm Tree Planting Method to educate residents of the City/District on the stormwater management benefits of trees; and

WHEREAS, the District Board of Managers has authorized payment of no more than \$50,000 for the engineering design costs of the Stockholm Tree Planting Method for the Payne-Maryland Development defined in the attached exhibits; and

WHEREAS, the City is committed to funding the remainder of the project costs;

NOW, THEREFORE, IT IS HEREBY MUTUALLY AGREED AS FOLLOWS:

1. Project: The City shall, with the input from the District, engage an Engineer to complete the design of the Payne-Maryland Development Stockholm Tree Planting consistent with grant application received and approved by the District.

2. Payment: The District shall make a grant to the City in an amount not to exceed \$50,000. The grant is for the engineering design costs of the Stockholm Tree Planting Method for the Payne-Maryland Development as identified in the exhibits of this agreement. Payment will be in the form of reimbursement for actual costs, following receipt of documentation from the City that the work has been completed satisfactorily.

The City shall complete the project and request reimbursement no later than December 31, 2012.

3. Reports: The City will provide periodic updates during the design process. Reports shall provide information on project status, draft and final deliverables, project meeting summaries and other relevant work products for the project.

4. Liability: Each party agrees to be responsible for its own acts and omissions while carrying out the terms of this agreement.

5. Modification: It is understood and agreed by the parties hereto that this agreement shall not be modified or amended except in writing duly signed by each of the parties.

This agreement shall remain in full force and effect until December 31, 2012, unless earlier terminated by mutual agreement of the City and the District.

IN WITNESS WHEREOF, the parties have caused this agreement to be executed.

CITY OF ST. PAUL

CAPITOL REGION WATERSHED DISTRICT

By _____

By _____

Name _____
Director, Parks and Recreation

Mark Doneux
District Administrator

By _____

Name _____
Director, Finance

Approved as to Form:

By _____
Assistant City Attorney

By _____
James A Mogen
Assistant County Attorney
Attorney for CRWD

By _____

Name _____
Mayor's Office

Exhibit 1

Special Grant Application Letter dated February 25, 2011

DEPARTMENT OF PARKS AND RECREATION
DESIGN AND CONSTRUCTION



CITY OF SAINT PAUL
Mayor Christopher B. Coleman

400 City Hall Annex
25 West 4th Street
Saint Paul, Minnesota 55102
www.stpaul.gov/parks

Telephone: 651-266-6400
Facsimile: 651-292-7405

February 25, 2011

Mr. Bob Fossum
Water Resource Project Manager
Capitol Region Watershed District
1410 Energy Park Drive, Suite 4
Saint Paul, MN 55108

Re: 2011 Special Project and Grants Program
Payne-Maryland Development: Stockholm Tree Planting Method Engineering Design

Dear Mr. Fossum:

We are pleased to submit this application for funding a grant with the above captioned program. Both tree survival and water quality suffer in the harsh and unforgiving urban environment of our cities that endure wide temperature swings, draught, heavy rains, and pollutants washed off of streets, parking lots and rooftops. Engineers in Stockholm have rethought the planting process with an eye to longer term tree health that could also accomplish a dual goal of improved stormwater control and pollutant removals. If funded at a requested \$60,000 level, this proposal will provide engineering design for an innovative method to address these challenges at a new development complex at the intersection of Payne and Maryland in Saint Paul. Such an investment may pay for itself many times over if successful in meeting its goals. This project could provide a basis for a future funding request to implement the plans. Engineering plans and specifications generated by this project are meant to become part of the bid documents for the entire project.

The proposal supports CRWD goals of pollutant removal and improved water quality in stormwater runoff. It also reaches out to a goal shared among many people and agencies; that of a healthier urban forest that will bring with it such associated benefits as raindrop interception, pollution absorption and carbon sequestration, temperature and wind moderation in urban heat islands, absorption of runoff, habitat for a wide range of species, improved erosion control, and associated benefits to tree life, water quality and quality of life in an urban setting. We are excited at the possibilities and hope we can partner on this project that could have nationwide positive implications for hundreds of cities, millions of trees, and many water bodies!

Thank you for your consideration.

Sincerely,

Mike Kimble
Manager Assistant III



CAPRA Accreditation

An Affirmative Action Equal Opportunity Employer



National Gold Medal Award

CRWD 2011 SPECIAL PROJECT AND GRANTS PROGRAM

Proposal: Payne-Maryland Development: Stockholm Tree Planting Method Engineering Design

1. Project Description and Justification

This project proposes to provide engineering services for application of the Stockholm Tree Planting Method to an existing site in Saint Paul proposed for a combined development that may include a park recreation center, library, and private worship and funeral facilities. This innovative idea is perfect for inclusion of an also innovative tree planting method designed to prolong health and life of our trees, while at the same time providing significant water quality benefits.

2. Conceptual Design

The consultant will assemble a team of hydrologists and engineers to collaborate on engineering of a Stockholm tree planting system for an estimated 10,000 SF parking lot and 30,000 SF building, and about a block and a half of street trees planted at a minimum spacing of 30 feet on center. The 2 areas will be connected and function together to receive stormwater from the building, parking lot, and sidewalk areas in the vicinity of the system. They will evaluate existing conditions, including existing infrastructure and potential underground obstructions such as foundation walls, model system hydrology, and develop concepts of pollutant removal and water quality improvements. A potential work scope follows:

- A. Gather information base
- B. Obtain and review detailed site survey
- C. Analyze site conditions and runoff potential
- D. Model Stockholm Tree Planting system flow dynamics
- E. Develop calculations of pollutant removal and water quality improvements
- F. Design development for the system
- G. Permitting requirements dialogue
- H. Develop estimate of probable construction cost

This proposal has been developed with assistance of a consultant that has familiarity with the Stockholm method. The work scope may require some modification upon approval of the grant by, and project detail discussions with, the Capitol Region Watershed District (CRWD).

3. Estimated Water Quality Benefit and Calculations

The estimated water quality benefits are noted below, but should be considered preliminary only, pending final design and engineering of the system.

The consultant cost estimate below assumes a system designed to capture 3,333 c.f. of runoff, or 1 inch of runoff from 40,000 s.f. impervious surface (the areas of the building roof and parking identified by Saint Paul Parks and Recreation staff). Composed of pipes and various aggregates, the passive system will promote conditions for trees to thrive and encourage the infiltration and uptake of rain water. The inlet(s) to the treatment area will be designed to pretreat for large sediment and bypass high-flow storm events. A preliminary estimated level of pollutant removal for the treatment volume is 70 to 80% removal of Total Suspended Solids, over 50% removal of Total Phosphorus, 45 to 85% removal of metals, 35% removal of pathogens and 80% removal of hydrocarbon toxins (estimated filtration treatment values from the Minnesota Stormwater Manual).

Volume reduction will be challenging in the early phases of vegetation establishment. As the trees mature, subsurface conditions will be created to promote root growth and encourage the infiltration of stormwater through small gaps created as roots penetrate subsoils.

4. Detailed Cost Estimate

The following preliminary estimates are from a local consultant familiar with the Stockholm method:

Preliminary Construction Costs:

550 LF (@\$400/LF with 18 trees) "Stockholm" Tree Trench = \$220,000
Storm Sewer and Drainage Control Structures = \$20,000

Construction Subtotal: \$240,000

If utility or other relocation is needed in relation to the Stockholm system, a future placeholder should be allowed in at least the \$20,000 to \$30,000 range, possibly more.

Planning, Engineering and Design Costs (PED):

Preliminary Design = \$10,000

Meetings & Coordination w/ Design Team = \$7,000

Final Design, Plans and Specifications = \$28,000

Part-Time Construction Oversight and Administrative Assistance = \$6,000

PED Subtotal = \$51,000

Total (Construction Costs + PED) = \$291,000

The above estimates also assume that utilities are located and a site survey has been completed. If further survey work is needed, up to \$5,000 may be needed to confirm utilities and other items not already located.

Therefore, total estimated consulting costs to design the Stockholm Tree Planting method for the areas mentioned total \$56,000 (PED costs + survey update). Adding for potential unforeseen factors and costs, the City of Saint Paul respectfully requests a grant in the amount of \$60,000. Cost sharing for construction and system monitoring may be requested in the future.

5. Description for Education and/or Demonstration

This unique and historic environmental project, if it is as successful as efforts in Stockholm, Sweden, will be a landmark accomplishment, while informing similar projects in the future. Local to state and nationwide dissemination of the information, site tours, web site posting, and interpretive signage and brochures are all potential methods of sharing information resulting from this installation. Existing and possibly new methods of testing, analyzing and monitoring the system could be employed, perhaps by the CRWD.

6. Description of Level of Innovation Associated with the Project

This project may be one of the first ever implemented outside of Stockholm, and in the United States. The potential to test, monitor and evaluate this system, and follow its progress for the life of

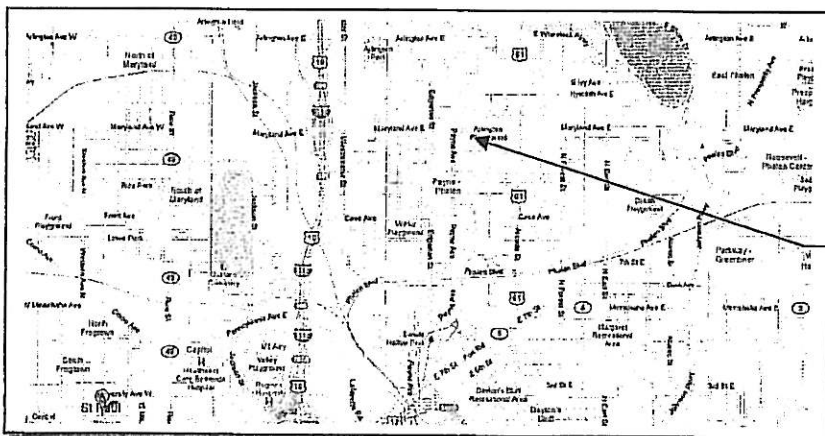
the trees, is unsurpassed. New variants of the Stockholm method that we can't yet envision may evolve for our species, climate and urban conditions. A variety of tree planting details that address existing tree plantings and varying site conditions and climates are also likely to develop over time that will add to the knowledge and experience base. If the results of this experiment look promising, other cities and regions may adapt this method try their own versions based on their particular circumstances and conditions. New methods of testing, analyzing and monitoring the system may be developed, perhaps lead by the CRWD.

7. Description of Monitoring and/or Evaluation of Effectiveness

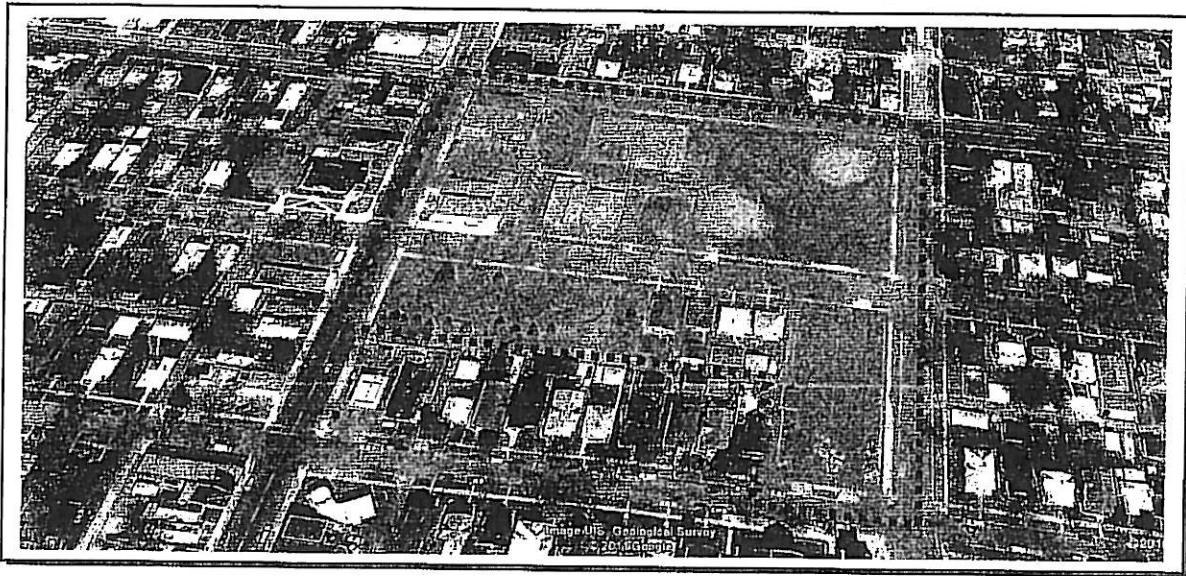
This proposal requests funds for engineering design of construction of an innovative tree planting system which will be built when funds become available. The design consultant for the system will not be formally contracted for monitoring this system. Assuming that the plan is implemented, the system could also be monitored by the City's Environmental Section of the Parks and Recreation Department for establishment of plant communities, removal of invasive species, and maintenance requirements. We are hoping that the CRWD will partner with us to provide the monitoring and report on the functioning of the system in terms of water quality improvements. Once an adequate amount of data has been obtained, a full report of the effectiveness of the system on tree growth and health, and water quality should be compiled. It has not yet been determined who the lead agency will be on the report, but such discussions should commence once the project gets the green light for construction.

Stockholm, Sweden, also a dense, urban, capital city with a diversifying population approaching 900,000, has many other similarities, and some differences, to Saint Paul that make a compelling case for long term monitoring of this project by experienced agencies. Stockholm is very water and park based, is considered a very "green" city, is highly educated and culturally significant in terms of architecture, museums and the arts, has a large commitment to public transportation, a rich history, and, very importantly, has a similar latitude and climate, with the exception that Saint Paul is somewhat more extreme in terms of wider, colder and warmer temperature fluctuations, and more precipitation in summer, about the same in winter.

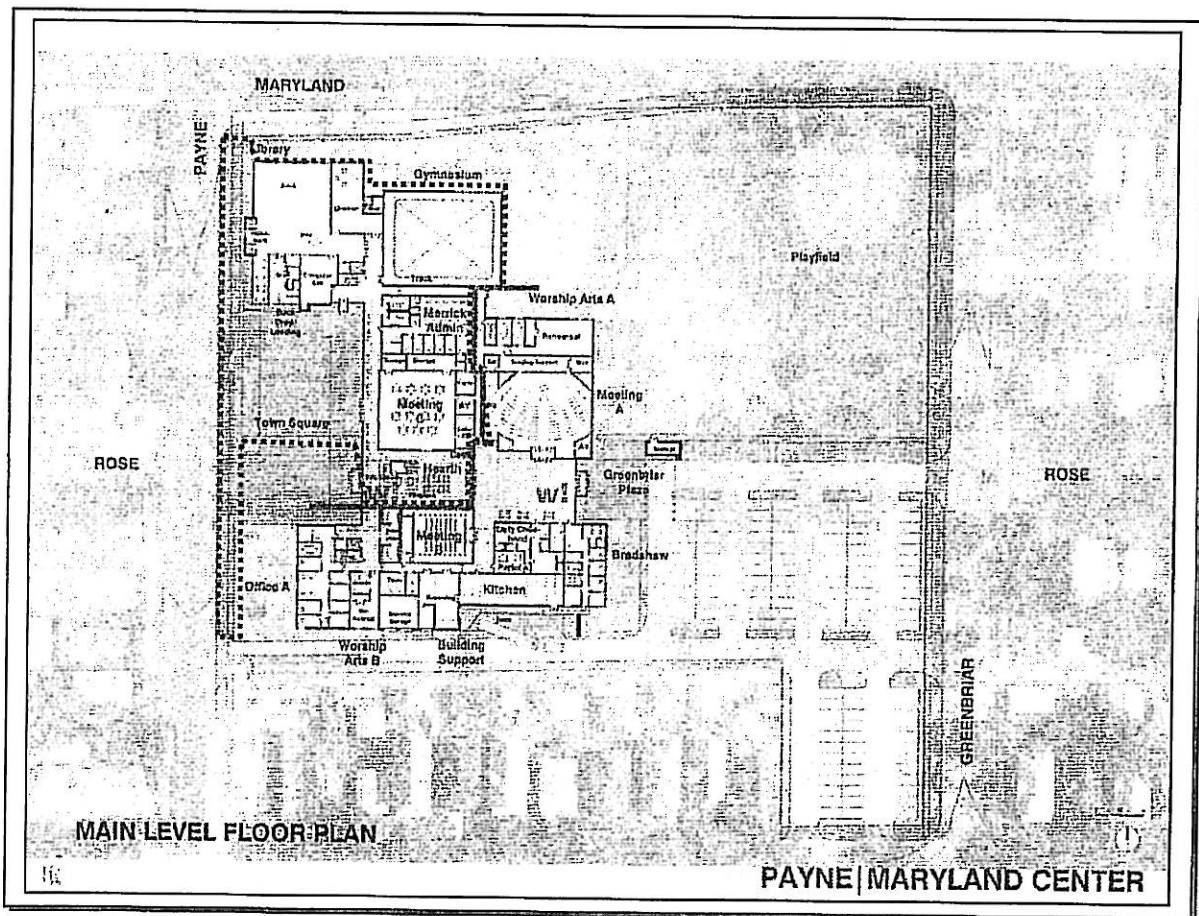
As global warming progresses, some believe that higher latitudes may experience even colder extremes as temperatures tend stratify across latitudes, with lower latitudes becoming even warmer. Therefore, this test case may be an excellent barometer of effects of climate change on the urban forest. Stockholm, being situated on islands near the Baltic Sea, may have its climate moderated to some extent due adjacency to a large water body, even though it is located at a more northerly latitude than Saint Paul. The bottom line to all this is a good comparable test case, with potential results that may be embraced by an educated, as well as environmentally aware, concerned and supportive citizenry that may be interested in further investing in this method, if successful.



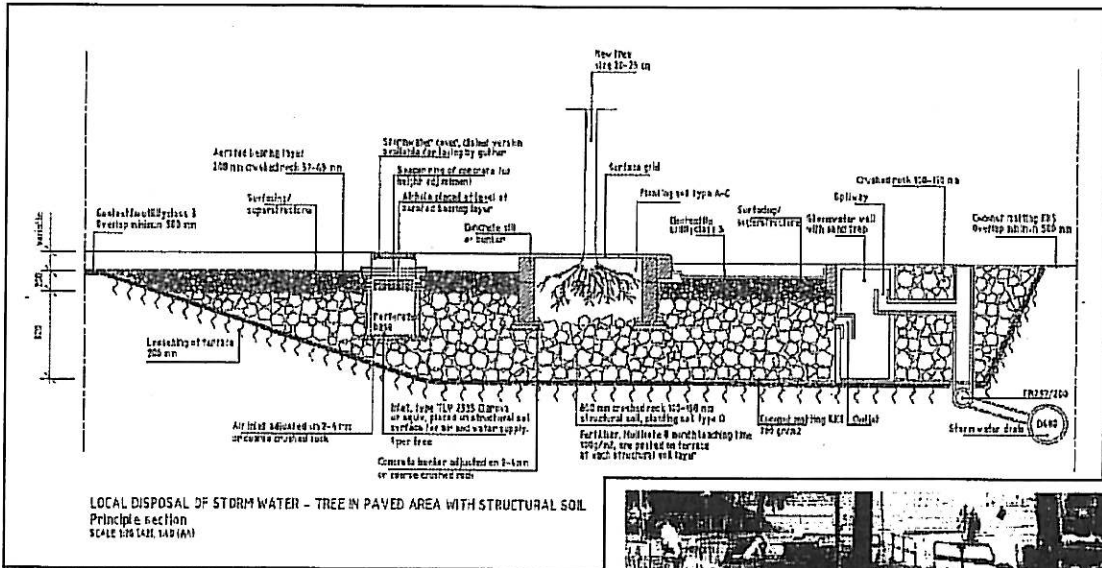
Project location



Development site, looking northerly



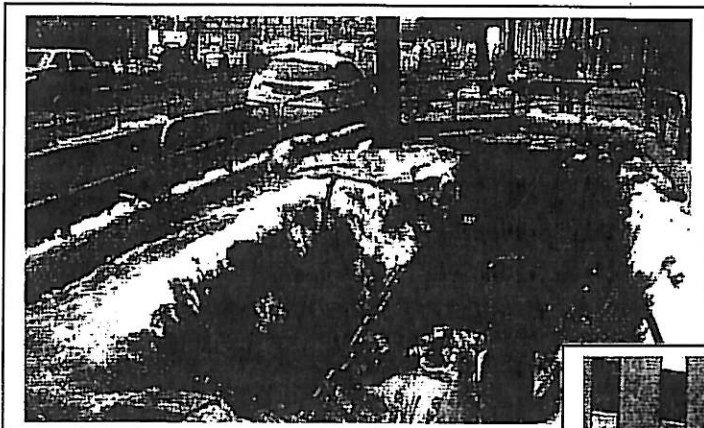
Preliminary site plan, with Stockholm Tree Planting method and approximate water quality treatment areas outlined in blue dotted polygon



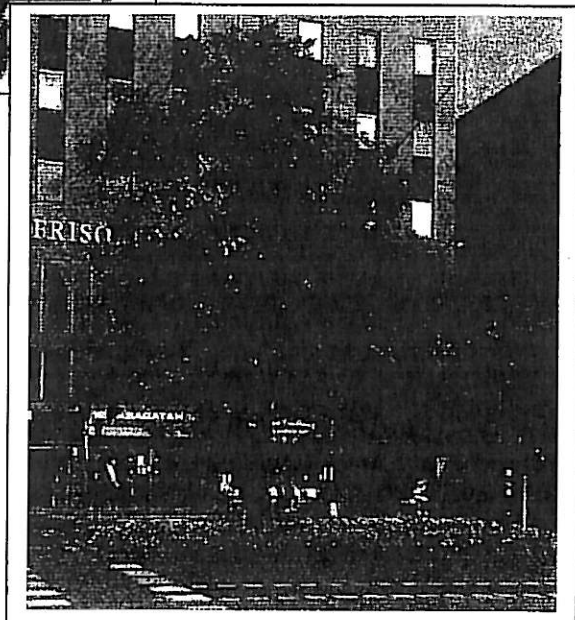
One of the many possible Stockholm method planting situation construction details



Example of a Stockholm method installation under way



This photo shows some of the many above and below ground facilities that trees must compete with for space



An example of a completed Stockholm method addressing existing trees in what was formerly a concrete island, now also planted with a summer groundcover. Trees responded quickly with renewed vitality when nutrient and water supply increased dramatically.