LANDSCAPE PERFORMANCE SERIES

Corktown Common Methods Document

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This Methods Document was produced in 2016 to accompany a *Landscape Performance Series* Case Study Brief through the Landscape Architecture Foundation's *Case Study Investigation* program, a unique research collaboration that matches LAF-funded faculty-student research teams with leading practitioners to document the benefits of exemplary high-performing landscapes.

The full Case Study Brief for this project can be found at
https://landscapeperformance.org/case-study-briefs/corktown-common

Environmental Benefits

Environmental Benefit 1

Retains 100% of annual rainfall on site, equivalent to 1.15 million gallons per year.

This water is retained through the site-specific water harvesting underdrainage system that collects, filters, and reuses the stormwater and potable water from the water play area throughout the site. This prevents the water from burdening the city's systems and from entering the floodplain.

Calculations
Conducted by MVVA Inc. design team, using Statistics Canada's *Weather Conditions in Capital and Major Cities*.

Limitations
Researchers did not independently verify calculations.

Sources
For total annual precipitation, please see Statistics Canada's *Weather Conditions in Capital and Major Cities*, http://www.statcan.gc.ca/tables-tableaux/sum-som/l01/cst01/phys08a-eng.htm

ARUP, Correspondence: Don River Park Arup #96125, 3/19/2007.

Environmental Benefit 2: Water conservation

Saves approximately 1,246,400 gallons of potable water annually through the capture and reuse of stormwater and waterplay runoff for irrigation.

Calculations

	Water used (in gallons)	Water captured (in gallons)	Difference (in gallons)
Weekly irrigation	41,095		
Weekly harvested rainwater		32,678	
Weekly waterplay drainage		80,640	
Weekly totals	41,095	113,318	72,223

Water used for irrigation of the landscape:
Weekly: 41,095 gallons per week for 7 months
7 months = .5833 of a year = 30.33 weeks

41,095 x 30.33 = 1,246,411.35 gallons annually for irrigation

Water captured for same portion of a year:
113,318 x 30.33 = 3,436,934.94 gallons captured annually

Recycled Water Sources: UV-filtered recycled potable water from splash pad; Sediment-filtered recycled stormwater underdrainage system

Limitations
Conducted by MVVA Inc. design team. Estimates not independently verified by researchers. Water testing results not available. This benefit was calculated to reflect the 7 months of the year that the park is in highest usage.

Sources
ARUP, "Water Storage with Rainfall in July" from 3/19/2007

Michael Van Valkenburgh Associates, Inc.

For total annual precipitation, please see Statistics Canada's *Weather Conditions in Capital and Major Cities*, http://www.statcan.gc.ca/tables-tableaux/sum-som/l01/cst01/phys08a-eng.htm

Environmental Benefit 3: Water quality

Eliminates more than 99% of *E.coli* potentially present in 4 million gallons annually of captured water play wastewater.

This is achieved by using UV filters before it is piped and daylighted in the marsh, allowing for flushing and aeration.

Limitations
Conducted by MVVA Inc. design team. Results not independently verified by researchers. Water testing results not available.

Sources
Michael Van Valkenburgh Associates, Inc.

For total annual precipitation, please see Statistics Canada's *Weather Conditions in Capital and Major Cities*, http://www.statcan.gc.ca/tables-tableaux/sum-som/l01/cst01/phys08a-eng.htm

Environmental Benefit 4: Carbon sequestration and avoidance

Sequesters approximately 8,400 lbs of atmospheric carbon annually through the planting of 766 trees (see Appendix D).

To support the rich diversity of plant life, 11 soil profiles were used in the 1.7 million cubic feet of soil installed on top of the flood protection landform. Varying by number of layers, gradation and organic content, the layering systems used are:

- 3-layer profiles, consisting of sandy loam for nutrients, loamy sand for root development, sand for drainage, in all plant beds and trees.
- 2-layer profiles, consisting of sandy loam for nutrients and root development and coarse sand for drainage, in the lawns and prairie west of the FPL.
- 1-layer profile, consisting of loam was used for nutrients and root development, used in the marsh and urban prairie east of the FPL.

Calculations
Tree count by site visits conducted by Michael Van Valkenburgh Associates, Inc.

Utilized Toronto's Live Green assumptions that an average tree size of 6.4 inches in diameter sequesters approximately 11 pounds of carbon annually. GHGs reduced from planting trees (pounds) = 766 trees planted x 11 pounds/year = 8,426 pounds of carbon per year

Limitations
Calculations dependent on tree count from MVVA, Inc. Results not independently verified by researchers. Does not take into account tree size or species, which would provide a more accurate estimate of atmospheric carbon sequestered.

Sources
Michael Van Valkenburgh documents; 'Planting Plan'

Toronto's "LiveGreen Toronto Quantification Guide"
https://www1.toronto.ca/City%20Of%20Toronto/Environment%20and%20Energy/Programs%20for%20Residents/PDFs/Live%20Green%20Grants/Project%20Quantification%20Guidelines%202011.pdf

For planting soil plan, please refer to page 17-19 of *Organic Landscape Maintenance Guidelines* prepared by Michael Van Valkenburgh Associates, Inc., which may be accessed here: www.waterfrontoronto.ca/uploads/documents/20140909_donriver_omg_booklet_final_1.pdf

For Planting Soil profiles, please refer to 20-21 of the *Organic Landscape Maintenance Guidelines.*

For a comprehensive Maintenance Calendar, please refer to page 22-23 of the *Organic Landscape Maintenance Guidelines.*

Mather, L. W. (2014). *DESIGN SOLUTION*. Toronto.

Social Benefit 1: Recreational and social value

Serves as a neighborhood anchor, with 55% of 22 users coming from within 0.5 miles of the park.

Calculations
Please see Appendix C for detailed survey results including dates, times, weather, number of individuals approached, number of individuals who completed survey, and their responses.

Limitations
For University of Toronto conducted surveys, please see the methodology outlined below and in Appendix B and C as approved by the University of Toronto on May 31, 2016.

Our method was to interview visitors to three relatively new public parks along the Toronto waterfront, inquiring about their experience and perception of the parks and their context. We anticipate surveying a sample of 25 people per site over the course of a three-month period including June, July, and August 2016. Interviews were conducted on each site during a weekday afternoon and evening and during a weekend afternoon and evening. Our graduate research assistant approached individual subjects, identified herself as a researcher and asked subjects to participate in a voluntary interview designed to gauge the parks' social benefits. The interviews were anonymous and no personal data was collected.

Sources
Please see Appendix C-CSI survey results.

Economic Benefit 1: Construction cost savings
Saved an estimated $1.1 million in construction costs by reusing excess construction overburden rather than hauling it off-site.

Calculations
Calculations completed by Michael Van Valkenburgh Associates, Inc. All dollar values are in 2010 unit prices, when project was tendered.

<u>Actual Cost Avoided</u>
Cost to ship excess FPL overburden fill offsite: $30/$m^3$ x 73,500 m^3 = **$2,205,000**
: Converted to Imperial Measurements 1 m^3 = 35.31 /ft^3 73,500 m^3 = 2,595,630 ft^3
$30/$m^3$ = $30/35.31 = $.85/$ft^3$ $.85x2,595,630 = $2,205,293

Actual Cost Incurred
Cost to sculpt excess FPL overburden into park subgrade: $14.50/$m^3$ x 73,500 m^3 = **$1,065,750**
: Converted to Imperial Measurements 1 m^3 = $.41 /$ft^3$ @2,595,630 = $1,065,892

Traditional Alternative
Cost to import new park subgrade fill onsite = $45/$m^3$ x 73,500 m^3 = **$3,307,500**
: Converted to Imperial Measurements 1 m^3 = $1.27 /$ft^3$ @2,595,630 = $3,296,450

Savings
Actual: $2,205,000 - $1,065,750 = **$1,139,250**
Comparative: $3,307,500 - $1,065,750 = **$2,168,250**

Limitations
Does not take into consideration all costs incurred or avoided for all options for subgrade material. Estimates not independently verified by researchers.

Sources
Calculations and estimates provided by Michael Van Valkenburgh design team.

Appendix A - Resources

Barth, Brian. "Ground Swell." *Green building & design.* Accessed February 28, 2016. http://gbdmagazine.com/2015/ground-swell/

"Corktown Common." *Michael Van Valkenburgh Associates, Inc.* Accessed March 01, 2016. http://www.mvvainc.com/project.php?id=8

"Corktown Common park invigorates Toronto waterfront." *on-site Magazine.* July 16, 2014. Accessed February 24, 2016. http://www.on-sitemag.com/construction/corktown-common-toronto-waterfront/1003161501/

"Corktown Common" *WATERFRONToronto.* Accessed February 20, 2016. http://www.waterfrontoronto.ca/explore_projects2/west_don_lands/corktown_common

"Economic Impact Analysis (2001-2013)." Prepared for Waterfront Toronto by urbanMetrics inc. Accessed May 10, 2016. http://www.waterfrontoronto.ca/uploads/documents/economic_impact_analysis_2001_2013_1_1.pdf

Kalinowski, Tess. "Corktown Common a new style park in a new neighbourhood." *Toronto Star.* July 10, 2014. Accessed March 02, 2016. http://www.thestar.com/news/gta/2014/07/10/corktown_common_a_new_style_park_in_a_new_neighbourhood.html

"Live Green Toronto: Project Quantification Guidelines." Prepared for Toronto Environment Office. Accessed April 30, 2016. https://www1.toronto.ca/City%20Of%20Toronto/Environment%20and%20Energy/Programs%20for%20Residents/PDFs/Live%20Green%20Grants/Project%20Quantification%20Guidelines%202011.pdf

Reshaping Toronto's Waterfront. Editors Gene Desfor and Jennefer Laidley. Toronto: University of Toronto Press, 2011.

Stinson, Liz. "A Gorgeous Park Designed With a Double Purpose: Flood Protection." *WIRED*. August 25, 2014. Accessed February 29, 2016. http://www.wired.com/2014/08/a-gorgeous-park-designed-with-a-double-purpose-flood-protection/

Speckhardt, Lisa. "Landscapes over time." *Landscape Architecture Magazine*, March 14, 2013. Accessed July 3, 2016. https://landscapearchitecturemagazine.org/2013/03/14/landscapes-over-time/

Appendix B - Social Benefits - Oral interview guide

1. Methodology:
Our method is to interview visitors to three relatively new public parks along the Toronto waterfront about their experience and perception of the park and its context. We anticipate surveying a sample of twenty-five people per site over the course of a two-week period in June 2016. Interviews will be conducted on each site during a weekday afternoon and evening and during a weekend afternoon and evening. Our graduate research assistant will approach individual subjects, identify herself as a researcher and ask subjects to participate in a voluntary interview designed to gauge the park's social benefits. The interviews will be anonymous and no
personal data will be collected.

The interviews will address the following subjects:
• frequency of visits to the park
• distance from the interview subject's home
• whether the subject typically visits alone or as part of a group
• when the subject's visits to the park began
• the typical duration of the subject's visits
• the subject's activities at the park
• the subject's perception of the neighbourhood and waterfront and whether those perceptions changed since the opening of the park

Our study will also include a visual assessment of the numbers, ages and genders of people in the park. Our goal is to mirror this distribution in our interview sample.

2. Participants
The study aims to include a cross-sectional sample of people present in the park at any given moment. It is not intended to identify or study a particular group of park users. Participation is voluntary.

3. Potential harms
We are not aware of potential harms as the research method consists of a voluntary short interview (approximately five minutes) carried out in a public place.

4. Privacy and confidentiality
The interview will be anonymous and no personal information will be requested. We will inform potential subjects of these conditions when we ask them to participate.

5. Informed consent
We will ask for oral consent after we have explained the purpose and general outline of the interview. We will record consent in our notes before beginning the interview.

Oral consent record and interview guide

Date:
Site:
Weather condition:
Time of day:
Number of people in the park:
Approximate age distribution:
Approximate gender distribution:

Obtaining oral consent:
My name is --, and I am a graduate student in landscape architecture at the University of Toronto. May I talk with you about your experience of this park as part of a research study about its social benefits to the community? The study is anonymous and I will not ask for any personal information. You may stop the interview at any time.

Record of consent:
(indicated by researcher)

Interview questions:
How often do you visit the park?
How far is the park from where you live?
Do you usually come to the park by yourself or in a group?
When did you begin visiting the park?
How long do you usually stay?
What do you usually do here?
How do you perceive the neighbourhood and the waterfront?

Contact information regarding Case Study Investigation in Landscape Performance (to be given on 8.5" x 5" card to participants):

Thank you for your participation in our study about the social benefits of this park. If you have any questions about this anonymous research study you may contact the researchers at: landscapeperformance.utoronto@gmail.com. You can also contact the University of Toronto Office of Research Ethics (ethics.review@utoronto.ca, 416-946-3273), for confirmation that participant protection procedures have been followed consistent with:

www.research.utoronto.ca/wp-content/uploads/docments/2014/GUIDE-FOR-INFORMED-CONSENT-V-Oct-2014.pdf

This questionnaire was approved for use by the University of Toronto LAF Case Study Team by the University of Toronto on May 31, 2016.

Appendix C
Social Benefits - Oral interview results

Date:	June 12 2016					
Site:	**Corktown Common**					
Weather condition:	57 - 67 F, partially sunny & windy					
Time of day:	9:30am to 10:30am					
Number of people in the park:	unknown					
Approximate age distribution:	unknown					
Approximate gender distribution: F:M	unknown					
Record of consent	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**
How often do you visit the park?	7 times a week	7 times a week	7 times a week	7 times a week	7 times a week	first time
How far is the park from where you live?	within 2 km	within 2 km	within 2 km	within 2 km	within 2 km	>10000km
Do you usually come to the park by yourself or in a group?	on their own	on their own	on their own	on their own	on their own	on their own
When did you begin visiting the park?	2014	2014	2014	2014	2014	2016
How long do you usually stay? (minutes)	30-45	30-45	15-30	15-30	15-30	30
What do you usually do here?	dog walking	dog walking	dog walking	dog walking	dog walking	biking
How do you perceive the neighbourhood and the waterfront?	clean, quiet	clean, made for walking and biking	clean, made for walking and biking	clean, quiet	clean, quiet	clean, quiet

Date:	July 10 2016							
Site:	**Corktown Common**							
Weather condition:	63 - 84 F, sunny							
Time of day:	9:30am to 10:30am							
Number of people in the park:	unknown							
Approximate age distribution:	unknown							
Approximate gender distribution: F:M	unknown							
Record of consent	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**
How often do you visit the park?	7 times a week	7 times a week	once a week	once a week	7 times a week	once a week	more than twice a month	once a week
How far is the park from where you live?	>1km	>1km	>1km	>1km	>1km	>5km	>50km	>5km
Do you usually come to the park by yourself or in a group?	both	both	both	group	both	group	on their own	on their own
When did you begin visiting the park?	2014	2014	2015	2015	2016	2016	2015	2014
How long do you usually stay? (minutes)	30-60	30-60	30-60	15-60	15-60	15-30	30	30-45
What do you usually do here?	bringing kids to play & dog walking	bringing kids to play & dog walking	bringing kids to play	bringing kids to play	bringing kids to play & dog walking	break from biking	break from biking	walk
How do you perceive the neighbourhood and the waterfront?	safe, great for kids	safe, great for kids	safe, great for kids	safe, great for kids	safe, great for kids	safe at all times, safe to bike	safe at all times, safe to bike	safe, great to cool off in the trees

Date:	August 07 2016							
Site:	**Corktown Common**							
Weather condition:	63 - 84 F, sunny							
Time of day:	9:30am to 10:30am							
Number of people in the park:	unknown							
Approximate age distribution:	unknown							
Approximate gender distribution: F:M	unknown							
Record of consent	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**
How often do you visit the park?	once a month	once a month	once a month	once a week	once a month	once a month	once a week	twice a month
How far is the park from where you live?	> 15km	> 15km	>1km	>1km	>5km	>5km	> 15km	>10 km
Do you usually come to the park by yourself or in a group?	group	both	both	both	group	group	both	both
When did you begin visiting the park?	2010			2015			2016	2016
How long do you usually stay? (minutes)	60-120	60-120	120	30	30-60	30-60	30	30
What do you usually do here?	bike	bike	walk	bringing kids to play & dog walking	walk and hang out	dog walking	bringing kids to play & dog walking	bringing kids to play & dog walking
How do you perceive the neighbourhood and the waterfront?	Busier trails, but safer because people are learning how to use them	Busier trails, but safer because people are learning how to use them	Busier than before, safer, easy to get to	safe, great for kids	safe, great for kids	safe at all times, gorgeous to look at	safe, great for kids	safe, great for kids

Appendix D
Tree Species List

Acer rubrum (Red Maple)
Acer sachharinum (Silver Maple)
Acer saccharum (Sugar Maple)
Amelanchier laevis (Serviceberry)
Betula nigra (River Birch)
Carpinus carolinia (American Hornbeam)
Carya ovata (Shagbark Hickory)
Celtis occidentalis (Common Hackberry)
Cercis canadensis (Eastern Redbud)
Cladrastris kentukea (Yellowwood)
Cornus racemos (Gray Dogwood)
Fagus grandifolia (American Beech)
Gleditsia triancanthos var. Inermis (Thornless Honeylocust)
Gymnocladus dioicus (Kentucky Coffeetree)
Juniperus virginiana (Eastern Red Cedar)
Larix laricina (Tamarack)
Liriodendron tulipifera (Tulip Poplar)
Ostrya virginiana (American Hophornbeam)
Pinus strobus (White Pine)
Platanus occidentalis (Sycamore)
Populus deltoides (Eastern Cottonwood)
Populus tremuloides (Quaking Aspen)
Quercus macrocarpa (Bur Oak)
Quercus muehlenbergii (Chinkapin Oak)
Quercus rubra (Red Oak)
Quercus robur x. Q. alba (Crimson Spire Oak)
Quercus velutina (Black Oak)
Sassafras albidum (Sassafras)
Tilia americana 'Redbud' (Redmond Basswood)