



Green Infrastructure Retrofits on Private Land





New York City Soil & Water
Conservation District

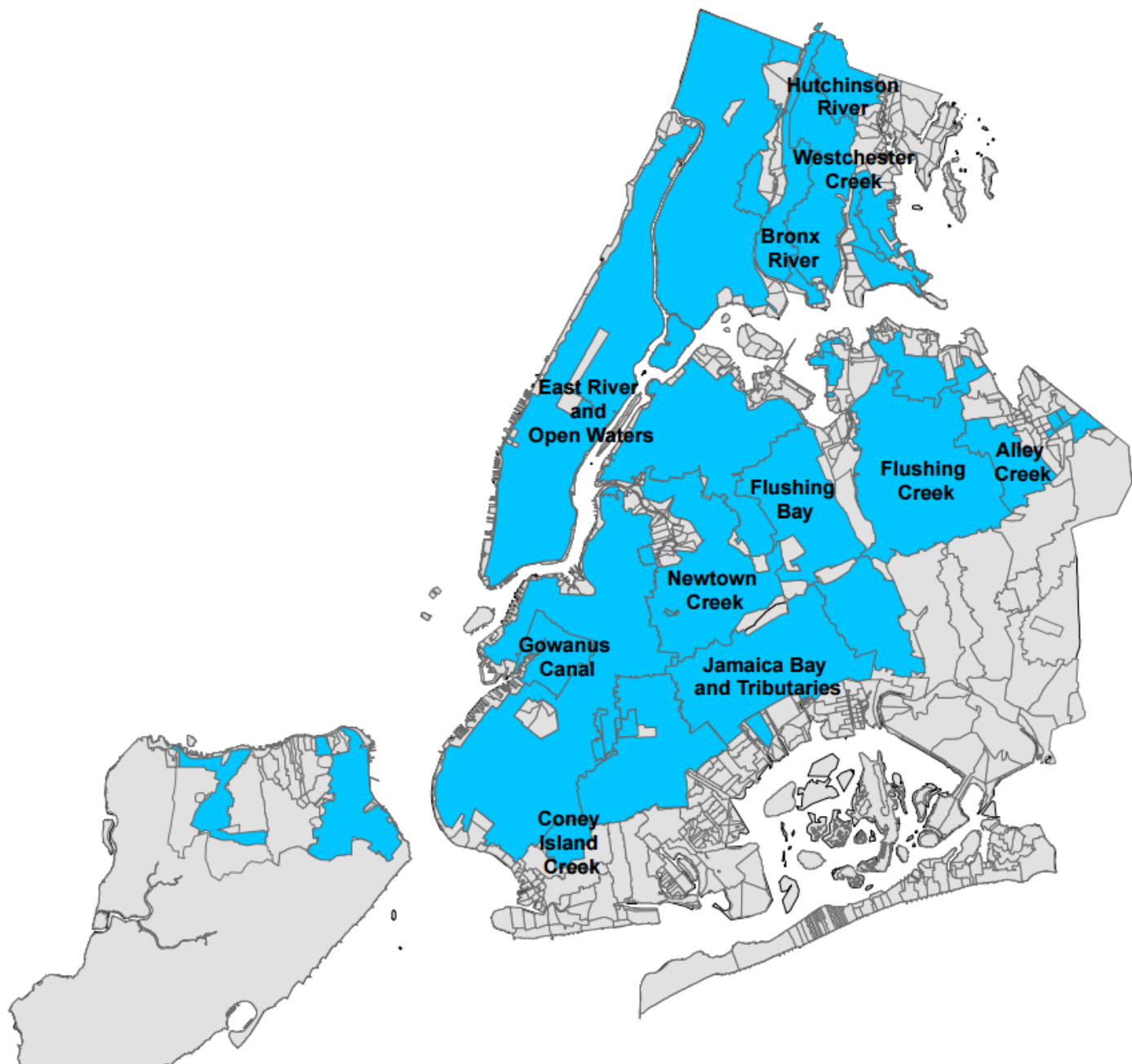
New York City Stats

- 305 Square Miles
- Population ~ 8.4 million
- Manhattan
 - Residential population ~1.5 million
 - Commuters ~1.6 million
 - Tourists ~ 800,000

New York City Stats

- **1.3 billion gallons per day of waste water**
- **14 waste water treatment plants**
- **>400 CSO outfalls**
- **Annual CSO discharges 27 billion gallons**
- **1/10" rain can trigger discharge**

-  Combined Sewer Watersheds
-  Other (Separate Sewers, Direct Drainage, Unsewered Areas)



New York City
CSO locations



Legend

CSO Locations

- Tier 1 (50%)
- Tier 2 (70%)
- Tier 3 (90%)

- Counties
- Major Cities



Source: NASA
via Flickr user, Flatbush
Gardener:
<http://www.flickr.com/photos/flatbushgardener/1877578094/>



SUSTAINABLE STORMWATER MANAGEMENT PLAN 2008

A GREENER, GREATER NEW YORK



The City of New York
Mayor Michael R. Bloomberg

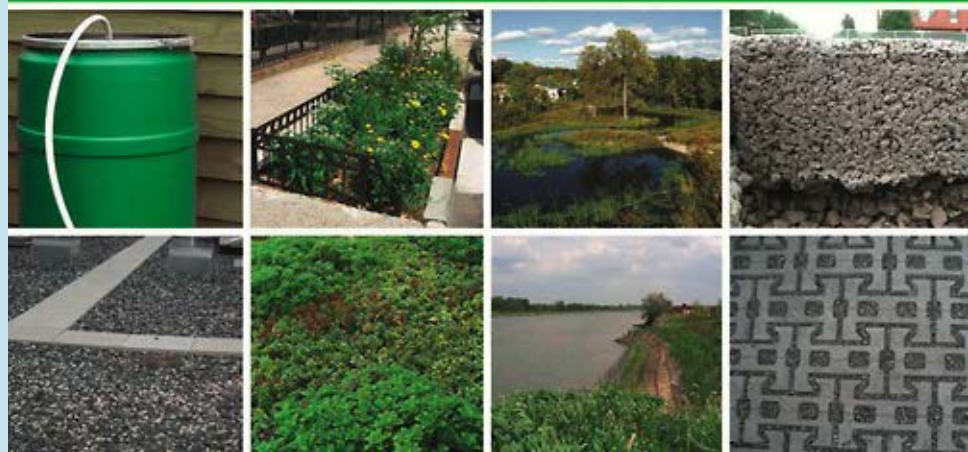


NYC GREEN INFRASTRUCTURE PLAN

A SUSTAINABLE STRATEGY FOR CLEAN WATERWAYS



Michael R. Bloomberg, Mayor
Cas Holloway, Commissioner



NYC GI Plan

- Only in CSO areas
- Right-of-Way bioswales
- Interagency collaboration & coordination
- Green Infrastructure Grants Program
- Greenroof Tax Abatement Program



District's GI Program

- **Implementation projects**
- **Policies**
- **Education and outreach**
- **Partnerships**



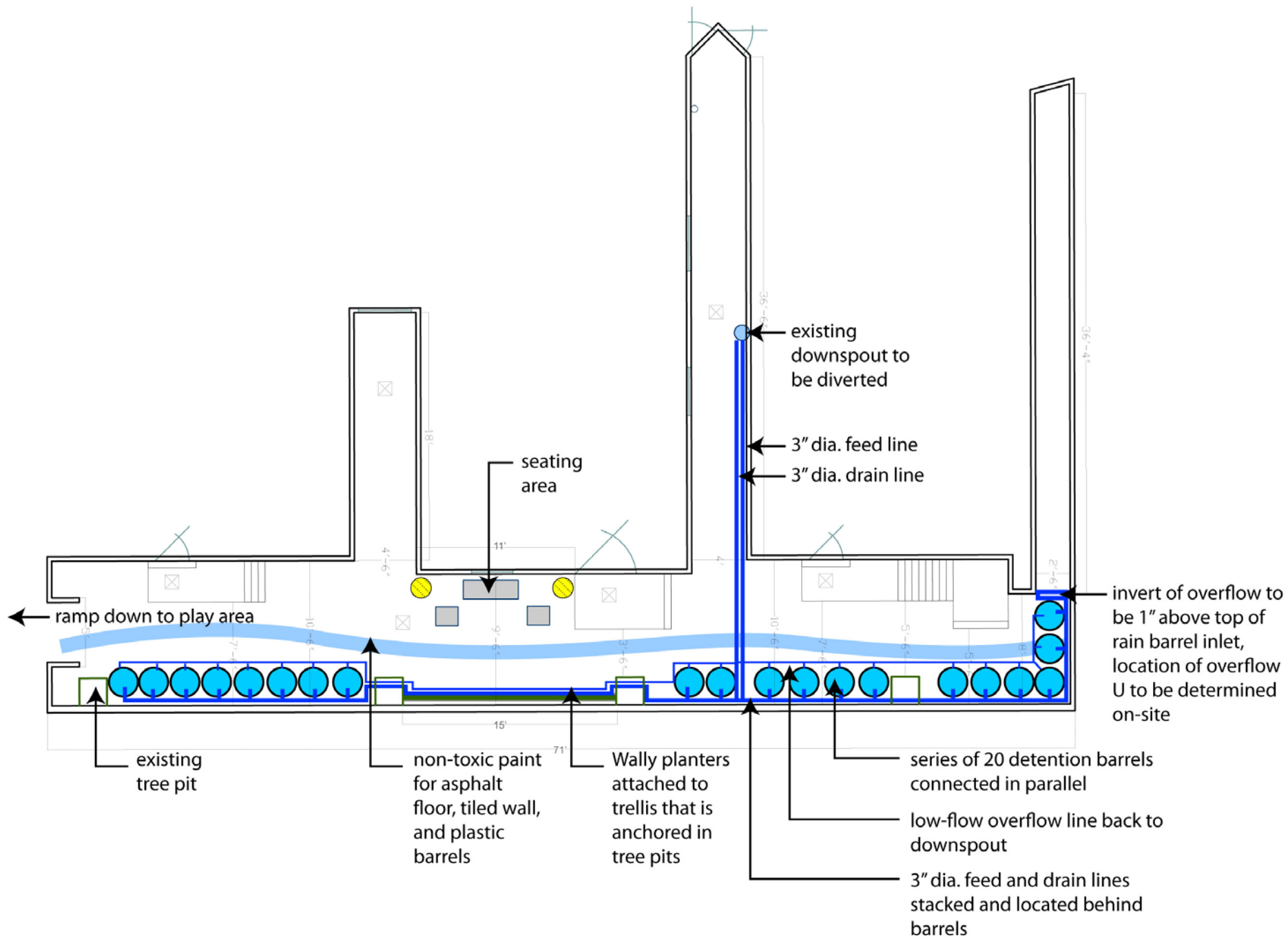
W 83rd Street, Manhattan

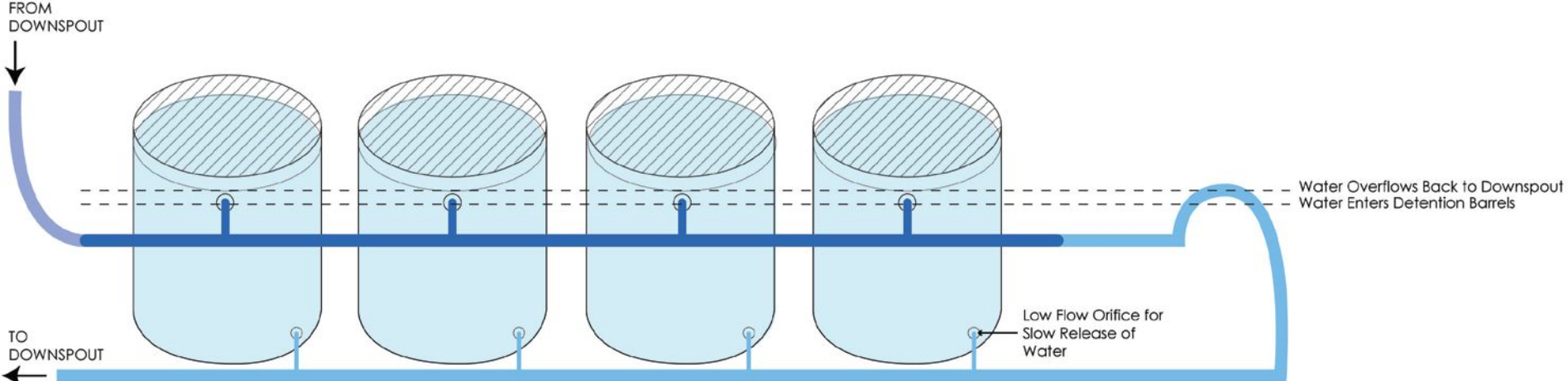
BEFORE



PROJECT CONSTRUCTED
June, 2010

AFTER





Rear Courtyard L.I.D. Project
122-130 West 83rd Street, NYC
RAIN BARREL SCHEMATIC

NYCSWCD
NEW YORK CITY SOIL AND WATER CONSERVATION DISTRICT



**STORMWATER FALLING ON 4,000SF IMPERVIOUS ROOF
CATCHMENT AREA WITHOUT LID DURING ONE-INCH STORM
= 2,493 gallons**

**LID MAXIMUM STORAGE VOLUME
= 900 gallons**

**% OF STORMWATER DETAINED DURING ONE-INCH STORM
= 36%**



W

A

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E

R

DO NOT USE THE WATER FOR DRINKING



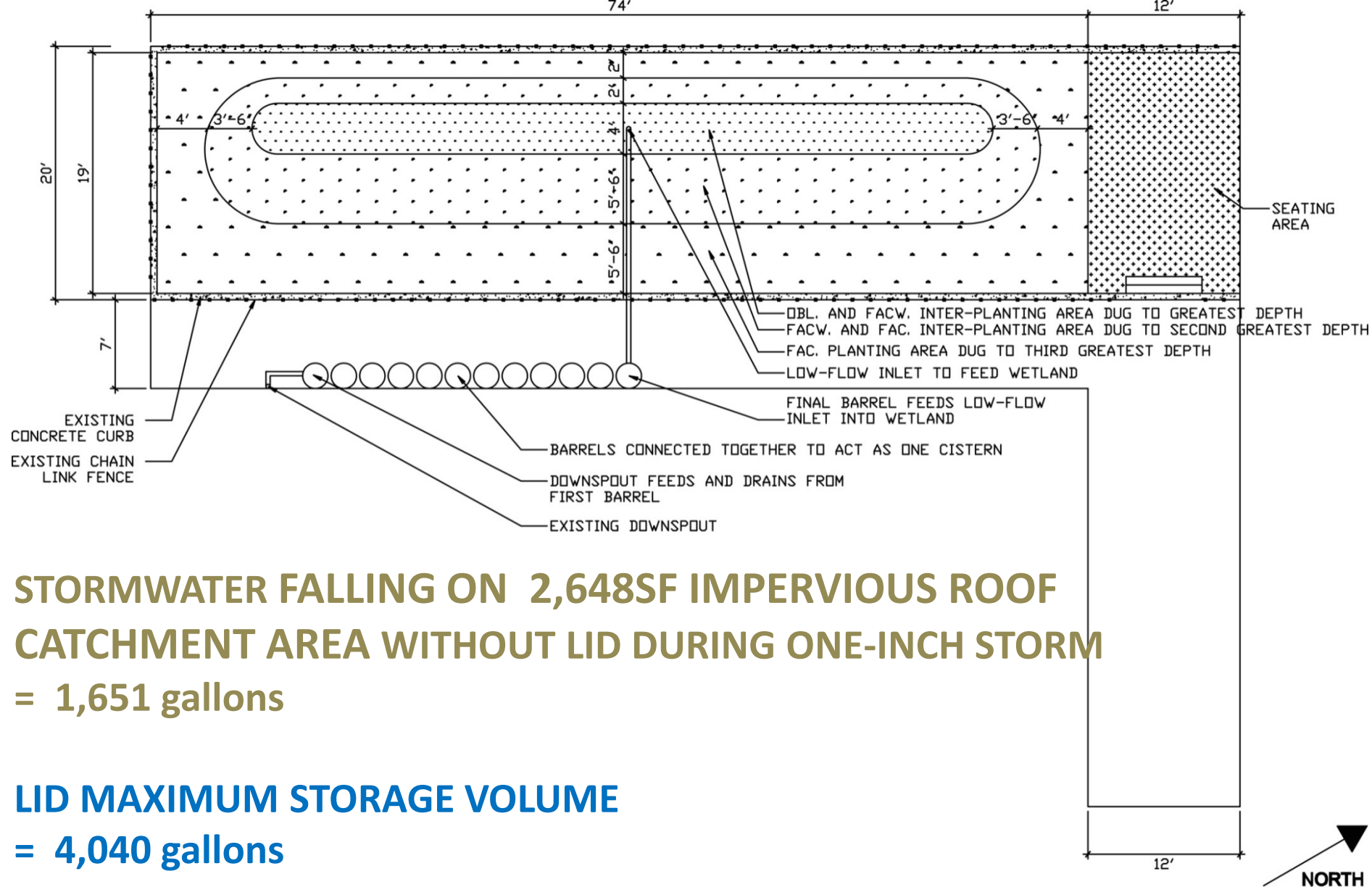
W150th Street, Manhattan

BEFORE



PROJECT CONSTRUCTED
July, 2010

AFTER



**STORMWATER FALLING ON 2,648SF IMPERVIOUS ROOF
CATCHMENT AREA WITHOUT LID DURING ONE-INCH STORM
= 1,651 gallons**

**LID MAXIMUM STORAGE VOLUME
= 4,040 gallons**

**% OF STORMWATER DETAINED DURING ONE-INCH STORM
= 100%**













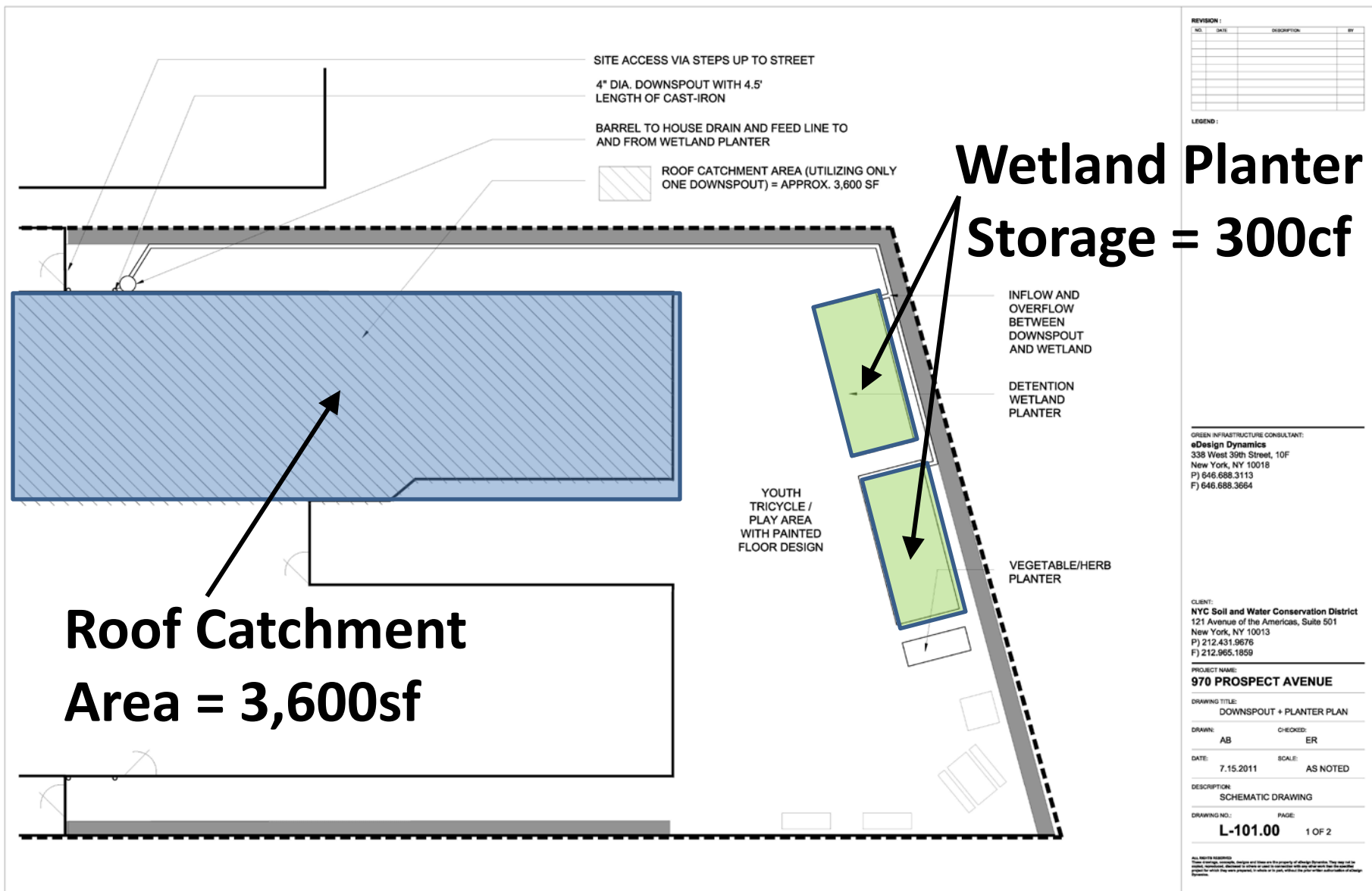
Prospect Ave, Bronx

BEFORE

PROJECT CONSTRUCTED
August, 2011



AFTER



REVISION:			
NO.	DATE	DESCRIPTION	BY

LEGEND:

GREEN INFRASTRUCTURE CONSULTANT:
eDesign Dynamics
 338 West 39th Street, 10F
 New York, NY 10018
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 F) 646.688.3664

CLIENT:
NYC Soil and Water Conservation District
 121 Avenue of the Americas, Suite 501
 New York, NY 10013
 P) 212.431.9676
 F) 212.965.1859

PROJECT NAME:
970 PROSPECT AVENUE

DRAWING TITLE:
DOWNSPOUT + PLANTER PLAN

DRAWN: **AB** CHECKED: **ER**

DATE: **7.15.2011** SCALE: **AS NOTED**

DESCRIPTION:
SCHEMATIC DRAWING

DRAWING NO.: **L-101.00** PAGE: **1 OF 2**

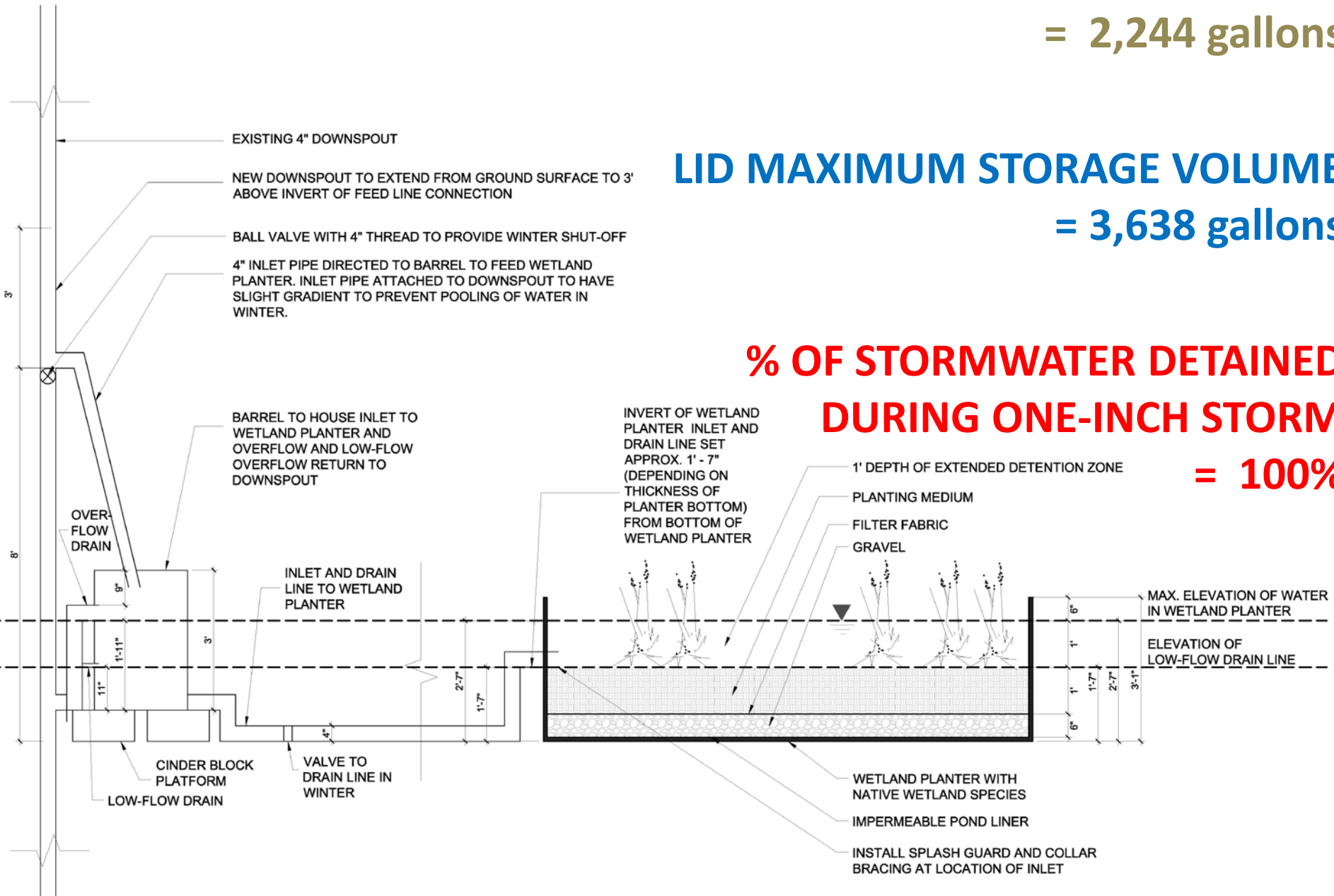
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STORMWATER FALLING ON 3,600SF IMPERVIOUS ROOF CATCHMENT AREA WITHOUT LID DURING ONE-INCH STORM

= 2,244 gallons

LID MAXIMUM STORAGE VOLUME
= 3,638 gallons

% OF STORMWATER DETAINED
DURING ONE-INCH STORM
= 100%







Feed line from roof downspout

Overflow return line to sewer

Low-flow return line to sewer

Feed line to wetland planters











Home Street, Bronx

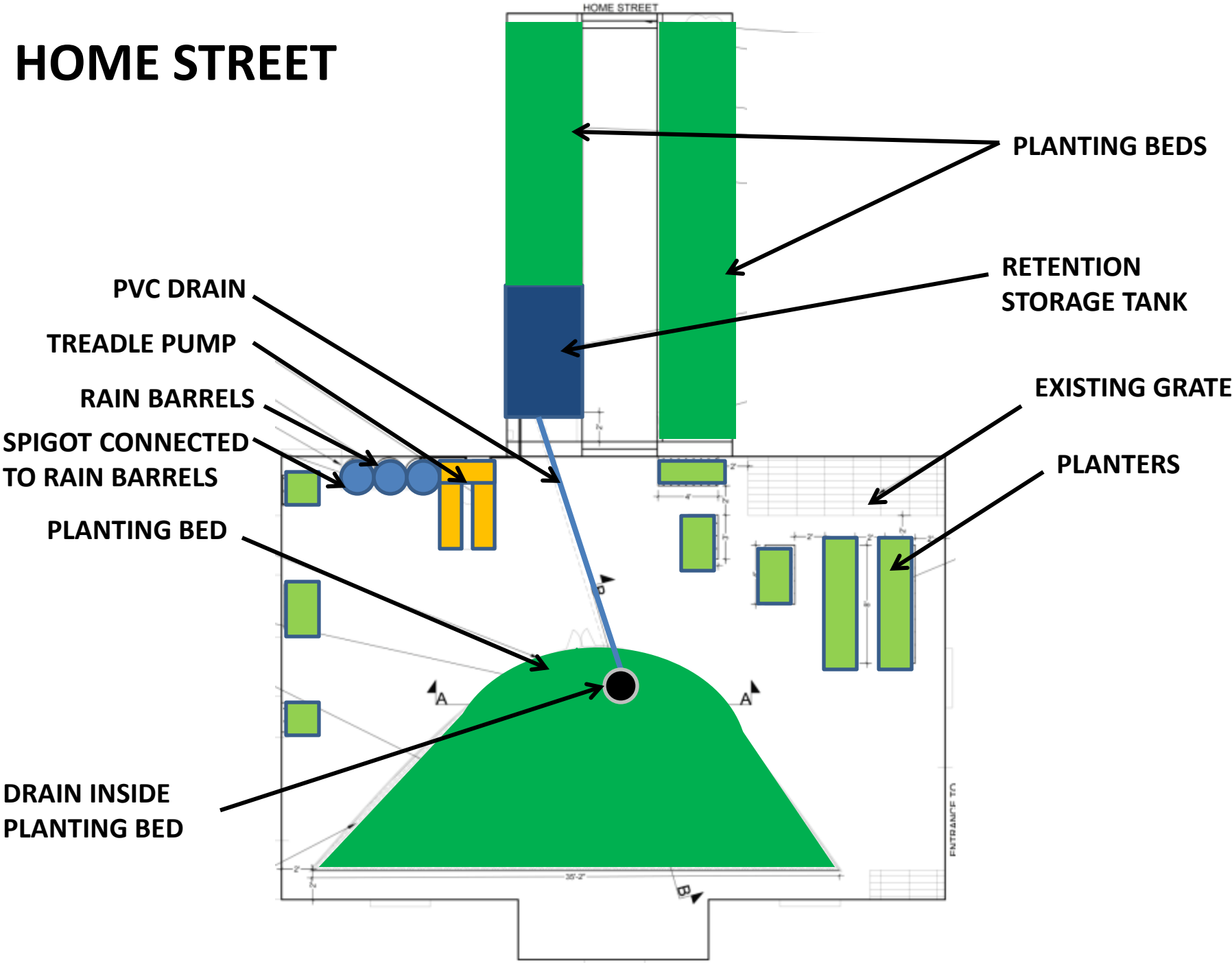
BEFORE



PROJECT CONSTRUCTED
May 2014

AFTER

HOME STREET



RAIN BARREL SCHEMATIC

TOTAL CATCHMENT AREA = 1,820 SF

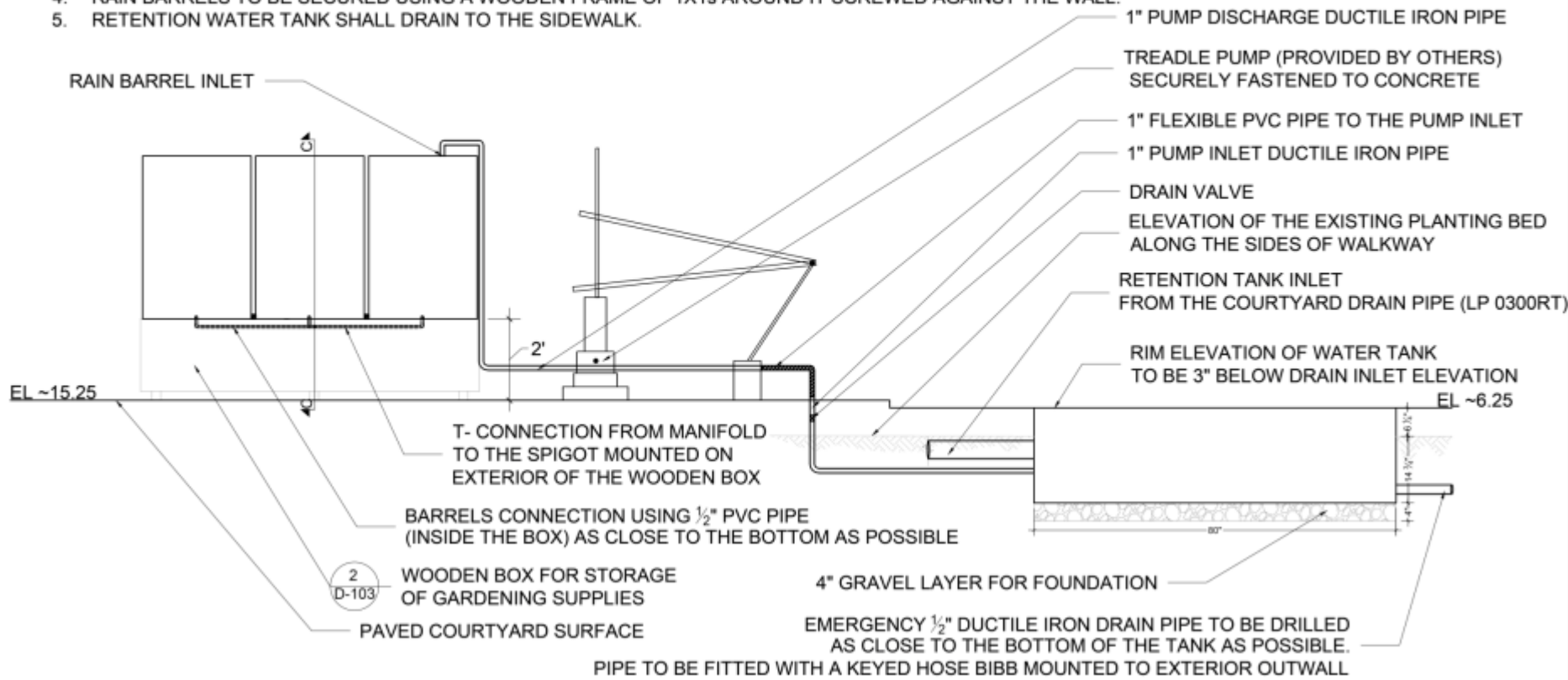
TOTAL RUNOFF FROM 1" STORM = 1,135 GALLONS

STORAGE VOLUME CAPACITY = 795 GALLONS

1" STORM MANAGED = 70%

NOTES:

1. THIS IS A SCHEMATIC REPRESENTATION AND DOES NOT REPRESENT ACTUAL ELEVATION OR POSITION IN THE FIELD.
2. ALL PIPE CONNECTIONS TO THE BARRELS SHOULD BE MADE WITH THREADED BULK HEAD FITTINGS AND GASKETS.
3. CONNECT THE CAST IRON PIPE TO THE PUMP SUCTION LINE USING FLEXIBLE CONNECTOR (FERNCO).
4. RAIN BARRELS TO BE SECURED USING A WOODEN FRAME OF 1X1s AROUND IT SCREWED AGAINST THE WALL.
5. RETENTION WATER TANK SHALL DRAIN TO THE SIDEWALK.







Challenges

- Limited opportunities
- Difficult access
- Harsh environmental conditions
- Bureaucracy
- Residents' involvement
- Maintenance

GI Policies

- Coalition & partnerships
- Policy analyses
- Public participation



GI Outreach & Education

- Tours of GI sites
- Workshops
- School visits
- Educational materials

