



Appendix A: Financial
Cost & Savings Data
Updated 23 September 2010

NYC GREEN CODES TASK FORCE

A REPORT TO MAYOR MICHAEL R. BLOOMBERG & SPEAKER CHRISTINE C. QUINN

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GREEN CODES TASK FORCE REPORT

Financial Cost & Savings Data of the Green Codes Task Force should be read in conjunction with the Executive Summary and the Full Proposals documents which can be found here:

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FINANCIAL COST & SAVINGS METHODOLOGY

Estimating the cost and savings of complying with the Task Force proposals presents a challenge, given the wide variety of building types and construction project scopes in New York City. A particular proposal could, for example, affect the renovation of a single bathroom in a townhouse quite differently than it would impact the construction of a new commercial skyscraper. It was thus necessary to develop a methodology for measuring costs and savings across the range of buildings and construction activities.

To assist the Task Force in estimating costs for proposals, the Mayor's Office of Economic Development (OED) researched methodologies used during code modifications in other cities and in the 2006 NYC Department of Building (DOB) code revision process. The OED selected DOB's methodology, which defined several prototypical buildings in which to assess the impact of code changes on construction costs.

The costing analysis developed by the OED utilized four of DOB's prototypes for new construction, which are a new commercial high-rise, a new residential high-rise, a new residential low-rise; and a new single family house. To evaluate all the Task Force proposals accurately, the OED also found it necessary to add four other prototypes: a new commercial low-rise, a renovation of a large commercial building (equivalent to the new commercial high rise), a renovation/tenant fit-out of a smaller commercial space (equivalent to the low-rise commercial), and a renovated apartment. Most proposals were evaluated in a subset of these eight prototypes, but all prototypes proved useful for some proposals.

The key assumptions used in the costing analysis are:

Only proposals involving hard or soft construction costs were evaluated in the cost analysis; proposals that recommended studies or administrative processes were not analyzed.

Costs were assessed according to 2009 prices using recent bids from the Bovis database, adjusted as necessary to account for price escalation.

Whenever there were a variety of potential compliance paths, it was assumed owners would follow the least expensive path. The cost of a more expensive compliance path was also evaluated if common in New York design or construction practice.

The analysis of the proposals included all direct costs required for compliance. For example, if changing a mechanical system required additional structural upgrades, those costs were included.

Only hard construction costs, including related construction markups, were included unless the proposal states that soft costs were also included.

The cost of each proposal was expressed both in absolute dollars and as a percentage of the overall project cost.

The costing analysis did not incorporate two considerations that would likely have reduced the estimated cost of many proposals. First, future market trends were not considered, although the cost of green code changes should reduce over time. Presently, green products and services represent a niche within the building construction industry, and this is reflected in their pricing. Codifying green practices should make them standard, leading to economies of scale and lower costs.

Second, the analysis did not assess cost reductions that may flow from building design trade-offs. In the Bovis analysis, each decision had to be treated in isolation. By contrast, in an actual design process, increases in the cost of one design element are weighed against potential savings from other design decisions. For example, improvements in the insulation of exterior building walls could permit downsizing of heating and cooling equipment, thus involving both cost increases and decreases. The Bovis cost estimates therefore provide a “worst case” metric.

Members of the Technical Committees calculated annual operational savings for those proposals where savings could be estimated with assurance - namely, the proposals relating to energy efficiency and water efficiency. Savings were analyzed with the same prototypes used for the cost analysis, so that cost and savings figures could be meaningfully compared. Savings from proposals that were difficult to monetize, such as improvements in health and productivity, were not evaluated.

OVERARCHING CODE ISSUES

Add Environmental Protection as Fundamental Principle of the Construction Codes

OC 1

(Old ID-CA 1)

Cost Analysis						
Proposed change to building code- no cost.						
Cost Analysis Detail						
Item #	Description	Quantity	Unit	Rate		Proposed Cost
						\$ -

Fully Enforce NYC's Construction Codes

OC 2

(Old ID-SC 1)

Cost Analysis							
Proposed change to building code- no cost.							
Cost Analysis Detail							
Item #	Description	Quantity	Unit	Rate			Proposed Cost
						\$	-

Don't Exempt Existing Buildings from Green Codes

OC 3

(Old ID-SC 4)

Cost Analysis							
Proposed change to building code- no cost.							
Cost Analysis Detail							
Item #	Description	Quantity	Unit	Rate			Proposed Cost
						\$	-

Reconvene The Green Codes Task Force

OC 4

(Old ID-SC 3)

Cost Analysis						
Proposal- no cost						
Cost Analysis Detail						
Item #	Description	Quantity	Unit	Rate		Proposed Cost
						\$ -

Develop Framework For Sustainable Landscape Practices

OC 5

(Old ID-SS 19)

Cost Analysis							
Code change-no costs, other than individual items indicated on specific proposals.							
Cost Analysis Detail							
Item #	Description	Quantity	Unit	Rate			Proposed Cost

Streamline Approvals for Green Technologies & Projects

OC 6

(Old ID-SC 5)

Cost Analysis							
Proposal-no costs							
Cost Analysis Detail							
Item #	Description	Quantity	Unit	Rate			Proposed Cost
							\$ -

Enhance Code Training for Architects & Engineers

OC 7

(Old ID-SC 2)

Cost Analysis						
Proposal- no costs						
Cost Analysis Detail						
Item #	Description	Quantity	Unit	Rate		Proposed Cost
						\$ -

HEALTH & TOXICITY

Limit Harmful Emissions From Carpets

HT 1
(Old ID-MVOC 2)

Cost Analysis						
This analysis covers all building types. Using LOW VOC products do not contribute to additional costs to the construction project, it is considered cost neutral. Updating code language, would contribute to minor administrative costs to make revisions. Architects and Interior Designers would need to incorporate these changes into their specifications to ensure compliance.						
Cost Analysis Detail						
Item #	Description	Quantity	Unit	Rate		Proposed Cost
	Limit emissions from Carpet	1.00	sf	\$ -		\$ -
	TOTAL COST FOR PROJECT:					\$ -

Limit Harmful Emissions From Paints & Glues

HT 2
(Old ID- MVOC 1)

Cost Analysis						
This analysis covers all building types. Using LOW VOC products do not contribute to additional costs to the construction project, it is considered cost neutral. Updating code language, would contribute to minor administrative costs to make revisions. Architects and Interior Designers would need to incorporate these changes into their specifications to ensure compliance.						
Cost Analysis Detail						
Item #	Description	Quantity	Unit	Rate		Proposed Cost
	Use low VOC products	1.00	sf	\$	-	\$ -
	TOTAL COST FOR PROJECT:					\$ -
	All Projects-no additional costs					

Restrict Cancer-Causing Chemicals In Building Materials

HT 3

(Old ID- MVOC 6)

Cost Analysis							
If this becomes code, the restrictions will become cost neutral over time as the market catches up and suppliers adjust. Prices presented here are current and only for when the proposal first becomes law.							
Type 1- Large Scale Commercial							
Item #	Description	Quantity	Unit	Rate			Proposed Cost
	Ground floor entry lobby-assume 100,000 Allowance for lobby millwork (\$40,000 material cost)						
1	No added formaldehyde composite woods	\$ 40,000	Allow	\$ 0		Premium for value of material only.	\$ 8,000
TOTAL PROJECT COST:							\$ 8,000
Type 2- Large Scale Residential							
Item #	Description	Quantity	Unit	Rate			Proposed Cost
	(KITCHEN CABS, BATH VANITIES)						
1	No added formaldehyde composite woods	288	units	100			28,800
2	Wood Trim	288	units	100		Premium for value of material only.	28,800
TOTAL PROJECT COST:							57,600
(108 SF PER UNIT, 6 UNIT/FLR, 48 FLOORS-total wood material only cost at \$500)							

Keep Street Contaminants Out of Buildings

HT 4

(Old ID- MVOC 4)

Cost Analysis						
Walk-off mats are additional cost to project both during construction and post construction. Post occupancy, generally, owners install these mats. Pricing below is assumed at 6' width and depth to cover size of (2) 3' doors. Assume a Pedimat system. No drain, assume cleaned out on a regular basis. Rates are INCLUSIVE of all labor and material required for the completion of the work indicated.						
Cost Analysis Detail: Residential Building Renovation (regardless of type)						
Use of Metal Grating						
Item #	Description	Quantity	Unit	Rate		Proposed Cost
	Excavation (6" deep, 6'					
1	width, 6' wide)	4.00	cyd	\$ 75.00	typical high rise	\$ 300.00
2	Cost for angle frame	36.00	sf	\$ 70.00		\$ 2,520.00
	TOTAL PROJECT COST:					\$ 2,820.00
	TOTAL COSTS FOR 2 EXITS					\$ 5,640.00

Filter Soot from Incoming Air

HT 05
(Old ID- EV 35)

Cost Analysis

For new construction, this proposal to require MERV 11 filters is cost neutral. In retrofit situations, it will often be cost neutral, and our panel recommends that if the proposal is implemented, an exception be granted if a licensed engineer affirms that the use of MERV 11 filters would require installing larger motors. With that understanding, we are presenting this proposal as cost neutral. (An earlier version of this analysis was mistakenly based on MERV 13 filters and small units like PTACs.)

Type 2-Large Scale Residential

Item #	Description	Quantity	Unit	Rate	Proposed Cost
	MERV 11 filters		cfm	\$ -	\$ -

Ensure Ventilation Airflow in Residences

HT 6

(Old ID-EV 38)

Cost Analysis						
This proposal makes an implicit code requirement explicit, and requires no work in addition to current acceptable practice. It merely makes it harder to fail to conform to code.						
Cost Analysis Detail						
Item #	Description	Quantity	Unit	Rate		Proposed Cost
						\$ -

Reduce Mold in Bathrooms

HT 7
(Old ID-MVOC 7)

Cost Analysis

Assume all areas per recommendation details. Restrooms, Shaftwalls (if drywall). Rate indicated below are all premium rates.

Cost Analysis Detail- 4 - Small Scale Commercial-New Construction-wet areas only

Item #	Description	Quantity	Unit	Rate	Floors	Proposed Cost
1	Mold Resistance GWB-Restrooms	1,376	sf	\$ 0.11	5	\$ 756.80
2	Shaftwalls	1,280	sf	\$ 0.11	6	\$ 844.80
TOTAL COST FOR PROJECT						\$ 1,601.60

Cost Analysis Detail- 1 - Large Scale Commercial Building

Item #	Description	Quantity	Unit	Rate	Floors	Proposed Cost
1	Mold Resistance GWB-Restrooms	1,376	sf	\$ 0.11	64	\$ 9,687.04
2	Shaftwalls	1,280	sf	\$ 0.11	64	\$ 9,011.20
TOTAL COST FOR PROJECT						\$ 18,698.24

Cost Analysis Detail- 2 - Large Apartment Building

1	Mold Resistance GWB-Restrooms	3,200	sf	\$ 0.11	44	\$ 15,488.00
2	Shaftwalls	880	sf	\$ 0.11	44	\$ 4,259.20
TOTAL COST FOR PROJECT						\$ 19,747.20

Cost Analysis Detail- H - 2 Bedroom/2 Bathroom Apartment

1	Mold Resistance GWB	410	sf	\$ 0.11		\$ 45.10
TOTAL COST FOR PROJECT						\$ 45.10

Improve Air Quality During and After Construction

HT 8
(Old ID- CP 4)

Cost Analysis	
Based on contractor surveys, the cost to cover and maintain ductwork protection is in the range of 0.5% to 1.5% of the typical mechanical contract amount.	
If permanent systems are run to provide ventilation while a jobsite is open, there should be no trade standby costs to operate the systems.	
There will be an incremental cost to cover return grilles with filter fabric. Assuming 1 return grill per 400 square feet, a 10,000 floor space would have 25 returns grilles requiring filters. If the filters are installed with the grilles, there should be no incremental cost for labor and the cost of material per grill will run about \$2.00 each, or about \$50 / 10,000 sf. Filters must be changed when dirty, so assume one filter change per month, requiring 2 sheet metal worker for 4 hours to complete the work – approximately \$1000 + \$50 in material for a total of \$1050.	

Type 1: Commerical High Rise						
Item #	Description	Quantity	Unit	Rate		Proposed Cost
1	Costs for 200 CFM Air filters	371.00	ea	\$ 235.00		\$ 87,185.00
2	Costs for replacement filters (2x's)	742.00	ea	\$ 40.00		\$ 29,680.00
3	Air sampling tests	74.00	ea	\$ 300.00		\$ 22,200.00
4	Flushout (see sub calc below)	1.00	ea	\$ 14,640.00		\$ 14,640.00
TOTAL CONSTRUCTION COSTS:						\$ 139,065.00

Type 2: High Rise Residential						
Item #	Description	Quantity	Unit	Rate		Proposed Cost
1	Costs for 200 CFM Air filters	78.00	ea	\$ 235.00		\$ 18,330.00
2	Costs for replacement filters (2x's)	156.00	ea	\$ 55.00		\$ 8,580.00
3	Air sampling tests	16.00	ea	\$ 300.00		\$ 4,800.00
4	Flushout	1.00	ea	\$ 6,024.00		\$ 6,024.00
TOTAL CONSTRUCTION COSTS:						\$ 37,734.00

Type 4: Commerical Low Rise						
Item #	Description	Quantity	Unit	Rate		Proposed Cost
1	Costs for 200 CFM Air filters	10.00	ea	\$ 235.00		\$ 2,350.00
2	Costs for replacement filters (2x's)	20.00	ea	\$ 55.00		\$ 1,100.00
3	Air sampling tests	2.00	ea	\$ 300.00		\$ 600.00
4	Flushout	1.00	ea	\$ 5,376.00		\$ 5,376.00
TOTAL CONSTRUCTION COSTS:						\$ 9,426.00

Flush out Calculations (small commercial)	Flush out Calculations (commercial)	Flush out Calculations (commercial)
50 kw	200 kw	1500 kw
0.18 cents	0.18 cents	0.18 cents
9 cost per kw/hr	36 cost per kw/hr	270 cost per kw/hr
24 hours	24 hours	24 hours
216 Cost for electricity	864 Cost for electricity	6480 Cost for electricity
3600 Supervisor	3600 Supervisor	3000 Operating Engineer
1560 Helper	1560 Helper	3600 Supervisor (Cxa)
5376	6024	1560 Helper
		14640

Phase Out Dirty Boiler Fuels

HT 9
(Old ID- MV 16)

Cost Analysis						
See process below for conversion to number 2 oil. No premiums for boiler with fuel limitations. Existing boilers are not required to be permitted on a regular schedule, although inspections occur in accordance with code requirements. No cost premium in new construction (small savings); all costs are for retrofits.						

Cost Analysis Detail-Retrofit of Large Scale Commercial						
Item #	Description	Quantity	Unit	Rate		Proposed Cost
1	Clean out existing tanks	80	hrs	\$ 85		\$ 6,800
2	Test tank after cleaning	32	hrs	\$ 85		\$ 2,720
	Replace burner (delta between					
3	-#6 & #2 oil Burners)	2	ea	\$ 500	(labor/material)	\$ 1,000
						\$ -
TOTAL COST FOR PROJECT						\$ 10,520

Cost Analysis Detail-Retro-Mid-Size Commercial						
Item #	Description	Quantity	Unit	Rate		Proposed Cost
1	Clean out existing tanks	40	hrs	\$ 85		\$ 3,400
2	Test tank after cleaning	16	hrs	\$ 85		\$ 1,360
	Replace burner (delta between					
3	-#6 & #2 oil Burners)	1	ea	\$ 500	(labor/material)	\$ 500
TOTAL COST FOR PROJECT						\$ 5,260

Cost Analysis Detail-Retro Large Scale Residential						
Item #	Description	Quantity	Unit	Rate		Proposed Cost
1	Clean out existing tanks	40	hrs	\$ 85		\$ 3,400
2	Test tank after cleaning	16	hrs	\$ 85		\$ 1,360
	Replace burner (delta between					
3	-#6 & #2 oil Burners)	1	ea	\$ 500	(labor/material)	\$ 500
TOTAL COST FOR PROJECT						\$ 5,260

Phase Out Toxic & Inefficient Light Fixture Components

HT 10

(Old ID-LD 10)

Cost Analysis					
If a situation arises where lights are mandated to be changed, the cost on a per fixture basis is indicated below. All NEW fixtures require electric ballasts. Pre-1979 (or lamps w/ PCB's or magnetic ballasts)					
Type 1: Large Scale Commercial Renovation (10 floors totaling 270,000 sf Only)					
Item #	Description	Quantity	Unit	Rate	Proposed Cost
Option 1					
1	Remove & replace Ballast & Lamp (8' FL Fixture-covers 50 sf per)	4,860.00	ea	\$ 200.00 (includes L&M)	\$ 972,000.00
2	Disposal fee (2 per fixture)	4,860.00	ea	\$ 2.00	\$ 9,720.00
TOTAL COST FOR PROJECT:					\$ 981,720.00
Option 2					
1	Remove & replace fixture (8' FL Fixture-covers 50 sf per)	4,860.00	ea	\$ 325.00 (includes L&M)	\$ 1,579,500.00
2	Disposal fee (2 per fixture)	4,860.00	ea	\$ 2.00	\$ 9,720.00
TOTAL COST FOR PROJECT:					\$ 1,589,220.00
Option 2 not used - cost of compliance sufficient.					

Type 1 savings:			
Floor area=	270,000	sf	
Standard lighting power density=	2.1	W/sf	
Use during	10 hour day,	5 days/week for	
=	1,474,200	kWh/yr	
Ballast replacement saves	50%	(Studies cited in proposal claim 17-485%)	
Net savings=	737,100	kWh/yr	
=	2.73	kWh/yr-sf	
Building financial savings=	\$154,791 /year at	\$0.21 /kWh	
=	\$0.573	/yr-sf	
Payback period=	6.34	years	

Type 4: Small Scale Commercial Renovation (Full example: 50,000 sf)					
Item #	Description	Quantity	Unit	Rate	Proposed Cost
1	Remove & replace Ballast (8' CF Fixture-covers 50 sf per)	900.00	ea	\$ 200.00 (includes L&M)	\$ 180,000.00
2	Disposal fee (2 per fixture)	900.00	ea	\$ 2.00	\$ 1,800.00
TOTAL COST FOR PROJECT:					\$ 181,800.00

Convene Task Force on Recycling Fluorescent Light Bulbs

HT 11

(Old ID-LD 3)

Cost Analysis						
This initiative is cost neutral.						
Cost Analysis Detail						
Item #	Description	Quantity	Unit	Rate		Proposed Cost
						\$ -

Reduce Oversized Batteries in Emergency Lighting

HT 12

(Old ID- LD 18)

Cost Analysis						
This measure refers only to emergency lighting, which is only on during emergencies. Cost savings come from reduced fixture density.						
Type 1: High Rise Commercial						
Item #	Description	Quantity	Unit	Rate		Proposed Cost
1	Stair & Corridor fixture Reduction	(173.00)	fix	\$ 200.00		\$ (34,600.00)
	TOTAL COST FOR PROJECT:	(reduction of fixture count)				\$ (34,600.00)
Type 2: High Rise Residential						
Item #	Description	Quantity	Unit	Rate		Proposed Cost
1	Stair & Corridor fixture Reduction	(100.00)	fix	\$ 200.00		\$ (20,000.00)
	TOTAL COST FOR PROJECT:	(reduction of fixture count)				\$ (20,000.00)
Type 4: Small Commercial Building						
Item #	Description	Quantity	Unit	Rate		Proposed Cost
1	Stair & Corridor fixture Reduction	(8.00)	fix	\$ 200.00		\$ (1,600.00)
	TOTAL COST FOR PROJECT:	(reduction of fixture count)				\$ (1,600.00)

Treat Corrosive Concrete Waste Water

HT 13
(Old ID-CP 1)

Cost Analysis						
Costs below based on 21 months of concrete pouring (foundations through topping out). Bovis' experience is that the cost of restoring clogged sewers (here taken as a credit) is much greater than the cost of containing the washout water.						
Type 1: Commercial High Rise						
Item #	Description	Quantity	Unit	Rate		Proposed Cost
	(based on 12 trucks)					
1	Truck applied concrete washout bucket	12.00	veh	\$ 1,400		\$ 16,800
2	On-Site Constructed (plywood washout box)	21	mos	\$ 4,120	(typical means-concrete operation at 21 months)	\$ 86,520
3	Chopping/Cleaning out of sewers	(84)	cleanouts	\$ 480		\$ (40,320)
TOTAL CONSTRUCTION COSTS (SAVINGS):						\$ 63,000

Reduce Red Tape for Asbestos Removal

HT 14

(Old ID-CP 7)

Cost Analysis					
Administrative procedure.					
Cost Analysis Detail					
Item #	Description	Quantity	Unit	Rate	Proposed Cost
					\$ -

Improve Stair Access

HT 15
(Old ID-PA 1)

Cost Analysis						
Type 1: Commercial High Rise (assume 1 full stair as accessible-incl. garage levels)-Base Compliance Only-Alternates below If building does not opt for floor by floor security there are no additional costs.						
Item	Description	qty	Unit	Cost	Total	Comments
1	Signage	66	ea	66.00	\$4,356.00	Additional signage at 8.5" x 11" would be \$66 per sign installed. This is using a permanent metal type sign.
2	Card readers	66	per	625.00	\$41,250.00	This is for access to individual floors
3	TOTAL (union based pricing)				\$45,606.00	
Item	Description	qty	Unit	Cost	Total	Comments
1	Access to stair					No costs
2	TOTAL					
Potential Alternates - Type 1						
1	Use Polyethylene signs	66	ea	2.43	160.38	In lieu of metal based
3	Use 1' x 2.5' vision glass	66	per	880.00	\$58,080.00	this is a PREMIUM ONLY, assume door costs, this cost is for extra to go to large fire rated glass opening
4	Fire Alarm Integration	1	ls	6000	\$6,000.00	No additional costs, programming change
High Rise Residential						
Item	Description	qty	Unit	Cost	Total	Comments
1	Signage	49	ea	66.00	\$3,234.00	Additional signage at 8.5" x 11" would be \$66 per sign installed. This is using a permanent metal type sign.
2	Card readers	49	per	625.00	\$30,625.00	This is for access to individual floors-if needed
5	TOTAL (union based pricing)				\$33,859.00	
6	TOTAL (Non-union based pricing)		(-35%)	\$11,850.65	22,008.35	
Potential Alternates-Type 2						
3	Use vision glass- all doors with 1'x 2.5' vision glass	49	per	880.00	\$43,120.00	This is a premium to door w/ no vision glass
4	Fire Alarm integration	1	ls	6000	\$6,000.00	This is a premium.
Type 5: Substantial Renovation to High Rise Commercial						
Item	Description	qty	Unit	Cost	Total	Comments
1	Signage	66	ea	66.00	\$4,356.00	Additional signage at 8.5" x 11" would be \$66 per sign installed. This is using a permanent metal type sign.
2	Card readers	66	per	625.00	\$41,250.00	This is for access to individual floors-if needed
5	TOTAL (union based pricing)				\$45,606.00	
6	TOTAL (Non-union based pricing)		(-35%)	\$15,962.10	29,643.90	

Encourage Stairway Use with Transparent Doors

HT 16

(Old ID-PA 3)

Cost Analysis						
Analysis done for renovation projects only as new construction would follow PA1/PA2. Based on 1 staircase being modified the entire length, pricing does not include a new door-rather a retrofit kit for adding and modifying existing doors.						
Type 5: Large Scale Commercial Renovation						
Item #	Description	Quantity	Unit	Rate		Proposed Cost
	Use 6 sf of fire rated vision glass					
1	(retrofit kit)	66	per	930.00	(Pricing for labor	\$ 61,380.00
	(based on on 6'-8" x 3' Door)				and vision glass kit)	
	TOTAL COST FOR PROJECT					\$ 61,380.00

Type 2: High Rise Residential						
Item #	Description	Quantity	Unit	Rate		Proposed Cost
	Use 6 sf of fire rated vision glass					
1	(retrofit kit)	49	per	930.00	(Pricing for labor	\$ 45,570.00
	(based on on 6'-8" x 3' Door)				and vision glass kit)	
	TOTAL COST FOR PROJECT					\$ 45,570.00

Type 1: Commercial High Rise						
Item #	Description	Quantity	Unit	Rate		Proposed Cost
	Use 6 sf of fire rated vision glass					
1	(retrofit kit)	66	per	930.00	(Pricing for labor	\$ 61,380.00
	(based on on 6'-8" x 3' Door)				and vision glass kit)	
	TOTAL COST FOR PROJECT					\$ 61,380.00

Promote Stair Use Through

HT 17
(Old ID-PA 2)

Cost Analysis						
This proposal requires the implementation of signage; costs shown are minimal compared to building construction costs.						
Type 1 - Commercial High Rise						
Item #	Description	Qty	Unit	Rate		Proposed Cost
1	Signage	66	ea	\$ 66	Additional signage at 8.5" x 11" would be \$66 per sign installed. This is using a permanent metal type sign.	\$ 4,356

Type 2 - Residential High Rise						
Item #	Description	Qty	Unit	Rate		Proposed Cost
1	Signage	49	ea	\$ 66	Additional signage at 8.5" x 11" would be \$66 per sign installed. This is using a permanent metal type sign.	\$ 3,234

Type 1 - Small Commercial						
Item #	Description	Qty	Unit	Rate		Proposed Cost
1	Signage	6	ea	\$ 66	Additional signage at 8.5" x 11" would be \$66 per sign installed. This is using a permanent metal type sign.	\$ 396

Encourage Stairway Use by Holding Doors Open

HT 18

(Old ID-PA 5)

Cost Analysis						
This is an allowance not a requirement, therefore there are no associated costs.						
Cost Analysis Detail						
Item #	Description	Quantity	Unit	Rate		Proposed Cost
						\$ -

Provide Zoning Bonus For Inviting Staircases

HT 19

(Old ID-PA 4)

Cost Analysis						
No hard costs for this initiative						
Cost Analysis Detail						
Item #	Description	Quantity	Unit	Rate		Proposed Cost
						\$ -

Increase Availability of Drinking Fountains

HT20

(Old ID-W10)

Cost Analysis						
Based on 1st and 2nd floor of the large scale commercial example being zoned as Mercantile. Does not apply to the offices spaces above. Actual quantity is based on occupancy counts.						
Type 1: Cost Analysis Detail High Rise Commercial						
Item #	Description	Quantity	Unit	Rate		Proposed Cost
1	Water Fountains (non-cooled)	2	ea	\$ 650.00		\$ 1,300.00
2	Water Piping (supply)	9	lf	\$ 15.00		\$ 134.09
3	Waste Lines	10.73	lf	\$ 18.00		\$ 193.09
TOTAL COSTS TO PROJECT:						\$ 1,627.18
No water savings associated with this proposal.						

ENERGY & CARBON EMISSIONS: FUNDAMENTALS

Simplify Commercial Energy Code to Current ASHRAE 90.1

EF 1

(Old ID EV 24)

Cost Analysis						
<p>We did not assume any additional costs to move to the newest version of ASHRAE 90.1 because the state currently is required to do so under requirements for ARRA funding. The proposal to simplify can decrease soft costs by creating uniformity. Alternatively it could increase costs for some projects because it limits flexibility. On balance, we assume this proposal has no cost impacts.</p>						
Cost Analysis Detail						
Item #	Description	Quantity	Unit	Rate		Proposed Cost
						\$ -

Build New Homes to Energy Star® Standard

EF 2
(Old ID-H2)

Cost Analysis						
Require NYC homes to be built/retrofitted according to Energy Star Homes Standards. No significant construction cost increment is expected, and there will be substantial savings in operating expenses.						
Cost Analysis Detail-Type H						
Item #	Description	Quantity	Unit	Rate		Proposed Cost
1	Perform Energy Star Inspection	1.00	Is	\$4,300.00	(premium based on recommendation)	\$4,300.00

Limit Heat Loss Through Exterior Walls

EF 3

(Old ID-EV 10)

Cost Analysis

Costs were reviewed as per square foot premiums. Square foot costs indicated are facade areas only (less storefront). Wall types that were priced include: Curtain Wall (40%, 52.5% and 65% vision glazing). WindowWall (40%, 52.5%, 65% vision glazing) and Brick & Block (40, 52.5%, punch window glazing). Exposed Slab edge (30% punch window glazing). Typical construction utilizes double glazing with low emissivity coatings, argon fill, and moderately thermally broken aluminum mullions. It was assumed that the 52.5% glazing represents the mid-range of options where one could either improve mullion or upgrade glass. Baseline (CW with 40% Glazing) glass assumed is similar to Viracon VE1-2M High Performance Glass. Please see EV-10 Envelope Technical Summary for further explanation of types.

Also assumed in the costs presented are any additional structural or construction measures required to consider these wall types. Market factors were not considered in these cost evaluations, but may affect overall pricing.

1. Cost Analysis Detail-Large Scale Commercial

Item #	Description	WALL Quantity	Unit	Rate		Proposed Cost
1	Curtain Wall w/ 40% Glazing	576,180	sf	\$0.00	baseline complies	\$0.00
2	Curtain Wall w/ 52.5% Glazing	576,180	sf	\$9.38	premium	\$5,401,687.50
3	Curtain Wall w/ 65% Glazing	576,180	sf	\$16.63	premium	\$9,578,992.50

Savings and payback estimates: Type 1: Large Commercial

Total Fuel Savings:	12,740	MMBtu/yr
Fuel Savings/SQFT:	6865	Btu/sf/yr
Total Electric Savings:	307,000	kWh/yr
Electric Savings/SQFT:	0.17	kWh/sf/yr
Total Dollar Savings:	\$421,000	/yr
Dollar savings/SQFT:	\$0.227	/yr
Simple Payback:	12.8	yr

Based on heating fuel and electricity decrease calculated from decrease in U-value from 0.45 to 0.25; no infiltration or solar gain credit.

2. Cost Analysis Detail-Large Scale Residential

Item #	Description	Quantity	Unit	Rate		Proposed Cost
1	Curtain Wall w/ 40% Glazing	164,160	sf	\$0.00	baseline complies	\$0.00
3	Curtain Wall w/ 65% Glazing	164,160	sf	\$16.00	premium	\$2,626,560.00
4	Window Wall with 40% Glazing	164,160		\$0.00	baseline complies	\$0.00
6	Brick & Block w/40% Glazing	164,160	sf	\$10.00	premium	\$1,641,600.00
7	Brick & Block-Eyebrow w/30% Glazing	164,160	sf	\$7.50	premium	\$1,231,200.00

4. Cost Analysis Detail-Mid-Size Commercial

Item #	Description	Quantity	Unit	Rate		Proposed Cost
1	Curtain Wall w/ 40% Glazing	31,590	sf	\$0.00	baseline complies	\$0.00
2	Curtain Wall w/ 52.5% Glazing	31,590	sf	\$9.00	premium	\$284,310.00
3	Curtain Wall w/ 65% Glazing	31,590	sf	\$17.00	premium	\$537,030.00
4	Window Wall with 40% Glazing	31,590	sf	\$9.00	baseline complies	\$0.00
5	Window Wall with 52.5% Glazing	31,590	sf	\$25.00	premium	\$789,750.00
6	Brick & Block w/40% Glazing	31,590	sf	\$10.00	premium	\$315,900.00
7	Brick & Block-Eyebrow w/30% Glazing	31,590	sf	\$7.50		\$236,925.00

Promote Super-Insulated Exterior Walls

EF 4
(Old ID EV 15)

Cost Analysis							
An allowance, not a requirement, so no cost calculated.							
Cost Analysis Detail							
Item #	Description	Quantity	Unit	Rate			Proposed Cost

Allow External Insulation Beyond Zoning Limits

EF 5
(Old ID-EV 12)

Cost Analysis						
An allowance, not a requirement, so no cost calculated						
Cost Analysis Detail						
Item #	Description	Quantity	Unit	Rate		Proposed Cost
						\$ -

Increase Allowable Size of Solar Shades

EF 6
(Old ID- EV 14)

Cost Analysis						
An allowance, not a requirement, so no cost calculated						
Cost Analysis Detail						
Item #	Description	Quantity	Unit	Rate		Proposed Cost
						\$ -

Minimize Air Leakage Through Building Exteriors

EF 7
(Old ID-EV 9.5)

Cost Analysis						
Standard curtain wall construction will have satisfactory air barrier qualities. This proposal would require significant details for non curtain wall construction. For ease of comparison we have converted the costs to a SF equivalent. The SF cost is a premium above standard costs. For CW example, it was assumed that additional gasketing would be applied between panels, and additional "taping" or caulking to create a continuous seal to satisfy requirements for continuous air barrier.						
Cost Analysis Detail-Mid-Size Commercial Type 4						
Item #	Description	Quantity	Unit	Rate		Proposed Cost
1	Tape for Curtain Wall w/ 40% Glazing	31,590	sf	\$5.00	TOTAL	\$157,950.00
2	Tape for Masonry/CMU/Punch 40%	31,590	sf	\$3.00	TOTAL	\$94,770.00

Cost Analysis DetailHigh Rise Commercial - Type 1						
Item #	Description	Quantity	Unit	Rate		Proposed Cost
1	Tape Curtain Wall w/ 40% Glazing	576,180	sf	\$1.50	TOTAL	\$864,270.00

Savings and payback estimates: Type 1: Large Commercial			
	Total Fuel Savings:	3,900	MMBtu/yr
	Fuel Savings/SQFT:	2102	Btu/sf/yr
	Total Electric Savings:	259,000	kWh/yr
	Electric Savings/SQFT:	0.14	kWh/sf/yr
Area	Total Dollar Savings:	\$163,000	/yr
1,855,700	Dollar savings/SQFT:	\$0.088	/yr
	Simple Payback:	5.3	yr
Based on a 5% reduction in both heating fuel and AC electricity			

Provide Window Screens to Encourage Natural Ventilation

EF 8

(Old ID- CA 10)

Cost Analysis						
Costing assumptions: Assume window screens on floors 7 and below; additional cost of screen included in new window units.						
Type 2: Residential High Rise						
Item #	Description	Quantity	Unit	Rate		Proposed Cost
1	Window Screens	2,814.00	sf	\$5.00	30 sf window	\$14,070.00
						\$14,070.00
Type H: One Family Home						
Item #	Description	Quantity	Unit	Rate		Proposed Cost
1	Window Screens	240.00	sf	\$3.75	30 sf window	\$900.00
	Assume 13 windows					\$900.00

Ensure Operable Windows in Residential Buildings

EF 9

(Old ID- CA 7)

Cost Analysis							
Since this is an enforcement issue, incremental cost is zero.							
Cost Analysis Detail							
Item #	Description	Quantity	Unit	Rate			Proposed Cost
							\$ -
							\$ -

Reduce Artificial Lighting in Sunlit Spaces

EF 10
(Old ID-LD 8)

Cost Analysis						
<p>Option 1 involves more sophisticated Daylight harvesting which would require sensors, dimmable ballasts, control stations & programming (computer monitored) to over-ride in different scenarios. Life cycle savings should be considered to offset the additional costs associated with these sophisticated electrical systems. For simplicity, we have created a SF cost for this type system. Although the calculation will be done for all 56 floors, it would likely only be implemented on higher floors in a downtown neighborhood. However, all calculations scale, so the results are essentially independent of the number of floors actually used (as long as they actually receive daylight).</p>						
Type 1: Commercial High Rise						
Item #	Description	Quantity	Unit	Rate		Proposed Cost
1	Daylight responsive controls (full system, based on floors 2-57, 9500 SF/Floor)	532,000	sf	\$2.50	Option 1	\$1,330,000.00
	Option 1 cost for system only in illuminated area:	277,092	sf		Option 1	\$692,730.72
Type 1 savings:						
	Floor plate (first floor) area=	9,500 sf	of which	15 ft	naturally illuminated perimeter gives	
	=	4948 sf			52% will receive adequate outdoor light to be equipped.	
	Standard lighting power density=	1.1 W/sf				
	Use during	10 hour day,		5 days/week	for	
	=	14,151 kWh/yr	w/o daylighting controls			
	Sunlight available	70% of occupied time				
	Reduction of	60% possible when sunlight available				
	Net savings=	5,944 kWh/yr	per floor	56 floors		
	=	0.63 kWh/yr-sf				
	Building financial savings=	\$69,897 /year	at	\$0.21	/kWh	
	=	\$0.131 /yr-sf				
	Payback period=	10 years				

Type 4: Small Commercial						
Item #	Description	Quantity	Unit	Rate		Proposed Cost
1	Daylight responsive controls (Reductions taken for core, common areas @ ground)	28,500.00	sf	\$2.50	Option 1	\$71,250.00

Reduce Summer Heat with Cool Roofs

EF 11
(Old ID-SS11)

Cost Analysis						
Using low SRI materials (white in lieu of black) is nominal from a cost perspective. As example Hanover Pavers standard color charts are LEED accepted for SRI levels and allow for a high albedo. NYC Building code already regulates white roofs as standard, this proposal is a modification of that existing requirement.						
Cost Analysis Detail						
Item #	Description	Quantity	Unit	Rate		Proposed Cost
1	Use Low SRI Materials	-		\$ -		\$ -

Reduce Summer Heat with Cool, Shady Building Lots

EF 12

(Old ID-SS12)

Cost Analysis							
Using low SRI materials (white in lieu of black) is nominal from a cost perspective and in most cases avoided during purchasing.							
Cost Analysis Detail							
Item #	Description	Quantity	Unit	Rate			Proposed Cost
1	Use Low SRI Materials	-		\$ -			\$ -

Clarify Standards For Attaching Rooftop Solar Panels

EF 13

(Old ID- EV 33)

Cost Analysis						
This code change will not increase costs and may decrease them.						
Cost Analysis Detail						
Item #	Description	Quantity	Unit	Rate	Proposed Cost	
					\$	-

Allow Large Solar Rooftop Installations

EF 14

(Old ID-EV 34)

Cost Analysis						
This code change will not increase costs and may decrease them.						
Cost Analysis Detail						
Item #	Description	Quantity	Unit	Rate		Proposed Cost
						\$ -

Remove Zoning Impediments to Alternative Energy

EF 15
(Old ID-H3)

Cost Analysis							
This is a code/zoning issue and involves administrative costs to update zoning resolution and code. As an allowance, it will not increase project costs.							
Cost Analysis Detail							
Item #	Description	Quantity	Unit	Rate			Proposed Cost
							\$ -

Remove Landmarks Impediments to Alternative Energy

EF 16

(Old ID-H4)

Cost Analysis								
This is a code/zoning issue and involves administrative costs to update zoning resolution and code. As an allowance, it will not increase project costs.								
Cost Analysis Detail								
Item #	Description	Quantity	Unit	Rate				Proposed Cost
								\$ -

Cost Analysis						
This would not have installation cost impacts, nor would it be required, therefore no impact to existing building stock. Potential costs would be associated with scrubber type systems.						
Cost Analysis Detail						
Item #	Description	Quantity	Unit	Rate		Proposed Cost
						\$ -

ENERGY & CARBON EMISSIONS: OPERATIONS & MAINTENANCE

Re-tune Large Buildings Every Seven Years

EO 1
(Old ID-EV 4)

Type 5: Cost Analysis Detail-Large Scale Renovation (commercial)

Item #	Description	Quantity	Unit	Rate	Proposed Cost
1	Retrocommissioning	1,855,700	sf	\$ 0.30	\$ 556,710.00
TOTAL COST FOR PROJECT:					\$ 556,710.00

Type 1: New Commercial High Rise

Item #	Description	Quantity	Unit	Rate	Proposed Cost
1	Retrocommissioning	1,855,700	sf	\$ 0.30	\$ 556,710.00
TOTAL COST FOR PROJECT:					\$ 556,710.00
TOTAL OVR 100 YRS					\$ 7,793,940.00

Savings and payback estimates: Type 1: Large Scale Commercial

	Total Fuel Savings:	2,700	MMBtu/yr
	Fuel Savings/SQFT:	1455	Btu/sf/yr
	Total Electric Savings:	533,000	kWh/yr
	Electric Savings/SQFT:	0.29	kWh/sf/yr
Area	Total Dollar Savings:	\$188,000	/yr
1,855,700	Dollar savings/SQFT:	\$0.101	/yr
	Simple Payback:	3.0	yr

Based on a 3.5% reduction in both fuel and electricity

Type 2: Residential High Rise

Item #	Description	Quantity	Unit	Rate	Proposed Cost
1	Retrocommissioning	391,527	sf	\$ 0.30	\$ 117,458.10
TOTAL COST FOR PROJECT:					\$ 117,458.10
TOTAL OVR 100 YRS					\$ 1,644,413.40

Type 4: Commercial Low Rise

Item #	Description	Quantity	Unit	Rate	Proposed Cost
1	Retrocommissioning	50,000	sf	\$ 0.30	\$ 15,000.00
TOTAL COST FOR PROJECT:					\$ 15,000.00
TOTAL OVR 100 YRS					\$ 210,000.00

Measure Electricity Use in Tenant Spaces

EO 2
(Old ID- EV 1)

Cost Analysis						
This proposal requires electric metering for any tenant occupying an entire floor or occupying 10,000 sf or more. We took a conservative approach assuming an average of four (4) tenants per floor. Actual meter costs vary substantially based on functionality of meter. The unit pricing below reflects a mid range meter.						
Type 1: Cost Analysis Detail-Large Scale Commercial						
Item #	Description	Quantity	Unit	Rate	Utility Co	Sub-Metering
1	Electric sub Metering (4 per flr) (meter, CT's, Software, Installation)	236	ea	\$2,200	\$571,120	\$519,200
TOTAL COST FOR PROJECT:					\$571,120	\$519,200

Savings and payback estimates - Type 1: Large Scale Commercial		
Total Fuel Savings:	0	MMBtu/yr
Fuel Savings/SQFT:	0	Btu/sf/yr
Total Electric Savings:	813,000	kWh/yr
Electric Savings/SQFT:	0.438109608	kWh/sf/yr
Total Dollar Savings:	\$170,687	/yr
Dollar savings/SQFT:	\$0.092	/yr
Simple Payback:	3.0	yr
Based on a 2.5% reduction in use in metered spaces		

Type 4: Cost Analysis Detail-Mid-Size Commercial						
Item #	Description	Quantity	Unit	Rate	Utility Co	Submetering Cost
1	Electric sub Metering (1 per flr) (meter, CT's, Software, Installation)	5.00	ea	\$ 2,200	\$ 12,100	\$ 11,000
TOTAL COST FOR PROJECT:					\$ 12,100	\$ 11,000

Type 5: Reconstruction of large commercial building						
Item #	Description	Quantity	Unit	Rate	Utility Co	Submetering Cost
1	Electric sub Metering (2 per flr) (meter, CT's, Software, Installation)	118.00	ea	\$ 2,500	\$ 324,500	\$ 295,000
TOTAL COST FOR PROJECT:					\$ 324,500	\$ 295,000

Train Building Operators in Energy Efficiency

EO 3
(Old ID-EV 3)

Cost Analysis

This study as indicated would be a cost of \$50,000 - \$100,000. If required, the costs regardless of building type relate to software purchases (one time costs and subsequent upgrades). The publication of these reports can be e-mailed to employees, and made available in residential buildings via e-mail or board meetings.

Cost Analysis Detail

Item #	Description	Quantity	Unit	Rate	Proposed Cost
1	Basis of Costs (20 Year Life Cycle)				
	Training of Building operators	1.00	ls	\$ 20,000	\$ 20,000
	Assume (4) trainees				
2	Changing code (administrative costs)	-		\$ -	\$ -
	Follow-up inspections (Use independent				
3	consultant)	20 yrs		\$ 1,000	\$ 20,000
	TOTAL COST DURING BUILDING OPERATION (POST CONSTRUCTION):				\$ 40,000
	(This cost is offset by life cycle returns to building owner via utility cost savings)				

Savings and payback estimates: Type 2: Large Scale Commercial

Total Fuel Savings:	300	MMBtu/yr
Fuel Savings/SQFT:	766	Btu/sf/yr
Total Electric Savings:	64,000	kWh/yr
Electric Savings/SQFT:	0.16	kWh/sf/yr
Total Dollar Savings:	\$23,000	/yr
Dollar savings/SQFT:	\$0.059	/yr
Simple Payback:	1.7	yr

Based on a 2% reduction in both fuel and electricity

Automate Tracking of Building Energy Use

EO 4
(Old ID-EV 2)

Cost Analysis						
A BMS is a normal component of large commercial buildings; the cost is nonetheless presented here, since it would become a requirement.						
Type 1: Commercial High Rise						
Item #	Description	Quantity	Unit	Rate		Proposed Cost
	BMS type software to record energy consumption on					
1	individual floor, unit or suite.	1	ls	6,000		6,000
2	Cost for computer system	1	ls	5,000		5,000
3	Additional metering/sensors (1 per floor)	59	ls	1,500		88,500
	TOTAL COST FOR PROJECT:					99,500
	Includes hardware, software and training					

Savings and payback estimates- Type 1: Large Scale Commercial			
	Total Fuel Savings:	2,000	MMBtu/yr
	Fuel Savings/SQFT:	1078	Btu/sf/yr
	Total Electric Savings:	304,000	kWh/yr
	Electric Savings/SQFT:	0.16	kWh/sf/yr
Area	Total Dollar Savings:	\$107,568	/yr
1,855,700	Dollar savings/SQFT:	\$0.058	/yr
	Simple Payback:	0.9	yr
Based on 2% reduction in both fuel and electricity			

Type 2: Residential High Rise						
Item #	Description	Quantity	Unit	Rate		Proposed Cost
	BMS type software to record energy consumption on					
1	individual floor, unit or suite.	1.00	ls	\$ 6,000		\$ 6,000
2	Cost for computer system	1.00	ls	\$ 5,000		\$ 5,000
3	Additional metering/sensors (1 per floor)	48.00	ls	\$ 1,500		\$ 72,000
	TOTAL COST FOR PROJECT:					\$ 83,000
*	Includes hardware, software and training					

Type 4: Commercial Low Rise						
Item #	Description	Quantity	Unit	Rate		Proposed Cost
	BMS type software to record energy consumption on					
1	individual floor, unit or suite.	1.00	ls	\$ 6,000		\$ 6,000
2	Cost for computer system	1.00	ls	\$ 5,000		\$ 5,000
3	Additional metering/sensors (1 per floor)	5.00	ls	\$ 1,500		\$ 7,500
	TOTAL COST FOR PROJECT:					\$ 18,500
*	Includes hardware, software and training					

Type 5: Renovation Large						
Item #	Description	Quantity	Unit	Rate		Proposed Cost
	BMS type software to record energy consumption on					
1	individual floor, unit or suite.	1.00	ls	\$ 6,000		\$ 6,000
2	Cost for computer system	1.00	ls	\$ 5,000		\$ 5,000
3	Additional metering/sensors (1 per floor)	59.00	ls	\$ 1,500		\$ 88,500
	TOTAL COST FOR PROJECT:					\$ 99,500
*	Includes hardware, software and training					

Inspect & Maintain Commercial HVAC Systems

EO 5

(Old ID-EV 27)

Cost Analysis							
The cost for this proposal is the one-time cost to develop a maintenance plan. Any maintenance work that follows is at the discretion of the owner and not required under the proposal.							
Cost Analysis Detail - Type 1: High Rise Commercial							
Item #	Description	Quantity	Unit	Rate			Proposed Cost
1	Prepare maintenance plan	1,855,700.00	sf	\$ 0.03			\$ 55,671.00
							\$ 55,671.00

Savings and payback estimates: Type 1: Large Commercial		
Total Fuel Savings:	717	MMBtu/yr
Fuel Savings/SQFT:	386	Btu/sf/yr
Total Electric Savings:	47,621	kWh/yr
Electric Savings/SQFT:	0.03	kWh/sf/yr
Total Dollar Savings:	\$30,000	/yr
Dollar savings/SQFT:	0.016	/yr
Simple Payback:	1.9	yr
Based on a 0.92% reduction in both fuel and electricity, which is 20% of typical commissioning savings.		

Establish Maximum Heating and Minimum Cooling Temperatures

EO 6

(Old ID-EV 26)

Cost Analysis							
This will not add to capital costs, but will afford energy savings by building operators. Many factors are to be considered including building characteristics, users, occupancy etc.							
Cost Analysis Detail							
Item #	Description	Quantity	Unit	Rate			Proposed Cost
							\$ -
Savings and payback estimates: Type 1: Large Commercial							
	Total Fuel Savings:	3,892					MMBtu/yr
	Fuel Savings/SQFT:	2,097					Btu/sf/yr
	Total Electric Savings:	991,696					kWh/yr
	Electric Savings/SQFT:	0.53					kWh/sf/yr
Area	Total Dollar Savings:	\$317,000					/yr
1,855,700	Dollar savings/SQFT:	0.171					/yr
	Simple Payback:	0.0					yr
Based on heating & cooling load reductions from 1 degree F decreases and increases in set points.							
Because this proposal is for a study, no direct savings will occur, and this estimate is included only as possible input to that study and is not carried forward to the summary report.							

ENERGY & CARBON EMISSIONS: ENERGY EFFICIENCY

Improve Energy Modeling for Building Design

EE 1
(Old ID-EV 23)

Cost Analysis						
Although there are multiple performance paths that could be taken in ASHRAE 90.1, these are assumed to be averaged based on historical costs. Initial capital costs will increase mechanically by less than 1% from \$40 sf to \$41.37 sf, but substantial savings will come as life cycle returns. This is meeting ASHRAE compliance by conforming to mechanical requirements of ASHRAE.						
Type 1: Commercial High Rise						
Item #	Description	Quantity	Unit	Rate		Proposed Cost
1	Conform with ASHRAE 90.1 2007	1,855,700.00	sf	\$ 1.37	(premium only)	\$ 2,542,309.00
TOTAL COSTS						\$ 2,542,309.00
Savings and payback estimates: Type 2: High Rise Residential						
Total Fuel Savings:		7,794				MMBtu/yr
Fuel Savings/SQFT:		4,200				Btu/sf/yr
Total Electric Savings:		1,522,403				kWh/yr
Electric Savings/SQFT:		1				kWh/sf/yr
Total Dollar Savings:		\$538,000				/yr
Dollar savings/SQFT:		0.290				/yr
Simple Payback:		4.7				yr
Based on a 10% reduction in both fuel and electricity (14% specified in the summary of the recommendation is a typographical error)						

Type 2: Residential High Rise						
Item #	Description	Quantity	Unit	Rate		Proposed Cost
1	Conform with ASHRAE 90.1 2007	403,690.00	sf	\$ 1.37	(premium only)	\$ 553,055.30
TOTAL COSTS						\$ 553,055.30

Type 4: Low Rise Commercial						
Item #	Description	Quantity	Unit	Rate		Proposed Cost
1	Conform with ASHRAE 90.1 2007	50,000.00	sf	\$ 3.00	(premium only)	\$ 150,000.00
TOTAL COSTS						\$ 150,000.00

Improve Analysis of Heating & Cooling Needs During Design

EE 2

(Old ID-EV 09)

Cost Analysis						
Calculations are normally done, this recommendation indicates the calculations will be done an alternate way. This is additional soft costs for consultant to gather appropriate loads in lieu of using Code dictated minimal loads.						
Type 1: High Rise Commercial						
Item #	Description	Quantity	Unit	Rate		Proposed Cost
1	Actual load assessment (FEE)	1,855,700	sf	\$ 0.08		\$ 148,456.00
2	Mechanical system- hard costs	1,855,700	sf	\$ (0.20)		\$ (371,140.00)
	TOTAL					\$ (222,684.00)
*Note: we are not undersizing						

Type 2: Residential High Rise						
Item #	Description	Quantity	Unit	Rate		Proposed Cost
1	Actual load assessment	391,527	sf	\$ 0.08		\$ 31,322.16
	TOTAL					\$ 31,322.16
*Note: we are not undersizing						

Savings and payback estimates: Type 2: Large Residential		
Total Fuel Savings:	740	MMBtu/yr
Fuel Savings/SQFT:	1890	Btu/sf/yr
Total Electric Savings:	0	kWh/yr
Electric Savings/SQFT:	0.00	kWh/sf/yr
Total Dollar Savings:	\$15,000	/yr
Dollar savings/SQFT:	\$0.038	/yr
Simple Payback:	2.1	yr
Based on a 3% reduction in fuel use		

Type 4: Low Rise Commercial						
Item #	Description	Quantity	Unit	Rate		Proposed Cost
1	Actual load assessment	50,000	sf	\$ 0.08		\$ 4,000.00
	TOTAL					\$ 4,000.00
*Note: we are not undersizing						

Assess Co-generation Feasibility in Large Buildings

EE 3

(Old ID- EV 42)

Cost Analysis						
The cost analysis below is for soft costs only for a feasibility study.						
Type 1: Commercial High Rise						
Item #	Description	Quantity	Unit	Rate		Proposed Cost
	Feasibility Study for Co-Gen					
1	Plant	1.00	ls	\$ 8,000.00	Soft Costs Only	\$ 8,000.00
					Total	\$ 8,000.00

Improve Energy & Water Efficiency upon Sale of Residences

EE 4

(Old ID- H1)

Cost Analysis						
For one & two family homes (Building Type H) only. Savings not calculated, but all required improvements are known to be cost effective with short payback periods.						
Type H: Cost Analysis Detail						
Item #	Description	Quantity	Unit	Rate		Proposed Cost
1	Attic Insulation	1,200.00	sf	\$ 1.85		\$ 2,220.00
2	Insulate Hot Water Heater	1.00	ea	\$ 85.00		\$ 85.00
3	Low Flow Devices	-	ea	\$ -	Cost Neutral	\$ -
4	Light Bulb Efficiency (hall, common spaces)	12.00	ea	\$ 5.00	deduct incandesce	\$ 60.00
5	Weather-stripping	1,200.00	lf	\$0.10		\$ 120.00
6	Chimney Dampers	1.00	ea	\$120.00		\$ 120.00
TOTAL COST TO DWELLING:						\$ 2,605.00

Improve Efficiency of Boilers & Heating Distribution Systems

EE 5

(Old ID- EV 18)

Cost Analysis							
Use hot water system or two pipe steam system. Add second pipe in instances where a single pipe steam system is in place currently on full rehab projects. Replacement of boiler to new more efficient boiler is part of standard maintenance in any building, therefore this recommendation would not cause any additional costs should the recommendation be made law. The only instance where costs would come into play are for the three types of buildings below, which are single pipe systems and are required to be made two pipe.							
Type 7 Family Home (renovation)							
Item #	Description	Quantity	Unit	Rate			Proposed Cost
1	Add second pipe	2,000.00	sf	\$ 2.00			\$ 4,000
							\$ 4,000

Type 2: High Rise Residential							
Item #	Description	Quantity	Unit	Rate			Proposed Cost
1	Add second pipe	391,527.00	sf	\$ 2.40			\$ 939,665
	Type 2 developed by Urban Green using Bovis' highest Rate + 20%.						\$ 939,665

Savings and payback estimates: Type 2: High Rise Residential		
Total Fuel Savings:	3,524	MMBtu/yr
Fuel Savings/SQFT:	9,000	Btu/sf/yr
Total Electric Savings:	0	kWh/yr
Electric Savings/SQFT:	0	kWh/sf/yr
Total Dollar Savings:	99,000	/yr
Dollar savings/SQFT:	0	/yr
Simple Payback:	9.5	yr
Based on increasing AFUE from 60 to 70; no credit for 1-pipe losses.		

Type 6: Commercial Renovation							
Item #	Description	Quantity	Unit	Rate			Proposed Cost
1	Add second pipe	50,000.00	sf	\$ 1.75			\$ 87,500
							\$ 87,500

Increase Efficiency of Large Cooling Systems

EE 6
(Old ID-EV28)

Cost Analysis						
Improved efficiency by use of central chilled water: Based on building type it is assumed that we have 6000 tons of refrigeration. The efficiency of the base project is 1.1kw/Ton, with the more efficient system at .7kw/Ton.						
Type 1: Commercial High Rise						
Item #	Description	Quantity	Unit	Rate		Proposed Cost
	Improve efficiency					
1	Equipment expenditure	1,855,700.00	sf	\$ 1.70	premium only	\$3,154,690
					Total	\$3,154,690
Savings and payback estimates:			Type 1: Large Commercial, Option 2			
	Total Fuel Savings:	0			MMBtu/yr	
	Fuel Savings/SQFT:	0			Btu/sf/yr	
	Total Electric Savings:	1,882,243			kWh/yr	
	Electric Savings/SQFT:	1.01			kWh/sf/yr	
	Total Dollar Savings:	\$395,000			/yr	
	Dollar savings/SQFT:	0.213			/yr	
	Simple Payback:	8.0			yr	
Based on a decrease from 1.1 to 0.7 kW/ton						

Increase Lighting Efficiency in Apartment Buildings

EE 7

(Old ID- LD 19)

Cost Analysis							
This proposal is an allowance with the exception of the luminous efficacy standards which would effectively prohibit incandescent lamps. The costs below are cost to go from Incandescent to fluorescent lighting Savings not calculated, but this measure is well-known to be cost effective.							
Type 2: High Rise Residential Construction							
Item #	Description	Quantity	Unit	Rate			Proposed Cost
1	Premium to go fluorescent lighting	500.00	ea	\$ 1.75	premium	\$	875.00
						\$	875.00
Type 3: Low Rise Residential Construction							
Item #	Description	Quantity	Unit	Rate			Proposed Cost
1	Premium to go fluorescent lighting	64.00	ea	\$ 1.75	premium	\$	112.00
						\$	112.00

Encourage Installation of Energy Star® Appliances

EE 8
(Old ID- EV 28)

Cost Analysis						
Most vendors supply energy star fixtures without additional charge.						
Cost Analysis Detail						
Item #	Description	Quantity	Unit	Rate		Proposed Cost
						\$ -

Savings and payback estimates:		Type H: Single Family Home		
Total Fuel Savings:	0	MMBtu/yr		
Fuel Savings/SQFT:	0	Btu/sf/yr		
Total Electric Savings:	1,700	kWh/yr		
Electric Savings/SQFT:	0.85	kWh/sf/yr		
Total Dollar Savings:	\$357	/yr		
Dollar savings/SQFT:	0.179	/yr		
Simple Payback:	0.0	yr		
Energy Star Items for EE08/ EV29				
Primary	/Household			
	Primary	Site		
Quads	MMBtu	kWh		\$/month
Refrigeration:	1.50	13.33	1,333	23.33
Wet clean,no dry	0.41	3.66	366	6.41
Total:	17.00	1,700		29.75
Source: 2008 Buildings Energy Data Book				
	#Households=			112,511,047

E-S Items for EE 8				
Primary	/Household			
Quads	MMBtu	kWh		\$/month
Refrigeration:	1.50	13.33	1,333	23.33
Wet clean,no dry	0.41	3.66	366	6.41
Total:	17.00	1,700		29.75
Source: 2008 Buildings Energy Data Book				
	#Households=	112,511,047		

Improve Operation of Dryers in Apartment Buildings

EE 9

(Old ID- EV 41)

Cost Analysis						
No cost implications.						
Cost Analysis Detail						
Item #	Description	Quantity	Unit	Rate		Proposed Cost
						\$ -
Savings and payback estimates Type 2:High Rise Residential						
Total Fuel Savings:		17	MMBtu/yr			
Fuel Savings/SQFT:		43	Btu/sf/yr			
Total Electric Savings:		0	kWh/yr			
Electric Savings/SQFT:		0.00	kWh/sf/yr			
Total Dollar Savings:		\$331	/yr			
Dollar savings/SQFT:		0.001	/yr			
Simple Payback:		0.0	yr			
Based on a 5% reduction in both dryer gas						

Reduce Overheating in Apartments

EE 10
(Old ID-EV 22)

Cost Analysis						
Danfoss valve installation (2 hrs to install, \$300 for material). Main equipment (central heating pump) assumed to have Variable Frequency Drives on all heating hot water pumps.						
2 Large Residential						
Item #	Description	Quantity	Unit	Rate		Proposed Cost
1	Radiator Temperature Guage (danfoss valve)	792.00	ea	\$ 600.00		\$ 475,200.00
		(3 radiators per unit)				\$ 475,200.00
Savings and payback estimates: Type 2: High Rise Residential						
Total Fuel Savings:		1,653		MMBtu/yr		
Fuel Savings/SQFT:		4,221		Btu/sf/yr		
Total Electric Savings:		0		kWh/yr		
Electric Savings/SQFT:		0		kWh/sf/yr		
Total Dollar Savings:		\$72,000		/yr		
Dollar savings/SQFT:		0.184		/yr		
Simple Payback:		6.6		yr		
Based on a 10% reduction in heating fuel						

5 Large Scale Renovation						
Item #	Description	Quantity	Unit	Rate		Proposed Cost
1	Radiator Temperature Guage (danfoss valve)	864.00	ea	\$ 600.00		\$ 518,400.00
		(3 radiators per unit)				\$ 518,400.00

6 Small Scale Renovation						
Item #	Description	Quantity	Unit	Rate		Proposed Cost
1	Radiator Temperature Guage (danfoss valve)	190.00	ea	\$ 600.00		\$ 114,000.00
		(3 radiators per unit)				\$ 114,000.00

7 Small Scale Renovation- Residential (2 bedroom apartment)						
Item #	Description	Quantity	Unit	Rate		Proposed Cost
1	Radiator Temperature Guage (danfoss valve)	4.00	ea	\$ 600.00		\$ 2,400.00
		(3 radiators per unit)				\$ 2,400.00

Turn Off Equipment in Empty Hotel Rooms

EE 11
(Old ID-LD7)

Cost Analysis						
A master switch is best option. This system is only controlling lighting (except one nightlight) and power in the room. Independent night-light, excludes any appliances or mechanical units within a room.						
Type 2- High Rise Residential (applicable to a hotel project)						
Item #	Description	Quantity	Unit	Rate		Proposed Cost
1	Master switch	288.00	ea	\$ 1,800.00	(per room)	\$ 518,400.00
TOTAL COST FOR PROJECT:						\$ 518,400.00
(assume 6 per floor-including commercial spaces at lower levels, gym and other spaces)						

Provide Ventilation Air Only as Needed in Large Spaces

EE 12

(Old ID- EV 37)

Cost Analysis						
Cost to Install (CO2) sensor and software at BMS to make calculated adjustments at Air Handling Units (AHU's) and fresh air intakes. Although once again, additional capital costs offset by system operating savings. Assumed units are individually controlled (similar to the requirements of LEED). Therefore common areas would need to comply.						
1 Large Commercial						
Item #	Description	Quantity	Unit	Rate		Proposed Cost
1	CO2 Sensor,	10.00	ea	\$ 2,000.00	common areas	\$ 20,000.00
2	Occupancy Sensor	10.00	ea	\$ 2,000.00	common areas	\$ 20,000.00
3	Temperature Sensor	10.00	ea	\$ 2,000.00	common areas	\$ 20,000.00
4	Programming & Software	1.00	ls	\$ 3,800.00	common areas	\$ 3,800.00
						\$ 63,800.00
*Assume units are controllable via Variable Frequency Drives (VFD's)						

Savings and payback estimates: Type 1: Large Commercial		
Total Fuel Savings:	390	MMBtu/yr
Fuel Savings/SQFT:	210	Btu/sf/yr
Total Electric Savings:	25,881	kWh/yr
Electric Savings/SQFT:	0.01	kWh/sf/yr
Total Dollar Savings:	\$16,346	/yr
Dollar savings/SQFT:	0.009	/yr
Simple Payback:	3.9	yr
Based on a 0.5% reduction in both fuel and electricity		

Use Manual On - Auto Off Lighting

EE 13
(Old ID- LD2)

Cost Analysis						
There is no cost premium for vacancy sensors over occupancy sensors, which are already required. The additional cost would be to install controls in individual offices smaller than 200 sf (which is not currently required by code)						
Type 1: High Rise Commercial						
Item #	Description	Quantity	Unit	Rate		Proposed Cost
1	Ceiling mounted Lighting sensor	590.00	ea	\$ 210.00	\$ -	\$ 123,900.00
TOTAL COST FOR PROJECT:						\$ 123,900.00
(assumed 12 offices per floor on average)						

Type 6: Tenant Fit-Out						
Item #	Description	Quantity	Unit	Rate		Proposed Cost
1	Ceiling mounted Lighting sensor	4.00	ea	\$ 210.00	\$ -	\$ 840.00
TOTAL COST FOR PROJECT:						\$ 840.00
(based on 9500 sf office plate)						

Type 4: Low Rise Commercial						
Item #	Description	Quantity	Unit	Rate		Proposed Cost
1	Ceiling mounted Lighting sensor	12.00	ea	\$ 210.00	\$ -	\$ 2,520.00
TOTAL COST FOR PROJECT:						\$ 2,520.00
(assumed 30 sensors per floor on average)						

Type 4 savings:						
From drawings, conference rooms & offices are 25% of 50,000 sf						
Lighting power density= 1.1 W/sf						
In use= 1800 hr/yr						
Savings= 17.5% Based on M. Mehl's estimate of 15-20% from va						
Expected annual savings = 4331.25 kWh/yr						
= 86.625 kWh/yr-sf						
Expected financial savings = \$910 at \$0.21 /kWh						
= \$0.018 /sf						
Simple payback = \$2.770 yrs						
The same calculation and per square foot savings will apply to building types 1, 5, and 6.						

Limit After-Hours Retail Lighting

EE 14
(Old ID- LD 6)

Cost Analysis						
A time clock would be the best solution for this problem. Larger projects would require multiple timeclocks (ie: Macy's or other large retailers)						
Cost Analysis Detail						
Item #	Description	Quantity	Unit	Rate		Proposed Cost
1	Timeclock (F&I)	1.00	ea	\$ 2,500.00		\$ 2,500.00
	TOTAL COST FOR PROJECT:					\$ 2,500.00
Type 4 and 6 savings:						
	Floor plate (first floor) area=	9,500	sf			
	of which	50%	is sales area			
	=	4750	sf			
	Lighting power density (sales)=	4.2	W/sf			
	Use during	9	hr potential "off" period			
	=	56,020	kWh/yr for a 6 day/week store			
	Uses during "off" period:	0.2	W/sf for egress			
	+	50	W/ft (perimeter) for marketing, use 97 ft storefront			
	=	16,352	kWh/yr			
	Net savings=	39,668	kWh/yr			
	=	4.2	kWh/yr-sf			
	Financial savings=	\$8,330	/year at \$0.21 /kWh			
	=	\$0.88	/yr-sf			
	Payback period=	0.3	years			

Reduce Artificial Lighting in Sunlit Lobbies & Hallways

EE 15

(Old ID LD 16)

Cost Analysis					
This is a code revision without additional cost impacts.					
Cost Analysis Detail					
Item #	Description	Quantity	Unit	Rate	Proposed Cost
					\$ -

Increase Lighting Efficiency on Construction Sites

EE 16
(Old ID CP 8)

Cost Considerations for Implementation of the Recommended Revisions:

Initial Cost	\$1.67 /lamp
Lamp Wattage	100 watts
Lamp Life	2500 hrs
kWh Cost	\$0.16 /hr
Recycling cost	Not required
Cost over project	$(\$1.67 \text{ /lamp} \times 4 \text{ lamps}) + (100 \text{ watts} \times 1 \text{ kW} / 1000 \text{ watts} \times \$0.16 \text{ /kWh} \times 7200 \text{ hrs}) = \mathbf{\$121.88}$

Cost of Florescent lamps over life of project* (7200 hours)

Initial Cost	\$5 /lamp
Lamp Wattage	23 watts
Lamp Life	8000 hrs
kWh Cost	\$0.16 /hr
Recycling cost	\$0.39/lamp
Cost over project	$(\$5 \text{ /lamp} + \$0.39) + (23 \text{ watts} \times 1 \text{ kW} / 1000 \text{ watts} \times \$0.16 \text{ /kWh} \times 7200 \text{ hrs}) = \mathbf{\$31.88}$

NOTE: \$0.21/kWh used in savings calculations below to comport with all other savings calculations.

Type 1: Cost Analysis Detail-Large Scale Commercial-New Construction

Item #	Description	Quantity	Unit	Rate	CFL Cost
1	Use CFL Lamps	11,800	ea	\$ 5.00	\$ 59,000.00
TOTAL COST FOR PROJECT					\$ 59,000.00

Type 2: Cost Analysis Detail-Mid-Size Commercial-New Construction

Item #	Description	Quantity	Unit	Rate	CFL Cost
1	Use CFL Lamps	2,646	ea	\$ 5.00	\$ 13,230.00
TOTAL COST FOR PROJECT					\$ 13,230.00

Type 3 Cost Analysis Detail-Low Rise Residential

Item #	Description	Quantity	Unit	Rate	CFL Cost
1	Use CFL Lamps	360	ea	\$ 5.00	\$ 1,800.00
TOTAL COST FOR PROJECT					\$ 1,800.00

Savings and payback estimates: All Types - One Lamp		
Total Electric Savings:	554	kWh/yr
Electric Savings/SQFT:	3.58	kWh/sf/yr
Total Dollar Savings:	\$116	/yr
Dollar savings/SQFT:	0.751	/yr
Simple Payback:	0.043	yr

Use Outdoor Air for Cooling

EE 17

(Old ID-EV 44)

Cost Analysis

The cost analysis below is for the addition of an air side economizer with all of the required controls. The large commercial high rise is less on a \$/cfm than a small scale commercial structure. The analysis is based upon 1 cfm of fresh air required per square foot of building area.

Type 1: Commercial High Rise

Item #	Description	Quantity	Unit	Rate		Proposed Cost
	1 air side economizer w/controls	1,875,500	cfm	\$ 0.03		\$ 56,265.00
					Total	\$ 56,265.00

Savings and payback estimates: Type 1: Large Commercial

Total Fuel Savings:	0	MMBtu/yr
Fuel Savings/SQFT:	0	Btu/sf/yr
Total Electric Savings:	155,240	kWh/yr
Electric Savings/SQFT:	0.08	kWh/sf/yr
Total Dollar Savings:	\$32,600	/yr
Dollar	0.018	/yr
Simple Payback:	1.7	yr

Based on a 3% reduction in AC electricity; 30% cited in studies

Type 4: Small Scale Commercial

Item #	Description	Quantity	Unit	Rate		Proposed Cost
	1 air side economizer w/controls	50,000	cfm	\$ 0.05		\$ 2,500.00
					Total	\$ 2,500.00

Use Waste Heat from ConEd Steam

EE 18
(Old ID-EV 17)

Cost Analysis						
One must consider the necessary requirement of treating condensate water as steam is not 100% clean and could cause damage to sensitive mechanical equipment. A filtration system will have to be installed, or piping system with corrosive resistant qualities for the water to be reused.						
Type 2-Cost Analysis Detail-High Rise Residential: Pre-heating Hot water/CT Make Up/Sidewalk Cln						
Item #	Description	Quantity	Unit	Rate		Proposed Cost
	High Temperature high condensate return + Shell and Tube Heat exchanger for pre-heating domestic hot water	1.00	ea	\$ 5,000.00	heat exchanger	\$ 5,000.00
		50.00	lf	\$ 36.00	Piping	\$ 1,800.00
		1.00	ls	\$ 3,500.00	Controls/misc	\$ 3,500.00
TOTAL COST TO COMMERCIAL BLDG:						\$ 10,300.00
			ea			
1	Heat Exchanger	1	ea	\$ 8,000.00		\$ 8,000.00
2	Piping	120	lf	\$ 50.00		\$ 6,000.00
3	Backflow Preventor	1	lf	\$ 4,000.00	(reuse ex. Cooling twr piping)	\$ 4,000.00
4	Filtration system			\$ 3,000.00		
5	Independent hose Bid	1	ea	\$ 250.00		\$ 250.00
						\$ 21,250.00

Savings and payback estimates Type 2: High Rise Residential		
Total Fuel Savings:	987	MMBtu/yr
Fuel Savings/SQFT:	2,520	Btu/sf/yr
Total Electric Savings:	0	kWh/yr
Electric Savings/SQFT:	0	kWh/sf/yr
Total Dollar Savings:	28,000	/yr
Dollar savings/SQFT:	0	/yr
Simple Payback:	0.8	yr

Based on saving 40 Btu/lb of condensate

Insulate Pipes Exposed During Construction

EE 19
(Old ID-EV11)

Cost Analysis	
This recommendation would require adding insulation to pipes once they have been exposed during renovation projects. Refer to three types below, and three qualifying scenarios in Assumptions and Qualifications below. These are extracted from actual BLL examples, and applied to building types in summary sheet. See percentage cost notes as requested.	

7 Cost Analysis Detail-Apartment Renovation						
Item #	Description	Quantity	Unit	Rate		Proposed Cost
1	HVAC Insulation (piping) & Water (2 bedroom unit)	85	lf	\$ 12.00		\$ 1,020.00
TOTAL COST FOR PROJECT:						\$ 1,020.00

5 Cost Analysis Detail-Large Scale Renovation (commercial)						
Item #	Description	Quantity	Unit	Rate		Proposed Cost
1	HVAC Piping	25,434.00	lf	\$ 16.00		\$ 406,944.00
2	Plumbing (Hot water)	17,671.00	lf	\$ 12.00		\$ 212,052.00
TOTAL COST FOR PROJECT:						\$ 618,996.00

H Cost Analysis Detail-Small Scale Residential (2000 SF Town Home)						
Item #	Description	Quantity	Unit	Rate		Proposed Cost
1	HVAC Piping (IF AC)	30.00	lf	\$ 10.000		\$ 300.00
2	Plumbing Hot Water	170.00	lf	\$ 10.000		\$ 1,700.00
3	Steam Heat (Single Pipe)	190.00	lf	\$ 10.000		\$ 1,900.00
TOTAL COST FOR PROJECT:						\$ 3,900.00

Savings and payback estimates: Type 1: Large Commercial		
Total Fuel Savings:	156	MMBtu/yr
Fuel Savings/SQFT:	78,000	Btu/sf/yr
Total Electric Savings:	0	kWh/yr
Electric Savings/SQFT:	0	kWh/sf/yr
Total Dollar Savings:	4,000	/yr
Dollar savings/SQFT:	2	/yr
Simple Payback:	1.0	yr

Based on savings of 400,000 Btu/lf of pipe per year in fuel from engineering experience

Clarify Standards for Equipment Venting

EE 20
(Old ID-EV 19)

Cost Analysis					
This is a clarification of standards with no additional costs.					
Cost Analysis Detail					
Item #	Description	Quantity	Unit	Rate	Proposed Cost

Modernize Boiler Regulations

EE 21
(Old ID- EV5a)

Cost Considerations for Implementation of the Recommended Revisions:

This is a code change. No direct costs are incurred.

Cost Analysis Detail

Item #	Description	Quantity	Unit	Rate	Proposed Cost
					\$ -

Reduce the Required Lighting Power Requirements for Offices

EE 22

(Old ID- EV 31)

Cost Analysis						
This proposal reduces requirements, therefore will not increase costs.						
All types						
Item #	Description	Quantity	Unit	Rate	Sub-Metering	
					\$	-

Reduce CO2 Emissions From Concrete

EE 23
(Old ID- MV 11)

Cost Analysis					
This proposal limits the amount of cement in concrete mixes. This is cost neutral.					
Cost Analysis Detail					
Item #	Description	Quantity	Unit	Rate	Proposed Cost
					\$ -

Reduce CO2 Emissions From Specialized Concrete

EE 24

(Old ID-MV 10)

Cost Analysis					
This proposal increases the percentage of fly ash that may be used in concrete mixes. This is cost neutral.					
Cost Analysis Detail					
Item #	Description	Quantity	Unit	Rate	Proposed Cost
TOTAL COST FOR PROJECT:				\$	-

Ensure New Energy Systems Function Properly

EE 25
(Old ID-EV 8)

Cost Analysis						
Cost below include all labor costs for testing and standby (MEP), as well as adjustments and repairs. Also included in this ate is a 3rd party commissioning agent.						
1. Cost Analysis Detail-Large Scale Commercial						
Item #	Description	Quantity	Unit	Rate		Proposed Cost
1	Commissioning	1,855,700	sf	\$ 0.10		\$ 185,570.00
	TOTAL COST FOR PROJECT:					\$ 185,570.00
Savings and payback estimates: Type 2: Large Residential						
	Total Fuel Savings:	3,600			MMBtu/yr	
	Fuel Savings/SQFT:	1940			Btu/sf/yr	
	Total Electric Savings:	696,000			kWh/yr	
	Electric Savings/SQFT:	0.38			kWh/sf/yr	
Area	Total Dollar Savings:	\$246,000			/yr	
1,855,700	Dollar savings/SQFT:	\$0.133			/yr	
	Simple Payback:	0.8			yr	
Based on a 3200 Btu/sf reduction in all energy use, from references						
4. Cost Analysis Detail-Mid-Size Commercial						
Item #	Description	Quantity	Unit	Rate		Proposed Cost
1	Commissioning	50,000	sf	\$ 0.21		\$ 10,500.00
	TOTAL COST FOR PROJECT:					\$ 10,500.00
2. Cost Analysis Detail-Large Scale Residential						
Item #	Description	Quantity	Unit	Rate		Proposed Cost
1	Commissioning	403,690	sf	\$ 0.10		\$ 40,369.00
	TOTAL COST FOR PROJECT:					\$ 40,369.00
5. Cost Analysis Detail-Large Scale Renovation (commercial)						
Item #	Description	Quantity	Unit	Rate		Proposed Cost
1	Commissioning	1,855,700	sf	\$ 0.10		\$ 185,570.00
	TOTAL COST FOR PROJECT:					\$ 185,570.00

Ensure Lighting Systems Function Properly

EE 26
(Old ID-LD 13)

Cost Analysis						
Cost to commission lighting systems. Note that lighting is normally included in general commissioning.						
Type 1: Commercial High Rise						
Item #	Description	Quantity	Unit	Rate		Proposed Cost
1	Walkthrough (PE)	17.00	days	\$ 1,200.00		\$ 20,400.00
2	Walkthrough (PE Helper) (includes soft costs for reports)	17.00	days	\$ 520.00		\$ 8,840.00
TOTAL COST FOR PROJECT:						\$ 29,240.00

Type 1 savings:			
Floor area=	1,855,700	sf	
Standard lighting power density=	1.1	W/sf	
Use during	10 hour day,	5 days/week for	
=	5,307,302	kWh/yr	
Functional test saves:	5%	(Studies cited in proposal claim 5-15%)	
Net savings=	265,365	kWh/yr	
=	0.14	kWh/yr-sf	
Building financial savings=	\$55,727 /year at	\$0.21 /kWh	
=	\$0.030 /yr-sf		
Payback period=	0.52	years	

Type 4: Commercial Low Rise						
Item #	Description	Quantity	Unit	Rate		Proposed Cost
1	Walkthrough (PE)	1.00	days	\$ 1,200.00		\$ 1,200.00
2	Walkthrough (PE Helper) (includes soft costs for reports)	1.00	days	\$ 520.00		\$ 520.00
TOTAL COST FOR PROJECT:						\$ 1,720.00
(should be completed every 5 years)						

Reduce Leakage from Air Ducts

EE 27

(Old ID-EV 36)

Cost Analysis						
Ensure ventilation ductwork is sealed and tested.						
Type 4: Small Scale Commercial						
Item #	Description	Quantity	Unit	Rate		Proposed Cost
	AHU Leak Testing (pressure					
	1 test)	35.00	hrs	\$ 100.00		\$ 3,500.00
	2 Repair Allowance	35.00	hrs	\$ 100.00		\$ 3,500.00
						\$ 7,000.00

Type 1: Large Scale Commercial						
Item #	Description	Quantity	Unit	Rate		Proposed Cost
	AHU Leak Testing (pressure					
	1 test)	72.00	hrs	\$ 100.00		\$ 7,200.00
	2 Repair Allowance	72.00	hrs	\$ 100.00		\$ 7,200.00
						\$ 14,400.00

Savings and payback estimates: Type 1: Large Commercial		
Total Fuel Savings:	3,897	MMBtu/yr
Fuel Savings/SQFT:	2,100	Btu/sf/yr
Total Electric Savings:	258,808	kWh/yr
Electric Savings/SQFT:	0.14	kWh/sf/yr
Total Dollar Savings:	\$163,465	/yr
Dollar savings/SQFT:	0.088	/yr
Simple Payback:	0.1	yr
Based on a 5% reduction in both fuel and AC electricity		

Expand Boiler Efficiency Testing & Tuning

EE 28
(Old ID- EV5b)

Cost Analysis						
Assumed building has 1 boiler + 1 Standby and uses #2 Fuel Oil. Pricing includes minor repairs. This is the same cost for all building types over 50,000 SF. For smaller buildings like a house it would be much less (approximately \$150).						
Type 1: Commercial High Rise or Type 2: Large Residential						
Item #	Description	Quantity	Unit	Rate		Proposed Cost
1	Annual Boiler Testing	2.00	ea	\$ 1,400.00		\$ 2,800.00
2	Retune	2.00	ea	\$ 750.00		\$ 1,500.00
TOTAL COST TO PROJECT						\$ 4,300.00
Savings and payback estimates: Type 2: Large Residential						
Total Fuel Savings:		1,200				MMBtu/yr
Fuel Savings/SQFT:		3065				Btu/sf/yr
Total Electric Savings:		0				kWh/yr
Electric Savings/SQFT:		0.00				kWh/sf/yr
Total Dollar Savings:		\$23,000				/yr
Dollar savings/SQFT:		\$0.059				/yr
Simple Payback:		0.2				yr
Based on a 5% reduction in fuel						

BUILDING RESILIENCE

Create & Use 2080 Flood Map Based on Climate Change Predictions

BR 1

(Old ID- CA 02)

Cost Analysis						
This recommendation does not involve hard costs on the end users (developers etc) for the recommendation indicated. Some consideration to comply with building code restrictions are a factor, but it would be necessary to have new maps to determine the monetary effect. Additional insurance costs will apply for developments built in new flood prone areas. There will be one time costs for salary to work on updating these maps.						
Cost Analysis Detail						
Item #	Description	Quantity	Unit	Rate		Proposed Cost
						\$ -

Safeguard Toxic Materials Stored in Flood Zones

BR 2

(Old ID- CA 18)

Cost Analysis						
It is possible that the storage of highly toxic materials could result in higher costs, but it is unfeasible to quantify such specific circumstances in a generic way.						
Cost Analysis Detail						
Item #	Description	Quantity	Unit	Rate		Proposed Cost
						\$ -

Study Adaptive Strategies to Flooding

BR 3
(Old ID- CA 05)

Cost Analysis							
Study only - no direct cost impact.							
Cost Analysis Detail							
Item #	Description	Quantity	Unit	Rate			Proposed Cost
							\$ -

Study Adaptive Strategies to Non-Flood Climatic Risks

BR 4

(Old ID- CA 04)

Cost Analysis						
<p>Cost impact would have to be considered AFTER an environmental impacts study is addressed. These factors would affect the lateral loads buildings can withstand, mold issues from humidity, electrical grid upgrades etc. This would be a full cost exercise in and of itself.</p>						
Cost Analysis Detail						
Item #	Description	Quantity	Unit	Rate		Proposed Cost
						\$ -

Forecast Non-Flood Climatic Hazards to 2080

BR 5

(Old ID- CA 03)

Cost Analysis						
<p>Cost impact would have to be considered AFTER an environmental impacts study is addressed. These factors would affect the lateral loads buildings can withstand, mold issues from humidity, electrical grid upgrades, etc. This would be a full cost exercise in and of itself.</p>						
Cost Analysis Detail						
Item #	Description	Quantity	Unit	Rate		Proposed Cost
						\$ -

Analyze Strategies to Maintain Habitability During Power Outages

BR 6

(Old ID- CA 08)

Cost Analysis						
A study with no direct cost implications.						
Cost Analysis Detail						
Item #	Description	Quantity	Unit	Rate		Proposed Cost
						\$ -

Ensure Toilets and Sinks Can Operate During Blackouts

BR 7

(Old ID- CA 13)

Cost Analysis

Standard practice is to hard wire toilets with automatic controls in commercial buildings. This proposal could be complied with through either self-powered, manual flush or battery back up. Using self-powered controls or manual flush would represent a savings compared with standard practice (calculations below). For this reason, the proposal was estimated to have no cost impacts. Calculations below show savings based on current practice (for information purposes only) No actual savings would be achieved.

Type 1: High Rise Commercial

Item #	Description	Quantity	Unit	Rate	Proposed Cost
Option 1-manual flush toilet					
1	Standard Automatic Flush	392	ea	\$ (550.00)	\$ (215,600.00)
2	Remove Electrical Scope	392	ea	\$ (400.00)	\$ (156,800.00)
3	Install Manual Flush	392	ea	\$ 150.00	\$ 58,800.00
Total					\$ (313,600.00)
Total w/Sinks					\$ (633,600.00)
Option 2-battery back up to auto flush					
1	Standard Automatic Flush	392	ea	\$ -	\$ -
2	Remove Electrical Scope	392	ea	\$ (400.00)	\$ (156,800.00)
3	Battery Back-up	392	ea	\$ 200.00	\$ 78,400.00
Total					\$ (78,400.00)
Total w/ sinks					\$ (398,400.00)
Sinks					
1	Standard Automatic Faucet	400	ea	\$ (650.00)	\$ (260,000.00)
2	Remove Electrical Scope	400	ea	\$ (400.00)	\$ (160,000.00)
3	Install Manual Faucet	400	ea	\$ 250.00	\$ 100,000.00
Total					\$ (320,000.00)

Enhance Building Water Supply During Blackout BR 8

(Old ID- CA 14)

Cost Analysis						
Proposal calls for existing water tanks to remain in place. Below are costs for installation and maintenance of new towers, which had been included in a prior iteration of this proposal						
Large Scale Residential						
Item #	Description	Quantity	Unit	Rate		Proposed Cost
1	Wood water tank	40,000.00	gal	\$ 1.50		\$ 60,000.00
2	Duplex water pump 20HP with controls	1.00	set	\$ 27,000.00		\$ 27,000.00
3	Triplex booster pump with controls (standard for non-tank water supply)	1.00	set	\$ (30,000.00)		\$ (30,000.00)
TOTAL						\$ 57,000.00
<u>Annual maintenance costs</u>						
	duplex water pump & tank maintenance (2 men 1 day) general cleaning of tank, check controls, check & lubricate pump	1.00	allow	\$ 2,200.00		
	triplex water pump maintenance (1 man 1 day)	1.00	allow	\$ 750.00		
	NET Add'l Maint			\$ 1,450.00		

Include Climate Change in Environmental Impact Statements

BR 9

(Old ID- CA 06)

Cost Analysis							
A code or rule change with no direct cost implications.							
Cost Analysis Detail							
Item #	Description	Quantity	Unit	Rate			Proposed Cost
							\$ -

RESOURCE CONSERVATION

Recycle Construction Waste

RC 1
(Old ID-CP 2)

Cost Analysis: High Rise Commercial						
This practice is cost neutral based on countless projects. Waste haulers sort and recycle nearly 75% as minimum standard, in some cases more. If anything above 75-80% is required, you will require on-site sorting, and an additional dumpster will be required.						
The costs below are those normally incurred.						
Type 1: New Commercial High Rise						
Item #	Description	Quantity	Unit	Rate		Proposed Cost
1	Recycle/Sorting	484.00	hrs	\$ 85.00		\$ 41,140.00
1	Dumpster (for further sorting)	3.00	ea	\$ 750.00		\$ 2,250.00
						\$ -
	TOTAL CONSTRUCTION COSTS:					\$ 43,390.00
*based on fit out program of 11 months (22 days per month) Labor spending 2 hours to recycle per day.						

Provide Recycling Areas in Apartment Buildings

RC 2

(Old ID- MV 08)

Cost Analysis							
Based on 12 LEED projects for both residential high-rise and low-rise, there were no premiums for this recommendation that affects rentable area.							
Cost Analysis Detail							
Item #	Description	Quantity	Unit	Rate			Proposed Cost
	NO costs						\$ -
	TOTAL COST FOR PROJECT:						\$ -

Use Recycled Aggregate in Concrete

RC 3
(Old ID-MV 12)

Cost Analysis							
There are no additional costs associated with this standard. There can be cost savings.							
Cost Analysis Detail							
Item #	Description	Quantity	Unit	Rate			Proposed Cost
TOTAL COST FOR PROJECT:							\$ -

Use Recycled Asphalt

RC 4
(Old ID-MV 13)

Cost Analysis						
<p>There are no additional costs associated with this standard. There is no new material costs for this proposal. A potential cost increase could occur with the added step of a recycle facility or truck which recycles ripped up asphalt that is to be used. Typically this is done in-situ once removed from road, it is heated and reused instantly. The cost for recycle plant type truck negates the costs necessary for delivery and virgin materials. This is also contributes positively to avoiding carbon footprint, as you do not need separate trucks for asphalt deliveries.</p>						
Cost Analysis Detail						
Item #	Description	Quantity	Unit	Rate		Proposed Cost
TOTAL COST FOR PROJECT:						\$ -

Protect Forests by Using Sustainable Wood

RC 5
(Old ID- MV 17)

Cost Analysis							
FSC premium is 20% of MATERIAL costs on 25% of the wood. For this analysis we are carrying 10% additional towards the FSC premium. Rates below do not include labor as this will not change.							
TYPE 1: Cost Analysis Detail-Large Scale Commercial							
Item #	Description	Quantity	Unit	Rate	FSC Premium	Proposed Cost	
1	Wood Lobby Security Desk	25	lf	\$ 1,200	\$ 240	\$	6,000
2	Wood Lobby Information Desk	30	lf	\$ 1,200	\$ 240	\$	7,200
3	2 4x8 Plywood @ each floor	38,040	sf	\$ 0.75	\$ 0.15	\$	5,706
	Misc. Wood throughout (100 per						
2	floor)	6,000	sf	\$ 1.00	\$ 0.10	\$	600
TOTAL COST FOR PROJECT						\$	19,506

TYPE 4: Cost Analysis Detail-Mid-Size Commercial							
Item #	Description	Quantity	Unit	Rate	FSC Premium	Proposed Cost	
1	Wood Lobby Security Desk	25	lf	\$ 1,200	\$ 240	\$	6,000
2	Wood Lobby Information Desk	30	lf	\$ 1,200	\$ 240	\$	7,200
3	2 4x8 Plywood @ each floor	38,040	sf	\$ 0.75	\$ 0.15	\$	5,706
	Misc. Wood throughout (100 per						
2	floor)	6,000	sf	\$ 1.00	\$ 0.20	\$	1,200
TOTAL COST FOR PROJECT (25% Wood FSC)						\$	5,027

TYPE 2: High Rise Residential							
Item #	Description	Quantity	Unit	Rate	FSC Premium	Proposed Cost	
1	Wood Lobby Security Desk	25	lf	\$ 1,200	\$ 240	\$	6,000
2	Wood Lobby Information Desk	30	lf	\$ 1,200	\$ 240	\$	7,200
3	2 4x8 Plywood @ each floor	38,040	sf	\$ 0.75	\$ 0.15	\$	5,706
	Misc. Wood throughout (100 per floor-						
4	ie: elect panels, meters)	6,000	sf	\$ 1.00	\$ 0.20	\$	1,200
5	Flooring	31,104	sf	\$ 4.25	\$ 0.85	\$	26,438
TOTAL COST FOR PROJECT						\$	46,544

WATER EFFICIENCY

Enhance Water Efficiency Standards

WE 1
(Old ID-W 2)

Cost Analysis						
In any scenario the economics are contingent on quantity of buying fixtures. As example, using a dual flush toilet in a major commercial building will not cause any significant additional costs as labor would be driver. Dual flush or standard WC's have same connection to waste and supply, the mechanics of the toilet are different- not installation. All other fixtures are cost neutral as they exist in the market today.						

Cost Analysis Detail-Large Scale Commercial-New Construction						
Item #	Description	Quantity	Unit	Rate		Proposed Cost
1	Dual Flush Toilets	392	ea	\$ 75.00	premium only	\$ 29,400.00
TOTAL COST FOR PROJECT						\$ 29,400.00
Savings and payback estimates: Type 1: Large Commercial						
Total Water Savings:		9,191,000				gal/yr
Water		4.95				gal/yr
Total Dollar Savings:		\$83,062				/yr
Dollar savings/SQFT:		\$0.0448				/yr
Simple Payback:		0.4				yr

Cost Analysis Detail-Type 4: Mid-Size Commercial-New Construction						
Item #	Description	Quantity	Unit	Rate		Proposed Cost
1	Dual Flush Toilets	90	ea	\$ 85.00		\$ 7,650.00
TOTAL COST FOR PROJECT						\$ 7,650.00
Savings and payback estimates: Type 4: Mid-Sized Commercial Fit-out						
Total Water Savings:		346,632				gal/yr
Water		6.93				gal/yr
Total Dollar Savings:		\$3,133				/yr
Dollar savings/SQFT:		\$0.0627				/yr
Simple Payback:		2.4				yr

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Cost Analysis Detail-Type 5: Large Scale Renovation (commercial)

1	Dual Flush Toilets	392	ea	\$	75.00	premium	\$	29,400.00
TOTAL COST FOR PROJECT							\$	29,400.00

Savings not calculated for this case.

Cost Analysis Detail-Type H: Single Family Home or 2 bedroom Apart/Condo

1	Dual Flush Toilets	2	ea	\$	125.00	premium	\$	250.00
TOTAL COST FOR PROJECT							\$	250.00

Savings and payback estimates: Type H: Single family home

Total Water Savings:	42,632	gal/yr
Water	21.32	gal/yr
Total Dollar Savings:	\$385	/yr
Dollar savings/SQFT:	\$0.1925	/yr
Simple Payback:	0.6	yr

Cost Analysis Detail-Type 3 Low Rise Residential

Item #	Description	Quantity	Unit	Rate		Proposed Cost
1	Dual Flush Toilets	40	ea	\$	125.00	\$ 5,000.00
TOTAL COST FOR PROJECT						\$ 5,000.00

Savings and payback estimates: Type 3: Low Rise Residential

Total Water Savings:	927,246	gal/yr
Water	25.85	gal/yr
Total Dollar Savings:	\$4,636	/yr
Dollar savings/SQFT:	\$0.1293	/yr
Simple Payback:	1.1	yr

Cost Analysis Detail-Type 2 High Rise Residential

Item #	Description	Quantity	Unit	Rate		Proposed Cost
1	Dual Flush Toilets	483	ea	\$	125.00	\$ 60,375.00
TOTAL COST FOR PROJECT						\$ 60,375.00

Savings and payback estimates: Type 2: Residential High Rise

Total Water Savings:	5,861,900	gal/yr
Water	14.52	gal/yr
Total Dollar Savings:	\$30,650	/yr
Dollar savings/SQFT:	\$0.0759	/yr
Simple Payback:	2.0	yr

Upgrade Inefficient Toilets, Showerheads & Faucets During Renovations

WE 2

(Old ID-W5)

Cost Analysis					
Based on any building type, this a cost neutral change. The fixture water usages specified by the EPA are sold as standard nationwide and have no associated incremental costs. The total cost for doing a fixture replacement is shown for Types 5 and 7 to demonstrate that fixture replacement is cost effective even if not being done otherwise. But since nothing in this proposal forces bathroom renovations, the cost of the proposal is presented as zero.					
Cost Analysis Detail-Type 7					
Item #	Description	Quantity	Rate		Proposed Cost
1	Replace toilets	2.00	\$ 220.00	(1.28 toilet)	\$ 440.00
2	Replace Showerhead	2.00	\$ 40.00		\$ 80.00
3	Aerators at Lavatories	2.00	\$ 10.00		\$ 20.00
TOTAL COST TO PROJECT:					\$ 540.00
Cost Analysis Detail-Type 5					
Item #	Description	Quantity	Rate		Proposed Cost
1	Replace toilets	392.00	\$ 210.00	(1.28 toilet)	\$ 82,320.00
3	Aerators at Lavatories	588.00	\$ 2.00		\$ 1,176.00
TOTAL COST TO PROJECT:					\$ 83,496.00

Savings and payback estimates: Type 5: Reno Large			
Total Water Savings:	9,191,000	gal/yr	
Water Savings/SQFT:	4.95	gal/yr	
Total Dollar Savings:	\$83,062	/yr	
Dollar savings/SQFT:	\$0.0448	/yr	
Simple Payback:	1.0	yr	
Savings and payback estimates: Type 6: Reno Small			
Water Savings/SQFT:	6.93	gal/yr	
Total Dollar Savings:	\$3,133	/yr	
Dollar savings/SQFT:	\$0.0627	/yr	
Simple Payback:	NA	yr	
Savings and payback estimates: Type 7: Reno Small,			
Total Water Savings:	31,974	gal/yr	
Water Savings/SQFT:	29.61	gal/yr	
Total Dollar Savings:	\$289	/yr	
Dollar savings/SQFT:	\$0.268	/yr	
Simple Payback:	1.9	yr	

Catch Leaks by Measuring Water Use

WE 3
(Old ID-W1)

Cost Analysis						
Assume standard Office Building-New Construction, two tenants for the pricing exercise. Assume a meter at: boiler make-up, cooling tower, and on two high-use tenants.						

Type 1: Cost Analysis Detail-Large Scale Commercial-New Construction						
Item #	Description	Quantity	Unit	Rate		Proposed Cost
1	Tenant Water Sub-Meter Allowance for existing	2	ea	\$1,000.00	inc. labor	\$2,000.00
2	plumbing modifications (Assume one for restaurant, one for laundry or other similar tenant.)	1	ls	\$600.00		\$600.00
2	@ Boiler: Water Sub-Meter	1	ea	\$1,000.00	inc. labor	\$1,000.00
	Overflow Alarm	1	ea	\$280.00	inc. labor	\$280.00
	Water make-up valve	1	ea	\$160.00	inc. labor	\$160.00
3	@ Cooling Tower Water Sub-Meter (negligible difference w/ pipe size)	1	ea	\$1,000.00	inc. labor	\$1,000.00
4	@ Point of Entry	1	ea	Already required-no additional costs		-
TOTAL COST FOR PROJECT						\$5,040.00

Savings and payback estimates:

Because the primary function of these meters is to detect leaks and system failures, the savings will depend on these stochastic events and cannot be projected with confidence. However, wide experience in the plumbing industry gives confidence that the meters will more than pay for themselves, when averaged over many buildings. We have included estimates from a major engineering firm that savings can range up to \$1230/year for Type 1 and \$1135 for Type 2 to include possible payback periods of 4 and 8 years, represented by two open dots, indicating a possibility of no payback, or of useful payback.

Type 2: High Rise Residential						
(assume 6 Units Per floor)						
Item #	Description	Quantity	Unit	Rate		Proposed Cost
1	Tenant Water Sub-Meter No meters; not appropriate for residential plumbing.)		ea	\$1,000.00	inc. labor	
2	@ Boiler: Water Sub-Meter	6	ea	\$1,000.00	inc. labor	\$6,000.00
	Overflow Alarm	6	ea	\$280.00	inc. labor	\$1,680.00
	Water make-up valve	6	ea	\$160.00	inc. labor	\$960.00
3	@ Cooling Tower Water Sub-Meter (negligible difference w/ pipe size)	1	ea	\$1,000.00	inc. labor	\$1,000.00
4	@ Point of Entry	1	ea	Already required-no additional costs		-
TOTAL COST FOR PROJECT						\$9,640.00

Savings estimated; see previous note.

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Type 4: Cost Analysis Detail-Mid-Size Commercial-New Construction

Item #	Description	Quantity	Unit	Rate		Proposed Cost
1	Tenant Water Sub-Meter (assume 1 per floor & link to BMS)	6	ea	\$1,000.00	inc. labor	\$6,000.00
2	@ Boiler: Water Sub-Meter	1	ea	\$1,000.00	inc. labor	\$1,000.00
	Overflow Alarm	1	ea	\$280.00	inc. labor	\$280.00
	Water make-up valve	1	ea	\$160.00	inc. labor	\$160.00
3	@ Cooling Tower Water Sub-Meter	1	ea	\$1,000.00	inc. labor	\$1,000.00
	(negligible difference w/ pipe size)					
4	@ Point of Entry	1	ea	Already required-no additional costs		-
TOTAL COST FOR PROJECT						\$8,440.00

Savings not calculated; see previous note.

Type 5: Cost Analysis Detail-Large Scale Renovation (commercial)

1	Tenant Water Sub-Meter (Assume one for restaurant, one for laundry or other similar tenant.)	2	ea	\$300.00	inc. labor	\$600.00
SUBTOTAL (TENANT COSTS ON INDIV. FLOOR)						\$600.00
If Scope in Retro-fit: (assume piping is accessible in each location)						
2	@ Boiler: Water Sub-Meter	1	ea	\$1,000.00	inc. labor	\$1,000.00
	Overflow Alarm	1	ea	\$280.00	inc. labor	\$280.00
	Water make-up valve	1	ea	\$160.00	inc. labor	\$160.00
3	@ Cooling Tower Water Sub-Meter	1	ea	\$1,000.00	inc. labor	\$1,000.00
	(negligible difference w/ pipe size)					
4	@ Point of Entry	1	ea	Already required-no additional costs		-
TOTAL COST FOR PROJECT						\$3,040.00

Savings not calculated; see previous note.

Facilitate Use of Recycled Water

WE 4
(Old ID-W 9)

Cost Analysis							
Proposal would relax standards, not require any installations. No hard costs associated with this recommendation.							
Cost Analysis Detail							
Item #	Description	Quantity	Unit	Rate		Proposed Cost	
1						\$ -	
<p>Note: Savings calculations assume 50% of yearly rainfall available to building site is utilized. However, these savings estimates are not reported further, since using the water would entail costs for tanks, cleaning equipment, etc., that are too diverse to estimate.</p>	Savings and payback estimates: Type 1: Commercial High Rise						
	Total Water Savings:		336,600		gal/yr		
	Water		0.18		gal/yr		
	Total Dollar Savings:		\$1,760		/yr		
	Dollar savings/SQFT:		\$0.00095		/yr		
	Simple Payback:		NA		yr		
	Savings and payback estimates: Type 2: High Rise Residential						
	Total Water Savings:		561,000		gal/yr		
	Water		1.4		gal/yr		
	Total Dollar Savings:		\$2,930		/yr		
	Dollar savings/SQFT:		\$0.0073		/yr		
	Simple Payback:		NA		yr		
	Savings and payback estimates: Type 3: Low Rise Residential						
	Total Water Savings:		99,700		gal/yr		
	Water		2.78		gal/yr		
	Total Dollar Savings:		\$520		/yr		
	Dollar savings/SQFT:		\$0.014		/yr		
Simple Payback:		NA		yr			
Savings and payback estimates: Type H: Single Family Home							
Total Water Savings:		47,400		gal/yr			
Water		23.7		gal/yr			
Total Dollar Savings:		\$250		/yr			
Dollar savings/SQFT:		\$0.12500		/yr			
Simple Payback:		NA		yr			
Savings and payback estimates: Type: Reno Large							
Total Water Savings:		336,600		gal/yr			
Water		0.18		gal/yr			
Total Dollar Savings:		\$1,760		/yr			
Dollar savings/SQFT:		\$0.00095		/yr			
Simple Payback:		NA		yr			

Reduce Use of Drinking Water to Clean

WE 5
(Old ID-W 4)

Cost Analysis	
Base compliance would include purchasing a water conserving power wash/broom hooked up to standard potable water supply. If a building owner chooses to go further with intent of this recommendation, a graywater capture system could be implemented.	

Type 1: Commercial High Rise: Use of Water Broom (Power wash)					
Item #	Description	Quantity	Unit	Rate	Proposed Cost
1	Power wash (water broom)	\$2.00	ea	\$300.00	\$600.00
TOTAL COST FOR PROJECT					\$600.00

Savings and payback estimates:			
Occupants	Total Water Savings:	52,946	gal/yr
3500	Water	0.029	gal/yr
	Total Dollar Savings:	\$277	/yr
	Dollar savings/SQFT:	\$0.00015	/yr
	Simple Payback:	2.2	yr

Stop Wasting Drinking Water for Cooling

WE 6

(Old ID-W 3)

Cost Analysis	
<p>For new construction or reconstruction of an HVAC system, the cost will be negligible. If conversion is required in a retrofit, the costs will vary from negligible to significant based on type of alternate system to be used. If a location for an air-cooled condenser can be found, replacing a broken water-cooled system with an air-cooled system will be cost neutral; if a grey water system is used on a project the costs could exceed \$100k, but this option would never be chosen in isolation.</p>	

Type 1: Commercial High Rise						
Item #	Description	Quantity	Unit	Rate		Proposed Cost
1	Code already limits to one unit		ea	-		-
1	Air cooling system (Air cooled remote condenser)	na	ls			\$ -
TOTAL COST FOR PROJECT						\$ -

Reuse Water from ConEd Steam

WE 7
(Old ID-W 6)

Cost Analysis						
Cost indicated below are based on a commercial high rise as indicated in the narrative.						
Type 1: Commercial High Rise and Type 2: High Rise Residential.						
Item #	Description	Quantity	Unit	Rate		Proposed Cost
1	Steam condensate recapture piping	1.00	ea	\$4,800.00		\$4,800.00
2	Receiver is assumed present	-				
3	Larger Receiver (prevent overflow)	1.00	ea	\$1,500.00		\$1,500.00
4	Preheating domestic water	1.00		\$7,500.00	based on 50' distance	\$7,500.00
5	Cooling (not required if temp low enough to reuse)					
6	Piping to cooling tower	800.00	lf	\$45.00		\$36,000.00
7	Piping to irrigation system	200.00	lf	\$45.00		\$9,000.00
TOTAL PROJECT COSTS (IRRIGATION):						\$22,800.00
TOTAL PROJECT COSTS (COOLING TOWER MAKE-UP):						\$49,800.00
*Utility company steam is not 100% clean, so damage to tower and condenser water line and or toilets can happen as a result of condensate water being contaminated.						

Savings and payback estimates: Type 1: Commercial High Rise		
Total Water Savings:	10,021,000	gal/yr
Water Savings/SQFT:	5.4	gal/yr
Total Dollar Savings:	\$27,100	/yr
Dollar savings/SQFT:	\$0.01460	/yr
Simple Payback:	1.8	yr
Savings and payback estimates: Type 2: High Rise Residential		
Total Water Savings:	2,180,000	gal/yr
Water Savings/SQFT:	5.4	gal/yr
Total Dollar Savings:	\$5,890	/yr
Dollar savings/SQFT:	\$0.01459	/yr
Simple Payback:	8.5	yr

Water Savings Estimates

See following sheets for WE1 & WE2

		Gross Area	Estimated Occupants	WE 3	WE 4	WE 5	WE 6	WE 7
1	Commercial High Rise	1,855,700 SF	3500	Total Water Savings: 235,060 gal/yr Water Savings/SQFT: 0.13 gal/yr Total Dollar Savings: \$1,230/yr Dollar savings/SQFT: \$0.0007/yr NOT USED DUE TO LACK OF BACKUP	Assume 50% of yearly rainfall available to building site is utilized Total Water Savings: 336,600 gal/yr Water Savings/SQFT: 0.18 gal/yr Total Dollar Savings: \$1,760/yr Dollar savings/SQFT: \$0.009/yr	Using Water Broom (2gpm vs 8gpm) Total Water Savings: 52,946 gal/yr Water Savings/SQFT: 0.03 gal/yr Total Dollar Savings: \$277/yr Dollar savings/SQFT: \$0.0001/yr	Cannot quantify, depends on type of building equipment utilized. Once through cooling would not be feasible for entire building cooling.	Total Water Savings: 10,020,780 gal/yr Water Savings/SQFT: 5.4 gal/yr Total Dollar Savings: \$27,056/yr Dollar savings/SQFT: \$0.015/yr
2	Residential High Rise (for LD-7 assume hotel confirm room quantity)	403,690	550	Total Water Savings: 216,810 gal/yr Water Savings/SQFT: 0.54 gal/yr Total Dollar Savings: \$1,135/yr Dollar savings/SQFT: \$0.003/yr NOT USED DUE TO LACK OF BACKUP	Assume 50% of yearly rainfall available to building site is utilized Total Water Savings: 561,000 gal/yr Water Savings/SQFT: 1.39 gal/yr Total Dollar Savings: \$2,934/yr Dollar savings/SQFT: \$0.0073/yr	Using Water Broom (2gpm vs 8gpm) Total Water Savings: 48,873 gal/yr Water Savings/SQFT: 0.12 gal/yr Total Dollar Savings: \$256/yr Dollar savings/SQFT: \$0.0006/yr	Cannot quantify, depends on type of building equipment utilized. Once through cooling would not be feasible for entire building cooling.	Total Water Savings: 2,179,926 gal/yr Water Savings/SQFT: 5.4 gal/yr Total Dollar Savings: \$5,886/yr Dollar savings/SQFT: \$0.015/yr
3	Lo-Rise Residential	35,865 SF	87	N/A	Assume 50% of yearly rainfall available to building site is utilized Total Water Savings: 99,733 gal/yr Water Savings/SQFT: 2.78 gal/yr Total Dollar Savings: \$522/yr Dollar savings/SQFT: \$0.015/yr	Using Water Broom (2gpm vs 8gpm) Total Water Savings: 6,353 gal/yr Water Savings/SQFT: 0.18 gal/yr Total Dollar Savings: \$33/yr Dollar savings/SQFT: \$0.0009/yr	N/A	N/A
H	Single Family Home	2000 SF	4	N/A	Assume 50% of yearly rainfall available to building site is utilized Total Water Savings: 47,373 gal/yr Water Savings/SQFT: 12.47 gal/yr Total Dollar Savings: \$248/yr Dollar savings/SQFT: \$0.065/yr	Using Water Broom (2gpm vs 8gpm) Total Water Savings: 7,942 gal/yr Water Savings/SQFT: 3.97 gal/yr Total Dollar Savings: \$42/yr Dollar savings/SQFT: \$0.021/yr	N/A	N/A
4	Tenant Fit out of commercial space, Assume 50,000 SF	50,000	132	N/A	N/A	N/A	N/A	N/A
Reno Large	Substantial reconstruction of large commercial building	1,855,700 SF	3500	N/A	Assume 50% of yearly rainfall available to building site is utilized Total Water Savings: 336,600 gal/yr Water Savings/SQFT: 0.18 gal/yr Total Dollar Savings: \$1,760/yr Dollar savings/SQFT: \$0.009/yr	Using Water Broom (2gpm vs 8gpm) Total Water Savings: 52,946 gal/yr Water Savings/SQFT: 0.03 gal/yr Total Dollar Savings: \$277/yr Dollar savings/SQFT: \$0.0001/yr	N/A	Total Water Savings: 10,020,780 gal/yr Water Savings/SQFT: 5.4 gal/yr Total Dollar Savings: \$27,056/yr Dollar savings/SQFT: \$0.015/yr
Reno Small	Tenant Fit out of commercial space, Assume 50,000 SF	50,000	132	N/A	N/A	N/A	N/A	N/A
Reno Small-R	Domestic Renovation Condo	1080	3	N/A	N/A	N/A	N/A	N/A

UPDATED CALCULATIONS FOR WE 1 & WE 2

Enhance Water Efficiency Standards

WE 1

Water Rate Data	
Water Rate(July 2009)	\$2.61 Per 100 CUFT
Sewer Rate(July 2009)	\$4.15 Per 100 CUFT (Of Water Supplied)
Total	\$6.76 Per 100 CUFT
Total	\$0.0090 Per gallon

Existing Fixture Usage Assumptions					
Commercial/Office	Use/Day	Gal/Flush	Gal/Min	Duration (min)	Total Gal
Toilet(Male)	1	4.5	N/A	N/A	4.5
Urinal(Male)	2	3	N/A	N/A	6
Toilet(Female)	3	4.5	N/A	N/A	13.5
Lavatory	3	N/A	2.5	0.25	1.875
Home					
Toilet(Male)	4	4.5	N/A	N/A	18
Toilet(Female)	4	4.5	N/A	N/A	18
Lavatory	3	N/A	2.5	3	22.5
Shower	1	N/A	3	7	21

Efficient Fixture Usage:					
Commercial/Office	Use/Day	Gal/Flush	Gal/Min	Duration (min)	Total Gal
Toilet(Male)	1	1.2	N/A	N/A	1.2
Urinal(Male)	2	1	N/A	N/A	2
Toilet(Female)	3	1.2	N/A	N/A	3.6
Lavatory	3	N/A	0.5	0.25	0.375
Home					
Toilet(Male)	4	1.2	N/A	N/A	4.8
Toilet(Female)	4	1.2	N/A	N/A	4.8
Lavatory	3	N/A	1.5	3	13.5
Shower	1	N/A	2	7	14

Savings per capita per day		Savings per building per year			
Commercial/Office	GPC/DAY	Type	Occupants	Days/wk	Savings (gal/yr)
Toilet(Male)	3.30	1	3500	5	9,191,000
Urinal(Male)	4.00	2	550	7	5,845,840
Toilet(Female)	9.90	3	87	7	924,706
Lavatory	1.50	4	132	5	346,632
Totals	10.10	H	4	7	42,515
Home					
Toilet(Male)	0.00				
Toilet(Female)	13.20				
Lavatory	13.20				
Shower	9.00				
Totals	7.00				
Totals	29.20				

Upgrade Inefficient Toilets, Showerheads & Faucets During Renovations

WE 2

Water Rate Data	
Water Rate(July 2009)	Per 100 \$2.61 CUFT
Sewer Rate(July 2009)	\$4.15 Per 100 CUFT (Of Water Supplied)
Total	Per 100 \$6.76 CUFT
Total	\$0.0090 Per gallon

Existing Fixture Usage Assumptions					
Commercial/Office	Use/Day	Gal/Flush	Gal/Min	Duration (min)	Total Gal
Toilet(Male)	1	4.5	N/A	N/A	4.5
Urinal(Male)	2	3	N/A	N/A	6
Toilet(Female)	3	4.5	N/A	N/A	13.5
Lavatory	3	N/A	2.5	0.25	1.875
<u>Home</u>					
Toilet(Male)	4	4.5	N/A	N/A	18
Toilet(Female)	4	4.5	N/A	N/A	18
Lavatory	3	N/A	2.5	3	22.5
Shower	1	N/A	3	7	21

Efficient Fixture Usage:					
Commercial/Office	Use/Day	Gal/Flush	Gal/Min	Duration (min)	Total Gal
Toilet(Male)	1	1.2	N/A	N/A	1.2
Urinal(Male)	2	1	N/A	N/A	2
Toilet(Female)	3	1.2	N/A	N/A	3.6
Lavatory	3	N/A	0.5	0.25	0.375
<u>Home</u>					
Toilet(Male)	4	1.2	N/A	N/A	4.8
Toilet(Female)	4	1.2	N/A	N/A	4.8
Lavatory	3	N/A	1.5	3	13.5
Shower	1	N/A	2	7	14

Savings per capita per day	
Commercial/Office	GPC/DAY
Toilet(Male)	3.30
Urinal(Male)	4.00
Toilet(Female)	9.90
Lavatory	1.50
Totals	10.10
<u>Home</u>	
Toilet(Male)	13.20
Toilet(Female)	13.20
Lavatory	9.00
Shower	7.00
Totals	29.20

Savings per building per year			
Type:	5	6	7
Occupants:	3500	132	3
Days/week:	5	5	7
Savings(g/y):	9191000	346632	31886
Svgs(g/y-sf):	6.93		

How Enhanced Water Efficiency Standards for Plumbing Products Reduces Per Capita

End Use	gs (Additional Savings)	Notes
Toilet Use at Home	13.2 gcpd (2.4 gcpd)	$4.5 \text{ gpf} - 1.2 \text{ gpf} = 3.3 \text{ gpf} * 4 \text{ flushes per day} = 13.2 \text{ gcpd}$ savings
Showerheads	14 gcpd (3.5 gcpd)	$4 \text{ gpm} - 2 \text{ gpm} = 2 \text{ gpm} * 7 \text{ minutes per shower} = 14 \text{ gcpd}$
Faucets	6 gcpd (3 gcpd)	$2 \text{ gpm reduction} * 3 \text{ minutes per day} = 6 \text{ gcpd}$
Toilets and Urinals at Work	5.8 gcpd (3.6 gcpd)	Males: $(3.5 \text{ gpf} - 0.5 \text{ gpf}) * 2 \text{ uses} = 6 \text{ gcpd}$ Females: $(4 \text{ gpf} - 1.28 \text{ gpf}) * 2 \text{ uses} = 5.4 \text{ gcpd}$
Total at Home	33.2 gcpd (8.9 gcpd)	
Total at Work	5.8 gcpd (3.6 gcpd)	

Abbreviations and Acronyms:

Gcpd = Gallons per capita per day

Gpf = Gallons per flush

Gpm = Gallons per minute

4.5 gpf = water use of pre-1980 toilets (some are 5 gpf or more)

1.2 gpf = water use of mix of single-flush High Efficiency Toilets and Dual Flush Toilets

4 gpm = Flow rate for pre-1990 showerheads (some are 5 gpm or more)

2 gpm = Proposed new showerhead flow rate (Current Code is 2.5 gpm)

Old faucets flow at anywhere from 3 gpm to 6 gpm

Existing fixture standards will already provide significant water savings over time. The proposed new standards will increase those savings significantly: About 27% increased saving in home water use and 62% savings in water use in the workplace compared to current standards alone..

Existing Residential Water Use: 78 gcpd average,

Fixture Replacement Rates: 20-30 years (toilets and faucets); 10 years (showerheads)

Toilets: 45% currently 1.6 gpf, 5% currently 3.5 gpf; 50% 5 gpf (oldest portion, mostly in 1-20 unit

After 10 years: All showerhead savings attained, 30% of toilet and faucet savings: Average $(13.2$

$\text{gcpd} * 0.3) + 14 \text{ gcpd} + (6 \text{ gcpd} * 0.3) = 19.96 \text{ gcpd}$ (25.5% reduction in residential use, 18.6%

After 20 and 30 years: Additional $(13.2 \text{ gcpd} * 0.3) + (6 \text{ gcpd} * 0.3) = 5.96 \text{ gcpd}$

After 30 years: $19.96 + 5.96 + 5.96 = 31.88 \text{ gcpd}$

Conservatism and other Notes:

4.5 gpf used for older toilets instead of nominal 5 gpf.

1.2 gpf reflects mix of HET single flush and dual flush fixtures

4 gpm used for old showerheads based on field data rather than 5 gpm nominal

Additional savings in second and third decades may be less as the toilet being replaced is increasingly more likely to be 3.5 gpf or even 1.6 gpf.

URBAN ECOLOGY

Increase Biodiversity In Public Landscapes

UE 1
(Old ID-SS 3)

Cost Analysis						
This proposal requires diverse plantings, but does not have a cost impact.						
Cost Analysis Detail						
Item #	Description	Quantity	Unit	Rate		Proposed Cost
TOTAL COST TO PROJECT:						\$ -

Increase Biodiversity in Sidewalk Plantings

UE 2
(Old ID-SS10)

Cost Analysis						
Zoning code requires owners to have plantings within planting strips. This proposal changes the types of required plantings and does not increase costs.						
Cost Analysis Detail						
Item #	Description	Quantity	Unit	Rate		Proposed Cost
						\$ -
						\$ -

Construct Sustainable Sidewalks

UE 3
(Old ID-SS 6)

Type 1-Large Scale Commerical Renovation				
Where sidewalk is being retrofitted to accommodate new code, No Finishes (see below for options)				
Excavation (2D x 5W x 1168L)	433 Cu yd	\$28.00	\$12,124.00	Excavation to this extent only on 'retrofits'
Structural Soil	324.75 Cu yd	\$50.00	\$16,237.50	18" of Structural Soil, w/ 6" topping (already a requirement)
Additional Trees.	40 Ea.	\$1,500	\$60,000	Cost for approx. 1 additional tree every 30 lf.
Total			\$88,361.50	

Preserve "100-Year" Old Trees

UE 4
(Old ID-SS 18)

Cost Analysis							
Code change-no costs, except pruning related, or protection in case of nearby construction. See other SS items for pricing related to this.							
Cost Analysis Detail							
Item #	Description	Quantity	Unit	Rate			Proposed Cost

Protect Street Trees From Construction Activities

UE 5
(Old ID-SS 9)

Cost Analysis						
Existing trees for any property are at 25' intervals at a minimum, sidewalk exposure indicated in each type. Time per each tree is contingent on tree size and canopy reach. No cost if no trees.						
Type 1: Commercial High Rise						
(example used is a corner w/ 200' sidewalk w/ 8 existing trees @ 25' oc)						
Item #	Description	Quantity	Unit	Rate		Proposed Cost
	Prune existing Trees	32.00	hr	\$ 100.00	(4 hrs per tree)	\$ 3,200.00
	Build custom sidewalk Shed	48.00	hrs	\$ 85.00		\$ 4,080.00
	Custom Shed Materials	8.00	ls	\$ 1,000.00		\$ 8,000.00
	Materials	8.00	ea	\$ 200.00		\$ 1,600.00
	TOTAL COST TO PROJECT:					\$ 16,880.00

Type 2: Residential High Rise						
(Example used is a corner development w/ 180lf sidewalk w/ 7 existing trees @ 25' oc)						
Item #	Description	Quantity	Unit	Rate		Proposed Cost
	Prune existing Trees	28.00	hr	\$ 100.00	(4 hrs per tree)	\$ 2,800.00
	Build custom sidewalk Shed	42.00	hrs	\$ 85.00		\$ 3,570.00
	Custom Shed Materials	7.00	ls	\$ 1,000.00		\$ 7,000.00
	Materials	7.00	ea	\$ 200.00		\$ 1,400.00
	TOTAL COST TO PROJECT:					\$ 14,770.00

STORMWATER

Reduce Excessive Paving of Sites

SW 1
(Old ID-H7)

Cost Analysis						
Building Type 7 (foot print of Lot 2500 sf, Open Space 1000 (30x25 + 10x25) Analysis is for permeable concrete versus standard concrete.)						
Type 7: Cost Analysis Detail						
Item #	Description	Quantity	Unit	Rate		Savings
1	Permeable concrete	1,000.00	sf	\$ 2.00		\$ 2,000.00
2	Final grading for permeable concrete (3-4" gravel layer)	1,000.00	sf	\$ 0.50		\$ 500.00
					TOTAL	\$ 2,500.00
	Standard Concrete surface:	1,000.00	sf	\$ 5.00		\$ (5,000.00)
	*Compaction included in Item #1: Up to 92% compaction required per ASTM D 1557				NET:	\$ (2,500.00)

Reduce Runoff From New Developments

SW 2
(Old ID-SS1)

Cost Analysis						
Below are two standard retention examples for consideration with appropriate measure indicated for each.						
Type 7: Small Residential						
Item #	Description	Quantity	Unit	Rate		Proposed Cost
	Costs for Water Barrels	1.00	ea	\$ 200.00		\$ 200.00
	TOTAL COST TO DWELLING:					\$ 200.00

Type 1: Large Commercial						
Item #	Description	Quantity	Unit	Rate		Proposed Cost
	Costs for Underground Detention	1.00	acre	\$ 150,000.00		\$ 150,000.00
	TOTAL COST TO DWELLING:					\$ 150,000.00

Notes:

For Large Commercial Developments, assuming allowable rate of discharge will be limited to 0.25 cfs/acre (reduced runoff rate currently being considered by DEP in the proposed changes to their regulations) and proposed site runoff coefficient of 0.85 (85% of site is impervious) the volume of stormwater detention required would be approximately 5,250 CF/acre of development.

Assuming an underground detention system comprised of 36" diameter HDPE pipes, stone bedding/backfill and inlet and outlet structures the unit cost is approximately \$150,000/acre (\$30/CF of detention).

Reduce Stormwater Runoff from Construction Sites

SW 3
(Old ID-SS 14)

Cost Analysis						
Proper construction measures, regardless of lot size are required regardless of the EPA prevention plan. De-watering, and other means or sediment control take place.						
Cost Analysis Detail						
Item #	Description	Quantity	Unit	Rate		Proposed Cost
	Allowance for erosion control	1.00	acre	\$ 100,000.00		\$ 100,000.00
(Note: does not include premiums for hazardous or contaminated soil and/or groundwater treatment.)						
(Note: Assumes Large Residential project for estimating.)						

Send Rainwater To Waterways

SW 4
(Old ID-SS 7)

Cost Analysis						
Direct discharge to tidal waterbodies would not require stormwater detention facilities that would otherwise be required for sewer connections to the City sewers. However, direct discharges to tidal bodies will require water quality treatment potentially creating a longer term approval process (not quantifiable).						
1-Large Scale Commerical						
Item #	Description	Quantity	Unit	Rate		Proposed Cost
1	Water Quality Unit	1.00	ea	\$ 15,000.00	(Aquaswirl or eq)	\$ 15,000.00
2	Headwall	1.00	ls	\$ 10,000.00		\$ 10,000.00
3	Deduct for Underground Detention	1.00	ls	\$ (150,000.00)		\$ (150,000.00)
	TOTAL PROJECT COSTS:					\$ (125,000.00)

Encourage Innovative Stormwater Practices

SW 5

(Old ID-SS 8)

Cost Analysis					
Proposal provides for more flexibility in meeting stormwater control requirements; no increased cost implications.					
Cost Analysis Detail					
Item #	Description	Quantity	Unit	Rate	Proposed Cost
					\$ -
					\$ -

Maintain Site-Based Stormwater Systems

SW 6

(Old ID-SS 5)

Cost Analysis					
Proposal requires development of rules; no direct or immediate costs.					
Cost Analysis Detail					
Item #	Description	Quantity	Unit	Rate	Proposed Cost
					\$ -

Reduce Runoff From Existing Developments

SW 7

(Old ID-SS 02)

Cost Analysis						
This proposal calls for a study to be undertaken by New York City. Since doing the study imposes no requirements or costs on building owners other than their negligible share of the study costs, the cost is presented as zero. The costs for retention technologies below are informational only.						
Cost Analysis Detail						
Item #	Description	Quantity	Unit	Rate		Proposed Cost
	Costs for Water Barrels	2.00	sf	\$ 200.00		\$ 400.00
	Costs for Drywell/Catch basin	1.00	ls	\$ 9,000.00		\$ 9,000.00
	TOTAL COST TO DWELLING:					\$ 9,400.00

FINANCIAL COSTS AND SAVINGS SUMMARY CHART

Summary of Cost and Savings Estimates for All Proposals

Proposal Number	Building Type	Standard Construction Cost (\$)	Incremental Cost of Proposal (\$)	Cost Change from Total Construction Cost	# of Cost Dots	Incremental Cost (\$/sq. ft.)	Annual Savings (\$)	Payback Period (years)	# of Payback Dots
BR01			Study		0	\$0.000			
BR02			\$0		0	\$0.000			
BR03	-	-	Study		0	\$0.000	-	-	
BR04	-	-	Study		0	\$0.000	-	-	
BR05	-	-	Study		0	\$0.000	-	-	
BR06	-	-	Study		0	\$0.000	-	-	
BR07	1 (opt 1)	\$738,568,600	-\$633,600	-0.086%	0	-\$0.341			
BR07	1 (opt 2)	\$738,568,600	-\$398,400	-0.054%	0	-\$0.215			
BR08	2	\$176,187,150	\$57,000	0.032%	1	\$0.141			
BR09	-	-			0	\$0.000	-	-	
EE01	1	\$738,568,600	\$2,542,309	0.344%	2	\$1.370	\$538,000	4.7	2
EE01	2	\$176,187,150	\$553,055	0.314%	2	\$1.370			
EE01	4	\$10,250,000	\$150,000	1.463%	3	\$3.000			
EE02	1	\$738,568,600	\$148,456	0.020%	1	\$0.080			
EE02	2	\$176,187,150	\$31,322	0.018%	1	\$0.078	\$14,511	2.2	3
EE02	4	\$10,250,000	\$4,000	0.039%	1	\$0.080			
EE03	1	\$176,187,150	\$8,000	0.000%	0	\$0.004	na		
EE04	H		\$2,605	0.750%	3	\$1.303			
EE05	6	\$10,250,000	\$87,500	0.854%	3	\$1.750			
EE05	2	\$176,187,150	\$939,665	0.533%	3	\$2.328	\$98,665	9.5	2
EE05	7	\$72,000	\$4,000	5.556%	3	\$3.704			
EE06	1	\$738,568,600	\$3,154,690	0.427%	2	\$1.700	\$395,000	8.0	2
EE07	2	\$176,187,150	\$875	0.000%	0	\$0.002		3 - 10	2
EE07	3	\$7,173,000	\$112	0.002%	0	\$0.003			
EE08	H	\$176,187,150	\$0	0.000%	0	\$0.000	\$357	0	3
EE09	2	\$176,187,150	\$0	0.000%	0	\$0.000	\$331	0	3
EE10	2	Retrofit	\$475,200	Use IC/SF	2	\$1.177	\$72,000	6.6	2
EE10	7	Retrofit	\$2,400	Use IC/SF	3	\$2.222			
EE 10	5	Retrofit	\$518,400	Use IC/SF	2	\$0.279			
EE 10	6	Retrofit	\$114,000	Use IC/SF	3	\$2.280			
EE11	2	\$175,000,000	\$518,400	0.296%	2	\$1.284			
EE12	1	\$176,187,150	\$63,800	0.036%	1	\$0.034	\$16,346	3.90	1
EE13	1	\$738,568,600	\$123,900	0.017%	1	\$0.067			
EE13	6	\$5,750,000	\$840	0.015%	1	\$0.017			
EE13	4	\$10,250,000	\$2,520	0.025%	1	\$0.050	\$910	0	3
EE14	4	Retrofit	\$2,500	Use IC/SF	1	\$0.050	\$8,330	0.30	3
EE15	Removal of Code Impediment				0	\$0.000			
EE16	1	\$738,568,600	\$59,000	0.008%	0	\$0.032	\$1,368,800	0.04	3
EE16	2	\$176,187,150	\$13,230	0.008%	0	\$0.033	\$306,936	0.04	3
EE16	3	\$7,173,000	\$1,800	0.025%	1	\$0.050	\$41,760	0.04	3
EE17	1	\$738,568,600	\$56,265	0.008%	0	\$0.030	\$32,600	1.73	3
EE17	4	\$10,250,000	\$2,500	0.024%	1	\$0.050			
EE18	2	\$176,187,150	\$18,250	0.010%	1	\$0.045	\$27,626	0.66	3
EE19	7	\$72,000	\$1,020	1.417%	3	\$0.944		1.07	3
EE19	5	\$371,140,000	\$618,996	0.167%	2	\$0.334		1.43	3
EE19	H	\$350,000	\$3,900	1.114%	3	\$1.950	\$4,368	0.89	3
EE20	All		\$0	0.000%	0	\$0.000			
EE21					0	\$0.000			
EE22	No requirement, Tenant lease		\$0		0	\$0.000	\$0		
EE23			\$0		0	\$0.000			
EE24			\$0		0	\$0.000			
EE25	1	\$738,568,600	\$185,570	0.025%	1	\$0.100	\$245,913	0.75	3

Summary of Cost and Savings Estimates for All Proposals

Proposal Number	Building Type	Standard Construction Cost (\$)	Incremental Cost of Proposal (\$)	Cost Change from Total Construction Cost	# of Cost Dots	Incremental Cost (\$/sq. ft.)	Annual Savings (\$)	Payback Period (years)	# of Payback Dots
EE25	2	\$176,187,150	\$40,369	0.023%	1	\$0.100			
EE25	4	\$10,250,000	\$10,500	0.102%	2	\$0.210			
EE25	5	\$371,140,000	\$185,570	0.050%	2	\$0.100			
EE26	1	\$738,568,600	\$29,240	0.004%	0	\$0.016	\$33,436	0.87	3
EE26	4	\$10,250,000	\$1,720	0.017%	1	\$0.034			
EE27	4	\$10,250,000	\$7,000	0.068%	2	\$0.140			
EE27	1	\$738,568,600	\$14,400	0.002%	0	\$0.008	\$163,465	0.09	3
EE28	1	Retrofit	\$4,300	Use IC/SF	0	\$0.002	\$23,148	0.19	3
EE28	2	Retrofit	\$4,300	Use IC/SF	0	\$0.011			
EF01	All		\$0	0.000%	0	\$0.000			
EF02	H	\$350,000	\$4,300	1.229%	3	\$2.150	\$869	4.9	2
EF03	1 (CW1)	\$738,568,600	\$0	0.000%	0	\$0.000	\$421,000	0	3
EF03	1 (CW2)	\$738,568,600	\$5,401,687	0.731%	3	\$2.911	\$421,000	13	1
EF03	1 (CW3)	\$738,568,600	\$9,578,992	1.297%	3	\$5.162	\$421,000	23	1
EF03	2 (CW1)	\$176,187,150	\$0	0.000%	0	\$0.000			
EF03	2 (CW3)	\$176,187,150	\$2,626,560	1.491%	3	\$6.506			
EF03	2 (WW4)	\$176,187,150	\$0	0.000%	0	\$0.000			
EF03	2 (M6)	\$176,187,150	\$1,641,600	0.932%	3	\$4.066			
EF03	2 (M7)	\$176,187,150	\$1,231,200	0.699%	3	\$3.050			
EF03	4 (CW1)	\$10,250,000	\$0	0.000%	0	\$0.000			
EF03	4 (CW2)	\$10,250,000	\$284,310	2.774%	3	\$5.686			
EF03	4 (CW3)	\$10,250,000	\$537,030	5.239%	3	\$10.741			
EF03	4 (WW4)	\$10,250,000	\$0	0.000%	0	\$0.000			
EF03	4 (WW5)	\$10,250,000	\$789,750	7.705%	3	\$15.795			
EF03	4 (M6)	\$10,250,000	\$315,900	3.082%	3	\$6.318			
EF03	4 (M7)	\$10,250,000	\$236,925	2.311%	3	\$4.739			
EF04	All		\$0	0.000%	0	\$0.000	na	na	
EF05	All		\$0	0.000%	0	\$0.000	na	na	
EF06	All		\$0	0.000%	0	\$0.000	na	na	
EF07	1	\$738,568,600	\$864,270	0.117%	2	\$0.466	\$163,465	5.3	2
EF07	4	\$10,250,000	\$157,950	1.541%	3	\$3.159			
EF08	2	\$176,187,150	\$98,560	0.056%	2	\$0.244			
EF08	H	\$350,000	\$900	0.257%	2	\$0.450			
EF09			\$0		0	\$0.000			
EF10	1 (option 1)	\$738,568,600	\$692,731	0.094%	2	\$0.373	\$69,897	9.9	2
EF10	4 (option 1)	\$10,250,000	\$71,250	0.695%	3	\$1.425			
EF11			\$0		0	\$0.000			
EF12			\$0		0	\$0.000			
EF13	Removal of Code Impediment		\$0		0	\$0.000	\$0		
EF14	Removal of Code Impediment		\$0		0	\$0.000	\$0		
EF15	Removal of Code Impediment		\$0	0.000%	0	\$0.000			
EF16	Removal of Code Impediment		\$0	0.000%	0	\$0.000			
EF17			\$0		0	\$0.000			
EO01	1	Retrofit	\$556,710	Use IC/SF	2	\$0.300	\$188,000	3.0	3
EO01	2	Retrofit	\$117,458	Use IC/SF	2	\$0.291			
EO01	4	Retrofit	\$15,000	Use IC/SF	2	\$0.300			
EO02	1	\$738,568,600	\$519,200	0.070%	2	\$0.280	\$341,375	1.5	3
EO02	4	\$10,250,000	\$11,000	0.107%	2	\$0.220			
EO02	5	\$371,140,000	\$295,000	0.079%	2	\$0.159			
EO03	all	Retrofit	\$40,000	Use IC/SF	1	\$0.099	\$23,000	1.7	3
EO04	1	\$738,568,600	\$99,500	0.013%	1	\$0.054	\$107,568	0.92	3
EO04	2	\$176,187,150	\$83,000	0.047%	1	\$0.206			

Summary of Cost and Savings Estimates for All Proposals

Proposal Number	Building Type	Standard Construction Cost (\$)	Incremental Cost of Proposal (\$)	Cost Change from Total Construction Cost	# of Cost Dots	Incremental Cost (\$/sq. ft.)	Annual Savings (\$)	Payback Period (years)	# of Payback Dots
EO04	4	\$10,250,000	\$18,500	0.180%	2	\$0.370			
EO04	5	\$371,140,000	\$99,500	0.027%	1	\$0.054			
EO05	1	\$738,568,600	\$55,671	0.008%	0	\$0.000	\$30,078	1.9	3
EO06	1		\$0	0.000%	0	\$0.000	\$317,239	0	3
HT01			\$0		0	\$0.000			
HT02			\$0		0	\$0.000			
HT03	1	\$738,568,600	\$8,000	0.0011%	0	\$0.004			
HT03	2	\$176,187,150	\$57,600	0.008%	0	\$0.031			
HT04	2	\$176,187,150	\$5,640	0.003%	0	\$0.014			
HT05	2	\$176,187,150	\$0	0.000%	0	\$0.000	\$0		
HT06			\$0	0.000%	0	\$0.000	\$0		
HT07	4	\$10,250,000	\$1,602	0.016%	1	\$0.032			
HT07	1	\$738,568,600	\$18,698	0.003%	0	\$0.010			
HT07	2	\$176,187,150	\$19,747	0.011%	1	\$0.049			
HT07	H	\$350,000	\$45	0.013%	1	\$0.023			
HT08	1	\$738,568,600	\$139,065	0.019%	1	\$0.075			
HT08	2	\$176,187,150	\$37,734	0.021%	1	\$0.093			
HT08	4	\$10,250,000	\$9,426	0.092%	2	\$0.189			
HT09	5	Retrofit	\$10,520	Use IC/SF	0	\$0.006			
HT09	6	Retrofit	\$5,260	Use IC/SF	1	\$0.105			
HT09	2	Retrofit	\$5,260	Use IC/SF	0	\$0.013			
HT10	1	Retrofit	\$1,589,220	Use IC/SF	3	\$5.886	\$154,791	10	2
HT10	4	Retrofit	\$181,800	Use IC/SF	3	\$3.636			
HT11	STUDY				0	\$0.000			
HT12	1	\$738,568,600	-\$34,600	-0.005%	-1	-\$0.019			
HT12	2	\$176,187,150	-\$20,000	-0.011%	-1	-\$0.050			
HT12	4	\$10,250,000	-\$1,600	-0.016%	-1	-\$0.032			
HT13	1	\$738,568,600	\$63,000	0.009%	0	\$0.034			
HT14			\$0		0	\$0.000			
HT15	1	\$738,568,600	\$45,606	0.006%	0	\$0.025			
HT15	2	\$176,187,150	\$33,859	0.019%	1	\$0.084			
HT15	5	\$371,140,000	\$45,606	0.012%	1	\$0.025			
HT16	5	\$371,140,000	\$61,380	0.017%	1	\$0.033			
HT16	2	\$176,187,150	\$45,570	0.026%	1	\$0.113			
HT16	1	\$738,568,600	\$61,380	0.008%	0	\$0.033			
HT17	1	\$738,568,600	\$4,356	0.001%	0	\$0.002			
HT17	2	\$176,187,150	\$3,234	0.002%	0	\$0.008			
HT17	4	\$10,250,000	\$396	0.004%	0	\$0.008			
HT18	Removal of Code Impediment				0	\$0.000			
HT19	Removal of Code Impediment				0	\$0.000			
HT20	1	\$738,568,600	\$1,627	0.000%	0	\$0.001			0
OC01	-	-	Study		0	\$0.000	-	-	
OC02	Removal of Code Impediment				0	\$0.000			
OC03	No requirement, code implementation				0	\$0.000			
OC04	No requirement, reconvening the task force				0	\$0.000			
OC05	No Requirement, Code Implementation				0	\$0.000			
OC06	No Requirement, code improvement				0	\$0.000			
OC07	No requirement, code training				0	\$0.000			
RC01	1	\$738,568,600	\$43,390	0.006%	0	\$0.023			
RC02			\$0		0	\$0.000			
RC03			\$0		0	\$0.000			
RC04			\$0		0	\$0.000			

Summary of Cost and Savings Estimates for All Proposals

Proposal Number	Building Type	Standard Construction Cost (\$)	Incremental Cost of Proposal (\$)	Cost Change from Total Construction Cost	# of Cost Dots	Incremental Cost (\$/sq. ft.)	Annual Savings (\$)	Payback Period (years)	# of Payback Dots
RC05	1	\$738,568,600	\$19,506	0.003%	0	\$0.011			
RC05	4	\$10,250,000	\$5,027	0.049%	1	\$0.101			
RC05	2	\$176,187,150	\$46,544	0.026%	1	\$0.115			
SW01	H	\$72,000	-\$2,500	-3.472%	-1	-\$1.250			
SW02	7	\$72,000	\$200	0.278%	2	\$0.185			
SW02	1	\$738,568,600	\$150,000	0.020%	1	\$0.081			
SW03	2	\$176,187,150	\$39,000	0.022%	1	\$0.097			
SW04	1	\$738,568,600	-\$125,000	-0.017%	-1	-\$0.067			
SW05	Removal of Code Impediment				0	\$0.000			
SW06	All		Study		0	\$0.000			
SW07	All		Study		0	\$0.000			
UE01			\$0		0	\$0.000			
UE02			\$0		0	\$0.000			
UE03	1	\$738,568,600	\$88,361	0.012%	1	\$0.048			
UE04			\$0		0	\$0.000			
UE05	1	\$738,568,600	\$16,880	0.002%	0	\$0.009			
UE05	2	\$176,187,150	\$14,770	0.008%	0	\$0.037			
WE01	1	\$738,568,600	\$29,400	0.004%	0	\$0.016	\$7,800	3.8	2
WE01	4	\$10,250,000	\$7,650	0.075%	2	\$0.153	\$290	26	1
WE01	5	\$371,140,000	\$29,400	0.008%	0	\$0.016	na		
WE01	H	\$350,000	\$250	0.071%	2	\$0.125	\$15	17	1
WE01	3	\$7,173,000	\$5,000	0.070%	2	\$0.139	\$327	15	1
WE01	2	\$176,187,150	\$60,375	0.034%	1	\$0.150	\$2,160	28	1
WE02	5	\$371,140,000	\$0	0.000%	0	\$0.000	\$7,800	0	3
WE02	6	\$5,750,000	\$0	0.000%	0	\$0.000	\$290	0	3
WE02	7	\$72,000	\$0	0.000%	0	\$0.000	\$12	0	3
WE03	1	\$738,568,600	\$5,040	0.001%	0	\$0.003	\$1,230	4.1	2
WE03	4	\$10,250,000	\$8,440	0.082%	2	\$0.169	na		
WE03	5	\$371,140,000	\$3,040	0.001%	0	\$0.002	na		
WE03	2	\$176,187,150	\$9,640	0.005%	0	\$0.024	\$1,135	8.5	2
WE04	Removal of Code Impediment; actual cost will vary widely with tech				0	\$0.000	NA-too diverse to estimate		na
WE05	1	Retrofit	\$600	Use IC/SF	0	\$0.000	\$277	2.2	3
WE06	1	\$738,568,600	\$0	0.000%	0	\$0.000	na		na
WE07	1	\$738,568,600	\$49,800	0.007%	0	\$0.027	\$27,100	1.8	3
WE07	2	\$176,187,150	\$49,800	0.028%	1	\$0.123	\$5,890	8.5	2

BUILDING DATA SUMMARY CHART

BASELINE BUILDING TYPES USED IN THIS ANALYSIS

Based on those used in NYC Dept. of Buildings Provision Pricing Study 2006

Source	Type	Stories	Below Grade	Gross Area	Height	Typical Area/Floor	Lot Size (SF)	Floor to Floor Ht	Mech Area/Info	Structure	Envelope	
1	Per DOB drawings dated 8/18/06	Commercial High Rise	59+Bulkhead	5 Stories Parking (440 Stalls)	1,855,700 SF	873 Ft	27,000	13'-6"	2 Floors, Water cooled chiller plant. Heat: district steam--perimeter radiation.	Concrete Shear, Steel Frame, Composite Slab	curtain wall?	
2	Bovis Substitution	Residential High Rise (for LD-7 assume hotel confirm room quantity)	48 Stories	2 Cellars	403,690 SF	456	8,073	9'-4"	Mechanical Room, Water Source heat pumps	Concrete Flat Plate (CIP)	Alum Storefront and Window Wall/Window Wall at	
3	Per DOB drawings dated 8/18/06	Lo-Rise Residential	4 - 4St-rowhouses	1 cellar	35,865 SF	55'-9"	2000 (x4)		Under one row house 2,000 sf. Hydronic baseboard, gas fired atmos boilers.	block & plank	block/brick	
H	Per DOB/private engineer	Single Family Home	3 Stories (3BR)	Cellar	2000 SF		3800 SF					
4	6 Story Bldg, w/ 9500 sf floor plate	Tenant Fit out of commercial space, Assume 50,000 SF	6	1	50,000 SF	78	9,500	9,500	13'-6"	Roof Mounted Packaged Air Cooled Units, Condensing Boilers	Steel & CMU construction	curtain wall
5	Complete renovation of large commercial building #1 above.	Substantial reconstruction of large commercial building	5	5 Stories Parking	1,855,700 SF	873 Ft	27,000	13'-6"	New chillers, boilers, heat distribution. New general conduit/piping. Electrical	Remains the same, reuse	remains the same	
6	6 Story Bldg, w/ 9500 sf floor plate	Tenant Fit out of commercial space, Assume 50,000 SF	6	1	50,000 SF	78	9,500	9,500	13'-6"	Packaged Air Cooled Units, Condensing Boilers Heat, Fin Tube	Steel & CMU construction	curtain wall
7	2 Bedroom Condo (as part of bldg indicated in Item 2)	Domestic Renovation Condo, Assume SF	1	n/a	1080 SF	1	1080	NA	9'-4"	Individually controlled heat pump		