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# Construction Cost Challenges, Innovative Contracting Alternatives, and Risk Management

*NACWA Presentation  
February 1, 2007*

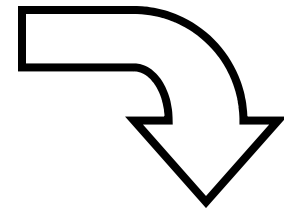
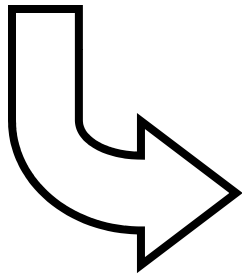
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**NYCDEP is responsible for providing NYC with water and wastewater related services.**

Watershed Management  
Water Distribution



Wastewater Treatment  
Combined Sewer Overflow (CSO) Control

# Watersheds: by the numbers

3 💧 Controlled lakes

19 💧 Reservoirs

580 💧 Billion gallons storage capacity

2,000 💧 Square miles of drainage area

1.3 💧 Billion gallons of water provided



# NYCDEP manages an extensive but aging water distribution system.



**Tunnel #3  
Stage One Location**

Serving 8 million NYC residents:

- 💧 Deep tunnels are the system's main arteries
- 💧 City Tunnel #1
  - *activated 1917*
- 💧 City Tunnel #2
  - *activated 1936*
- 💧 City Tunnel #3
  - *under phased construction*

# NYCDEP oversees treatment of 1.4 billion gallons of wastewater daily.

## Collection System Includes

- 💧 6,500 miles of sewers
- 💧 93 Pumping stations
- 💧 14 Water Pollution Control Plants (WPCP)



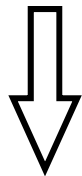
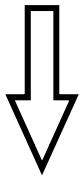
# NYCDEP is working to improve the quality of NYC waterways.



- Currently - 450 combined sewer overflow (CSO) outfalls
- Adopted a comprehensive watershed-based planning approach
- Plans will address CSO impacts on
  - water quality
  - water use

# Water and sewer ratepayers fund NYCDEP projects.

*Water*



*Wastewater*

## 2007 Preliminary Budget:

- 💧 Total Expense Budget  
\$800 million
- 💧 Total Capital commitments  
\$2.7 billion

# **Bidding Climate has changed.**

## **(Development of the Perfect Storm)**

- ◆ Commodity Price Escalation
- ◆ Labor Cost Escalation
- ◆ Robust U.S. Economy
- ◆ Track record on DEP projects established (long-term and recent)
  - Bureaucracy inhibits quick payment for change order work
  - Contractors essentially float a loan to the City – impacts bid prices
- ◆ Long duration/complex projects now bidding
  - Bonding costs have risen due to Hurricanes in 2005
  - Bond limits are valuable commodity to contractors – charge a premium
- ◆ Lower risk projects available outside of DEP
- ◆ Minimal number of bidders (2 vs 4; 20% Cost Difference)



# Newtown Creek WPCP upgrade to secondary treatment is under construction.



- Required by Clean Water Act
- Dry weather capacity 310 MGD
- Estimated upgrade cost \$4.0 billion
- Expected construction completion 2013

# Performance of Cost Model compared to other “G” Contracts.

<b>Contract</b>	<b>Advertised on</b>	<b>Engineers Estimate (\$)</b>	<b>Lowest Bid (\$)</b>	<b>Contract Duration (Yrs)</b>	<b>Bid as % of Engr's Estimate</b>	<b>EE as % of Bid</b>
NC-32G	Oct-99	214,825,000	195,610,000	4.5	91%	110%
NC-30G	Mar-00	115,580,000	124,773,000	4.5	108%	93%
NC-31G	May-00	322,000,000	304,491,000	4.5	95%	106%
NC-35G	Dec-02	487,000,000	493,000,000	4.5	101%	99%
NC-40	Apr-04	152,800,000	139,900,000	5.0	92%	109%
WI-79G	Sep-05	146,812,000	141,296,000	4.0	96%	104%
TI-3	Dec-05	150,800,000	224,400,000	3.75	149%	67%
NC-41	Mar-06	210,000,000	379,900,000	5.75	181%	55%

# Partitioning of added cost to Engineer's Estimate.

Bid (\$)		<b>Intangible &amp; Risks (35-45%)</b> General Conditions Business with DEP Duration/Bonds Soils
		<b>Bidding Climate (15-20%)</b> (Competition/Size of Job)
		<b>Future Labor Escalation (10-15%)</b>
		<b>Future Material Escalation (10-15%)</b>
		<b>Age of Base Estimate (20-35%)</b>
		<b>Engineer's Estimate (\$)</b>

## Competition compared to other past projects.

Contract	Bid Date	Number of Bids per contract or package			
		G	H	P	E
NC-32	January-00	7	9	5	3
NC-31	April-00	4	3	4	6
NC-30	May-00	5	4	7	3
NC-35	May-03	3	5	4	1
NC-40	August-04	4	6	3	3
NC-41	March-06	2	2	2	2

# Material costs were extremely volatile compared to past projects.

Material Costs:

💧 Predicted escalation of 3.5%



Recent Annualized Escalation Factors:

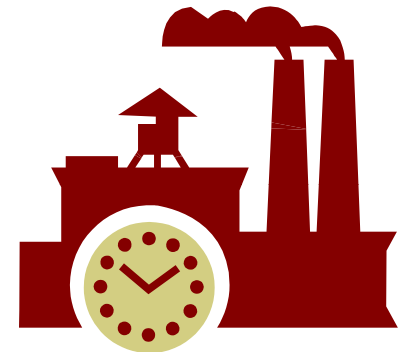
Material	2005	2004	2003
Copper (ENR March 2006)	34%	30%	4%
Structural Steel (PPI)	-0.8%	48%	11%
Ductile Iron Pipe (PPI)	8.1%	22%	1.5%
Stainless Steel (PPI)	18%	60%	14%
Concrete Products (PPI)	9.8%	6.4%	1.2%

# Bottlenecks in the supply chain are affecting project costs and scheduling.

## Supply and Demand Principles

### Fabricators and Manufacturers

- Operating at 100%
- No capacity expansion forecasted
- Turning down work



### Shipping and Logistics

- Full ship bookings are common
- Long lead often required
- Fuel price escalation



# The Croton Water Filtration Plant

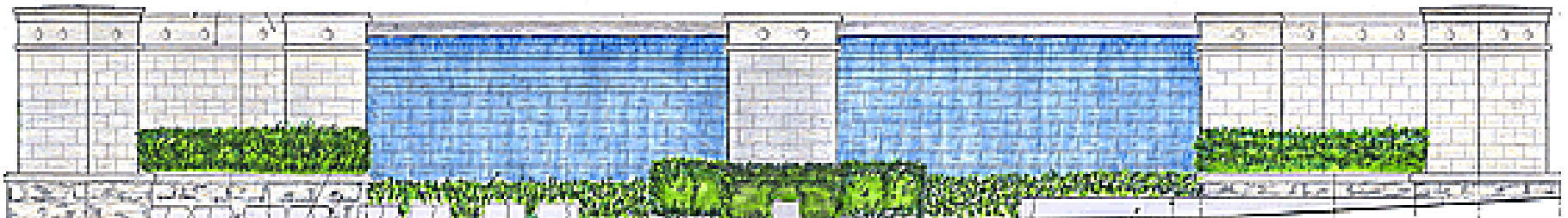
- 💧 Surface Water Treatment Rule (SWTR)
  - Meet supply & public health needs
  - 10% of the City's supply comes from Croton
- 💧 Unique underground facility
  - Site preparation           \$ 127 million
  - Plant construction       \$1,500 million\*
  - Tunneling                 \$ 212 million
- 💧 Associated pledge to spend \$220 million on Bronx parks
- 💧 Adopted lessons learned from Newtown Creek  
and other projects

\* Low Bid for G contract = \$1.1B; 2 bidders

# NYCDEP took a proactive approach to risk sharing/reduction with recent contracts.

Various alternatives including...

- 💧 Repackaging of larger contracts
  - 💧 Bid Staggering - bid General Contract (G) first
- 💧 Development of 3D model for planning purposes
- 💧 Extending work hours - allows larger delivery windows



Artist Rendition of an Ornamental Wall of Filtration Facility at Jerome Avenue



# Contract planning alternatives used by NYCDEP are related to...

- Contractors

  - Risk/Insurance

  - Unit/ Material costs



- General - listening to and addressing concerns of construction contractors
- CRIP - *Cost Reduction Incentive Program*, encouraging contractors to propose cost saving alternatives
- Change Order Contingency - providing payment sooner for selected COs considered critical

# Contract planning alternatives used by NYCDEP are related to...

- Contractors
  - Risk/Insurance
    - Unit/ Material costs



- Bond Reduction -
  - Verified with State Law, 100% bond not required
  - Maintains qualified bids and increases competition
- Insurance Reduction -
  - Builders risk insurance reduced from 115% to 50%
- Improve contract language to better define and share risks

# Contract planning alternatives used by NYCDEP are related to...

- Contractors

- Risk/Insurance

- Unit/ Material costs



- Unit cost items for disposal of various soil classifications

- Commodity Price Index - NYCDEP shares risk if commodity price increased beyond 55%, for...

- Carbon steel rebar

- Copper

- Stainless steel

- Concrete

- Ductile iron pipe

# NYCDEP is experiencing improved bid pricing as a result of planning alternatives.

Contract NC-41 Example:

- Repackaged with reduced scope & shorter timeline
- Cost estimates were updated
  - New bids received were 20% less than new estimate

Improved bid cost:

- Majority of difference in unit prices
- More competitive pricing with 4 bids
  - Reduced risk



# Alternative contracting can mitigate some costing challenges.

## 💧 NYC Challenges

- Bonding and insurance availability
- Volatile material cost

## 💧 Contract Planning Alternatives

- Reduce bid cost disparities
- Sharing risk
- Increase competition
- Improved communication with contractors



Thank you. Any Questions?

