

Sustainable Water and Wastewater Infrastructure Planning and Design Using Envision

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Agenda

- Introduction to Envision™
- Project Goals
- NYC Green Codes
- Sustainable Design
- Envision™ Strengths and Rating
- Benefits of Using Envision™



Envision™ is the Sustainable Infrastructure System for Utilities

LEED and Green Globes
are for *Occupied Buildings*



Envision™ is for everything else...



ENERGY



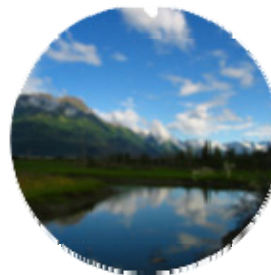
WATER



WASTE



TRANSPORT



LANDSCAPE



INFORMATION

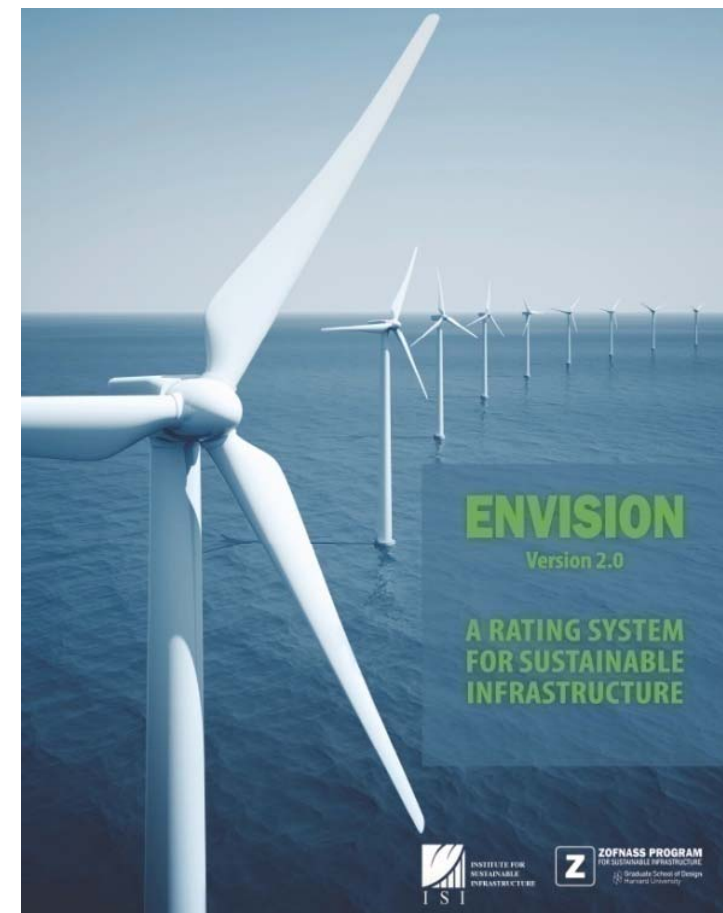


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Envision™ Rating System

- Guidance in Decision Making
- Can be Applied at Any Time
- 5 Categories – 60 Credits
 - Quality of Life (QL)
 - Leadership (LD)
 - Resource Allocation (RA)
 - Natural World (NW)
 - Climate and Risk (CR)
- 5 Levels of Achievement
 - Improved (above conventional)
 - Enhanced
 - Superior
 - Conserving (no negative impact)
 - Restorative (highest)

GUIDANCE MANUAL



Why use Envision™?

- Quantify sustainable practices with standardized, nationally-recognized metrics



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- Quantify sustainable practices with standardized, nationally-recognized metrics
- Incorporate sustainable philosophies into discreet infrastructure projects
- Quantify soft benefits of sustainable infrastructure
- Compare “impact” of mutually exclusive sustainability options (green roof vs. solar panels)

Project Goals

- Reliable Wet Weather Performance
- Improved Flow Distribution and Solids Handling
- Durability and Energy Efficiency
- Identify Risks
- Reuse Materials
- Energy Efficient and Environmentally Preferable Materials
- Landscaping
- Stakeholder Involvement

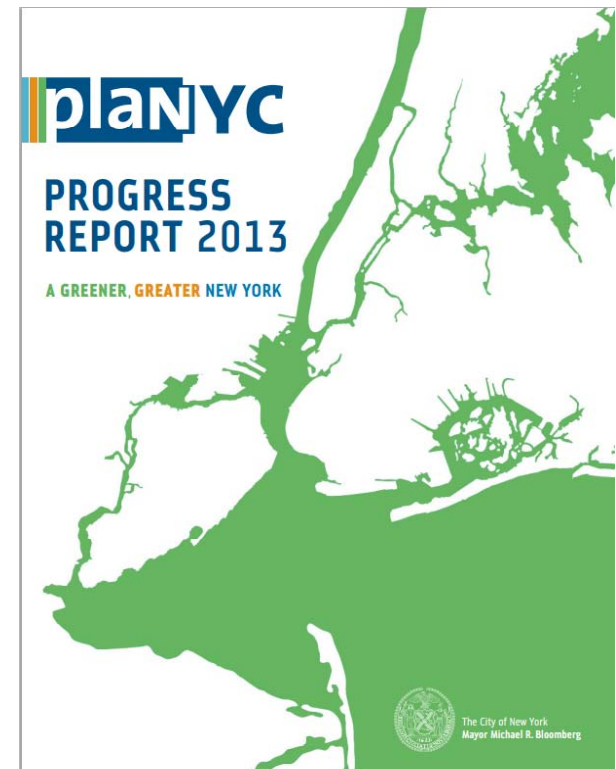


NYC Green Codes

- Reduce GHG Emissions – 30% by 2030

LOCAL LAWS

- LL 84: Benchmarking
- LL 85: NYC Energy Conservation Code
- LL 86: Minimum Sustainability Requirements for New and Existing Construction
- LL 87: Energy Audits and Retro-commissioning
- LL 88: Lighting Upgrades & Sub-metering



1. Pump Upgrades and Sizing

- Three MSPs: 22 MGD Each
 - High efficiency Induction motors
 - Motor Control Panel
- Eight PSPs: 650 GPM Each
- Two SWPs: 18 GPM

Credits

- RA 2.1 - Reduce Energy Consumption
- RA 3.3 - Monitor Water Systems
- LD 3.1 - Plan for Long-Term Monitoring & Maintenance



2. Turbo Type Process Air Blowers

- Sized to Meet Current Process Air Demand – 54,000 scfm
- Quieter
- 18% More Efficient than Existing Blowers
- Provision for Future

Credits

- RA 2.1 - Reduce Energy Consumption
- QL 2.2 – Minimize Noise and Vibration
- LD 2.2 - Improve Infrastructure Integration



- ## Credits

-

4. Updated FEMA Flood Level

2007 FLOOD MAP

- Limited areas located in an 500-year floodplain. No elevation determined
- Majority of the site lies outside the defined floodplain

2014 PRELIMINARY FLOOD MAP

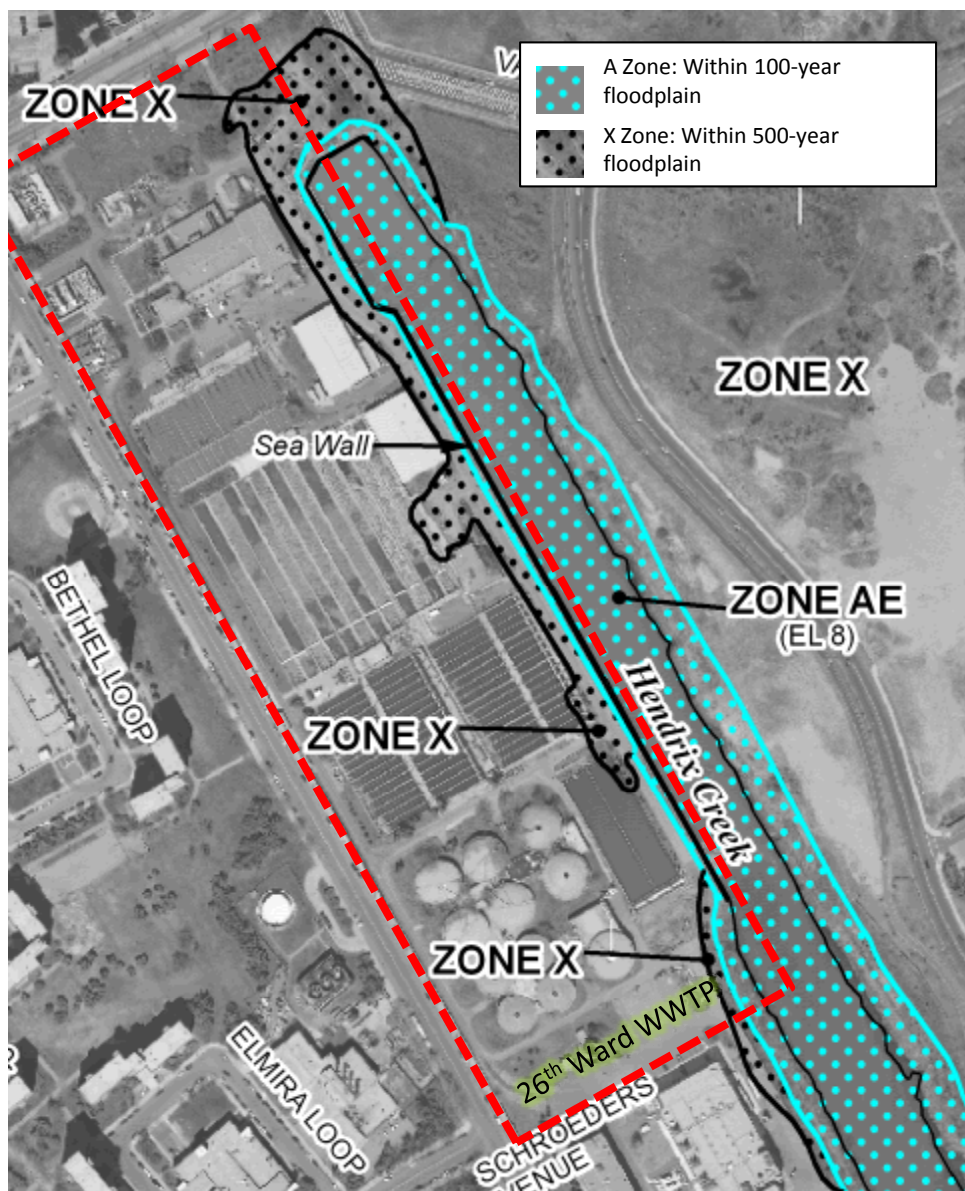
- Serves as a guideline; elevations considered preliminary
- Portions of the site now lie within an A Zone (within 100-yr floodplain) with ABFE of 11FT (NAVD)

NYCDEP 11/26/2013 DESIGN FLOOD ELEVATION GUIDELINES

- Calls for a Design Flood Elevation of 32"+ the ABFE.

NOTE

- NYC Expected to Adopt Preliminary Flood Maps in near future
- Local Law



2007 Flood Map
BFE: Undefined



2014 Flood Map
ABFE: EL 11 FT (NAVD-88)

5. New Switchgear and MCC's

- Located Above DEP Flood Elevations
- Provides Enhanced Plant Energy Monitoring

Credits

- CR 2.1 - Assess Climate Threat
- CR 2.2 - Avoid Traps and Vulnerabilities
- CR 2.3 - Prepare for Long-Term Adaptability
- RA 2.3 - Commission and Monitor Energy Systems



6. Material Diverted From Landfill

PST Tanks 1-4

- Approximately 5,470 CY of Material
- Identified Volume of Materials Diverted from Landfill

Ammonia Building

- Approximately 23 Tons of Steel
- Deconstruction List
- Identify Materials to be Recycled
- Identify Volume of Materials Diverted from Landfill

Credits

- RA 1.5 - Divert Waste from Landfills
- RA 1.7 - Provide for Deconstruction and Recycling



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7. PST Tanks 5 and 6

PST Tanks 5 and 6

- Increase Flexibility
- Allow for Future Expansion

Credits

- LD 2.2 – Improve Infrastructure Integration



8. MCC No. 25 Building

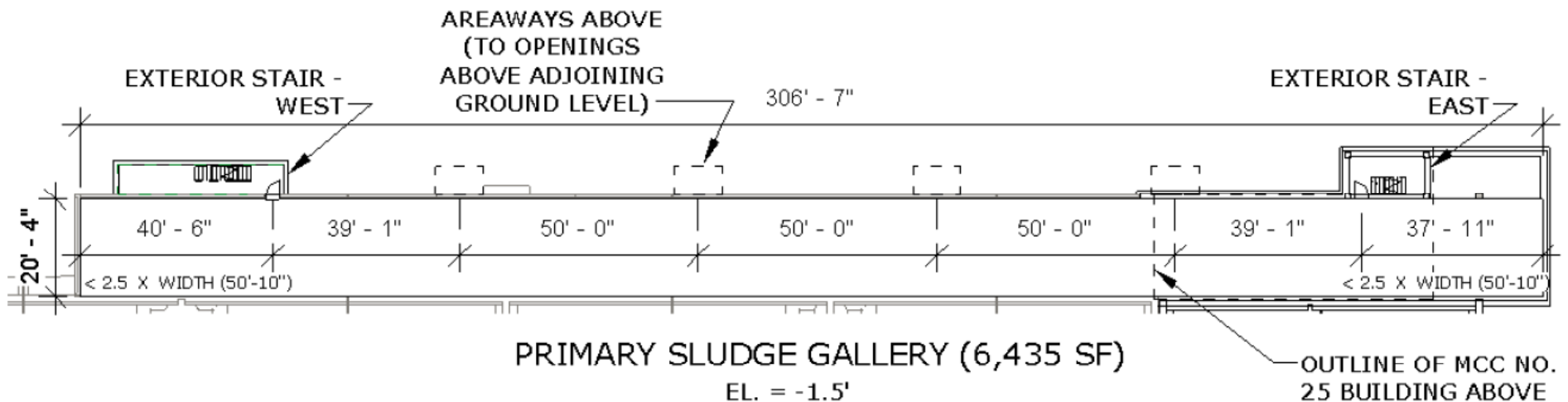
- Moving Switchgear Up and Above Floodplain
- Daylighting
- Solar Shading
- Reduced Energy Consumption - Unheated Stair Tower



Credits

- RA 2.1 – Reduce Energy Consumption
- RA 2.2 – Use Renewable Energy

9. Primary Sludge Gallery and Stairway



- Increased Day Lighting
- Energy Efficient “Exterior Stairs”
- LED Lighting

Credits

- RA 2.1 – Reduce Energy Consumption
- RA 2.2 – Use Renewable Energy

10. Materials

- High Recycled Content
 - Aluminum
 - Steel
 - Concrete
- High SRI Roofing
- Preferred Purchasing
- Locally Sourced



Credits

- RA 1.2 – Support Sustainable Procurement Practices
- RA 1.3 – Use Recycled Material
- RA 1.4 – Use Regional Materials

11. Roofs (Approx 10,000 SF)

- Pilot test
- Green Roof Potential
- Reduce Run-Off to Sewers by 50-90%

Credits

- NW 2.1 – Manage Storm Water
- QL 1.1 – Improve community quality of life



24-hr NRCS Type II Storm with 2.18 Inches of Precipitation

Hydrologic Simulation Results

Roof Runoff Rate (cfs)	Stormwater Model Used	Time of Peak (min)	Runoff Volume (cf)	Runoff Volume (gal)	Runoff Volume (inches)	Rainfall Retained (in)
0.43	SBUH	710	1,629	12,187	1.95	0.23
0.06	WBM/PULS	740	354	2,647	0.42	1.76

12. Site Work

- Risk Posed by Pervious Paving Outweighs Benefits
- Landscaping
- No Pesticides
- Storm Water Retention

Credits

- NW 2.2 – Reduce Pesticide and Fertilizer Impacts
- NW 2.3 – Prevent Surface and Groundwater Contamination
- NW 2.1 – Manage Storm Water



Life Cycle Analysis (LCA)

- Cradle-to-Grave Life Cycle Analysis
 - Tally™ Software
 - Modeling Principles: ISO 14040 and 14044
 - Manufacturing, Maintenance, Disposal, Recycling
- Environmental Impact Study Analysis
 - Results per CSI Division
 - Global Warming Potential, Primary Energy Demand
- WWTP process LCA
 - Four Phases
 - Assessment and Interpretation of Analysis Provide Recommendations

Sustainable Design Strengths

- Plan for Long-Term Maintenance and Monitoring
(Leadership – LD 3.1)
- Supports Sustainable Procurement Practices
(Resource Allocation – RA 1.2)
- Reduce Energy Consumption
(Resource Allocation – RA 2.1)
- Monitor Water Systems
(Resource Allocation – RA 3.3)
- Avoid Traps and Vulnerabilities
(Climate and Risk – CR 2.2)

Envision™ Checklist Score



Next Steps

- Full Project Assessment
 - Log Project into Envision Portal
- Verification
 - Waiting on final award based on Verification

Why Use Envision™?

- Incorporate Sustainable Philosophies into Discreet Infrastructure Projects Across Agency/City/ Authority
 - **Economic**: Reduced Costs
 - **Environment**: Stormwater Management
 - **Social**: Noise Reduction
- Improve Infrastructure Integration
- Meet Community Needs and Interests



Thank You!



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