

NYCEDC Clean and Circular: Design & Construction Guidelines

NYIEC
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NYC/EDC



About NYCEDC Green Economy + Climate Innovation

Building Our Future Economy

- Ensure businesses, investors, and employees have confidence in NYC
 - Enable equitable growth and development of priority industries
 - Deliver future-forward infrastructure
 - Shape the growth of and strengthen neighborhoods where New Yorkers live, learn, and work
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- **225** managed properties
 - **64M** square feet of real estate
 - **170** capital projects
 - **\$9B** capital budget
 - **435** initiatives
 - **\$200M** offshore wind investment



Agenda

Part I

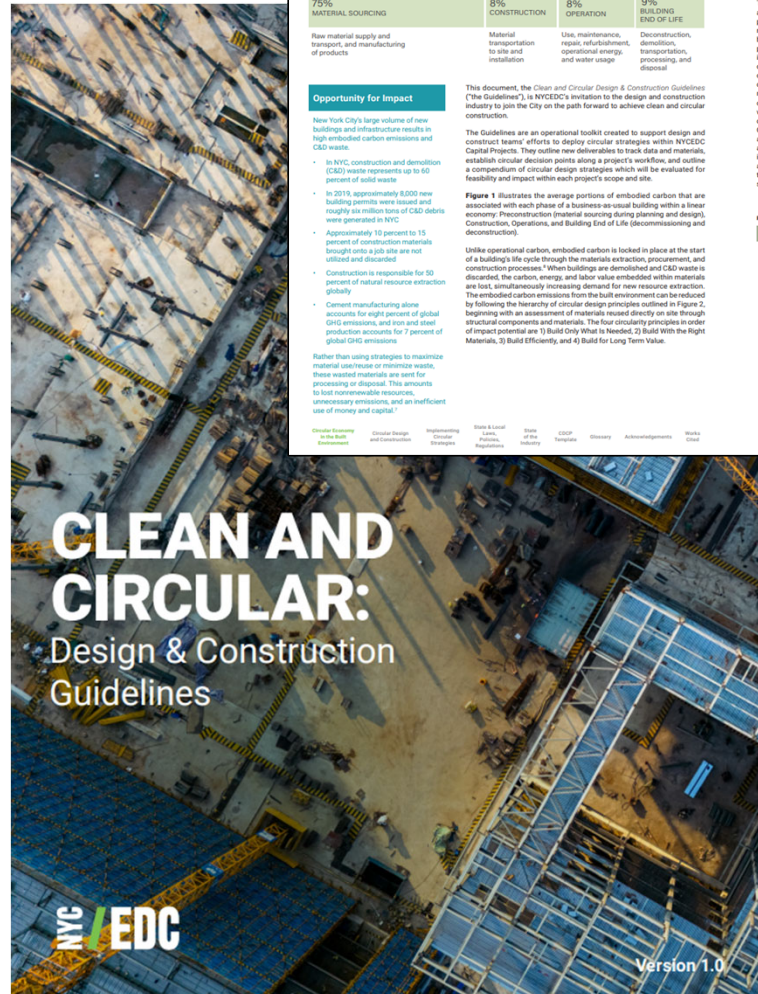
- Background
 - Circularity in the Built Environment & Embodied Carbon

Part II

- Overview of the Guidelines
 - Goals, Strategies, Deliverables
 - Tracking of baselines and improvement overtime

Part III

- EDC Project Examples
- Discussion/Q&A



CLEAN AND CIRCULAR:

Design & Construction Guidelines

NYC / EDC

Version 1.0



Background

Positioned between public and private industry, NYCEDC will facilitate demand and build capacity for circularity through procurement of contractors on capital projects

EDC will support our green economy vision by creating an embodied carbon strategy across the \$9 billion capital construction portfolio, which will:

Target outcomes within EDC's capital projects

Drive demand for clean construction and achieve citywide scale

Develop knowledge and capacity across industry stakeholders

Background

Building a future in which we decarbonize our built environment by reimagining how it is constructed

- Decarbonizing NYC's built environment requires addressing both operational and embodied carbon



Operational carbon: GHG emissions from a building's energy consumption (70% of its emissions)



Embodied carbon: GHG emissions associated with pre- and post-construction, including manufacturing, transportation, installation, maintenance, and disposal of building materials (30% of its emissions)

- Circular construction can **reduce C&D waste and embodied carbon** in the built environment
 - C&D waste represents ~40% of our solid waste stream
 - Concrete production represents 8% of global emissions
 - Buildings account for 28% of operational carbon and 11% of embodied carbon globally

Background

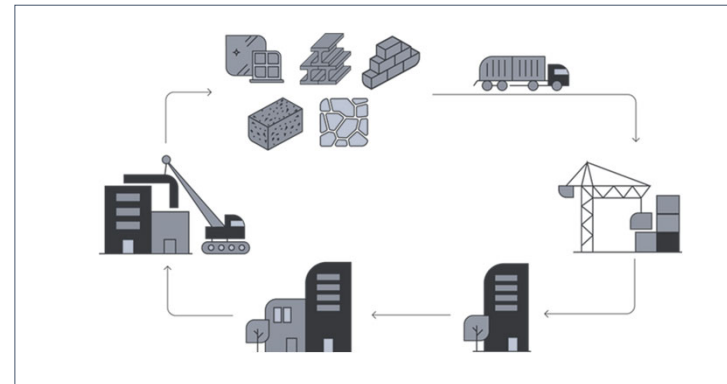
Circular design and construction optimizes the use of materials while minimizing waste and maximizing value

To reduce embodied carbon in NYC's buildings and construction, the Guidelines take a materials-focused approach:

- In lieu of demolition, buildings can be deconstructed to recover the maximum volume of reusable materials
- In lieu of high carbon building materials like concrete and steel, buildings can use more sustainable alternatives



Linear Economy in Construction



Circular Economy in Construction

An **operational guide** to facilitate materials reuse and use of sustainable material alternatives to reduce waste and embodied carbon

Goals

- 75% minimum C&D material diversion via reuse or recycling
- 95% minimum recycling/reuse of discarded concrete and soil
- 25% minimum of all project materials must be low carbon

Strategies

- Best practices by project stage (preconstruction through deconstruction)
- Identified roles and responsibilities
- Focus on how to plan for reuse, deconstruction, materials sourcing and optimization, and adaptive reuse

Deliverables

- Circular Design and Construction Plan is the primary deliverable, including:
 - Circularity Audit
 - Life Cycle Assessments + EPDs
 - Materials Management and Waste Minimization Tracker



Strategies

CCDCG establishes a hierarchy of circular construction principles and their carbon reduction potential

BUILD WHAT YOU NEED

- Reuse, adapt or transform asset
- Analyze potential for structural reuse
- Determine scope for deconstruction in lieu of demolition

BUILD WITH THE RIGHT MATERIALS

- Refuse unnecessary building components
- Use renewable, bio-based materials
- Consider using material passports

BUILD EFFICIENTLY

- Standardize building components
- Increase material efficiency through prefabrication
- Use BIM to optimize material use/reuse

BUILD FOR LONG TERM VALUE

- Design for longevity, adaptability, and disassembly
- Submit EPDs and material passports for material procurement



Battery Coastal Resilience:

Through the Battery Coastal Resilience Project, a coastal protection initiative to reduce flood risk as part of the Lower Manhattan Coastal Resiliency (LMCR) Project, NYCEDC has developed a robust material management strategy to inform material selection and design development and prioritize on-site reuse as much as possible.

Precedent
Project

Red Hook Library Renovation

- Renovated by NYCEDC to expand the space by 14 percent and implement flood mitigation and protection measures
- The project team will reuse the foundation, roof structure and ground floor slab
- Designed to be a Net Zero Building, where total energy usage will equal energy created on-site resulting in no new GHG emissions



Deliverables

The CDCG calls for a series of deliverables that enable teams to identify circular strategies that best meet the projects' needs + capacity

The **Circular Design and Construction Plan (CDCP)** will be the primary deliverable tracking progress and collecting data, including and informed by:

- **Circularity Audit** – Review of existing asset to determine materials reuse potential and conduct a materials inventory
- **Sustainable Design Workshops** – Specific touchpoints to identify circular strategies (EDC, Asset Owner, Design Consultant, CM)
- **Material Management + Waste Minimization Tracker** -- materials tracking and planning mechanism to meet CDCG goals
- **Life Cycle Analysis (LCAs)** – environmental impact analysis conducted during design and construction

Case Study

SPARC Kips Bay

The first large project to deploy the Guidelines is the Science Park and Research Campus (SPARC) Kips Bay, a first-of-its-kind job and education center transforming Hunter College Brookdale campus into a 2M sq ft state-of-the-art life sciences hub



Case Study

SPARC Kips Bay



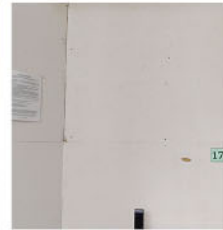
GW8
PAINTED WOOD STOREFRONT



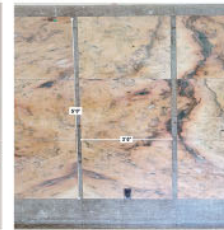
GW9
FLUTED GLAZING ALUMINUM



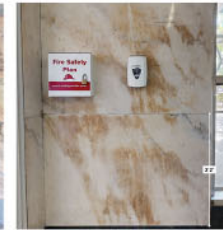
GWB
GYPSUM WALL BOARD



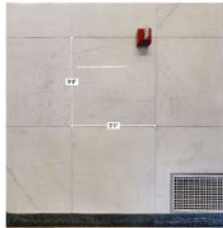
PL1
PLASTER



ST1
PINK MARBLE



ST2
MARBLE #1



ST3
MARBLE #2



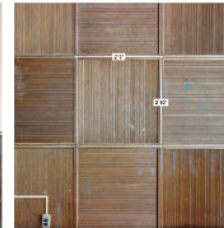
ST4
BROWN MARBLE



ST5
BLACK MARBLE



SW1
STONE WAINSCOTED



WA1
SQUARE WOOD PANEL



WA2
ACOUSTIC CONCAVE WOOD PANEL



WA3
WOOD SLATS



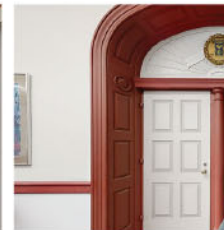
WP1
WOOD CASEWORK



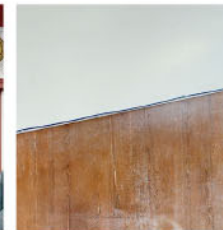
WP2
WOOD PANEL



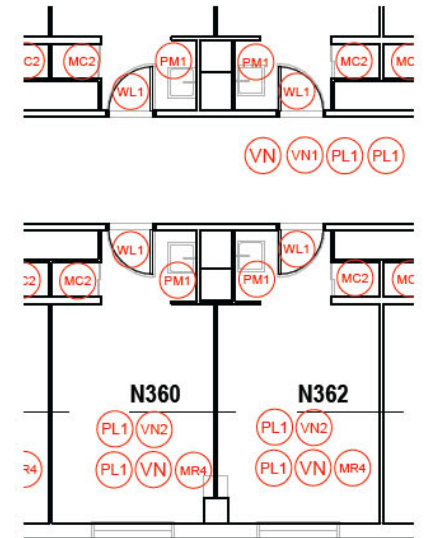
WP3
WOOD PANEL



WP4
WOOD TRIM

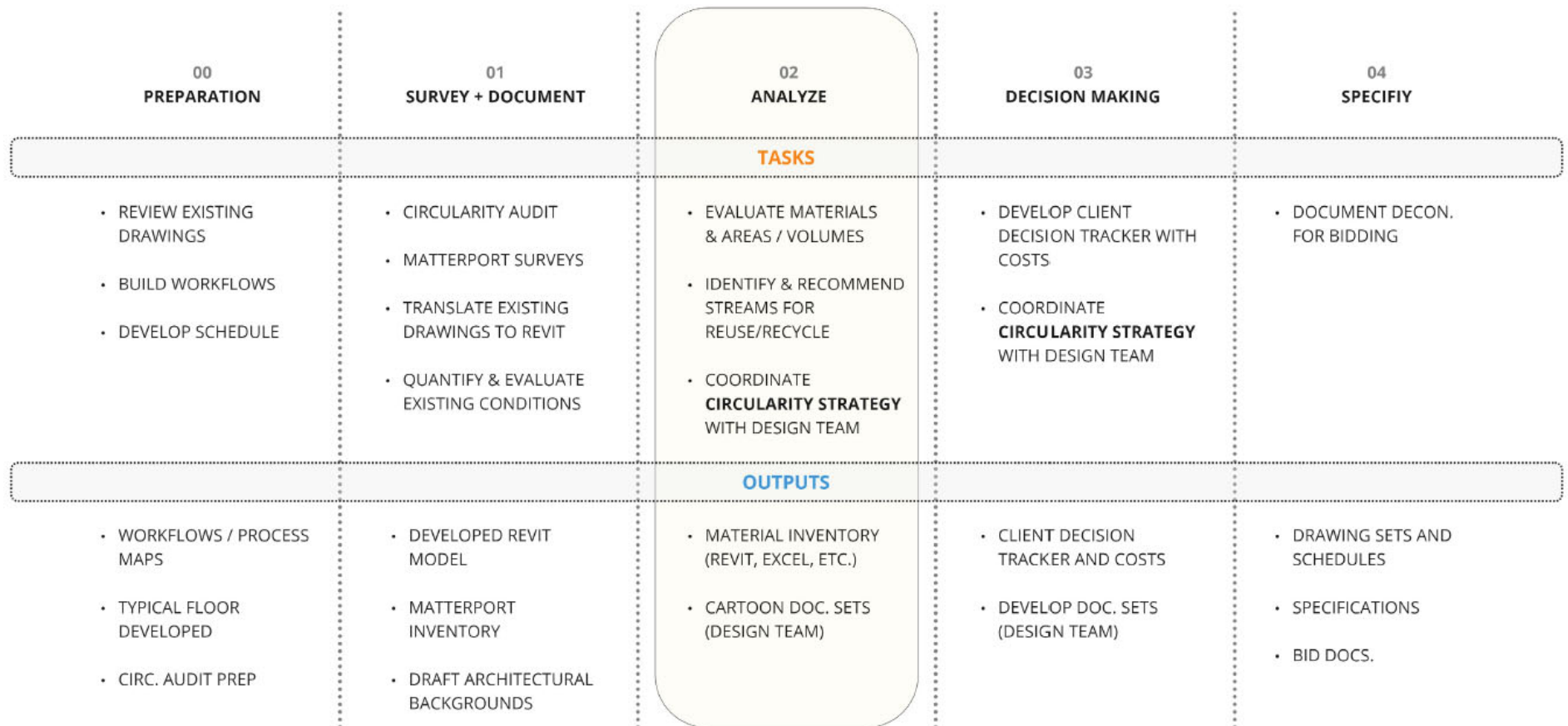


WW1
WOOD WAINSCOTED



Case Study

SPARC Kips Bay



Using the Guidelines as a Tool to Streamline NYC's Collective Efforts

To facilitate cleaner and circular construction at scale, we need to streamline data collection and establish cohesive infrastructure

EDC	EDC will implement the CCDCG in all Design and CM RFPs in the Capital Program and in Asset Management's CM Scope of Services
City	To comply with EO23 and achieve broader sustainability goals, City capital agencies may benefit from the infrastructure the CCG provides
Private Sector	With the private sector, we can achieve materials reuse at scale and drive the necessary demand to change how we design + construct

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