

66th Annual New Jersey Asphalt Paving Conference

An Owner's Commitment to Carbon Reduction

Presented By:

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03.7.2023

Outline

- Introduction
- Projects
 - Completed
 - Current
- Clean Construction Program

PORT
AUTHORITY
NY NJ
AIR LAND RAIL SEA



THE PORT AUTHORITY
100 YEARS OF MOVING
THE REGION



Port Authority Facility Map



An aerial night-time photograph of a major airport. The terminal building is brightly lit, and numerous commercial aircraft are parked at the gates. A multi-level highway interchange is visible in the foreground, with long-exposure light trails from cars creating vibrant streaks of red and white. The airport is situated next to a large body of water, and some urban development is visible in the lower-left corner.

Airports

Airports

Current and Completed Major Asphalt Projects

- Teterboro
 - Rehabilitation of Runway 6-24 (2022)
- John F. Kennedy International
 - Interim Pavement Rehabilitation of Taxiway C (2022)
- Newark Liberty International
 - New Terminal A (2018-Current)
 - New Apron and Taxiway Areas as well as a New Redesigned Terminal Roadway System



New Newark Liberty Airport Terminal A



Teterboro Airport Runway 6-24

- Estimated \$18.3 Million Cost
- Electrical Upgrades
- 3" Mill and Overlay
- Full Depth Runway Widening
- 30,000+ Tons of Asphalt



Teterboro Airport Runway 6-24

- Design
 - Shoulders
 - Full Depth Widening
 - Runway/Taxiway Proper
 - 3" Mill & Overlay
- Construction
 - Truck Coordination
 - Echelon Paving
 - Material Transfer Vehicle
- Weekend Closures
 - Paved June to August 2022



Clean Construction Program

**PORT
AUTHORITY
NY NJ**
AIR LAND RAIL SEA



Background

PRESS
RELEASE



In September 2020, the PANYNJ Announced its Clean Construction Program

- **Incorporation of LEED and Envision-equivalent standards** during infrastructure design
- **Specification for low carbon concrete:** reduces the required cement content in certain concrete mixes by 25%, significantly reducing its carbon intensity and allowing for lower-carbon alternatives
- **Pilot projects** to develop low carbon concrete and materials
- **Requirement for Environmental Product Declaration:** enables systematic collection of environmental data directly from construction contractors to help inform more environmentally focused material selection
- **Waste matching for concrete, asphalt and soil:** creates a platform for waste matching across Port Authority construction sites to reduce waste sent to landfills and the truck trips required to bring materials to and from construction sites
- **Requirement for low emissions vehicles on-site:** specifies that large diesel construction equipment must be Tier 4 or newer to ensure the cleanest models available are used for agency projects



The Clean Construction Program builds on our already industry-leading practices to further reduce carbon emissions from construction (embodied carbon), promote the reduction and reuse of construction and demolition waste (circular economy), and reduce the air quality impacts of construction activity.

Accomplishments to Date:

- ➡ Socialized our Policy
 - Outreach – Met with regional Contracting associations and material suppliers before making changes to Contract documents
- ➡ Started Tracking
 - Developed a Carbon Management System to calculate the Carbon Emissions based upon Mix Designs or EPDs, and Contractor Quantity Submittals
- ➡ Codified and Established Workflows
 - Updated our Contract Books to include the Embodied Carbon Clause which requires the submission of database importable files (*Electronic Data Deliverables - EDD*) for quantities of incoming materials (daily yardage/tonnage tallies reported monthly) along with corresponding EPDs (*Environmental Product Declarations*)

EDD-Electronic Data Deliverables

- Contractor to populate and upload EDD monthly
 - Daily quantities delivered to construction site:
 - Asphalt
 - Concrete
 - Steel
 - Aluminum
 - Wood
 - Tying Contractor deliverables to monthly payments
- 3.) Field Delivery Tickets: The field delivery tickets obtained by the Contractor shall be used to populate the EDD. The EDD shall show the daily quantities delivered to the construction site, by material type, reported on a monthly basis, as shown in Figure 2. These files shall be submitted monthly, together with the Contractor's monthly payment request. In most instances for repetitive deliveries of the same materials, only the material quantity information will require updating in the EDD. Each mix and material shall receive its own line on the EDD for each day that it is delivered to the site. If the same mix or material is delivered several times on the same day, they shall be combined into one line with the sum of the delivered quantities. For months in which applicable materials are not delivered, no submission is necessary.
- a. EDDs shall be uploaded to the Authority's Microsoft *SharePoint* or other submittal platform site at the link provided by the Engineer. EDDs that are not submitted in the proper file format will not be accepted.
 - b. The Authority will audit randomly selected EDD submissions for accuracy against the field delivery tickets. The Contractor shall maintain the original field delivery tickets and provide them promptly to the Engineer upon request.
- 4.) Failure to submit the EDDs on a monthly basis will result in the Engineer, at his discretion, withholding out of any payment such sums as he deems necessary or desirable, all as more fully provided in the clause of the Form of Contract entitled "Withholding of Payments".

EPD-Environmental Product Declarations

- Focus on incoming Construction Materials
- Contractor will reach out to asphalt supplier for plant and mix specific EPD
- All new Contracts include the Embodied Carbon Clause
 - If you submit an asphalt mix for a Contract with the Embodied Carbon Clause and you do not submit an EPD, your mix will not be approved.

B. Embodied Carbon

In order to comply with the Authority's greenhouse gas emissions reduction goals, and to quantify and reduce the impact of embodied carbon emissions, the Contractor and his subcontractors and suppliers shall comply with the EPD and EDD submittal requirements for data related to the embodied carbon of the following construction materials used in the Work of the Contract:

- 1.) Asphalt.
- 2.) Concrete.
- 3.) Steel.
- 4.) Aluminum.
- 5.) Wood.

C. The Contractor shall submit EPDs for each of the materials listed in B. above. Non-third-party verified EPDs will be rejected.

- 1.) EPDs shall be specific to the material, product, plant and mix used in the Work. In the absence of providing a specific EPD, the Contractor shall submit evidence that no material, product, plant or mix-specific EPD could be sourced. Evidence may be in the form of a computer screenshot showing a "No EPDs found" outcome from a query within *EC3* identifying the parameters used to search. Figure 1 below is a sample of the search results for a 6000 psi (28-day) ready mix concrete from a manufacturer searched with the name field containing the word "Jersey".

Published EPD



Company Information

Tilcon NY Inc. is an asphalt mixture producer.
Mt. Hope Asphalt asphalt plant
625 Mt. Hope Road
Wharton, NJ 07885
USA



Product Description

This EPD reports the potential environmental impacts and additional environmental information for an asphalt mixture, which falls under the United Nations Standard Products and Services Code 30111509. Asphalt mixtures are typically incorporated as part of the structure of a roadway, parking lot, driveway, airfield, bike lane, pedestrian path, railroad track bed, or recreational surface.

Mix Name: Mix 3/PA 5 64 10% RAP
Specification Entity: Port Authority of New York New Jersey
Specification: Mix 3/PA 5
Gradation Type: dense
Mix Design Method: marshall
Nominal Maximum Aggregate Size: 19.0 mm
Performance Grade of Asphalt Binder: PG 64-22
Customer [Project/Contract] Number: Port Authority NYNJ

This mix producer categorizes this product as a Hot Mix Asphalt (HMA) asphalt mixture. This asphalt mixture was produced within a temperature range of 143 to 163°C (290.0 to 325.0°F). Energy and environmental impacts are based on a plant's average performance over a 12-month period and are not adjusted for mix-specific production temperatures.

Product Ingredients

The product ingredients as identified in the mix design are provided in the table below.

TABLE 1. PRODUCT INGREDIENTS

| COMPONENT | MATERIAL | WEIGHT % |
|-----------|-------------------------------------|----------|
| Aggregate | Natural Stone | 43 |
| Aggregate | Natural Stone | 15 |
| Aggregate | Natural Stone | 27 |
| RAP | Reclaimed Asphalt Pavement | 10 |
| Binder | Unmodified + 1 terminal additive(s) | 5 |
| | | |
| | | |
| | | |
| | | |
| | | |

*Indicates that this material is a data gap. Upstream data associated with extraction and processing is not accounted for in this EPD.

TABLE 4. LIFE CYCLE IMPACT INDICATORS

| ACRONYM | INDICATOR | UNIT | QUANTITY PER METRIC TONNE ASPHALT MIXTURE (PER SHORT TON ASPHALT MIXTURE) | | | |
|---------|----------------------------------------------|------------------|---------------------------------------------------------------------------|---------------------|---------------------|---------------------|
| | | | MATERIALS (A1) | TRANSPORT (A2) | PRODUCTION (A3) | TOTAL (A1-A3) |
| GWP-100 | Global warming potential, incl. biogenic CO2 | kg CO2 Equiv. | 35.20 (31.94) | 1.39 (1.26) | 19.36 (17.56) | 55.95 (50.75) |
| ODP | Ozone depletion potential | kg CFC-11 Equiv. | 1.66e-08 (1.50e-08) | 8.37e-09 (7.59e-09) | 2.28e-08 (2.07e-08) | 4.78e-08 (4.33e-08) |
| EP | Eutrophication potential | kg N Equiv. | 9.40e-03 (8.53e-03) | 4.13e-04 (3.75e-04) | 1.99e-03 (1.81e-03) | 1.18e-02 (1.07e-02) |
| AP | Acidification potential | kg SO2 Equiv. | 1.01e-01 (9.15e-02) | 7.06e-03 (6.41e-03) | 3.46e-02 (3.14e-02) | 1.42e-01 (1.29e-01) |
| POCP | Photochemical ozone creation potential | kg O3 Equiv. | 2.08 (1.89) | 0.23 (0.21) | 1.06 (0.96) | 3.37 (3.06) |

TABLE 3. ENVIRONMENTAL IMPACT SUMMARY TABLE

| IMPACT CATEGORY | POTENTIAL IMPACT PER METRIC TONNE ASPHALT MIXTURE (PER TON ASPHALT MIXTURE) |
|-----------------------------------------------|-----------------------------------------------------------------------------|
| Global warming potential (GWP-100) | 55.95 (50.75) kg CO2 Equiv. |
| Ozone depletion potential (ODP) | 4.78e-08 (4.33e-08) kg CFC-11 Equiv. |
| Eutrophication potential (EP) | 1.18e-02 (1.07e-02) kg N Equiv. |
| Acidification potential (AP) | 1.42e-01 (1.29e-01) kg SO2 Equiv. |
| Photochemical ozone creation potential (POCP) | 3.37 (3.06) kg O3 Equiv. |



This declaration is an EPD in accordance with ISO 14025:2006¹ and ISO 21930:2017². The PCR is Product Category Rules for Asphalt Mixtures^{3,4}. This EPD transparently describes the potential environmental impacts associated with the identified life cycle stages of the described product.

Declaration Number: 60.150.398 v2 Software Version: 2.0.0

Date of Issue: July 7, 2022 Period of Validity: March 31, 2027

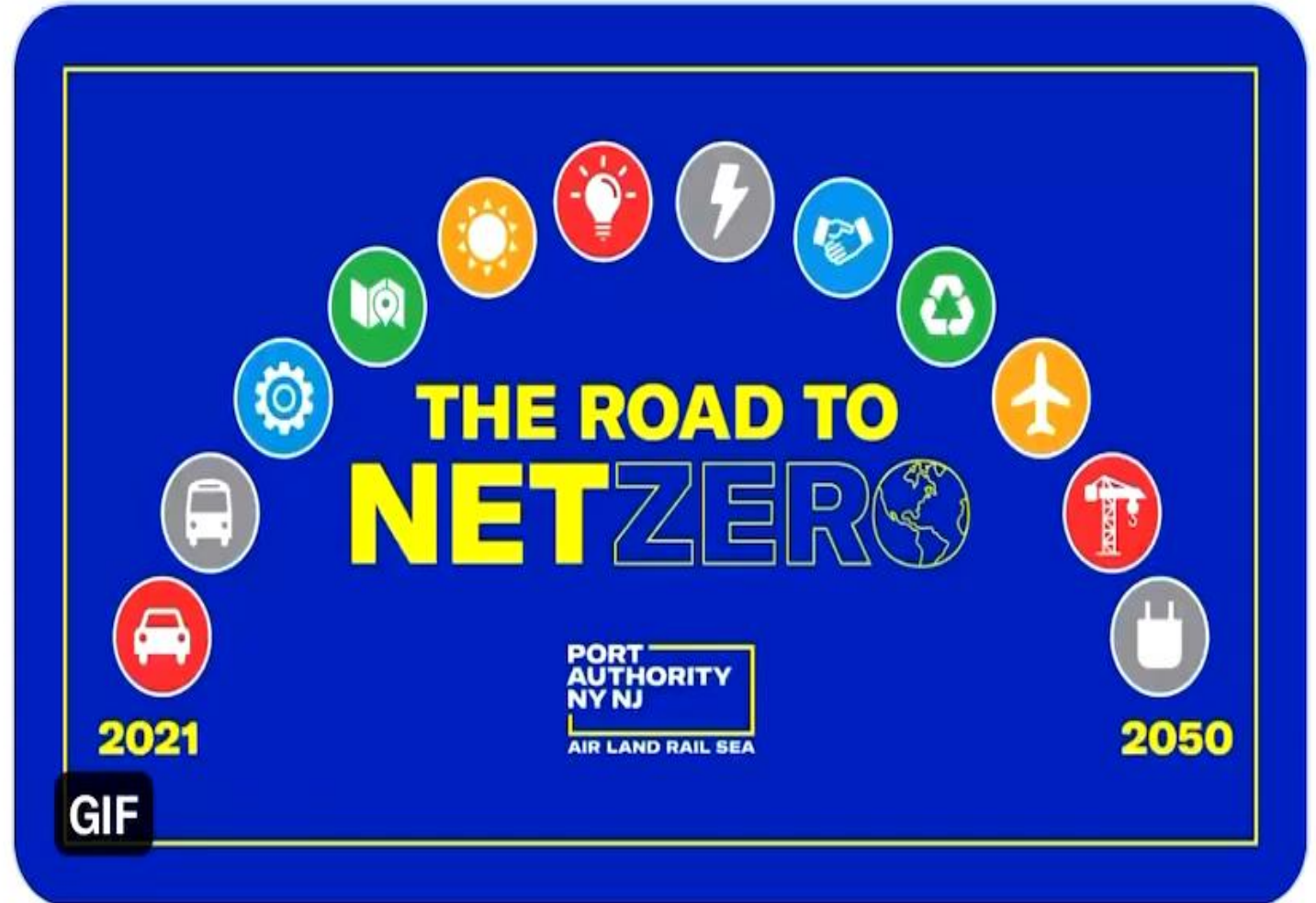
This EPD is valid for asphalt mixtures produced at the location indicated on this page. Data used to inform this EPD reflect plant operations from a 12-month period beginning on Jan. 1, 2020.

This EPD can be found at <https://asphaltpd.org/epd/d/J5UMa/>

LCA performed by: Ben Ciavola, PhD

Looking Ahead →

- Working with NAPA, NJAPA, FHWA and our suppliers to identify programs and ways to help lower Carbon Emissions from Asphalt.
- The Port Authority has a goal of a 50% GHG reduction by 2030 and achieving net-zero GHG emissions by 2050 – these goals include the reduction of Carbon Emissions from Asphalt.



DRAFT Specification Changes

Potential Changes – Subject To Change

- Increased use of RAP through minimum requirements (**Decrease A1 Emissions**)
 - Increased Plant Air Void Tolerances for RAP use beyond 10%
- Increased use of Warm Mix Asphalt Technologies to reduce Production Temperatures (**Decrease A3 Emissions**)
- Moisture Management Requirements (**Decrease A3 Emissions**)
 - 50% of plant energy consumption goes to removing the Aggregate Moisture Content
 - Implementing moisture management strategies

PANYNJ-FHWA Climate Challenge

Low Carbon Asphalt Support

- **GOAL 1 – Comprehensive Review of Low Carbon Asphalt**
 - Literature review of low carbon asphalt solutions
 - In-Place Recycling Review and LCA Quantification
 - Ranking of Carbon Reduction Solutions based on CO₂e Reduction
- **GOAL 2 – Testing Plan**
 - Enables a standard method of evaluating new technologies



Points of Contact

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Thank You!

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