Environmental Product Declaration
General Information

This Environmental Product Declaration (EPD) is for 5 structural precast products manufactured by Clark Pacific at their NorCal and Adelanto California plants for use by Microsoft in their parking garage located at 1 Microsoft Way, Redmond Washington 98052. This declaration has been prepared in accordance with ISO 14025, ISO 14040, ISO 14044 and ASTM International’s EPD program operator rules.

EPD Scope: Cradle to Gate

EPD Type: Product Specific

Product Category Rule: ASTM Product Category Rules (PCR) for Precast Concrete issued March 2015

Verification Type: Independent external verification of the declaration and data, according to ISO 14025

Declared Unit: 1 metric ton of structural precast product

Date of Issue: November 9, 2020 (valid for 5 years until November 4, 2025)

ASTM Declaration Number: EPD - 161

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This study reports the average performance of five structural precast products described in Tables 1-3.

<table>
<thead>
<tr>
<th>Product</th>
<th>Description</th>
<th>Standards</th>
<th>Number of Designs</th>
<th>Compressive strength (PSI)</th>
<th>Amount of additional hardware (kg/tonne)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gravity Beam</td>
<td>A horizontal structural building block for precast structures help support deck members like double tees, hollowcore, and solid slabs. Beams accommodate different flooring types, lengths, and methods.</td>
<td>PCI MNL-116, PCI Category C3</td>
<td>28</td>
<td>9,000</td>
<td>7.35e-12</td>
</tr>
<tr>
<td>Gravity Column</td>
<td>A vertical structural building block for precast structures are made as single story or multi-story members and serve as a gravity and lateral load-resisting element.</td>
<td>PCI MNL-116, PCI Category C3</td>
<td>14</td>
<td>9,000</td>
<td>1.71e-10</td>
</tr>
<tr>
<td>Double Tee</td>
<td>A load bearing structure that resembles two T-beams connected to each other side by side. The strong bond of the flange and the two webs create a structure that is capable of withstanding high loads while having a long span</td>
<td>PCI MNL-116, PCI Category C3</td>
<td>13</td>
<td>6,000</td>
<td>9.34e-12</td>
</tr>
<tr>
<td>Spandrel</td>
<td>A tall narrow beam element that is non-load bearing in the structure. The structural spandrels are used adjacent to double tees to act as vehicle crash barriers for the levels above ramps.</td>
<td>PCI MNL-116, PCI Category C3</td>
<td>1</td>
<td>6,000</td>
<td>2.82e-10</td>
</tr>
<tr>
<td>Hollowcore</td>
<td>A prestressed concrete slab that can serve as the floor and roof deck system with continuous voids to reduce weight and cost.</td>
<td>PCI MNL-116, PCI Category C3</td>
<td>1</td>
<td>3,500</td>
<td>0</td>
</tr>
</tbody>
</table>
System boundary

This study captures the following mandatory cradle-to-gate (A1-A3) life cycle product stages (as illustrated in Figure 1).

Except as noted above, all other life cycle stages as described in Figure 1 are excluded from the LCA study.
The Production Stage includes the following processes:

- **A1** - Extraction and processing of raw materials, including fuels used in product production and transport within the manufacturing process (A3);
- **A2** - Average or specific transportation of raw materials from the extraction site or source to manufacturing site, inclusive of empty backhauls (where applicable);
- **A3** - Manufacturing of each precast product including all energy and materials required and all emissions and wastes produced;

The Production Stage excludes the following processes:

- Production, manufacture, and construction of manufacturing capital goods and infrastructure;
- Formwork;
- Production and manufacture of production equipment, delivery vehicles, and laboratory equipment;
- Personnel related activities (travel, office operations and supplies); and
- Energy and water use related to company management and sales activities that may be located either within the factory site or at another location.

The main processes included in the system boundary are illustrated in Figure 2.

Electricity impacts are calculated based on the 2014 resource mix at the level of North American Electricity Reliability Council (NERC) Western Electricity Coordinating Council (WECC) region. The 2014 grid mix contains: 29.2% Natural Gas, 22.6% Hydro, 14.3% Lignite, 13.9% Coal, 8.1% Nuclear, 6.6% Wind, 2.2 Geothermal, 1.7% British Columbia (BC) import, 0.6% Wood Chips, 0.4% Biogas, 0.3% Solar. NorCal generates on-site 71.6% of their electricity via solar.
Cradle to Gate (A1-A3) impact results per 1 metric ton of product are outlined in Table 4.

Table 4: Cradle-to-Gate Impact Results for Products Covered in Study

<table>
<thead>
<tr>
<th>Impact category</th>
<th>Unit</th>
<th>Gravity Beam</th>
<th>Gravity Column</th>
<th>Double Tee</th>
<th>Spandrel</th>
<th>Hollowcore</th>
</tr>
</thead>
<tbody>
<tr>
<td>Global warming potential</td>
<td>kg CO₂ eq</td>
<td>342</td>
<td>431</td>
<td>275</td>
<td>268</td>
<td>243</td>
</tr>
<tr>
<td>Acidification potential</td>
<td>kg SO₂ eq</td>
<td>1.51</td>
<td>1.93</td>
<td>1.13</td>
<td>1.10</td>
<td>0.90</td>
</tr>
<tr>
<td>Eutrophication potential</td>
<td>kg N eq</td>
<td>0.14</td>
<td>0.18</td>
<td>0.12</td>
<td>0.12</td>
<td>0.40</td>
</tr>
<tr>
<td>Smog creation potential</td>
<td>kg O₃ eq</td>
<td>30.3</td>
<td>36.4</td>
<td>24.8</td>
<td>24.1</td>
<td>21.5</td>
</tr>
<tr>
<td>Ozone depletion potential</td>
<td>kg CFC-11 eq</td>
<td>2.80E-06</td>
<td>4.13E-06</td>
<td>2.84E-06</td>
<td>2.51E-06</td>
<td>7.09E-06</td>
</tr>
</tbody>
</table>

Energy Consumption

| Total primary energy consumption | MJ (HHV) | 3,602 | 4,876 | 2,547 | 2,511 | 2,555 |
| Nonrenewable energy             | MJ (HHV)  | 3,465 | 4,679 | 2,472 | 2,421 | 2,404 |
| Renewable energy                | MJ (HHV)  | 137   | 197   | 74.8  | 90.5  | 15    |

Material resources consumption

| Nonrenewable material           | kg         | 947   | 1,031 | 1,093 | 1,043 | 1,108 |
| Renewable material              | kg         | 0.10  | 0.18  | 0.10  | 0.06  | 0.08  |
| Net fresh water                 | l          | 4,704 | 5,369 | 4,125 | 4,253 | 6,209 |

Waste Generated

| Non-hazardous waste generated   | kg         | 7.06  | 8.94  | 5.36  | 5.82  | 11.1  |
| Hazardous waste generated       | kg         | 2.63E-03 | 3.29E-03 | 2.89E-03 | 2.53E-03 | 3.31E-03 |

This EPD only covers the cradle-to-gate impacts of aggregates using a declared unit and the results cannot be used to compare between products. EPDs from different programs (using different PCR) may not be comparable.

Explanatory materials may be requested by contacting: Emily Clark, (530) 207-4100
Adelanto Plant Storm Water Design
Clark Pacific’s newest plant located in Adelanto, is an award-winning Sustainable Zero Storm Water Discharge Storm Water Site. In 2018, Clark Pacific received an award for “Outstanding Industrial Sustainable Stormwater BMP Project” from the California Stormwater Quality Association (CASQA). At 111-acres, the Adelanto Plant is scaled to facilitate both production needs, storm water capacity to ensure complete capture, and allow for infiltration back into underground aquifers. During a storm event, the water is funneled through a series of channels and storm drains to the final detention infiltration basin. The Dry Extended Detention Basin accounts for 522% for the required retention volume for the site and nearly double the entire on-site run off generated from 100-year storm event criteria.

NorCal Plant Storm Water Design
Clark Pacific’s 170-acre NorCal Plant was designed and engineered for Zero Discharge of storm water with advanced pollution prevention CASQA approved BMPs built into the site. In 2018, Clark Pacific was officially recognized by the Sacramento Area Business Environmental Resource Center (BERC) and awarded the Sustainable Business of the Year Award “for outstanding efforts in enhancing sustainability, conserving resources, and reducing pollution”. All storm water is captured for filtration through a system of grassy swales and treated berms and drain inserts. Storm water is collected in a filtration pond and then diverted and stored in a CASQA TC-22 Dry Extended Detention Basin, which prevents potential pollutants from entering ground water systems. The detention basin is designed with a 100-year, 24-hr storm event capacity.

NorCal Plant Solar Farm and Rail Spur
Clark Pacific owns and operates a 5-acre solar farm located at the NorCal Plant. The 1.11 MW system has generated over 5.03 GWh during its lifetime, since installation in August 2017. The solar farm offsets approximately 40% of Clark Pacific’s electrical consumption across all three plants. Utilization of solar energy helps Clark Pacific offset GHG emissions associated with plant operations and energy use and move more towards sustainable operative goals. Additionally, the NorCal plant has installed a rail spur, which helps remove trucks from the road and allows rail delivery of aggregates needed for the manufacturing process.