

**DOCKETED**

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<b>Project Title:</b>	Building Decarbonization and Energy Efficiency
<b>TN #:</b>	239466
<b>Document Title:</b>	Presenation - Contractor Embodied Carbon Reductions
<b>Description:</b>	S1.2E REVISED Emi LaFountain, Turner Construction
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<b>Docketed Date:</b>	8/25/2021

# Contractor Embodied Carbon Reductions

IEPR Embodied Carbon Workshop

Turner Construction | August 28<sup>th</sup>, 2021

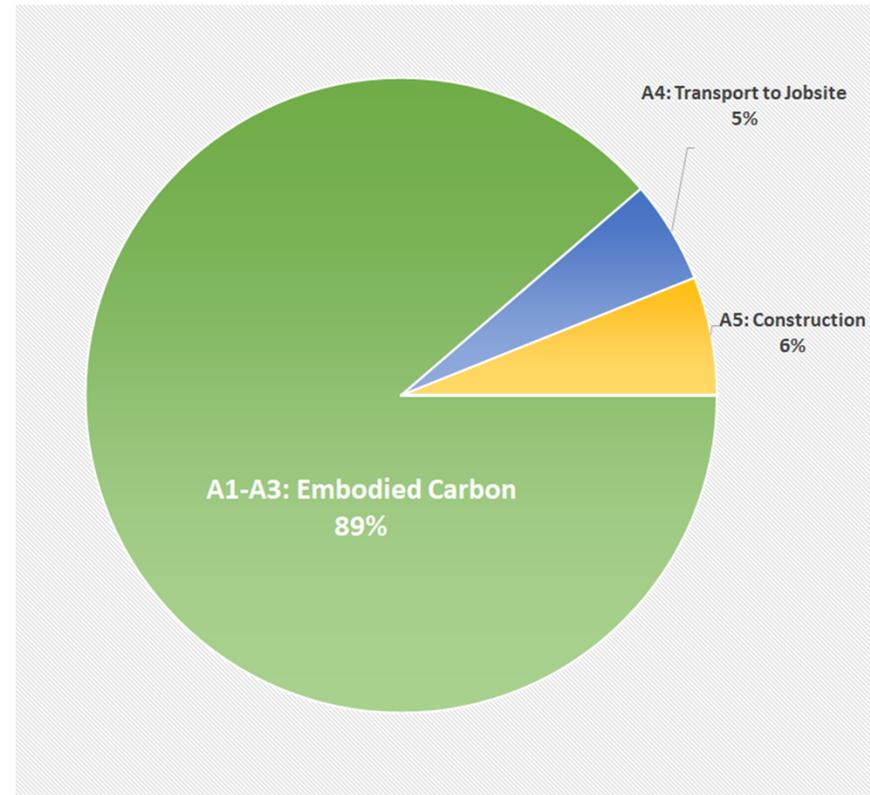


## Brock Commons Tallwood House, University of British Columbia

An Environmental Building Declaration According to  
EN 15978 Standard



Photo courtesy of Lara Shecter

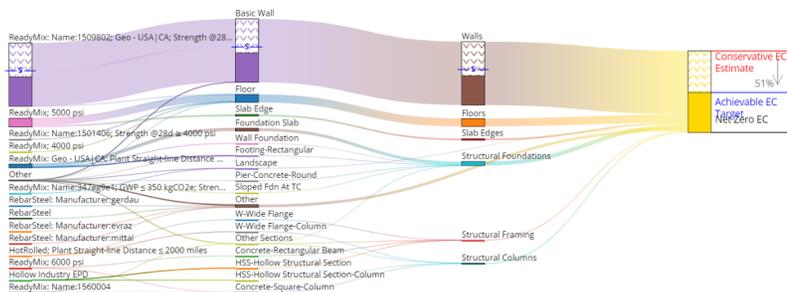


# A1-A3 EMBODIED CARBON



## THE CONTRACTOR'S ROLE

1. Engage with trade partners early on
2. Collect EPDs
3. Price out lower-carbon pathways



vs.

Central Concrete – Grout mix # 80W100EC

SCM: 25% Fly ash

GWP: 549 kgCO<sub>2</sub>e / m<sup>3</sup> (= **418 kgCO<sub>2</sub>e / yd<sup>3</sup>**)

Compressive strength: 6 ksi at 28 days

Central Concrete – Grout mix # 8SUP00Z3 (back up mix)

SCM: 30% Slag + 15% Fly ash (45% total)

GWP: 444 kgCO<sub>2</sub>e / m<sup>3</sup> (= **339 kgCO<sub>2</sub>e / yd<sup>3</sup>**)

Compressive strength: 6 ksi at 28 days

# A4 TRANSPORT EMISSIONS

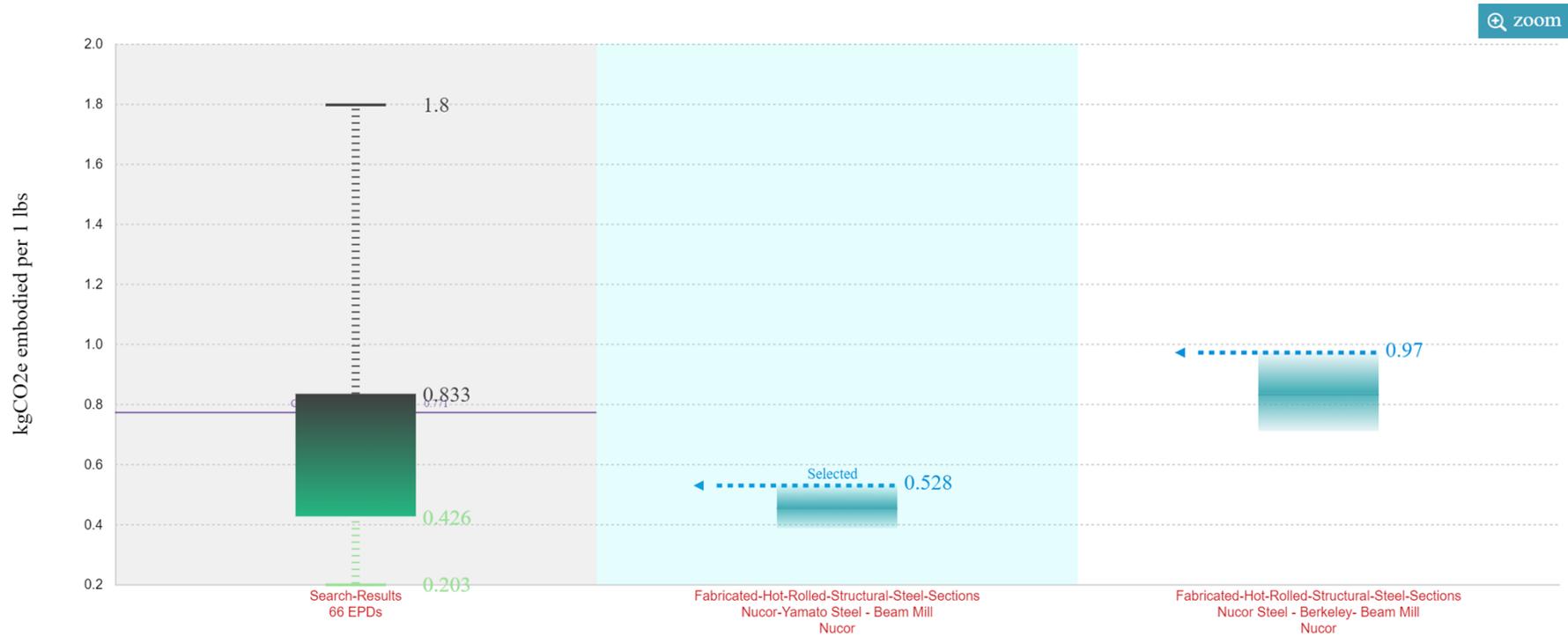


# MAIN TAKEAWAYS

- 1. This is more difficult to track than embodied carbon or jobsite emissions at the moment
- 2. EC3 is working on integrating the EcoTransit tool into their calculator to make tracking easier
- 3. Reductions will be achieved here through
  - 1. Smart procurement (domestic vs. international, rail vs. truck, etc.)
  - 2. Fleet electrification
  - 3. Interim fuel swap-outs (e.g. renewable diesel)
- 4. Lower transit emissions should not be prioritized without considering embodied carbon implications

The screenshot shows the EcoTransIT World website. At the top left is the logo, and at the top right are navigation links: Home, FAQ, Gloss. Below the logo is a horizontal menu with links: At a glance, Emission Calculator, Methodology, Business Solutions, News, Contact. The main heading is "Emission calculator for greenhouse gases and exhaust emissions". Below this is a paragraph: "You can get here an impression of how EcoTransIT World works. The [Business Solutions](#) offer the user significantly extended options for an accurate calculation of transport emissions." Below the text is a "CALCULATION PARAMETERS" section with a green header. It contains three rows of input fields: "Input mode" with a dropdown menu set to "Standard"; "Freight" with two sub-inputs: "Amount" (text box with "100") and "Weight" (dropdown menu set to "Bulk and Unit Load (Tonnes)"); and "Origin" with a dropdown menu set to "City district" and a secondary dropdown menu with the text "Please press ENTER to confirm."

# STEEL REDUCTION



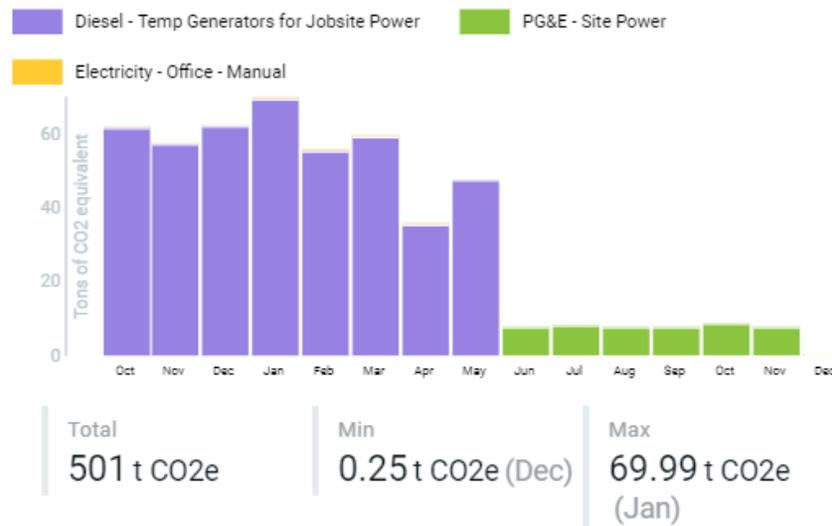
- If Hot-Rolled Structural Steel sections procured from Nucor Yamato Mill (Armored, Arkansas), ~34% reduction is achievable in steel scope. If procured from Berkeley, South Carolina mill, resulting GWP is HIGHER than the baseline.

# A5 CONSTRUCTION EMISSIONS



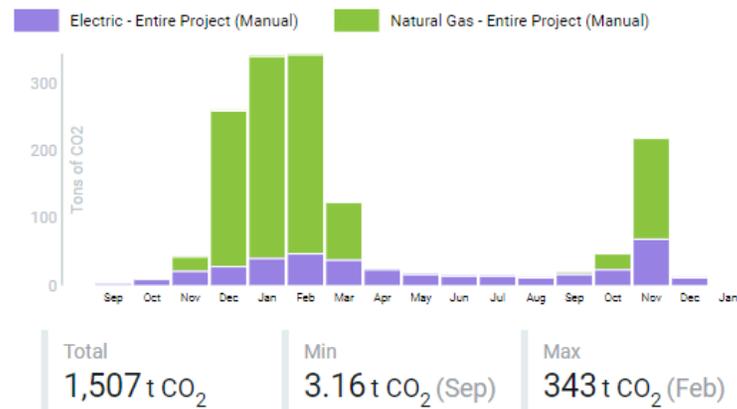
# Major Finding: Get Off Generators ASAP

CO2 Breakdown - Site Power / Oct 1, 2019-Dec 1, 2020



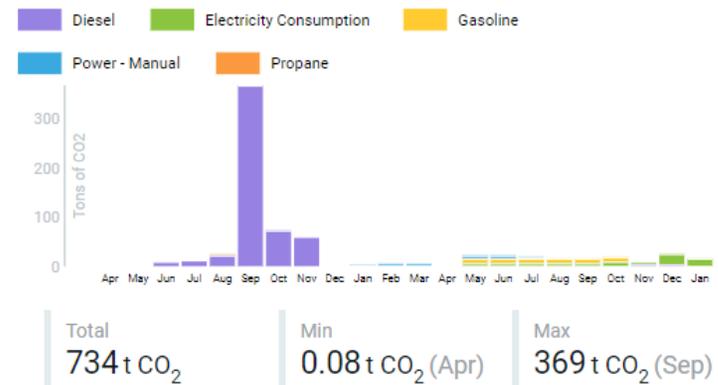
# Major Finding: Combustion heating is more CO2 intensive than electrical

CO2 Emission Breakdown / Sep 1, 2018-Jan 15, 2020



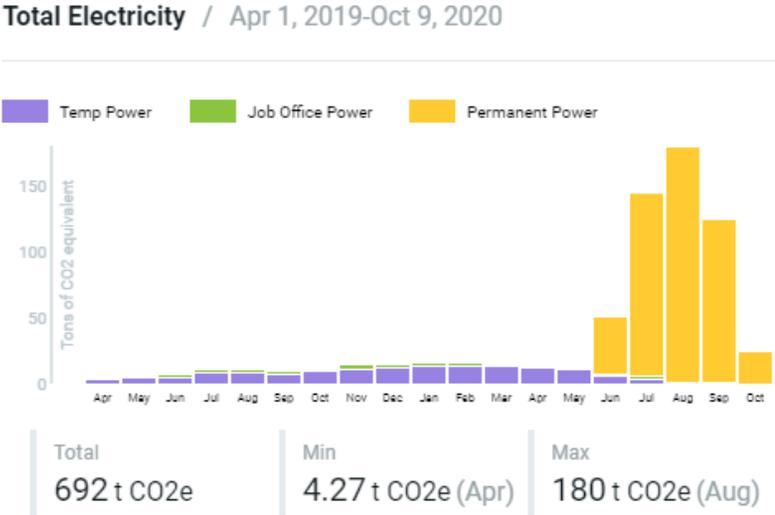
Chicago  
(NG Heating)

CO2 Emission Breakdown / Apr 1, 2018-Jan 15, 2020



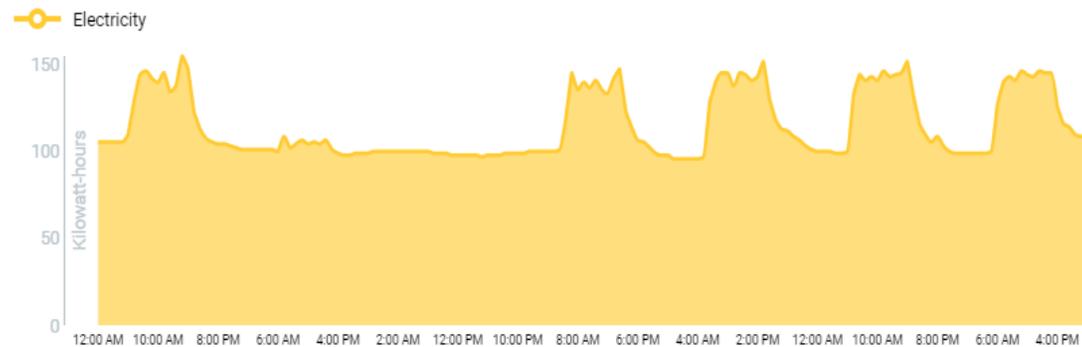
Sacramento  
(Electric Heating)

# Major Finding: The majority of total electrical use happens once the project is on permanent power (Cx phase)



# Major Finding: The majority of temporary electrical use happens off-hours

Live Electrical / Jun 5-Jun 11, 2020



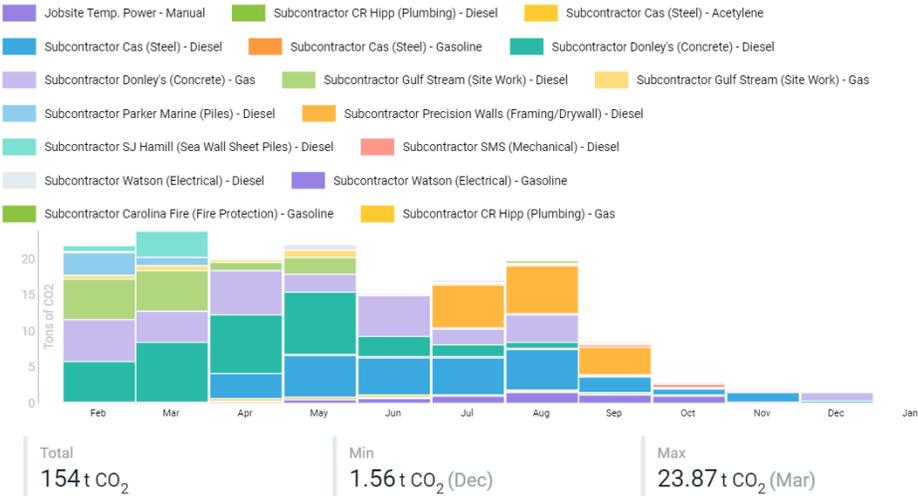
Total  
19,228 kWh

Min  
95.56 kWh (2:00 AM)

Max  
155 kWh (2:00 PM)

# Major Finding: Site equipment is one of the largest factors in CO2 emissions

CO2 Emission Breakdown / Last 12 months



## CO2 Emission Breakdown / Jan 16, 2019-Jan 5, 2021

