



The Reed at Southbank

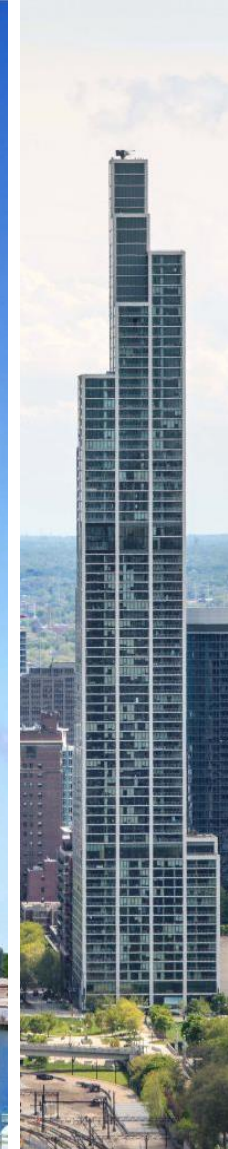
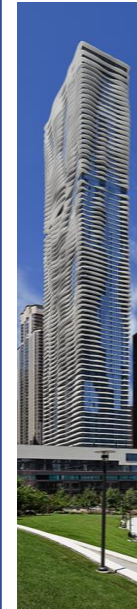
ACI Concrete Construction
Excellence Award Presentation
October 31, 2023

Category
High-Rise Structures
over 15-stories



About McHugh Concrete

- McHugh Concrete has been building Chicago's skyline for over 125 years. We are an elite concrete subcontractor specializing on all applications of vertical, cast-in-place concrete structures – parking garages, high-rises, mid-rises, healthcare facilities, commercial buildings, foundations, etc.
- 8 out of 10 of Chicago's tallest reinforced concrete structures were built by McHugh Concrete.
- We have offices in Chicago, IL and Nashville, TN.
- We have a Concrete Special Operations division that focuses specifically on the concrete construction of 5-to-10-story structures (mid-rise buildings).



The Reed at Southbank Team



Perkins&Will

MAGNUSSON
KLEMENCIC
ASSOCIATES

Structural + Civil Engineers

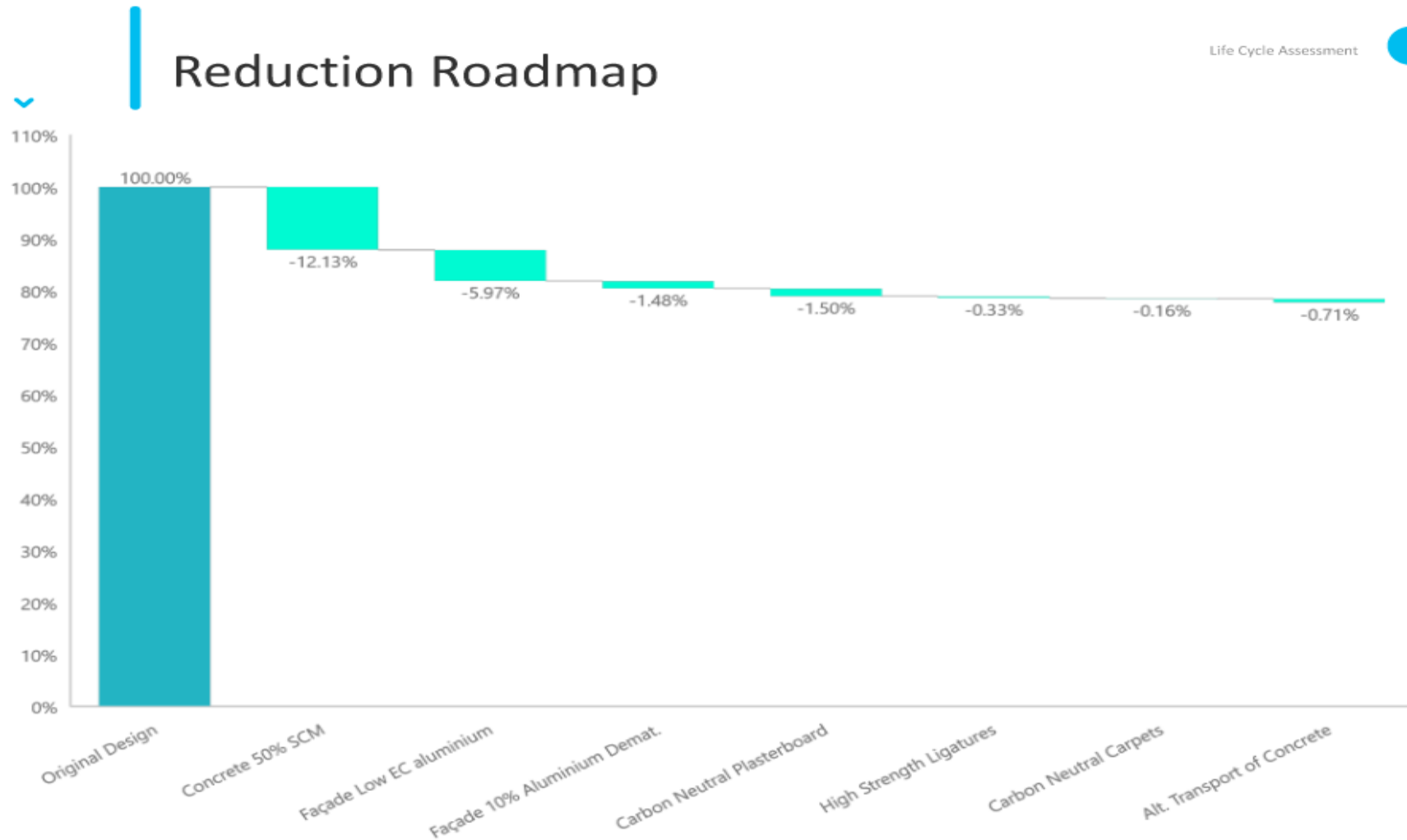


The Reed at Southbank

- 663,000 sf
- 41-story cast-in-place concrete structure
- 29,200 CY of concrete
- 422,000 lbs of ½” unbonded post tensioned strand
- 4,650,000 lbs (2,325 tons) of mild reinforcement
- The Residential Tower is located along the South Branch of the Chicago River and offers 224 rental apartment units, 216 condominium units and a variety of amenity spaces
- Exposed Concrete Ceilings and Columns throughout
- The Reed is the first high-rise in Chicago built with a new low-carbon concrete mix, replacing up to 30-70% of Portland Limestone cement with SCM



Lendlease's Reduction Roadmap



Committed to rapidly and dramatically reducing CO2 emissions

Lendlease's Spec for The Reed at South Bank

Embodied Carbon Specific Clause – Concrete

Embodied Carbon

Embodied Carbon

The Subcontractor shall work closely with Lendlease to provide low embodied carbon products and solutions. The requirements extend to the materials used in the manufacturing of products that are required and form part of the installation to complete the scope of works.

In the pursuit of minimising embodied carbon within the Southbank Building E development, Lendlease is committed to maximising the extent of recycled content utilised within specified construction materials. Portland cement content in concrete mixes are a key factor in the building's overall embodied carbon, and therefore a high percentage of supplementary cementitious materials are required. All concrete mixes proposed shall not exceed the cradle to gate emissions in the below table for the associated strengths. Cradle to gate is defined as modules A1-A3 under the EN15804 system boundary.

Strength	kgCo2e/yd3
2500 psi	149
3000 psi	164
4000 psi	200
5000 psi	242
6000 psi	254
8000 psi	294



The Subcontractor is required to provide the following for each product or group of products to be supplied:

- A Life Cycle Assessment (LCA), prepared in accordance with ISO14040 and ISO14044, with results presented based on the following impact category: Global Warming Potential (GWP 100yr);
- An Environmental Product Declaration (EPD), prepared in accordance with ISO14025, with results presented based on at least the following impact category: Global Warming Potential (GWP 100yr);

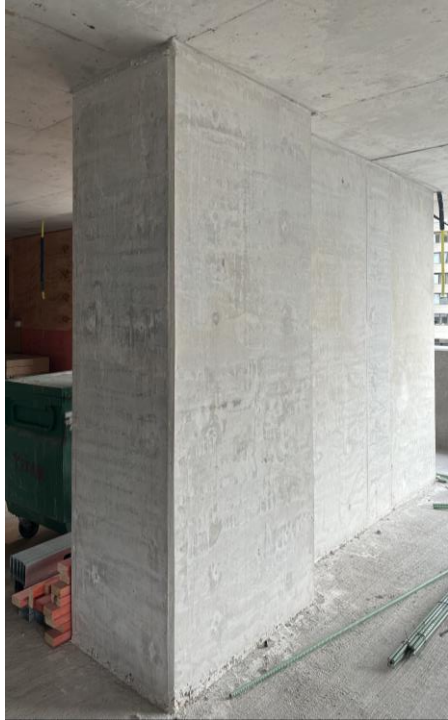


Meeting the Spec
Partnered with Oremus & Master Builders
• Green Sense Concrete
 Previously used in New York – 432 N Park Ave
Created new mix design specific for The Reed

The Solution

14% Lower than spec requirements & 32% Lower than NRMCA Average

Specification Mix Type	Test Age Days	UM	Takeoff Quantity	NRMCA - Average <small>Assume 30% cement replacement with cementitious material</small>		Supplier C Lend Lease Specifications		Test Data 3/16/21	
				GWP KG CO2/CY	GWP KG CO2	GWP KG CO2/CY	GWP KG CO2	GWP KG CO2/CY	GWP KG CO2
3000 Mud Slab	28	cy	76.00	182.94	13,903.44	164	12,464.00	164	12,464.00
4000	28	cy	392.63	250.52	98,361.67	200	78,526.00	243.1	95,448.35
4000 AE	28	cy	322.43	250.52	80,775.16	200	64,486.00	243.1	78,382.73
6000 FDN	28	cy	405.30	321.08	130,133.72	254	102,946.20	283.7	114,983.61
6000 MASS FDN	28	cy	236.13	321.08	75,816.62	254	59,977.02	283.7	66,990.08
6000 COLS/SW/WALLS	56	cy	1,117.05	321.08	358,662.41	254	283,730.70	283.7	316,907.09
6000 AE WALLS/COLS EXP	28	cy	861.95	321.08	276,754.91	254	218,935.30	283.7	244,535.22
6000 SLABS PT/BM/STAIRS	28	cy	680.22	321.08	218,405.04	254	172,775.88	274	186,108.19
6000 AE GRG SLABS/BM/STAIRS	28	cy	3,611.26	321.08	1,159,503.36	254	917,260.04	274	988,040.74
8000 MASS FDN	28	cy	980.10	372.49	365,077.45	294	288,149.40	232.7	228,069.27
8000 SLABS PT/BM/STAIRS	28	cy	12,441.08	372.49	4,634,177.89	294	3,657,677.52	232.7	2,895,039.32
8000 AE SLABS	28	cy	98.09	372.49	36,537.54	294	28,838.46	232.7	22,825.54
8000 COLS/SW	56	cy	681.08	372.49	253,695.49	294	200,237.52	232.7	158,487.32
10000 COLS/SW	56	cy	6,373.13	372.49	2,373,927.19	294	1,873,700.22	226.5	1,443,513.95
TOTALS			28,276.45		10,075,732		7,959,704.26		6,851,795.40



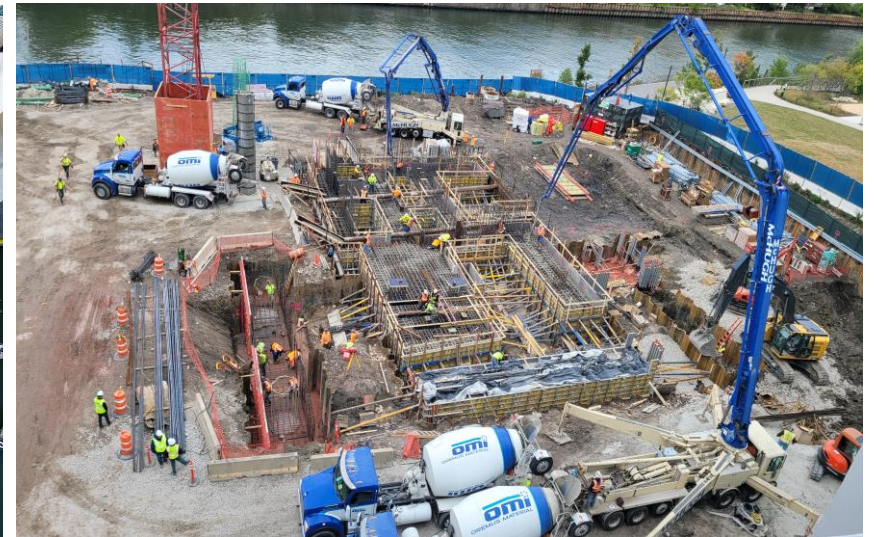
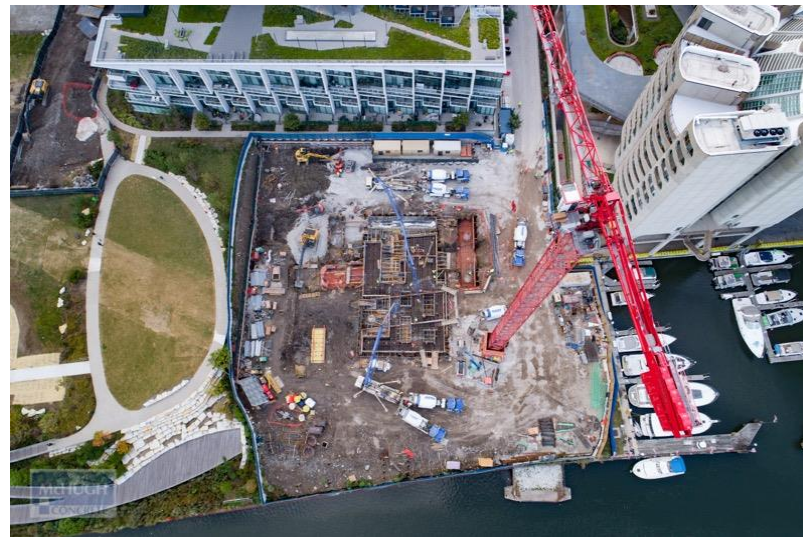
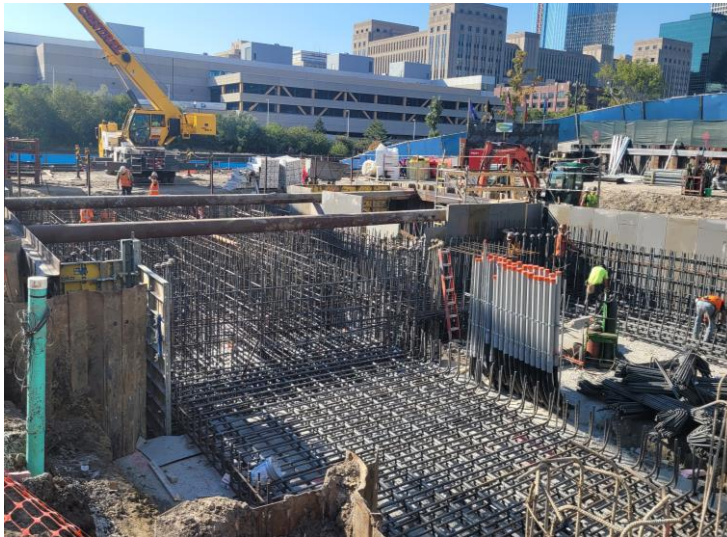
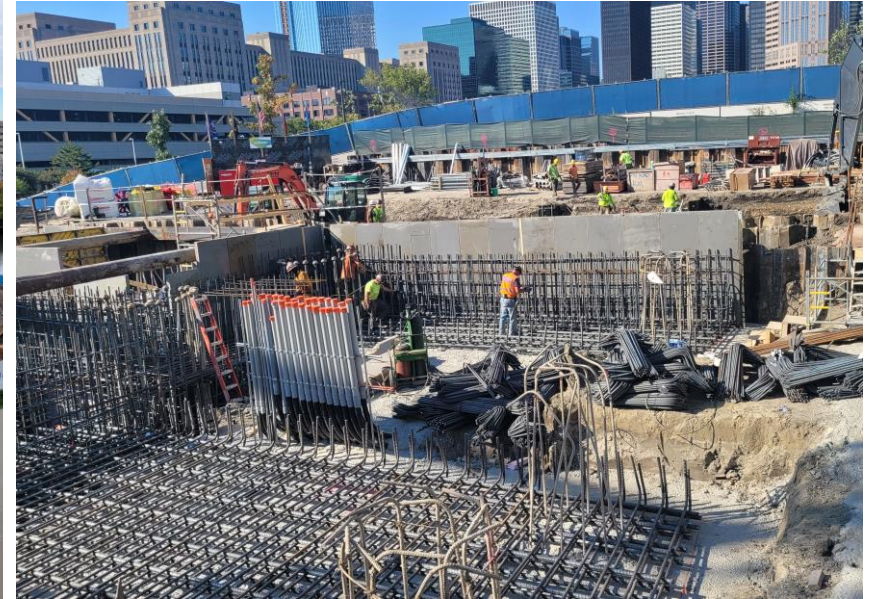
The Uniformity of Concrete

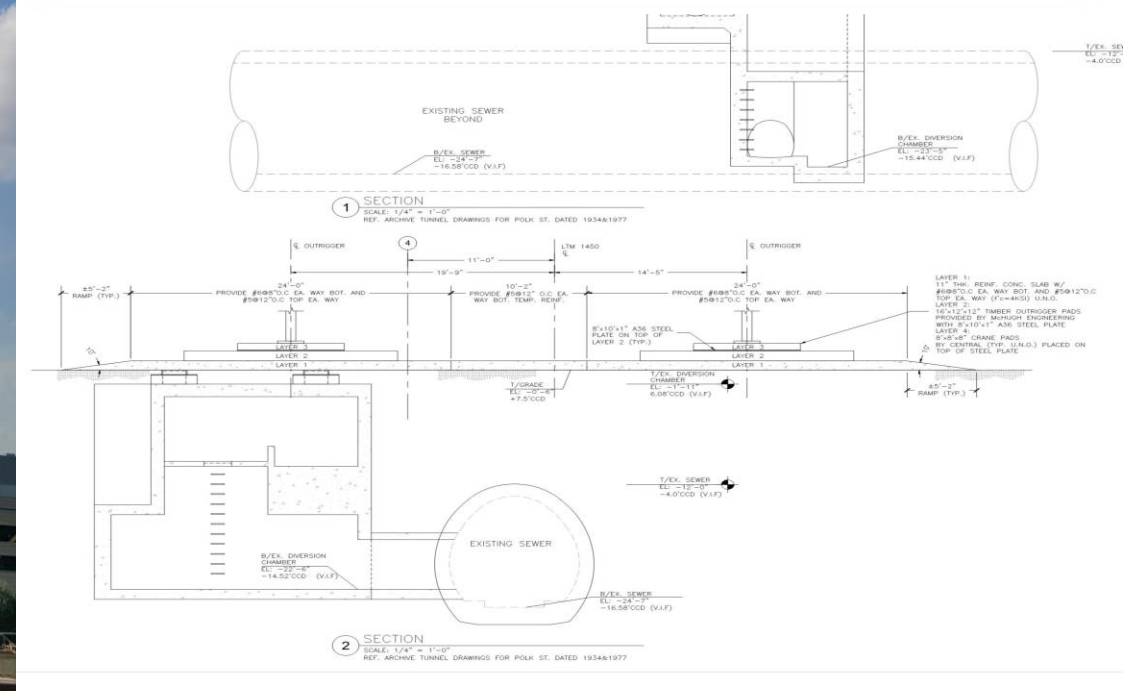
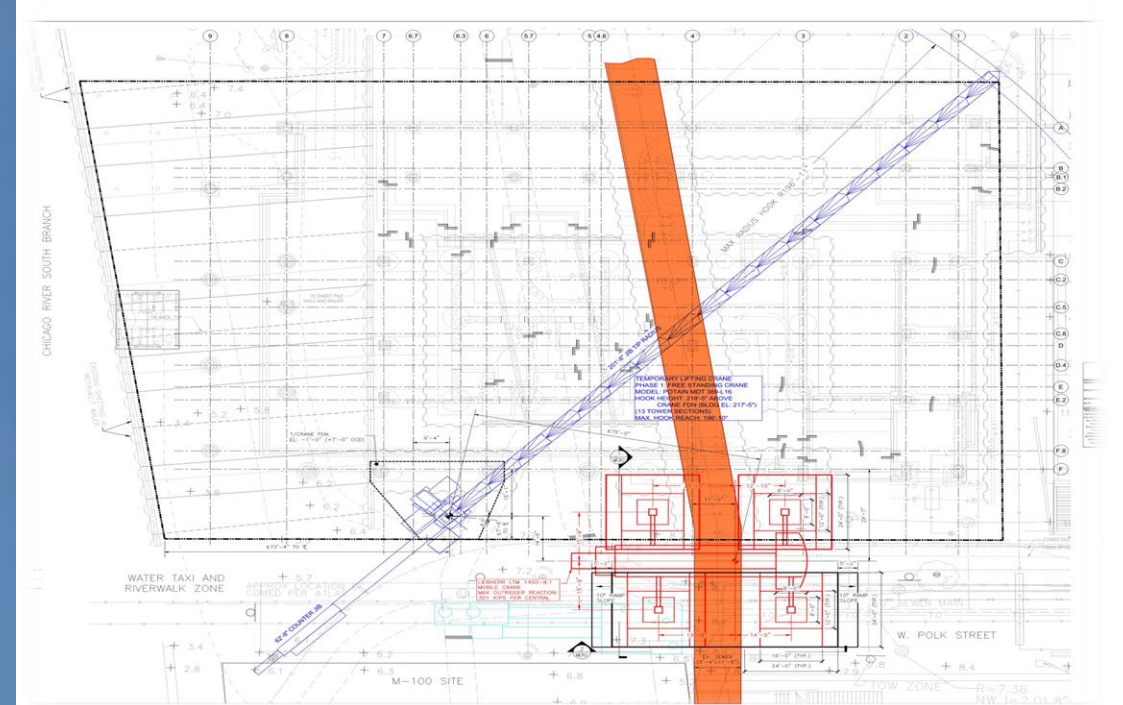


Challenging Logistics

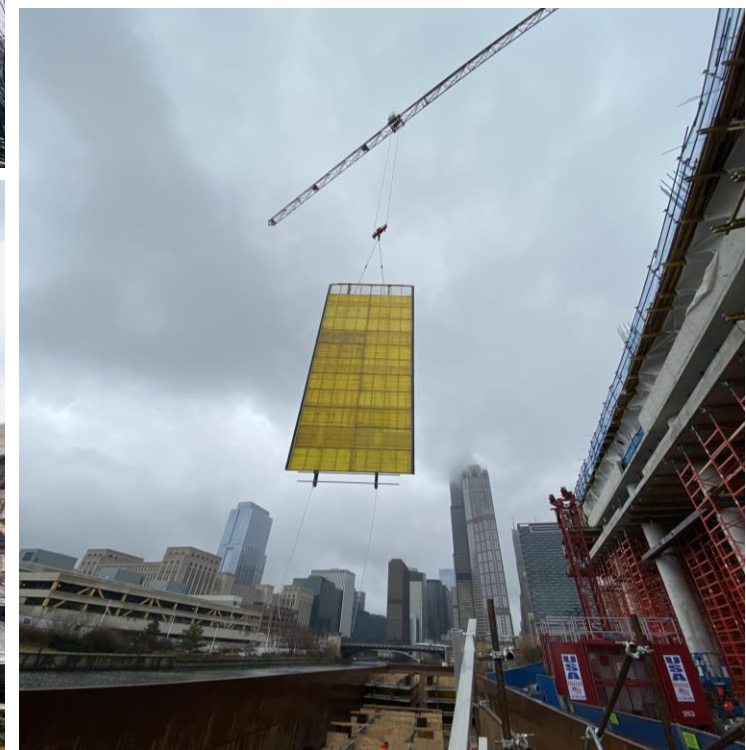
Unforeseen Conditions

- MWRD pipe ran directly through the jobsite with a large civil structure underneath it
- Logistics plan required mobile crane to be placed directly on top of a live MWRD structure

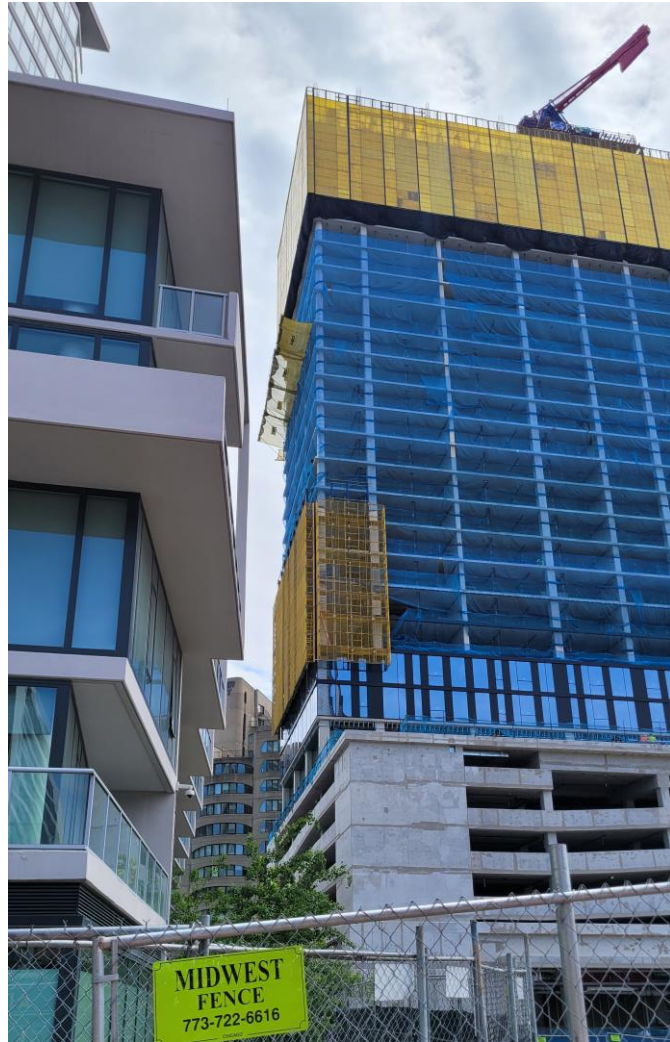




Challenges



Secondary Screens



Worked with Lendlease to create a system to encapsulate the slab edge during window installation

Safety

- No Ladder Rule
- We developed a precast stair system to replace the use of ladders up to the working deck for typical floors
- The stairs were prefabricated onsite, lifted by tower crane prior to framing the next slab
- This provided all trades with safer and more efficient access to the working decks





Questions?

THE
REED
SOUTHBANK