

Manitoba Hydro Downtown Office Project

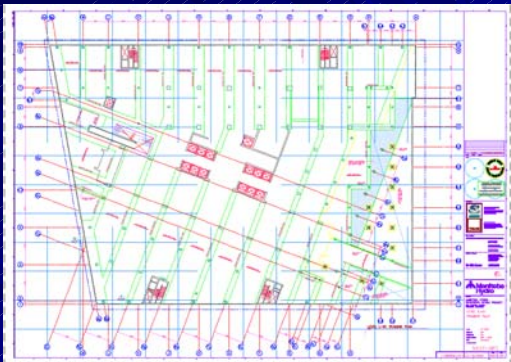
"What's this STUFF in my concrete?"

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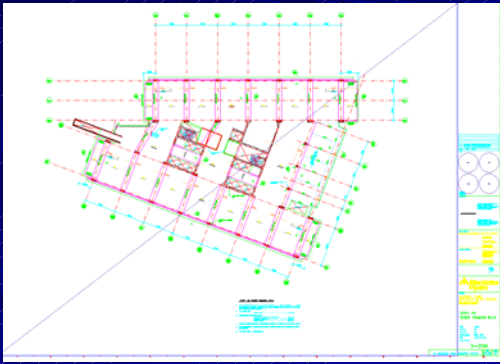
Some Stats

- Approx. 650,000 square feet in area.
- 39 000 cubic meters of concrete
 - Caissons 35, 50 MPa
 - Slabs/Beams 35 MPa
 - Walls 30 MPa
 - Columns 35, 50, 60, 80? MPa
- 3 550 000 kg (7 800 000 lbs) of rebar
- Largest load – 31 300 Kn (7 000 000 lbs)
- Tower col. – 25 000 Kn (5 600 000 lbs)
- 211 caissons/piles

Main Floor Plan



Tower Floor Plan



Decision Factors:

- Cost
- Schedule
- Environmental
- Additional Design Qualities in:
 - Durability
 - Strength
 - Reduced Heat of Hydration
 - Finishing Characteristics

Our Concrete Spec

- Specified using A23.1 Alternative 1 (performance)
- Majority is Exposure Class N, F-2, and S-2
- Strengths of 30 MPa, 35 MPa, & 50 MPa
- Many of the columns and slab soffits are exposed architectural concrete.
- Minimum 30% Fly Ash with lots of curing notes.

Why not more Fly Ash?

- A23.1 Section 8.8 – HVSCM
- Over 30% and your curing requirements go from:
 - Curing Type 1 – 3 days to
 - Curing Type 2 – 7 days
- Schedule & Cost
 - Formwork stays on longer
 - Reshoring longer
 - Winter Construction
 - Time is Money

LEED

- Credit 4.1 AND 4.2 – Recycled Content
- Based on LEED Canada-NC 1.0
 - Caissons 88% reduction
 - Walls 69.3% reduction
 - Slabs/beams 71.4% reduction
- Combined with Rebar and other materials, Manitoba Hydro Project achieved both credits.

Questions?
