

A Contractor's Perspective on the Use of High Fly Ash Concrete

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Bison Courtyard



Bison Courtyard

- Commercial/residential development with underground parkade
- CIP concrete structure with some structural steel and glulam
- Designed for a 100 year lifespan



Bison Courtyard



Bison Courtyard

- Meets LEED Silver requirements
- PCL is construction manager and general contractor
- Over 3 years for design and development processes



Bison Courtyard



Bison Courtyard

- Winter construction
- 35%, 45% & 50% fly ash content used
- Over 3,000m³ of concrete



Bearspaw Water Treatment Plant



High Fly Ash Concrete – Main Differences

- Slower set times
- More difficult to finish slabs
- Higher strengths at 28 to 56 days
- Less cracking



Slower Set Times

- Formwork can't be cycled as quickly
- Schedule and/or cost implications
- Choice is either more formwork or use additives
- One-sided formwork at Bison Courtyard

Slower Set Times

- Formwork design “beefed up”



Slower Set Times

- Experimented on the footings



Slower Set Times

- One sided wall formwork



Slower Set Times

- Coordination between formwork sub, formwork supplier and concrete supplier



Slower Set Times

- Planning in preparation of forms and rebar



Finishing Considerations

- Stickier texture



Finishing Considerations

- Slumps controlled with plasticizer
- Bearspaw mostly pumped; Bison mostly by crane bucket



Additional Comments

- Strengths – good strength with proper preparation and curing
- Less cracking – especially good for water retaining structures



Summary

- Schedule and budget impact
- Formwork design
- Planning is critical
- Communication to subcontractors


