

Innovative Pavement Construction Contracting Methods

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Presentation Overview

- PHM Strategic Directions
- Performance Based Contracts
- Pavement with Warranty
- Minimum Oversight
- Design Build Minor & Design Build Major
- Construction Manager/General Contractor
- Concluding Remarks

PHM Strategic Directions 2010 - 2015

1. A provincial expansion plan developed in collaboration with Policy & Planning Division.
2. A strengthened policy capability to influence ministry and government activities in support of division initiatives.
3. A workforce that is poised to meet our changing business directions.
4. The greenest roads in North America.
5. **A quarter of our business delivered in innovative and improved ways.**
6. Seventy-five cents of every construction dollar spent directly on pavements and bridges.
7. **In collaboration with industry, develop performance-based specifications for all contracts.**

Performance-Based Contracts

Guiding Principles

- Appropriate risk allocation
- Service provider accountability
- Encourage innovation
- Use of Performance Specifications
 - Move away from specifying methods and materials toward specifying required performance levels
- Performance assessed at construction completion and through warranty period
- Reduce oversight

Performance-Based Contracts

Concept

- Contractor to be responsible for quality of product
- Require warranty to ensure quality provided
- In order to hold the contractor accountable during the warranty period, remove prescriptive elements from contract that may put responsibility for potential product failure back on MTO
- Performance Specifications minimize prescriptive elements

Performance-based contracts currently in place

- Pavement with Warranty, Min O, AMC, Design-Build

Majority of Performance Based Contract Initiatives are lead by our Contract Innovations Office

Pavement with Warranty

- Unique Partial “Design/Build/Warranty”
- Minimal material & construction requirements
- Fixed 7-year unconditional warranty on pavement performance
- Performance requirements for each year
- Bidders are permitted to take pavement samples and field measurements
- Normal pre-qualification of bidders
- Low bid award
- **RESULT:** The contractor is responsible for pavement performance problems

PWW Performance Measures

- Ride Quality (Roughness)
 - mechanical (objective) measurements
 - International Roughness Index (IRI)
- Pavement Distresses
 - subjective evaluation
 - based on field manuals
- Pavement Friction (ASTM skid trailer)

Pavement with Warranty

- 10 Tendered
- 1 Non-award
- 8 Constructed, now in warranty period
- 1 Still in construction
- 1 in the design stage: to be advertised in 2011

Minimum Oversight (MinO) Contracts

Projects where the oversight efforts can be significantly reduced

- Primarily for low complexity type construction work
- Greater accountability for the contractor

Use of performance-based specifications (PERFs) to ensure a quality product and promote innovation

- The ministry does **not** specify the methods and materials that are to be used (e.g for pavement, shoulder and pavement marking items).
- The ministry **does** specify prohibited materials.

Contract specifies outcome targets at beginning, during and end of construction and during the warranty period

- Warranties up to 3 years depending on the nature of the product.
- Consequences for non-conformance e.g. repair and or replace using MTO traditional specifications.

Minimum Oversight (MinO) Contracts

The Contractor is not responsible for:

- Performance for features beyond the scope of the specification, for example:
 - Pavement Distresses caused by the condition of the underlying existing pavement.
 - unless the PERF includes issue specific details addressing the condition of the pavement or the underlying pavement structure.

Minimum Oversight (MinO) Contracts

Min O Specifications Developed for:

- PERF 2204 – Double Seal Coat
- PERF 2207 – Shouldering
- PERF 2214 – Surface Treatment, Single
- PERF 2224 – Surface Treatment, Double
- PERF 2215 – Micro-Surfacing, Single
- PERF 2225 – Micro-Surfacing, Double
- PERF 2212 – Hot Mix Asphalt, Type A
- PERF 2222 – Hot Mix Asphalt, Type B1
- PERF 2232 – Hot Mix Asphalt, Type B2

Minimum Oversight (MinO) Contracts

Performance Requirements (PERF 2202 , Hot Mix Type A)

- Roughness (as constructed only – 3mm/3m)
- Coarse Aggregate Loss including Ravelling
- Potholes
- Flushing
- Wheel Track Rutting

- Pavement Friction

Minimum Oversight (Min O)

18 Trial projects in 2008

- Methods and materials selected by the contractors were generally the same as those the ministry would have selected

22 Trial projects in 2009 (~\$30 Million)

- Regional staff have better understanding of concepts
- Contractors have better understanding of expectations

35 Projects in 2010 (~\$110 Million)

- Progressing well

Min O Assessment Team

- Annual evaluation of results from previous years to facilitate changes for upcoming year

Outcomes so far

- Contract preparation time reduced
- Quality comparable to that using conventional level of oversight
- Reduction in MTO resources required for field inspection
- Successfully used to deliver additional projects in 2010

Design Build Projects

Design Build Minor

- Low risk, low complexity projects, < \$10 million
- Expansion joint replacements, structural/non structural culvert replacement & barrier wall

For 2010

- 5 projects awarded
- 2 non awards (no bids/1 bid)
- 2 additional tenders planned

Further projects planned for 2011

Design Build Major

- Medium to high complexity projects
- Developing DB Major procurement documents
- Projects planned for 2011

Construction Manager/General Contractor (CMGC)

- Engage construction expertise early in the design process to enhance constructability, foster innovation, and manage project risks.
- Follows an integrated team approach to the design and construction of a highway project
 - Team: owner, designer, construction manager (who may become the contractor)
 - Owner hires the designer
 - Owner hires the construction manager during the design phase
 - Owner still has control over the design details, but receives better design based on contractor's input
- The detailed design proceeds to the point where the construction manager can provide a Guaranteed Maximum Price (GMP) for the construction services.
 - If Owner feels the GMP is reasonable, the construction work proceeds with the construction manager becoming the construction contractor
 - If Owner rejects the GMP, the full design is completed and the project proceeds to tender as a conventional Design Bid Build contract.

Construction Manager/General Contractor (CMGC) cont'd

- Advantages:
 - Ability to better address risks and changes in scope
 - Improved constructability
 - Provides opportunity for innovation
 - Owner retains control of design
 - Contractor selected on qualifications and price of significant construction items
- Challenges:
 - May need to reconcile differences between designer and construction
 - Determining if GMP provides value for money
 - Does not address staffing resources

Evolution of Specifications at MTO

Moving from End Result to Performance Based

Hot Mix Asphalt Performance Based Specification

- Under construction - stay tuned



Performance Based Crack Sealing Specification

- Drafted and in discussion with industry

Concluding Remarks

- MTO is committed to delivering a quarter of our business in innovative and improved ways
- The development of performance based specifications in collaboration with industry is a key component of our innovative contract delivery models

Questions?

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