

Editor's Remarks

The December Newsletter contains articles on Highway Ditch Erosion Remediation, Geotechnical Conferences, Recommended Guidelines for Traffic Control Devices, Usage of the Alberta Infrastructure and Transportation New Products List, Alberta Infrastructure and Transportation Goes Florescent on Select Traffic Warning Signs, and Technology Transfer/Technical Training.

All of us in Technical Standards Branch look forward to working with all in the New Year.

This newsletter also contains wishes for a safe and Happy Holiday Season.

May the coming year be filled with good health, prosperity, and peace for you and your friends and loved ones.

*Allan Kwan
Editor-in-Chief*

*Tricia Hurry
Roger Skirrow..... Ron Stoski
Associate Editors*

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Highway Ditch Erosion Remediation Hwy 986:01 Daishowa East Hill North of the Town of Peace River

*Fred Cheng
Geotechnical and Materials*

This project was presented by the author at the 2007 Canadian Land Reclamation Association (CLRA), Alberta Chapter Fall Tour - Peace River Tour, on September 20, 2007. There were about 150 conference participants, primarily environmental practitioners and consultants (plant ecologists, fish biologists, planners) involved with reclamation and conservation in the mine and oil and gas industries, as well as government regulators, and 40 students and faculty from Lakeland College, Vermillion.

Background

There is active erosion along the south ditch of Hwy 986 along the approach to BF81239, east of Daishowa Pulp Mill, north of the Town of Peace River. Thurber Engineering Ltd was retained by AIT to undertake the annual inspection and monitoring of geohazard sites in the Peace River area. Over the past several years the monitoring team has observed rapidly occurring, severe erosion and deterioration of the south ditch. These conditions jeopardize the safety of the travelling public and negatively affect the environment. Although the ditch was regraded several times the erosion problems soon returned. Permanent remediation work to repair the south ditch erosion was recommended.

Erosion Observations of South Ditch

The ditch erosion stretched for 850m along the south highway ditch (7% grade). The erosion gully varied from 0.1 to 2.2m in depth and from 0.4 to 15m in width. At the west end of the site the ditch entered a small settling basin, beyond which the ditch flow was redirected across the highway through a centreline culvert that carries the flow into another deeply scoured gully which eventually flowed into to a marshy pond north of the highway. Photos of typical ditch erosion conditions follow.



Severely Eroded South Highway Ditch

The gully erosion along south ditch was a result of the steep ditch bed gradient, erodible soil type, large catchment area and frequent intense rainfall and snowmelt conditions. Erosion of the south ditch was aggressive and progressive, acting to deepen, widen and lengthen the erosion gully. Additional background information and photos can be found under geohazard site PH7, located on the INFTRA website at <http://aicm/Content/doctype372/production/PH7.htm>.



Severely Eroded South Highway Ditch

Remediation

During the remediation design process, the 850m south ditch was identified as an ideal test section when considering the ditch grade and soil condition uniformity. A project was initiated to install eight (8) different ditch liner products. Some of these products are listed on the AIT Products List and BMPs in the department's Design Guidelines for Erosion and Sediment Control for Highways. Four (4) of these liner products have never been used by AIT so this test site provides an opportunity for side-by-side comparison. In addition, the severe ditch grade with test the performance boundaries of the remaining four products. The re-constructed ditch will be monitored over a number of years to assess the effectiveness of each lining under such a harsh environment. The performance results and associated cost/benefit analysis will be used when considering repairs at similar sites within Alberta

Cost of repairs for this project was about \$1.1 million. Construction work was awarded to Core Energy Solutions (a Nabors Co.) of Grande Prairie, and Project Design and Management to Thurber Engineering Ltd. Work started on July 24, 2007 and was completed on October 22, 2007. Construction was interrupted for several weeks due to wet weather.

Permanent Ditch Liners

The south ditch was filled and graded to a trapezoidal cross-section with typical 4H:1V side slopes and a 3.5m bottom width. Each of the eight permanent ditch liners was placed on a 100 m slope length and 10 m slope width. Adjoining liners were tightly joined to prevent undercutting at the joint location. This was done by tucking the upper ends of the downstream liners under the bottom ends of the upstream liners. The liners are, going from upstream (uphill) to downstream (downhill) area as follows:

1. Pillow Concrete Mattress – Hydrotex™ Fabric Forms. Fabric forms are placed on the ditch and filled with concrete to form a hard and durable ditch bed.



Pillow Concrete

2. Cable Concrete Mattress – Alberta Wilbert CC35. Concrete blocks are made of high strength concrete that are joined together by flexible stainless steel cable in a regular pattern to produce a flexible mattress.



Chain Concrete

3. Interlocking Concrete Blocks – Larfarge Mini-Slabs II. Concrete blocks are placed in a tight interlocked manner on a sand and non-woven geotextile bedding. Voids and spaces are filled with sand or gravel.



Concrete Blocks

4. Gabion Mattress – Maccaferri Gabion Mattress. Galvanized and PVC coated wire gabion mattresses filled with cobble sized gravel. This is a proven ditch armoring technique.



Gabion Mats and Site Tour

5. Cellular Confinement System – Presto Geo-web. They are lightweight, expandable high density polyethylene panels that are opened to form a honeycomb mattress. They are placed and filled with granular fill.



Geo-web Mat

6. Canal Liner – Coletanche ES Geomembrane. It is a modified bitumen impregnated geomembrane that has been reinforced with a non-woven geotextile. It is used in environmental protection and hydraulic applications. It is mechanical and chemical resistant and waterproofing.



Coletanche Canal Liner

7. Compost Sock – Filtrexx™ Channel Soxx. Compost is the controlled biological decomposition of organic material under aerobic conditions (for this project compost derived from wood by-products is used). It is seeded and grass is expected to catch.



Compost Channel Soxx

8. Rolled Erosion Control Products (RECPs) - Vmax³ C350. This is a composite permanent Turf Reinforcement Mat (TRM) made of a biodegradable material (coconut coir) sandwiched in synthetic nettings used for permanent protection of disturbed soils at slopes and channels. It is seeded and grass is expected to catch.



TRM C350 Mat

Conclusion

Installation of the 8 liners on the south ditch, and the cross highway culvert and ancillary work in the north side was successfully completed. Since some of these liner products have not been used by INFTRA on highway projects, periodic performance monitoring will be done. Successful products will be introduced to other regions where severe erosion has occurred. A cost/benefit assessment will also be undertaken to determine which products provide the best value.

Acknowledgement

Thank you to staff from the following groups who assisted in the conference presentation and Site Tour: Peace Region and Edmonton AIT, Thurber Engineering, Core Energy Solutions and CLRA Alberta Chapter.

If there are questions regarding this article please contact:

Fred Cheng:
by email: Fred.cheng@gov.ab.ca
or phone: 780-415-1039.

Geotechnical Conferences

*By Roger Skirrow
Geotechnical and Material*

Canadian Geotechnical Society/International Association of Hydrogeologists Conference, Ottawa, Ontario. October 21-24, 2007

About 600 people from geotechnical and hydrogeological academia, consultants, government, industry specialists and exhibitors attended the three day conference. Technical presentations were offered in 6 concurrent technical sessions, with about 320 papers delivered in rapid fire 12 minutes presentations. Topics included: Buried Structures; Cold Region Engineering; Computer Modeling; Earthquake Engineering; Engineering Geology; Foundation Engineering; Landfills and Contaminated Sites; Mining Geotechnique and the Environment; Slope Stability/Landslides; Unsaturated Soils; Experimental Geotechnique; Geosynthetics; Problematic Soils; Rock Mechanics: Soil Dynamics and Liquefaction; Soil-structure Interaction; and a dozen other topics. Of special note was a professional practice presentation by Neil Abbott, a Toronto lawyer from Gowlings and Associates, who talked about the expectations and obligations of being an expert witness and revealed some trick and traps that lawyers use to dissect expert witnesses on the stand.

The conference was held at the Westin Ottawa, a short distance from Parliament. The local color night was held at the Museum of Civilization. This year's conference title was Breaking Ground in the Nation's Capital. The article contributor attended the CGS Board of Directors meeting, and chaired the Professional Practice Committee meeting. Many opportunities were found to meet informally with colleagues to discuss matters of shared interest and develop collaborative projects (Rail Geohazard characterization project, Canadian Space Agency/NRC/Alberta Geological Survey InSAR and LIDAR projects).

A CD copy, as well as a hard copy of the proceedings is available from

Roger Skirrow at
roger.skirrow@gov.ab.ca

First North American Landslide Conference, Vail, Colorado, June 3-8, 2007

A theme specific conference sponsored by TRB, FHWA and various learned societies was held at the Vail Marriott Mountain Resort & Spa. About 400 people from government agencies that deal with landslides, geotechnical academia, consultants, industry specialists and exhibitors attended the five day conference. Technical presentations were a combination of invited keynote addresses in the mornings and about 120 technical paper presentations in the afternoons. Topics included:

MONITORING & MANAGEMENT OF SLOPES & LANDSLIDES

Landslides and Society: an Overview of Landslide Processes
Advances in Landslide Mapping and Modeling
Advances in Parameterization, Instrumentation, and Monitoring
Appraisal of Instability and Risk
Loss Reduction Strategies
Snow Avalanches - Hazards and Mitigation

EVALUATION & CONTROL OF LANDSLIDES

Characterization and Assessment of Earth and Rock Slides
Landslide Triggering Mechanisms
Stabilization of Landslide Masses
Remedial Works and Hazard Mitigation
Landslides in Permafrost
Debris Flows and Debris Avalanches
Rockfall Evaluation and Control

Wednesday was devoted to field trips. A trip to the top of a local ski hill was taken, to discuss ski resort project specific geohazards and mitigation strategies

The conference was important in that it was the first of its kind; it attracted regulatory and government agencies directly involved with landslide risk management policy development; the keynote presentations and technical papers dealt with broader topics than typically found at a geotechnical conference, and; The conference was designed to provide a stimulating forum for geoscientists, engineers, planners, economists, program managers, and other decision makers concerned with landslide hazards and their impact on North American society.

A CD copy, as well as a hard copy of the proceedings is available from Roger Skirrow at:

roger.skirrow@gov.ab.ca .

Recommended Guidelines For Traffic Control Devices

*Corinna Mulyk
Highway Operations*

The department has developed a constantly increasing number of recommended practices guidelines to provide guidance for the use of traffic control devices and other signage to promote consistency in application throughout the province. These guidelines are often developed to provide guidance in addition to what is contained in the Manual of Uniform Traffic Control Devices for Canada (MUTCDC), or to convey local practice which deviates from this manual.

The department has recommended practices on topics ranging from regulatory, warning, and information signage to business/community signage, typical sequencing of signs in certain situations (i.e., log-haul jug handle intersections, signing in advance of vehicle inspection stations), beacons, specific pavement marking applications, and other roadside features (i.e., highway beautification). All of these recommended practice guidelines are posted on the department website at the following location:

http://www.infratrans.gov.ab.ca/INFTRA_Content/doc/Type233/Production/recom_practices.htm

Each recommended practices guideline typically consists of guidelines/criteria for when the device can/should be used, guidelines for placement, maintenance and installation considerations, and references to other department/government standards that affect the application of the device/sign.

New recommended practices guidelines are created as questions of the application of a given sign or traffic control device arise. These guidelines are intended to assist department staff throughout the province when they are responding to public requests for signs, traffic control devices and other roadside features, as well as to assist staff in planning/installing appropriate signage on new and existing roadways.

For further information on recommended practices guidelines, and new guidelines under development, please contact:

Corinna Mulyk at (780) 415-9961
or Corinna.Mulyk@gov.ab.ca.

Use of Alberta Infrastructure and Transportation New Products List

*Joe Filice
Geotechnical and Material*

Introduction

The Alberta Infrastructure & Transportation Products List (AITPL) is **not** a Standard; it is a reference guide. The AITPL was created as an information tool for contractors, engineering consultants and department personnel to identify products which meet, or are expected to meet department standards or specifications for a particular application. Posting of a product to the AITPL should not be construed as an endorsement by the department of that product or a guarantee of product performance relative to specific contract requirements or warranty. The use of any product listed in the AITPL document by a contractor shall in no way relieve the contractor from the contractual obligation.

The Alberta Infrastructure & Transportation Products List can be accessed through the web at the following link:

http://www.infratrans.gov.ab.ca/INFTRA_Content/doc/Type253/Production/productindex.pdf

NPEC Background

The AITPL was established by the New Products Evaluation Committee (NPEC) in 2001. The NPEC consists of technical referees, representatives from each of the major process committees (MPMC, CPMC and BPMC) and other Twin Atria and Regional staff.

New products are evaluated by technical referees who have specialist knowledge of the product's area of application. The NPEC meets every second month to review recommendations made by the technical referees and either accept or reject the product for inclusion on the AITPL. The NPEC main function is to determine the needs and feasibility of using any particular new product.

Alberta Infrastructure & Transportation Product List (AITPL)

The AITPL identifies various products that may be used on AIT highway/bridge construction and maintenance contracts. The products listed may include “brand names” that either meet the department’s standards/specifications or are otherwise satisfactory to the department. In some instances, a qualifier on the applicability or usage of the product may be included. The absence of a particular brand or product from the products list does not necessarily mean that the product fails to meet department standards or specifications. A product may not be used on a department contract until such time as the product has been confirmed suitable for use through the AITPL process described herein. Under exceptional circumstances the AITPL process can be fast-tracked if a particular project requires the use of a product that is not listed on the AITPL.

Individual products are listed in four separate categories; Approved, Proven, Trial and Potential. Products listed under “Approved” and “Proven” may be used where applicable on any department project. However, unless a particular product is specifically referenced in the contract documents, the use of products listed under “Trial” and “Potential” will require prior approval of the department. Such approval may only be obtained from Mr. Roger Skirrow, Director, Geotechnical and Material Section, Alberta Infrastructure and Transportation, Phone: 780-427-5578 or roger.skirrow@gov.ab.ca. This approval is required for the department to gather documentation about the product usage, and to establish a performance monitoring and reporting process for that product.

AITPL Category Definitions

Approved Product

Products for which AIT has been directly involved in the testing of the products. This category only includes: Bridge Concrete Sealers, Bridge Coating Systems, Non-Shrink Grout, Portland and Cement Concrete Patching Products and Traffic Paint Formulations.

Proven Product

Products for which an adequate performance record has been established on department projects.

Trial Product

Products which appear to meet standard specification requirements and/or specific requirements of the work and have been installed/used in AIT trial projects. The performance of trial products are monitored for acceptability for a period of a year or more.

Potential Product

Products that have the potential to meet standard specification requirements and/or specific work requirements but have not yet been used on AIT projects. A potential product that has not been used on an AIT project within a predetermined time frame will be removed from the AITPL. It is the responsibility of the product supplier/distributor to market their product to AITPL partners.

NPEC Review Process

1. The proponent (manufacturer or supplier) will initiate the process by submitting a Product Submission Form, along with all the necessary documentation for the product so that an evaluation can be conducted. The Products Submission Form can be found at: <http://www.trans.gov.ab.ca:81/docType253/Production/psml.htm>
2. The new product submission along with the product evaluation is sent to the appropriate technical referees for their assessment. The referees will determine if the new product has a potential beneficial use to the department and recommend listing as a Potential Product on the AITPL. The referees may also reject the product based on the documentation submitted and/or other sources of information. For products being considered under the Trial Product category, performance criteria and the time period needed for trials will also be determined by the referees.
3. The NPEC reviews the referee’s evaluations and has the final say regarding the recommendations. A review is also carried out by the committee to ensure each product’s status is updated, and to remove any products deemed obsolete, not-in-use, or which no longer meet current standards.
4. Products that are rejected or removed may not be resubmitted before a minimum two-year moratorium period has elapsed.

The New Products Evaluation process is illustrated in the evaluation flow chart below.

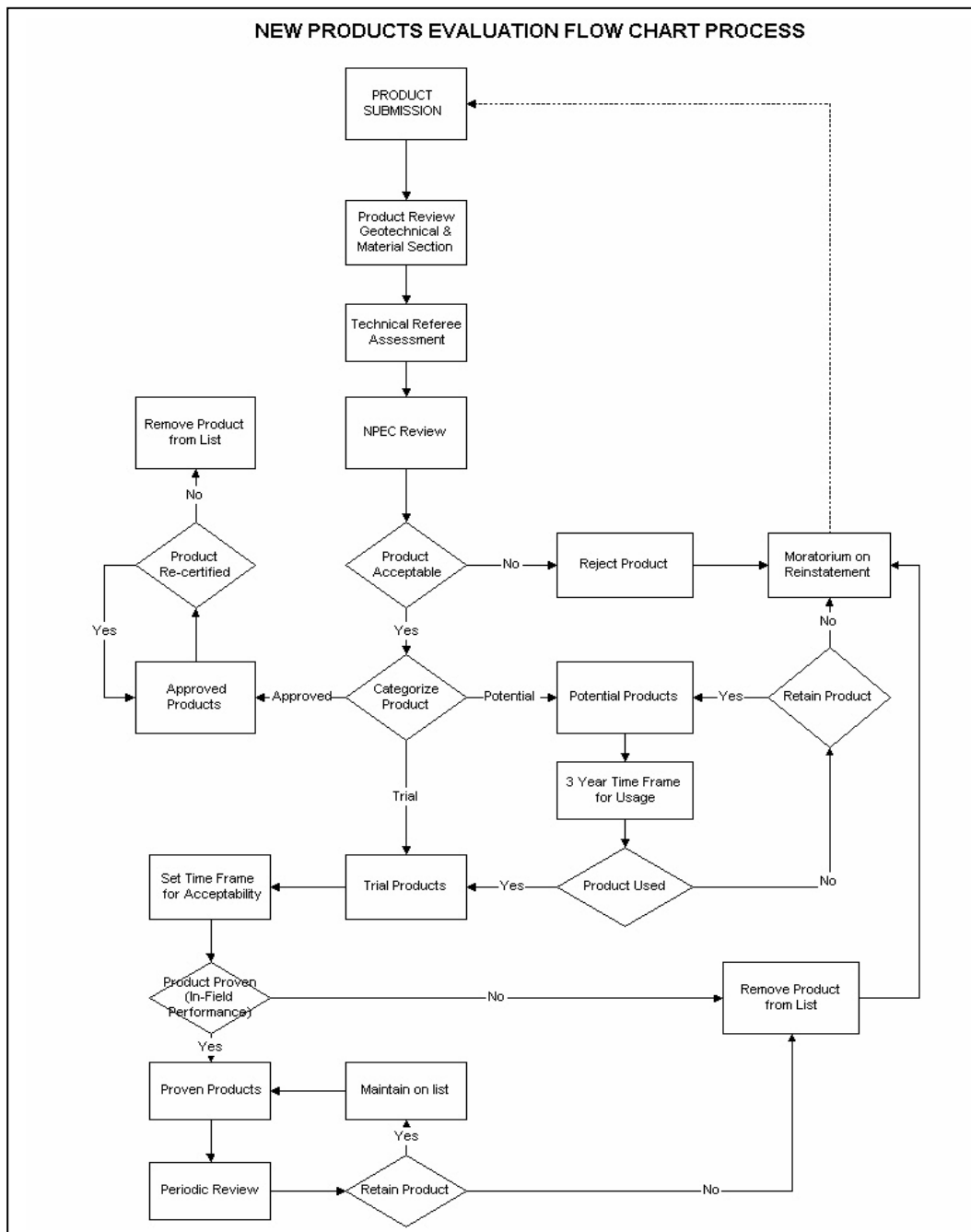
The AITPL was established to assist contractors, consultants and department staff in selecting products for department projects. The products list is intended as a guide in the selection process of construction materials and is not to be considered a standard.

Questions about a product's latest status or for approval of new product for use as a trial project may be directed to:

Joe Filice, Materials Technologist
 Phone: 780 415-1022, email: joe.filice@gov.ab.ca

or

Roger Skirrow,
 Director of Geotechnical and Material Section
 Phone: 780 427-5578, email: roger.skirrow@gov.ab.ca



Alberta Infrastructure and Transportation Goes Florescent on Select Traffic Warning Signs

*Richard Chow
Highway Operations*

“Do more with less.”

**“We need to design roads
to accommodate the aging driver.”**

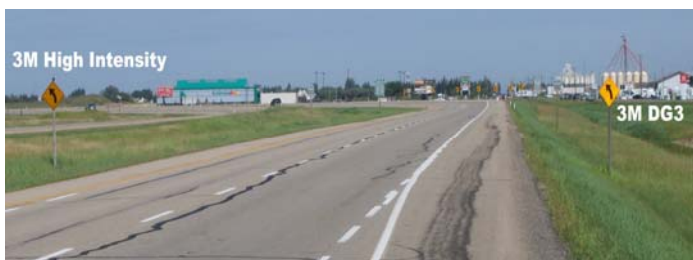
“Brighter is better.”

These are all commonly heard statements
in the world of traffic operations.

With the challenge to traffic professionals to make roadways safer without increasing budgets, there are few safety improvements that can have a resounding and widespread impact as the upgrade of traffic signing. It has been accepted that making signs more visible increases their effectiveness and therefore improves the safety of the road. In June 2007, Alberta Infrastructure and Transportation took a resounding step towards improving the visibility of traffic warning signs. Provincial highways in Alberta will use a higher retro-reflective sheeting to improve conspicuity and visibility of traffic warning signs. The department will use Florescent Yellow Diamond Grade Cubed sheeting on a variety of warning signs as follows:

- Roadway alignment warning signs – curve signs (WA-1 to WA-6) and chevrons (WA-9).
- Traffic control ahead signs – stop ahead (WB-1), yield ahead (WB-2), two-way traffic ahead (WB-3), signals ahead (WB-4), prepare to stop AAWS (WB-5), railway crossing ahead (WB-6), school bus stop ahead (WC-9).
- Hazard signs – hazard board (WA-36) and clearance signs (WA-26, WA-27).
- Pedestrian signs – pedestrian crossing ahead (WC-2), playground ahead (WC-3).

“Florescent Yellow Diamond Grade Cubed sheeting traffic signs significantly increases both daytime and night-time sign detection and shape recognition when compared with non-florescent high-intensity signs of identical size and design.”¹



Drivers in Alberta are already familiar with florescent signs as they are used on construction work zone signs (florescent orange) and school zone signs (florescent yellow/green) throughout the province.



Now drivers will have added benefit of florescent yellow applied to warning signs. The use of florescent yellow makes signs more visible to motorists who can recognize and respond to signs earlier. Florescence provide additional performance factors, such as greater overall daytime visibility, higher visibility at dusk and dawn, high visibility in inclement weather and greater performance at all distances from the sign. This is a compelling case for using Florescent Yellow Diamond Grade Cubed sheeting on more important warning signs.



For further information on Alberta Infrastructure and Transportation’s new practice of utilizing Florescent Yellow Diamond Grade Cubed sheeting on the more important warning signs please contact one of the following people from Technical Standards Branch:

Richard Chow phone: 780 415 1050

richard.chow@gov.ab.ca

or

Corinna Mulyk phone: 780 415 9961

corinna.mulyk@gov.ab.ca

Notes:

1. Department of Transport Engineering, SINTEF and Environmental Engineering in partnership with the Norwegian Roads Administration.
2. With sincere appreciation to Municipal Products Review Magazine for permission to reprint this article in the Alberta Infrastructure and Transportation, Technical Standards Branch’s News Letter.

Technology Transfer // \ Technical Training

*Ron Stoski
Geotechnical and Material*

Technical training and upgrading has been identified as one important way to improve job skills and to keep up to date in our fields.

The following Bridge Inspection training courses and dates have been arranged for by TSB for 2008.

TSB Training Courses.....Calendar of Events

Class B BIM Course.....April 21-25
Class B BIM Course.....August 25-29
BIM Field Training Course.....September 23-25
Class A BIM CourseOctober 6-10

Please contact Lloyd Atkin by email:

lloyd.atkin@gov.ab.ca or by phone: 780 415 1080
for more information about the above BIM courses.

The following courses and seminars are being set up by TSB. Course Dates will be available in the New Year.

Developments in Bridge Planning Seminar - May

Livelihood Training to Enter - Profile Bridge Documents
- May – ½ Day per region

Roundabouts – ½ Day Department Perspective

Pavement Preservation: Preventive Maintenance
Treatment, Timing and Selection.....February
(For Operations and Infrastructure Managers and
Operations and Infrastructure Engineers)

*Additional technical training courses, as they are
identified and developed are posted at*

*[Technical Resources, Technology Transfer, Courses
Seminars and Event.](#)*

For additional information and/or if you have training
course suggestions please contact

Ron Stoski Phone: 780 415 1020
email: ron.stoski@gov.ab.ca

Everything happens for a reason.

C-TEP Training Courses

*Neil Little
C-TEP*

The Center for Transportation Engineering and Planning (C-TEP) is working with department staff and industry to arrange for the delivery of the following courses during the first six months of 2008:

Vulnerable Road Users
Edmonton – January 24-25
Calgary – January 29-30
Roadside Design
Roundabout/Access Management
Risk Analysis
Functional Planning (May)
Work Zone Safety Regulations

Neil Little, Executive Director of C-TEP, will provide additional details as dates and places are finalized.

Neil will also be arranging for additional training courses and seminars as needs are identified.

For information about C-TEP courses please go to the website at <http://www.c-tep.com/>

Previous newsletters can be viewed at:
<http://www.infratrans.gov.ab.ca/1881.htm>

If you would like to publish an article or
to comment on the newsletter please contact:

Tricia Hurry 780 427 1228
Ron Stoski 780 415 1020
Roger Skirrow 780 427 5578
or Allan Kwan 780 427 8990

*"Today is your day,
your mountain is waiting,
so get on your way."*

-Dr. Seuss-