

Case Study - Insulating, Heavy-Duty Road Base

Brentwood Light Rail Transit (LRT) Bus-Lane Calgary, Alberta, Canada

Problem: Transit buses exert heavy loading due to the single rear axle. A bus-lane with traffic volumes of up to 100 buses per hour had frost-heaved substantially and became virtually impassable. The sub-base of the road was saturated silty deposits, over 30 m in depth. The subgrade soil had a California Bearing Ratio (CBR) of 0.8%.

Solution: In 2000, the road was completely reconstructed with the following structure:

- Geotextile fabric,
- 50 mm of drainage rock (with subdrains beneath the curb & gutter),
- 200 mm of CEMATRIX CMRI-475 Insulating Road Base
- 150 mm of granular base course, and
- 125 mm of asphalt.

Since construction, the road has experienced no frost-heaving and has required no additional remediation as of November 2009. A Benkelman Beam Deflection Test resulted in 0.012 inches of deflection, much less than the 0.035 inches allowed for such a road. This and other road rehabilitation projects throughout Alberta have proven the extreme effectiveness in dealing with soft, frost-heave prone roads with cellular concrete insulation / base material. A reference letter dated November 11, 2009 is available.

Advantages: Following were the benefits of using CMRI-475 on this project:

- Insulating value – By utilizing CMRI-475 within the roadway structure, pavement damage from frost heave and spring thaw softening are eliminated.
- Superior structural properties - Use of CMRI-475 as a pavement subbase material creates an extremely rigid pavement structure, thus extending the life of the pavement and reducing maintenance costs.
- Less cost – CMRI-475 replaces both the insulating and granular subbase materials, as well as reducing excavation; therefore resulting in significant monetary savings.
- Ease of placement – CMRI-475 may be cast on an "as excavated" surface, and can be placed and leveled to exactly the thickness required to provide a prescribed insulation—unlike pre-formed board products that come in limited thicknesses.
- Reduced excavation – CMRI-475 typically replaces granular bases two-to-three-times greater in thickness; therefore, less underlying soil needs to be excavated.
- Reduced subgrade disturbance – Placement and compaction of granular soil can result in disturbance and weakening of the underlying sub grade soils. CMRI-475 is self-leveling; therefore, it requires no compaction, vibration or use of heavy equipment.



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