

Case Study - Shallow Utility Insulation

Calgary, Alberta, Canada

Problem: In seasonal frost zones, pipes carrying water must be insulated when they cannot be buried below frost penetration depth. The reasons for shallow burial may include conflicts with other utilities, change of grade, high groundwater level, or high cost of blasting through solid rock. Moreover, it is often advantageous to reduce the depth of burial to allow access to the pipes for repair, reduce the settlement of backfill soils (especially when backfilling in winter with frozen soil), and eliminate shoring.

In Calgary, pipes are buried 2.7 to 3.3 m deep, depending on the soil type and operational conditions of the pipe.

Solution: A layer of CEMATRIX CMI-475 Insulating Cellular Concrete is placed immediately above the pipe, thus trapping the heat of the earth below the insulation. CEMATRIX CMI-475 is a product approved by The City of Calgary for use in shallow utility applications. This approval was granted as a result of extensive analytical calculations and field studies that were conducted by CEMATRIX and reviewed by Dr. Walter Dilger. (Dr. Dilger, FRSC, P.Eng. is a professor emeritus at the University of Calgary, and was involved in the approval of Granulite™, an expanded shale product previously used for shallow utility insulation throughout Alberta). A reference letter dated November 16, 2009 is available.

Advantages: The advantages of using CEMATRIX CMI-475 on these projects are as follows:

- Superior strength – CMI-475 has greater than four-times the compressive strength of plastic foam. Also, cellular concrete is a monolithic material; therefore, it has much higher shear strength than particulate materials such as Granulite™.
- Ease of placement – CMI-475 is self-compacting; therefore, it does not require vibration during placement. When cast-in-place, CMI-475 does not require a sand bed to provide an even surface.
- Ease of excavation – Due to its cellular structure, CMI-475 can easily be re-excavated if repairs are needed to underlying structures, and may easily be patched once repairs are complete.
- No settlement potential – CMI-475 does not creep under sustained load, as do plastic foam insulations.
- Flexibility – CMI-475 can be cast into any desired configuration.
- Chemical Resistance – CMI-475 is used in many process facilities due to its resistance to petrochemicals.



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