

TECH SOLUTIONS 603.0 STYROFOAM™ BRAND HIGHLOAD INSULATION FOR ROADWAYS



PROTECTING ROADWAYS FOR OVER 45 YEARS

Roadways are at risk of damage from frost heaving and spring breakup throughout regions where underlying soils are susceptible to frost action. STYROFOAM™ Brand HIGHLOAD 40, 60 and 100 Extruded Polystyrene Insulation products have long been used beneath roadway embankments to help prevent hazardous driving conditions due to frost action. Since 1962, STYROFOAM™ Brand HIGHLOAD Insulation has been used in road construction throughout Canada and the United States. STYROFOAM™ Brand HIGHLOAD Insulation is the proven, long-term solution to protect roadways against ground frost problems.

Table 1 shows a partial list of highway insulation projects in Canada and the United States. A select list of references provides additional information sources.

Samples of STYROFOAM™ Brand HIGHLOAD Insulation recovered from various roadway test installations over the years have shown little increase in water absorption or loss of thermal resistance. In all cases, the insulation's structural integrity was retained.

STYROFOAM™ Brand HIGHLOAD Insulation products are durable, versatile and reusable – making them a preferred choice for a variety of high-load applications, including roadways.

TABLE 1: INSULATED ROADWAY CONSTRUCTIONS

Date	Facility	Location	Owner	Comments
1963	Trans-Canada Highway ¹	Winnipeg, Manitoba	Manitoba Dept. of Highways	Two sections totaling 61 m of 50 mm and 90 mm STYROFOAM™ Brand HIGHLOAD
1963	Highway ²	Hampden, Maine	Maine Highway Commission	198 m of 40 mm STYROFOAM™ Brand HIGHLOAD 40*
1963	Highway 18	West Union, Iowa	Iowa Dept. of Highways	76 m of 40 mm STYROFOAM™ Brand HIGHLOAD
1963	Highway ³	Minneapolis-St. Paul, Minnesota	Minnesota Dept. of Highways	Two sections totaling 15 m x 9 m and 21 m x 12 m of 50 mm STYROFOAM™ Brand HIGHLOAD 40
1964	Highway ⁴	Sudbury, Ontario	City of Sudbury	Two 11 m x 30 m sections of 50 mm STYROFOAM™ Brand HIGHLOAD
1965	Highway 26	Togwotee Pass, Dubois, Wyoming	Wyoming Highways Dept.	46 m of 50 mm STYROFOAM™ Brand HIGHLOAD
1965	Highway	Otsego County, Michigan	Michigan Dept. of Highways	Two sections totaling 152 m of 25 mm STYROFOAM™ Brand HIGHLOAD
1966	Highway I-35	Owatonna, Minnesota	Minnesota Dept. of Highways	320 m of 75 mm STYROFOAM™ Brand HIGHLOAD 40
1966	Highway I-15	Dubois, Idaho	Dept. of Highways	Three sections totaling 63 m of 25 mm, 40 mm and 50 mm STYROFOAM™ Brand HIGHLOAD 40
1966	Highway I-29	Vermillion, South Dakota	Dept. of Highways	18 m of 40 mm STYROFOAM™ Brand HIGHLOAD 40
1966	Highway 69	Sudbury, Ontario	Dept. of Transportation	154 m of 50 mm and 75 mm STYROFOAM™ Brand HIGHLOAD
1966	Highway	Fort Dodge, Iowa	Dept. of Highways	305 m of 40 mm STYROFOAM™ Brand HIGHLOAD
1966	Highway 63	Grandview, Wisconsin	Dept. of Highways	68 m of 65 mm STYROFOAM™ Brand HIGHLOAD 40
1967	Highway I-95	Augusta, Maine	Maine Highway Commission	366 m of 50 mm STYROFOAM™ Brand HIGHLOAD
1967	Trans-Canada Highway	White City, Saskatchewan	Dept. of Transportation	15 m of 75 mm STYROFOAM™ Brand HIGHLOAD
1967	Highway I-89	Royalton, Vermont	Dept. of Highways	77 m of 50 mm STYROFOAM™ Brand HIGHLOAD
1967	Highway 14	Towner, North Dakota	North Dakota Dept. of Highways	160 m of 75 mm STYROFOAM™ Brand HIGHLOAD
1968	Seward Highway ⁵	Potter, Alaska	Alaska Dept. of Highways	10 m x 29 m of 75 mm STYROFOAM™ Brand HIGHLOAD 40
1969	Highway ⁶	Rossville, Indiana	Indiana State Highway Commission	Two sections: 10 m x 61 m of 25 mm and 14 m x 61 m of 40 mm STYROFOAM™ Brand HIGHLOAD 40

*STYROFOAM™ Brand HIGHLOAD 40 Insulation was called STYROFOAM™ Brand HI-35 at the time of the test.

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STYROFOAM™ BRAND HIGHLOAD INSULATION FOR ROADWAYS

TABLE 1: CONTINUED

Date	Facility	Location	Owner	Comments
1969	Highway ^{7,8}	Chitina, Alaska	Alaska Dept. of Highways	Permafrost; 56 m insulated with 10 mm and 100 mm STYROFOAM™ Brand HIGHLOAD 40
1971	Trans-Canada Highway	Cabano, Québec	Ministre des Transports du Québec	139 m of 65 mm STYROFOAM™ Brand HIGHLOAD 60
1971	Highway	St. Foy, Québec	Dept. of Public Works	204 m of 40 mm and 50 mm STYROFOAM™ Brand HIGHLOAD
1972	Highway ⁹	Inuvik, Northwest Territories	Dept. of Indian & Northern Affairs	Permafrost; winter and summer sections built along Mackenzie Highway
1973	Trans-Canada Highway	St. Honoré & Cte Temiscouata, Québec	Ministre des Transports du Québec	Four sections totaling 525 m of 65 mm STYROFOAM™ Brand HIGHLOAD
1974	Highway ⁷	Alder Creek S., Alaska	Alaska Dept. of Highways	Permafrost insulation of 0.125 lane miles of 100 mm STYROFOAM™ Brand HIGHLOAD
1974	Highway ⁷	Alder Creek N., Alaska	Alaska Dept. of Highways	Permafrost insulation of 0.072 lane miles of 100 mm STYROFOAM™ Brand HIGHLOAD
1975	Work Pad ^{10,11}	North of Brooks Range, Alaska	Alyeska Pipeline Service Co.	Permafrost; 240 km length, 200 m to 275 m width; two sections: 40 mm and 75 mm STYROFOAM™ Brand HIGHLOAD 40
1976	Trans-Canada Highway	Siegas, New Brunswick	N.B. Dept. of Transportation	75 mm STYROFOAM™ Brand HIGHLOAD 60
1977	Highway 2	Hunter River and Bloomfield, Prince Edward Island	P.E.I. Dept. of Transportation & Public Works	STYROFOAM™ Brand HIGHLOAD
1977	Highway 17	Raith, Ontario	Dept. of Transportation	305 m of 50 mm and 75 mm STYROFOAM™ Brand HIGHLOAD 40
1978	Highway	Inuvik, Northwest Territories	Town of Inuvik	Permafrost insulation of town main street
1978	Airport Road	Québec City, Québec	Québec City	4.8 km of 50 mm STYROFOAM™ Brand HIGHLOAD 60
1979	Trans-Canada Highway	St. Leonard, New Brunswick	N.B. Dept. of Transportation	1.2 km of 75 mm STYROFOAM™ Brand HIGHLOAD 60
1980	Highway 7	Lincoln, New Brunswick	N.B. Dept. of Transportation	50 mm STYROFOAM™ Brand HIGHLOAD 60
1980	Highway 11	Hearst, Ontario	Ministry of Transportation Ontario	STYROFOAM™ Brand HIGHLOAD
1980	Highway 10	Hardwood Ridge, New Brunswick	N.B. Dept. of Transportation	100 mm STYROFOAM™ Brand HIGHLOAD 60
1980	Highway	Sherbrooke, Québec	Sherbrooke Dept. of Public Works	244 m of 75 mm STYROFOAM™ Brand HIGHLOAD 40
1981	Crowchild Trail	Calgary, Alberta	Calgary Engineering Dept.	STYROFOAM™ Brand HIGHLOAD 40
1986	Eaglesham Highway	Grande Prairie, Alberta	Alberta Transportation	50 mm STYROFOAM™ Brand HIGHLOAD 60
1989	Whitemud Drive	Edmonton, Alberta	City of Edmonton Public Works	5 million board feet of STYROFOAM™ Brand HIGHLOAD 40 installed in 25 mm to 100 mm thicknesses
1990	Trans-Canada Highway	Near Charlottetown, Prince Edward Island	P.E.I. Dept. of Transportation & Public Works	2.5 million board feet of STYROFOAM™ Brand HIGHLOAD 60 installed in 40 mm thickness
1990	Whitemud Drive at 100th Avenue and Anthony Henday Drive	Edmonton, Alberta	City of Edmonton Public Works	Asphalt overlay with 500,000 board feet of STYROFOAM™ Brand HIGHLOAD 40
1996	Whitemud Drive at 170th – 199th Street, W	Edmonton, Alberta	City of Edmonton Public Works	Asphalt overlay with 1 million board feet of STYROFOAM™ Brand HIGHLOAD 40

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The selected references listed below contain documentation of the performance of insulated roadways.

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2. *Maine Road Tests Show Foam Plastic Prevents Frost Heaves*. Better Roads, June, 1968.
3. Korfhage, G.R. *Subgrade Insulation for Frost Heave Correction*. Engineering Standards Division Office of Materials, State of Minnesota Department of Highways, Special Study No. 285, Interim Report, 1968.
4. Penner, E., M.D. Oosterbaan and R.W. Rodman. *Performance of City Pavement Structures Containing Foamed Plastic Insulation*. Highway Research Record 128, pp. 1-17, 1966.
5. *Subgrade Insulation for Frost Heave Control – Summary of Second and Third Winter's Performance*. State of Alaska Department of Highways, Materials Division, 1971.
6. Horton, James A., M.M. Bowers and C.W. Lovell, Jr. *Indiana's Thermally Insulated Test Road*. Highway Research Record.
7. Esch, David C. *Insulation Performance Beneath Roads and Airfields in Alaska*. Alaska Department of Transportation and Public Facilities, Fairbanks, Alaska, 1986.
8. Esch, D.C. *Control of Permafrost Degradation Beneath a Roadway by Subgrade Insulation*. Proceedings 2nd Permafrost Conference, Yakutsk, USSR, 1972.
9. Johnston, G.H. *Performance of an Insulated Roadway on Permafrost. Inuvik, NWT*. National Research Council Canada. Permafrost: Fourth International Conference, Fairbanks, Alaska, 1983.
10. McPhail, James F., William B. McMullen and Allan W. Murfitt. *Yukon River to Prudhoe Bay Highway – Lessons in Arctic Design and Construction*. Civil Engineering-ASCE February, 1976 Ed.
11. Metz, Michael C., Thomas G. Krzewinski and Edwin S. Clarke. *The Trans-Alaska Pipeline System Workpad – An Evaluation of Present Conditions*. 4th Canadian Permafrost Conference, 1982.

STYROFOAM™ BRAND HIGHLOAD INSULATION FOR ROADWAYS

TABLE 1: CONTINUED

Date	Facility	Location	Owner	Comments
1996	50th at Yellowhead	Edmonton, Alberta	City of Edmonton Public Works	STYROFOAM™ Brand HIGHLOAD
1996	UBC Library	Vancouver, British Columbia	University of British Columbia	Landscape fill application over an existing roof; 400,000 board feet of Type 2 product
1997	Evain Road	Abitibi, Québec	Ministre des Transports du Québec	69,700 m ² of 50 mm STYROFOAM™ Brand HIGHLOAD 60
1998	Brockington Drive	Calgary, Alberta	City of Calgary	STYROFOAM™ Brand HIGHLOAD
1998	McWatter Road	Abitibi, Québec	Ministre des Transports du Québec	46,500 m ² of 50 mm STYROFOAM™ Brand HIGHLOAD 60
1998	Shaganappi Trail	Calgary, Alberta	City of Calgary	Asphalt overlay with 25 mm STYROFOAM™ Brand HIGHLOAD 100
2000	Route 70	Chicoutimi, Québec	Ministre des Transports du Québec	800,000 board feet of STYROFOAM™ Brand HIGHLOAD 60
2000	Big Grassy River Bridge and Eleanor Bay Bridge	Rainy River, Ontario	Ministry of Transportation Ontario	Bridge approach and full bed application; 488,000 board feet of STYROFOAM™ Brand HIGHLOAD 40
2001	Route 185	Notre-Dame-du-Lac, Québec	Ministre des Transports du Québec	1,800 m ² of 25 mm, 40 mm and 50 mm STYROFOAM™ Brand HIGHLOAD 40
2001	Chemin du Golf	La Malbaie, Québec	Ministre des Transports du Québec	11,600 m ² of 25 mm STYROFOAM™ Brand HIGHLOAD 60
2002	Route 138	Chateau Richer, Québec	Ministre des Transports du Québec	2,300 m ² of 40 mm STYROFOAM™ Brand HIGHLOAD 40 and 2,900 m ² of 25 mm STYROFOAM™ Brand HIGHLOAD 60
2002	Autoroute 40	Cap Santé, Québec	Ministre des Transports du Québec	11,200 m ² of 25 mm STYROFOAM™ Brand HIGHLOAD 60
2002	Route 229	Cap Chat, Québec	Ministre des Transports du Québec	2,900 m ² of 25 mm STYROFOAM™ Brand HIGHLOAD 60
2002	Highway 417/ Regional Road 20	Amprior, Ontario	Ministry of Transportation Ontario	Bridge approach; 3 million board feet of STYROFOAM™ Brand HIGHLOAD 47**

**Specially produced product with 47 psi vertical compressive strength

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Building and/or construction practices unrelated to building materials could greatly affect moisture and the potential for mold formation. No material supplier including Dow can give assurance that mold will not develop in any specific system.

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