U.S. Department of Transportation
Research and Special Programs Administration
400 Seventh Street, S.W.
Washington, D.0 20590

FEB -1 1999

Mr. Robert F. Smalicomb, Jr.
Director, Pipeline Engineering and Safety Division
Massachusetts Department of Telecommunications & Energy
100 Cambridge St., 12th floor
Boston, MA 02202

Dear Mr. Smalicomb:

We have considered your letter of December 3, 1998, notifying us that the Massachusetts Department of Telecommunications & Energy has granted the Boston Gas Company a waiver from compliance with 49 CFR 192.321(a) for plastic pipe across a bridge on Medway Street in Milton, Massachusetts. The waiver will permit the installation of 81 feet of 6-inch plastic pipe above ground inside an 8-inch welded steel casing across the bridge. The steel-encased plastic pipe will be protected against mechanical damage and ultraviolet radiation, and meet all stress limits applicable to plastic pipe.

We have no objection to the waiver. The circumstances are comparable to those of previous waivers we have approved permitting the installation of plastic pipe above ground on bridges.

Sincerely,
Richard B. Felder
Associate Administrator for Pipeline Safety

COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF
TELECOMMUNICATIONS & ENERGY
100 CAMBRIDGE STREET, 12TH FLOOR
BOSTON, MA 02202
(617) 305-3500

December 3, 1998

Mr. Richard B. Felder
Associate Administrator for Pipeline Safety (DPS-1)
Research and Special Projects Administration
U.S. Department of Transportation
400 Seventh Street, S.W.
Washington, D.C. 20590

RE: Waiver of Pipeline Safety Regulations §192.211(a)

Dear Mr. Felder:

Being a certified agent under Public Law 103-272, § 60105, the Massachusetts Department of Telecommunications and Energy has granted a waiver to Boston Gas Company from the requirements of Title 49 C.F.R. Part 192, § 192.321(a). The waiver allows Boston Gas Company to install an 6" nominal diameter plastic pipe into a new 8" nominal diameter coated steel casing. Approximately 81 feet of the plastic piping will not meet the burial requirements of 192.321(a). The installation is in Milton, Massachusetts.

As required by Public Law 102-272, § 60116(d), I am forwarding a copy of this waiver to your office with the understanding that the waiver will become effective within 60 days of the notification unless the Secretary stays the waiver in writing before the effective date. Thank you for your assistance.

Very truly yours,
Robert F. Smallcomb, Jr.
Director, Pipeline Engineering and Safety Division

Bostongas

Mr. Robert F. Smallcomb, Director
Massachusetts Department of Telecommunications and Energy
Leverett Saltonstall Building
100 Cambridge Street
Boston, MA 02202

October 21, 1998

RE: Medway Street Bridge Crossing

Dear Mr. Smallcomb:

The Massachusetts Bay Transit Authority (MBTA) is planning the reconstruction of one of its bridges located on Medway St in Milton, MA. As part of the bridge reconstruction, Boston Gas is planning to replace an existing 6 inch gas main with a new 6 inch plastic gas main inside an 8 inch steel casing. Boston Gas is requesting approval for this new 6 inch plastic gas main.

In accordance with CMR 220, § 101.06 (10), I am providing the following information on the new main.

1. The nominal pipe diameter is 6 inches with a wall thickness of 0.576 inches. The material of the carrier pipe is polyethylene PE 2406 with a Specified Minimum Yield Strength (SMYS) of 3,000 psi. The carrier pipe will be housed in an 8 inch diameter steel casing pipe.
2. The maximum operating pressure of the line is 11 inches w.c.(0.4 psig), with a test pressure of 90 psig.
3. Based on the formula presented in CMR 220, § 101.06 (10), the hoop stress is 422 psi for a test pressure of 90 psig and 2.3 psi for a maximum operating pressure of 11 inches w.c.(0.4 psig.)
4. It is not necessary in this case to provide for expansion and contraction, since the carrier pipe is laterally restrained and the combined stresses on the carrier pipe are within allowable limits. The thermal movements can be absorbed in the pipe and in the soil behind the bridge abutments.
5. Details of the pipe supports are shown on the attached Boston Gas plan (Drawing No. P-118). There will be a total number of 16 supports on the bridge spaced approximately 5 feet apart.
6. The approximate location of the valves on each side of the bridge are also shown on the attached plan.

The layout of the abutments and support beams was obtained from a set of construction drawings prepared by Pennoni Associates Inc. dated June, 1997 for the MBTA.

I have also enclosed two copies of a petition to install plastic pipe across this bridge. Please call me at (617) 723-5512 ext. 4432 if you have any questions. Thank you.

Sincerely,
Michelle C. Roche Project Engineer
Engineering

Bostongas

Mr. Robert F. Smallcomb
Director, Pipeline Engineering and Safety Division
Commonwealth of Massachusetts
Department of Telecommunications and Energy
100 Cambridge Street
Boston, MA 02202

October 21, 1998

Subject: Petition for a Waiver to Install Plastic Pipe Across an Existing Bridge Located on Medway Street in Milton, Massachusetts

Dear Mr. Smallcomb:

In accordance with 220 CMR 101.02: Application for Exceptions and Waivers from Provisions of the D. T. E. Regulation, Boston Gas Company (the "Company") hereby petitions the Massachusetts Department of Telecommunications and Energy (the "Department") for a waiver from the provision of 49 CFR 192.321, Installation of Plastic Pipe, paragraph (a). Paragraph (a) requires that plastic pipe must be installed below ground level.

The Company proposes to install approximately 80 feet of 6-inch nominal diameter, SDR 11.5, PE 2406, plastic pipe inserted in an 8-inch steel casing supported underneath an existing bridge.

The pipeline will be joined by heat fusion and inserted in an 8-inch nominal diameter, coated, welded, steel casing. The pipeline will be tested in accordance with Massachusetts and federal regulations so that it may be operated at 0.4 psig.

The specifications for the plastic pipe appear in Table 1 and Table 2 of Exhibit A; and the specifications for the casing appear in Table 1 of Exhibit B. The design of the pipeline installation across the bridge, including, but not limited to, the carrier pipe and casing supports, the number of supports, the distance between supports, and the means for maintaining a separation between the plastic pipe and the metallic casing appear in Exhibit C. In accordance with 220 CMR 101.06(10)(a)6, a 6-inch polyvalve will be located on each side of the bridge at the approximate distances shown in Exhibit C.

The stress on the plastic pipe will not exceed the pipe's yield strength of 3,000 psig presented in Exhibit A, Table 1 because the anticipated temperature that the pipe will experience after installation is not less than —20°F, nor greater than 100°F. The anticipated temperature of the plastic pipe at the time of its installation will be between 60°F and 80°F. The plastic pipe will not be exposed to excessive thermal stresses, the deteriorating affects of ultraviolet light from the sun, or mechanical damage under normal operating conditions. Consequently, the Company believes that there is no safety hazard associated with the installation of the plastic pipe above ground level across the bridge, as described herein.

If you have any questions or require additional information to be submitted regarding this petition, please contact me at 723-5512, Ext. 4432. A check for the amount of $100 has been included with this submittal for the filing fee required by the Department of Telecommunications and Energy.

Very truly yours,
Michelle C. Roche
Project Engineer
Engineering

EXHIBIT A

Plastic Pipe Specifications

TABLE 1
Physical Property Data For UAC 2000 Polyethylene Pipe

PE 2406

Property	Nominal Value
Melt Index	0.2 g/10 min
Density	0.943 g/cc
Thermal Expansion	9×10^{-5} in/in/°F
Yield Strength	3,000 psi
Flexular Modulus	100,000 psi
Thermal Conductivity	1.8 Btu/hr/sq ft/°F/in
Hydrostatic Design Basis @73°F	1,250 psi
Deflection Temperature @ 68 psi	140°F
Vicat Softening Point	248°F
Brittleness Temperature	<-180°F
Hardness, shore D	64
Flammability	1 in/min
Ultimate Elongation	>800%

TABLE 2

Plastic Pipe Data – PE 2406

Nominal Pipe Size (inches)	Standard Dimension Ratio (SDR)[1]	Average Outside Diameter (inches)	Average Inside Diameter (Inches)	Minimum Wall Thickness (Inches)	Design Pressure Rating @ 100°F(psi)
2	11.0	2.375	1.917	0.216	80
3	11.5	3.500	2.856	0.301	76
4	11.5	4.500	3.672	0.391	76
6	11.5	6.625	5.403	0.576	76
8	13.5	8.625	7.270	0.639	64
12	13.5	12.750	10.749	0.945	64

[1] SDR, Standard Dimension Ratio, is calculated by dividing the average outside diameter of the pipe by the minimum wall thickness as described in ASTM D2513.

EXHIBIT B

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Casing Specifications

TABLE 1

Specifications for Casing Pipe
TYPE OF PIPE: API 5L, Grade B

Property, Dimension, or Specification	
Nominal Pipe Size:	8 in.
Outside Diameter:	8.625 in.
Inside Diameter	8.125 in.
Wall Thickness:	0.250 in.
Schedule Number	20
Weight per foot:	22.36 lb
Coating:	Pritec high molecular polyethylene outer coating with butyl rubber adhesive

EXHIBIT C
Installation Design
Drawing No. P-118

DEPARTMENT OF
TELECOMMUNICATIONS AND ENERGY

November 24, 1998

D.T.E. 98-17-H

Application of Boston Gas Company for approval by the Department of Telecommunications and Energy of a waiver from the requirements in 49 C.F.R. Part 192 which mandate underground installation of plastic pipe pertaining to a bridge crossing to be located in the Town of Milton, Massachusetts.

I. BACKGROUND

On October 23, 1998, Boston Gas Company ("Boston Gas"), an intrastate natural gas distribution company that operates solely in Massachusetts, requested that the Department of Telecommunications and Energy ("Department") grant a waiver of the underground installation requirements for plastic pipe contained in 49 C.F.R. Part 192 ("Part 192"). Boston Gas seeks to install 81 feet of plastic main inside a steel casing across a bridge located on Medway Street, Milton. The bridge spans MBTA tracks, and it is being rebuilt by the MBTA.

II. REGULATORY REQUIREMENTS

The minimum federal safety standards for transportation of natural gas by pipeline are contained in Part 192. Specifically § 192.321(a) states:

"(a) Plastic pipe must be installed below ground level."

Any waiver of any of the provisions of Part 192, granted by the Department, is subject to the approval of the Secretary of Transportation's Office of Pipeline Safety ("OPS"). The Massachusetts Pipeline Safety Code ("220 C.M.R. 101") and Public Law 103-272, formerly the Natural Gas Pipeline Safety Act, require the Department to give OPS notice of any waiver at least 60 days before it becomes effective. The Department regulations at 220 C.M.R. 101.02(2) state:

"The D.T.E. may issue a waiver to a gas corporation or municipal gas department from the provisions of Part 192 in Title 49 of the Federal regulations providing that the waiver pertains to an intrastate facility and the D.T.E. gives notice to the Department of Transportation at least 60 days before the waiver becomes effective:

Public Law 103-272 states in § 60118 Compliance and Waivers:

"(d) Waivers by State Authorities. If a certification under section 60105 of this title...is in effect, the state authority may waive compliance with a safety standard to which the certification...applies in the same way and to the same extent the Secretary may waive compliance .... However, the authority must give the Secretary written notice of the waiver at least 60 days before its effective date. If the Secretary makes a written objection before the effective date of the waiver, the waiver is stayed . "

III. ANALYSIS AND FINDINGS

The proposed 6-inch nominal diameter plastic pipe is to be permanently installed in an 8-inch nominal diameter, coated, welded steel casing installed in a utility bay underneath the bridge. The plastic pipe, sheathed within the casing, will not be exposed to ultraviolet radiation.

Since 1979, many similar waivers have been granted by states and approved by OPS. OPS has approved dozens of similar waivers to operators in Massachusetts. All of these pipelines have operated satisfactorily.

There are advantages to the use of encased plastic pipe at this bridge crossing. First, plastic pipe is not prone to corrosion, and therefore will require less maintenance than a steel pipeline. Second, a steel-encased plastic pipe is less susceptible to damage from vandalism, airborne objects and external loading.

In the expected ambient temperature range, the forces acting on the plastic pipe due to expansion and contraction are well within acceptable limits. The tensile stress due to temperature variation is 810 pounds per square inch gauge ("p.s.i.") which is well below the allowable limit of 2,160 p.s.i. [72% of the specified minimum yield strength ("SMYS") which is 3,000 p.s.i.]. The stresses due to pressure and bending, including the combined stresses are also well below the allowable limits established in the A.S.M.E. B31.8 which is incorporated into Part 192 by reference.

In addition, the following factors support Boston Gas' application. Casing spacers will be placed on the plastic pipe at intervals no greater than 5 feet. These will support the carrier pipe and allow for movement due to expansion and contraction. The steel casing shall continue past the abutment to approximately 18 feet on each side. The plastic pipe will be joined by butt fusion, requiring no fittings over the encased portion of the main. The pipe will be tested to 90 p.s.i. Its maximum operating pressure will be 0.4 p.s.i. (11" water column). Isolation valves will be installed on the approaches to each side of the bridge in accordance with 220 C.M.R. 101.06(10) (a)6.

IV. ORDER

Accordingly, after due consideration, it is:

ORDERED: Boston Gas Company is hereby exempted from the underground installation requirement in 49 C.F.R. Part 192 for plastic pipe to be installed on the bridge on Medway Street, Milton. The foregoing waiver is granted with an effective date of January 25, 1999 provided that the Secretary of Transportation or his designee does not object to the waiver prior to the effective date.

By Order of the Department,
Janet Gail Besser, Chair
James Connelly, Commissioner
W.Robert keating, Commissioner
Paul B. Vasington, Commissioner
Eugene J. Sullivan , Jr., Commissioner