



South Jersey Gas

Stacy A. Mitchell, Esq.  
Regulatory Affairs Counsel



BOARD OF PUBLIC UTILITIES

MAY 04 2017

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**UPS and ELECTRONIC MAIL**

Irene Kim Asbury, Secretary  
NJ Board of Public Utilities  
44 South Clinton Avenue, 3rd Floor  
P. O. Box 350  
Trenton, NJ 08625-0350

**Re: In the Matter of the Petition of South Jersey Gas Company for Authorization to Construct and Operate a 16-Inch Distribution Pipeline Pursuant to N.J.A.C. 14:7-1.4  
BPU Docket No. GO17030188**

Dear Secretary Asbury:

Enclosed, please find an original and two (2) copies of an Amended Exhibit "A" in the referenced matter.

The Exhibit has been modified to reflect the .375 inch wall thickness contained in the specifications as previously discussed with the BPU's Bureau of Pipeline Safety.

If you have any questions, please feel free to contact me directly.

Respectfully,

Stacy A. Mitchell

SAM:lvk  
Enclosure

cc: Service List ✓

*Case Mgmt*

**IN THE MATTER OF THE PETITION OF  
SOUTH JERSEY GAS COMPANY FOR  
AUTHORIZATION TO CONSTRUCT AND  
OPERATE A 16-INCH DISTRIBUTION  
PIPELINE PURSUANT TO N.J.A.C. 14:7-1.4**

**: SERVICE LIST**

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**: BPU DOCKET NO. GO17030188**

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AMENDED EXHIBIT A  
SPECIFICATIONS AND CODE REQUIREMENTS

16" PIPELINE THROUGH BOROUGH OF LAWNSIDE, BOROUGH OF MAGNOLIA,  
BOROUGH OF SOMERDALE, BOROUGH OF HI-NELLA, BOROUGH OF  
STRATFORD, BOROUGH OF LAUREL SPRINGS, BOROUGH OF LINDENWOLD,  
BOROUGH OF PINE HILL AND GLOUCESTER TOWNSHIP IN CAMDEN  
COUNTY, NEW JERSEY

49 CFR PART 192 - Transportation of Natural Gas and Other Gas by Pipeline:  
Minimum Federal Safety Standards

N.J.A.C. 14:7 Natural Gas Pipelines

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Class Location -USDOT 192.5/NJAC 14:7-1.3

South Jersey Gas Company's Standard criteria is to design all pipelines for Class 4 locations. The design of the pipeline shall be for Class 4 locations and shall comply with NJAC 14:7-1.3. The actual class locations include Class 1, Class 2 and Class 3 as defined by USDOT 192.5.

**16" PIPE INSTALLED VIA OPEN TRENCH**

Pipe Specification -USDOT 192.55

The 16" pipe shall be API 5L, Grade X-65, electric resistance welded, 0.375" wall thickness.

Design Operating Pressure -USDOT 192.105

Class 4 Location (Design Criteria):

Design Factor	F = 0.40
Longitudinal Joint Factor	E = 1.0 (ERW)
Temperature Factor	T = 1.0 (250 degrees F. and less)
Min. Yield Strength	S = 65,000 psi

Design Pressure "P" for 16" Pipe (0.375 Wall)

Outside Diameter	D = 16.000"
Wall Thickness	t = 0.375"

Formula

$$P = \frac{2St}{D} \times F \times E \times T$$

$$P = \frac{2(65,000) \times (0.375)}{16} \times 0.40 \times 1.0 \times 1.0 = 1218.75 \text{ psig}$$

In accordance with API-5L table 26, the pipe was pressure tested to at least 2590 psig at the pipe mill. The Project Pipeline will be designed, constructed and certified to Class 4 requirements with a MAOP of 600 psig. The percent of yield strength at this pressure is:

Formula

$$\text{Operating Stress} = \frac{PD}{2t}$$

$$\text{Operating Stress (0.375 Wall)} = \frac{(600) \times (16)}{2(0.375)} = 12,800 \text{ psi}$$

$$\% \text{ Yield (0.375 Wall)} = \frac{12,800}{65,000} \times 100 = 19.69\% \text{ at MAOP}$$

**16" PIPE INSTALLED VIA HORIZONTAL DIRECTIONAL DRILL**

Pipe Specification -USDOT 192.55

The 16" pipe shall be API 5L, Grade X-65, electric resistance welded, 0.375" wall thickness.

Design Operating Pressure -USDOT 192.105

Class 4 Location (Design Criteria):

Design Factor	F = 0.40
Longitudinal Joint Factor	E = 1.0 (ERW)
Temperature Factor	T = 1.0 (250 degrees F. and less)
Min. Yield Strength	S = 65,000 psi

Design Pressure "P" for 16" Pipe (0.375 Wall)

Outside Diameter	D = 16.000"
Wall Thickness	t = 0.375"

Formula

$$P = \frac{2St}{D} \times F \times E \times T$$

$$P = \frac{2(65,000) \times (0.375)}{16} \times 0.40 \times 1.0 \times 1.0 = 1218.75 \text{ psig}$$

In accordance with API-5L table 26, the pipe was pressure tested to at least 2590 psig at the pipe mill. The Project Pipeline will be designed, constructed and certified to Class 4 requirements with a MAOP of 600 psig. The percent of yield strength at this pressure is:

Formula

$$\text{Operating Stress} = \frac{PD}{2t}$$

$$\text{Operating Stress (0.375 Wall)} = \frac{(600) \times (16)}{2(0.375)} = 12,800 \text{ psi}$$

$$\% \text{ Yield (0.375 Wall)} = \frac{12,800}{65,000} \times 100 = 19.69\% \text{ at MAOP}$$

Pipelines near Railroads and Highways – N.J.A.C. 14:7-1.8

The pipeline shall be designed in accordance with Conrail's CE-8 Specifications entitled "Specifications for Pipeline Occupancy of Consolidated Rail Corporation Property" where the pipeline intersects or runs parallel to a railroad. The pipeline shall be designed in accordance with Section 653 "Gas" of N.J.D.O.T.'s 2007 Standard Specifications for Road & Bridge Construction".

Projections – N.J.A.C. 14:7-1.13

All portions of the pipeline which protrude above the ground shall be conspicuously painted in accordance with the Steel Structures Painting Council's Paint Application Specification SSPC-PA 1-64 and enclosed and secured within a chain link fence.

Meter and Regulator Stations: Electric Installation – N.J.A.C. 14:7-1.15

All electric equipment and wiring in the meter, regulator and above ground valve facilities shall be designed and installed in accordance with the National Electrical Code and ANSI/NFPA 70.

Operator Reporting Requirements – N.J.A.C. 14:7-1.26

Pressure test records shall be submitted within one month after the test date and include the pressure and temperature recording charts, dead weight test records, other records of pressure and temperature readings and calibration records for recording instruments used during the pressure test.

Valve Specification -USDOT 192.145

All valves shall meet the minimum requirements of API 6D and South Jersey Gas Company specifications, which constitute a supplement to API 6D. All valves shall be ANSI 600-lb. Class. Each point on the pipeline shall be within 2 ½ miles of a sectionalizing block valve.

Pipe Flanges -USDOT 192.147

All pipe flanges shall be carbon steel weld neck 600-lb. R.F. ANSI B16.5, MSS SP-44, or equivalent.

Pipe Fittings -USDOT 192.149

Welding elbows shall be ANSI B16.9, ASTM A-234 WP91.

Welding tees shall be ANSI B16.9, ASTM A-234 WP91.

Welding caps shall be ANSI B16.9, ASTM A-234 WP91.

Welding reducers shall be ANSI B16.9, ASTM A-234 WP91 concentric type.

Each steel butt-welding fitting shall have pressure and temperature ratings based on stresses for pipe of the same or equivalent material. The actual bursting strength of the fitting shall at least equal the computed bursting strength of pipe of the designated material and wall thickness, as determined by a prototype that was tested to at least the pressure required for the pipeline.

Passage of Internal Inspection Devices -USDOT 192.150

The pipeline, valves and fittings shall accommodate the passage of internal inspection devices.

Fabricated Components -USDOT 192.153

All fabricated components shall be constructed using regularly manufactured butt-welding fittings.

Welded Branch Connection -USDOT 192.155/NJAC 14:7-1.7

Full-size and reduced-sized branch connections shall be fabricated using manufactured forged steel fittings such as weld-o-lets made by Bonney Forge or equivalent.

Supports and Anchors -USDOT 192.161

Underground piping shall be continuously supported by a firm graded trench bottom of consolidated undisturbed soil.

Carrier pipe entering or leaving a casing shall be continuously supported on thoroughly compacted soil.

All above ground pipe supports shall be made of non-combustible material and shall not be welded or firmly secured to the pipe.

Transmission Line Valves -USDOT 192.179/ NJAC 14:7-1.10

The pipeline shall have in-line valves installed at each end and valves at 5 mile intervals. The operating device to open or close the valve shall be readily accessible and protected from damage through an enclosed gear housing and roadbox extension assembly. Each section of the transmission line shall have a blow down valve with enough capacity allow the transmission line to be blown down as rapidly as practicable. The blowdown discharge shall be designed in accordance with USDOT 192.179.

Qualification of Welding Procedures -USDOT 192.225/NJAC 14:7-1.6

All welding procedures shall be qualified under API 1104.

Qualification of Welders -USDOT 192.227

All welders shall be qualified using procedures qualified under API 1104.

A written record shall be kept of each welder qualified.

Miter Joints -USDOT 192.233

No mitered joints will be allowed on this pipeline.

Inspection and Test of Welds -USDOT 192.241

A visual examination shall be performed on all welded joints and they shall meet the requirements of API 1104.

Non-Destructive Testing -USDOT 192.243/NJAC 14:7-1.6

All new welded joints shall be radiographed 100% and meet the standards of API 1104.

All radiographic testing shall be performed by trained, experienced persons and meet the standards of API 1104.

Oversight of field welding will be by welding inspectors qualified by the Company on the basis of training and experience.

Repair or Removal of Defects -USDOT 192.245

Any weld that is determined to be unacceptable under API 1104 shall be removed or repaired. All repairs shall be completed in accordance with written weld repair procedures that have been qualified under API 1104.

Oversight of Construction Activity -USDOT 192.305/NJAC 14:7-1.24

Oversight of pipeline construction activity will be by inspectors qualified by the Company on the basis of knowledge and experience in all areas of work to be inspected and meet all requirements of the of the Company's qualification of pipeline personnel.

Directional Drilling Operations NJAC 14:7-1.25

A plan and profile which depicts all subsurface facilities in proximity has been prepared for all proposed horizontal directional drilling (HDD) locations within the project.

All subsurface facilities will be located by test hole prior to HDD operations. Instrumentation approved by the Company will be provided, used and maintained to accurately locate the drilling/reaming head during HDD operations.

All HDD pipe shall be supported by roller assemblies.

A Company qualified inspector shall be physically present on site at all times when subsurface utilities are being crossed by HDD.

Bends and Elbows -USDOT 192.313-315/ NJAC 14:7-1.7

All changes in direction shall be made using field bending equipment or manufactured elbows as indicated on the drawings. All field bends shall have a smooth contour. No wrinkle bends shall be allowed.

Protection from Hazards -USDOT 192.317

The pipeline shall be designed and constructed to avoid any hazards that may cause the pipeline to move or sustain any abnormal loads. The pipeline located above ground that is located in the vicinity of vehicular traffic shall be protected from accidental damage by concrete bollards.

Installation of Pipe in a Ditch -USDOT 192.319

The pipeline shall be installed in a ditch with a firm graded bottom free of large stones, clods, rubbish, wood and welding rods. The ditch shall be backfilled with material free of large stones, clods, rubbish, wood and welding rods and in a manner to avoid damaging to the coating of the pipe.

Casing -USDOT 192.323

All casings for the pipeline shall be designed to withstand the superimposed loads. The ends of the casing shall be sealed and the casing shall be vented.

Underground Clearance -USDOT 192.325

The pipeline shall be installed maintaining a minimum 12" of clearance from any other underground structure.

Cover -USDOT 192.327/NJAC 14:7-1.12

The pipeline shall be installed with a minimum cover of 48".

External Corrosion Control: Buried or Submerged Pipelines Installed After July 31, 1971 -USDOT 192.455

All piping shall be protected from external corrosion by mill applied coating, except field joints which will be coated with heat shrink sleeves. A cathodic protection system shall be designed and installed to protect this pipeline.

External Corrosion Control: Protective Coating -USDOT 192.461/NJAC 14:7-1.11

All piping shall be protected from external corrosion by mill applied coating, except field joints which will be coated with heat shrink sleeves.

External Corrosion Control: Cathodic Protection -USDOT 192.463

A cathodic protection system shall be designed and installed to protect this pipeline.

External Corrosion Control: Test Stations -USDOT 192.469/.471

This pipeline shall have sufficient test stations for electrical measurement to determine the adequacy of cathodic protection. The test station wires shall be

connected to the pipeline so as to remain mechanically secure and electrically conductive.

Internal Corrosion Control: Design and Construction of Transmission Line -USDOT 192.476

The pipeline shall be designed and constructed to reduce the risk that liquids will collect in the line. The pipeline shall be designed to allow the use of pigs and smart pigs for the removal of liquids and the monitoring of internal corrosion.

Atmospheric Corrosion Control: General -USDOT 192.479

All above ground pipeline facilities shall be coated and sealed via Flame Sprayed TSA (Thermal Sprayed Aluminum). The Flame Sprayed TSA shall be applied in accordance with NACE No. 12/AWS C2.23M/SSPC-cs 23.00 – Specification for the Application of Thermal Spray Coatings (Metallizing) of Aluminum, Zinc, and Their Alloys and Composites for the Corrosion Protection of Steel.

Strength Test Requirements for a Steel Pipeline to Operate at Hoop Stress of 30 Percent or More of SMYS -USDOT 192.503/505/619 NJAC 14:7-1.14

A static pressure test, with water, shall be performed for a minimum 24-hour period at 900 psig (min) on all piping which will stress the 16 inch (.375 wall) pipe to 29.5 percent of SMYS.

Records -USDOT 192.517

All records of static pressure and leak tests shall be retained for the life of the pipeline. The proposed route of this pipeline is shown on the drawings entitled "16" Natural Gas Pipeline – Lawnside Borough to Pine Hill Borough, Camden County, New Jersey – Prepared for South Jersey Gas, dated December 30, 2016 prepared by J. F. Kiely Service Company.

MAOP -USDOT -192.619

The MAOP of the 16 inch pipeline will be 600 psig. The 16 inch pipeline shall not be operated in excess of 600 psig.

Odorization of Gas -USDOT 192.625/NJAC 14:7-1.16

The gas in this pipeline will be odorized so that the gas concentration in air of one-fifth of the lower explosive is detectable by smell.

Tapping Pipelines Under Pressure -USDOT 192.627

All tapping and stop-offs will be performed by a qualified crew.

Purging of Pipelines -USDOT 192.629

The new pipeline shall be purged into service using natural gas. This procedure will be done in a manner which will not allow a hazardous mixture of gas and air to form.

Pipeline Marker -USDOT 192.707 / NJAC 14:7-1.11

Pipeline markers shall be installed at all locations as outlined in this section of Subpart 192. In addition, for pipe 16" or more in diameter, marking tape consisting of one 12 inch wide strip or two 6 inch wide strips shall be installed side-by-side in any trenched in place piping.

What Additional Preventive and Mitigative Measures Must an Operator Take? -USDOT 192.935

All above ground sectionalizing block valves shall be designed to be remote control valves (RCV).