VARIANCE REQUEST
Iowa Department of Natural Resources

1.	Date:	October 1, 2010	14. Decision:	Approved
2.	Reviewer/Engr.:	Marty Jacobs	Date:	10/22/10
3.	Date Received:	September 20, 2010		
4.	Facility Name:	City of Brooklyn		
5.	Facility Number:	6-79-09-0-01		
6.	County Number:	79 (Poweshiek)	15. Appealed:	
7.	Program Area:	CP (Wastewater)	Date:	
8.	Facility Type:	C01 (collection/transport)		
9.	Subject Area:	394 (Pipe Reaming/Pipe Bursting – Installation)		
10.	Rule Reference:	567-64.2(9)a		
11.	Design Std. Ref.:	12.5.1, 12.5.6		
12.	Consulting Engr.:	MMS Consultants, Inc.		
13.	Variance Rule:	567-64.2(9)c		

16. Description of Variance Request:

The City of Brooklyn is requesting variance from the Iowa Wastewater Facilities Design Standards Chapter 12 – Iowa Standards for Sewer Systems – 12.5.1 (Diameter) and 12.6 (Details of Construction) for the installation of a 8-inch gravity sewer lines by pipe bursting methods and cast-in-place-pipe (CIPP) lining of an existing 6-inch gravity sewer.

17. Applicant's/Consulting Engineer's Justification:

There are 2,743 linear feet of existing 6-inch diameter proposed to be CIPP lined with this project. CIPP lining of these mains is preferred to standard removal and replacement with 8-inch diameter mains because of the locations in back yards and in close proximity to other utilities, including storm sewer, water main, natural gas, overhead electric and telephone. CIPP lining will allow for these mains to be rehabilitated without relocating or otherwise handling these utility conflicts or disturbing resident's back yards or associated fences, sheds and landscaping. It is anticipated that the CIPP lining will provide a solution for these mains that will have a similar life span to newly installed PVC mains. The life span is estimated to be 50 years.

Calculations are attached for estimated flows in each of the mains that are proposed to be CIPP lined. These mains serve in most cases only a few homes and most of the mains are on fairly steep slopes. The flows were calculated two ways. The first method of calculating used DNR design criteria of 100 gallons per day per capita with a peaking factor of 4. The second method uses a mechanical engineering plumbing design method which estimates the number of fixtures in each home. Information on this method is attached as well.

These calculations show that the capacity (at 2/3 depth) of all but two of the mains after the proposed CIPP lining is greater than the estimated flows calculated by both methods. The remaining two mains have capacity to handle estimated flows calculated by both methods at ¾ depth of the mains after CIPP lining. Since flows in the mains would be less than the capacity of the mains at ¾ depth after CIPP lining, there would be no adverse effect on the system.

None of the, mains that are proposed for CIPP lining are projected to be extended to serve additional areas in the future. The mains in the Brookhaven Heights Neighborhood (Clay and Alice Streets) will serve only this neighborhood. The nursing home to the east blocks future expansion in that direction and the property to the north drains to the north and will be served by newer mains to the north and west. The mains along the BGM School property (North of the homes on Bellevue Street and the west side of Jackson Street) will serve only these homes. The property to the west of these homes drains to

the west and will need to be served from the west. The school property is served downstream of these mains.
The main on the east side of Jackson Street will serve only these homes. Existing homes south of these are served by mains that drain to the south. Vacant property to the north and east of these homes will be served from MH#30 with 8-inch diameter mains proposed downstream from there. Mains on the east end of North Street will continue to serve only those homes as the surrounding area is fully developed and served by existing mains so no future extension of this main will be necessary. A USGS Quad Map and a sewer map of the City of Brooklyn are attached for reference.

18. Department's Justification:
Recommend variance ***approval***.
CIPP lining and pipe bursting has been approved at many locations in the past. This is a clear improvement over the existing condition of the sewer lines and the methods are justified by the interference of existing utilities in the area. Although no precedent could be found for a variance for CIPP in a 6-inch sewer, their justification is similar to that used to approve installation of new 6-inch sewers.
Based on the documentation presented by your Engineer, it is the determination of this Department that satisfactory justification has been presented to warrant the granting of variances for the installation of a gravity sewer by the pipe bursting method and for the use of cast-in-place-pipe lining for existing six-inch public gravity sewers. The requested variance is deemed to be reasonable and necessary pursuant to the Iowa Code section 455B.181.
The facts presented for the project present unique circumstances and the variance is therefore justified to provide the narrowest exception possible to the provisions of the rule in accordance with Rule 561 IAC 10.5. Since the project planning and construction may last more than one year, the variance is considered to be of a permanent nature. The validity of this variance approval shall last for a period of one year from the date of the construction permit in accordance with Rule 561 IAC 10.5.
This decision is based on the Department's review of justification presented to support the request. This concurrence with the request is based on the Department's finding that the resulting project will provide substantially equivalent effectiveness (567 IAC 64.2 (9) e) as would be provided by technical compliance with the design standard on this issue.

19. Precedents Used: North Liberty – 5/2/05
Fontanelle – 6/23/00
Grimes – 2/24/10

20. Staff Reviewer:	Quinton Jacobs	Date:	10-13-10
21. Supervisor:	Satya Chennupati	Date:	10/21/10
22. Authorized by:	Wayne Gieselman	Date:	10-22-10

IOWA CITY IOWA
OFFICE: 319-351-8282

CEDAR RAPIDS IOWA
OFFICE: 319-841-5188

September 14, 2010 6387-011

Mr. Marty Jacobs, P.E.
Iowa DNR Wastewater Construction
Wallace State Office Building
502 East 9th Street
DesMoines, IA 50319

Re: 2010 North Side Sanitary Sewer Improvements – Phase Two – Brooklyn, Iowa
Variance Request for CIPP Lining of 6" Sanitary Sewers

Dear Mr. Jacobs:

On behalf of the City of Brooklyn, 138 Jackson Street, Brooklyn, IA 52211, (515) 522-7066, I would like to request a variance from Chapter 12.5.1 which states that "No public gravity sanitary sewer shall be less than eight inches in diameter." This project proposes to construct Cured in Place Pipe (CIPP) Lining of existing six inch diameter sanitary sewer mains.

There are 2,743 lineal feet of existing 6 inch diameter proposed to be CIPP lined with this project. CIPP lining of these mains is preferred to standard removal and replacement with 8 inch diameter mains because of the locations of the mains in back yards and in close proximity to other utilities, including storm sewer, water main, natural gas, overhead electric and telephone. CIPP lining will allow for these mains to be rehabilitated without relocating or otherwise handling these utility conflicts or disturbing residents' back yards and associated fences, sheds and landscaping. It is anticipated that the CIPP lining will provide a solution for these mains that will have a similar life span to newly installed PVC mains. The life span is estimated to be 50 years.

I have attached calculations for estimated flows in each of the mains that are proposed to be CIPP lined. These mains serve in most cases only a few homes and most of the mains are on fairly steep existing slopes. The flows were calculated two ways. The first method of calculating used DNR Design Criteria of 100 gallons per day per capita with a peaking factor of 4. The second method uses a mechanical engineering plumbing design method which estimates the number of fixtures in each home. Information on this method is attached as well.

These calculations show that the capacity (at 2/3 depth) of all but two of the mains after the proposed CIPP lining is greater than the estimated flows calculated by both methods. The remaining two mains have capacity to handle estimated flows calculated by both methods at 3/4 depth of the mains after CIPP Lining. Since the flows in the mains would be less than the capacity of the mains at 3/4 depth after CIPP Lining, there would be no adverse effect on the system by granting the variance.

None of the mains that are proposed for CIPP lining are projected to be extended to serve additional

1917 SOUTH GILBERT STREET • IOWA CITY • IOWA • 52240
WEBSITE: WWW.MMSCONSULTANTS.NET • EMAIL: MMS@MMSCONSULTANTS.NET

will serve only this neighborhood. The nursing home to the east blocks future expansion in that direction and property to the north drains to the north and will be served by newer mains to the north and west. The mains along the BGM School property (North of homes on Bellevue Street and west side of Jackson Street) will serve only those homes. The property to the west of these homes drains to the west and will need to be served from the west. The school property is served downstream of these mains.

The main on the east side of Jackson Street will serve only these homes. Existing homes south of these are served by mains that drain to the south. Vacant property to the north and east of these homes will be served from MH #30 with 8" diameter mains proposed downstream of there. Mains on the east end of North Street will continue to serve only those homes as the surrounding area is fully developed and served by existing mains so no future extension of this main will be necessary. I have attached a USGS Quad Map and a sewer map of the City of Brooklyn for reference.

According to the DNR, there are no known variances for this work previously requested. However, CIPP lining of 6 inch diameter mains has been done in several cities in Iowa as a maintenance measure. We have had conversations with some cities that have performed this work and they have reported no problems with the 6 inch diameter CIPP lined mains and are pleased with how they have performed.

There are no other known public agencies or political subdivisions which would regulate this activity. There are no known persons or entities that would be adversely affected by the granting of this variance.

We have been working with Municipal Pipe Tool, 515 5th Street, Hudson, Iowa 50643, 800-798-4205 on this lining. They have performed TV Inspection of the mains in question and have recommended the CIPP lining as a solution. Our contacts are Todd Patterson and Sharon Waschkat. Feel free to contact them with questions as they have knowledge of the project and the proposed CIPP lining.

We trust that the enclosed information will enable you to approve the variance for this project. Please call us if you have any questions or require any additional information.

Sincerely,

MMS CONSULTANTS, INC.

Scott B. Pottorff, P.E.

Encls.

cc: Lorraine Willett, City of Brooklyn, Iowa. (w/encls)
Marsha Cory, Simmering-Cory (w/encls)

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SSUMPTIONS: 100 GAL/DAY/PERSON
4 PEOPLE/HOME
PEAKING FACTOR = 4
5"ϕ AFTER LINING
TOTAL FLOW/HOME = 1600 GAL/DAY
= 0.0025 cfs

FIXTURES/HOME

(1) CLOTHES WASHER	2
(2) BATHROOM GROUPS (1.6 GPF TOILET)	1C
(1) DISHWASHER	2
(1) KITCHEN SINK	2
(1) FLOOR DRAIN	2
(1) MISC SINK	2

ANNINGS EQUATION $Q = \frac{1.49 A R^{2/3}}{0.013} \sqrt{S}$

TOTAL FIXTURES/HOME = 20
TOTAL DEMAND/HOME = 15 GPM
= 0.0334 c

5" ϕ at 2/3 DEPTH A = 0.0966 R = 0.0812
CAPACITY = 2.0761 $\sqrt{S}$ ⑥ 2/3 DEPTH

⑨ 3/4 DEPTH A = 0.1097 R = 0.089
CAPACITY = 2.5065 $\sqrt{S}$

ISTING MH AT PARK AVENUE TO WEST LENGTH = 455 LF

HOMES SERVED = 7 TOTAL FLOW = 0.018 cfs TOTAL DEMAND = 0.23 cfs
SLOPE = 2.06% CAPACITY = 2.0761 $\sqrt{0.0206}$ = 0.30 cfs ⑥ 2/3 DEPTH

TWEEN PARK AVENUE AND JACKSON STREET LENGTH = 257 LF

HOMES SERVED = 10 TOTAL FLOW = 0.025 cfs TOTAL DEMAND = 0.33 cfs
SLOPE = 4.00% CAPACITY = 2.0761 $\sqrt{0.04}$ = 0.42 cfs ⑥ 2/3 DEPTH

EST SIDE OF JACKSON STREET LENGTH = 451 LF

HOMES SERVED = 15 TOTAL FLOW = 0.038 cfs TOTAL DEMAND = 0.50 cfs
SLOPE = 3.85% CAPACITY = 2.0761 $\sqrt{0.0385}$ = 0.41 cfs ⑥ 2/3 DEPTH
CAPACITY = 2.5065 $\sqrt{0.0385}$ = 0.49 cfs ⑨ 3/4 DEPTH

EAST SIDE OF JACKSON STREET LENGTH = 433 LF

HOMES SERVED = 6 TOTAL FLOW = 0.015 cfs TOTAL DEMAND = 0.20 cfs
SLOPE = 3.46% CAPACITY = 2.0761 $\sqrt{0.0346}$ = 0.39 cfs

ORTH SIDE OF ALICE STREET LENGTH = 285 LF

OMES SERVED = 6 TOTAL FLOW = 0.015 cfs TOTAL DEMAND = 0.20 cfs

LOPE = 5.33% CAPACITY = $2.0761\sqrt{0.0533}$ = 0.48 cfs @ 2/3 DEPTH

OUTH SIDE OF ALICE STREET LENGTH = 288 LF

OMES SERVED = 7 TOTAL FLOW = 0.018 cfs TOTAL DEMAND = 0.23 cfs

LOPE = 3.44% CAPACITY = $2.0761\sqrt{0.0344}$ = 0.39 cfs @ 2/3 DEPTH

EST SIDE OF CLAY STREET LENGTH = 303 LF

OMES SERVED = 10 TOTAL FLOW = 0.025 cfs TOTAL DEMAND = 0.33 cfs

LOPE = 1.90% CAPACITY = $2.0761\sqrt{0.019}$ = 0.29 cfs @ 2/3 DEPTH

CAPACITY = $2.5065\sqrt{0.019}$ = 0.35 cfs @ 3/4 DEPTH

AN MH #24 TO SAN MH #34 LENGTH = 145 LF

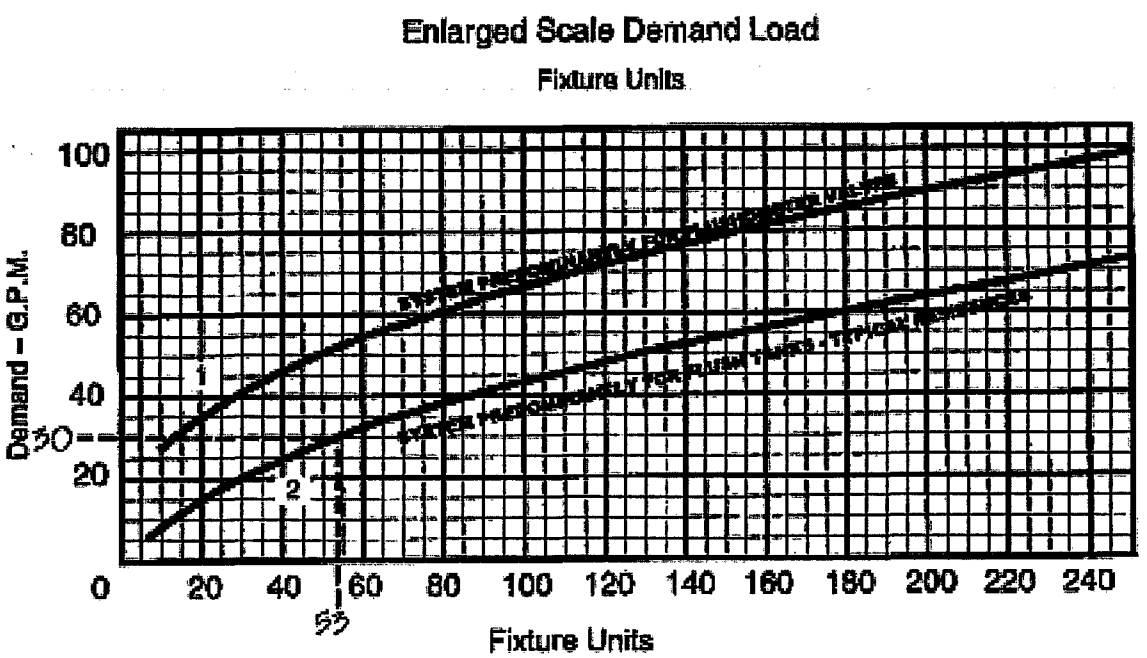
OMES SERVED = 4 TOTAL FLOW = 0.01 cfs TOTAL DEMAND = 0.13 cfs

LOPE = UNKNOWN ASSUME 1% CAPACITY = $2.0761\sqrt{0.01}$ = 0.21 cfs @ 2/3 DEPTH

AN MH #34 TO SAN MH #35 LENGTH = 123 LF

OMES SERVED = 3 TOTAL FLOW = 0.008 cfs TOTAL DEMAND = 0.10 cfs

LOPE = UNKNOWN ASSUME 1% CAPACITY = $2.0761\sqrt{0.01}$ = 0.21 cfs @ 2/3 DEPTH

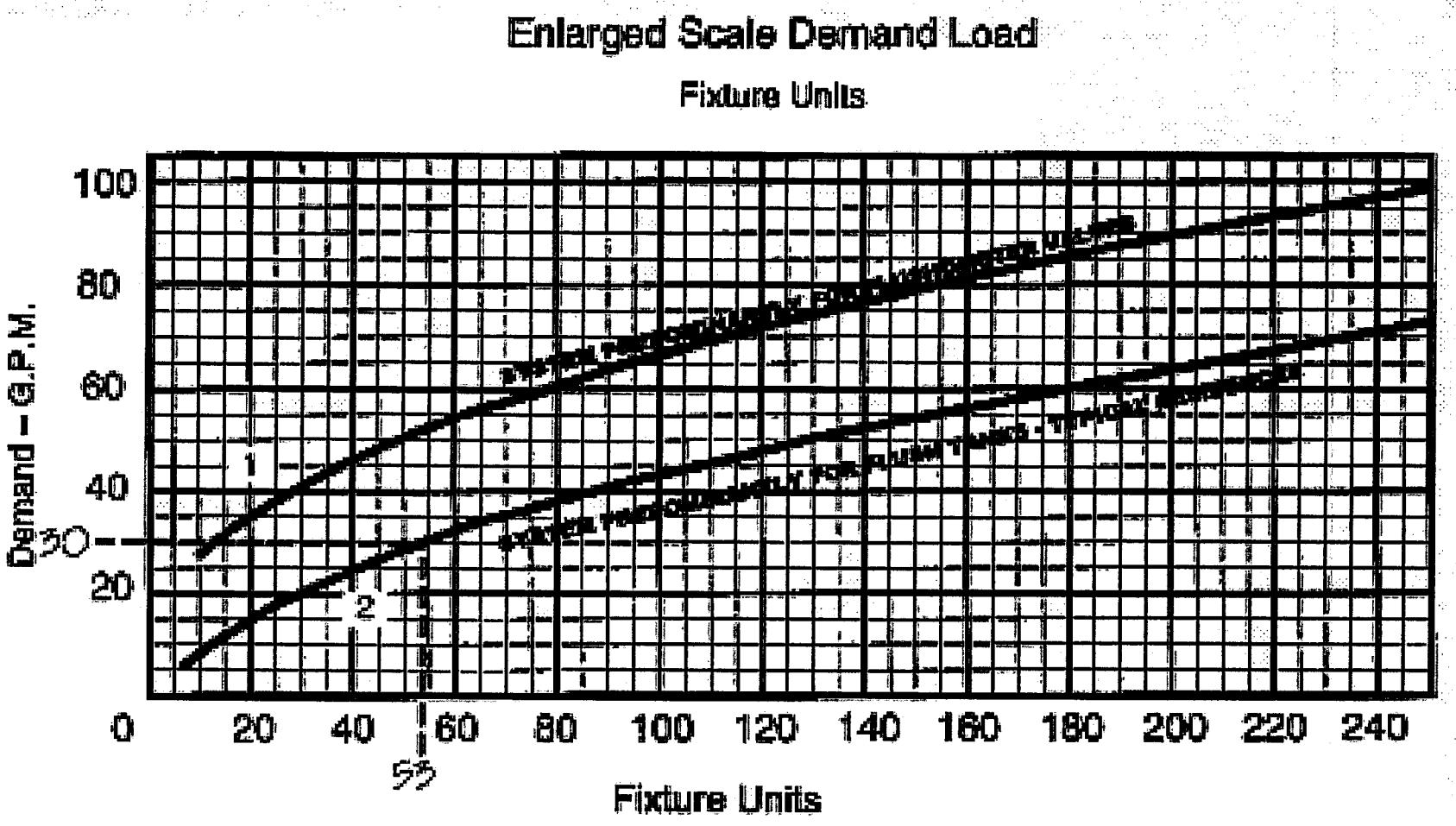


CURVE 1 (Top): SYSTEM PREDOMINANTLY FOR FLUSHOMETER VALVES

CURVE 2 (Bottom):
SYSTEM PREDOMINANTLY FOR FLUSH TANKS - TYPICAL RESIDENCES

Type of Fixture or Group of Fixtures Based on the *2000 International Plumbing Code*	Fixture Units
Automatic (commercial) clothes washer (2" standpipe)	3
Automatic (residential) clothes washer	2
Bathroom group consisting of water closet, lavatory, bathtub or shower, including or excluding a bidet, an emergency floor drain, or both. (1.6 gpf water closet)	5
Bathroom group consisting of water closet, lavatory, bathtub or shower, including or excluding a bidet, an emergency floor drain, or both. (greater than 1.6 gpf water closet)	6
Bathtub (with or without overhead shower)	2

Bidet	1
Combination sink-and-tray	2
Dental unit or cuspidor	1
Dental lavatory	1
Drinking fountain	1/2
Dishwasher, domestic	2
Floor drains with 2" waste	2
Kitchen sink, domestic, with one 1½" waste	2
Kitchen sink, domestic, with food waste grinder and/or dishwasher	2
Lavatory with 1¼" waste	1
Laundry tray (1 or 2 compartments)	2
Shower stall	2
Sinks	2
Urinal	4
Urinal, 1 gallon per flush or less	2
Wash Sink (circular or multiple) each set of faucets	2
Water closet, flushometer tank, public or private	4
Water closet, private (1.6 gpf)	3
Water closet, private (flushing greater than 1.6 gpf)	4
Water closet, public (1.6 gpf)	4
Water closet, public (flushing greater than 1.6 gpf)	6
Fixture drain or trap size (inches): 1 1/4 1 1/2 2 2 1/2 3 4	 1 2 3 4 5 6


Enlarged Scale Demand Load
Fixture Units
Demand – G.P.M.
100
80
60
40
30
20
1
2
0
20
40
60
80
100
120
140
160
180
200
220
240
55
Fixture Units

July 23, 2010

Mr. Scott B. Pottorff, P.E.
MMS Consultants, Inc.
1917 South Gilbert St.
Iowa City, IA 52240

RE: North Side Sanitary Sewer Improvements 2010
Brooklyn, Iowa
Variance Request

Dear Mr. Pottorff:

As we discussed this week, the above referenced project will require a variance for the installation of a cast-in-place pipe rehabilitation in a sewer smaller than eight inches in diameter. I am sending information on the format for wastewater construction permit variance requests. Depending on the date of your last request, this may be a different format than you have used in the past.

This letter is to inform you that requests for variances are required to be submitted in the form of a petition filed pursuant to 561 Iowa Administrative Code (IAC) Chapter 10, incorporated by reference by 567 IAC Chapter 13. A variance request is required to be submitted in writing and is required to include certain information. If the variance relates to a contested case proceeding, the variance must be filed in the contested case proceeding and state the case number. Otherwise the variance is required to be filed with the Director of this Department. Please send the petition and any other correspondence concerning the variance request to the attention of the Wastewater Engineering Section project manager. Separate submittal to the Director's office will not be necessary.

The following information is required to be provided in the petition when applicable and known to the petitioner.

1) The name, address and telephone number of the entity or person for whom a waiver or variance is requested.

2) A description and citation of the specific rule from which a waiver or variance is requested.

3) The specific waiver or variance requested, including the precise scope and operative period that the waiver or variance will extend.

4) The relevant facts that the petitioner believes would justify a waiver or variance. The factual statement is to include a signed statement from the petitioner attesting to the accuracy of the facts provided in the petition and a statement of reasons that the petitioner believes will justify a waiver or variance.

5) The history of prior contacts between the Department and the petitioner for the past five years. The history must include a description of each affected permit held by the petitioner and any notices of

violation, administrative orders, contested case proceedings, and lawsuits involving the Department or the petitioner.

6) Any information known to the petitioner regarding the Department's treatment of similar cases.

7) The name, address, and telephone number of any public agency or political subdivision of the state or federal government which also regulates the activity in question, or might be affected by the granting of a waiver or variance.

8) The name, address, and telephone number of any person or entity that would be adversely affected by the granting of the petition.

9) The identity of those having knowledge of relevant facts concerning the variance.

10) Signed releases authorizing persons with factual knowledge concerning the request to furnish the Department with information relevant to the waiver or variance.

11) The signature of the Iowa licensed engineer who prepared the variance request.

Please submit the petition with the required information within thirty days. You are required to serve notice of the pending petition and a concise summary of its contents upon all persons to whom notice is required by any provision of law by certified mail within thirty days of submission of the petition. The petitioner is required to provide a written statement to the Department attesting that the required notice has been provided. Please send this written statement to my attention.

The variance petition will be reviewed by the Department pursuant to Iowa Code section 455B.181 and under 567 IAC 64.2(9)"c"-"e" to determine if the variance should be granted. You will be notified in writing of the Department's decision concerning the variance.

If you have any questions, you may contact me at (515) 242-6148. The Department may request additional information relative to the petition and surrounding circumstances prior to issuing a decision granting or denying the variance request.

Sincerely,

Marty Jacobs, P.E.
Wastewater Engineering Section

cc: DNR Sewage File

October 22, 2010

Mr. Dennis K. Solem, Mayor
City of Brooklyn
138 Jackson Street
Brooklyn, Iowa 52211

Subject: Variance Request from Design Standards Sections 12.5.1 and 12.6
2010 North Side Sanitary Sewer Improvements, Phase Two
Brooklyn, Iowa

Honorable Mayor Solem:

After careful and thorough consideration, the Department has *approved* your September 14, 2010 request for a variance from Chapter 12.6 of the Iowa Wastewater Facilities Design Standards which requires the installation of a gravity sewer by cut and fill methods and Chapter 12.5.1 of the Iowa Wastewater Facilities Design Standards which sets a minimum size of eight inches for public sewer mains.

Based on the documentation presented by your Engineer, it is the determination of this Department that satisfactory justification has been presented to warrant the granting of variances for the installation of a gravity sewer by the pipe bursting method and for the use of cast-in-place-pipe lining for existing six-inch public gravity sewers. The requested variance is deemed to be reasonable and necessary pursuant to the Iowa Code section 455B.181.

The facts presented for the project present unique circumstances and the variance is therefore justified to provide the narrowest exception possible to the provisions of the rule in accordance with Rule 561 IAC 10.5. Since the project planning and construction may last more than one year, the variance is considered to be of a permanent nature. The validity of this variance approval shall last for a period of one year from the date of the construction permit in accordance with Rule 561 IAC 10.5.

This decision is based on the Department's review of justification presented to support the request. This concurrence with the request is based on the Department's finding that the resulting project will provide substantially equivalent effectiveness (567 IAC 64.2 (9) e) as would be provided by technical compliance with the design standard on this issue.

If you have any questions, please call Marty Jacobs at 515-242-6148.

Sincerely,

Satya Chennupati

Satya P. Chennupati, P.E.
Wastewater Engineering Section Supervisor

Cc: DNR Field Office #5
DNR File 6-79-09-0-01
MMS Consultants Inc.
DNR Legal Services - Diana Hansen