

One-Half Inch (1/2") SERVICE DATA SHEET

One-Half Inch (1/2") Plastic Service Renewal Intermediate Pressure (IP)



CAUTION: When using one-half (1/2) inch service the customer loads must be obtained in order to determine if the pipe is large enough.

The table below shows the maximum load allowable for a one-half (1/2) inch service at given lengths. Gas Engineering recommends that the total length of one-half (1/2) inch pipe not exceed 100 feet. Equivalent footage for fittings is included. The length in the table will correspond with the actual field measurement. This table reflects a slightly larger than one-half (1/2) psi pressure drop.

Service Length in Feet	Maximum Load in CFH	Maximum Load in BTU / Hour
20	320	320,000
30	275	275,000
40	250	250,000
50	225	225,000
60	205	205,000
70	190	190,000
80	180	180,000
90	170	170,000
100	160	160,000



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A. Backfill Requirements

1. Backfilling shall be done as soon as possible after the pipe has been placed in the trench and in such a manner as not to damage the pipe or coating.
2. The preferred method of backfilling shall be by using compacted excavated material from the trench provided such material consists of finely divided top soil, sand, or gravel. Back fill material must be free from organic matter, slag, cinders, frozen lumps, or debris; and, in the opinion of the Purchaser, is suitable for back filling.
3. The spoil removed from the excavation of a plastic main installation may be used as back fill material provided that it contains no stone greater than ½ inch in diameter. If it contains stone greater than one-half (½) inch but less than 6 inches in diameter, at least 6 inches of bank run or sand must be placed over the plastic pipe before backfilling with the spoil.
4. The trench shall be backfilled with an approved material thoroughly compacted to a depth of one (1) foot above the top of the pipe.
5. **Excavated rocks or stones with any dimension greater than 6 inches must not be returned to the trench.**
6. The backfill shall then be completed to grade, using the excavated material. Excavated material, which is not suitable for backfilling, shall be disposed of by the Contractor at the Contractor's expense and replaced with bank run, gravel or sand, at the price specified in the bid.
7. The Contractor's quoted price for main installation shall provide for back filling the trench with the material that was removed while excavating and the compaction of backfill using the proper compaction procedures. The Contractor shall be responsible for the condition of the trench and shall indemnify the Purchaser against damages resulting from improper backfill.
8. Padding shall be used at the discretion of the Inspector and/or Engineer. Padding is defined as bank run placed below and above the pipe and will be used in soils unsuitable for back fill. Bank run gravel shall be per ODOT 703.11 Ohio type 2 as listed in ODOT's "Construction Material Specification" or clean washed sand.
9. When rock, ledge, hardpan, or boulder is encountered, the trench bottom shall be undercut at least four (4) inches and the undercut refilled with a pad of clean spoil, good-bearing bank run (with some rounded stone), or sand. Refer to Gas Standard 2.18.1 Typical Trench Details – Polyethylene Pipe.
10. When ledge rock or hardpan is encountered during the construction of plastic main installation, at least twelve (12) inches of bank run or sand must be placed over the

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plastic pipe. The side fills must be compacted to prevent the plastic pipe from being in contact with the rocky trench walls.

- a) Back filling shall be done in accordance with the rules of the governing agency responsible for the area where work is taking place, within the limits of all public or private roads and driveways.
 - b) CLSM must be used as required within the hard surface areas by the appropriate governmental agency or as directed by Duke Energy. CDF, CLSM or Flashfill must meet the specifications of the appropriate governing agency (Hamilton Co./Cincinnati, ODOT or KDOT specifications).
11. The Contractor shall delay the back filling operations in cases where live connections will be made by the Purchaser soon after pipe installation has been completed. However, the Contractor shall be required to take the necessary measures to insure the stability of the open ditch (by shoring, etc.) until such time as the Purchaser moves on to complete the project. Should the Contractor complete all other phases of the work and leave the job site before the Purchaser's connections are made, the Purchaser will assume the responsibility of backfilling at these locations.
12. When backfilling in sod areas, the gas main, service tee and stop cock shall be covered with sand before backfilling the remainder of the excavation with the removed spoil. The service pipe shall be installed with a smooth, gradual transition from the service tee to the required service installation depth. Sudden elevation changes in the service pipe overstress the service tee and can cause it to fracture over time.
13. When backfilling in roadways on:
- a) **Two (2) inch – six (6) inch** pipe, the gas main and service tee shall be covered with sand before backfilling the remainder of the excavation with the permit required backfill material. Sand shall be placed to a height of 6" above the pipe.
 - b) **Eight (8) inch and twelve (12) inch** pipe, the excavation will be filled with permit required backfill material and not padded with sand to avoid settlement. If the required backfill is CLSM and the fill is over an extended length, placing sand over the main in a few locations may be required to prevent the main from "floating".

B. Backfill Compaction

1. "Backfill Compaction" shall be defined as compaction by means of air tools, hand tools or machine tamping.
2. The Contractor is responsible for the pipe or casing he damages through backfilling operations. The Contractor shall be responsible for all necessary repairs and replacement due to said damages.

3. When crossing lawns, the back fill shall be thoroughly compacted to minimize future settlement. The top twelve (12) inches of backfill shall be shredded topsoil if sand backfill is used. The backfill shall be neatly rounded over the trench to a height sufficient to allow for settlement to grade after consolidation. The Contractor shall be responsible for the condition of the trench until consolidation has occurred, and shall indemnify the Purchaser against damages resulting from improper back fill.
4. If the back fill is to be **hand tamped** it shall be compacted in horizontal layers not exceeding four inches in depth.
5. Vibratory compaction equipment is approved for use over plastic pipe. Impact compaction equipment is not approved for use over plastic pipe.
6. Low Energy Compactors under four-thousand (4,000) Feet - Pounds
 Back fill material shall be placed and compacted in uniform horizontal layers not exceeding six (6) inches in thickness, loose measurement. Each layer shall be compacted by means of approved mechanical tampers. Successive blows of the tamper shall overlap no less than one-fourth of the width of the tamper head. Each layer shall be dampened when necessary to ensure the maximum density obtainable, or as directed.
7. High Energy Compactors Over four-thousand (4,000) to thirteen-thousand (13,000) Feet - Pounds
 Back fill material shall be placed in such a manner that the first layer, loose measurement, will provide a two (2) foot – six (6) inches over above the pipe. After compaction of the first layer, each additional layer shall be compacted in uniform layers of twelve (12) inches, loose measurement.
8. Unless otherwise directed, trench compaction using select excavated spoils, shall meet the following minimum compaction requirements:

Trench Soil Compaction	
Maximum Lab. Dry Weight	Minimum Compaction Requirements*
Pounds / Cubic Feet	% Lab. Max
90 - 104.9	98% of Standard
105 - 119.9	95% of Standard
120 & More	90% of Standard

Soils with a maximum dry weight of less than ninety (90) pounds per cubic foot are considered unsuitable for use as back fill materials. *Measured at one-half (½) depth of the fill.

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9. Extreme care will be taken to ensure that the back fill material is adequately compacted both underneath and around gas pipe and fittings to prevent excessive stress and shearing forces. Hand tamp around fittings where mechanical compaction cannot be used.
10. In the event that subsequent settlement occurs, the Contractor shall make the necessary repairs to the ditch at his/her expense.
11. Where the pipeline passes under main line sewers or culverts, and the installation was done by tunneling, the backfill material shall be controlled density fill or as directed by the Purchaser.
12. On slopes, the Contractor may be instructed to install a silt fence, field stone, rip rap, sandbags, water diversion terraces, or other surface treatments as directed by the Purchaser, to minimize washing of the trench.
13. Granular material may act as a trench drain and attract long term seepage where glacial outwash or wet zones within bedrock are penetrated. Outlet drainage must be provided consistent with the specific topography. A four (4) inch perforated drain pipe must be installed at the direction of the Inspector with the granular material and run to daylight where practical.
14. The Contractor shall spread excess dirt across the right-of-way when requested by the landowner.



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Page 4 – Appendix 9A - City Of Covington Restoration Ordinance

Page 7 – Appendix 9B - City Of Cincinnati Notes

A. Restoration Requirements

1. All surface, subsurface structures and improved areas shall be restored by the Contractor to a condition at least equivalent to that prior to construction.
 - a) Clean up and restoration on all projects must be in compliance with local governmental agency requirements and must be approved by the Duke Energy inspector.
2. The Purchaser's Gas Standards 2.14.0 through Gas Standard 2.14.23 is a general restoration guide for the Contractors. The Contractor shall supply all labor, machinery, tools, appliances, equipment and materials necessary to restore the various types of improved surfaces.
3. Areas which do not have comprehensive rules and regulations governing the opening and restoring of public ways shall be made in accordance with the appropriate Engineering Standards as determined by the Purchaser.
4. Where permitted, all surfaces shall be permanently restored immediately after adequate consolidation of the backfill has taken place. The Contractor may be required to provide and maintain a temporary surface until permanent restoration is made. Projects requiring the reconnection of customer service lines to the new facilities (replacement projects) will require permanent restoration to be completed after the service work are completed. This work must be coordinated with the Purchaser.
5. Surface restoration shall be made to the satisfaction of the inspector/responsible government agency.
6. The Contractor shall properly dispose of all construction debris and leave the working area in a clean condition.
7. Ditches disturbed during construction shall be restored promptly and graded for proper drainage.
8. The Contractor shall grade, remove large surface rock, seed and straw the work area with a seed mixture acceptable to the property owner or public authority having jurisdiction.
9. The Contractor agrees to answer all customer restoration complaints immediately upon receiving notice from the Purchaser.
10. All final soft restoration, seed and straw, shall be included in the length of main installed. Twelve (12) inches of topsoil will be required if granular material is used as a backfill. The Contractor shall be required to hydro-seed all soft areas, except when

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Duke Energy or a governing agency Inspector instructs the contractor to seed and straw based on weather conditions. Topsoil is a separate bid item.

11. Pavement marking restoration will be required after performing the hard surface restoration unless otherwise specified by the Duke Energy.
12. Traffic loop restoration shall be the responsibility of the contractor.
13. Curb ramps may be required at the intersections of streets.
14. All tie-in areas shall have permanent restoration placed within five (5) days of tie-in completion if weather and governing agency allow.
15. All final restoration of longitudinal cuts shall be rolled even if grind and pave is a requirement of the permit. Duke Energy will require all uneven restorations to be redone.
16. Grind and pave work required by permit will be done at Duke Energy's expense unless it is due to poor workmanship on the original trench restoration. In some cases, the permit required grind and pave work is waived by the permitting agency if the final restoration is considered adequately smooth.
17. When installing gas main in a brick paved street, the existing bricks shall be salvaged. Following gas main installation, the salvaged bricks must be weaved into the repair area; no straight line saw cutting of the pavement will be permitted.
18. Determination of the limits of CL 32 asphalt restoration shall be at the discretion of Duke Energy or the permitting agency.
19. The City of Covington has specific restoration requirements for brick streets. Refer to attached letter Appendix 9A.
20. The City of Cincinnati has submitted a general guideline of their traffic control requirements and usage of LSM and concrete. Refer to attached notes in Appendix 9B.
21. When pouring concrete over a multiple of days; specifically Class 33, (2) 1" diameter 12" long rebars will be inserted half way at the end of the pour each day in order to "secure" the beginning of the new pour.

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APPENDIX 9A

CITY OF COVINGTON RESTORATION ORDINANCE

CITY OF COVINGTON

688 MADISON AVENUE • COVINGTON, KENTUCKY 41011-8298

August 9, 2005

Cinergy
670 W. North Bend Road
Cincinnati, OH 45224

Re: City of Covington Restoration Ordinance

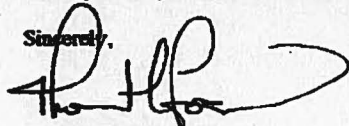
Based on the recent concerns expressed by Covington residents, neighborhood committees, and various public agencies regarding restoration of streets and sidewalks, I felt it necessary to provide all the utility organizations performing work within the City a copy of our restoration requirements. Enclosed is a copy of the pertinent sections of our Code of Ordinances specifically addressing restoration of streets, alleys, sidewalks, and other passageways within the City's right-of-way.

The recent concerns have been restoration of brick streets and alleys or the lack thereof. Due to the historical significance of this particular infrastructure I am asking that you remind your field crews and contractors of the detailed requirements for restoration of brick streets and alleys. The intent insofar as possible is to carefully remove the existing brick and replace the same after utility work is completed. In cases where this is not possible, I ask that you coordinate your efforts with the Engineering Department.

To assist in the planning process, I have enclosed a map highlighting the brick streets within Covington. We are hopeful that with proper coordination we can maintain the historical appeal we are known for in the state of Kentucky.

Thank you for your continued efforts in maintaining and improving our city.

Sincerely,



Thomas H. Logan, PE
City Engineer
City of Covington

c: Jay Fossett, City Manager

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§ 96.05 ENCROACHMENT PERMITS FOR WORK ON STREETS; REPAIRS TO STREETS.

(E) Restoration regulations.

(1) Each and every person who excavates, digs into, or occupies the right-of-way of any city street, alley, sidewalk, or other public way or any owner of real estate or the agent or lessee of such owner, who allows or permits such work to be done, whether under contract with the city or otherwise, has a duty, upon completion of such work, to immediately cause the street, alley, sidewalk, or other public way worked upon to be placed in reasonably close conformity to its condition before such work began. This work shall include, but not be limited to, the following:

(a) Installing, removing, or repairing any water pipe for the conveyance of water; gas pipe for the conveyance of gas; sewer pipe for the conveyance of drainage or sewerage; electric, telephone, computer, or cable type conduit of any kind; construction of any kind of sewer or other drain structure; or for the purpose of making house connections of any kind whatsoever;

(b) Installing, removing, or repairing any overhead lines or other similar facilities; and/or

(c) Opening, excavating, or occupying the right-of-way of any city street, alley, sidewalk or other public way or causing or permitting it to be opened, excavated, or occupied.

(2) Restoration work shall include the proper and thorough compacting and settling of the earth displaced, replacement of backfill, sub-base, or pavement, as required by current city standards or subdivision regulations. The top of any such opening shall be replaced or laid with the same or nearly the same kind of material(s) as composed the surface before such opening was made and in the same manner and upon the same level as it lay before such opening was made.

(a) If bricks or pavers are removed, to the extent possible, the removed bricks or pavers should be reused at the top of any such opening. If the removed bricks or pavers cannot be reused, then bricks or pavers of a like kind and material should be used. Restoration work must be completed immediately after the purpose for opening the street, alley, sidewalk, or public way is accomplished, and such work must be completed before the person or company doing the work leaves the work site, unless the City Engineer grants to said person or company a written extension of time to complete the restoration work. The street, alley, sidewalk, or other public way worked on, immediately after such work is done, shall be placed in reasonably close conformity to its original condition in every respect as it was before such work was commenced.

(b) The duty of restoring the street, alley, sidewalk, or other public way to conformity with its original condition is also imposed upon any contractor and any officer and upon any and all other persons under whose direction, supervision, or oversight such work is done or upon whose request, permission or cooperation such opening is made. It is the duty of the City Engineer to require and see that the provisions of this section are strictly, promptly, fully, and carefully carried out and enforced.

(77 Code, § 622.2, Sec. IV(a)) (Ord. O-16-82, passed 3-16-82; Am. Ord. O-17-02, passed 4-9-02) Penalty, see § 96.99



APPENDIX 9B

CITY OF CINCINNATI NOTES

Pre-Construction Meeting

Inspection

Call 352-3451 every morning between 7:30 AM & 8:30 AM with Permit Number.

No phone calls on cell phone for inspection.

All traffic control, excavations, backfill, temporary and permanent restoration must be inspected.

When field inspections are made a designated or responsible person must be on job site to take instructions.

Excavation and Restoration

Excavation – Pre-saw full-depth with wet diamond blade saw, brine from saw must be washed down so as not to be tracked by autos or pedestrians into business. Remove spoils every day, nothing left over night.

Backfill – CLSM required in all city streets, driveways, sidewalks and within 2 feet of the edge of the pavement. See approved Ham-Cin List for approved mixes.

- CDF with concrete base restoration – must wait a minimum of 12 hours before pouring concrete
- CDF with asphalt base restoration – must wait a minimum of 12 hours before placing asphalt
- Flashfill™ - must wait 1-4 hours before pouring concrete or asphalt base

Temporary Street Restoration – 3 options

1. 10" crushed stone or slag with a 2" cap of Hot Asphalt Mix #448
2. Bring CLSM within 2" of street and cap with 2" of Hot Asphalt Mix #448
3. Bring CLSM within 3" of street and cap with 3" of Concrete

Temporary Sidewalk Restoration – 2" of compacted Hot Asphalt Mix # 448

No Cold Mix will be allowed for any temporary restoration, street or sidewalk.

Final Street Restoration –

Concrete Base - 9" Class C Concrete with 2" cap of Hot Asphalt Mix #448. Main arterial roads require concrete to be pinned with #5 Epoxy Coated Rebar. Rebar or keyways will be required at the end of each concrete base pour.

Concrete

Standard Class C Concrete – minimum setup time 5-7 days
Class MS Concrete – minimum setup time 24 hours
Class FS Concrete – minimum setup time 4 hours

Internal Vibrator
Bull Float
Hand floats
Broom finish
String all castings for grade.

Asphalt

All asphalt restoration must be parallel and perpendicular to the
Center line or curb line
Hot Asphalt Mix #448
Tack coat per ODOT 702.04
3 to 5 ton roller
Sealer per ODOT 705.04 (except in crosswalks)

Asphalt Base

Arterial Road – 2-5" lifts of Asphalt Item 304 with a 2" cap of Asphalt Item 448
Residential – 2-4" lift of Asphalt Item 304 with a 2" cap of Asphalt Item 448

All Brick surface streets must be restored in kind.

Final Sidewalk and Driveway Restoration – 5" Class C Concrete for sidewalks and 7" Class C Concrete for driveways.

Any excavation through a curb ramp will require complete replacement of the curb ramp and upgraded to meet current ADA requirements.

Maintenance of Traffic

Follow all rules for maintenance of traffic. Item 614 ODOT Traffic Safety Manual

Advance warning signs for traffic pattern.

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Use of a uniformed police officer with cruiser may be required when working in or within 50' of a signalized intersection. Contact the Cincinnati Police Detail Unit at 352-2583 to coordinate.

No Parking Signs – Contact appropriate police district for policy and procedure

Some streets may have restricted working hours.

Miscellaneous

Street Plates – Plates will be required to be pinned, welded and ramped as necessary. No overnight noise. Silence plates with expansion paper, tar paper or ramp plates. Also see attached memo from the City of Cincinnati dated April 4, 2008.

Contact Urban Forestry at 861-9070 when working within fifteen (15) feet of a tree in the public right-of-way.

Special circumstances to be decided / directed by the City Engineer.

April 4, 2008

To all permit holders, Contractors, Utility Companies, Public Agencies with active excavations in City streets:

As the City of Cincinnati Traffic Road and Operations Division (TROD) prepares for the ongoing construction season, they will need to know the location of trench plates in City of Cincinnati streets during this season.

As a general rule we encourage everyone to make every attempt to complete permanent restoration of your trenches as soon as possible. If this can't be done we request that you use a temporary restoration acceptable to the Department of Transportation & Engineering Inspector assigned to your work.

Trench plates in City streets, during the construction season, should only be used for emergency purposes or when materials are not available to complete a good temporary pavement restoration.

We also request that all privately owned trench plates have permanent visible markings, such as the initials, of the company placed on the plates to better help identify which utility contractor the plates belong to.

Please advise ALL private contractors under your control and all necessary agency staff to contact TROD regularly with updated utility plate locations, the date placed, what utility it is for, and an emergency contact. Also, please remind them to call back when the plates are removed. You can contact TROD (Customer Service) at (513) 591-6000, 24 hours each day, 7 days a week.

This request is effective throughout the year, not just during snow plowing operations through the winter.

Your cooperation in providing this information to staff and attention to completing your street restorations are appreciated and will help to contribute to a safe and effective construction season.

Mike Niswonger
ROW Management Section
Transportation & Engineering
City of Cincinnati
(513) 352-3463



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Section 10 - Testing

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A. Internal Cleaning Prior to Testing

1. The Contractor shall furnish labor, equipment, and pigs suitable for traversing all bends, for cleaning the interior of all pipes prior to the air test.
2. Under no circumstances will any water removal equipment (pigs) be allowed to remain in the line. The Contractor shall be billed for all costs associated for the removal of any equipment left in the line.

B. Testing Main

After installation, the Contractor shall furnish the labor and equipment to test the main, in accordance with the following procedure. The contractor will also be responsible for ensuring the accuracy of the test charts. The crew leader must make sure the chart is good, fill in all applicable data, sign the chart and give it to the inspector for review. The inspector will initial chart.

1. Testing Distribution Mains Operating Less Than sixty (60) PSIG:
 - a) The Purchaser will visually inspect all welds on steel mains. The Purchaser will, at his/her option, inspect the welds by radiographic methods or by destructive testing methods. The Contractor shall conduct his/her work in a manner that permits the Purchaser and/or Radiographer to obtain a satisfactory examination of the pipeline. Welds found to be defective shall be replaced by the Contractor at his/her expense.
 - b) The Purchaser will inspect the heat fusion process used to join plastic pipe, connections, and fittings. Any joint connection or fitting that is visibly inspected and found to be defective or for any other reason believed not to be satisfactorily installed will be removed for testing. Joints found to be defective shall be replaced by the Contractor at his/her expense.
 - c) The Contractor must complete the air test on the new main at least two (2) working days from the date of completing the installation.
 - d) The Contractor shall furnish labor and equipment, including the calibrated pressure-recorder and charts, to successfully leak test all piping with air at ninety to one-hundred (90-100) psig. The maximum pressure of the pressure chart shall not exceed 200 psig and must be equal to or greater than eight (8) inch in diameter. Refer to Procedure GD10.1003-5 Air Testing for Leaks on Mains and Tie-ins.
 - e) The duration of the leak test shall be at least twenty-four (24) hours or as indicated on the "issued set" of plans.

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- f) Pressure testing of plastic will not be initiated until all fusion joints have cooled to below one-hundred (100) degrees Fahrenheit.
- g) Air compressors used for pressure testing shall be equipped with traps or filters on the discharge side to minimize the amount of oil contamination introduced to the system. On plastic main jobs, the air compressors shall be equipped with an after-cooler capable of limiting the outlet air temperature to maximum allowable temperature of 100 degrees Fahrenheit.
- h) While conducting pressure tests, every reasonable precaution must be taken to protect personnel and the general public during the test.
- i) The Contractor shall locate and repair all leaks at his/her expense. A successful retest after the repair will be required. Re-pigging the line may be required if water is suspected of entering the line.

2. Testing Mains Operating Greater Than sixty (60) PSIG:

- a) The Purchaser will visually inspect all welds and specify the minimum percentage of welds to be radio-graphed. Refer to Gas Standard 6.2 - Inspection of Pipeline Welding.
- b) The Contractor must defer the installation of line valves until after the strength test has been successfully completed unless specified by the Purchaser.
- c) After the line has been properly cleaned, the Contractor shall be required to furnish labor, tools, hydrostatic testing equipment, certified dead weight tester, and certified pressure chart recorder. Clean water is required to hydrostatically strength test the line to a pressure listed on the cover sheet of the "Issued Drawing". The pipe section being tested must have the test equipment located at the highest elevation in that section.
- d) The hydrostatic test must not include any portion of the live main, service tees, etc. Testing is not permitted in these areas so as to prevent the possibility of introducing water into the system and to maintain the integrity of the existing main. The maximum pressure at any point in the test section shall not exceed one-hundred (100) percent Specified Minimum Yield Strength (SMYS) unless specified by Engineering. The duration of the strength test shall be no less than the time listed on the cover sheet of the "Issued Drawing".
- e) After the completion of a successful strength test, the Contractor must supply suitable equipment and labor for removal of all water from the line. All water used for strength testing the main must be disposed of per that State's environmental guidelines.

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- f) After the completion of the strength test and before the air test, the Contractor shall install the valves, valve connections, blow-offs and other accessories as specified on the Purchaser's "Issued Drawings".
- g) In the event others perform the hydrostatic test, the Contractor shall be required to prepare the line for testing, including the attachment and removal of end closures and other testing appurtenances.
- h) The Contractor shall furnish the labor and equipment, including the calibrated pressure-recorder and charts, to successfully leak test all piping with air at ninety to one-hundred (90-100) psig. The maximum pressure of the pressure chart shall not exceed 200 psig and have a diameter greater than or equal to eight (8) inch.
- i) The duration of the leak test shall be at least twenty-four (24) hours or as indicated on the "Issued Set" of plans. The Contractor shall locate and repair all leaks at his/her expense. A successful leak test will be required after all leaks have been repaired.

C. Purging

1. In most cases, the Purchaser will purge the air from the completed installation. In some cases, the Contractor may be required to purge the air from the completed installations. In those cases, the Contractor shall furnish labor and certified purging equipment (exclusive of the purging medium) to purge the main in a manner approved and supervised by the Purchaser.
2. An inert gas, supplied by the Purchaser, shall be admitted to one end of the main and vented from the other end. The quantity of inert gas will be determined by the Purchaser.
3. The vent pipe shall extend a sufficient distance above ground level and shall be equipped with a conveniently located sampling connection.
4. The Purchaser may prescribe complete screening of the vent pipe with nonferrous material having a total area of at least fifteen (15) times that of the open end of the vent pipe. The screening material shall have a maximum screen size of fifty (50) mesh. The vent pipe shall be grounded using number twelve (#12) or larger copper wire, fastened securely to a metallic rod driven into moist earth. All purging shall be done while the new installation is physically isolated from gas lines in service. Immediately after purging has been completed, the main will be tied into the gas distribution system by the Purchaser. After adequate purging, as determined by the Purchaser, the line will be pressurized with natural gas by the Purchaser.

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D. Test Equipment

1. All test gages/recorders and dead weight testers shall be supplied by the Contractor.
2. The gages/recorders listed above must have been calibrated within one year's time before being used to perform any tests. All calibration records must be traceable to the National Bureau of Weights and Measures. The original calibration sheet or copy must be submitted to Gas Engineering for documentation purposes prior to use in field.
3. The dead weight testers must be in good condition. The piston must move freely in the vertical direction and also rotate freely.
4. The charts used on pressure chart recorder must have a maximum pressure listing of no more than twice the maximum pressure of the hydrostatic test, e.g., maximum pressure for the hydrostatic test is eight-hundred (800) psig; the maximum pressure listed on the chart must be sixteen-hundred (1600) psig or less.
5. The diameter of the charts used on the chart recorders must be eight (8) inch or larger.



GD150 Section 11 - Sewer Location & Breach Prevention

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Page 5 - Appendix 11A - Required Sewer Video DVD Labeling Format

Page 7 - Appendix 11B - Camera Guidelines If a Breach Is Encountered

Page 8 - Appendix 11C - Sanitation District Contact Information

GD150 Section 11: Sewer Location & Breach Prevention | 2015**A. Safety**

1. Duke Energy requires all pipeline Contractors to video inspect all sewers and drain lines located within the limits of any horizontal directionally drilled service and/or gas main after installation.
2. All Work performed must comply with OSHA Confined Space Regulations.
3. Proper traffic control is required, based on the permitting agency where Work is to take place. The contractor must notify MSD on a daily basis of what they intend to do that day. Duke Energy will handle the acquisition of the necessary permits to perform the Work.
4. All Sewer Districts must be notified at least twenty (24) hours prior to entering their facilities.

B. Sewer Video

1. Designated main sewer lines and sewer laterals shall be inspected by means of a remote Closed Circuit Television (CCTV) system. A "general flush" cleaning shall be included in the normal pre/post camera inspection. If a blockage in the sewer/drain line cannot be removed by performing the "general flush" and is found to impede the progress of the video recording, then the contractor shall attempt to complete that section by televising from the next manhole, or other access, in the opposite direction to complete this section. The reversal in the camera's direction must immediately follow the previously impeded direction of the inspection. An audio explanation must accompany this portion of the video.
2. All sewer laterals must be accounted for when directional drilling main and/or services on a particular street. In a situation where it is believed that the laterals exit the rear (opposite of street side) of the building, a pre-locate will be required in order to verify all tap locations. This video inspection shall be recorded on a DVD and be submitted to Duke Energy. If a lateral location cannot be verified using a main line sewer camera for a particular address, then the Contractor shall access the inside of the property to use a "push camera" in the lateral exiting the property to determine its exact location.
3. All sewer video work performed within the service territory of the Cincinnati Metropolitan Sewer District (CMSD) shall be done in accordance with the "Sewer Main, Lateral and Drain Line Video Recording within Cincinnati Metropolitan Sewer District Service Area" specification. The video contractor shall be responsible to get the necessary training from CMSD to perform this work.
4. It will be necessary for the camera view to be centered within the sewer pipe in order to provide an accurate measurement of important physical features located inside the

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sewer. These measurements shall be displayed and documented on the DVD. All video must provide accurate measurements from manhole to manhole and the manholes should indicate either the street address or intersecting streets. Pipes larger than forty (40) inches in diameter may require an actual entry into the pipe to record the information. The limits of the trunk line video must be within the extreme limits of the estimated property lines of the last house where the gas main was installed.

C. Recorded Data (DVD)

1. A sketch of the trunk line must accompany each DVD. Each tap must be shown on the sketch. The sketch must be in a readily available electronic format. The sketch must be recorded on the appropriate DVD in a legible fashion.
2. Individual sewer laterals must be inspected at a minimum from the trunk line to the foundation of the house. If it is not possible to inspect the lateral from the trunk line and there is no clean out to be found, then it will be necessary to inspect the lateral from the roof vent. If it is found that there is no possible way to video the lateral, a waiver must be utilized.
3. The CCTV inspections will be conducted entirely in a digital format. Two (2) properly marked DVD copies will be sent to the Duke Representative within two (2) weeks after the completion of the job.
4. The following information must be legibly hand-written (printed) on the surface of each submitted DVD. See Appendix 11A for required DVD labeling.
 - a) Job Number
 - b) Contractor Performing Work
 - c) Name of Municipality
 - d) Street/Streets' Name
 - e) Address Range - list all addresses and label them M-C or C-M
5. The following guidelines must be adhered to so as to facilitate retrieval of sewer information in the future:
 - a) The submitted DVD's must be recorded in a format that the software program "WIN DVD" can view. Other formats may be allowed after a Duke review and approval.
 - b) No more than one job is to be placed on each set of disks

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- c) Each set of DVD's shall have no more than one city block's worth of information recorded
 - d) A paragraph describing the work done and the location must be included on each disk as a PDF file
 - e) A sketch depicting the trunk line and laterals must be included on each disk as a readily available electronic format.
 - f) Each disk must be able to be copied
 - g) It shall be the recording Contractor's responsibility to provide properly recorded DVD's with the correct documentation on the DVD. If it is found that the DVD's supplied are not able to be read or missing the above requirements, a new recording will be required at no additional cost to Duke.
6. If a job requires more than one disk, the disks must be marked as a set, e.g. Disk 1 of 2, etc. Each DVD must still include all pertinent information as listed above.

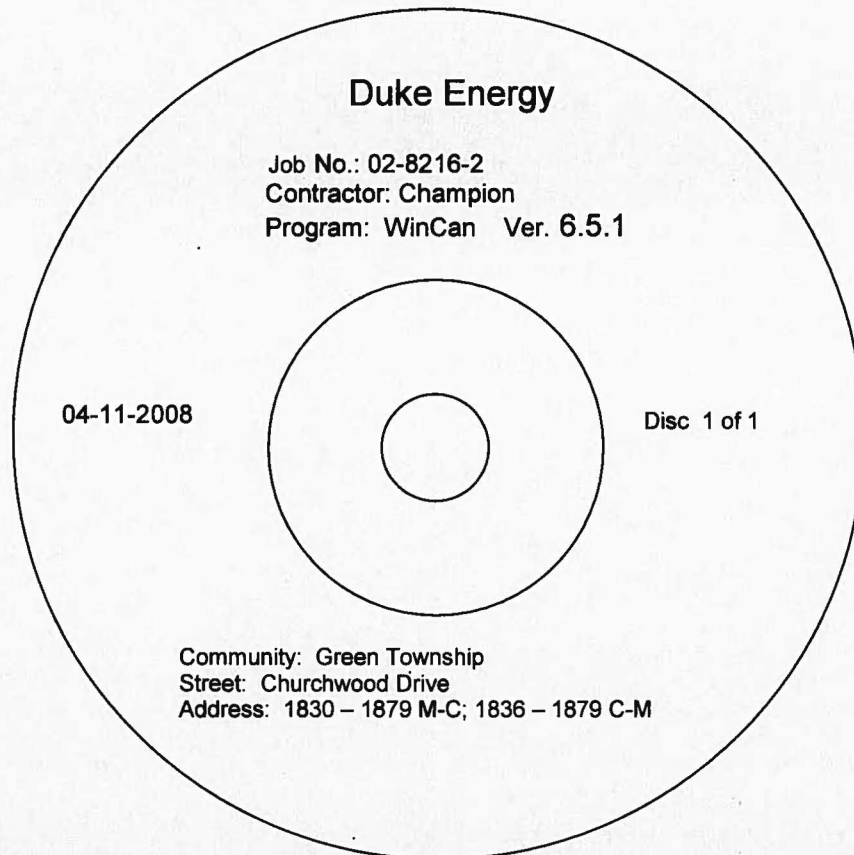
D. Breach Located

- 1. If a breach due to a gas facility installation by the Gas Contractor is encountered in a sewer main, lateral or drain line, then the Gas Contractor must respond immediately to the site of the breach and video camera all sewer mains, laterals and drain lines within a measured distance of five-hundred (500) feet in each direction from the location of the breach . If an additional breach is located, an additional measured 500 feet of camera work will be required from the last measured location. See Appendix 11B.
- 2. The Northern Kentucky Sanitation District and the Metropolitan Sewer District have requested that they be contacted when their facilities are damaged. Refer to attached letter in Appendix 11C.

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APPENDIX 11A

REQUIRED SEWER VIDEO DVD LABELING FORMAT



1. Font is to be Arial size 10, except for the Duke Energy heading which is Arial size 14
2. Layout is to be shown in the above diagram, any deviation needs prior written approval for its use.
3. All information shown is to be legible printing (hand-written) provided on the disc:
 - a. Heading – Duke Energy
 - b. Job No. – The Duke Energy Job Number; Only 1 Job per set of discs.
 - c. Contractor – The name of the Contractor company who performed videoing of sewer lines.
 - d. Program – The video program utilized, including the version used by Contractor for the disc.
 - e. Date – The month, day and year the post camera video of Street is completed.
 - f. Disc # of # – The number of the disc and total number of disc(s) in set.
 - g. Community – The community as stated in the contract documents.
 - h. Street – The street shown on disc; No more than 1 block of information per disc.
 - i. Address – The street address range shown on the disc.

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In addition to the video each disc shall contain:

- 1) Description of the work performed and the location as a PDF file.
- 2) A sketch depicting the trunk line and laterals as a PDF file or Excel Spreadsheet.

DVD's must be recorded in a format so that the program can be operated on Duke Energy's computers.

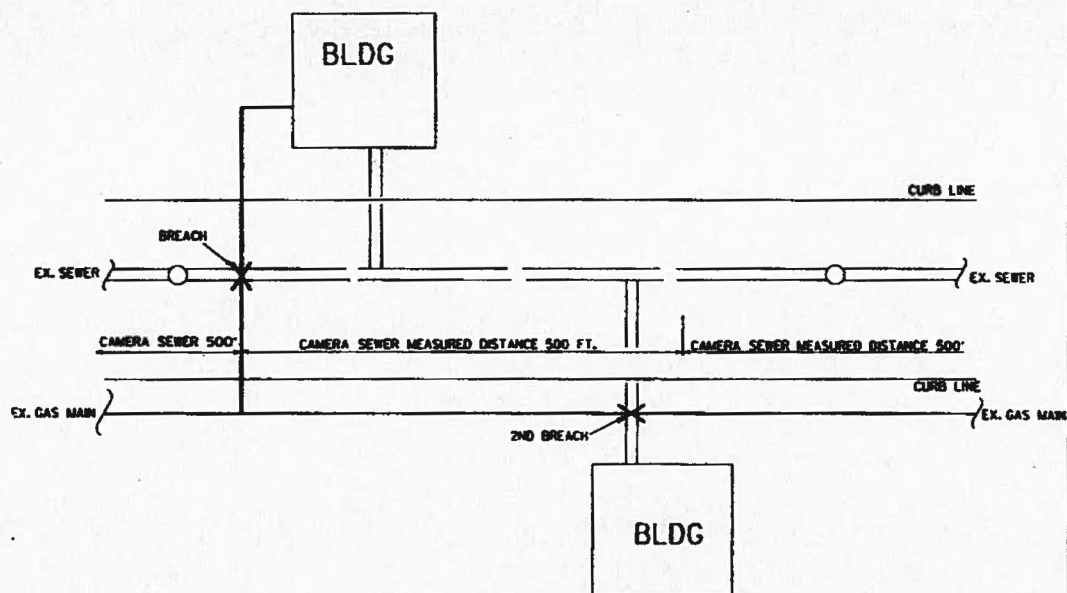
It is the contractor's responsibility to provide properly recorded DVD's with the correct documentation on the DVD. If, it is found the DVD's supplied are not able to be read or missing the above requirements, a new disc will be furnished at no cost to Duke Energy that is readable and meets all of the above requirements.

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APPENDIX 11B

CAMERA GUIDELINES IF A BREACH IS ENCOUNTERED

BREACH ENCOUNTERED

1) IF A BREACH IS FOUND A DISTANCE OF 500 FT. IN EACH DIRECTION MUST BE RE-CAMERA. THIS INCLUDES SEWER MAINS (SANITARY AND STORM). ALL SEWER LATERALS AND DOWN SPOUTS.


2) IF A 2ND BREACH IS FOUND WITHIN THAT 1000 FT RE-CAMERA DISTANCE, AN ADDITIONAL 500 FT. MUST BE RE-CAMERA STARTING FROM THE END OF THE ORIGINAL MEASUREMENT AT THE CONTRACTOR'S EXPENSE

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APPENDIX 11C

SANITATION DISTRICT CONTACT INFORMATION

SANITATION  **DISTRICT No. 1**

June 15, 2004

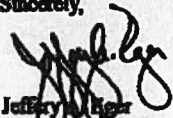
Ms. Rhonda Whitaker
Area Manager
Cinergy, ULH&P
107 Brent Spence Square
Covington, KY 41011

Dear Rhonda:

We understand that Cinergy is currently in the process of completing upgrades to gas systems throughout much of Northern Kentucky. While this work was being completed in the City of Southgate, crews damaged a sanitary sewer line on Willow Road near US 27. Gas crews made a repair to the sanitary line but unfortunately it was done improperly.

In the future, if a sanitary sewer line is damaged during a repair, we ask that you contact our Dispatch immediately at 859-578-7466. This will help us to ensure that proper materials and procedures are used to complete the repairs. We ask that if one of your crews completes the repair, that we be notified so that an inspection can be completed prior to the repair being backfilled. If it is more convenient for you, Sanitation District crews can complete the repair and invoice you for the costs of the repair including time and material.

If you have any questions regarding this matter, please do not hesitate to contact John Penick, Director of Collection Systems, at 859-578-7455.

Sincerely,

Jeffrey A. Hager
General Manager

1045 Eaton Drive • Ft. Wright, Kentucky 41017-9681 • Ph: (859) 578-7450 • Fax: (859) 331-2436

Metropolitan Sewer District (MSD) Repair Request

MSD/Collections needs to be informed of any repairs to one of their sewers so that they can inspect the repair and do not schedule one of their crews to make the repair. MSD/WWC should be contacted at 513-244-1369 between the hours of 7:00 a.m. and 9:00 a.m. when a sewer repair is scheduled. They will send one of their inspectors to the job site to approve the repair. This should save time and money for both MSD and Duke Energy by decreasing the number of failed repairs and double scheduling.



GD150 Section 12 - Procedure Listing

The following list is a recommended listing of procedures developed for use in Duke Energy for the typical gas construction project. This list is not all inclusive but contains those procedures most likely required for use in the field during the installation of gas mains and services along with similar related activities.

The actual procedures can be found on the "Gas Operation's Home Page" located on the Portal. If you are unable to get this information, notify the Sponsor Engineer and request a copy of the procedure be sent to you.

Procedure Number	Procedure Title
GD02.116	New Customer Notification of Customer Owned Service Lines (Maintain Buried Natural Gas Lines)
GD02.901.2	Corrosion Control Glossary
GD02.902.1	General Policy for Corrosion Control
GD02.903.1	Corrosion Control Plan
GD02.903.2	Coated Pipeline & Coating Materials Specification for Handling, Storage & Application
GD02.904.3	Wire Connections to Pipelines
GD02.1212-4	Damage Prevention Program
GD02.1212-8	Gas Facility Location
GD10.01	Upgrading of Steel Piping Systems
GD10.225	Manufacturing Specifications for Pipe and Pipeline Components
GD10.300	Free Span Limitations for Exposed Gas Mains During Excavation
GD10.302	Lowering In-Service Steel Pipelines
GD10.302-2	Design of Steel Piping Systems
GD10.1003-1	Strength Testing for Establishing MAOP
GD10.1003-5	Air Testing for Leaks on Mains and Tie-ins
GD10.1203	Medium Pressure – MAOP and MOP
GD10.1214	Procedures For Digging and Surveying Test Holes for Locating Buried Gas Main
GD20.463	Magnesium Anodes
GD40.01-01	Gas Main - Tracking & Recording Tie-In, Separation & Abandonment of Gas Mains
GD40.01-02	Gas Main - Standard Pressure - Abandonment
GD40.001	Pressure Conversion Guidelines
GD40.002	Pressure Increase Guidelines

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Procedure Number	Procedure Title
GD40.003	Pressure Decrease Guidelines
GD40.004	Pressure Uprate Guidelines
GD40.005	Pressure Downrate Guidelines
GD50.0001	Control of Hazardous Energy (Lockout/Tagout)
GD50.0002	Control Of Hazardous Energy (Lockout / Tagout) (energy isolating devices)
GD55.1210	Planned and Unplanned Interruption of Service
GD55.500	Visual and Radiographic Weld Inspection on Steel Pipelines
GD55.505-1	Welding Qualifications
GD55.512-1	Limitations of Welders and Welding Processes
GD55.1211-1	Purging Pipelines
GD55.1220-1	Locating & Temporary Marking of Natural Gas & Hazardous Liquid Facilities
GD55.1303-1	General Policy for Pipeline Markers and Navigable Waterway Pipeline Warning Signs
GD55.1304-2	Inside Piping Inspections
GD60.078	Annual Qualification For Joining Plastic Pipe By Qualified Personnel
GD60.111	Prevention of Accidental Ignition
GD60.122	Supplied Breathing Air
GD60.130	Gas Vault/Pit Access or Entry
GD60.162	Leak and Strength Testing of Short Segments of Steel Pipe used for Tie-ins and Main Repairs
GD60.200	Work Zone Safety
GD60.250	Receiving, Handling And Storage Of Polyethylene Pipe, Tubing And Fittings
GD60.383	Excess Flow Valve Installation
GD60.434	Tapping and Squeeze-off of Polyethylene Gas Mains under Pressure
GD60.444	Excavation Safety
GD60.445	Directional Drill Requirement for Locating Underground Utilities
GD60.462	Applying Wax Tape Coatings for Below Ground Applications
GD60.465-1	Insulphone Tester
GD60.465-2	Cathodic Protection Indicator
GD60.465-3	Continuity Tester
GD60.625	Gas Meter and Regulator Installations Inspection
GD60.631	Pressure Testing & Inspecting Residential Customer House Lines
GD60.632	Testing Inspecting Commercial and Industrial Houselines
GD60.633	Meter Testing or Pressure Testing Customer House Lines for Leaks
GD60.636	Customer Meters: Turning Gas On to a New Residential Meter Set
GD60.637	Customer Meters: Turning Gas On (Reconnect or Succession) For A New Customer

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Procedure Number	Procedure Title
GD60.658	Gas Meter Changes and Testing (Age Changes)
GD60.700	Gas Service Renewal
GD60.701	New Gas Service Installation
GD60.702	Gas Service Curb Box and Valve Box Accessibility Program
GD60.704	Flexible Service Riser Replacement
GD60.719	Joining Copper by High Temperature Soldering
GD60.720	Corrosion - Causes And Prevention
GD60.728	Tapping, Bagging and Stopping of Metallic Gas Mains Under Pressure
GD60.730	Main Tie-ins, Cut Outs and Isolation of Main Segments
GD60.732	Grounding and Temporary Bonding of Pipelines
GD60.738	Weld Inspection - Visual
GD60.739	X-Ray Report - Daily Completion
GD60.786	Grouting Abandoned Pipe
GD60.750	Pipeline Valve Inspection - Annual and 5-Year
GD60.751	Repair of Distribution Mains
GD60.776	Joining Polyethylene Piping Systems by Butt Fusion Utilizing the McElroy 14 & 26 Machine
GD60.779	Joining PE2406 Polyethylene Pipe, Tubing & Fittings By Electrofusion
GD60.780	Joining Pipe With Mechanical Fittings
GD60.782	Joining Polyethylene Pipe By Butt Fusion Utilizing The McElroy No. 28 Fusion Unit
GD60.782-1	Joining Polyethylene Pipe by Butt Fusion with McElroy no. 412 High Velocity Fusion Unit
GD60.783	Repair of Aldyl A Service Punch Tee (SPT) and Tapping Tee
GD60.785	Abandonment or Inactivation of Facilities
GD70.06-019	Pipeline Defect Evaluation
GD60.2001	Gas Pipeline Condensate (PCB) Management
GD60.2002	Mercury Regulator Handling, Spill Response and Clean-Up
GD147	Contractor Payment Schedule
GD210	Materials Specification for Plant Applied Coating Material for Carbon Steel Pipe
GD215	Polyethylene Pipe & Fitting Specification