SPECIFICATION FOR THE INSTALLATION OF GAS MAINS AND SERVICES
GD-150

Original Issue Date: 06/01/06 Revision Date: 08/13/15 Status: Revised

Subject Matter Experts: Chris Colyer, Manager Gas Operations Engineering & Katherine Wilson, Engineer II

Revised By: B. Kaiser & K. Wilson

Approved By: John Hill Department: Gas Operations

Reference: CFR Title 49 Parts 192 & 195 (various) Gas Standard: Various

Gas Operations Plan: Natural Gas Plan Sections F- K & Hazardous Liquid Plan Sections D, E G & H

Purpose: This procedure covers the general requirements and specifications for installing gas main and services.

Table of Contents

INTRODUCTION

1. GD150 covers the "general" field requirements for the various facets of installing steel welded protective coated mains, plastic mains, services and associated appurtenances under the contract proposal. For details on a specific subject it is recommended that both the Duke Energy Gas Operations Standards and Procedures are reviewed. They are available online for review.

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2. Shading has been used to show those items considered "significantly" different from the previous version of GD150.

3. Where provisions of GD150 differ with the Standard Terms and Conditions, GD-150 shall govern.

4. A complete GD150 should contain those items listed in the table of contents. If more information is required, please contact Gas Engineering.

5. For those items that deal with price/pricing refer to procedure GD147 Contractor Payment Schedule.

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Section 1 - General Conditions

A. Schedule of Work

1. All work shall be performed in conformance with the Purchaser's drawings and specifications. The Purchaser must approve any deviation from the original route.

2. The work may be started anywhere within the limits of the project at the Contractor's discretion; however, the Purchaser reserves the right to direct the application of the work force to any portion of the work.

3. No additional work outside of the original work scope shall be completed unless it is accepted by the authorized agent of Duke Energy. The new Work must comply with the agreed to proposal and all written negotiations.

4. The Contractor shall, upon request, submit a proposed schedule for construction and an installation procedure before beginning the work.

5. The Contractor shall employ overtime at his/her own expense at any time construction fails to meet the specified schedule and conditions.

6. The Contractor shall complete all punch list items within sixty (60) days of being notified.

B. Permits

1. All work shall be in accordance with the requirements and regulations of the public authorities having jurisdiction. The Contractor shall not make street or sidewalk openings unless the Contractor has evidence that a valid permit has been issued for the work. Construction permits will be obtained and paid for by the Purchaser with the exception of "fill" fees that may be required for dump sites.

2. Any permits required for movement of materials or equipment over highways shall be secured and paid for by the Contractor.

3. All railroad crossing permits are applied for by Duke Energy.

NOTE: If the Contractor wants to directional drill the crossing, the main typically has to be 10 feet below the tracks. If the change to directional drilling creates a problem with the original permit, the Contractor will not be reimbursed for any down time. It is the contractor's responsibility to notify Duke Energy of their intention to directional drill the crossing and to allow adequate time to obtain a change in the railroad permit. If time does not allow for a change in the permit, the contractor shall be expected to bore the crossing.

C. Employees

1. The Purchaser shall have the right at all times, to require the removal of any supervisor or workman, who in the opinion of the Purchaser performs unsatisfactorily.

2. The Contractor shall ensure that all Federal, State and Local rules/ regulations are satisfactorily met as applicable to the work. This includes, but is not limited to, the Department of Transportation (DOT), DOT Research and Special Program Administration (RSPA) rules/regulations.

D. Training

1. Duke Energy will require polyethylene qualification on all fusion and mechanical connections. Renewal of fusion cards are the responsibility of the contractor. Adequate time must be given by the Contractor to Duke Energy so classes can be scheduled.

2. Duke Energy will require welder certification on all welds performed on Duke's gas facilities. Renewal of welder certification cards are the responsibility of the contractor. Adequate time must be given by the contractor to Duke Energy so welder certifications can be scheduled.

3. Duke Energy will provide training to the Contractor on the renewal of services, installation of meter sets, turn off, turn on and appliance light up. Grounding procedures and a review for sizing services will also be covered in the training.

4. Contractors will be trained for free on Duke Energy policies associated with spotting unacceptable meter locations and the identification of tin meters and mercury regulators. Only Duke Energy Service Delivery personnel shall handle mercury regulators.

E. Public Relations During Construction

1. The Contractor shall be required to hold weekly on-site meetings with the community representative and/with the Inspector to ensure immediate handling of all customer concerns. The Contractor shall be required to provide the Inspector with a proposed schedule prior to the start of work, along with weekly progress reports.

2. The Contractor shall be required to provide emergency numbers to the dispatcher to assure twenty-four (24) hour / seven (7) day a week coverage. The Contractor shall also be required to leave door hangers with business cards, sewer tags and phone numbers for customer contact during and after working

hours. A customer notification log must be filled out and returned to the assigned onsite Inspector prior to the start of any construction.

3. Picture ID's are required for all Contractor employees. Contract personnel are required to show their ID when asked by customers or Duke Energy personnel.

4. All primary contractor and sub-contractors vehicles must be clearly marked with either decals or magnetic stickers displaying the company name and phone number while at the work site.

5. Contractor shall respond to customer complaints within 48 hours of being notified by a Duke Energy representative.

6. The Contractor shall conduct his/her work in such a manner, as to minimize damage to sidewalks, roadways, properties, underground utilities, and structures.

7. If a block of sidewalk is to be open for more than 48 hours, class 53 temporary asphalt must be placed into the open section of sidewalk. All tripping hazards are to be avoided in sidewalk areas and, where necessary; foot traffic shall be re-routed where a sidewalk blockage is present.

8. The Contractor shall be responsible for all losses or damages to public or private property including damage to walks, driveways, drain lines, curbs, lawns, shrubs, trees and streets resulting from his/her negligent acts.

9. The Purchaser will settle and pay for all lawn damages caused by the result of the construction; however, it is expected that the Contractor shall conduct his/her work in such a manner as to minimize lawn damage.

10. The Contractor shall assume responsibility for proper surface restoration, and shall indemnify and save harmless the Purchaser from any and all claims, demands, damages, actions, causes of action and defend any and all suits instituted against Purchaser, for property damages or personal injury to agents of the Contractor or third parties, whether caused by negligence attributable to Contractor or not, growing out of restoration or failure to restore.

11. The Contractor shall store and distribute materials and construction equipment in a manner to cause the least inconvenience to the public.

12. Pipe shall be strung in such a manner to satisfy the requirements of public authorities and involved property owners.

13. The Contractor shall be responsible for maintaining the traffic upon private or public roadways, involved within the construction limits of the project using proper signs, barrels, cones, etc.

14. The Contractor shall install and maintain temporary bridges where the trench is:

    a) opened across the street,

    b) crossing a vehicle entrance used for business purposes,

    c) located in front of a fire hydrant, or

    d) required by public authorities.

15. The Contractor shall provide and maintain footbridges with guard-railing and toe plates per OSHA guidelines for foot traffic where applicable.

16. The Contractor shall install safety shields to protect the public from injury when breaking concrete or welding/grinding.

17. Plastic rebar safety caps shall be placed on the ends of any vertically placed rebar at all times to prevent injury.

18. Adequate safety measures including caution lights, flagmen, and warning signs, shall be provided and maintained by the Contractor during construction.

19. The Contractor shall, at his/her expense, remove all excess material and debris, resulting from the construction as soon as possible, so as to permit safe passage on the roads and right-of-ways.

20. The Contractor shall provide and maintain sanitary accommodations for the use of his/her employees in a neat and satisfactory condition. The accommodations must comply with the requirements of the public authorities.

21. The Contractor shall cooperate fully with the street contractor, and cause as little interference as possible to the street improvement work.

F. Responsibility for Material

1. The Purchaser will furnish the Contractor, all required valves, fittings, accessories, prefabricated system stations, and patch coating materials, except for pipe, which will be delivered to the job site.

    a) The Contractor shall not accept any material from the Purchaser that is found to be defective.

    b) The Contractor shall be responsible to account for the material as it is unloaded.

c) The Contractor shall be held responsible for all material that he accepts until the work is completed and accepted.

d) The unloading, loading, and hauling of materials during these operations shall be done with care to avoid damage to the materials, to the highways and structures.

e) There may be occasions when the Contractor shall be required to pick up material at the Purchaser's designated location. Additional movement of the pipe and materials that are to be used in construction, after delivery on the site, shall be the responsibility of the Contractor.

2. Duke Energy will provide all piping and associated pipe materials required for the pipeline work.

a) All six (6) inch diameter and smaller polyethylene pipe will be medium density polyethylene (MDPE), colored yellow.

b) All eight (8) inch and twelve (12) inch polyethylene pipe will be high density polyethylene (HDPE), colored black with yellow stripes.

c) All steel pipe will be epoxy coated Grade B or stronger. Twelve (12) inch and sixteen (16) inch coated steel pipe will typically have a wall thickness of 0.219" and 0.250", respectively.

d) Duke Energy will specify the grade and wall thickness of all steel pipes on the construction drawings.

3. The contractor shall be responsible for requesting material as it is needed.

a) The contractor must allow a minimum of twenty-one (21) days for pipe deliveries on pipe sizes less than 8".

b) For pipes eight (8) inch and larger, a minimum of forty-two (42) days will be required.

c) It shall be the responsibility of the Contractor to unload material at the jobsite and to provide weekly reports showing material received, material used and material remaining.

d) The material assigned to a module/project is to be used on that module/project only. At the end of the project, all surplus materials are to be returned to the storeroom or a credit requisition completed allocating the material to another job.

i. The material must be returned or requisitioned to another job in the same condition that it was received.

e) A 10 % overrun in the quantity of pipe will be allowed for waste. All other unaccounted, damaged or material left unprotected shall be the responsibility of the Contractor.

4. Service material will be delivered to each Contractor's storage yard. Each Contractor shall be required to provide an adequate shelter area with shelves to organize all the service material.

   a) The Contractor shall provide a person to receive material, organize, and reorder material as needed.

   b) The Contractor shall accept responsibility to ensure the reorder is completed as necessary and the faxing of appropriate paperwork to 513-629-5822.

   c) At the end of each calendar year, the Contractor shall be required to inventory all service related material including material at job sites and truck inventory.

5. The Contractor must notify the Inspector of the exact location where the pipe is to be delivered. It shall be the Contractor's responsibility to determine where the staging location for the new pipe is to be. The Contractor shall have personnel available to unload the pipe when the delivery truck arrives.

6. The Contractor shall be responsible for the adequacy of supplies and materials necessary for doing the work without requiring revisions and causing delays.

7. The Contractor shall be responsible for packaging all excess material and having manpower and equipment available to load this material onto the Purchaser's trucks. There may be occasions when the Contractor may need to return material to the Purchaser's designated location.

8. Contractor Supplied Materials

   a) The Gas Contractor is required to provide all materials and equipment other than as indicated on the construction drawings, which is necessary to construct the project.

   b) Spray paint used by the contractor for markings must be water soluble and capable of being removed if needed.

   c) All welding materials such as welding rods, grinding wheels, clamps, etc. is to be provided by the Contractor.

G. Fences

1. Fences shall be repaired at the Contractor's expense, and to the satisfaction of the property owner. Damage claims arising from livestock wandering through open or temporarily repaired fences shall be paid for by the Contractor.

H. Crop Damages

1. The Purchaser will settle and pay for all crop damages necessary for the main installation; however, it is expected that the Contractor shall conduct his/her work in such a manner as to minimize crop damage.

I. Right-of-Ways

1. On private property, the Purchaser will furnish a right-of-way, including the right of ingress and egress, and the right to use the grantor's adjacent land for construction of the main within the specified limits. The Purchaser will note any and all restrictive clauses contained in the right-of-way agreements on the construction drawings, bids, or on a separate letter. The Contractor shall conduct his/her operations in accordance with such agreements.

2. When construction involves the use of the Purchaser's easements, the Contractor shall contact each property owner, prior to entering the property. The Contractor shall be responsible for damages to and restoration of driveways and temporary roadways used for the ingress and egress.

3. The Contractor shall clear the right-of-way to such a width as required by the Purchaser and in such a manner as to permit his/her ability to work satisfactorily. Excessive damage to the land must be avoided. Brush and timber taken from the right-of-way shall be disposed of by the Contractor to the property owner's/responsible party's satisfaction.

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Section 2 - Prior to Construction

A. Preliminary Work

1. The Purchaser will furnish a field Inspector for each job. The Inspector will be responsible for obtaining all necessary field measurements and notes on the installation drawing. The Contractor shall cooperate with Purchaser's field Inspector in the prosecution of the work and obtaining the necessary records.

2. Duke Energy recommends that the Contractor videotape every project prior to starting construction. This video record can be extremely important in settling disputes with governing agencies and customers. If the project is not videoed and there is a dispute between the contractor and the customer, Duke Energy will side with the customer. When videoing, addresses must be indicated verbally or pictorially.

3. The Inspector will order all material required for the job. The Contractor must provide a reasonable amount of advanced notice to allow the Inspector time to have the material ready for delivery.

4. Stockpiling of pipe on the site shall be in accordance with Gas Procedure GD02.903-2 *Coated Pipeline & Coating Materials Specification for Handling, Storage & Application*.

5. The Contractor shall have the underground utility locations marked on the streets, curbs, as required by House Bill and the Purchaser's Inspector. The Purchaser assumes no responsibility for miss-marked utilities or downtime as a result of late or incorrect marks.

6. The Contractor, together with Purchaser's representative, shall notify each property owner prior to working on, near or around the owner's property. They shall explain the nature of the work to be done, and make arrangements as necessary to minimize any inconvenience to the owner as the work progresses. Where fences, shrubbery, mailboxes, etc. are involved, there must be an agreement with the owner as to the location at which these private appurtenances are to be reinstalled. This reinstallation shall be at the Contractor's expense.

B. Surface and Subsurface Conditions

1. Because gas is usually one of the first utilities to begin work on a street improvement project, it can be assumed that trees/brush will not be cleared as indicated on the construction prints. Those incidental trees or brush that require removal for gas main installation, shall be removed by the Contractor. The cost to remove the trees/brush must be included in the "pipe installation" cost.

2. The Contractor shall be responsible for all tree damage unless directed by the Purchaser to perform work that could be detrimental to the trees. The Contractor is

responsible for notifying the Purchaser of potential detriment to the trees "prior" to excavation. Otherwise, the Contractor assumes responsibility for damages.

3. The Purchaser assumes no responsibility and gives no guarantee as to what subsurface conditions will be found to exist when the work is being carried out. Locations of underground structures as shown on Purchaser's drawings are approximate only. Test holes must be dug prior to saw cutting the street to insure underground structures will not create problems with construction.

C. Sewer Location and Breach Prevention

1. See Section 10 of this procedure.

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Section 3 - Excavation

A. Route Sequence and Installation

1. Prompt restoration of any interrupted gas, water, or other utility service is mandatory.

   CAUTION: The Contractor is not to repair any active gas services or gas mains that may be damaged during construction. If the Contractor encounters any leaks or suspects a potentially dangerous condition, the Duke Energy emergency contact number and the Duke Energy project inspector must be notified immediately

2. The Contractor is to maintain a minimum protected work area. All unattended open cuts in sod must be covered with ¾" plywood and barricaded with appropriate flashers, barrels, or other proper equipment. Stakes alone will not be acceptable.

3. The crossing of railroads, bridges, and streets shall be made in such a manner that will meet the specifications and requirements of the authorities having proper jurisdiction over such crossings.

4. The trench for the main shall have a maximum width as shown in Gas Standard *2.14.1: Typical Restoration Section Backfill Requirements Steel and Cast Iron and 2.18.1: Typical Trench Details – Polyethylene Pipe.*

5. Restoration costs will be determined based on these dimensions.

6. A minimum amount of pavement shall be removed in order to reduce the amount of restoration. Suitable equipment and methods shall be used for cutting the edges of the pavement so as not to disturb or damage the pavement or base to be salvaged.

7. The pavement shall only be removed a reasonable distance in advance of excavation, to avoid inconvenience to the public. However, it is recommended that test holes be dug enough in advance to reduce the possibility of potential unforeseen conflicts with other underground utilities.

8. The trench shall be dug so that a minimum number of vertical bends are required.

9. The trench shall be excavated to a depth to permit the necessary cover as shown on the "issued" drawing, as measured from the top of the pipe in the trench, to the average level of ground on the two sides of the trench. If the depth is not shown on the drawing, it must be assumed that a cover of 3 feet will be utilized or as directed by governing agency .Refer to Appendix 3-A "State of Kentucky Requirements".

Except as provided in paragraphs a through c below, all transmission and feeder line mains shall have a minimum cover of thirty-six (36) inches.

a) Where main is installed in consolidated rock the minimum cover shall be twenty-four (24) inches.

b) Where an underground structure prevents installation of a transmission or F\L main with minimum cover, the transmission or feeder line main may be installed with less cover if it is provided with additional protection to withstand anticipated external loads.

c) All pipes installed in a navigable river or stream shall have a minimum cover of forty-eight (48) inches in soil or twenty-four (24) inches in consolidated rock. However, less than minimum cover is permitted in accordance with paragraph(c) of this subsection.

For further details, reference Kentucky Administrative Regulation 807 Part 5.022 and DOT CFR Title 49, Minimum Federal Safety Standards, Part 192.327.

10. If the Purchaser's Inspector deems it prudent, the depth of cover may be reduced or increased on street improvements with the approval from the Design Engineer.

11. Whenever the bottom of the trench has been excavated below the proposed elevation, the correct amount of **compacted** materials must be placed in the bottom of the ditch to provide the proper elevation.

12. The Contractor shall be responsible for damage resulting from failure to locate other underground utilities and structures prior to excavating, within House Bill guidelines.

13. The trench shall be cut so as to permit the main to pass under other utilities, drainage tiles, and other structures, where the minimum cover as specified is not available by going over such structures. **A minimum clearance of twelve (12) inches between the main and other structures shall be maintained if main is located under hard pavement, six (6) inches if in sod.** Where the minimum clearance between the gas main and other structures cannot be obtained, insulating spacers of an approved type, provided by the Purchaser, shall be used between the main and other structure to prevent cathodic issues. Joint trench requirements differ from this procedure (Refer to Gas Standard *2.18.3: Joint Electric, Gas, Telephone and CATV Installation).*

14. The Contractor shall be entitled to additional payment if an offset is required to avoid an unforeseen obstacle, either in the vertical or horizontal direction. One offset will be defined as the use of two (2) unplanned elbows.

15. Should the Contractor be required to excavate the trench to a depth greater than five (5) feet and two (2) feet greater than the planned depth as a result of non-contemplated obstructions (culverts, water main, etc.), a payment for "extra depth" will be considered.

16. The Purchaser assumes no responsibility for estimating the quantity or the type of rock excavation that may be encountered. Only limestone and other hard-stratified material in a continuous volume of at least one cubic yard will be reported as rock excavation. One continuous cubic yard is not intended to mean a specific length, width, or thickness, but a combination of these three dimensions that yield a cubic yard. Length x width x thickness is equal to more than one cubic yard or twenty-seven (27) cubic feet.

NOTE: The thickness of the rock must be greater than 6" for the entire length in question in order to receive payment for rock excavation.

17. In order to eliminate potential problems for payment of rock excavation, the Contractor and the Purchaser must agree to the amount of rock, by measuring the rock located in the sides of the ditch. The actual amount of rock must be agreed upon between the Purchaser and the Contractor prior to backfilling the ditch.

18. The trench bottom shall be smooth and free from rocks, debris and/or protrusions that may damage the pipe or coating.

19. Bank run maybe required for use as padding. Padding is defined as bank run placed below and above the pipe and will be used in soils unsuitable for backfill. The Inspector will determine the use of padding. Approved bank run will be a separate pay item and will be paid by the ton.

20. Bank run gravel used for padding shall be per ODOT 703.11 Ohio Type 2 as listed in ODOT's "Construction Material Specification" (current edition) or clean washed sand.

21. Prior to laying the pipe in trenches where imbedded rock is present, the Contractor shall be required to pad the trench bottom with a minimum of three (3) inches of finely compacted material, and/or install rock shield on the pipe, as directed by the Purchaser. Refer to Gas Standard *2.14.1: Typical Restoration Section Backfill Requirements Steel and Cast Iron* and 2.18.1: *Typical Trench Details – Polyethylene Pipe.*

22. There will be times it will be necessary to lower an existing, in service gas main. The Purchaser's Engineering Department will provide the necessary information to lower the main in a safe manner. The procedure must be followed to ensure that no excessive stresses are created on the gas main.

B. Bracing

1. The Contractor must support the sides of the trench as necessary to prevent excessive damage to the sides of the pavement and creating an undermining situation. If excessive damage to the pavement occurs, the Contractor shall perform, at his/her expense, such restoration as shall be required by the Purchaser or public authorities having jurisdiction. The Inspector shall indicate these areas on the daily work sheets. Refer to Gas Standards Section 12: *Excavations – Shoring Manual*.

2. Bracing open trenches shall be required when:

   a. Increased cover is necessary,

   a) Changes in water and moisture conditions are observed,

   b) Noticeable cracks adjacent to the ditch or within the roadway pavement,

   c) Noticeable cracking bottom heave,

   d) Trench wall deformation,

   e) Surface settlement, or

   f) As defined in the OSHA requirements.

3. Particular attention must be given to the following:

   a) Placement and removal of support system and excavated materials,

   b) Load changes in the bracing, and

   c) Physical condition of the bracing.

4. If seepage of water into the trench occurs during excavation, the following steps are to be taken:

   a) Brace the trench walls,

   b) Limit the length of the excavation to short sections and do not allow the trench to remain open overnight,

   c) Provide a drainage system along the pipeline with a proper outlet, where possible, and

d) Provide proper compaction of the ditch per the specifications listed in Section 7 "Back-fill".

C. Installation at Specified Elevations

2. A surveyor's level and rod are required and must be supplied by the Contractor on projects that specify elevations for the top of the gas main.

3. The Contractor is responsible for reading the levels and installing the pipe according to the Purchaser's survey points.

4. The Purchaser will set points on the project to be used by the Contractor to determine how deep to install the main. The Contractor should notify the Purchaser at least 10 working days prior to starting the project, so that the points can be set. If set points are disturbed, the Contractor should notify the onsite Inspector immediately so that they can be reset.

5. The points typically are marked with a "C" which indicates a cut to the top of the pipe from the set point.

6. When using an offset, the cut is normally indicated on the offset stake and must be transferred to the centerline to determine proper elevation for the top of pipe.

7. A decimal measurement such as C 3.8 should be converted to feet and inches or use a decimal tape measure/decimal survey rod.

8. To convert decimal feet to inches, multiply the decimal by twelve (12) inches. (Example: .8' = 0.8 x 12" = 10")

   To determine how deep to dig the trench add the pipe diameter and depth of padding to the cut that is marked. For example if set point says C 3.5' and six (6) inch pipe with six (6) inch sand padding is being used, the ditch should be cut to a point four and one half (4.5) foot below the set point. (C = 3.5', pipe = 0.5', padding = 0.5'; 3.5' + 0.5' + 0.5' = 4.5')

   NOTE: The ditch should be four and a half (4.5) feet below the set point. A surveyor's level should be used if the set point is not on the center line.

8. Services (both main-to-curb and curb-to-meter) should be installed at the same ELEVATION as the main on street improvement projects unless the cross sections sheets show a potential conflict. Contact Purchaser's Inspector or Gas Engineering if in doubt.

APPENDIX 3A

STATE OF KENTUCKY UNDERGROUND UTILITIES DEPTH REQUIREMENTS

KENTUCKY TRANSPORTATION CABINET
FRANKFORT, KENTUCKY 40622
WWW.KENTUCKY.GOV

ERNIE FLETCHER
GOVERNOR

MAXWELL C. BAILEY

MEMORANDUM

TO: Chief District Engineers
District Permits Personnel
District Utilities Personnel

THRU: Maxwell C. Bailey
Secretary

Marc Williams
Commissioner of Highways

J.M. Yowell
State Highway Engineer

Charles A. Knowles
Executive Director of Traffic Operations & Maintenance

Tom Schomaker
Director of Maintenance

FROM: M. Chad LaRue
Branch Manager of Permits

DATE: October 27, 2004

SUBJECT: **Revision to Permits Policy Manual-Utility Crossings-Change to Underground Utilities Depth Requirements**

This memorandum is to notify all Kentucky Transportation Cabinet personnel of the change to the required depth for underground utilities that are located on state right-of-way. This change is being done to reduce the potential for impacting underground utilities that are located on state right-of-way. The previous policy had a variance that led to inconsistency in the depth at which underground utilities have been installed throughout the state. In addition, there have been instances where sign post installation, guardrail installation, and ditching have damaged underground utilities.

Effective the date of this memorandum, section PE 202-2, page 2 of 3, under Utilities in segment Underground, in the Permits Policy Manual shall now read, "The minimum depth for underground utilities is 42" under roadways, ramps, and ditch lines and 30" in all other areas within state right-of-way. Exceptions may be made only where the terrain is such that this requirement is proved to be impractical and where a lesser depth will not interfere with highway maintenance, safety or aesthetics. It is at the discretion of the Chief District Engineer to determine where these exceptions are to be allowed."

Section PE-202-3, page 1 of 5, in the segment Underground Utilities Installed Longitudinally, shall now read, "Requirements- These utilities must be buried a minimum of 30 inches deep..." The remaining portion of this segment shall remain the same.

Section PE-202-3, page 3 of 5, under Encasement of Utilities, in the segment Conditions Where Encasement Not Required, shall now read, "3. Pipe crossings 2" in diameter and under will not require encasement provided they are buried at least 42" below bottom of ditches, shoulders, and roadway surfaces." I have also attached an updated form TC 99-10 that reflects the above change.

This policy change will be made in the Permits Policy Manual upon its next revision.

MCL

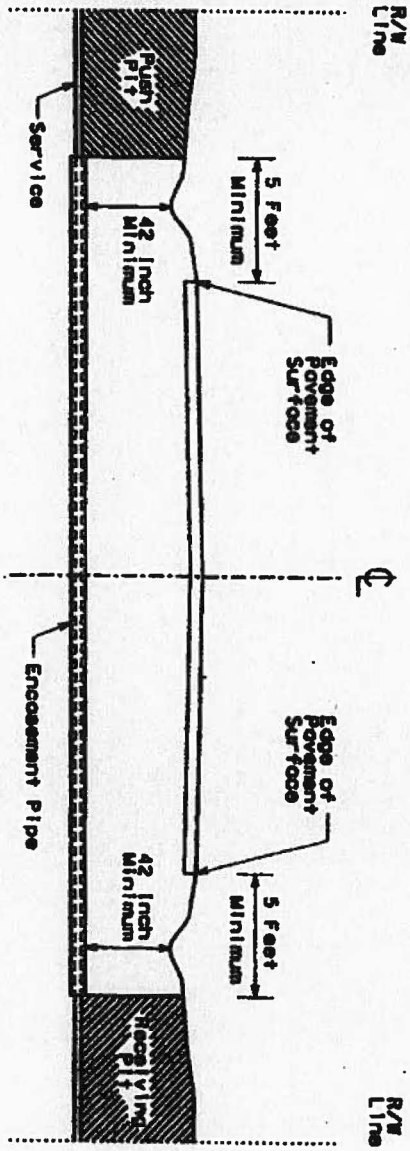
C: Central Office Division Directors

Attachment

Kentucky Transportation Cabinet
Department of Highways
Permits Branch

EXHIBIT B
TC 99-10
Rev. 9/2004

TYPICAL HIGHWAY BORING CROSSING DETAIL



1. Push Pit and Receiving Pit shall be backfilled and thoroughly compacted.
2. All ditch lines are to remain open at all times.
3. Seed and straw all disturbed areas immediately after completing the work.
4. Provide traffic control as required to insure the safety of the traveling public in accordance with the current edition of the "Manual on Uniform Traffic Control Devices".

ALL SERVICES OVER 2" IN DIAMETER SHALL REQUIRE ENCASEMENT.

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GD150
Section 4 - Installation of Steel Pipe

This specification covers the General Conditions and Technical Requirements for the storage, handling, welding and installation of steel gas mains and their associated appurtenances under contract proposal or by using Company construction forces.

A. Handling of Steel Pipe

1. Care shall be exercised during all phases of pipe handling to minimize damage to the coating as well as the beveled pipe ends.

2. If the Contractor must move the pipe, the pipe shall be loaded and secured so as to prevent undue shifting and/or flexing during transit. Stakes and chains shall be padded to prevent damage to the coating.

3. Coated pipe shall be handled with wide, non-abrasive canvas, rubber composition leather, or nylon slings. Minimum sling loads shall be as follows per 40' length of pipe:

Pipe Size	Minimum Strength Rating
12" an under	2500#
14" – 20"	5500#
24" and over	9000#

4. Slings of proper width and smoothness, as approved by the Purchaser, shall be used to prevent injury to the coating. Any slings showing signs of damage or fraying shall not be used.

5. Slings shall contain no bolts or rivets, which can come into contact with the coating. Wire rope, chains, hooks and bare cables shall not be used, except those hooks that may be used on the uncoated ends of single pipe lengths for loading and unloading purposes.

6. Skids used for supporting the coated pipe shall be free of nails or embedded rocks to insure the pipe coating is not damaged. Skids must have enough strength to safely hold the pipe in position.

B. Stringing Pipe

1. Stringing pipe shall be performed in a manner such that will not damage the ends of the pipe or the protective coating.

C. Welding

1. The joining of the steel pipe and components shall be done in accordance with the Purchaser's Qualified Welding Procedures.

2. No person shall be permitted to weld steel pipe unless they have been tested and qualified in accordance with Section 6 of API Standard 1104 (20th Edition) under the observation of a qualified Duke Energy welding supervisor. Each welder must have in his possession an up-to-date certification card. All testing will be at the Contractor's expense.

3. The contractor must have a copy of the welding specifications onsite for all steel pipeline projects, if the contractor does not have a copy, then one should be requested. F/L projects will have the welding specifications noted on the cover sheet of issued construction drawing. Contractor can question the specification if they are not in agreement with the required process.

4. Typically, pipe furnished shall be steel pipe API X-42 or X-52, Sizes 1 ¼", 2", 3", 4", 6", 8", 12", 16", 20", 24" and 30" unless otherwise specified. All pipe furnished will be double-random lengths (36'-41') mill coated with the ends beveled for welding. Fittings are Grade B unless specified otherwise. *(Refer to Gas Standard 2.1.2 - Coated Steel Pipe Inventory).*

5. The Contractor shall be required to provide all welding materials, such as correct welding rods, grinding wheels, clamps, etc. as well as other incidental materials and equipment necessary to construct the project.

6. Immediately prior to joining the pipe, each joint shall be visually inspected and, when required or specified, brushed out internally by a method approved by the Purchaser. The Contractor shall take positive measures to ensure that no foreign matter is sealed inside the main. Longitudinally welded pipe shall be joined with the welds staggered and located in the top segment of the pipe. The open ends of sections shall be closed by means of dead caps when no work is taking place on the main.

7. Production joints selected by the Purchaser that are removed from the line and found to be defective shall be replaced by the Contractor at the Contractor's expense. Welding the replacement back into the line shall be administered as if it was a test joint.

8. A qualified visual welding Inspector shall visually inspect all welds.

9. Miter joints shall not be permitted.

D. Valves and Other Appurtenances

- The Purchaser reserves the right to add valves and accessories not shown on the drawings. Payment will be the bid price if available; otherwise, a change order will be required.
- The Contractor must defer the installation of line valves until after the strength test has been successfully completed, if applicable, unless specified by the Purchaser.
- Valves to be welded into the line shall be installed in the closed position. The valve is to be opened when complete.
- Valve installation shall include valve, pressure stems, blow offs and valve box. Refer to Gas Standards 2.6.2 : *Steel Pressure Stem Installation – Distribution Systems* - and 2.6.2.1: *Steel Main Pressure Stem Installation F/L & T/L* and 2.6.1: *Steel Valve Installation*.

1. The application of cathodic protection materials and/or repairing of the coating, next to the valve, shall be included as part of the installation of the valve.

E. Direct Bury

1. The main shall be laid to the established grade with the pipe resting directly on the bottom of the trench or undisturbed soil.
2. The Contractor shall lower the main into the trench in such a fashion as not to cause any distortion or damage to the pipe, or coating. There may be some applications where the rock is so prevalent that the rock shield may have to be placed on the main prior to lowering.
3. The rock shield shall be bent to fit the curvature of the external surface of the coated pipe, and shall be secured to the pipe in such a manner as to prevent loosening or shifting during lowering-in or backfilling operations.
4. All trenches shall be visually inspected for sewer or septic facility damage. Visual inspection shall include examining both the trench and spoil for evidence of damage to sewer and septic facilities.
5. The Contractor shall remove liquids from the bottom of the trench before the main is lowered. Precautions shall be taken to prevent floating of the main, water draining into the main, and the caving of trenches.

7. In the event of excessive rainfall or subsequent bad working conditions, the Purchaser may require the Contractor to postpone operations until such time as the work can progress without excessive property damage.

6. Walking or standing on the coated pipe shall **not** be permitted.

F. Boring

1. The Contractor shall provide all necessary equipment to bore roadways and/or driveways in accordance with the Purchaser's construction drawings and specifications.

2. Where boring has been specified on the construction plans, boring will be the expected method of installation. The contractor must receive prior written approval from Gas Engineering if directional drilling is to be used in place of boring.

3. Driving of pipe will not be permitted.

4. A section of pipe will be brought beyond the exit hole and investigated for possible damage.

5. Jacking may be permitted with the agreement of the Design Engineer. All damaged main must be removed and must not be used. Any damaged coating must be repaired before acceptance. The Purchaser assumes no responsibility for failed attempts.

6. "Boring-With Casing" includes all excavation, hand or otherwise, required for placing the casing inside the bore including the bore pit. The bore is to be installed per design at the designated depth. The new casing must be positioned in such a fashion that no additional fittings will be required on the new main and that there will be no undue stress placed on the new main when installed. All casing joints must be welded per Duke Energy's welding standards to prevent water from entering the casing.

7. "Boring-With Casing" shall include the installation of all insulators, seals, and vents, if required. Refer to Gas Standard *2.12.1: New Steel Pipeline Cased Crossings for Railroad and Highway Crossings.*

8. Tunneling shall be done only upon agreement with the Purchaser. Tunneling must be performed in a manner as specified by the Purchaser or public authorities. The Contractor shall provide all adequate shoring for trenches and boxing for tunnels where necessary upon agreement with the Purchaser. The Contractor must have a competent person on site to ensure OSHA Shoring Regulations are being followed.

9. The borehole size must be at least the next pipe diameter larger than the pipe size being installed.

10. The borehole will not be used any time that the bore causes the pavement to hump.

11. All bores shall be installed per depth listed on the "issued" drawing. If the depth is not listed, it must be assumed that a cover of 3 feet will be required.

12. All bores must be installed within +/- one (1) foot horizontally of the designed location unless specifically authorized in writing by the Purchaser.

13. Before a main/casing is installed by boring, the location and depth of all existing utilities and sewer laterals must be determined. A plan showing the location of existing sewer laterals must be submitted to the Purchaser and approved prior to the Contractor performing the bore. Acceptable methods for locating the existing sewer laterals are a camera/sonde or by physically uncovering the lateral.

G. Horizontal Directional Drilling (HDD)

1. Because the HDD of steel main is typically done to cross bodies of water, the necessity to dig pot hole is lessened; however the location of neighboring utilities must be taken into consideration when deciding on the new gas main's alignment.

2. Gas Engineering must be notified before any attempts are made to HDD a steel main that was **not** considered in the original design.

3. The main used in the HDD must be coated with an adequate thickness of Powerecrete, or equivalent, to minimize the potential destruction of the protective coating. Refer to Gas Standard *2.1.2 - Coated Steel Pipe Inventory.*

4. The minimum bending radius of the proposed main, as determined by Gas Engineering, must not be exceeded.

H. Field Bending

1. The Contractor shall make all necessary field bends by means of a bending machine with the appropriate mandrels and shoes to create a smooth bent pipe free of any mechanical damage, per Pipeline Safety Regulations §192.313:

   a) Each field bend in steel pipe, other than a wrinkle bend made in accordance with §192.315, must comply with the following:

      (1) A bend must not impair the serviceability of the pipe.

(2) Each bend must have a smooth contour and be free from buckling, cracks, or any other mechanical damage.

(3) On pipe containing a longitudinal weld, the longitudinal weld must be as near as practicable to the neutral axis of the bend unless:

(i) The bend is made with an internal bending mandrel; or

(ii) The pipe is 12 inches (305 millimeters) or less in outside diameter or has a diameter to wall thickness ratio less than 70.

(b) Each circumferential weld of steel pipe which is located where the stress during bending causes a permanent deformation in the pipe must be nondestructively tested either before or after the bending process.

(c) Wrought-steel welding elbows and transverse segments of these elbows may not be used for changes in direction on steel pipe that is 2 inches (51 millimeters) or more in diameter unless the arc length, as measured along the crotch, is at least 1 inch (25 millimeters).

Pre-formed welding elbows, provided by Purchaser, will also be accepted.

2. Adjustments to the ditch are not acceptable to eliminate a planned field bend.

3. Wrinkle bends shall not be permitted, (Pipeline Safety Regulations §192.315). The cost for the replacement of damaged pipe, as a result of improper bending, will be charged to the Contractor.

4. A bend must not impair the serviceability of the pipe.

5. On pipe containing a longitudinal weld, the weld must be as near as practicable to the neutral axis of the bend unless:

   i. The bend is made with an internal bending mandrel.
   a) The pipe is twelve (12) inches or less in outside diameter, or has a diameter to wall thickness ratio less than seventy (70).

6. Cold bent pipe sections shall not include a circumferential weld, unless the weld is subject to radiographic examination after bending.

I. Pipe Defects

1. Should pipe defects be discovered such as sharp or deep gouges and dents and/or mill defects, they will evaluated and a repair option selected for the pipe body gouge

and/or mill defect.

CAUTION: Defects such as sharp or deep gouges and dents may have cracked during service and need to be handled with caution. Lowering the pressure is recommended when evaluating and repairing.

Reference Procedure GD70.06.019 *Pipeline Defect Evaluation and Repair*

DUKE ENERGY.

GD150
Section 5 - Cathodic Protection

The cathodic protection system shall be installed as indicated on the construction prints. The cathodic protection system installation is one of the most important aspects of the steel gas main installation because of the critical corrosion protection it provides to the gas mains.

A. Anode Installation

1. Magnesium Anodes (Sacrificial Anodes) shall be installed at the location or spaced center-to-center as indicated on the construction prints or Duke Energy Inspector. It is important to understand that when SWPC pipe is installed sacrificial anodes are a mandatory requirement unless a rectifier system is present. Refer to Gas Standard *7.5.3 - Magnesium Anode (3# to 50#) Installation for New or Existing Steel Gas Pipeline.*

CAUTION: Under no circumstances shall magnesium anodes be installed within 2 feet of a weld joint.

B. Insulating Joints

1. The Corrosion Engineer will determine the location of all insulated joints.

2. All insulating materials shall be cleaned and dried thoroughly before installation. Extreme care shall be exercised to insure that no electrical conducting path exists between the mating flanges.

3. The flange insulation shall be installed as shown on Gas Standard *7.6.2: Flanged Insulating Joint for Flat Face or Raised Face Flanges*.

4. Compression type insulating couplings shall be installed in accordance with the manufacturer's recommendations. Pipe ends and gaskets shall be thoroughly cleaned and dried. After installation, a thorough coating of pipe coating material, compatible with that on the adjacent pipe shall be used to protect the couplings.

5. Immediately after installation of each insulating joint, the completed joint shall be tested by a method approved by the Corrosion Engineer to ensure that no current conducting path exists across the joint.

6. The Contractor shall install a cathodic test wire on each side of the insulating joint that is to be buried. Test wires shall terminate inside the valve box or cathodic terminal box, whichever, is indicated in the construction drawings.

C. Coupling Bonds

1. Electrical shunts, known as coupling bonds, shall be installed across each compression type coupling except when armored or insulating gaskets are used to make up the joint.

2. Coupling bonds shall be formed by the Contractor from insulated copper wire. Connections to the pipe shall be made by thermite welding. Refer to Gas Standard *7.7.13 - Cathodic Protection Bonding of Coupling*.

3. After installation of the bond, the entire bond assembly shall be given two coats of an approved pipe coating for protection against galvanic action.

D. Test Connection Installations

1. The Contractor shall install test connections in accordance with Gas Standard *7.7.1 - Cathodic Protection Test Box Locations* at locations specified on the construction drawings or as indicated by the Purchaser's Inspector. The Design Engineer may specify that the loose end of the wire be placed in an existing valve or syphon box, in place of a separate box.

2. The cathodic protection test station shall be installed at the locations indicated on construction prints. It is important to understand that when SWPC pipe is installed, test stations/connections are a mandatory requirement with no exceptions. The following type of test stations/connections shall be installed in accordance with the following Duke Energy Gas Standards:

   a) Gas Standard *7.7.2 - Test Connection For Pipeline Crossings*

   b) Gas Standard *7.7.4.1 - Above Grade Test Station For Transmission & Distribution Main*

   c) Gas Standard *7.7.4.2 - Grade Level in Sod Test Station for Transmission & Distribution Mains*

   d) Gas Standard *7.7.4.3 - Hard Paved Grade Test Station for Transmission & Distribution Mains*

CAUTION: Under no circumstances shall test station/connection be installed within 2 feet of a weld joint.

3. It is very important that the cad weld connection for test stations or magnesium anodes be coated. If the coating is not installed properly, the coating will disbond and create a cathodic shielding condition. The cathodic protection current is unable to