| TYPE | YEAR | PROJECT NO. | SHEET NO. |
|---|---|---|---|
| CONSTRUCTION | 2014 | STP-101(16) | U3-1 |
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CUMBERLAND COUNTY

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SHT NO. U3-5 STA 89+00-102+00
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LAKEVIEW DRIVE
SHT NO. U3-18 DETAILS
SHT NO. U3-19 DETAILS
SHT NO. U3-20 DETAILED SPECIFICATIONS


| ITEM NUMBER | DESCRIPTION | UNIT | QUANTITY | FOOTNOTES TO THE ITEM TO BE SHOWN ON PLANS/SPECS |
|---|---|---|---|---|
| | | | | (NUMBERED FOOTNOTES LOCATED AT THE BOTTOM OF THIS ITEM LIST) |
| 791-02.01 | <2 IN MDPE GAS MAIN | L.F. | 450 | FOOTNOTE - 1 |
| 791-02.02 | 2 IN MDPE GAS MAIN | L.F. | 475 | FOOTNOTE - 1 |
| 791-02.04 | 4 IN MDPE GAS MAIN | L.F. | 810 | FOOTNOTE - 1 |
| 791-02.05 | 6 IN MDPE GAS MAIN | L.F. | 14500 | FOOTNOTE - 1 |
| 791-04.10 | HDD <2 IN PE PIPE ROCK | L.F. | 2200 | FOOTNOTE - 2 |
| 791-04.13 | HDD 4 IN PE PIPE ROCK | | 400 | FOOTNOTE - 2 |
| 791-04.14 | HDD 6 IN PE PIPE ROCK | L.F. | 200 | FOOTNOTE - 2 |
| 791-04.15 | HDD 8 IN PE PIPE ROCK | L.F. | 200 | FOOTNOTE - 2 |
| 791-06.01 | CONNECT TO 1-1/4 IN EX. PE MAIN | EACH | 2 | FOOTNOTE - 4 |
| 791-06.02 | CONNECT TO 2 IN EX. PE MAIN | EACH | 3 | FOOTNOTE - 4 |
| 791-06.03 | CONNECT TO 4 IN EX. PE. MAIN | EACH | 7 | FOOTNOTE - 4 |
| 791-06.09 | CONNECT TO 1 IN EX. PE MAIN | EACH | 1 | FOOTNOTE - 4 |
| 791-07.03 | 6 IN PE GAS VALVE ASSEMBLY | EACH | 3 | FOOTNOTE - 5 |
| 791-8.02 | 3/4 IN SERVICE ASSEMBLY | L.F. | 2620 | FOOTNOTE - 6 |
| | | | | |

FOOTNOTE 1:
INCLUDES ALL MATERIALS INCLUDING SAND/STONE BEDDING, FLOWABLE FILL, TEMPORARY PAVEMENT IN OR OUT OF ROW, LABOR EQUIPMENT FOR COMPLETE INSTALLATION OF PIPE INCLUDING BUT NOT LIMITED TO TRAFFIC CONTROL, EXCAVATION INCLUDING DIRT/ROCK, BACKFILLING, CREEK CROSSING PER SWPPP, COUPLINGS, FITTINGS, PIPE FUSION, APPURTENANCES, MAINTAINING THE TRENCH, PURGE POINT INSTALLATION, TESTING BY UTILITY SPECIFICATIONS TO INCLUDE BUT NOT LIMITED TO AIR, NITROGEN, HYDROSTATIC OR X-RAY, DEW POINT OR DRYING, AND ANY OTHER LABOR OR MATERIAL REQUIRED TO COMPLETE THE WORK AS SPECIFIED ON THE PLANS.

FOOTNOTE 2:
INCLUDES ALL MATERIALS, LABOR, EQUIPMENT, AND TRAFFIC CONTROL, INCLUDING BUT NOT LIMITED TO FLUID CONTAINMENT FOR COMPLETE HORIZONTAL DIRECTIONAL DRILLING INSTALLATION OF CASING PIPE OR UNCASED CARRIER PIPE IN BOTH UNCONSOLIDATED SOIL OR ROCK. STEEL PIPE INCLUDES SPECIAL COATING AS SPECIFIED ON PLANS AND SPECS. IF CASING PIPE HAS CARRIER PIPE, THE CARRIER PIPE SHALL BE PAID AT THE OPEN CUT ITEM PRICE.

FOOTNOTE 4:
INCLUDES ALL MATERIALS, LABOR, AND EQUIPMENT, NECESSARY FOR CONNECTING TO EXISTING GAS LINE INCLUDING TRAFFIC CONTROL.

FOOTNOTE 5:
INCLUDES TRANSITION FITTINGS, VALVES, VALVE BOX, BOX ADJUSTMENT, VALVE BOX COLLAR, VALVE MARKER, EXCAVATION, BEDDING, BACKFILL, COUPLINGS, FUSION TEES, TAP OF EXISTING LINE, AND ALL OTHER NECESSARY MATERIALS AND LABOR FOR COMPLETE INSTALLATION OF ASSEMBLY INCLUDING TRAFFIC CONTROL.

FOOTNOTE 6:
INCLUDES ALL MATERIALS, PARTS, LABOR, EQUIPMENT, MACHINERY, TOOLS, OR APPARATUS NECESSARY FOR INSTALLATION OF GAS SERVICE ASSEMBLIES AS DESCRIBED IN THE PLANS AND SPECS. INSTALLATION FOR LONG SIDE AND SHORT SIDE APPLICATIONS. SERVICE PIPE SHALL BE PAID PER LINEAR FOOT INSTALLED.

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UCGUD MAY BE CONTACTED AT 931-484-9380.

UTILITY INFORMATION

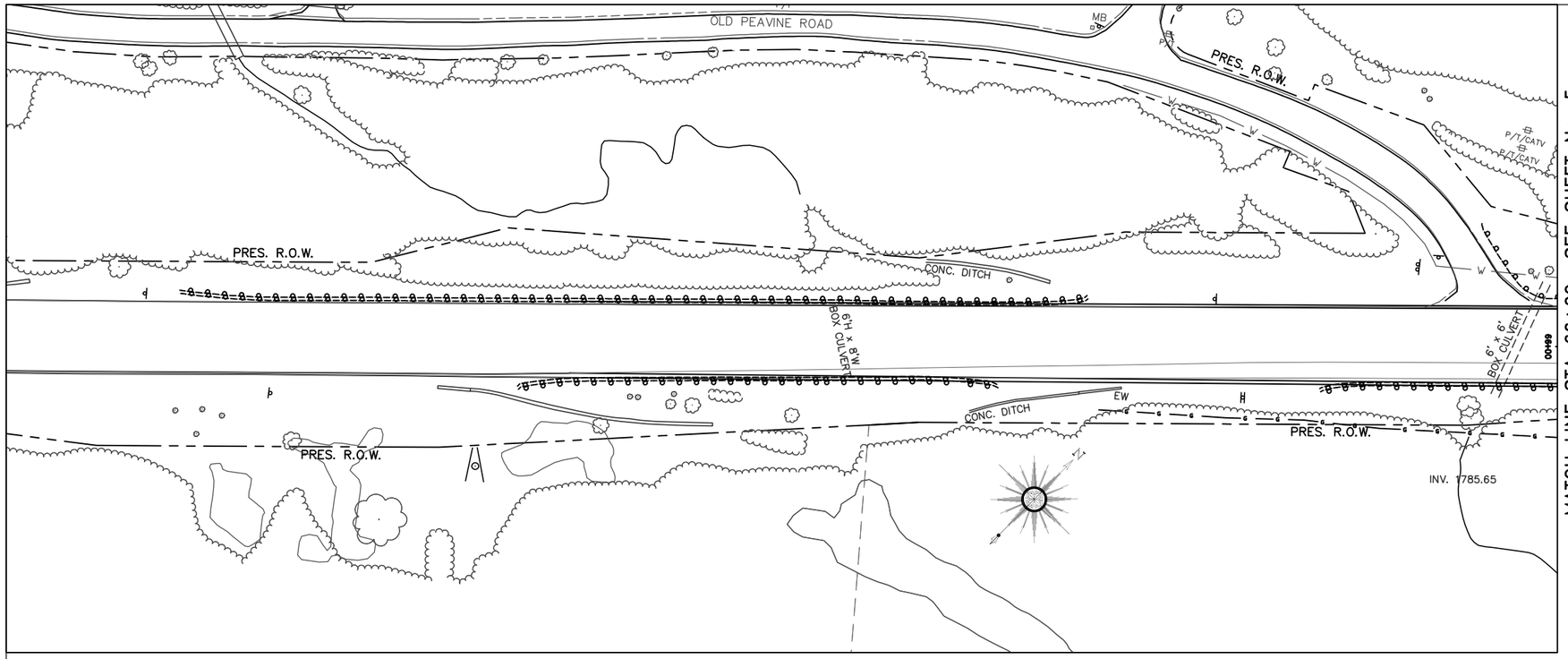
UPPER CUMBERLAND GAS UTILITY DISTRICT
POST OFFICE BOX 807
CROSSVILLE, TENNESSEE 38577
(931) 484-9380
CONTACT: CHARLES HERCHER

UPPER CUMBERLAND GAS UTILITY DISTRICT
POST OFFICE BOX 807
CROSSVILLE, TENNESSEE 38577

S.R. 101 (PEAVINE ROAD)
GAS LINE RELOCATION

FECS
FIELD'S ENGINEERING CONSULTANT SERVICES,LLC
77 COTHER STREET
CROSSVILLE, TENNESSEE 38555
(931) 456-6071

NOTES & UTILITY OWNER




| TYPE | YEAR | PROJECT NO. | SHEET NO. |
|---|---|---|---|
| CONSTRUCTION | 2014 | 18038-2237-14 | U3-2 |
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| | | | |

CUMBERLAND COUNTY

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NO GAS LINE RELOCATION IN THIS AREA

**CALL BEFORE YOU DIG**

UTILITIES PROTECTION CENTER

IN

TENNESSEE

CALL

1 - 800 - 351 - 1111

THREE WORKING DAYS BEFORE YOU DIG

IT IS THE CONTRACTORS RESPONSIBILITY TO CONTACT UTILITY COMPANIES PRIOR TO ANY CONSTRUCTION. THE LOCATION OF UTILITIES SHOWN ON THESE PLANS ARE APPROXIMATE AND POSSIBLY INCOMPLETE. THEREFORE CERTIFICATION TO THE LOCATION OF ALL UNDERGROUND UTILITIES IS WITHHELD.

UPPER CUMBERLAND GAS UTILITY DISTRICT
POST OFFICE BOX 807
CROSSVILLE, TENNESSEE 38577

S.R. 101 (PEAVINE ROAD)
GAS LINE RELOCATION

FECS
FIELD'S ENGINEERING CONSULTANT SERVICES
77 COTHER STREET
CROSSVILLE, TENNESSEE 38555
(931) 456-6071

STA. 56+00 TO STA. 66+00
SCALE: 1"=50' H
1"=10' V

| TYPE | YEAR | PROJECT NO. | SHEET NO. |
|---|---|---|---|
| CONSTRUCTION | 2014 | 18038-2237-14 | U3-3 |
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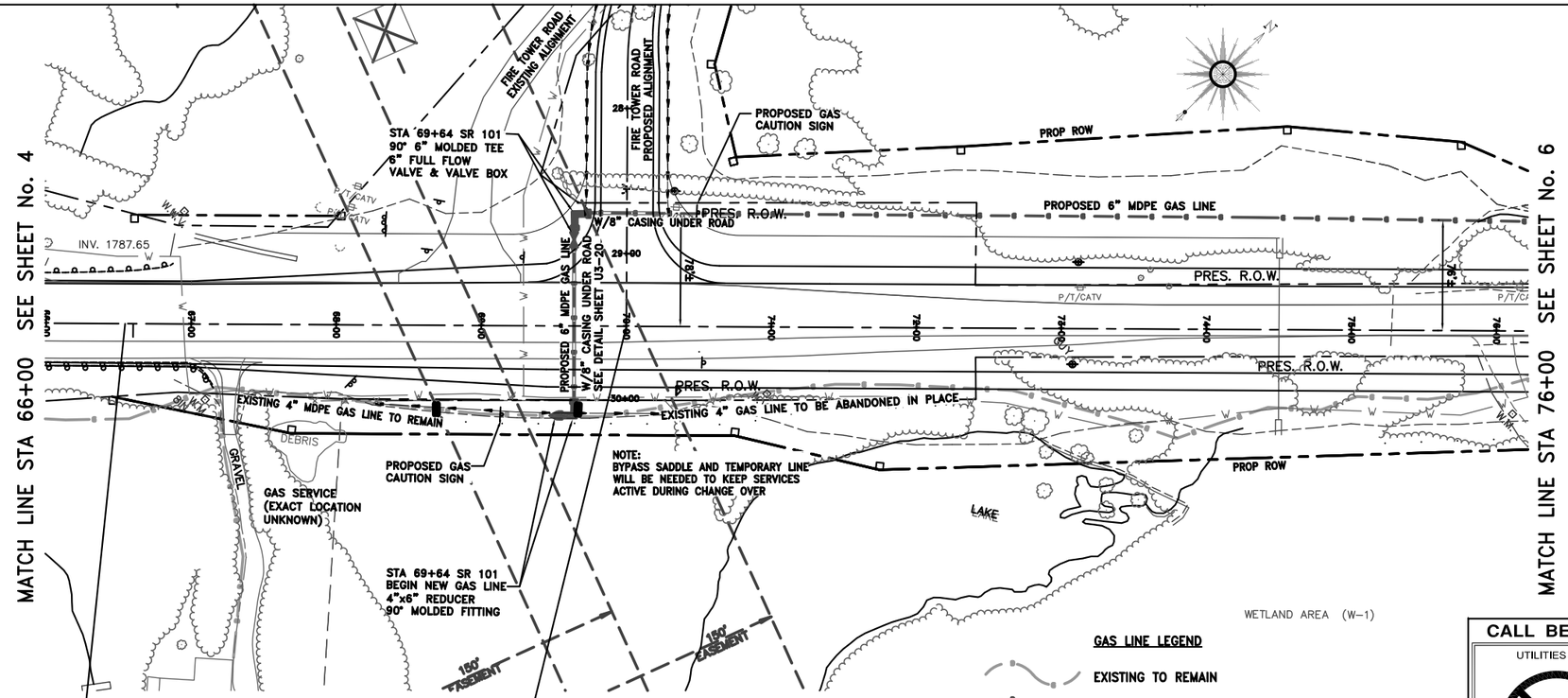
CUMBERLAND COUNTY




BEGIN PROJECT No. 18038-2237-14 (ROW)
STA. 66+54.40

STA. 70+00.00 S.R. 101
STA. 29+50.00 FIRETOWER RD.
N 902565.2800
E 2276222.3070
Δ = 90°00'00" RT.

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**GAS LINE LEGEND**

- EXISTING TO REMAIN
- NEW INSTALLATION
- TEMPORARY RELOCATION
- TO BE REMOVED OR ABANDONED IN PLACE
- GS — EXISTING GAS SERVICE TO BE RECONNECTED
- EXISTING UTILITY DATA AS PROVIDED BY TDOT

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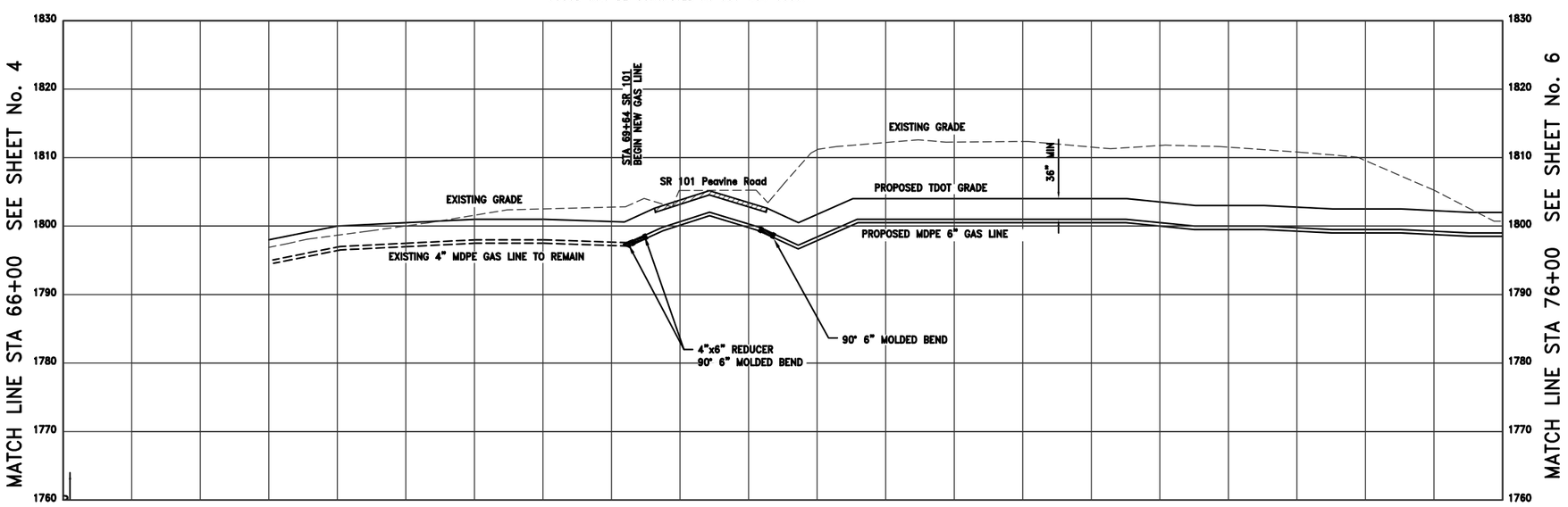


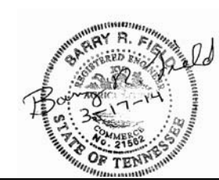


UPPER CUMBERLAND GAS UTILITY DISTRICT
POST OFFICE BOX 807
CROSSVILLE, TENNESSEE 38577

S.R. 101 (PEAVINE ROAD)
GAS LINE RELOCATION

FECS
FIELD'S ENGINEERING CONSULTANT SERVICES
77 COTHER STREET
CROSSVILLE, TENNESSEE 38555
(931) 456-6071

STA. 66+00 TO STA. 76+00
SCALE: 1"=50' H
1"=10' V

| TYPE | YEAR | PROJECT NO. | SHEET NO. |
|---|---|---|---|
| CONSTRUCTION | 2014 | 18038-2237-14 | U3-4 |
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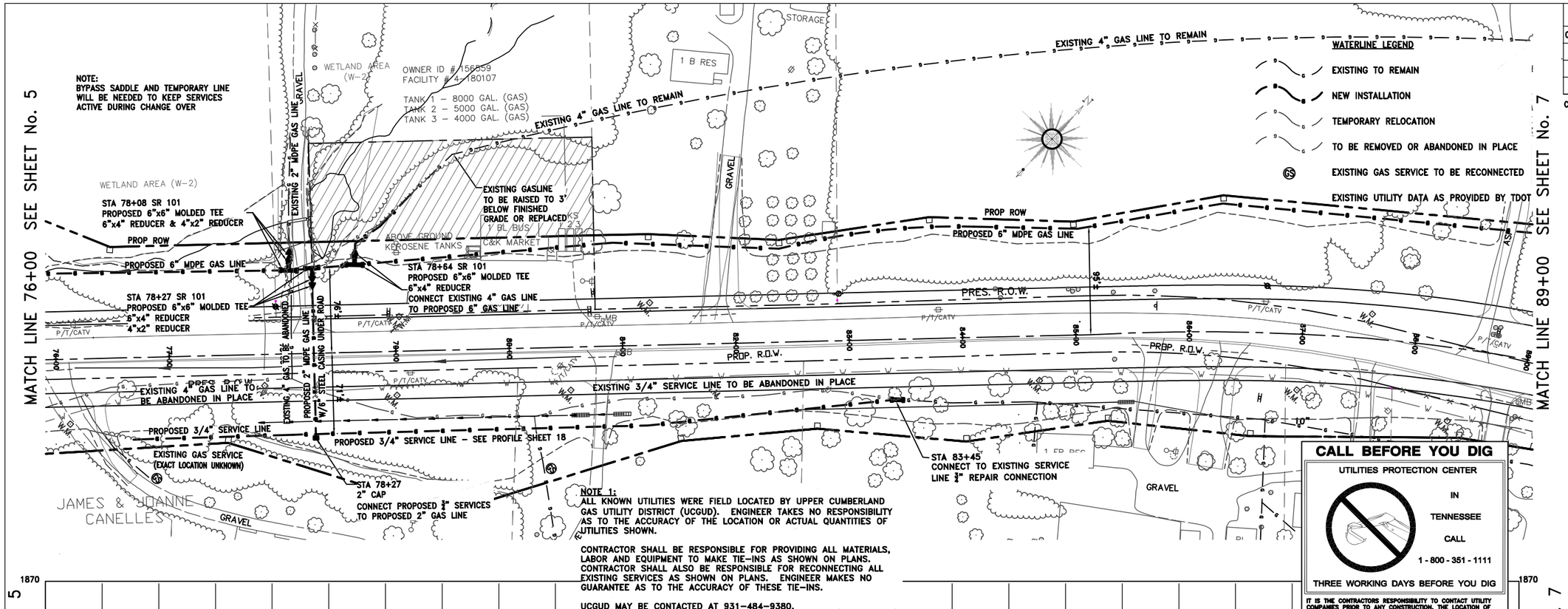
CUMBERLAND COUNTY

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IN

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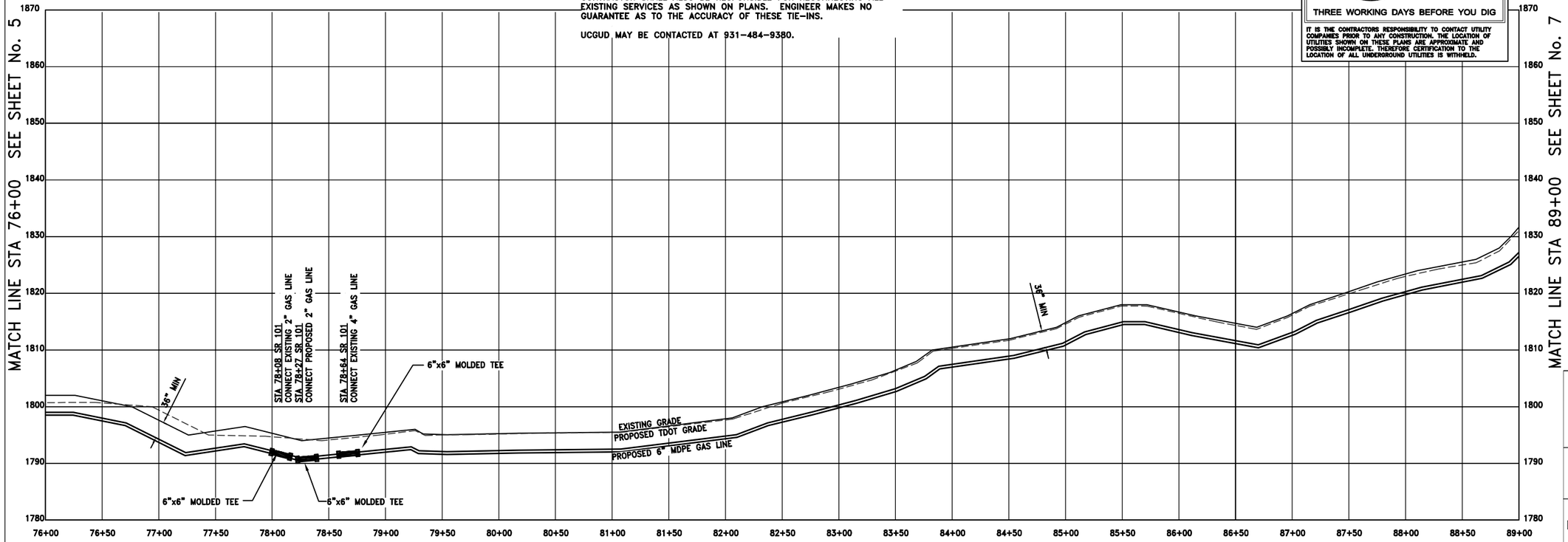

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POST OFFICE BOX 807
CROSSVILLE, TENNESSEE 38577

S.R. 101 (PEAVINE ROAD)
GAS LINE RELOCATION

FECS
FIELD'S ENGINEERING CONSULTANT SERVICES
77 COTHER STREET
CROSSVILLE, TENNESSEE 38555
(931) 456-6071

STA. 76+00 TO STA. 89+00
SCALE: 1"=50' H
1"=10' V

| TYPE | YEAR | PROJECT NO. | SHEET NO. |
|---|---|---|---|
| CONSTRUCTION | 2014 | 18038-2237-14 | U3-5 |
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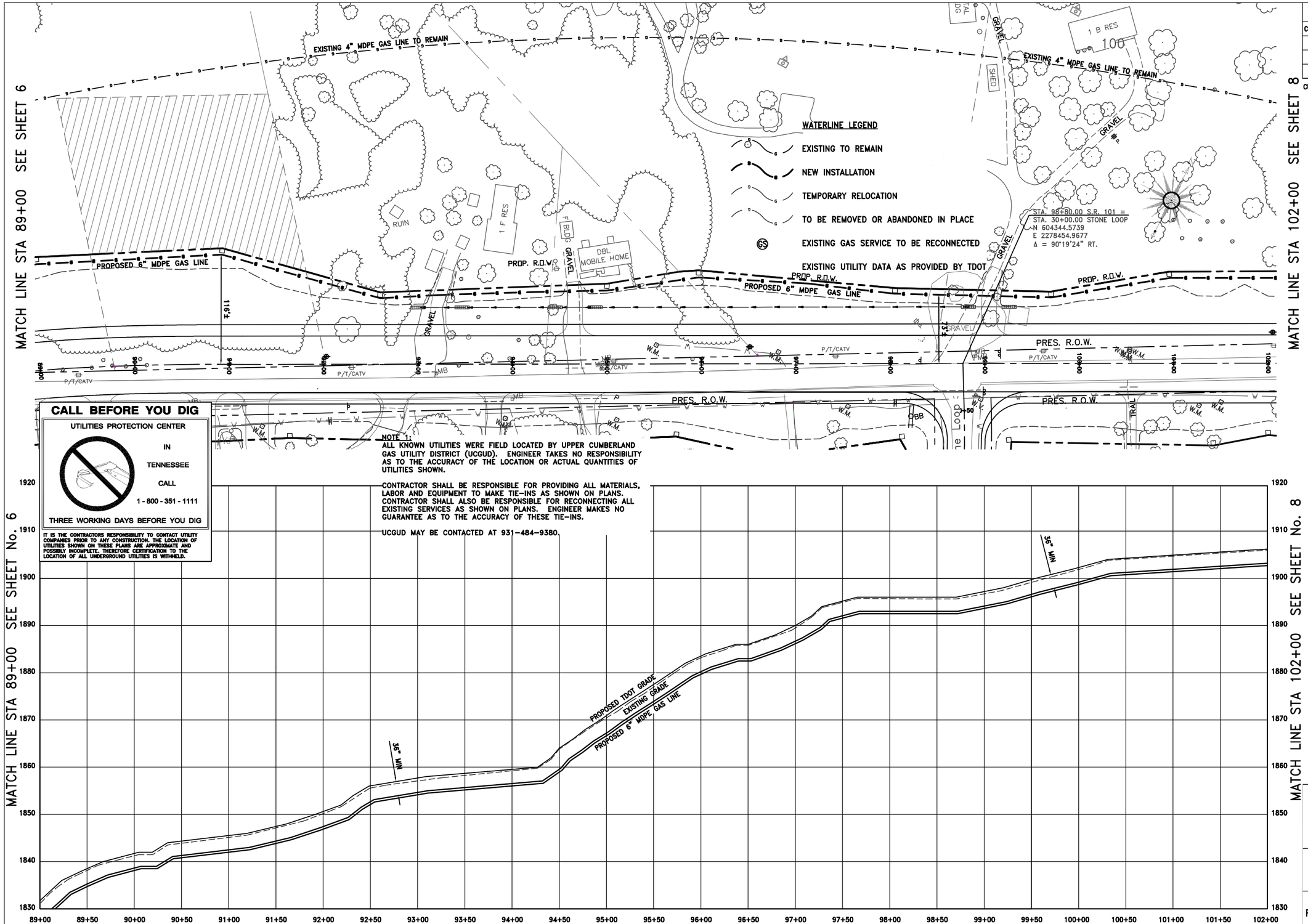
CUMBERLAND COUNTY



UPPER CUMBERLAND GAS UTILITY DISTRICT
POST OFFICE BOX 807
CROSSVILLE, TENNESSEE 38577

S.R. 101 (PEAVINE ROAD)
GAS LINE RELOCATION

FECS
FIELD'S ENGINEERING CONSULTANT SERVICES
77 COTHER STREET
CROSSVILLE, TENNESSEE 38555
(931) 456-6071

STA. 89+00 TO STA. 102+00
SCALE: 1"=50' H
1"=10' V

| TYPE | YEAR | PROJECT NO. | SHEET NO. |
|---|---|---|---|
| CONSTRUCTION | 2014 | 18038-2237-14 | U3-6 |
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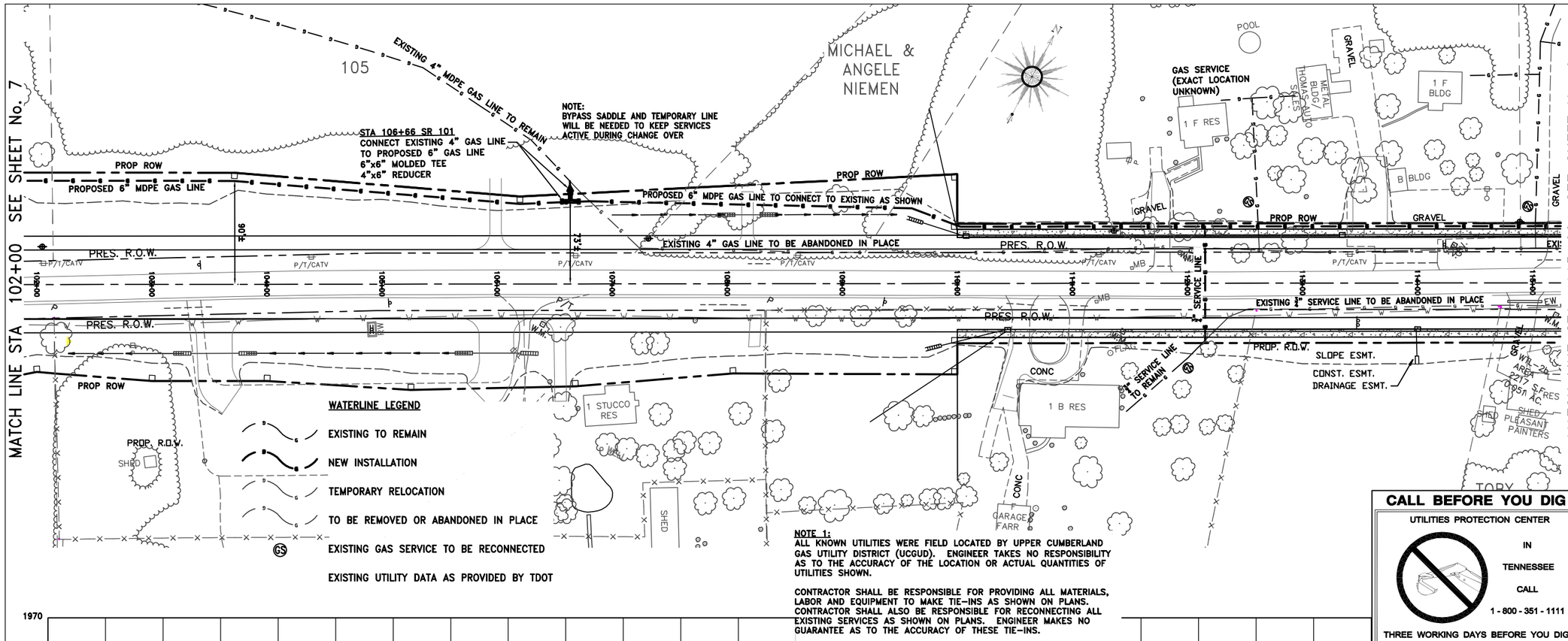
CUMBERLAND COUNTY

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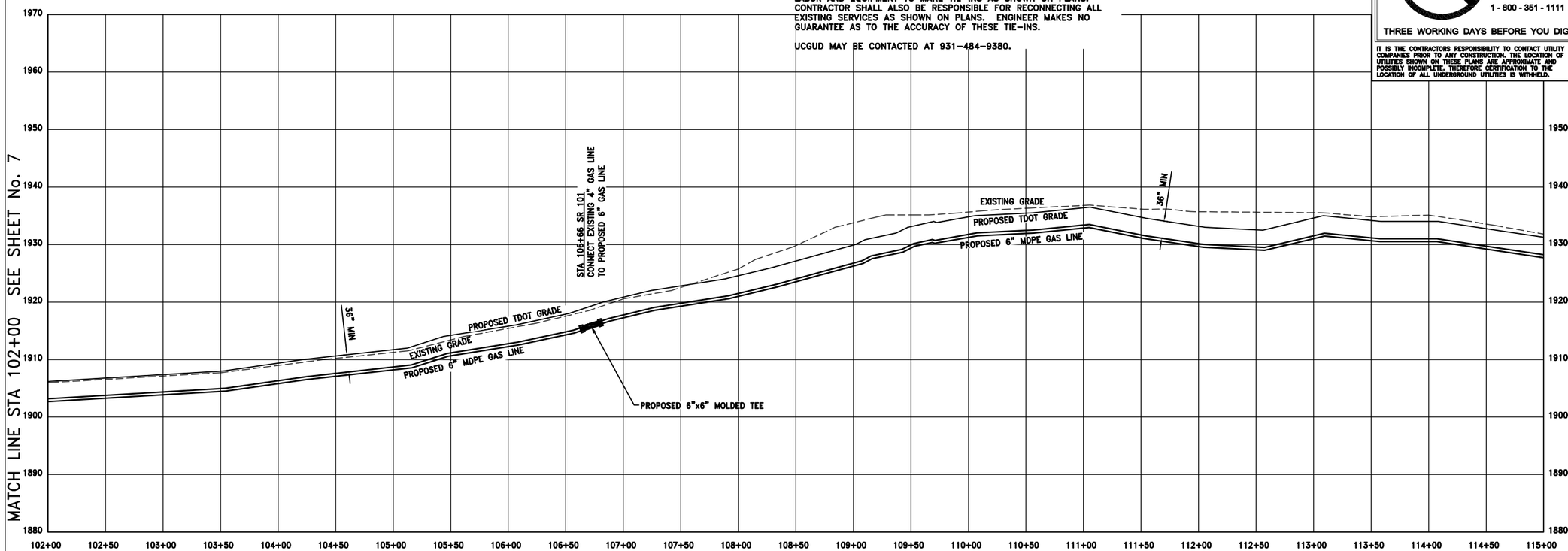

UPPER CUMBERLAND GAS UTILITY DISTRICT
POST OFFICE BOX 807
CROSSVILLE, TENNESSEE 38577

S.R. 101 (PEAVINE ROAD)
GAS LINE RELOCATION

FECS
FIELD'S ENGINEERING CONSULTANT SERVICES
77 COTHER STREET
CROSSVILLE, TENNESSEE 38555
(931) 456-6071

STA. 102+00 TO STA. 115+00
SCALE: 1"=50' H
1"=10' V

| TYPE | YEAR | PROJECT NO. | SHEET NO. |
|---|---|---|---|
| CONSTRUCTION | 2014 | 18038-2237-14 | U3-7 |
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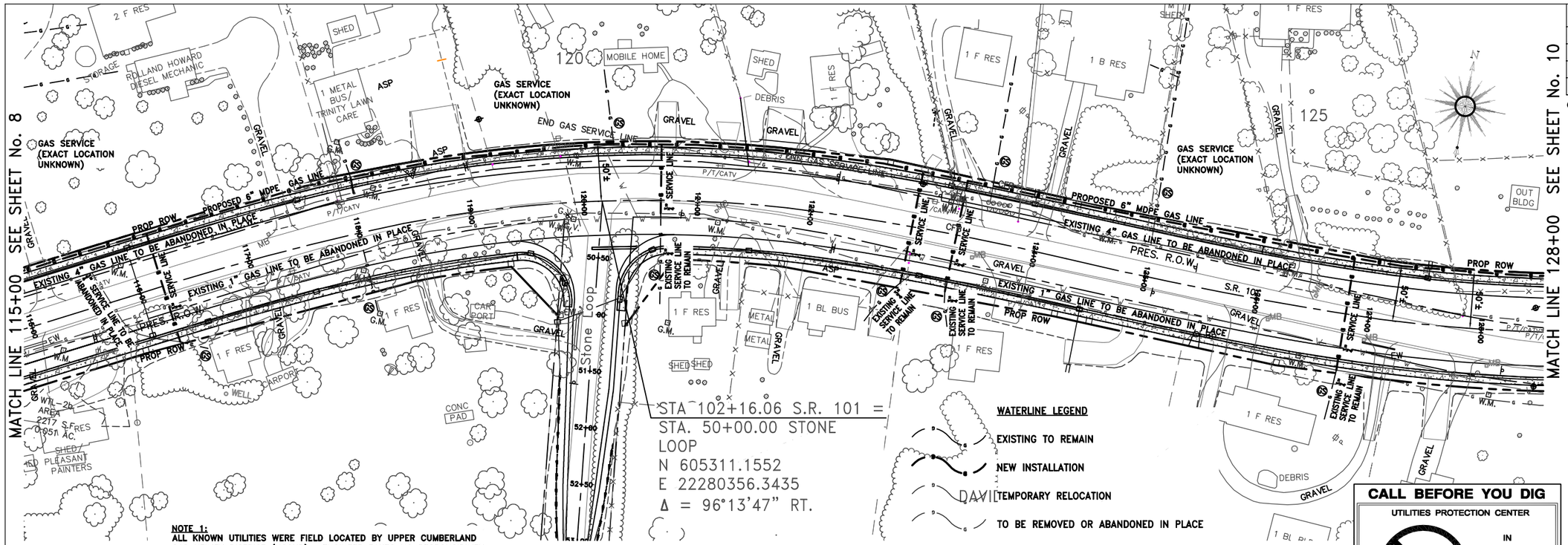
CUMBERLAND COUNTY




**WATERLINE LEGEND**

- EXISTING TO REMAIN
- NEW INSTALLATION
- TEMPORARY RELOCATION
- TO BE REMOVED OR ABANDONED IN PLACE
- GS EXISTING GAS SERVICE TO BE RECONNECTED
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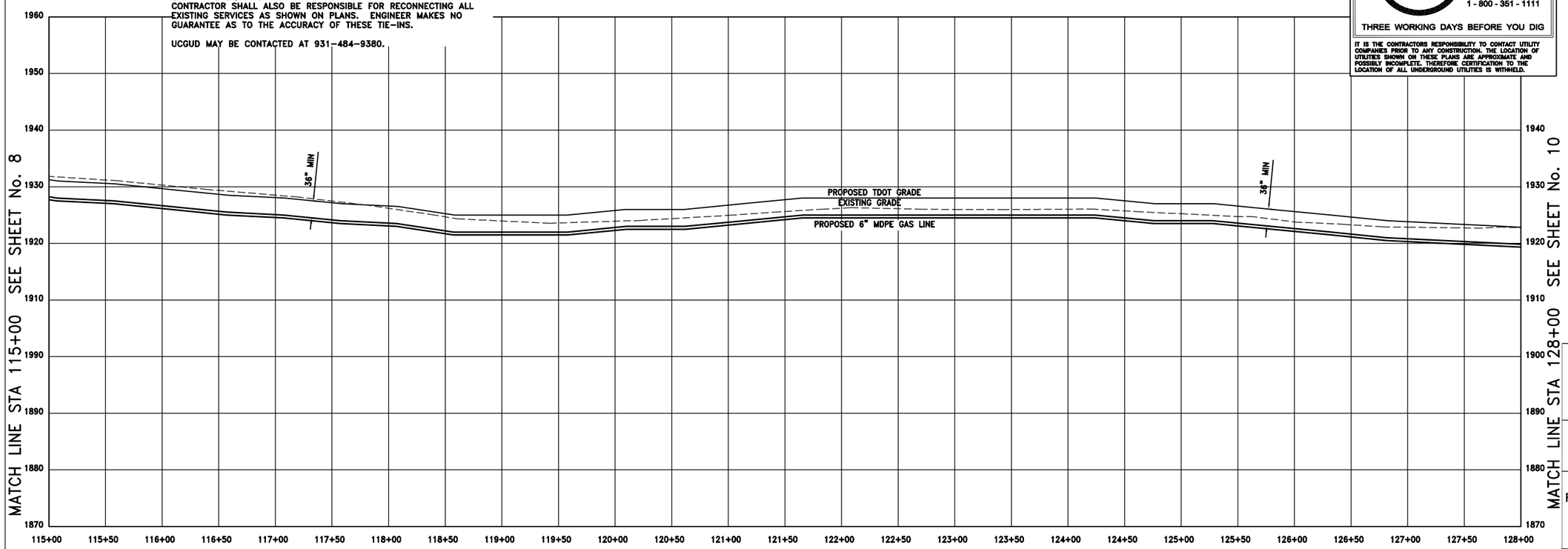


BARRY R. FIELD REGISTERED ENGINEER No. 21562 STATE OF TENNESSEE

Boyd Andrews 3-17-14

UPPER CUMBERLAND GAS UTILITY DISTRICT
POST OFFICE BOX 807
CROSSVILLE, TENNESSEE 38577

S.R. 101 (PEAVINE ROAD)
GAS LINE RELOCATION

FECS
FIELD'S ENGINEERING CONSULTANT SERVICES
77 COTHER STREET
CROSSVILLE, TENNESSEE 38555
(931) 456-6071

STA. 115+00 TO STA. 128+00
SCALE: 1"=50' H
1"=10' V

| TYPE | YEAR | PROJECT NO. | SHEET NO. |
|---|---|---|---|
| CONSTRUCTION | 2014 | 18038-2237-14 | U3-8 |
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CUMBERLAND COUNTY

**WATERLINE LEGEND**

- EXISTING TO REMAIN
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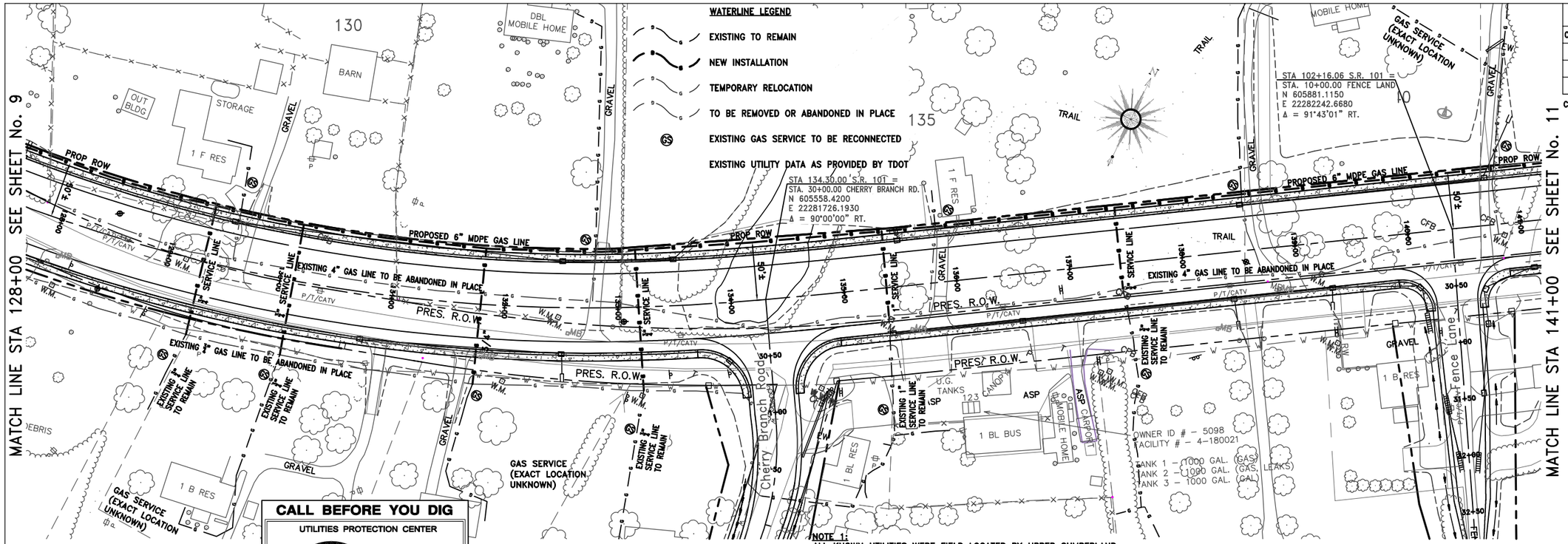
- TO BE REMOVED OR ABANDONED IN PLACE
- EXISTING GAS SERVICE TO BE RECONNECTED
- EXISTING UTILITY DATA AS PROVIDED BY TDOT

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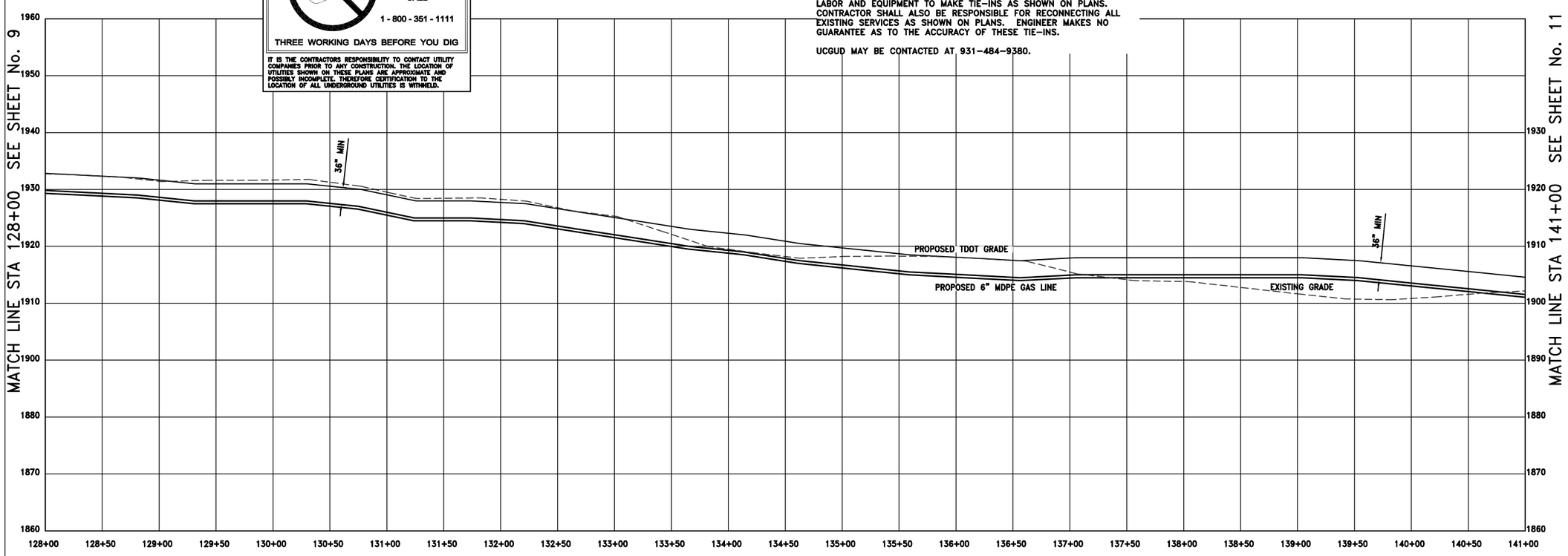


BARRY R. FIELD REGISTERED ENGINEER No. 21562 STATE OF TENNESSEE

8-17-14

UPPER CUMBERLAND GAS UTILITY DISTRICT
POST OFFICE BOX 807
CROSSVILLE, TENNESSEE 38577

S.R. 101 (PEAVINE ROAD)
GAS LINE RELOCATION

FECS
FIELD'S ENGINEERING CONSULTANT SERVICES
77 COTHER STREET
CROSSVILLE, TENNESSEE 38555
(931) 456-6071

STA. 128+00 TO STA. 141+00
SCALE: 1"=50' H
1"=10' V

| TYPE | YEAR | PROJECT NO. | SHEET NO. |
|---|---|---|---|
| CONSTRUCTION | 2014 | 18038-2237-14 | U3-9 |
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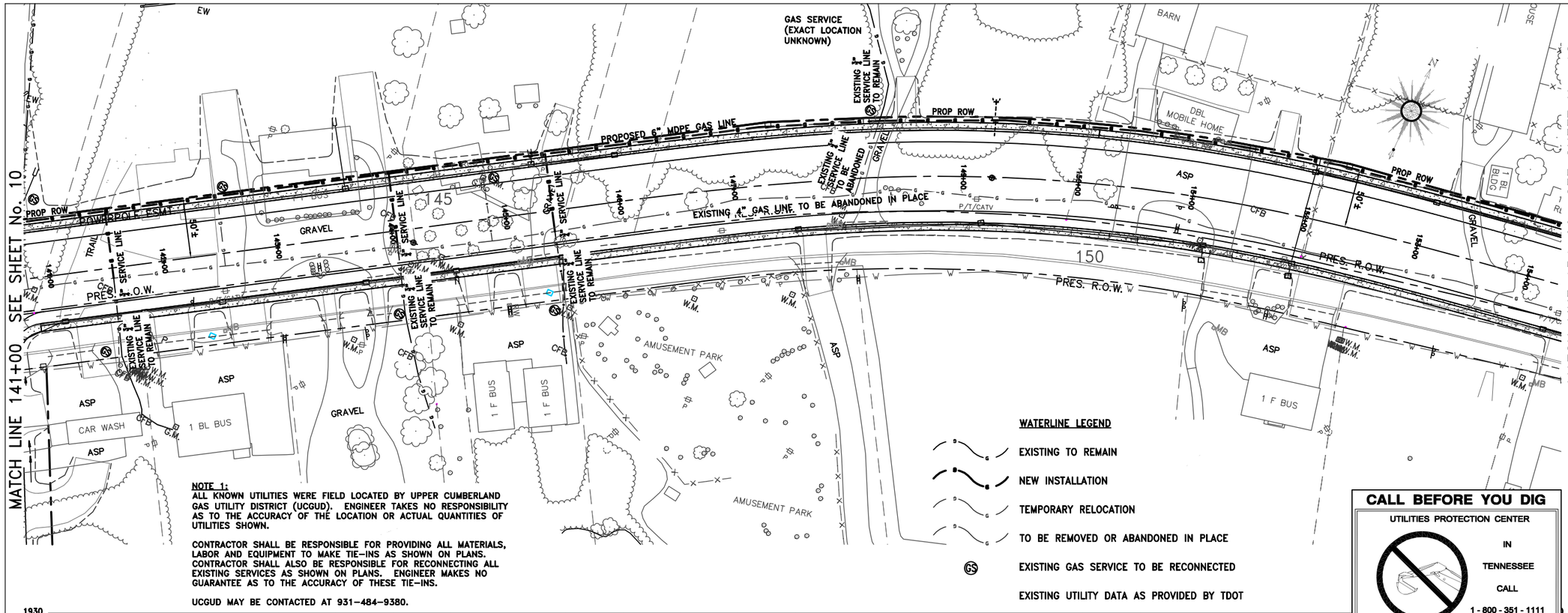
CUMBERLAND COUNTY

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- TEMPORARY RELOCATION
- TO BE REMOVED OR ABANDONED IN PLACE
- GS — EXISTING GAS SERVICE TO BE RECONNECTED
- EXISTING UTILITY DATA AS PROVIDED BY TDOT

**CALL BEFORE YOU DIG**

UTILITIES PROTECTION CENTER

IN TENNESSEE

CALL

1 - 800 - 351 - 1111

THREE WORKING DAYS BEFORE YOU DIG

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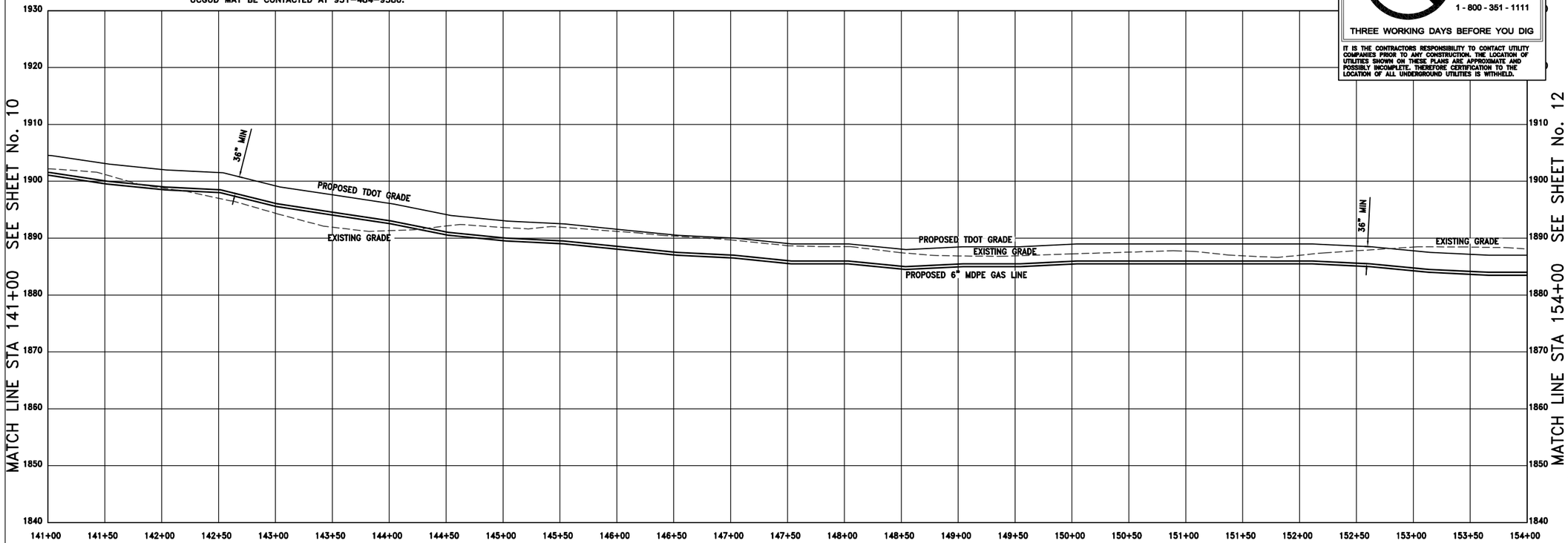


BARRY R. FIELD REGISTERED ENGINEER No. 21568 STATE OF TENNESSEE

8-17-14

UPPER CUMBERLAND GAS UTILITY DISTRICT
POST OFFICE BOX 807
CROSSVILLE, TENNESSEE 38577

S.R. 101 (PEAVINE ROAD)
GAS LINE RELOCATION

FECS
FIELD'S ENGINEERING CONSULTANT SERVICES
77 COTHER STREET
CROSSVILLE, TENNESSEE 38555
(931) 456-6071

STA. 141 TO STA. 154+00
SCALE: 1"=50' H
1"=10' V

| TYPE | YEAR | PROJECT NO. | SHEET NO. |
|---|---|---|---|
| CONSTRUCTION | 2014 | 18038-2237-14 | U3-10 |
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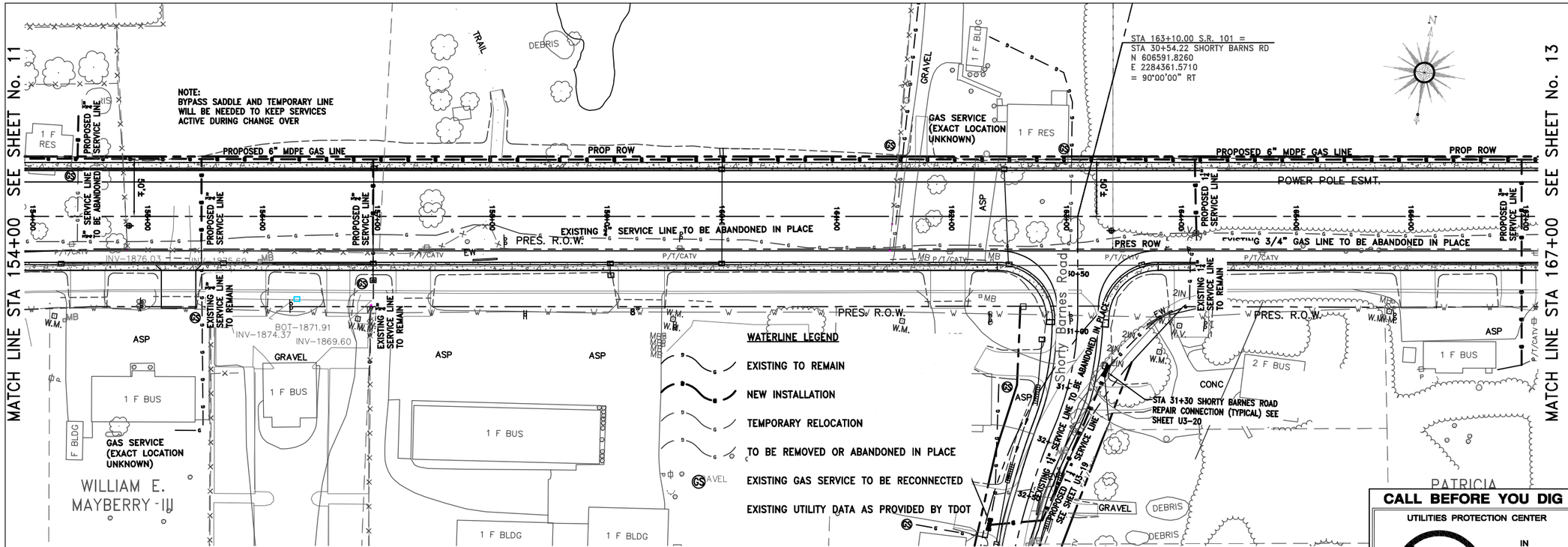
CUMBERLAND COUNTY

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UCGUD MAY BE CONTACTED AT 931-484-9380.

**CALL BEFORE YOU DIG**

UTILITIES PROTECTION CENTER

IN TENNESSEE CALL

1 - 800 - 351 - 1111

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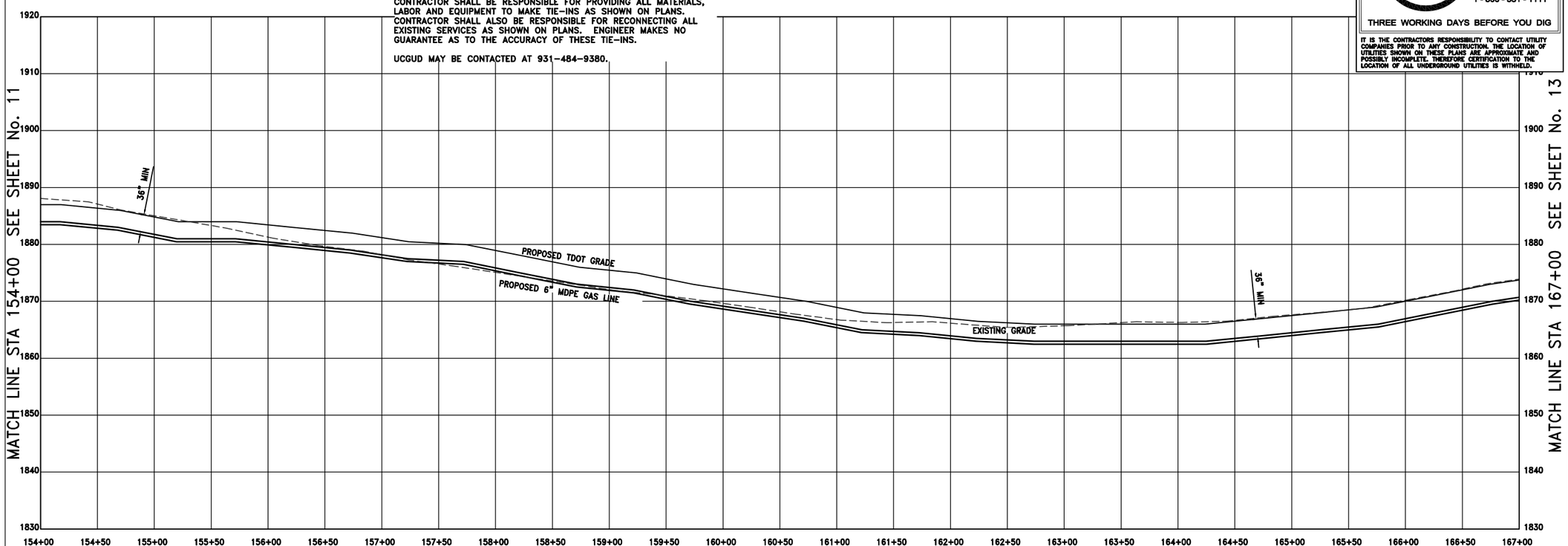


BARRY R. FIELD
REGISTERED ENGINEER
No. 21668
STATE OF TENNESSEE
COMMERCE
3-17-14

UPPER CUMBERLAND GAS UTILITY DISTRICT
POST OFFICE BOX 807
CROSSVILLE, TENNESSEE 38577

S.R. 101 (PEAVINE ROAD)
GAS LINE RELOCATION

FECS
FIELD'S ENGINEERING CONSULTANT SERVICES
77 COTHER STREET
CROSSVILLE, TENNESSEE 38555
(931) 456-6071

STA. 154+00 TO STA. 167+00
SCALE: 1"=50' H
1"=10' V

| TYPE | YEAR | PROJECT NO. | SHEET NO. |
|---|---|---|---|
| CONSTRUCTION | 2014 | 18038-2237-14 | U3-11 |
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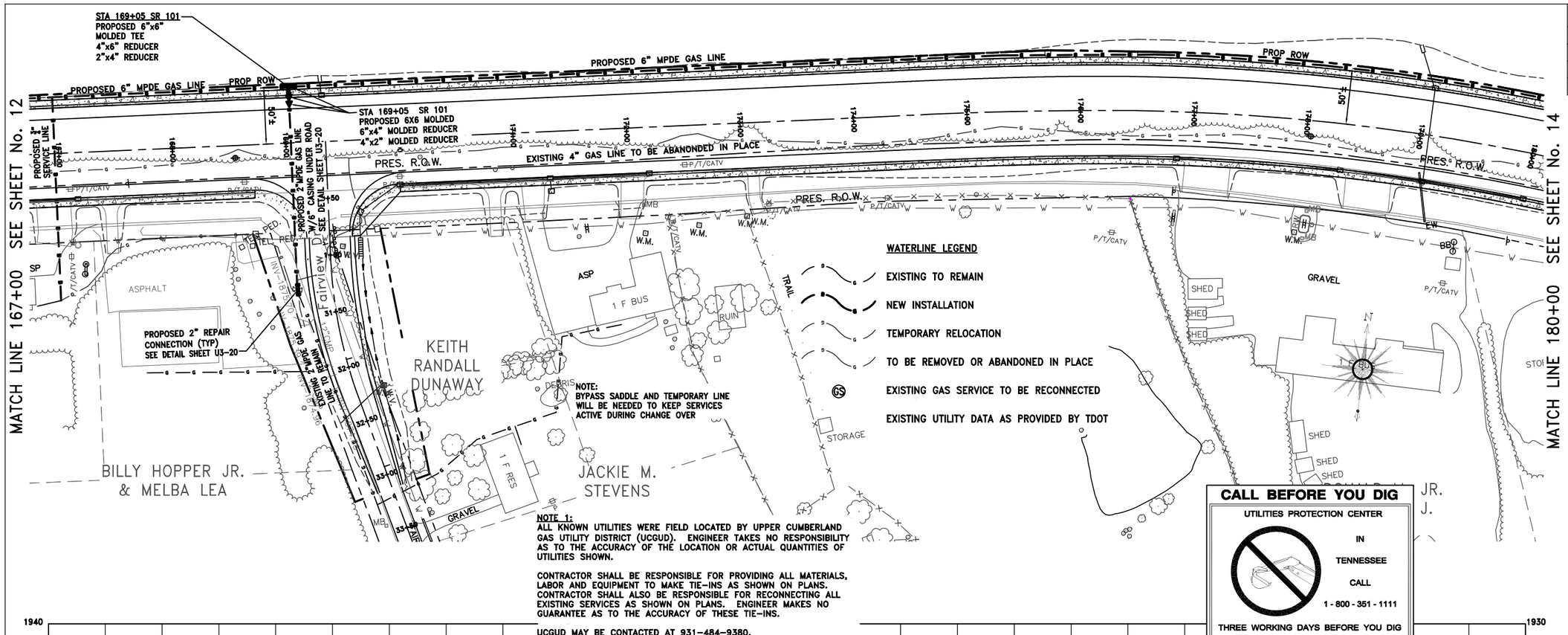
CUMBERLAND COUNTY

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TENNESSEE

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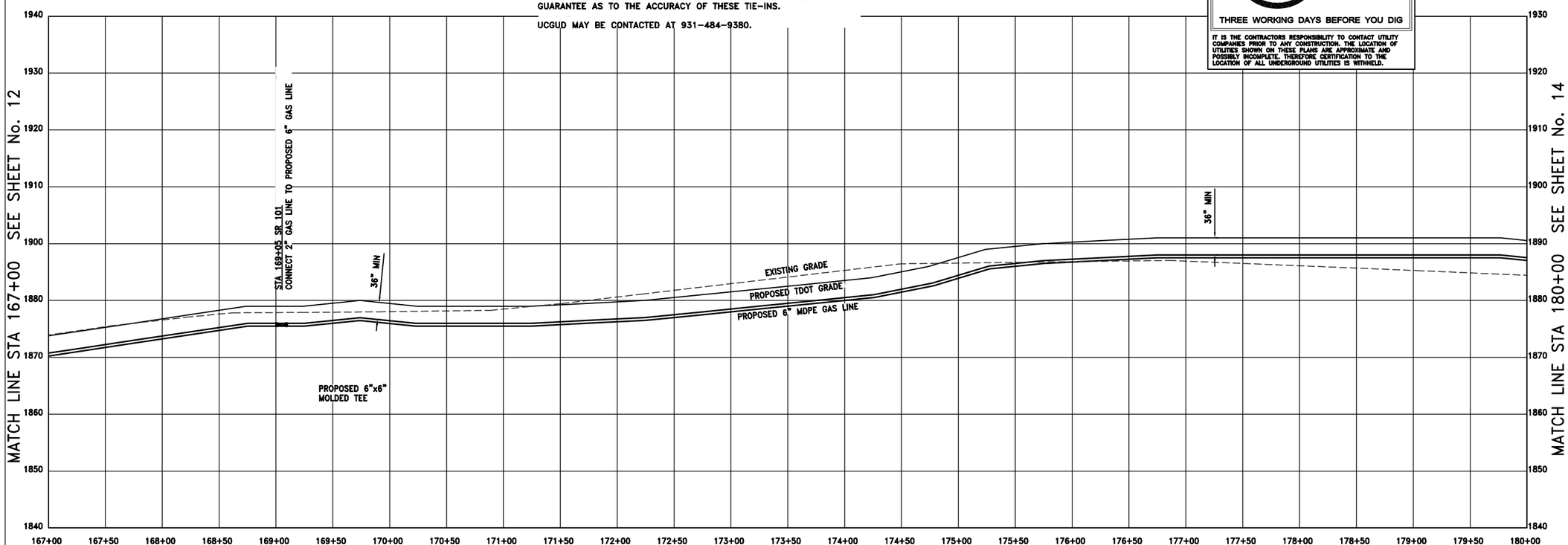


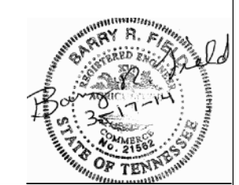


UPPER CUMBERLAND GAS UTILITY DISTRICT
POST OFFICE BOX 807
CROSSVILLE, TENNESSEE 38577

S.R. 101 (PEAVINE ROAD)
GAS LINE RELOCATION

FECS
FIELD'S ENGINEERING CONSULTANT SERVICES
77 COTHER STREET
CROSSVILLE, TENNESSEE 38555
(931) 456-6071

STA. 167+00 TO STA. 180+00
SCALE: 1"=50' H
1"=10' V

| TYPE | YEAR | PROJECT NO. | SHEET NO. |
|---|---|---|---|
| CONSTRUCTION | 2014 | 18038-2237-14 | U3-12 |
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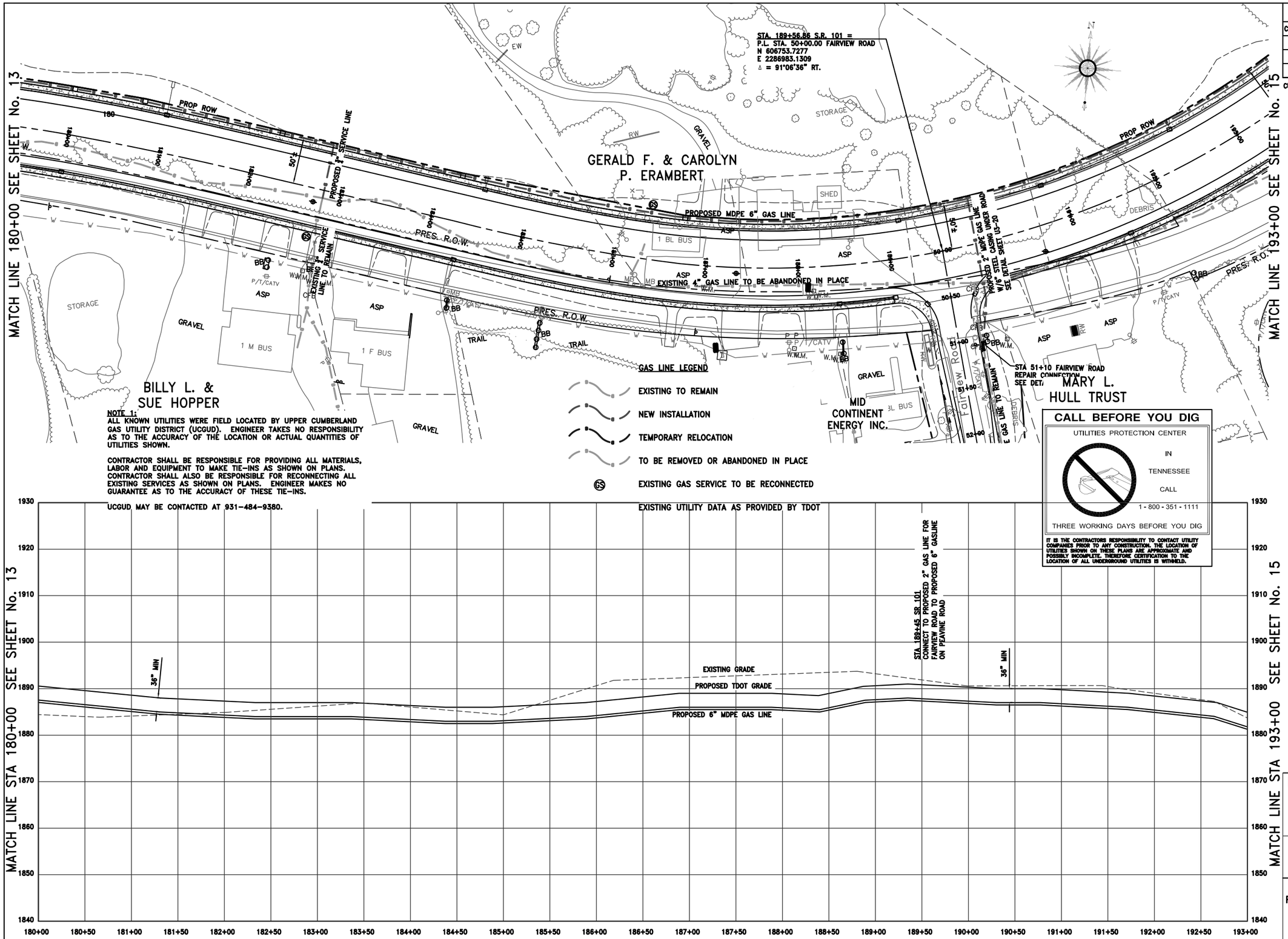
CUMBERLAND COUNTY

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**CALL BEFORE YOU DIG**

UTILITIES PROTECTION CENTER

IN TENNESSEE

CALL

1 - 800 - 351 - 1111

THREE WORKING DAYS BEFORE YOU DIG

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BARRY R. FIELD REGISTERED ENGINEER COMMERCE NO. 27582 STATE OF TENNESSEE

Rev. 10-17-14

UPPER CUMBERLAND GAS UTILITY DISTRICT
POST OFFICE BOX 807
CROSSVILLE, TENNESSEE 38577

S.R. 101 (PEAVINE ROAD)
GAS LINE RELOCATION

FECS
FIELD'S ENGINEERING CONSULTANT SERVICES
77 COTHER STREET
CROSSVILLE, TENNESSEE 38555
(931) 456-6071

STA. 180+00 TO STA. 193+00
SCALE: 1"=50' H
1"=10' V

| TYPE | YEAR | PROJECT NO. | SHEET NO. |
|---|---|---|---|
| CONSTRUCTION | 2014 | 18038-2237-14 | U3-13 |
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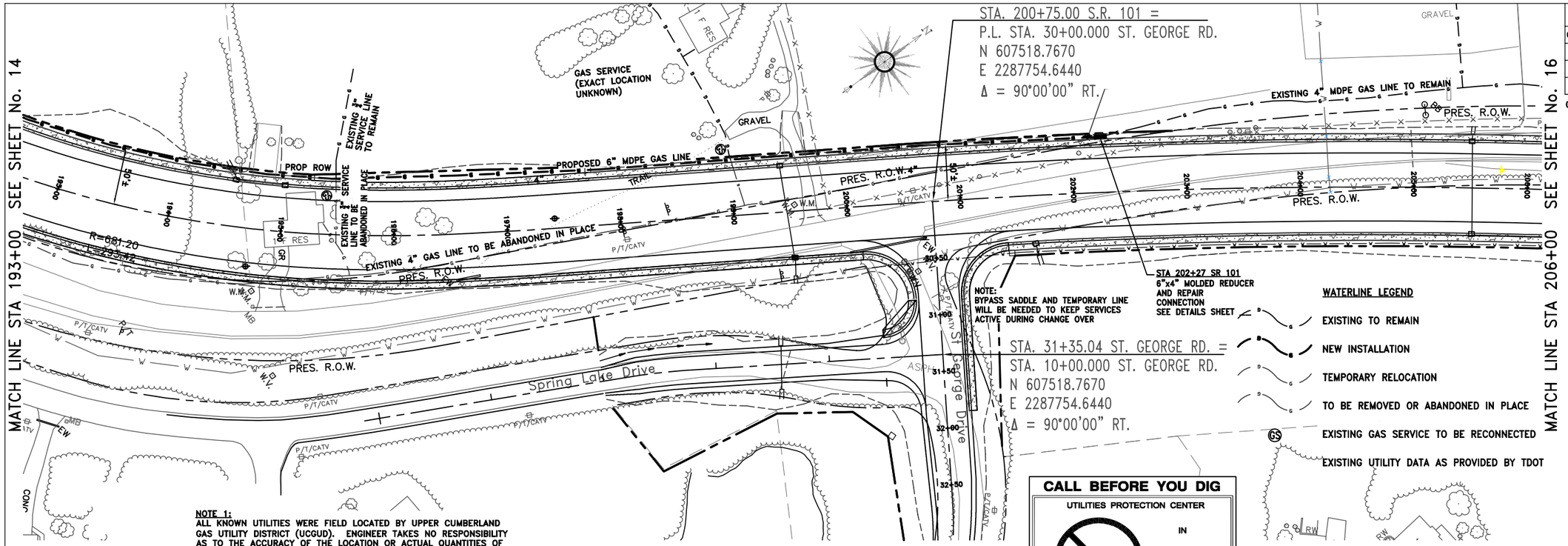
CUMBERLAND COUNTY

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UTILITIES PROTECTION CENTER

IN TENNESSEE CALL

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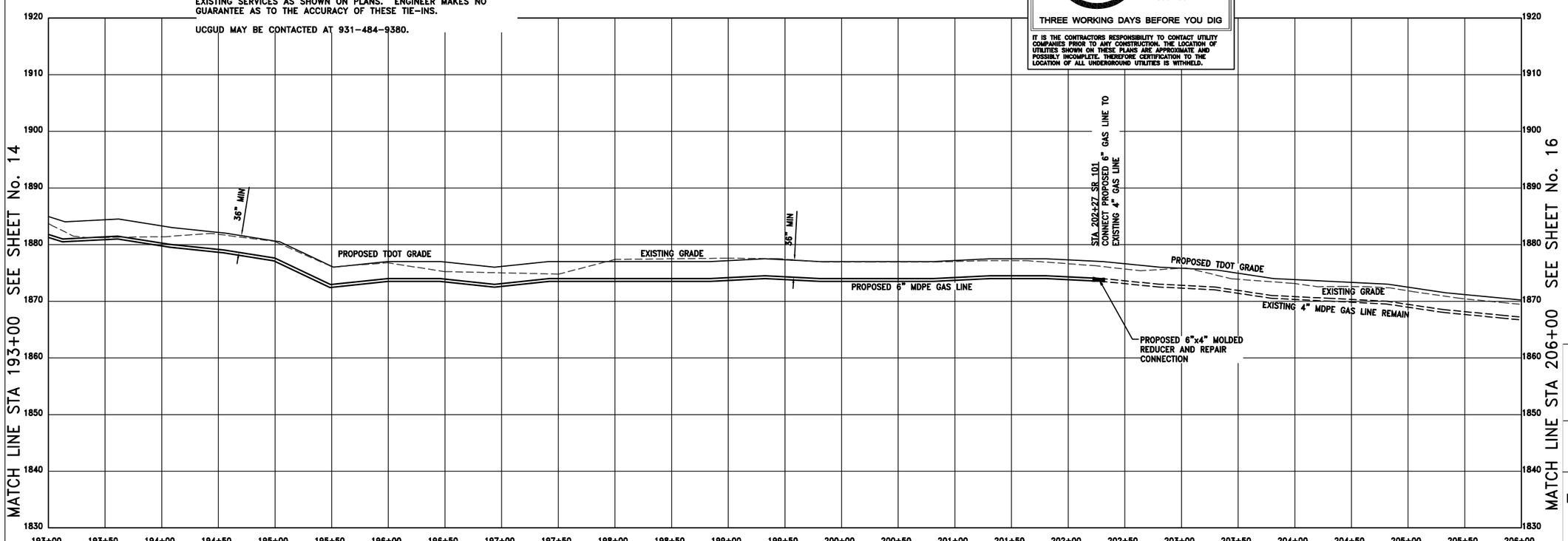


BARRY R. FIELDS REGISTERED ENGINEER COMMISSION NO. 21566 STATE OF TENNESSEE
8-17-14

UPPER CUMBERLAND GAS UTILITY DISTRICT
POST OFFICE BOX 807
CROSSVILLE, TENNESSEE 38577

S.R. 101 (PEAVINE ROAD)
GAS LINE RELOCATION

FECS
FIELD'S ENGINEERING CONSULTANT SERVICES
77 COTHER STREET
CROSSVILLE, TENNESSEE 38555
(931) 456-6071

STA. 193+00 TO STA. 206+00
SCALE: 1"=50' H
1"=10' V

| TYPE | YEAR | PROJECT NO. | SHEET NO. |
|---|---|---|---|
| CONSTRUCTION | 2014 | 18038-2237-14 | U3-14 |
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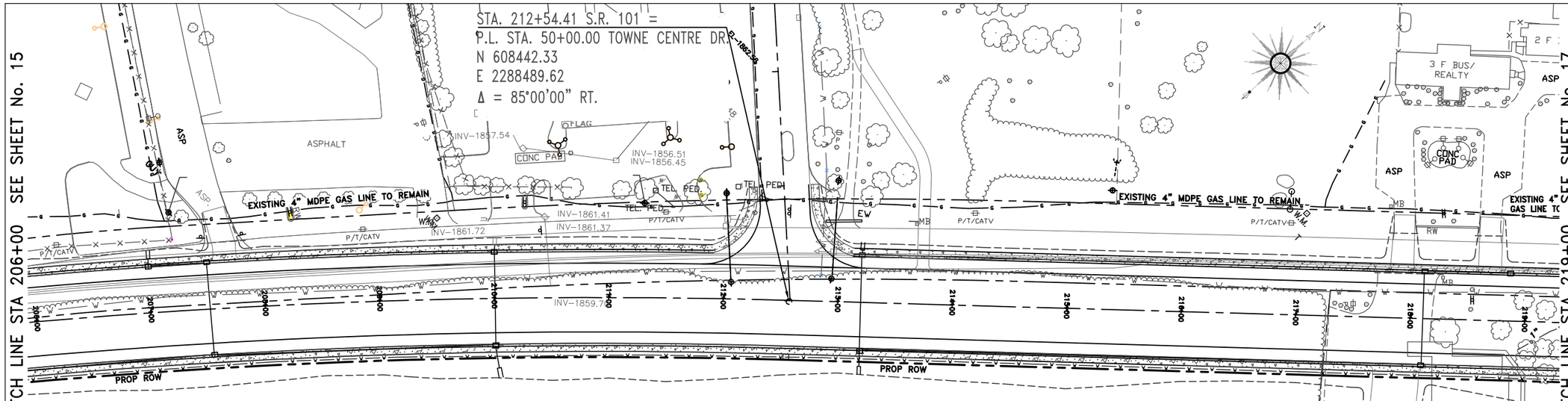
CUMBERLAND COUNTY




**WATERLINE LEGEND**

- EXISTING TO REMAIN
- NEW INSTALLATION
- TEMPORARY RELOCATION
- TO BE REMOVED OR ABANDONED IN PLACE
- GS — EXISTING GAS SERVICE TO BE RECONNECTED
- EXISTING UTILITY DATA AS PROVIDED BY TDOT

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UTILITIES PROTECTION CENTER

IN

TENNESSEE

CALL

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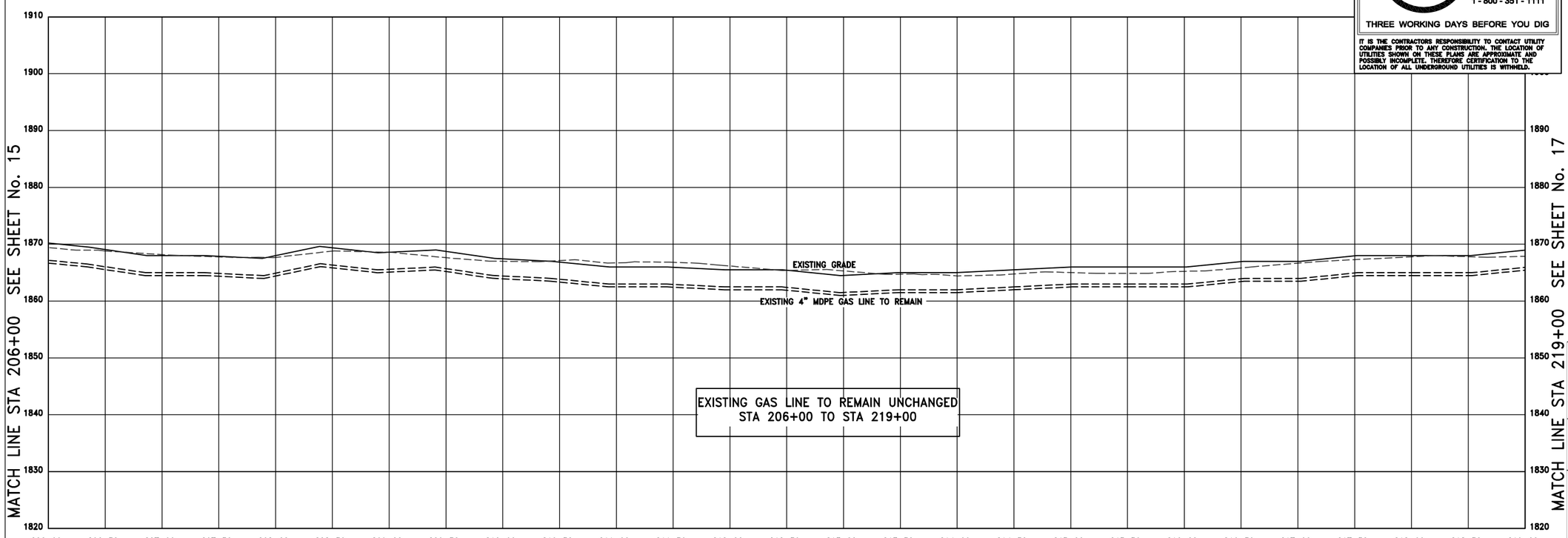

UPPER CUMBERLAND GAS UTILITY DISTRICT
POST OFFICE BOX 807
CROSSVILLE, TENNESSEE 38577

S.R. 101 (PEAVINE ROAD)
GAS LINE RELOCATION

FECS
FIELD'S ENGINEERING CONSULTANT SERVICES
77 COTHER STREET
CROSSVILLE, TENNESSEE 38555
(931) 456-6071

STA. 206+00 TO STA. 219+00
SCALE: 1"=50' H
1"=10' V

| TYPE | YEAR | PROJECT NO. | SHEET NO. |
|---|---|---|---|
| CONSTRUCTION | 2014 | 18038-2237-14 | U3-15 |
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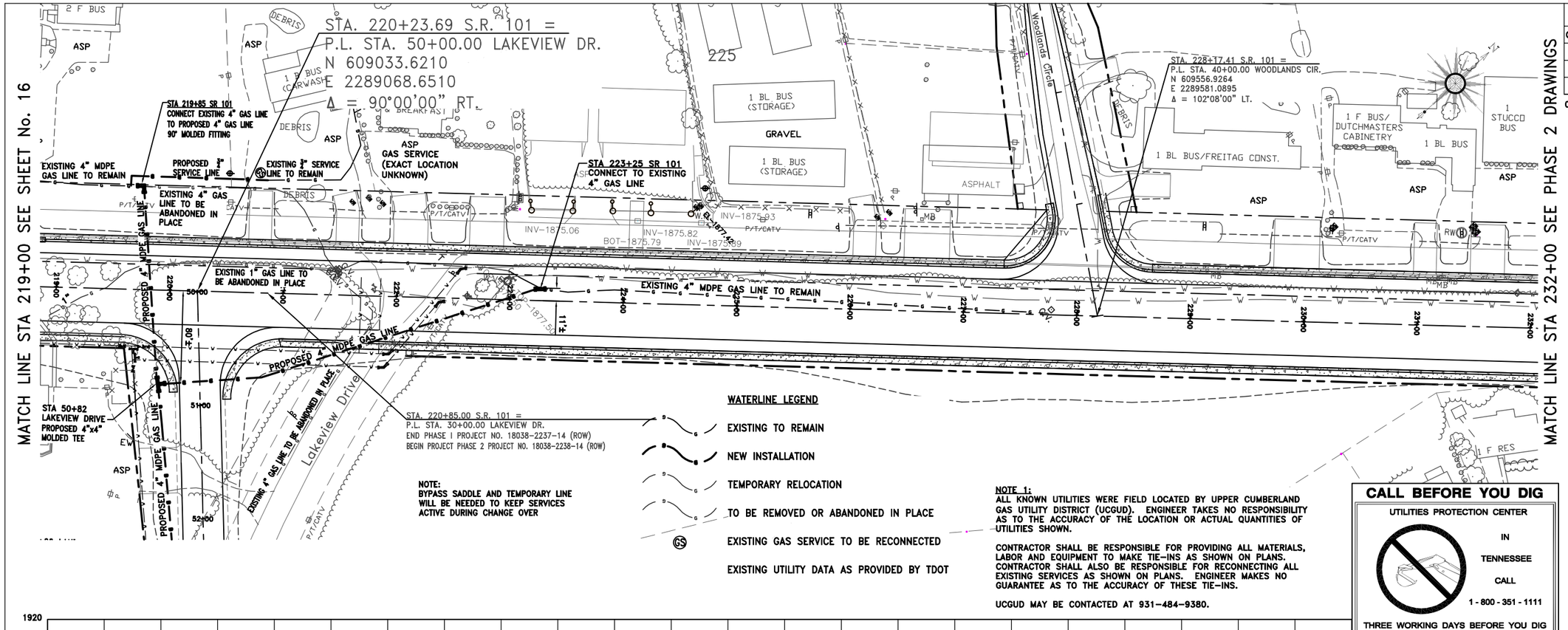
CUMBERLAND COUNTY

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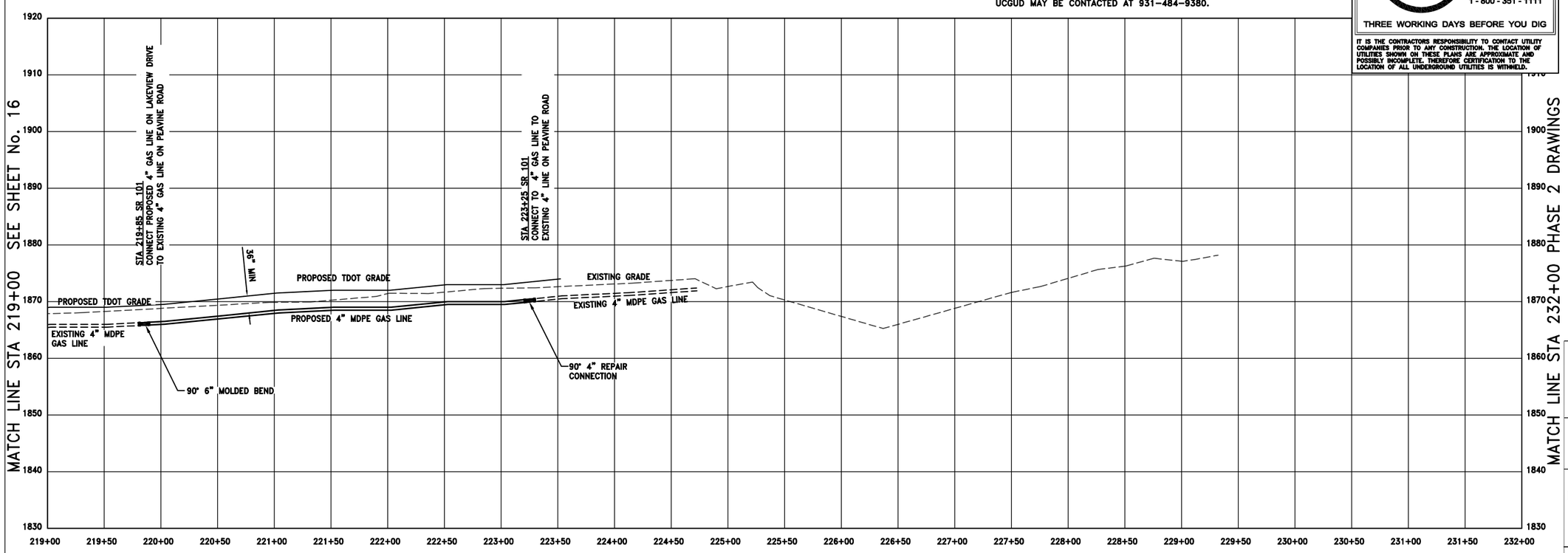

UPPER CUMBERLAND GAS UTILITY DISTRICT
POST OFFICE BOX 807
CROSSVILLE, TENNESSEE 38577

S.R. 101 (PEAVINE ROAD) GAS LINE RELOCATION

FECS
FIELD'S ENGINEERING CONSULTANT SERVICES
77 COTHER STREET
CROSSVILLE, TENNESSEE 38555
(931) 456-6071

STA. 219+00 TO STA. 232+00
SCALE: 1"=50' H
1"=10' V

| TYPE | YEAR | PROJECT NO. | SHEET NO. |
|---|---|---|---|
| CONSTRUCTION | 2014 | 18038-2237-14 | U3-16 |
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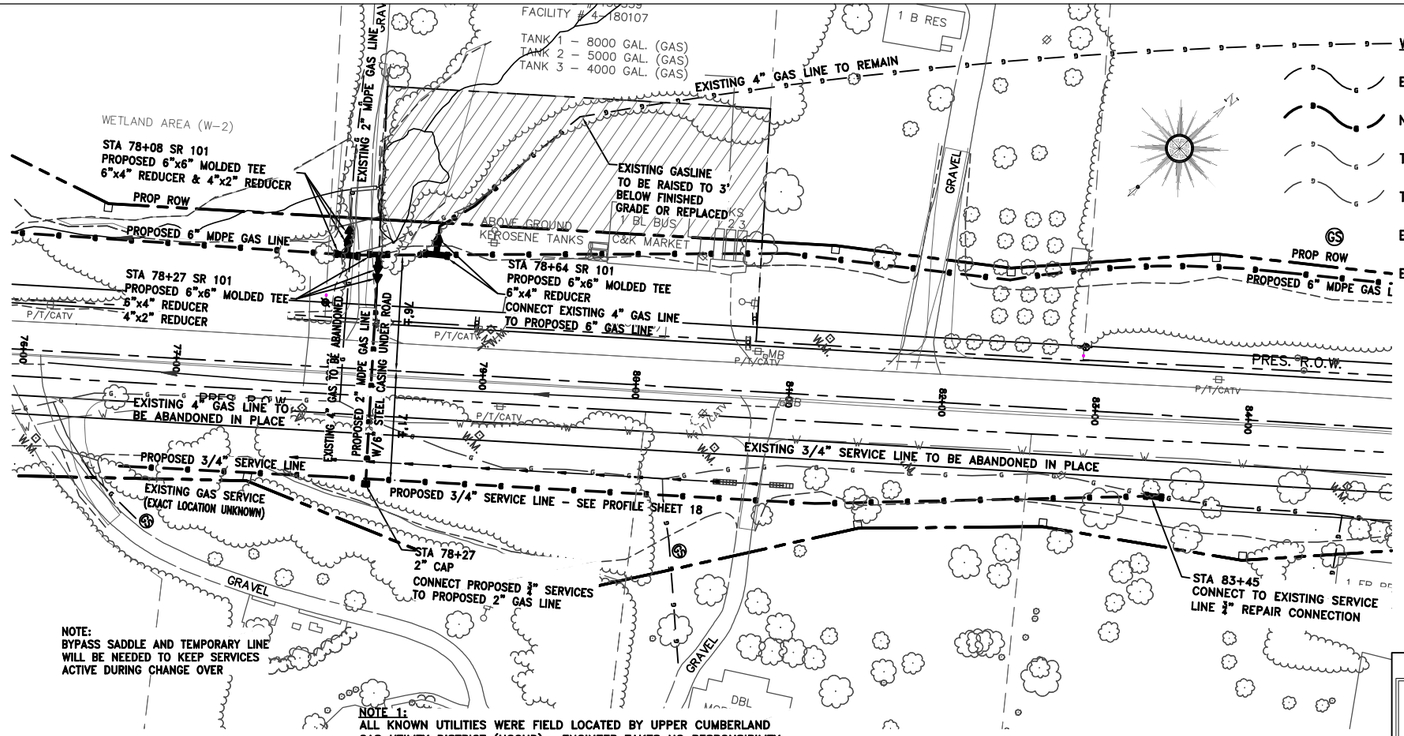
CUMBERLAND COUNTY




NOTE:
BYPASS SADDLE AND TEMPORARY LINE WILL BE NEEDED TO KEEP SERVICES ACTIVE DURING CHANGE OVER

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**WATERLINE LEGEND**

- EXISTING TO REMAIN
- NEW INSTALLATION
- TEMPORARY RELOCATION
- TO BE REMOVED OR ABANDONED IN PLACE
- EXISTING GAS SERVICE TO BE RECONNECTED
- EXISTING UTILITY DATA AS PROVIDED BY TDOT

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IN TENNESSEE CALL

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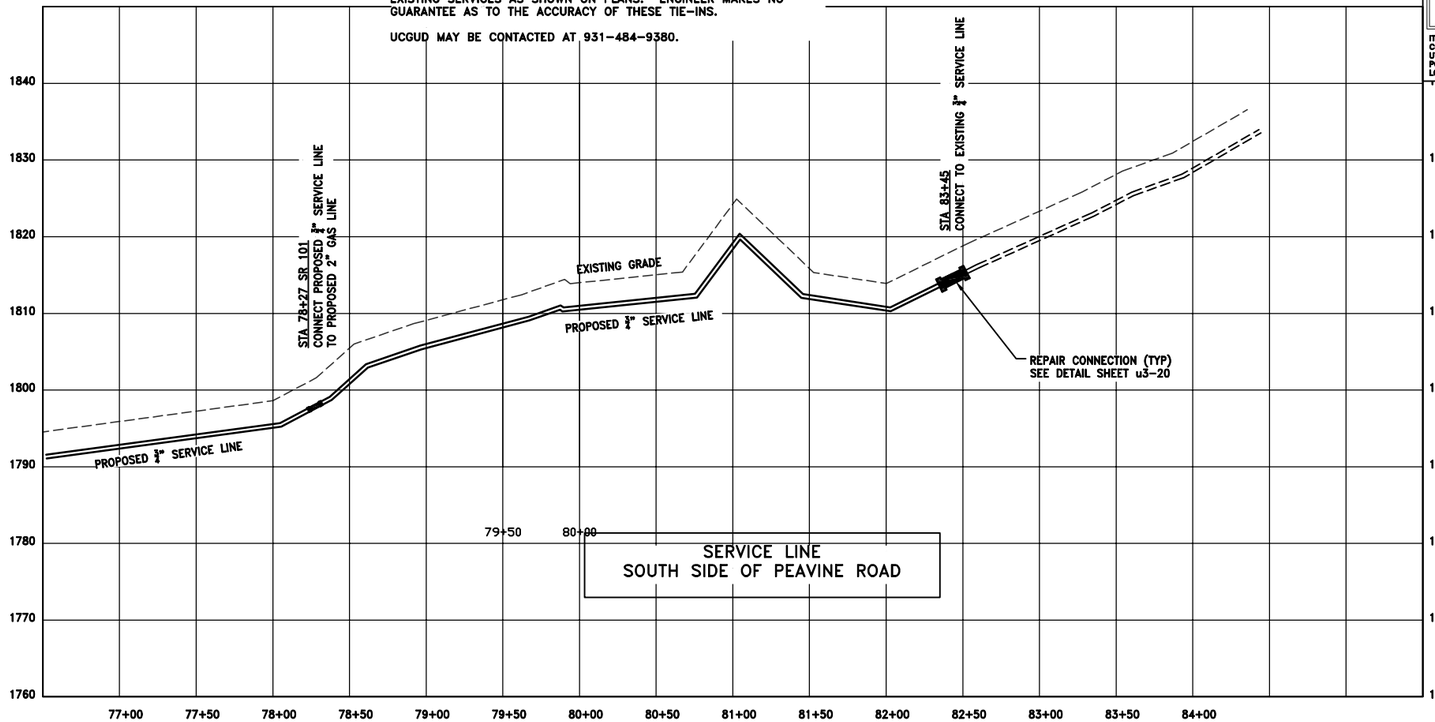


SERVICE LINE
SOUTH SIDE OF PEAVINE ROAD

8-17-14

UPPER CUMBERLAND GAS UTILITY DISTRICT
POST OFFICE BOX 807
CROSSVILLE, TENNESSEE 38577

S.R. 101 (PEAVINE ROAD)
SERVICE LINE RELOCATION

FECS
FIELD'S ENGINEERING CONSULTANT SERVICES
77 COTHER STREET
CROSSVILLE, TENNESSEE 38555
(931) 456-6071

STA. 76+43 TO STA. 83+45
SCALE: 1"=50' H
1"=10' V

| TYPE | YEAR | PROJECT NO. | SHEET NO. |
|---|---|---|---|
| CONSTRUCTION | 2014 | 18038-2237-14 | U3-17 |
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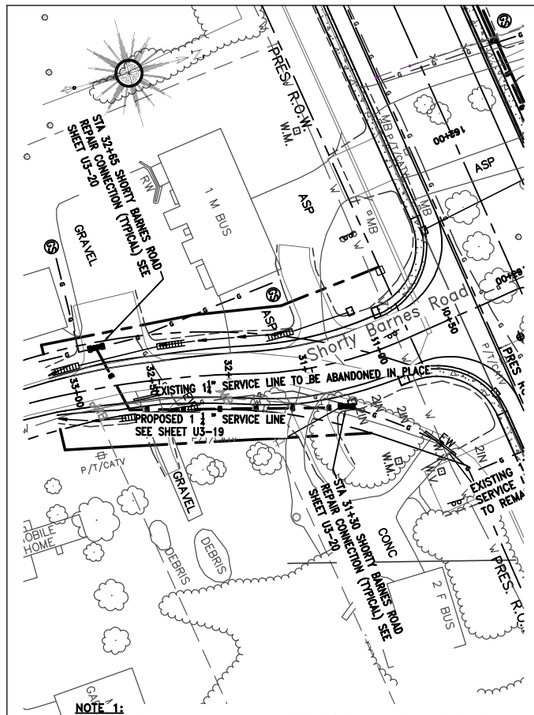
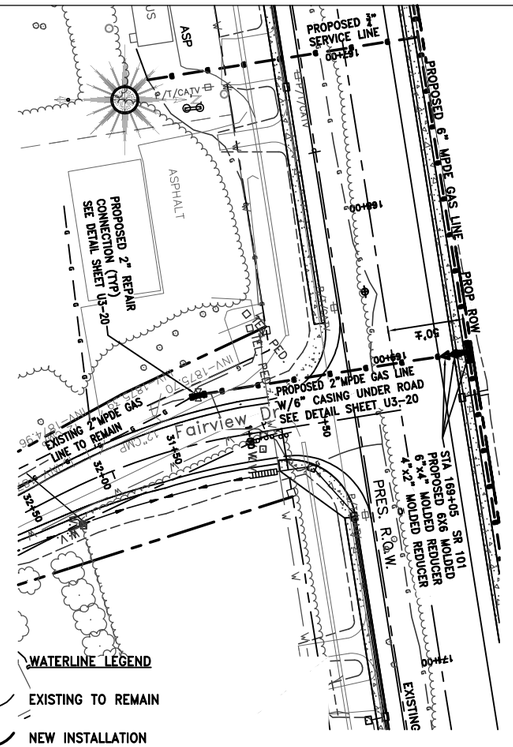
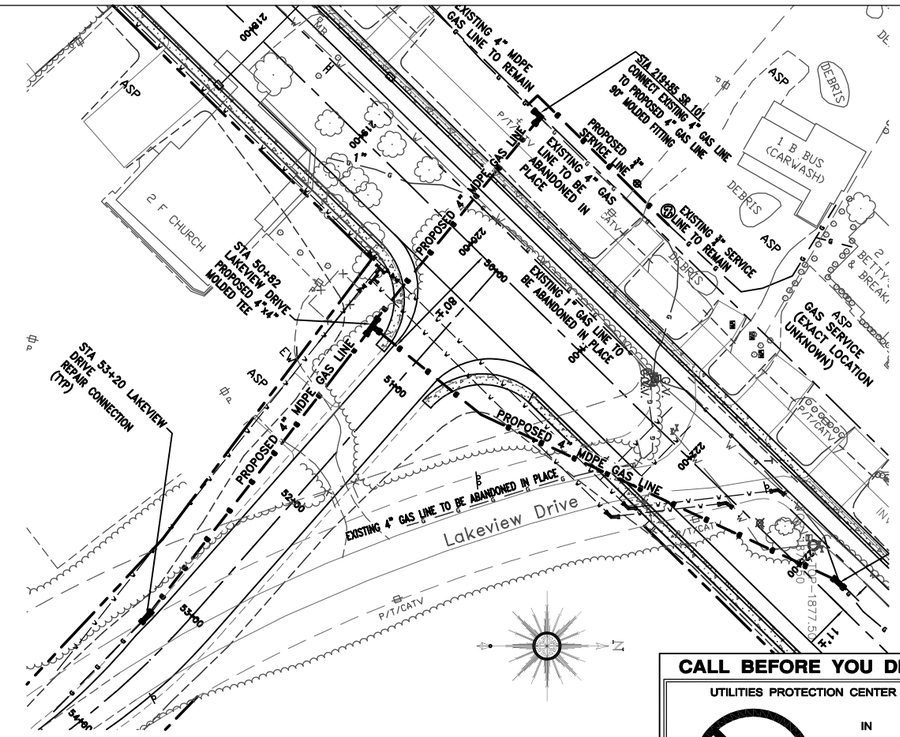
CUMBERLAND COUNTY

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WATERLINE LEGEND

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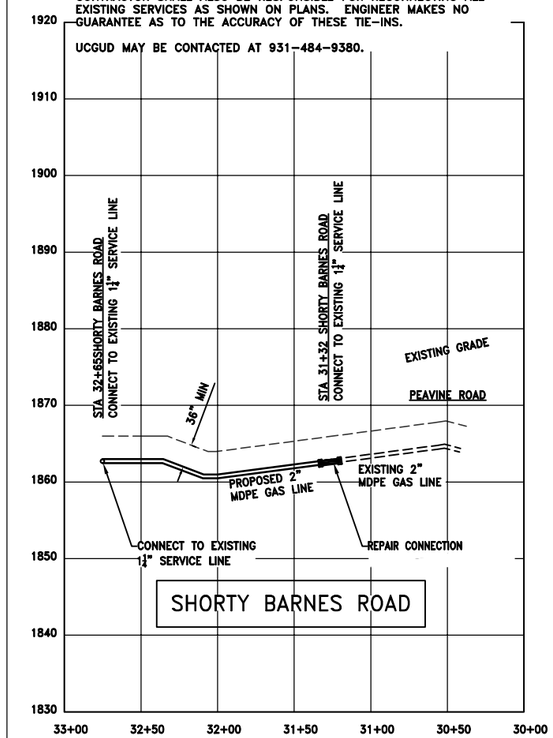


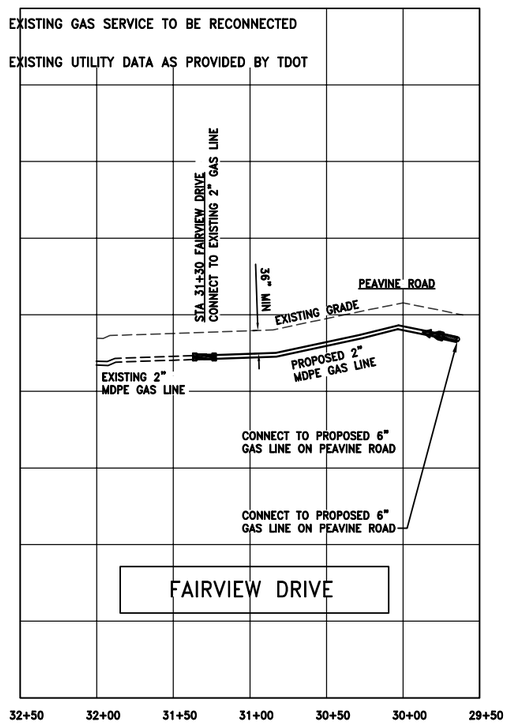


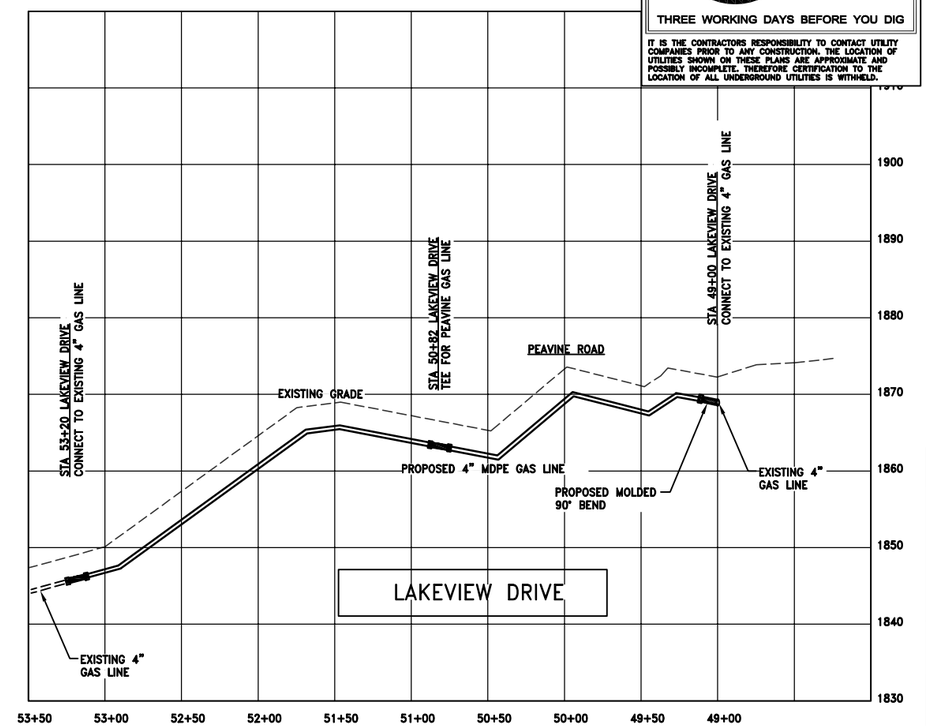


SCALE: 1"=50' H
1"=10' V

BARRY R. FIELD REGISTERED ENGINEER No. 21582 STATE OF TENNESSEE 3-17-14

UPPER CUMBERLAND GAS UTILITY DISTRICT
POST OFFICE BOX 807
CROSSVILLE, TENNESSEE 38577

SHORTY BARNES ROAD
FAIRVIEW DRIVE
LAKEVIEW DRIVE

FECS
FIELD'S ENGINEERING CONSULTANT SERVICES
77 COTHER STREET
CROSSVILLE, TENNESSEE 38555
(931) 456-6071

STA. 219+00 TO STA. 232+00
STA. 219+00 TO STA. 232+00
STA. 219+00 TO STA. 232+00

| TYPE | YEAR | PROJECT NO. | SHEET NO. |
|---|---|---|---|
| CONSTRUCTION | 2014 | STP-101(16) | U2-18 |
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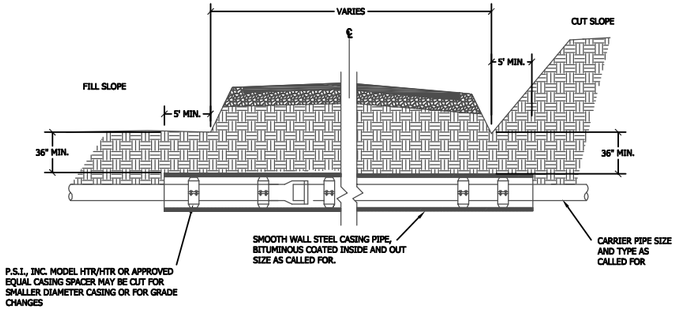
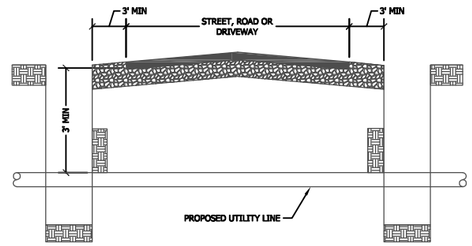
CUMBERLAND COUNTY



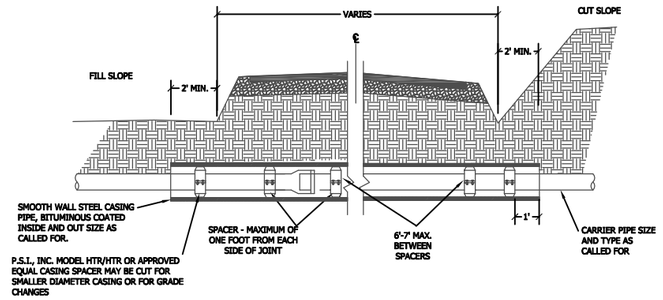

**A STATE HIGHWAY CROSSING**
SCALE: N.T.S.




**B TYPICAL UNCASED BORE DETAIL**
SCALE: N.T.S.

| STEEL CASING PIPE CASING SIZE | |
|---|---|
| NOMINAL PIPE SIZE (Diameter in inches) | (Inside diameter in inches) |
| 4 | 8-10 |
| 6 | 10-12 |
| 8 | 14-16 |
| 10 | 16-18 |
| 12 | 18-20 |
| 15 | 22-24 |

**B 10 BORE & JACK DETAILS**
SCALE: N.T.S.




**C CITY / COUNTY ROADS AND PAVED DRIVEWAY**
SCALE: N.T.S.

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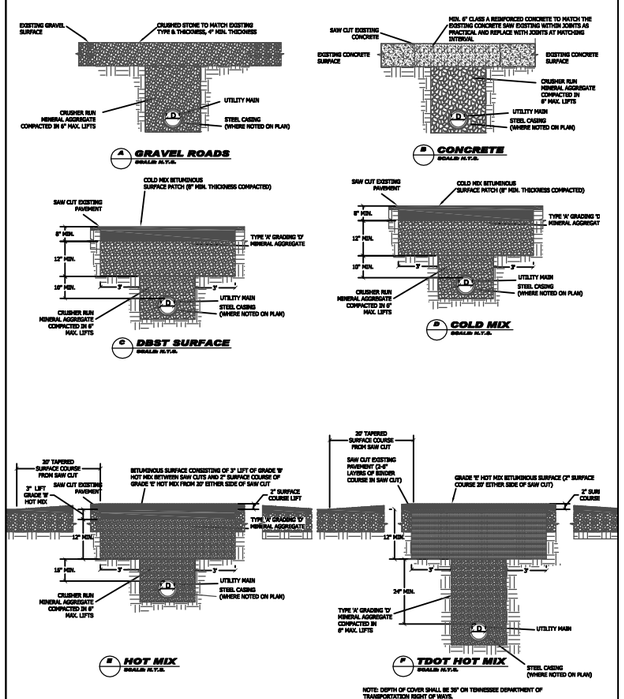
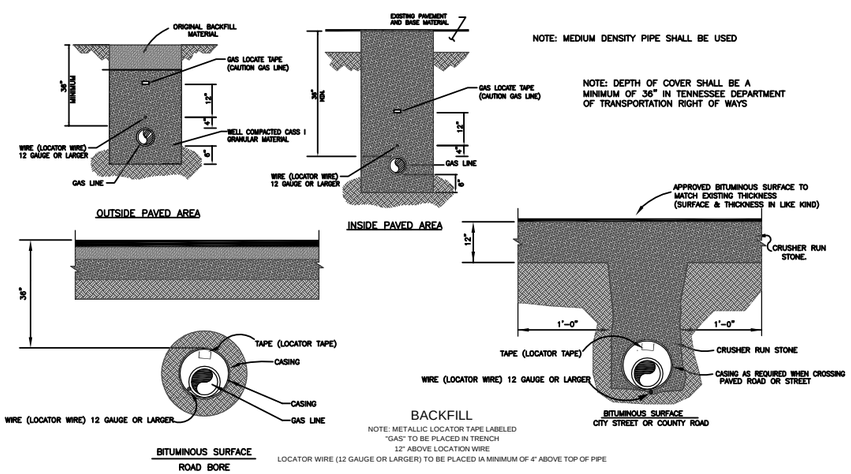
UCGUD MAY BE CONTACTED AT 931-484-9380.



UPPER CUMBERLAND GAS UTILITY DISTRICT
POST OFFICE BOX 807
CROSSVILLE, TENNESSEE 38577

S.R. 101 (PEAVINE ROAD) GAS LINE RELOCATION

FECS
FIELD'S ENGINEERING CONSULTANT SERVICES, LLC
77 COTHER STREET
CROSSVILLE, TENNESSEE 38555
(931) 456-6071

DETAILS

| TYPE | YEAR | PROJECT NO. | SHEET NO. |
|---|---|---|---|
| CONSTRUCTION | 2014 | STP-101(16) | U2-19 |
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CUMBERLAND COUNTY

# Product Fact Sheet

## Rhino 3-Rail™

### Description
The Rhino 3-Rail fiberglass post is rigid enough to be installed easily in most soil conditions and has the durability to withstand repeated impacts.

### Product Integrity
The Rhino 3-Rail design allows the post to bend over when hit, then snap back into its normal upright position. The Rhino 3-Rail can be driven directly into most soils.

### Fade Resistance
The Rhino 3-Rail is saturated with bright pigments, and UV stabilizers are added to ensure the color remains bright for years. For an extra layer of protection, we add our clear SunCoat™ over the entire surface of the post.

For even greater fade resistance, order the optional PolyTech Coating™. The PolyTech Coating blocks harmful ultraviolet light rays from reaching the resins and reinforcing fibers for at least 10 years. This protects the post from fading and fiberbloom.

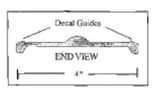
### Temperature Stable
The Rhino 3-Rail™ is unaffected by temperature extremes. The Rhino 3-Rail™ will remain flexible from -40°F to +140° F.

### Lengths
Standard lengths include 62", 66", 72" and 78"
Custom lengths available. Call for details.

### Colors
Standard colors include orange, yellow, white, blue, green, red, purple, gray and brown. Custom colors available on orders of 300 or more.

### Decals
A marker posts primary function is to support a warning message that will prevent an excavator from digging without calling for a locate. Our standard color fast decals use sharply contrasting colors and incorporate the international "No-Dig" symbol. This ensures that non-English speaking excavators will get the message! Use the 811 logo if you are a One-Call member in the United States.

### Anchor Barbs
Anchor Barb kits are available for use in sandy soil or for vandal resistance. The kit includes one metal anchor barb and two rivets. Kits may be ordered installed, uninstalled (with the posts drilled for rivets), or parts only (uninstalled, not drilled). A second metal anchor barb may also be purchased as part of the kit.




3RAIL_FACT • 2-5-09 • Page 1 of 2

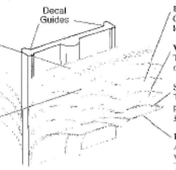
Rhino Marking and Protection Systems • A Division of REPNET, Inc.
www.RhinoMarkers.com • Phone: 1-800-522-4343 • Fax: 1-888-522-4343

# Product Fact Sheet

## ENGINEERED FOR MAXIMUM PERFORMANCE

**Fiber Core™**
Fiber strands run linearly through the mid-section of the post providing compressive strength to the post. Each strand contains 4000 filaments spun together and bonded by polyester resin, giving the post the stiffness necessary to ensure easy installation and the flexibility to withstand repeated impacts.

**Fiber Weave™**
Cross weave fibers embedded in polyester resin act as a cross strength reinforcement, much like steel rebar in cement. This gives the post very high strength integrity in the cross direction, eliminating splitting.




**Engineered Surface Mat**
Gives the post a smooth, rich finish and locks all the fibers below the surface.

**Weather Shield Veil™**
This synthetic shield protects the surface of the post from the elements.

**Sun Coat™**
Thin clear coating on the surface of the post will keep the post from fading and gives it a glossy finish.

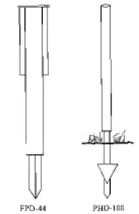
**Poly Tech Coating™**
A thick coating which totally blocks ultra-violet light from the surface of the post. This optional coating replaces the Sun Coat™ and is the same color as the post.

★ PolyTech Coating™ - Patent # 6,158,919

## HIGH VISIBILITY DECAL

- International "No-Dig" symbol reaches non-English speaking excavators.
- Federal Law Warning helps deter vandals.
- White background sharply contrasts with the black and yellow warning message to ensure maximum visibility.
- Warning in yellow (APWA) color for gas & petroleum meets Federal Office of Pipeline Safety Specifications.
- Black 1/4" x 1" tall letters meets Federal Office of Pipeline Safety Specifications.
- 811 logo if you belong to a One-Call center in the United States.
- Company name and 24 hour emergency phone number.

## EASY INSTALLATION




**EASY INSTALLATION**
Simply slide the Rhino 3-Rail™ into our FPD-44 Driver and pound the Rhino 3-Rail into the ground. If the soil conditions are hard or rocky, use our PHD-100 Pilot Hole Driver.

★ Longer and shorter drivers are available.

3RAIL_FACT • 2-5-09 • Page 2 of 2

Rhino Marking and Protection Systems • A Division of REPNET, Inc.
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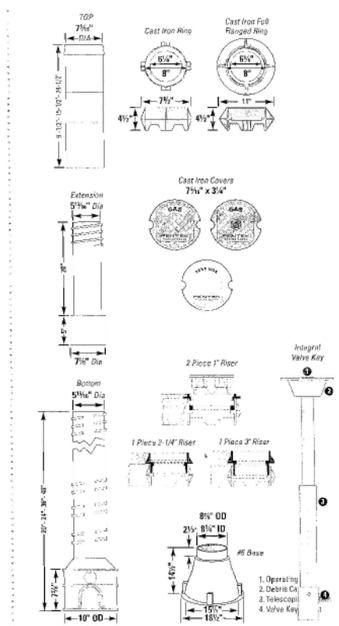
# PENTEK
## ACCESS BOXES




- Plastic body with full flanged cast iron ring and cover
- Screw-type valve box
- Polyiron® top section
  - One-third the weight of cast iron boxes which reduces the risk of injury
  - Interchangeable with cast iron bottoms
  - Magnetically locatable
- White molded bottom reflects light in box for greater visibility
- Optional vandal resistant pentagon bolt
- "No Tilt" cast iron cover
- Can be cut with hand saw
- Pipe knock-outs molded in
- Riser rings available to raise for paving
- Yellow covers standard

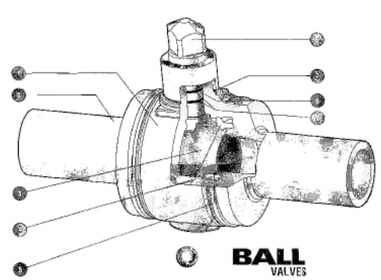
"You're Covered!"

LID GUARANTEE
PENTEK

# Made in America

The Polybal valve is manufactured at our Mansura, Louisiana facility. Custom dedicated tooling and equipment have been developed for every valve size to achieve and maintain quality levels during production and minimize variation in all processes.

At assembly, each valve is assigned a unique serial number that provides complete traceability for critical components. The serial number allows complete traceability from the customer's installation back to the raw material.



BALL VALVES

MATERIALS OF CONSTRUCTION

| NO. | COMPONENT | MATERIAL | FEATURES AND BENEFITS |
|---|---|---|---|
| 1 | Body | POLYETHYLENE | PE 2406/PE 2708, medium density<br>PE 3408/PE 4710, high density |
| 2 | Ends | POLYETHYLENE | PE 2406/PE 2708, various SDR's<br>PE 3408/PE 4710, various SDR's |
| 3 | Ball | POLYPROPYLENE | High strength, long life and low operating torque |
| 4 | Retainer | POLYPROPYLENE | Positive restraint under any condition; Retains seat under high differential pressure |
| 5 | Ball Seat | BUNA-N | Reliable sealing from -20°F to 140°F |
| 6 | Actuator | POLYPROPYLENE | 2" operating square, positive position indication, over-torque protection |
| 7 | Weather Seal | BUNA-N | Protects from ground water and dirt |
| 8 | Stem | ACETAL * | Excellent durability and strength, blowout proof |
| 9 | Stem Seals | BUNA-N | Redundant sealing with dual o-rings |

* Stem is stainless steel on 2" TIP, 1 1/2" FP, 1 1/4" FP sizes.

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UCGUD MAY BE CONTACTED AT 931-484-9380.

BARRY R. FIELD
REGISTERED ENGINEER
AGRICULTURE
COMMERCE
No. 21982
STATE OF TENNESSEE

UPPER CUMBERLAND GAS UTILITY DISTRICT
POST OFFICE BOX 807
CROSSVILLE, TENNESSEE 38577

S.R. 101 (PEAVINE ROAD)
GAS LINE RELOCATION

FECS
FIELD'S ENGINEERING CONSULTANT SERVICES, LLC
77 COTHER STREET
CROSSVILLE, TENNESSEE 38555
(931) 456-6071

DETAILS

| TYPE | YEAR | PROJECT NO. | SHEET NO. |
|---|---|---|---|
| CONSTRUCTION | 2014 | STP-101(16) | U2-20 |
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CUMBERLAND COUNTY

# DETAILED SPECIFICATIONS

## SCOPE OF WORK
The Scope of Work for the project is detailed in these notes and shown on the drawings prepared by Field's Engineering Consultant Services, LLC. The Utility that owns the gas distribution system is the Upper Cumberland Gas Utility District (UCGUD) and can be contacted at (931) 484-9380. The General Manager for the UCGUD is Mr. Charlie Hercher and can be reached at the aforementioned phone number. This project is located in Cumberland County and has been precipitated by the Tennessee Department of Transportation's widening and relocating of Peavine Road (State Route 101). The project begins at the intersection of Peavine Fire Tower Road and ends at the intersection of Lakeview Drive.

## GENERAL
All materials utilized on this project shall be manufactured in the United States of America.

Manufacturer's instructions shall be followed except in situations whereas Engineer instructs otherwise.

## Pipe
All pipe utilized for this project shall be Medium Density Polyethylene (MDPE) SDR 17 with sizes designated on the drawings. All pipe utilized shall be yellow and meet or exceed the specifications of PolyPipe, Inc., Gainesville, Texas.

## VALVES
All valves utilized on this project shall be manufactured by Kerotest or equal. Valves shall be of the ball type variety. All valves shall have welded ends and shall be manufactured according to standard specification ASTM A106 grade B, seamless carbon steel. Valves shall meet the standard specification ANSI 300.

## VALVE BOXES
All valve boxes utilized on this project shall be manufactured by Pentek or equal. They shall be full plastic body with full flanged cast iron ring and cover. They shall be of the "screw type" variety. All valve box lids shall be yellow and have "Gas" stamped into the material from which the lid is manufactured.

End Preparation: The valves shall be butt welded meeting the standard specification ANSI B31.8 (1989 edition or later).

Welding: The valve shall require no special welding procedures. Manufacturer recommends that the valve be in the closed position when welding is being performed.

Testing of Valves: All valves shall be tested at 150 percent of the maximum rated pressure.

## CONNECTION TO EXISTING GAS SYSTEM
The existing natural gas distribution system is owned and operated by the Upper Cumberland Gas Utility District (UCGUD). The contact for the Utility is Field's Engineering Consultant Services, LLC, (931) 456-6071 or the General Manager of the Utility District, Mr. Charles Hercher. Mr. Hercher can be contacted at (931) 484-9380.

Prior to any new gas lines being joined to the existing system, they must be thoroughly cleaned and satisfactory tested and approved by the Owner/Engineer, the utility contractor will proceed to tie this project into the existing gas system at the locations indicated on the drawings. All valves, appurtenances, labor, equipment etc. for testing of the gas line shall be the responsibility of the utility contractor.

Prior to performing the connections indicated on the drawings, the utility contractor shall provide written documentation to the UCGUD that the person(s) performing these connections have experience with making gas taps under similar conditions. The UCGUD shall be notified by the utility contractor a minimum of 48 hours prior to the planned tap. In addition to notifying the UCGUD, the Cumberland County Fire Department shall be notified as per notification of the UCGUD. Utility contractor shall be responsible for all costs related to safety or emergency responses. Utility contractor shall not discontinue gas service to gas customers for a period of time that will not to exceed two (2) hours.

## CASING AND BORING
All gas pipe greater than or equal to two (2) inches shall be steel cased.

## FINAL GRADING
All slopes within highway rights-of-way that have been cut down or notched to accommodate construction equipment shall be rebuilt to the original height and slope to the satisfaction of the Owner and/or TDOT inspector. All excess materials from grading operations shall not be placed whereas soil erosion will occur. If these excess materials are piled, cover for the piles shall be provided.

## EXCAVATION FOR GAS LINE TRENCHES
Excavation for gas lines shall be open cut trenches except where the drawings or Engineer indicate that the utility contractor shall bore under existing structures or roadway in order to keep traffic flowing. Excavate the trenches to the lines and depth indicated and to provide uniform and continuous bearing and support for the installed pipe. Trenching shall include all excavation necessary to prepare the trench for the pipe to be installed regardless of what means or methods are necessary to produce the trench.

Blasting for the gas line trenches shall not be allowed unless a pre-blast survey of the area where the blasting will be conducted is performed.

Trench depth shall be as required by the drawings and never less than thirty-six (36) inches. Trench widths shall be as required for the proper laying and joining of the piping and the proper placing and compacting of the backfill but in no case shall the trench be more than 24 inches wider than the inside diameter of the pipe.

In areas where the trench bottom at the required subgrade is found to be unstable or to include ashes, cinders, or any type of refuse, any organic materials, these materials shall be excavated and removed. These areas shall be backfilled with suitable materials for the pipe laying operation. This backfill shall be compacted to provide a stable base for the pipe.

In the event, and it will, that rock is encountered in pipe trenches, remove all rock from sides of trench to provide at least six (6) inches of horizontal clearance from the pipe on each side, and remove all rock from the trench. In no case shall the pipe be laid on any type rock.

Where applicable, any trench depth deep enough that shoring is required; the shoring shall meet OSHA requirements.

The utility contractor is fully responsible for locating all utilities where excavating is to be performed. Furthermore, the utility contractor shall be responsible for the cost to repair any damage caused by the excavating operation. The Engineer has made an effort of locating as many utilities as possible. Engineer utilized information provided by the Utility District and no guarantee is expressed or implied as to the accuracy of the location of utilities shown on the drawings. The utility contractor shall be responsible for locating all underground utilities whether shown on the drawings or not.

In the event that utility damage is caused by the trenching operation, the utility contractor shall immediately contact the appropriate Utility. Subsequent to the notification of the appropriate Utility, repair and restoration shall be made at once and backfill shall not be replaced until inspected by the appropriate Utility. Utility contractor shall practice hand digging in areas where utilities are expected.

Utility contractor shall not open more than 300 feet in advance of pipe laying operation. Furthermore, no more than 300 feet shall be left uncovered subsequent to the pipe laying operation. Trench shall not be left open in the event of equipment failure. All trenches must be refilled in the event that equipment breakdown is encountered. No trenches shall be left open at night without the proper barricades as required by OSHA Regulations.

## BEDDING OF PIPE
All gas line pipes shall be supported on a bed of well compacted earth or stone. Bedding material shall be acceptable to Engineer and shall be free from rock or any objectionable materials. There shall be no instances where pipe is resting on rock.

In areas that are wet where pipe is likely to sink below grade or floating out of line or grade, or where backfill materials are of such a fluid nature that such movement of the pipe might take place during the placing of the backfill, the pipe must be secured permanently in place in a manner that meets Engineer's approval.

## HAULING, HANDLING & STORAGE
The utility contractor shall receive the gas line piping and inventory the shipment. Utility contractor shall load, unload, haul, string along the route proposed for laying, and otherwise be responsible to the pipe subsequent to receiving the shipment.

Special care must be taken when handling and hauling all material and equipment, etc.

Pipe shall be placed on pallets so that it is above the ground surface a sufficient height to properly accommodate welding. Pipe with welded seams shall be laid with seams staggered in adjacent joints not less than three (3) inches apart.

## LOWERING, STRINGING, AND LAYING OF PIPE
Pipe shall not be lowered into the trench prior to the joint protective coating has hardened. All joints shall be inspected by Owner/Engineer prior to being lowered into the trench.

If powered equipment is required to lower the pipe, belt pipe slings or appropriately sized padded calipers shall be used to lower the pipe into the trench. Pipe shall not come into contact with any object in a violent manner.

Prior to lowering the pipe into the trench, special precautions should be taken at the ends of pipe to assure that dirt, debris, etc., does not enter the pipe.

## BACKFILLING TRENCHES
Trenches shall be backfilled as soon as possible subsequent to passage of the leakage test. Engineer shall make this determination. Backfilling of trenches shall not commence until approved by Engineer.

Backfill around and immediately over the top of the pipe with stable stone-free earth having a maximum particle size of one-half (1/2) inches placed to a minimum level of six (6) inches above the top of the pipe. This backfill shall be adequately compacted to prevent movement of the pipe. All trenches located in traveled areas shall be backfilled completely with road base limestone gravel.

The utility contractor is responsible for going back and re-grading trenches where settling in the trenches has occurred.

## ASPHALT, HIGHWAY, AND STREET REPLACEMENT
Should open cutting of driveways, roadways, etc. be performed by the utility contractor, the trench shall be completely filled with road base gravel and surface repaired with like materials, the repair shall meet the satisfaction of the engineer.

## UNPAVED DRIVEWAYS
Where trenching across unpaved driveways is required, utility contractor is responsible for completely filling the trench with road base gravel and going back to re-grade after settling has occurred.

## PIPE CLEANING
Utility contractor shall assure that the inside of all gas pipe have been thoroughly cleaned of all foreign materials, water, etc. Utility contractor is responsible for providing adequate evidence that the entire length of pipe laid has been cleaned. Engineer shall approve the cleaning process and the pipe subsequent to cleaning.

## PURGING OF PIPE
When it is necessary to blow down a gas line or fill a gas line with natural gas that has contained air, the following procedure shall be followed:

- When a gas line full of air is placed in service the air may be safely displaced with natural gas by introducing a moderately rapid rate of flow through the newly installed gas line and out of a vent at the opposite end of the gas line. The flow should be continued without interruption until the vented gas is free from air. "The vent should then be fully closed. Whenever possible, an apparatus such as a "squeegee" type pig or a slug of inert gas should be used to separate the gas and air to minimize the possibility of an explosive mixture.
- In cases where gas in the gas line is to be displaced with air, a procedure similar to, but the reverse of what is described in the previous paragraph should not be used. If the rate of air that can be supplied is not sufficient to create a turbulent flow of air, then a "squeegee" pig or slug of inert gas shall be utilized. If there is a reason to suspect the presence of volatile inflammable liquid precautions should be taken to minimize the possibility of striking static sparks with the gas line.
- Prior to any cutting or welding being performed on a gas line that contains gas, it must be disconnected from all gas sources and then purged with air, water or inert gas. If it is not possible to disconnect and purge the line per foregoing, the operation may be carried out in accordance with the following procedure subsequent to approval by Engineer.
  1. Keep the gas line full of gas and maintain a slight flow of gas toward the point where cutting or welding will be performed.
  2. Control the gas pressure at the point of the cutting and welding operation with a blow-off valve or other suitable methods approved by the Engineer.
  3. Close all slots or open ends immediately subsequent to the cutting operation. This can be performed by tape, plugs or other suitable appurtenances.
  4. No welding or cutting shall be performed on a gas line that contains air and is connected to a gas source unless a suitable means has been provided to assure that an explosive mixture does not exist

## FIRE PREVENTION
Utility contractor shall maintain suitable approved fire extinguishing equipment near the locations where work involving natural gas or other combustible materials are present. This is especially true in the vicinity of performing a "hot connection" and purging operations. Utility contractor is responsible for providing every possible safety precaution to prevent fire and explosions and comply with all applicable safety and fire prevention codes. Portable fire extinguishing equipment shall conform to the National Fire Protection Association's Standard in Section 10. The storage and use of flammable and explosive liquids, solids, and devices shall be in accordance with the applicable section of the National Fire Protection Association's Codes, Standards and recommended practices.

## GAS LINE MARKERS
Sixteen (16) gas line markers shall be installed in the locations as shown on the drawings.

## GAS LINE TESTING
All newly installed gas line shall be air tested for a period of twenty-four (24) hours at 1.5 times the normal operating pressure of the existing gas line but no less than 130 psi. No pressure loss in the gas line over the 24 hour period will be acceptable.

## BUY AMERICAN CLAUSE
All material to be utilized on this project shall be manufactured in the United States of America.

## AS-BUILT DRAWINGS
The CONTRACTOR shall be responsible for preparing 2 sets of "As-Built" drawings for the project. One set of drawings shall be turned over to the Upper Cumberland Gas Utitily District subsequent to the completion of the project. and one set submitted to Field's Engineering Consultant Services, LLC.

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BARRY R. FIELDS
REGISTERED ENGINEER
AGRICULTURE
COMMERCE
No. 21562
STATE OF TENNESSEE

UPPER CUMBERLAND GAS UTILITY DISTRICT
POST OFFICE BOX 807
CROSSVILLE, TENNESSEE 38577

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GAS LINE RELOCATION

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DETAILED SPECIFICATIONS