TYPE	YEAR	PROJECT NO.	SHEET NO.
CONSTRUCTION	2015	STP-101(16)	U2-1

CUMBERLAND COUNTY

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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)
795-03.02	2 IN PVC WATER LINE	L.F.	320	1
795-03.04	4 IN PVC WATER LINE	L.F.	680	1
795-03.05	6 IN PVC WATER LINE	L.F.	3500	1
795-03.06	8 IN PVC WATER LINE	L.F.	3000	1
795-03.07	10 IN PVC WATER LINE	L.F.	3400	1
795-03.08	12 IN PVC WATER LINE	L.F.	160	1
795-05.74	BORE/JACK 6 IN STEEL CASING PIPE-ROCK	L.F.	100	10
795-05.75	BORE/JACK 8 IN STEEL CASING PIPE-ROCK	L.F.	130	10
795-05.76	BORE/JACK 10 IN STEEL CASING PIPE-ROCK	L.F.	310	10
795-05.79	BORE/JACK 16 IN STEEL CASING PIPE-ROCK	L.F.	115	10
795-05.80	BORE/JACK 18 IN STEEL CASING PIPE-ROCK	L.F.	120	10
795-05.81	BORE/JACK 20 IN STEEL CASING PIPE-ROCK	L.F.	100	10
795-06.01	CONNECT TO 2 IN WATER LINE	EACH	2	3
795-06.03	CONNECT TO 4 IN WATER LINE	EACH	4	3
795-06.04	CONNECT TO 6 IN WATER LINE	EACH	8	3
795-06.05	CONNECT TO 8 IN WATER LINE	EACH	8	3
795-06.06	CONNECT TO 10 IN WATER LINE	EACH	12	3
795-06.07	CONNECT TO 12 IN WATER LINE	EACH	2	3
795-07.01	4 IN X 4 IN TAPPING SLEEVE AND VALVE	EACH	2	4
795-07.03	6 IN X 6 IN TAPPING SLEEVE AND VALVE	EACH	2	4
795-07.04	8 IN X 4 IN TAPPING SLEEVE AND VALVE	EACH	2	4
795-07.05	8 IN X 6 IN TAPPING SLEEVE AND VALVE	EACH	1	4
795-07.08	10 IN X 6 IN TAPPING SLEEVE AND VALVE	EACH	1	4
795-08.01	2 IN GATE VALVE ASSEMBLY	EACH	1	5
795-08.03	4 IN GATE VALVE ASSEMBLY	EACH	1	5
795-08.04	6 IN GATE VALVE ASSEMBLY	EACH	5	5
795-08.05	8 IN GATE VALVE ASSEMBLY	EACH	7	5
795-08.06	10 IN GATE VALVE ASSEMBLY	EACH	3	5
795-08.25	Electronic Control Valve Vault w/Bypass	EACH	1	6
795-09.09	RELOCATE/RE-CONNECT SERVICE ASSEMBLY	EACH	56	INCLUDES ALL MATERIALS, LABOR & EQUIPMENT FOR REMOVAL OF EXISTING WATER SERVICE METER ASSEMBLY AND
				INSTALLING AT NEWLY IDENTIFIED LOCATION
795-09.10	SAMPLE TAP	EACH	16	INCLUDES ALL MATERIALS, LABOR & EQUIPMENT FOR INSTALLATION OF TAP ON WATER LINE FOR
				WATER SAMPLING PURPOSES. COST OF ACTUALLY SAMPLING IS INCLUDED IN COST OF PIPE.
795-11.04	RELOCATE FIRE HYDRANT	EACH	4	INCLUDES ALL MATERIALS, LABOR, AND EQUIPMENT TO DISCONNECT AND RELOCATE EXISTING FIRE HYDRANT TO A NEW LOCATION
795-13.01	DI FITTINGS	LBS	1241	INCLUDES FITTINGS, GLANDS & RESTRAINT DEVICES DESCRIBED IN POUNDS

FOOTNOTE 1:
INCLUDES ALL MATERIALS, LABOR, EQUIPMENT FOR COMPLETE INSTALLATION OF PIPE INCLUDING BUT NOT LIMITED TO TRAFFIC CONTROL, MATERIALS, EQUIPMENT, EXCAVATION IN BOTH UNCONSOLIDATED AND ROCK, REMOVAL AND REPLACEMENT OF UNSUITABLE SOIL, ENVELOPE/BEDDING MATERIAL, BACKFILLING, FLOWABLE FILL, THRUST BLOCKING, CONCRETE DEADMAN, PIPE FUSION, TRACER WIRE, WARNING TAPE, APPURTENANCES, TEMPORARY/PERMANENT SHORING, MAINTAINING THE TRENCH, TESTING, FLUSHING, DISINFECTION, BACTERIOLOGICAL SAMPLING, TEMPORARY/PERMANENT SURFACE RESTORATION, 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. IF CASING PIPE HAS CARRIER PIPE, THE CARRIER PIPE SHALL BE PAID AT THE OPEN CUT ITEM.

FOOTNOTE 3:
INCLUDES ALL MATERIALS, LABOR, AND EQUIPMENT NECESSARY FOR CONNECTING TO AN EXISTING WATER LINE INCLUDING TRAFFIC CONTROL.

FOOTNOTE 4:
INCLUDES ALL MATERIALS, LABOR AND EQUIPMENT INCLUDING BUT NOT LIMITED TO TAPPING SLEEVE, VALVE, VALVE BOX, BOX ADJUSTMENT, VALVE BOX COLLAR, VALVE MARKER, EXCAVATION, BEDDING, BACKFILL, BLOCKING AND RESTRAINT, TAP OF EXITING LINE , AND TRAFFIC CONTROL.

FOOTNOTE 5:
INCLUDES ALL MATERIALS, LABOR AND EQUIPMENT INCLUDING BUT NOT LIMITED TO FITTINGS, VALVE, VALVE STEM EXTENSIONS, VALVE BOX AND COVER, BOX ADJUSTMENT, VALVE BOX COLLAR, VALVE MARKER, EXCAVATION, BEDDING, BACKFILL, BLOCKING, AND TRAFFIC CONTROL.

FOOTNOTE 6:
INCLUDES ALL MATERIALS, LABOR AND EQUIPMENT INCLUDING BUT NOT LIMITED TO MACHINERY, TOOLS OR APPARATUS NECESSARY FOR INSTALLATION OF ASSEMBLIES AS DESCRIBED IN THE PLANS AND SPECS EXCEPT FOR SERVICE LINE WHICH IS PAID SEPARATELY FOR EACH FOOT INSTALLED.

FOOTNOTE 7:
INCLUDES ALL MATERIALS, LABOR AND EQUIPMENT FOR COMPLETE INSTALLATION OF SERVICE LINE OR CASING FOR SERVICE LINE ON LONG SIDE AND SHORT SIDE OF MAIN.

FOOTNOTE 8:
INCLUDES ALL MATERIALS, LABOR AND EQUIPMENT FOR COMPLETE INSTALLATION OF UNIT OR LUMP SUM ITEM AS SPECIFIED ON BID FORM.

FOOTNOTE 9:
INCLUDES ALL MATERIALS, LABOR AND EQUIPMENT FOR REMOVAL OF ITEM.

FOOTNOTE 10:
INCLUDES ALL MATERIALS, LABOR AND EQUIPMENT INCLUDING BUT NOT LIMITED TO CASING PIPE, PIPE SPACERS, CASING END SEALS, FITTINGS, TRACER WIRE, WARNING TAPE, UTILITY LINE MARKERS AND TRAFFIC CONTROL. IF CASING PIPE HAS CARRIER PIPE, THE CARRIER PIPE SHALL BE PAID AT THE OPEN CUT ITEM.

FOOTNOTE 11:
INCLUDES ALL MATERIALS, LABOR AND EQUIPMENT, SETUP AND TRAFFIC CONTROL.

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NOTE 2:
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COUD MAY BE CONTACTED AT 931-484-6987.

UTILITY INFORMATION

CRAB ORCHARD UTILITY DISTRICT
2089 EAST 1ST STREET
CROSSVILLE, TENNESSEE 38555
(931) 484-6987
CONTACT: EVERETT BOLIN, JR.

BARRY R. FIELD
REGISTERED ENGINEER
AGRICULTURE
COMMERCE
No. 21982
STATE OF TENNESSEE
8-24-15

CRAB ORCHARD UTILITY DISTRICT
2089 EAST 1ST STREET
CROSSVILLE, TENNESSEE 38555

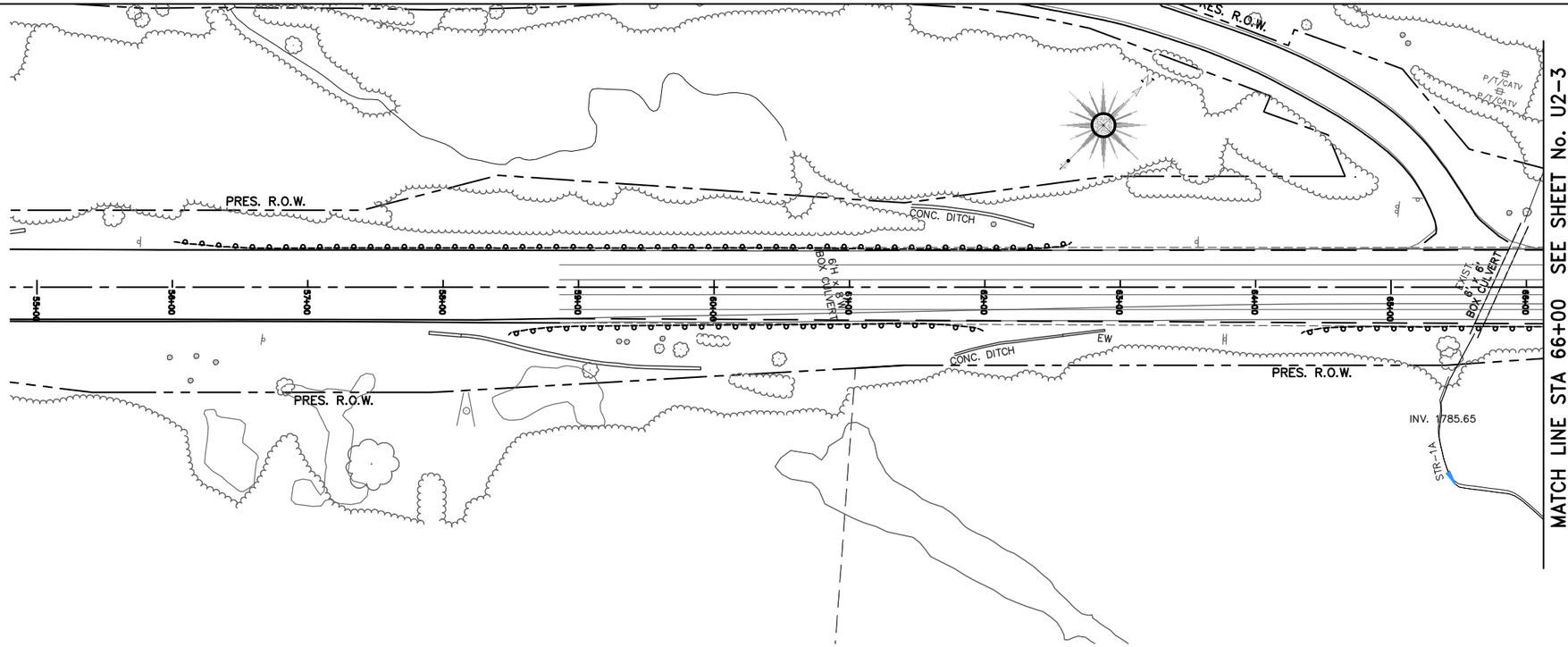
S.R. 101 (PEAVINE ROAD) WATERLINE RELOCATION

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	2015	STP-101(16)	U2-2

CUMBERLAND COUNTY



WATERLINE LEGEND

NEW INSTALLATION

EXISTING TO REMAIN

TEMPORARY RELOCATION/INSTALLATION

TO BE REMOVED OR RETIRED IN PLACE

NO WATERLINE RELOCATION IN THIS AREA

NOTE 1:
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COUD MAY BE CONTACTED AT 931-484-6987.

BARRY R. FIELD
REGISTERED ENGINEER
No. 21682
AGRICULTURE
COMMERCE
STATE OF TENNESSEE
8-24-15

CRAB ORCHARD UTILITY DISTRICT
2089 EAST 1ST STREET
CROSSVILLE, TENNESSEE 38555

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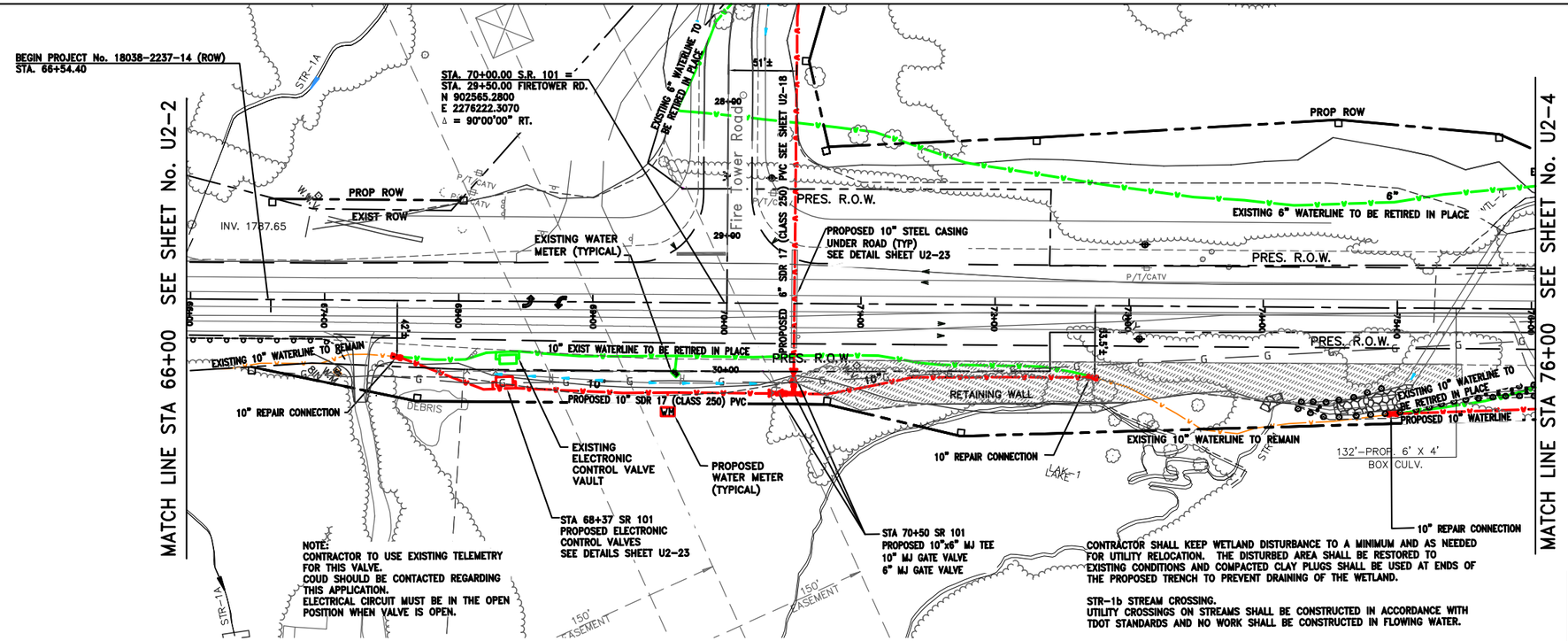
FECS
FIELD'S ENGINEERING CONSULTANT SERVICES, LLC
77 COTHER STREET
CROSSVILLE, TENNESSEE 38555
(931) 456-6071

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

TYPE	YEAR	PROJECT NO.	SHEET NO.
CONSTRUCTION	2015	STP-101(16)	U2-3

CUMBERLAND COUNTY



NOTE:
CONTRACTOR TO USE EXISTING TELEMETRY FOR THIS VALVE.
COUD SHOULD BE CONTACTED REGARDING THIS APPLICATION.
ELECTRICAL CIRCUIT MUST BE IN THE OPEN POSITION WHEN VALVE IS OPEN.

CONTRACTOR SHALL KEEP WETLAND DISTURBANCE TO A MINIMUM AND AS NEEDED FOR UTILITY RELOCATION. THE DISTURBED AREA SHALL BE RESTORED TO EXISTING CONDITIONS AND COMPACTED CLAY PLUGS SHALL BE USED AT ENDS OF THE PROPOSED TRENCH TO PREVENT DRAINING OF THE WETLAND.

STR-1b STREAM CROSSING.
UTILITY CROSSINGS ON STREAMS SHALL BE CONSTRUCTED IN ACCORDANCE WITH TDOT STANDARDS AND NO WORK SHALL BE CONSTRUCTED IN FLOWING WATER.

NOTE 1:
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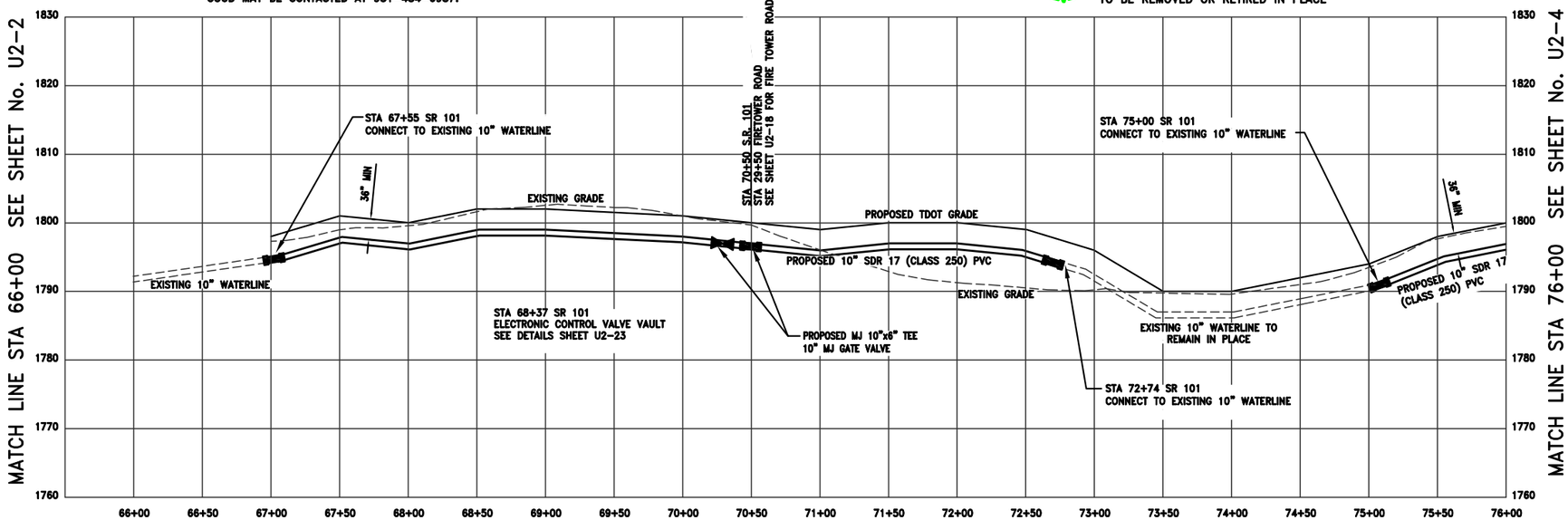
WATERLINE LEGEND

- NEW INSTALLATION
- EXISTING TO REMAIN
- TEMPORARY RELOCATION/INSTALLATION
- TO BE REMOVED OR RETIRED IN PLACE



NOTE: ALL COLD TAPS TO MAIN SHALL UTILIZE AN MJ TEE AND MJ GATE VALVE.
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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.

BARRY R. FIELD REGISTERED ENGINEER No. 21488 AGRICULTURE COMMERCE STATE OF TENNESSEE
5-24-15

CRAB ORCHARD UTILITY DISTRICT
2089 EAST 1ST STREET
CROSSVILLE, TENNESSEE 38555

S.R. 101 (PEAVINE ROAD) WATERLINE RELOCATION

FECS
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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	2015	STP-101(16)	U2-4

CUMBERLAND COUNTY

MATCH LINE 76+00 SEE SHEET No. U2-3

MATCH LINE 89+00 SEE SHEET No. U2-5

WATERLINE LEGEND

- NEW INSTALLATION
- EXISTING TO REMAIN
- TEMPORARY RELOCATION/INSTALLATION
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OWNER ID # 156559
FACILITY # 1-180107

TANK 1 – 8000 GAL. (GAS)
TANK 2 – 5000 GAL. (GAS)
TANK 3 – 4000 GAL. (GAS)

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STR-1b STREAM CROSSING.
UTILITY CROSSINGS ON STREAMS SHALL BE CONSTRUCTED IN ACCORDANCE WITH TDOT STANDARDS AND NO WORK SHALL BE CONSTRUCTED IN FLOWING WATER.

2– 40' – PROP. 48" PIPES

WTL-2

STR-1

EXISTING 6" WATERLINE TO BE RETIRED IN PLACE

PROPOSED WATER METERS (TYPICAL)

ABOVE GROUND KEROSENE TANKS

C&K MARKET

CANOPY (PUMPS)

PROPOSED 2" SDR 17 (CLASS 250) PVC W/ 6" STEEL CASING UNDER ROADWAY SEE DETAIL SHEET U2-23

PROPOSED 2" COPPER SERVICE LINE

EXISTING 2" COPPER SERVICE TO REMAIN

PRES. R.O.W.

EXISTING 10" WATERLINE TO BE RETIRED IN PLACE

PROPOSED 10" SDR 21 (CLASS 200) PVC

PROP ROW

STA 85+00 SR 101
CHANGE PIPE CLASS
TO SDR 21 (CLASS 200) PVC

EXISTING WATER METER (TYPICAL)

PROPOSED WATER METER (TYPICAL)

PROPOSED 2" COPPER SERVICE LINE

STA 78+29 SR 101
PROPOSED 10"x4" MJ TEE
4"x2" MJ REDUCER
2" GATE VALVE
10" MJ GATE VALVE

10" REPAIR CONNECTION

STA 86+80 SR 101
PROPOSED FIRE HYDRANT
SEE DETAIL SHEET U2-22

JAMES & JOANNE CANELLES

1 B RES

BL GAR

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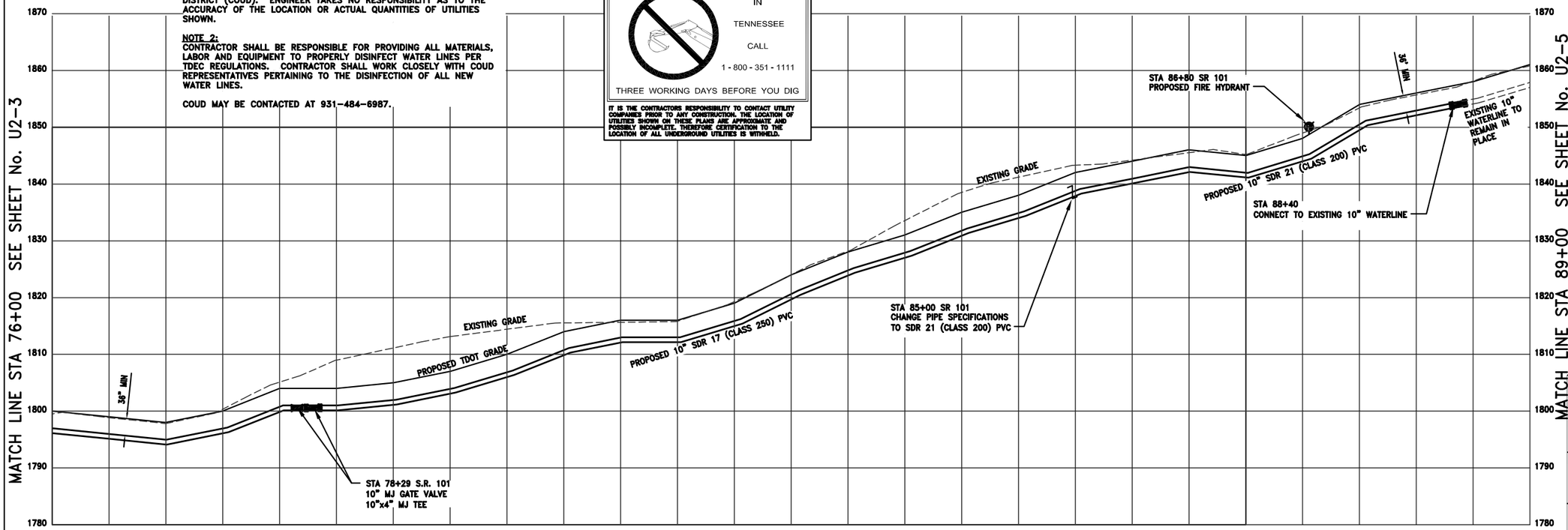

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BARRY R. FIELD
REGISTERED ENGINEER
No. 21668
STATE OF TENNESSEE
8-24-15

CRAB ORCHARD UTILITY DISTRICT

2089 EAST 1ST STREET
CROSSVILLE, TENNESSEE 38555

S.R. 101 (PEAVINE ROAD) WATERLINE RELOCATION

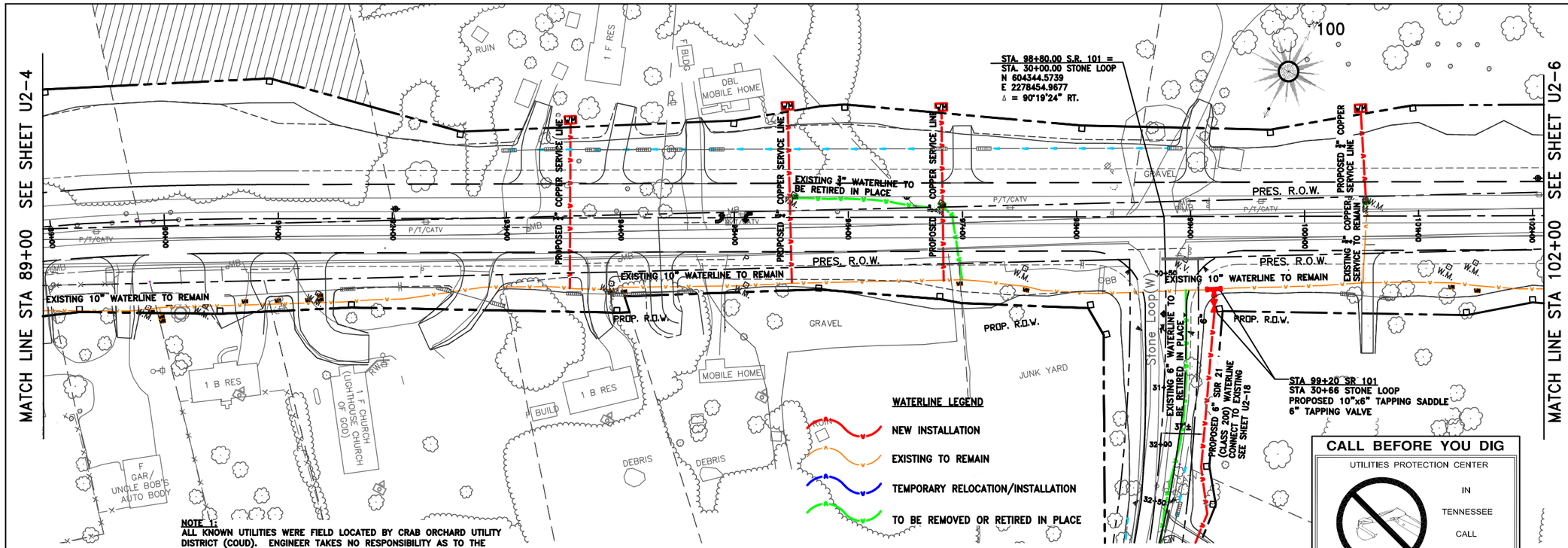
FECS
FIELD'S ENGINEERING CONSULTANT SERVICES, LLC
77 COTHER STREET
CROSSVILLE, TENNESSEE 38555
(931) 456-6071

STA. 76+00 TO STA. 89+00

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

TYPE	YEAR	PROJECT NO.	SHEET NO.
CONSTRUCTION	2015	STP-101(16)	U2-5

CUMBERLAND COUNTY



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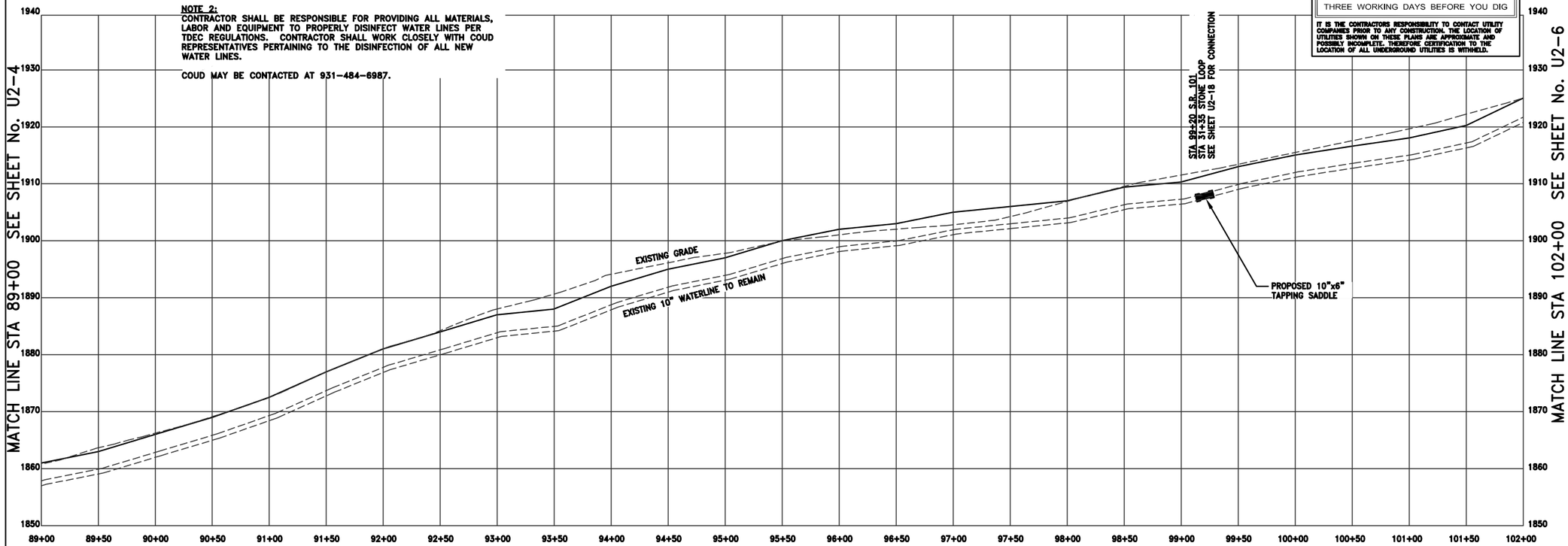

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BARRY R. FIELD
REGISTERED ENGINEER
No. 21662
STATE OF TENNESSEE
8-24-15

CRAB ORCHARD UTILITY DISTRICT
2089 EAST 1ST STREET
CROSSVILLE, TENNESSEE 38555

S.R. 101 (PEAVINE ROAD) WATERLINE RELOCATION

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CROSSVILLE, TENNESSEE 38555
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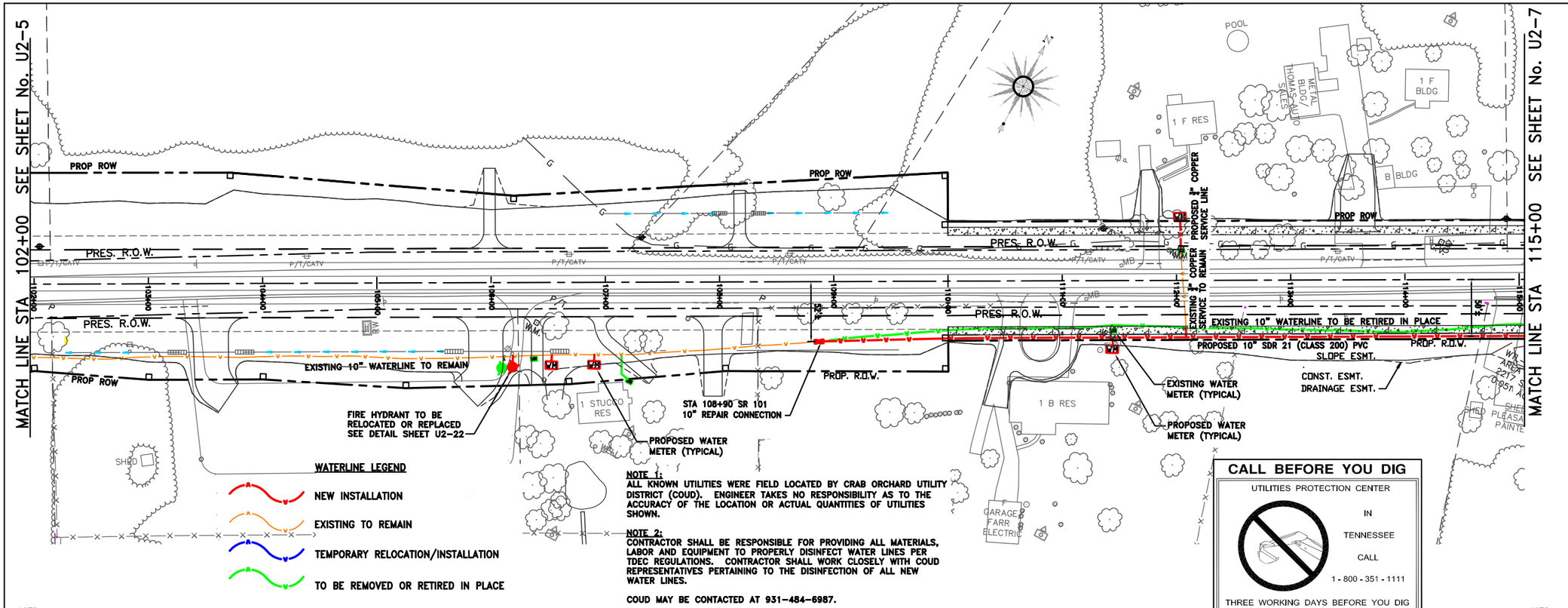
TYPE	YEAR	PROJECT NO.	SHEET NO.
CONSTRUCTION	2015	STP-101(16)	U2-6

CUMBERLAND COUNTY



WATERLINE LEGEND

- NEW INSTALLATION
- EXISTING TO REMAIN
- TEMPORARY RELOCATION/INSTALLATION
- TO BE REMOVED OR RETIRED IN PLACE

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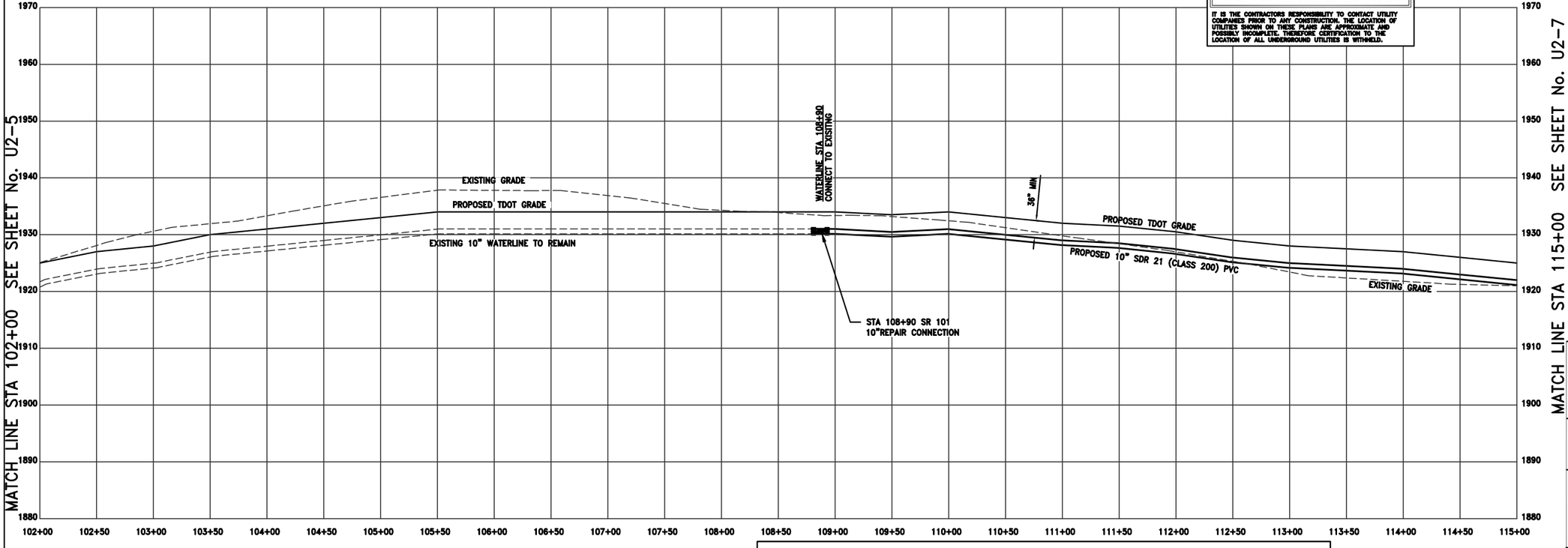

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BARRY R. FIELD REGISTERED ENGINEER STATE OF TENNESSEE COMMERCE No. 21682

8-24-15

CRAB ORCHARD UTILITY DISTRICT

2089 EAST 1ST STREET
CROSSVILLE, TENNESSEE 38555

S.R. 101 (PEAVINE ROAD) WATERLINE RELOCATION

FIELD'S ENGINEERING CONSULTANT SERVICES, LLC
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.
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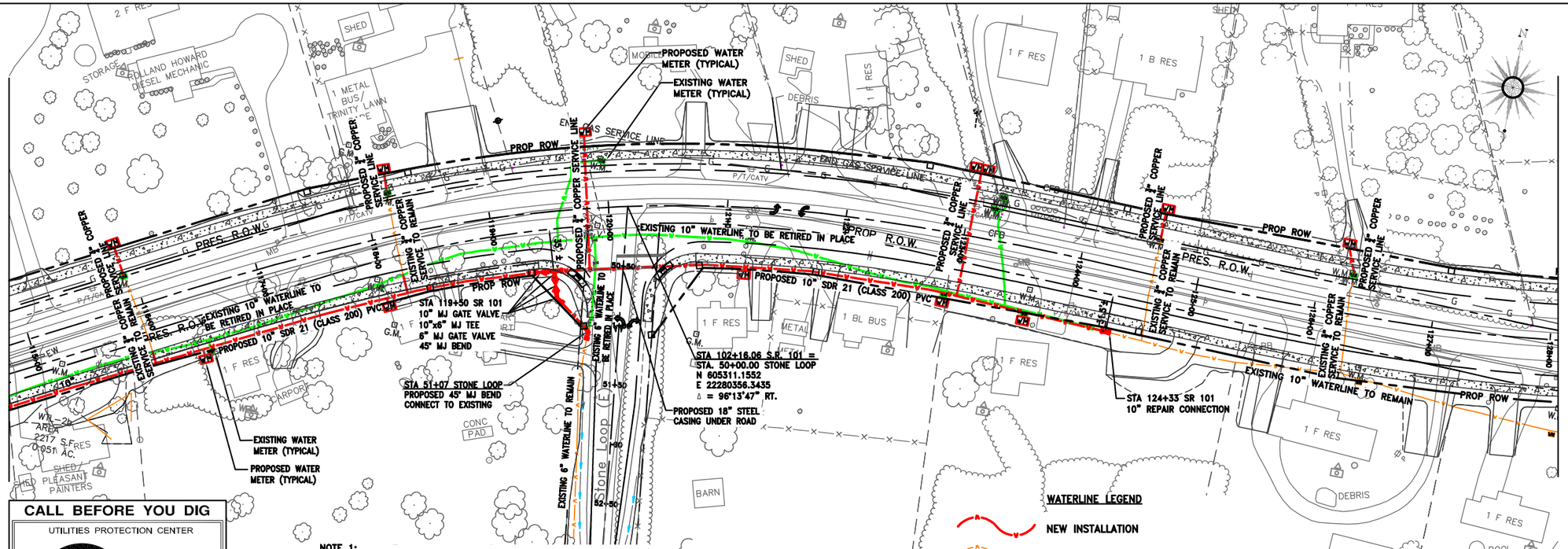
CUMBERLAND COUNTY

MATCH LINE 115+00 SEE SHEET No. U2-6

MATCH LINE 128+00 SEE SHEET No. U2-8



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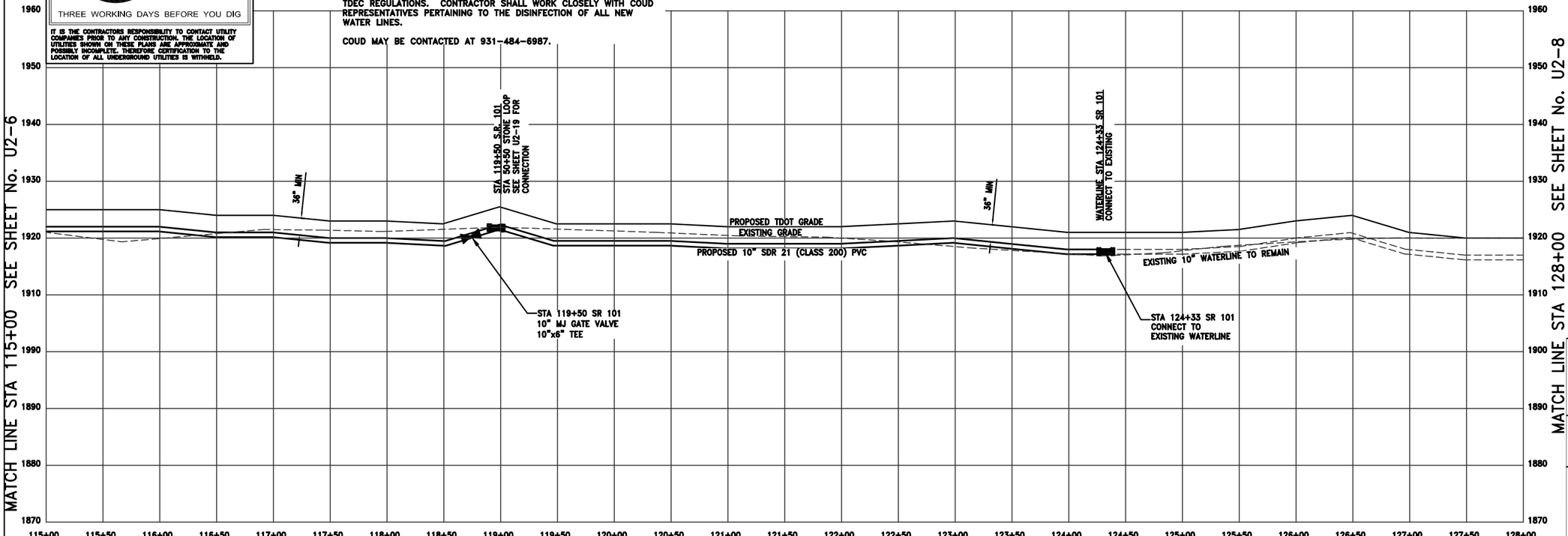
COUD MAY BE CONTACTED AT 931-484-6987.



MATCH LINE STA 115+00 SEE SHEET No. U2-6

MATCH LINE STA 128+00 SEE SHEET No. U2-8

BARRY R. FIELD REGISTERED ENGINEER AGRICULTURE COMMERCE No. 21682 STATE OF TENNESSEE 3-24-15

CRAB ORCHARD UTILITY DISTRICT

2089 EAST 1ST STREET
CROSSVILLE, TENNESSEE 38555

S.R. 101 (PEAVINE ROAD) WATERLINE RELOCATION

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

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

MATCH LINE STA 128+00 SEE SHEET No. U2-7

MATCH LINE STA 141+00 SEE SHEET No. U2-9

CONTRACTOR SHALL KEEP WETLAND DISTURBANCE TO A MINIMUM AND AS NEEDED FOR UTILITY RELOCATION. THE DISTURBED AREA SHALL BE RESTORED TO EXISTING CONDITIONS AND COMPACTED CLAY PLUGS SHALL BE USED AT ENDS OF THE PROPOSED TRENCH TO PREVENT DRAINING OF THE WETLAND.

WTL-3 WETLANDS CROSSING.
CONTRACTOR SHALL KEEP WETLAND DISTURBANCE TO A MINIMUM AND AS NEEDED FOR UTILITY RELOCATION. THE DISTURBED AREA SHALL BE RESTORED TO EXISTING CONDITIONS AND COMPACTED CLAY PLUGS SHALL BE USED AT ENDS OF THE PROPOSED TRENCH TO PREVENT DRAINING OF THE WETLAND.

STA 134+30.00 S.R. 101 =
STA. 30+00.00 CHERRY BRANCH RD.
N 605558.4200
E 22281726.1930
Δ = 90°00'00" RT.

STA 140+40 S.R. 101 =
STA. 10+00.00 FENCE LAND
N 605881.1150
E 22282242.6680
Δ = 91°43'01" RT.

PROPOSED WATER METER (TYPICAL)

EXISTING WATER METER (TYPICAL)

EXISTING 10" WATERLINE TO REMAIN

EXISTING 8" WATERLINE TO REMAIN

STA 134+85 SR 101
STA 30+82 CHERRY BRANCH RD
8"x4" TAPPING SADDLE
4" TAPPING VALVE

STA 139+98 SR 101
8"x4" TAPPING SADDLE
4" TAPPING VALVE

PROPOSED 4" SDR 17 (CLASS 200) PVC CONNECT TO EXISTING WATERLINE SEE SHEET U2-19

EXISTING 4" SDR 17 (CLASS 200) PVC WATERLINE TO BE RETIRED IN PLACE

PROPOSED 4" SDR 21 (CLASS 200) PVC - SEE SHEET U2-20

EXISTING 4" WATERLINE TO BE RETIRED IN PLACE

OWNER ID # - 5098
FACILITY # - 4-180021
TANK 1 - 1000 GAL. (GAS)
TANK 2 - 1000 GAL. (GAS, LEAKS)
TANK 3 - 1000 GAL. (GAL)

WATERLINE LEGEND

- NEW INSTALLATION
- EXISTING TO REMAIN
- TEMPORARY RELOCATION/INSTALLATION
- TO BE REMOVED OR RETIRED IN PLACE

CALL BEFORE YOU DIG

UTILITIES PROTECTION CENTER

IN TENNESSEE CALL

1 - 800 - 351 - 1111

THREE WORKING DAYS BEFORE YOU DIG

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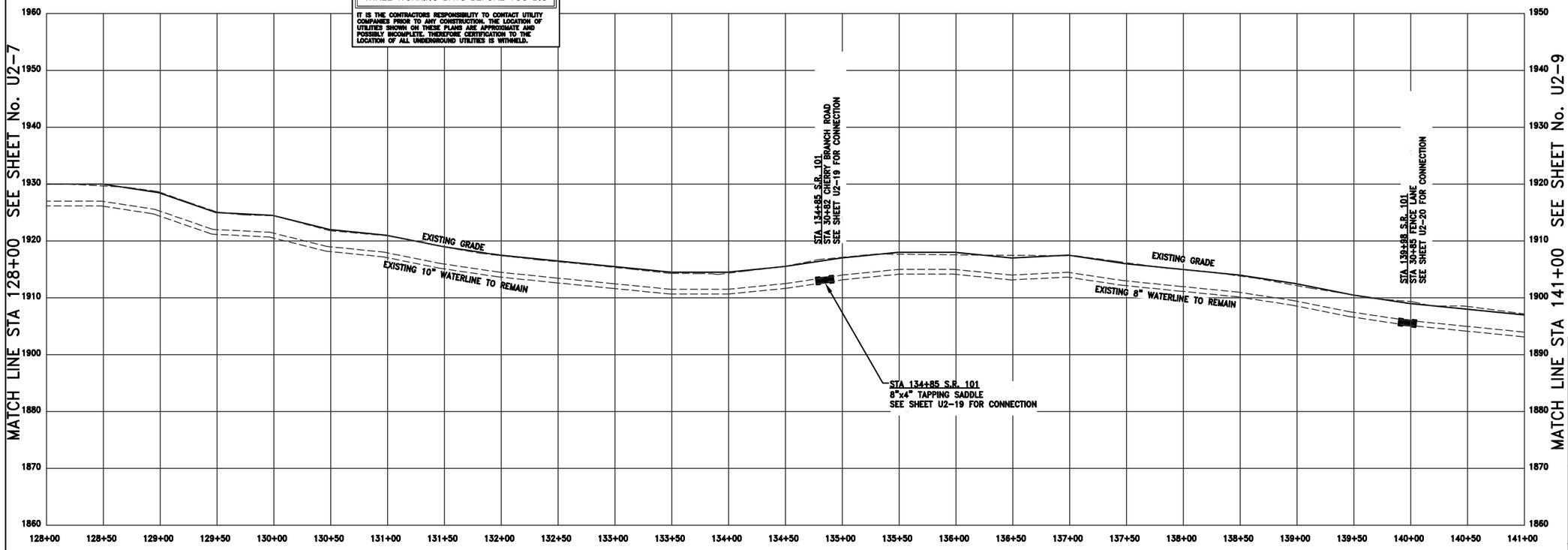


TYPE	YEAR	PROJECT NO.	SHEET NO.
CONSTRUCTION	2015	STP-101(16)	U2-8

CUMBERLAND COUNTY

BARRY R. FIELD
REGISTERED ENGINEER
AGRICULTURE
CERTIFICATE NO. 21662
STATE OF TENNESSEE
8-24-15

CRAB ORCHARD UTILITY DISTRICT
2089 EAST 1ST STREET
CROSSVILLE, TENNESSEE 38555

S.R. 101 (PEAVINE ROAD) WATERLINE RELOCATION

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

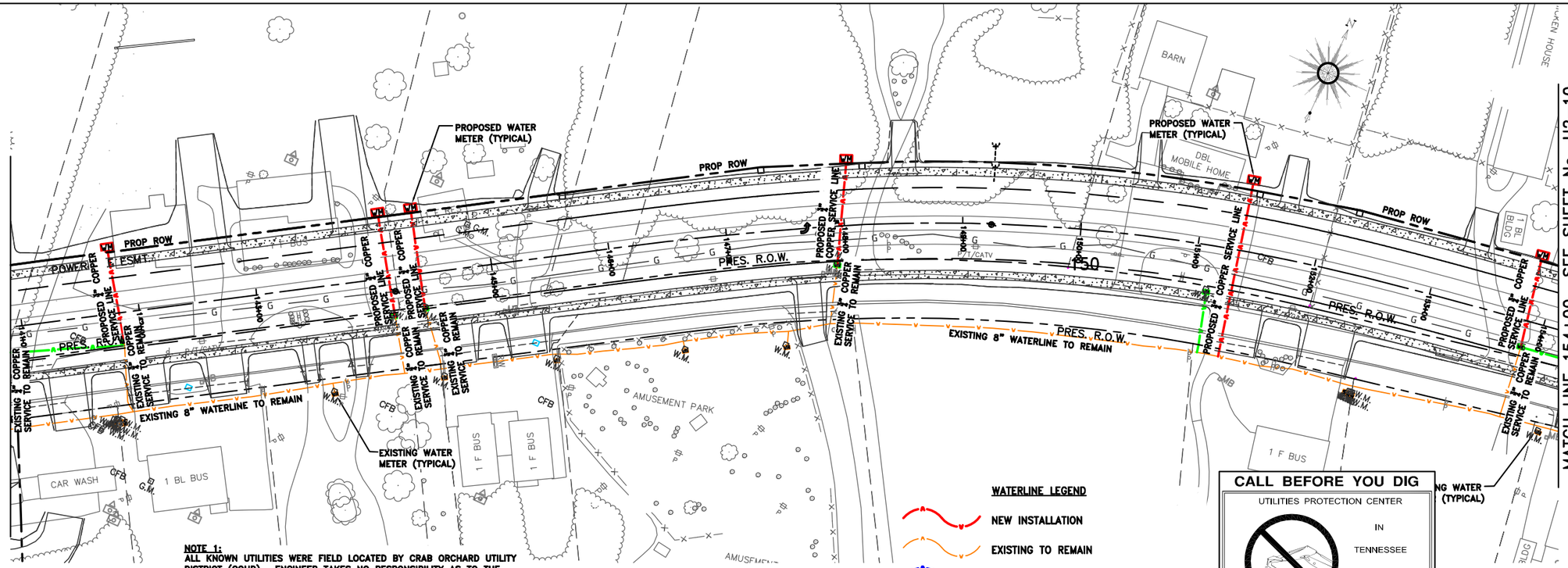
STA. 128+00 TO STA. 141+00
SCALE: 1"=50' H
1"=10' V

TYPE	YEAR	PROJECT NO.	SHEET NO.
CONSTRUCTION	2015	STP-101(16)	U2-9

CUMBERLAND COUNTY

MATCH LINE 141+00 SEE SHEET No. U2-8

MATCH LINE 154+00 SEE SHEET No. U2-10



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COUD MAY BE CONTACTED AT 931-484-6987.

WATERLINE LEGEND

- NEW INSTALLATION
- EXISTING TO REMAIN
- TEMPORARY RELOCATION/INSTALLATION
- TO BE REMOVED OR RETIRED IN PLACE

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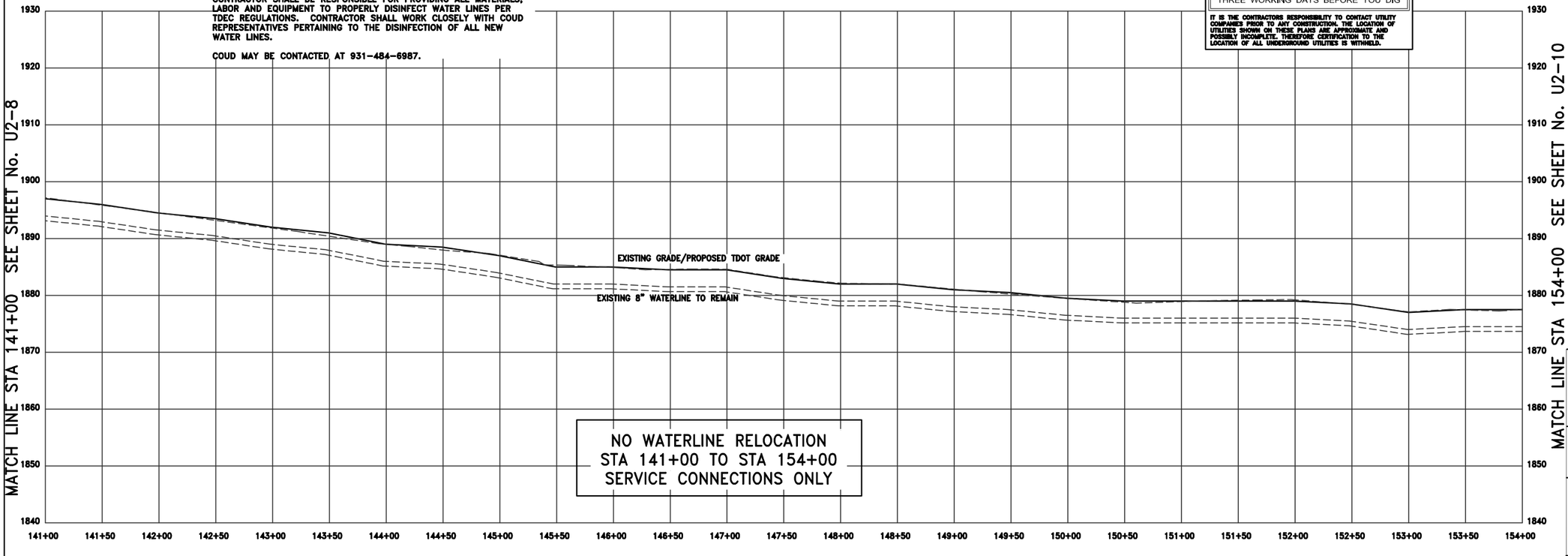


NO WATERLINE RELOCATION
STA 141+00 TO STA 154+00
SERVICE CONNECTIONS ONLY

BARRY R. FIELD
REGISTERED ENGINEER
AGRICULTURE
COMMERCE
No. 21686
STATE OF TENNESSEE
3-24-15

CRAB ORCHARD UTILITY DISTRICT

2089 EAST 1ST STREET
CROSSVILLE, TENNESSEE 38555

S.R. 101 (PEAVINE ROAD) WATERLINE RELOCATION

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

STA. 141+00 TO STA. 154+00

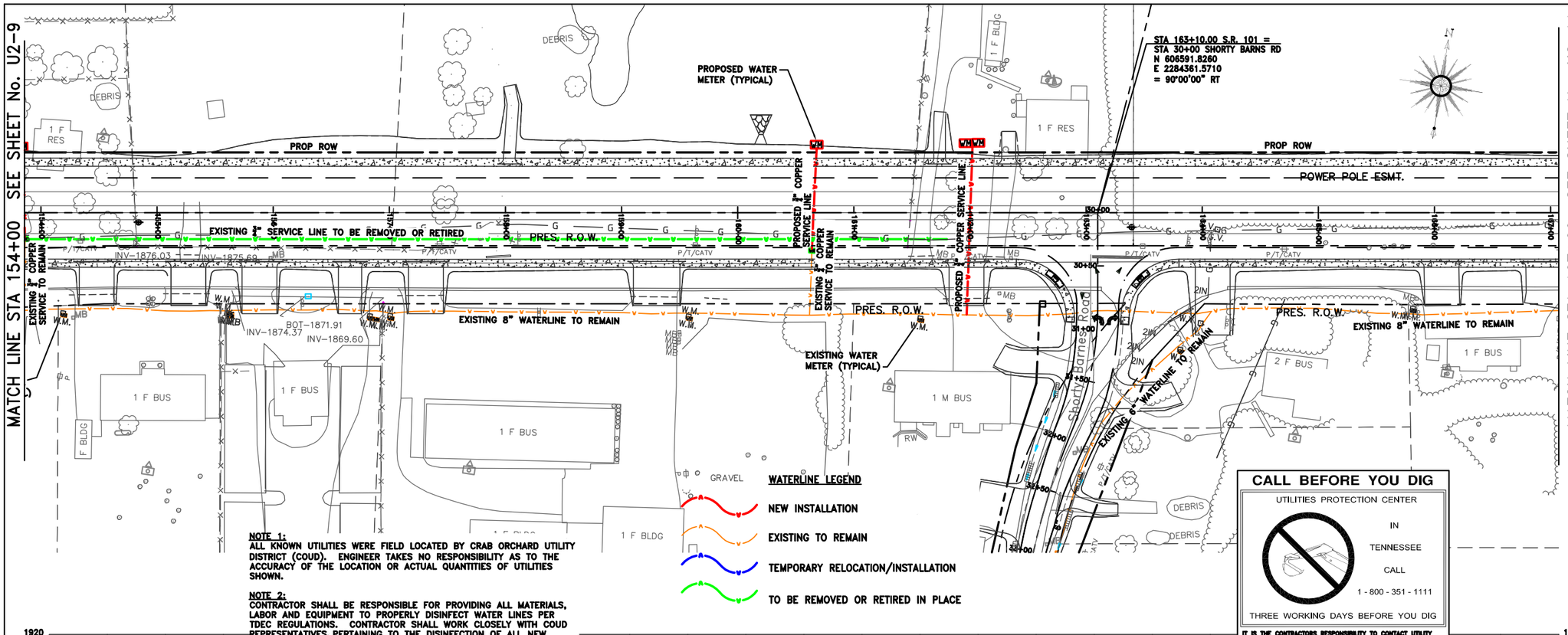
SCALE: 1"=50' H
1"=10' V

TYPE	YEAR	PROJECT NO.	SHEET NO.
CONSTRUCTION	2015	STP-101(16)	U2-10

CUMBERLAND COUNTY

MATCH LINE STA 154+00 SEE SHEET No. U2-9

MATCH LINE STA 167+00 SEE SHEET No. U2-11



WATERLINE LEGEND

- NEW INSTALLATION
- EXISTING TO REMAIN
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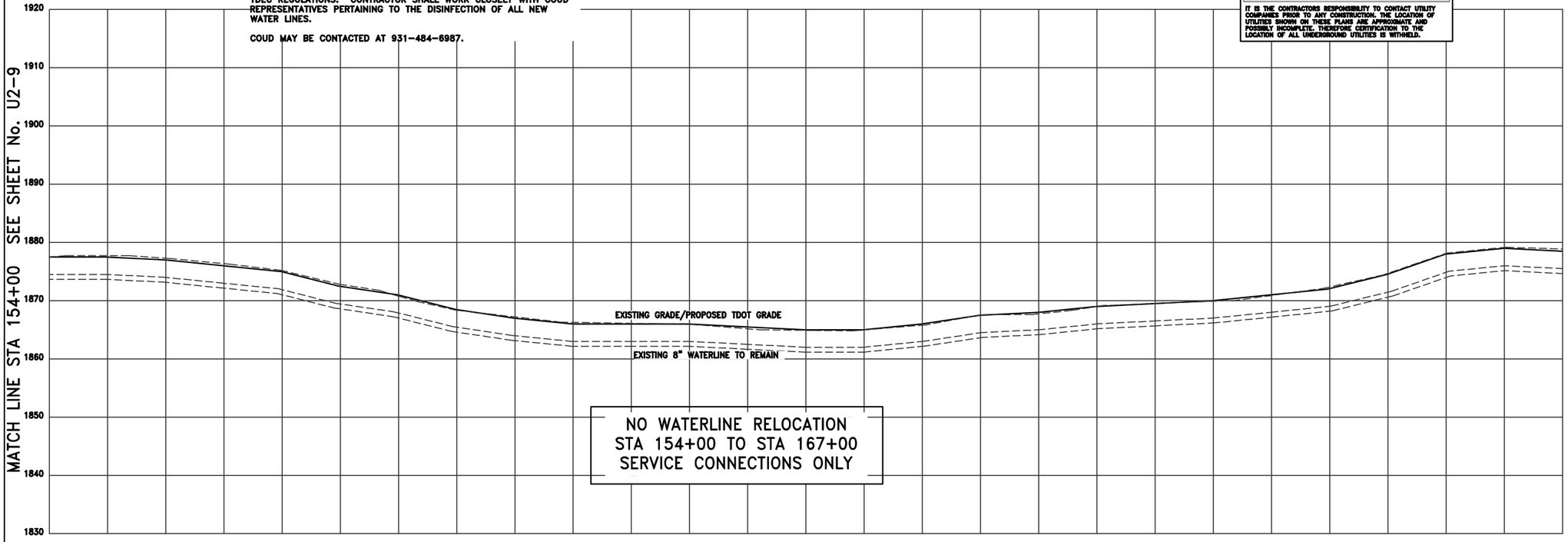


NO WATERLINE RELOCATION
STA 154+00 TO STA 167+00
SERVICE CONNECTIONS ONLY

BARRY R. FIELD
REGISTERED ENGINEER
AGRICULTURE
COMMERCE
No. 21682
STATE OF TENNESSEE
8-24-15

CRAB ORCHARD UTILITY DISTRICT
2089 EAST 1ST STREET
CROSSVILLE, TENNESSEE 38555

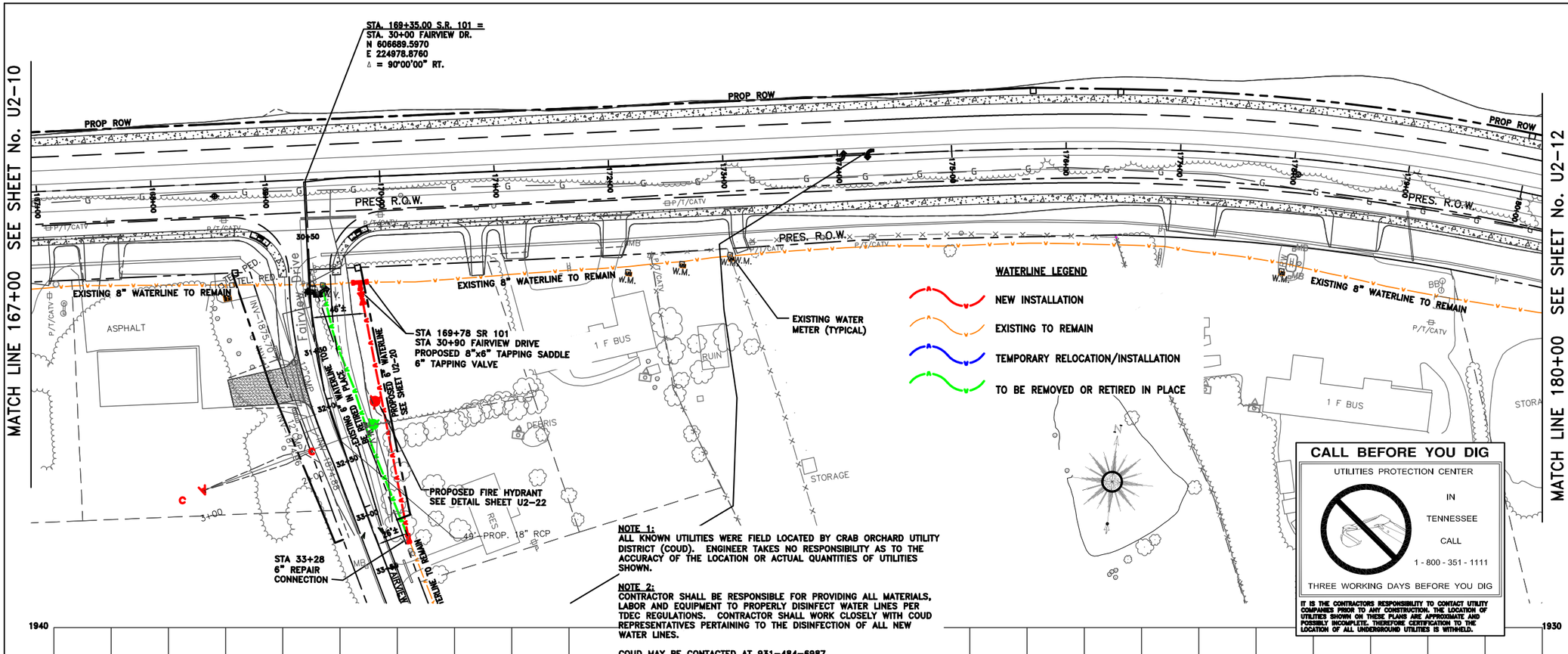
S.R. 101 (PEAVINE ROAD)
WATERLINE RELOCATION

FECS
FIELD'S ENGINEERING CONSULTANT SERVICES, LLC
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	2015	STP-101(16)	U2-11

CUMBERLAND COUNTY



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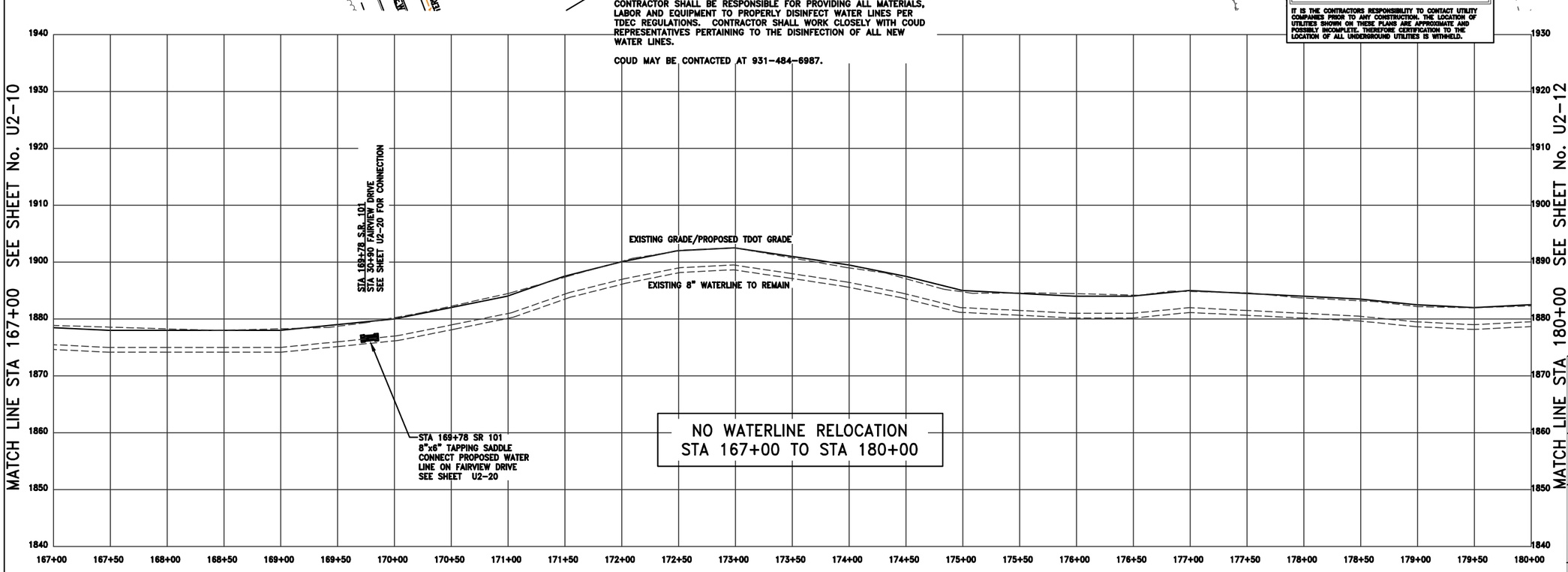

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No. 21682
STATE OF TENNESSEE
8-24-15

CRAB ORCHARD UTILITY DISTRICT
2089 EAST 1ST STREET
CROSSVILLE, TENNESSEE 38555

S.R. 101 (PEAVINE ROAD)
WATERLINE RELOCATION

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

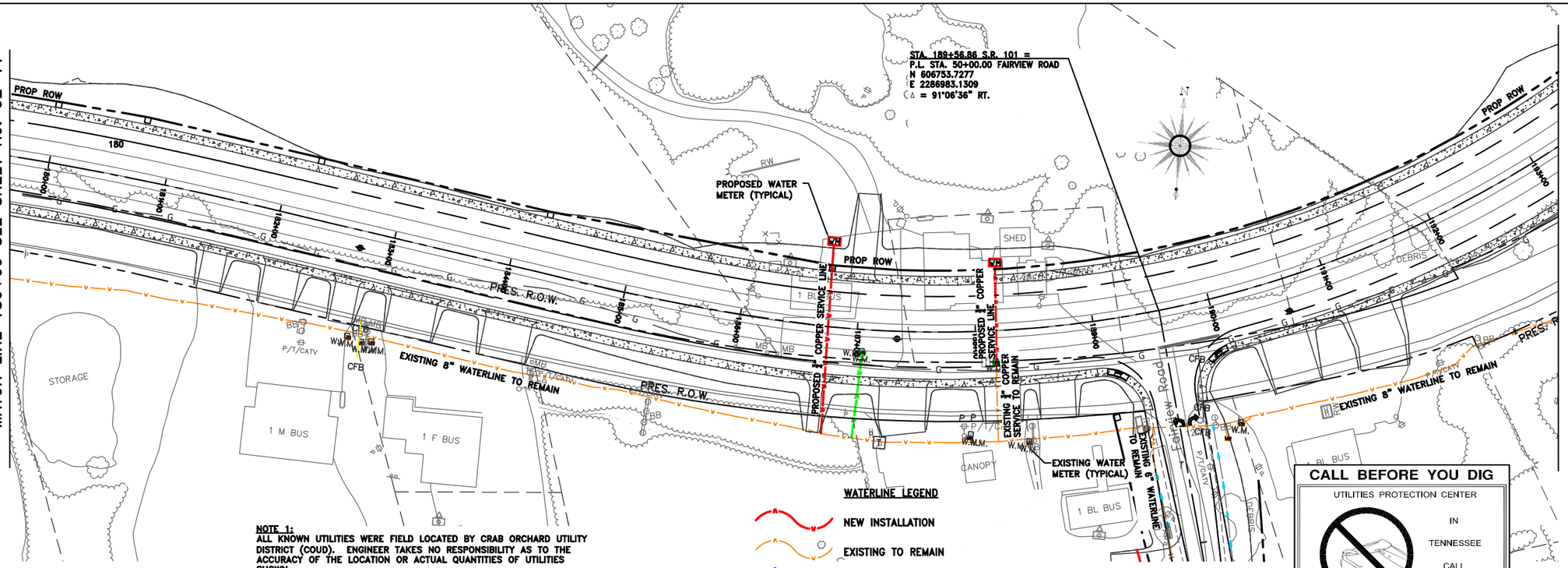
STA. 167+00 TO STA. 180+00
SCALE: 1"=50' H
1"=10' V

TYPE	YEAR	PROJECT NO.	SHEET NO.
CONSTRUCTION	2015	STP-101(16)	U2-12

CUMBERLAND COUNTY

MATCH LINE 180+00 SEE SHEET No. U2-11

MATCH LINE 193+00 SEE SHEET No. U2-13



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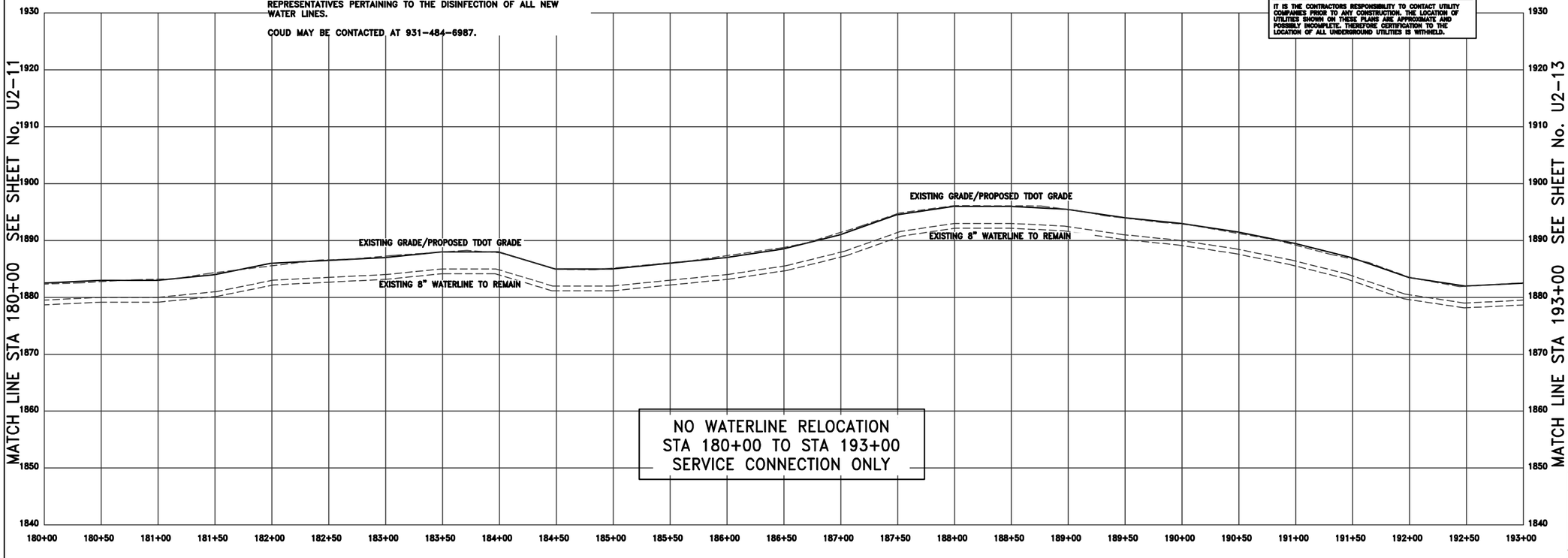

NO WATERLINE RELOCATION
STA 180+00 TO STA 193+00
SERVICE CONNECTION ONLY

BARRY R. FIELD
REGISTERED ENGINEER
AGRICULTURE
COMMERCE
No. 21662
STATE OF TENNESSEE
3-24-15

CRAB ORCHARD UTILITY DISTRICT
2089 EAST 1ST STREET
CROSSVILLE, TENNESSEE 38555

S.R. 101 (PEAVINE ROAD) WATERLINE RELOCATION

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

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

MATCH LINE STA 193+00 SEE SHEET No. U2-12

MATCH LINE STA 206+00 SEE SHEET No. U2-14

TYPE	YEAR	PROJECT NO.	SHEET NO.
CONSTRUCTION	2015	STP-101(16)	U2-13

CUMBERLAND COUNTY

PROPOSED WATER METER (TYPICAL)

PROP ROW

PRES. R.O.W.

R=681.20
L=293.42

PROPOSED 3" COPPER SERVICE LINE

3" COPPER REMAIN

EXISTING 3" COPPER SERVICE TO REMAIN

EXISTING WATER METER (TYPICAL)

EXISTING 8" WATERLINE TO REMAIN

Spring Lane Drive

IN.EL.1863.58

OUT.EL.1863.15

STA 200+18
8" REPAIR CONNECTION

16" STEEL CASING UNDER ROAD

EXISTING 6" WATERLINE TO REMAIN

STA 31+67
6" REPAIR CONNECTION

PROPOSED 10"STEEL CASING UNDER ROAD

STA. 200+75.00 S.R. 101 =
P.I. STA. 30+00.000 ST. GEORGE RD.
N 607518.7670
E 2287754.6440
Δ = 90°00'00" RT.

EXISTING 8" WATERLINE TO BE RETIRED IN PLACE

PROPOSED 8" SDR 21 (CLASS 200) PVC
SEE SHEET U2-21

St. George Drive

EXISTING 6" WATERLINE TO REMAIN

PROPOSED 8" SDR 21 (CLASS 200) PVC

STA 201+20 SR 101
STA 30+52 ST GEORGE DR
8"x8" MJ TEE
2- 8" MJ GATE VALVES

STA. 31+35.04 ST. GEORGE RD. =
STA. 10+00.000 SPRING LAKE DR.
N 607518.7670
E 2287754.6440
Δ = 90°00'00" RT.

STA 31+67 ST GEORGE DRIVE
8"x6" MJ TEE
8" MJ GATE VALVES
6" MJ VALVE
10" STEEL CASING UNDER ROADWAY (TYPICAL)

EXISTING WATER METER (TYPICAL)

STA 32+35 ST GEORGE DRIVE
8" REPAIR CONNECTION

EXIST 8" WATERLINE TO REMAIN

6" REPAIR CONNECTION

PROPOSED 8" SDR 21 (CLASS 200) PVC

PROPOSED 6" SDR 21 (CLASS 200) PVC
W/ 10" STEEL CASING UNDER ROAD
SEE DETAIL SHEET U2-23

STA 204+24 SR 101
8"x6" MJ TEE
8" MJ GATE VALVE
6" MJ GATE VALVE

WATERLINE LEGEND

NEW INSTALLATION

EXISTING TO REMAIN

TEMPORARY RELOCATION/INSTALLATION

TO BE REMOVED OR RETIRED IN PLACE

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CALL BEFORE YOU DIG

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CALL

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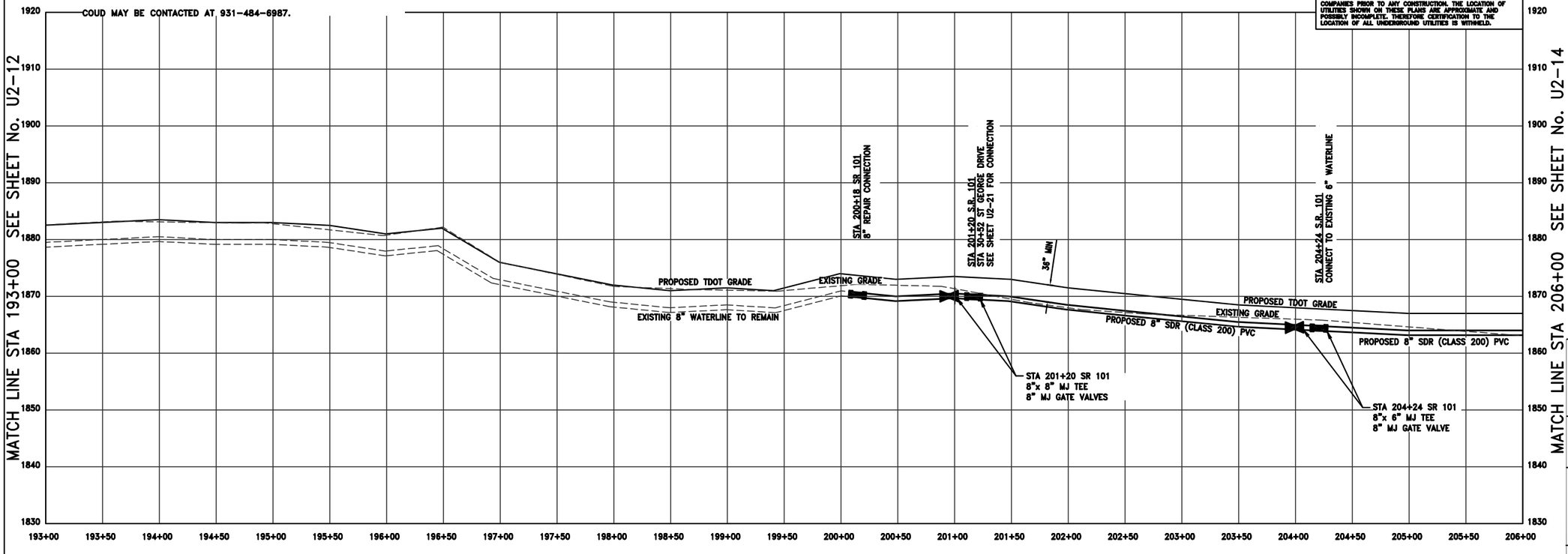


BARRY A. FIELD
REGISTERED ENGINEER
AGRICULTURE
COMMERCE
No. 21682
STATE OF TENNESSEE
5-24-15

CRAB ORCHARD UTILITY DISTRICT
2089 EAST 1ST STREET
CROSSVILLE, TENNESSEE 38555

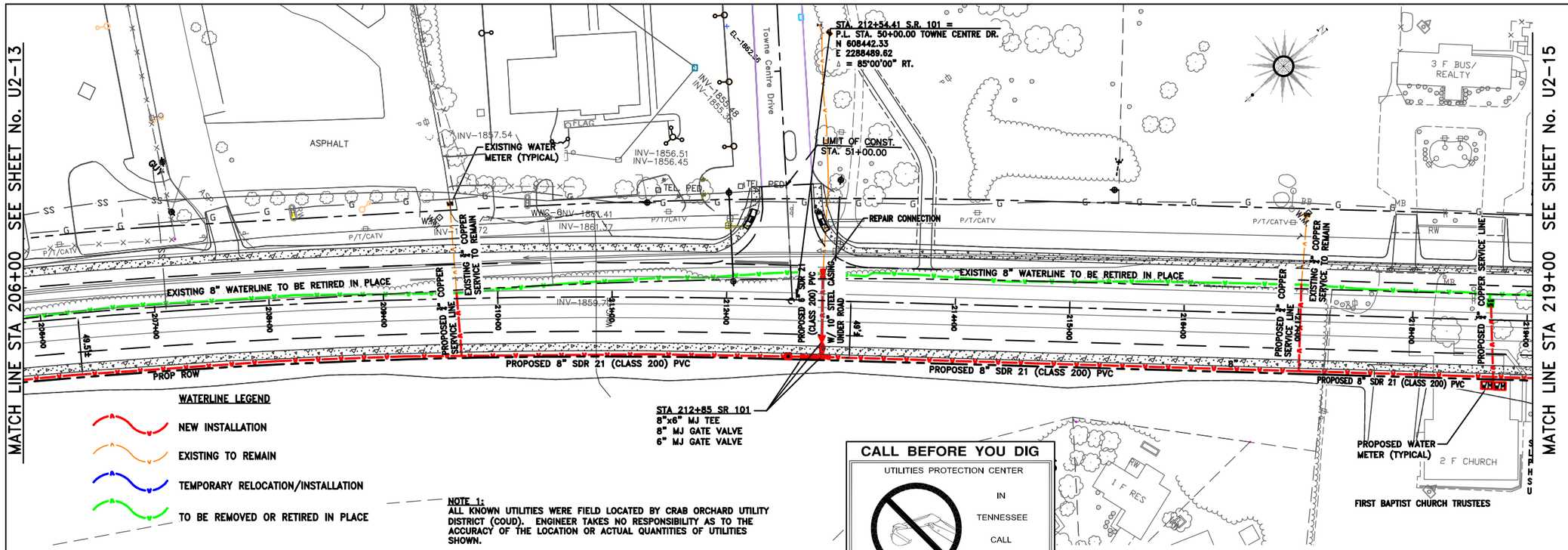
S.R. 101 (PEAVINE ROAD) WATERLINE RELOCATION

FECS
FIELD'S ENGINEERING CONSULTANT SERVICES, LLC
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	2015	STP-101(16)	U2-14

CUMBERLAND COUNTY



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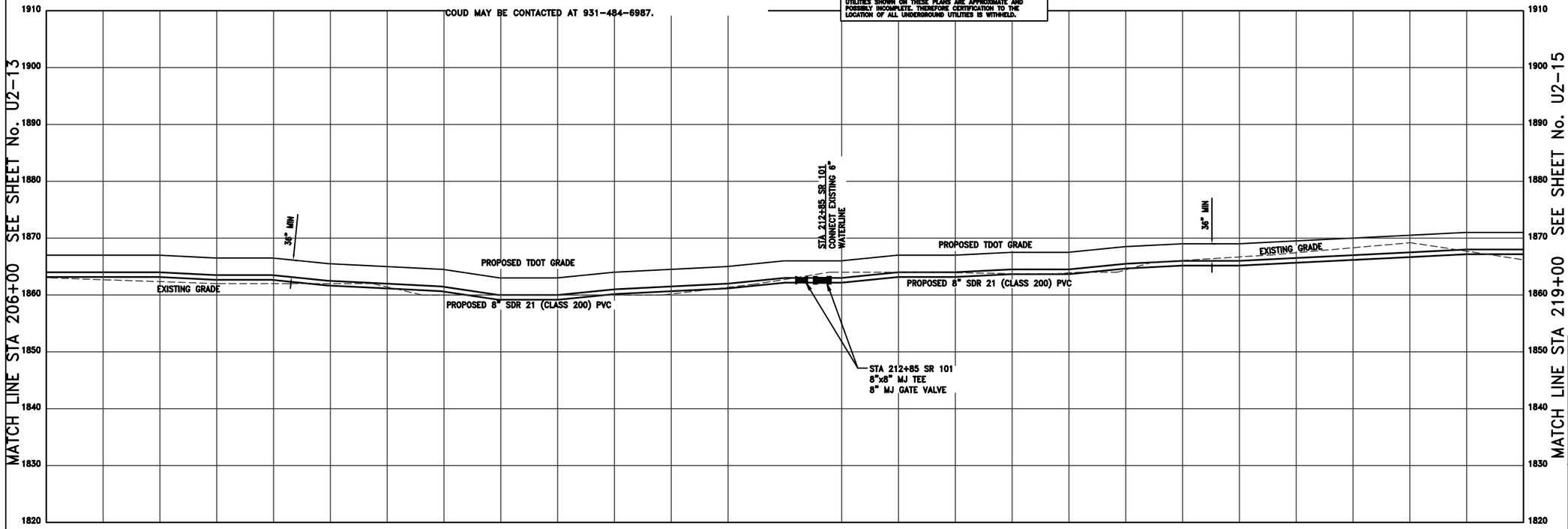

BARRY R. FIELD
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No. 21682
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5-24-15

CRAB ORCHARD UTILITY DISTRICT
2089 EAST 1ST STREET
CROSSVILLE, TENNESSEE 38555

S.R. 101 (PEAVINE ROAD) WATERLINE RELOCATION

FECS
FIELD'S ENGINEERING CONSULTANT SERVICES, LLC
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	2015	STP-101(16)	U2-15

CUMBERLAND COUNTY

MATCH LINE STA 219+00 SEE SHEET No. U2-14

MATCH LINE STA 232+00 SEE PHASE 2 DRAWINGS

STA 220+23.68 S.R. 101 =
P.I. STA. 50+00.00 LAKEVIEW DR.
N 609033.6210
E 2289068.6510
Δ = 90°00'00" RT.

STA. 220+85.00 S.R. 101 =
END PHASE I PROJECT NO. 18038-2237-14 (ROW)
BEGIN PROJECT PHASE 2 PROJECT NO. 18038-2238-14 (ROW)

STA 219+65 SR 101
8"x8" MJ TEE
8" MJ GATE VALVE
8"x4" MJ REDUCER
4" MJ GATE VALVE

EXISTING WATER METER (TYPICAL)

EXISTING 3" COPPER SERVICE TO REMAIN

STA 222+50
2-45° MJ BENDS

EXISTING 8" WATERLINE TO BE RETIRED IN PLACE

EXISTING 4" WATERLINE TO REMAIN

EXISTING 12" DIP WATERLINE TO REMAIN

PROPOSED 3" COPPER SERVICE LINE

PRV PIT

PROPOSED 4" SDR 21 (CLASS 200) PVC W/8" STEEL CASING UNDER ROAD

PROPOSED 12" SDR 21 (CLASS 200) PVC W/20" STEEL CASING UNDER ROAD

4" REPAIR CONNECTION

12" REPAIR CONNECTION

STA 221+90
2-45° MJ BENDS

STA 51+00
LAKEVIEW DRIVE
PROPOSED FIRE HYDRANT
SEE DETAIL SHEET U2-22

8"x8" MJ TEE
8"x12" MJ REDUCER
8" MJ GATE VALVE

Lakeview Drive - New Alignment

Lakeview Drive - Old Alignment

STA. 228+17.41 S.R. 101 =
P.I. STA. 40+00.00
WOODLANDS CIR.
N 609556.9264
E 2289581.0895
Δ = 102°08'00" LT.

1 F BUS
1 B BUS (CARWASH)
1 BL BUS (STORAGE)
1 BL BUS/FREITAG CONST.
1 F BUS/ DUTCHMASTERS CABINETRY
1 BL BUS
1 STUCCO BUS
DEBRIS
ASPHALT
Woodlands Circle

WATERLINE LEGEND

- NEW INSTALLATION
- EXISTING TO REMAIN
- TEMPORARY RELOCATION/INSTALLATION
- TO BE REMOVED OR RETIRED IN PLACE

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COUD MAY BE CONTACTED AT 931-484-6987.

CALL BEFORE YOU DIG

UTILITIES PROTECTION CENTER
IN
TENNESSEE
CALL
1 - 800 - 351 - 1111
THREE WORKING DAYS BEFORE YOU DIG

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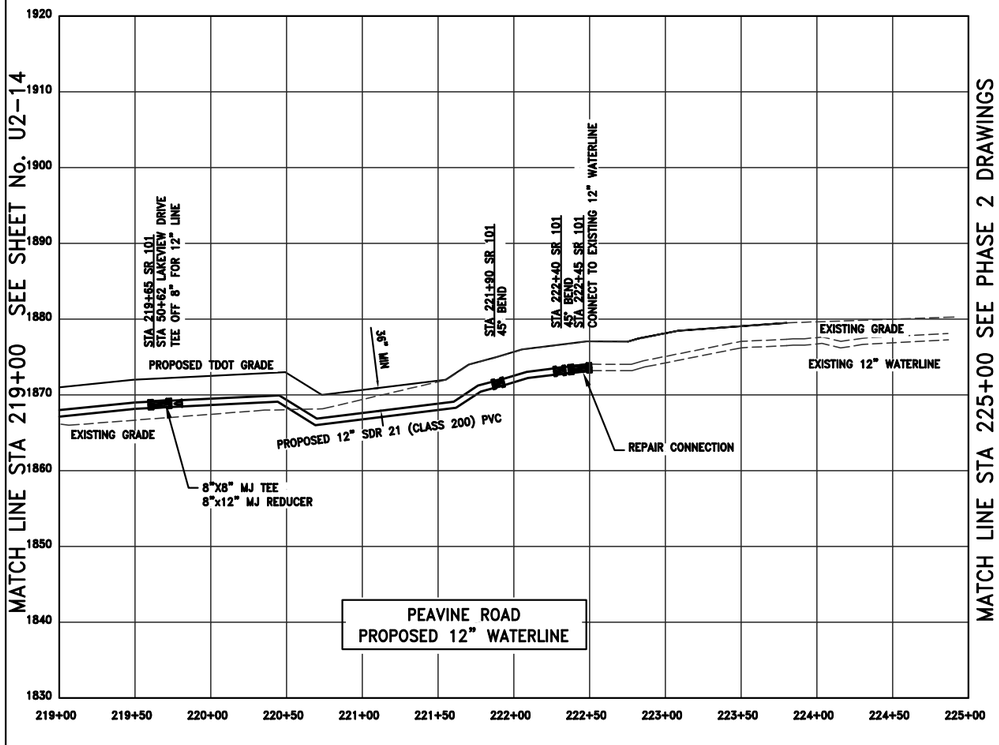
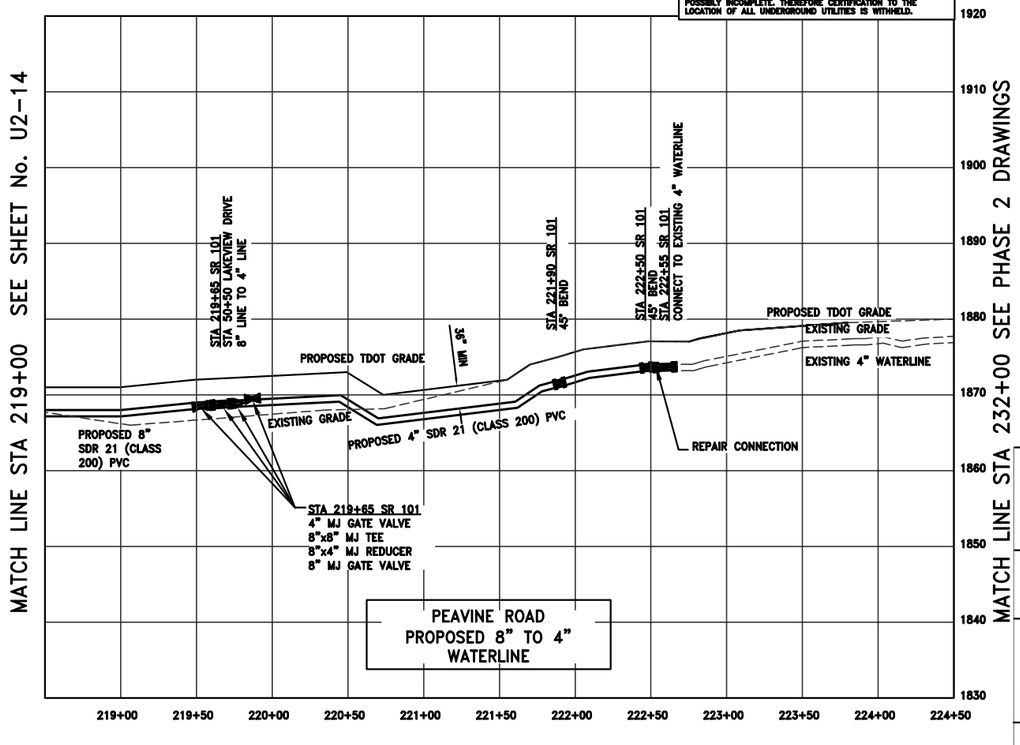




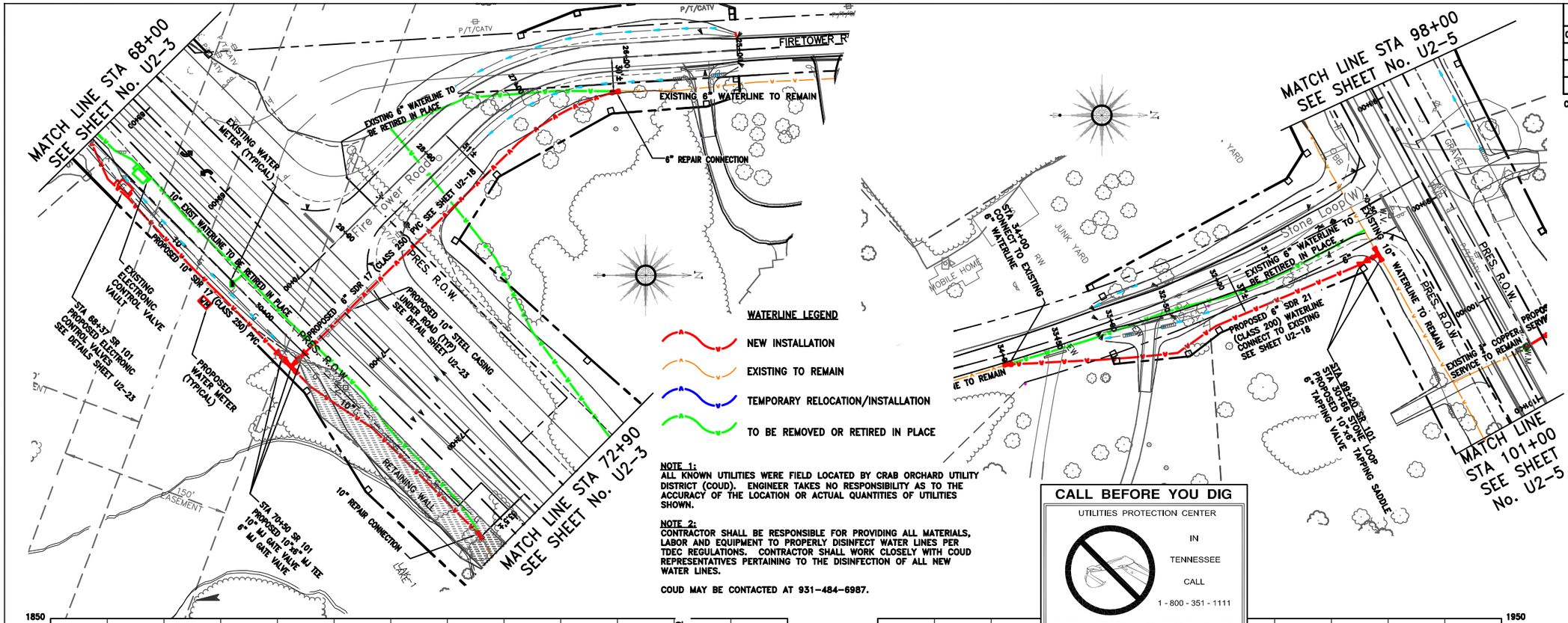
BARRY R. FIELD
REGISTERED ENGINEER
AGRICULTURE
COMMISSION NO. 21682
STATE OF TENNESSEE
8-24-15

CRAB ORCHARD UTILITY DISTRICT
2089 EAST 1ST STREET
CROSSVILLE, TENNESSEE 38555

S.R. 101 (PEAVINE ROAD) WATERLINE RELOCATION

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

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



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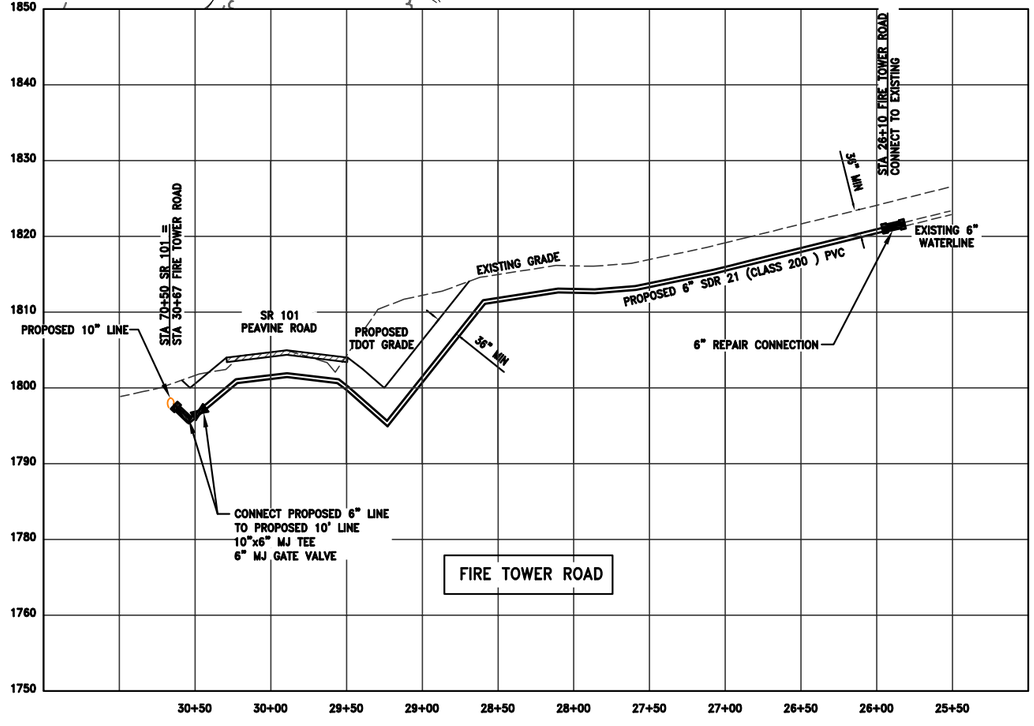
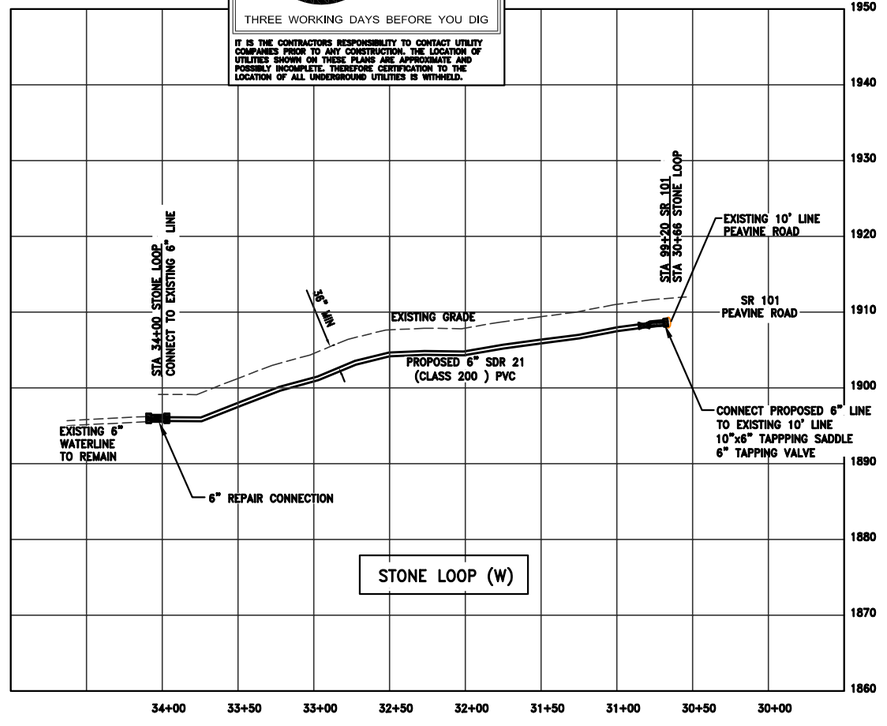




TYPE	YEAR	PROJECT NO.	SHEET NO.
CONSTRUCTION	2015	STP-101(16)	U2-16

CUMBERLAND COUNTY

BARRY R. FIELD
REGISTERED ENGINEER
AGRICULTURE
COMMERCE
No. 21662
STATE OF TENNESSEE
6-24-15

CRAB ORCHARD
UTILITY DISTRICT
2089 EAST 1ST STREET
CROSSVILLE, TENNESSEE 38555

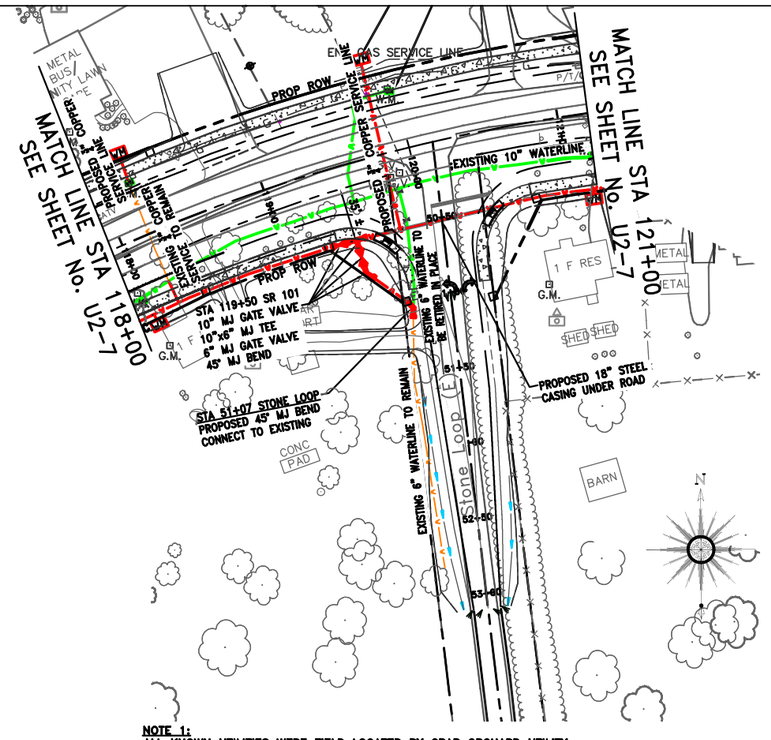
FIRE TOWER ROAD
STONE LOOP (WEST)
WATERLINE RELOCATION

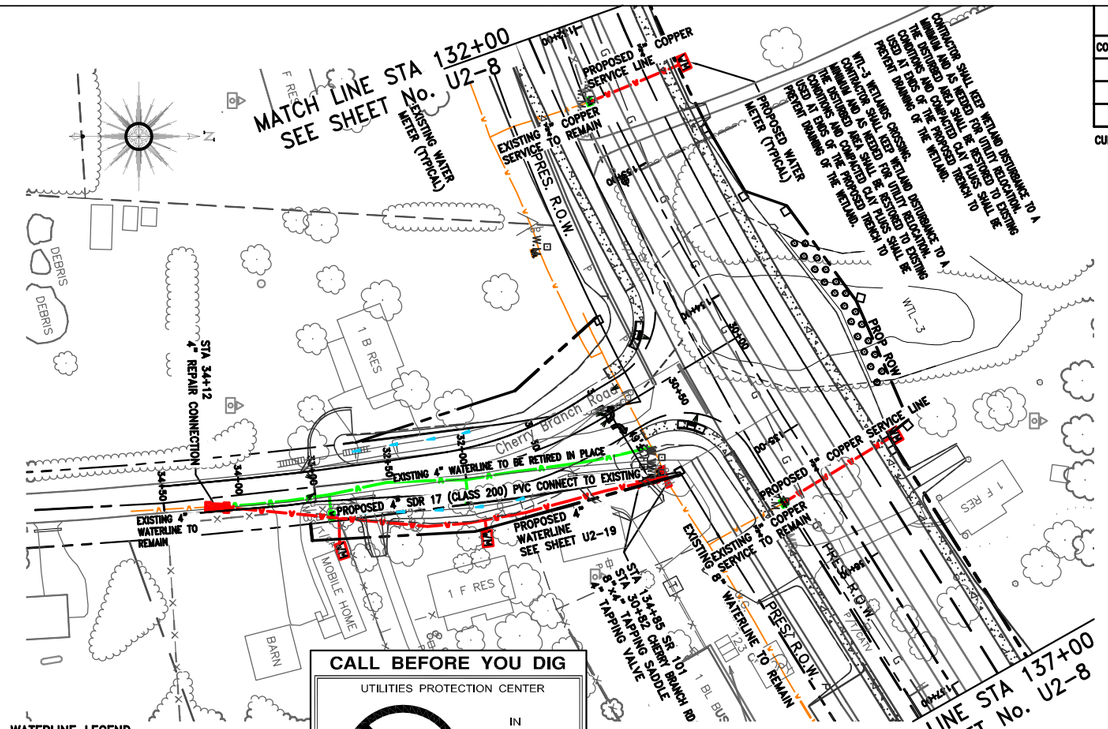
FECS
FIELD'S ENGINEERING CONSULTANT SERVICES, LLC
77 COTHER STREET
CROSSVILLE, TENNESSEE 38555
(931) 456-6071

STA. 25+00 TO STA. 30+00
STA. 30+00 TO STA. 34+00
SCALE : 1"=50' H - 1"=10' V

TYPE	YEAR	PROJECT NO.	SHEET NO.
CONSTRUCTION	2015	STP-101(16)	U2-17

CUMBERLAND COUNTY





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COUD MAY BE CONTACTED AT 931-484-6987.

WATERLINE LEGEND

- NEW INSTALLATION
- EXISTING TO REMAIN
- TEMPORARY RELOCATION/INSTALLATION
- TO BE REMOVED OR RETIRED IN PLACE

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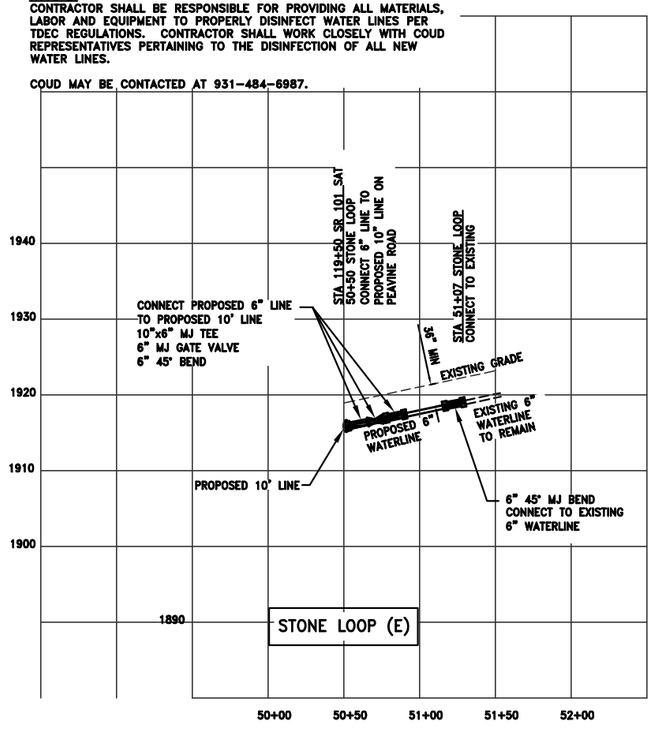
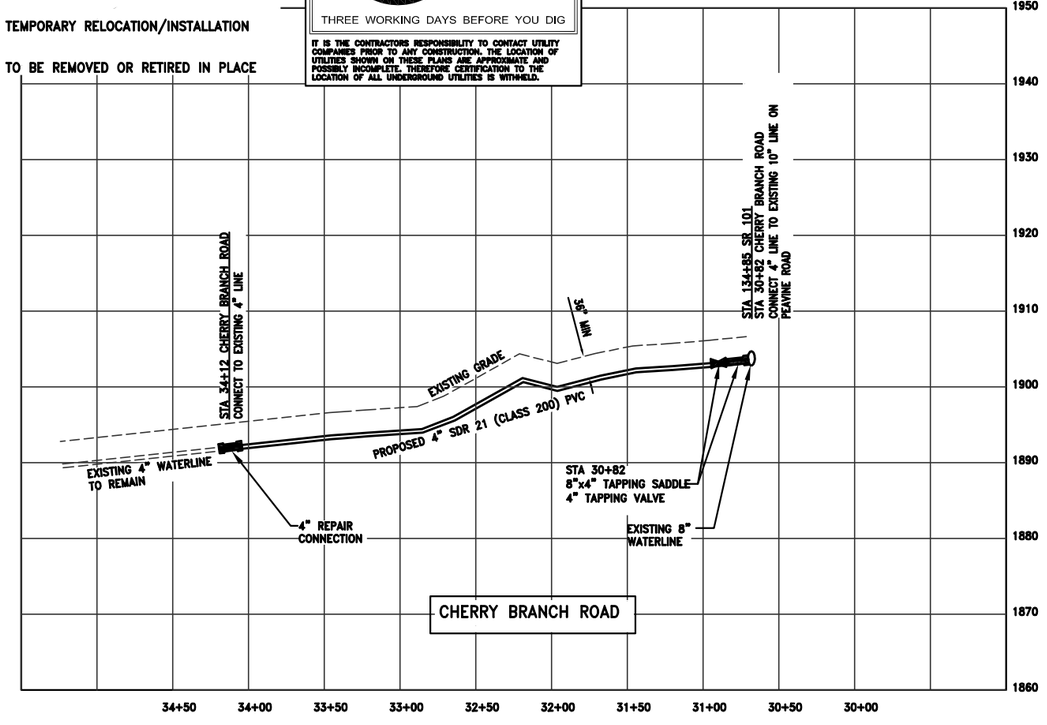




BARRY A. FIELD
REGISTERED ENGINEER
AGRICULTURE
COMMERCE
No. 21682
STATE OF TENNESSEE
8-24-15

CRAB ORCHARD UTILITY DISTRICT
2089 EAST 1ST STREET
CROSSVILLE, TENNESSEE 38555

STONE LOOP (EAST END) CHERRY BRANCH ROAD WATERLINE RELOCATION

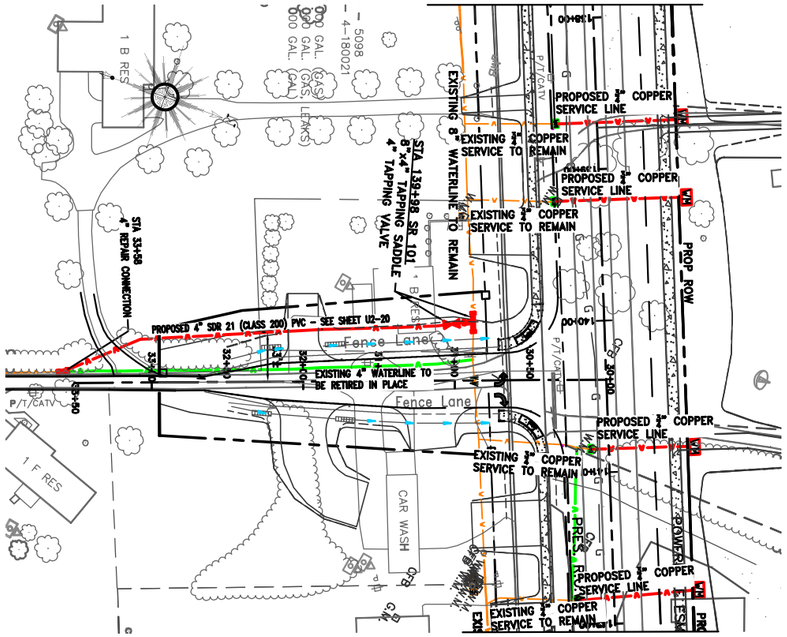
FECS
FIELD'S ENGINEERING CONSULTANT SERVICES, LLC
77 COTHER STREET
CROSSVILLE, TENNESSEE 38555
(931) 456-6071

STA. 50+50 TO STA. 51+50
STA. 30+00 TO STA. 34+50
SCALE : 1"=50' H - 1"=10' V

TYPE	YEAR	PROJECT NO.	SHEET NO.
CONSTRUCTION	2015	STP-101(16)	U2-18

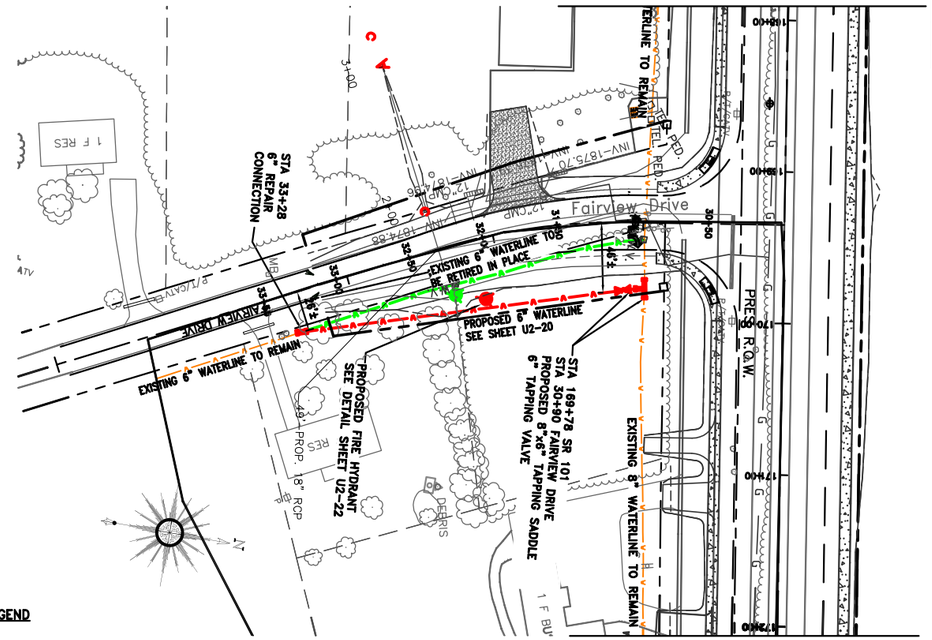
CUMBERLAND COUNTY

MATCH LINE STA 138+00 SEE SHEET No. U2-8



MATCH LINE STA 142+00 SEE SHEET No. U2-9

MATCH LINE STA 168+00 SEE SHEET No. U2-11



MATCH LINE STA 172+00 SEE SHEET No. U2-11

WATERLINE LEGEND

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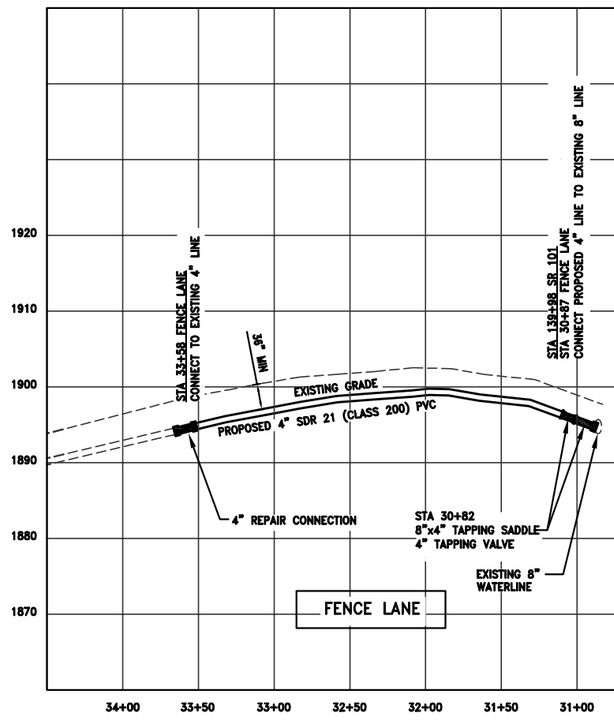

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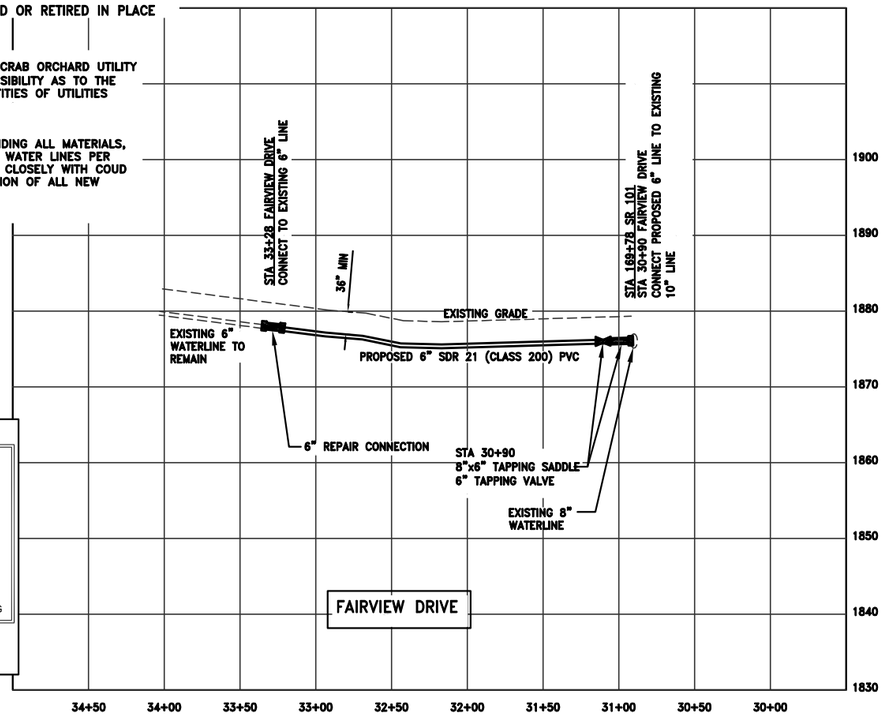


BARRY R. FIELD
REGISTERED ENGINEER
BY AGRICULTURE
COMMERCE NO. 21682
STATE OF TENNESSEE
5-24-15

CRAB ORCHARD UTILITY DISTRICT

2089 EAST 1ST STREET
CROSSVILLE, TENNESSEE 38555

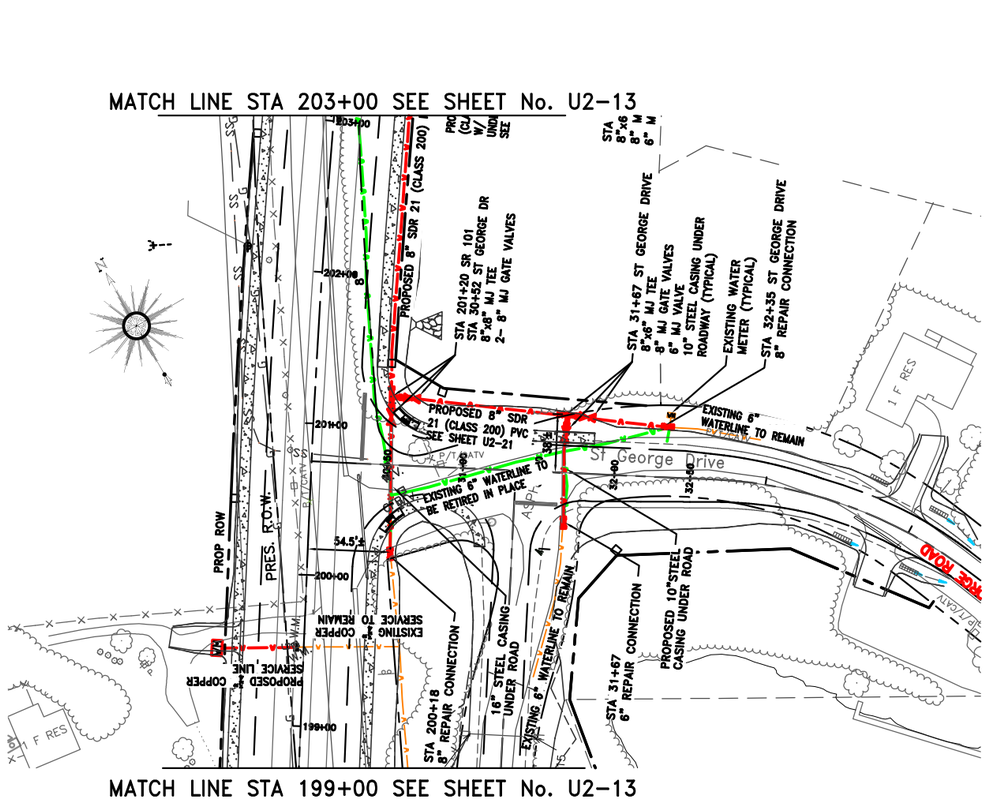
FENCE LANE
FAIRVIEW DRIVE
WATERLINE RELOCATION

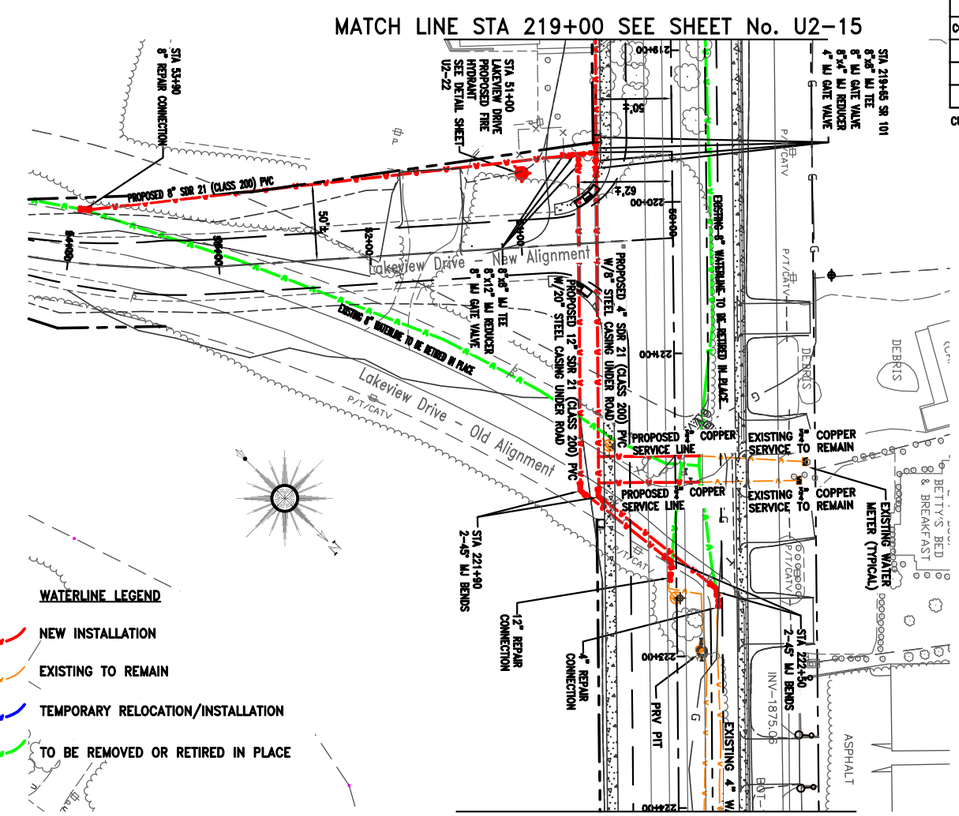
FIELD'S ENGINEERING CONSULTANT SERVICES, LLC
77 COTHER STREET
CROSSVILLE, TENNESSEE 38555
(931) 456-6071

STA. 30+00 TO STA. 34+00
STA. 30+00 TO STA. 34+00
SCALE : 1"=50' H - 1"=10' V

TYPE	YEAR	PROJECT NO.	SHEET NO.
CONSTRUCTION	2015	STP-101(16)	U2-19

CUMBERLAND COUNTY





WATERLINE LEGEND

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- TEMPORARY RELOCATION/INSTALLATION
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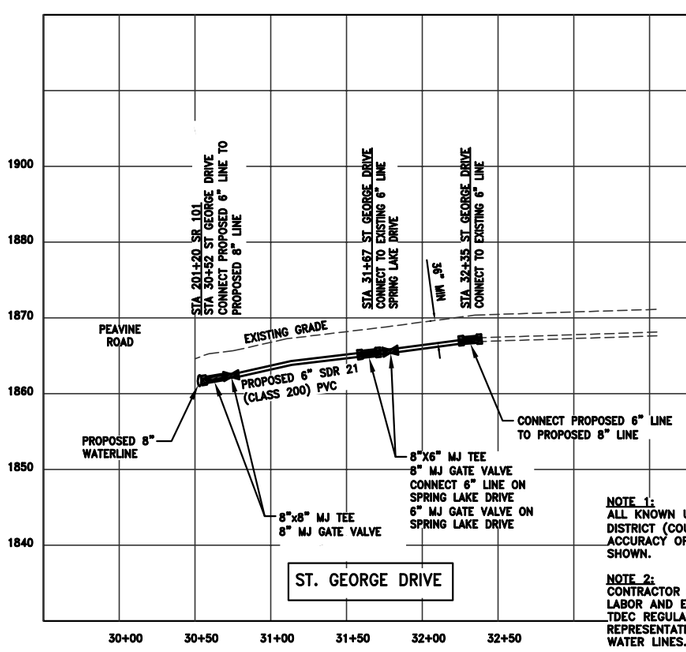

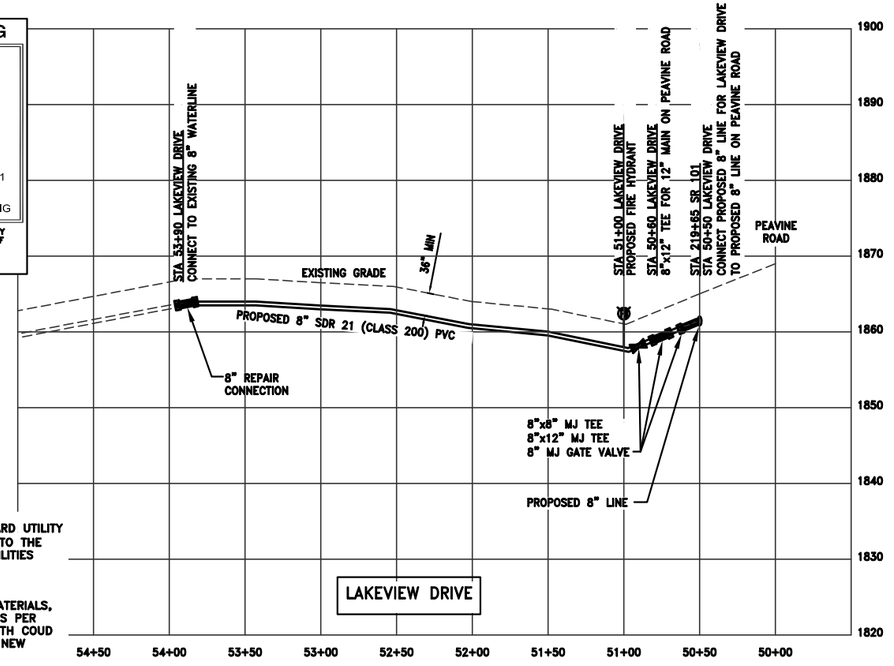

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BARRY R. FIELD
REGISTERED ENGINEER
AGRICULTURE
COMMERCE
No. 21682
STATE OF TENNESSEE
8-24-15

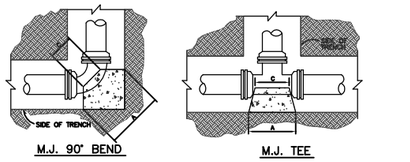
CRAB ORCHARD UTILITY DISTRICT

2089 EAST 1ST STREET
CROSSVILLE, TENNESSEE 38555

ST. GEORGE DRIVE LAKEVIEW DRIVE WATERLINE RELOCATION

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

STA. 30+00 TO STA. 32+50
STA. 50+00 TO STA. 54+75
SCALE : 1"=50' H - 1"=10' V



THRUST BLOCK DETAILS & DIMENSIONS

90° BEND						
SIZE	2"	4"	6"	8"	10"	12"	18"
A	16"	16"	26"	33"	40"	50"	70"
B	16"	16"	24"	33"	40"	50"	70"
C	9"	9"	12"	12"	15"	16"	22"
D	8"	8"	12"	16"	20"	25"	24"

45° BEND						
SIZE	2"	4"	6"	8"	10"	12"	18"
A	12"	12"	18"	24"	31"	37"	52"
B	12"	12"	18"	24"	31"	37"	52"
C	8"	8"	10"	12"	14"	16"	14"
D	6"	6"	9"	12"	15"	18"	18"

22-1/2° BEND						
SIZE	2"	4"	6"	8"	10"	12"	18"
A	9"	9"	13"	18"	23"	26"	40"
B	9"	9"	13"	18"	23"	26"	40"
C	8"	8"	10"	12"	14"	16"	15"
D	4"	4"	6"	9"	11"	13"	16"

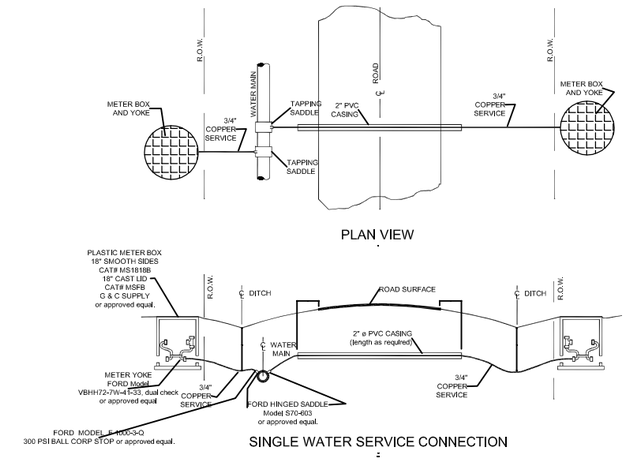
11-1/4° BEND						
SIZE	2"	4"	6"	8"	10"	12"	18"
A	9"	9"	11"	13"	16"	18"	30"
B	9"	9"	11"	13"	16"	18"	30"
C	8"	8"	10"	12"	14"	16"	15"
D	4"	4"	5"	6"	8"	9"	16"

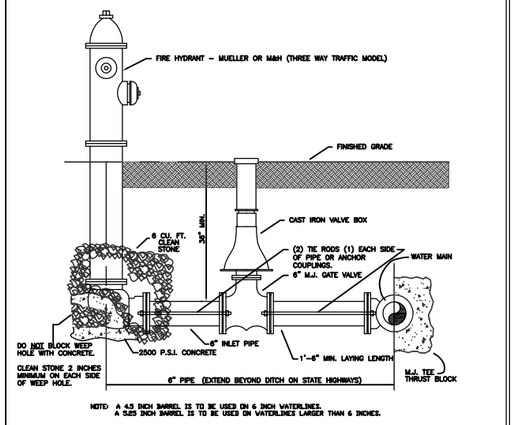
TEE						
SIZE						
Main	2"- 6"	8"-12"	8"- 10"	12"	12"	12"	18"
Branch	2"- 6"	2"- 6"	8"- 10"	2"- 6"	8"- 10"	12"	16"-18"
A	26"	26"	43"	26"	43"	52"	70"
B	26"	26"	43"	26"	43"	52"	70"
C	12"	12"	12"	12"	12"	12"	30"
D	13"	13"	21"	13"	21"	26"	24"

PLUG							
SIZE	2"	4"	6"	8"	10"	12"	18"
A	26"	26"	26"	34"	43"	52"	70"
B	26"	26"	26"	34"	43"	52"	70"
C	12"	12"	12"	12"	12"	12"	30"
D	11"	11"	11"	15"	22"	32"	32"

NOTE: PIPE SHALL BE WRAPPED IN 5 MIL. PLASTIC WHERE THRUST BLOCKS ARE INSTALLED.

PLASTIC LINING SHALL NOT COVER OR IMPAIR THE FLOW OF WATER FROM THE WEEP HOLE ON A FIRE HYDRANT OR BLOW OFF HYDRANT ASSEMBLY.





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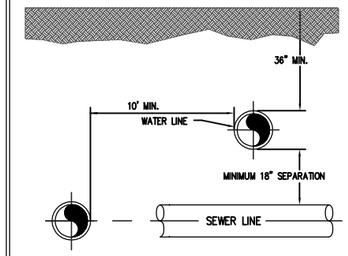
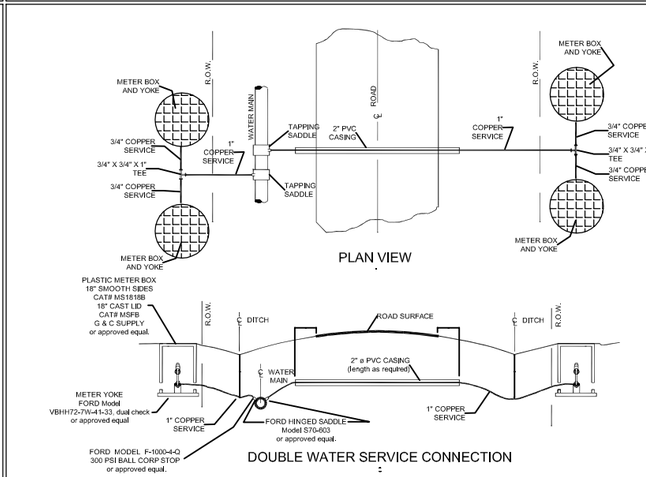
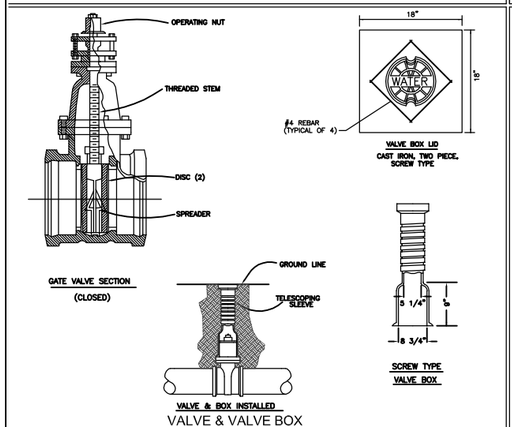
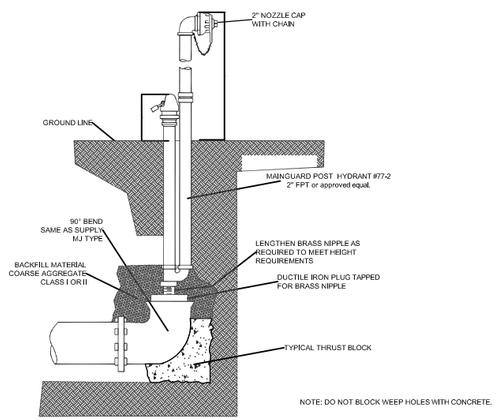






NOTE: WHENEVER A WATER VALVE IS ADJACENT TO A TEE IN THE WATER LINE THE WATER VALVE SHALL BE ATTACHED TO THE TEE USING RODDING OR ALL THREAD.



TYPE	YEAR	PROJECT NO.	SHEET NO.
CONSTRUCTION	2015	STP-101(16)	U2-20

CUMBERLAND COUNTY

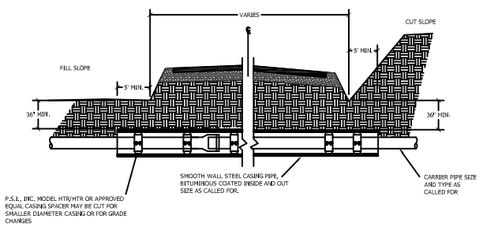
BARRY R. FIELD — REGISTERED ENGINEER — AGRICULTURE — COMMISSION NO. 21892 — STATE OF TENNESSEE — 8-24-15

CRAB ORCHARD UTILITY DISTRICT
2089 EAST 1ST STREET
CROSSVILLE, TENNESSEE 38555

S.R. 101 (PEAVINE ROAD) WATERLINE RELOCATION

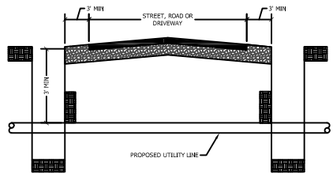
FECS
FIELD'S ENGINEERING CONSULTANT SERVICES, LLC
77 COTHER STREET
CROSSVILLE, TENNESSEE 38555
(931) 456-6071

DETAILS

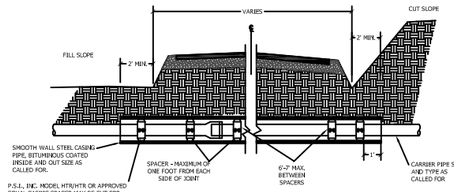


A STATE HIGHWAY CROSSING
SCALED N.T.S.

ALL CASINGS AND CONDUITS INSTALLED UNDER STATE ROADS SHALL MEET OR EXCEED THE MINIMUM AASHTO REQUIREMENTS.



B TYPICAL UNCASED BORE DETAIL
SCALED N.T.S.



C CITY / COUNTY ROADS AND PAVED DRIVEWAY
SCALED 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 BORE & JACK DETAILS
10 SCALED N.T.S.

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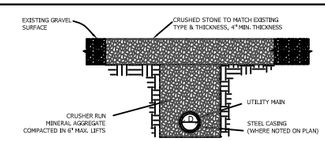

A GRAVEL ROADS
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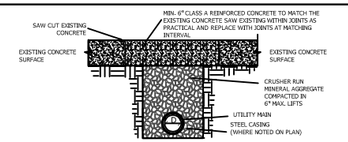

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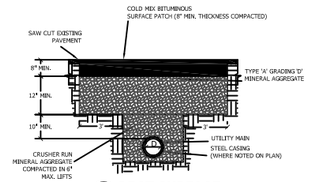

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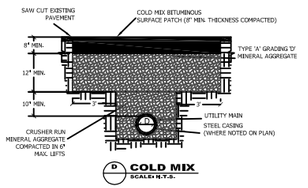

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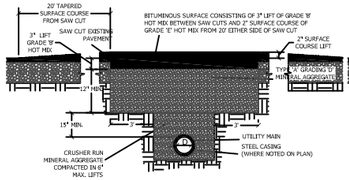

E HOT MIX
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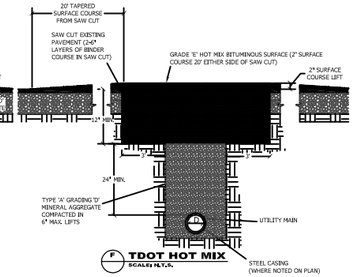
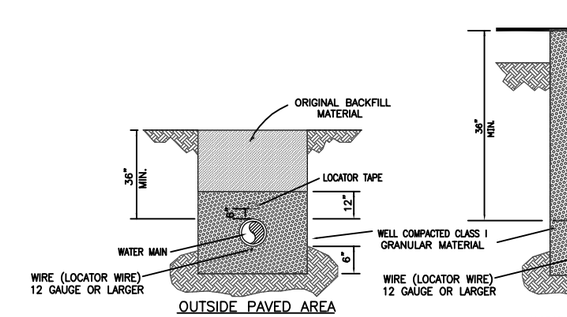


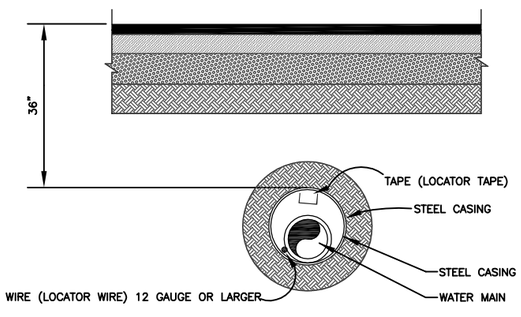
F TDOT HOT MIX
SCALED N.T.S.

NOTE: DEPTH OF COVER SHALL BE 36" ON TENNESSEE DEPARTMENT OF TRANSPORTATION RIGHT OF WAYS.

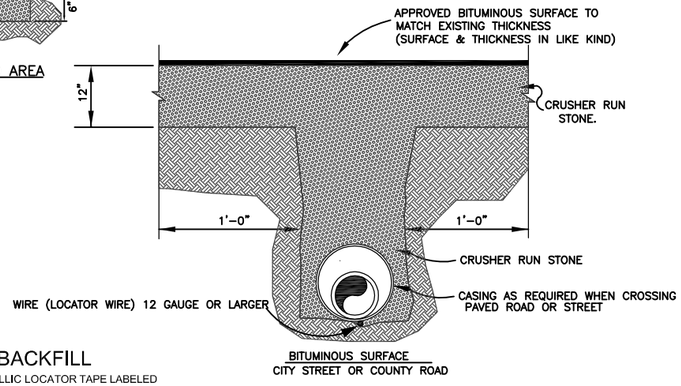
4 5 PAVEMENT REPLACEMENT DETAILS
SCALED N.T.S.



NOTE: 36" MINIMUM COVER IN ALL TENNESSEE DEPARTMENT OF TRANSPORTATION RIGHT OF WAYS

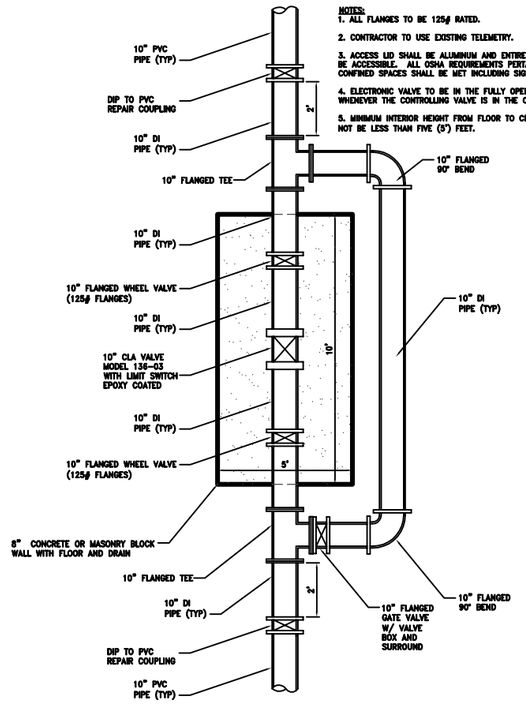


BITUMINOUS SURFACE
ROAD BORE



BITUMINOUS SURFACE
CITY STREET OR COUNTY ROAD

BACKFILL
NOTE: METALLIC LOCATOR TAPE LABELED "WATER" TO BE PLACED IN TRENCH 6" - 8" ABOVE WATER MAIN
LOCATOR WIRE (12 GAUGE OR LARGER) TO BE PLACED IN BOTTOM OF DITCH.



ELECTRONIC VALVE VAULT DETAILS
NTS

TYPE	YEAR	PROJECT NO.	SHEET NO.
CONSTRUCTION	2015	STP-101(16)	U2-21

CUMBERLAND COUNTY

CRAB ORCHARD UTILITY DISTRICT
2089 EAST 1ST STREET
CROSSVILLE, TENNESSEE 38555

S.R. 101 (PEAVINE ROAD) WATERLINE 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	2015	STP-101(16)	U2-22

CUMBERLAND COUNTY

DETAILED SPECIFICATIONS

Scope of Work
Project consists of the construction of a Water Distribution System Relocation Project to serve the Crab Orchard Utility District (COUD). The Relocation Project is being performed to accommodate the relocation and widening of Peavine Road, State Route 101. Field's Engineering Consultant Services, LLC and the Crab Orchard Utility District will coordinate with utility contractor pertaining to all work performed. The Crab Orchard Utility District can be contacted at (931) 484-6987 and Field's Engineering Consultant Services, LLC at (931) 456-6071. As detailed on the drawings, the relocation project will begin at Peavine Fire Tower Road and end at the intersection of Lakeview Drive.

Easement & Rights-of-Way
All work will be performed on properties owned by the State of Tennessee. However, Contractor is required to consult with Owner prior to any initiation of work in an area that is not located in the new Rights-of-Way of Peavine Road.

Rip-Rap
Where rip-rap (not shown on plans) is ordered by Engineer, it shall be considered as a separate/extra pay item.

Connecting to Existing Water Appurtenances
Contractor is responsible for properly tapping existing water mains to new main where applicable. This appurtenance is the property of the Crab Orchard Utility District.

Mr. M.C. Deck, Crab Orchard Utility District, Field Manager, shall be contacted prior to any work on any existing water appurtenance. Telephone Number: (931) 510-8723.

Subsurface Conditions
Engineer and/or Owner assume **NO** responsibility of subsurface conditions. Contractor shall be responsible for determining requirements for dewatering, rock excavation, unstable ground conditions, sheeting/shoring, etc. **NO** item pertaining to Contractor's misjudgment of subsurface conditions will be a separate/extra pay item. Contractor assumes **all** responsibility pertaining to subsurface conditions. **In no way will any unexpected subsurface conditions due to excessive rock, topsoil depth, or any other condition be considered an extra pay item.**

Safety
Contractor is solely responsible for complying with all prevailing local, state, and federal safety procedures. All work under this contract shall be done in strict compliance with the Occupational Safety and Health Act (OSHA) of 1970 (PL 91-596) and under Section 107 of the Work Hours and Safety Standards Act (PL 91-54).

Engineer and/or Owner assume **NO** responsibility as to assure that Contractor abides by said safety procedures.

GENERAL
The water system shall conform to the Rules of Tennessee Dept. of Environment and Conservation, Division of Water Supply, Minimum Design Criteria for Public Water Systems.

The water pipe shall be furnished and installed as illustrated in the details and drawings while maintaining not less than thirty six (36) inches of cover. All work is to be performed by an experienced worker. All materials and accessories are to be installed in accordance with the following specifications and by the manufacturer's recommendations.

The **CONTRACTOR** is to use top quality materials and shall practice proper storage, handling, and installation methods. The trench bottoms should be properly graded and bedded to provide proper, continuous support for the pipe except at the bell where holes should be dug to allow for bell.

LOCATOR WIRE
Locator wire shall be number twelve (#12) solid bare copper. Wire shall be buried continuously and four inches (4") below water main.

LOCATOR TAPE
Locator tape shall be approximately 3-inches wide with "WATER" or equal repetitively printed on entire length of tape. Tape shall be of a magnetic variety to allow for future locating with pertinent metal detection equipment. Tape shall be buried continuously twelve inches (12") above water main.

HANDLING OF MATERIALS AND ACCESSORIES
All materials shall be stored in a location where contamination or physical damage will not be possible. All materials must be delivered and unloaded by proper method as to not damage them in any way.

All equipment required to safely handle pipe and accessories shall be provided at the construction site when pipe laying is in progress. All pipe and joints **must** be properly inspected for defects and cleaned immediately before installation.

POLYVINYL CHLORIDE PIPE FOR WATER MAINS
Pipe for this project shall be of polyvinyl chloride variety colored WHITE. Pipe for the water mains shall be a variety of sizes and specifications as shown on the drawings. All pipe shall have push together elastomeric bell and joints designed so that pipe and fittings may be connected without the utilization of solvent cement or special equipment. All pipe shall be furnished in nominal lengths of 20 feet. Every length of pipe shall have size, class, and Manufacturer plainly marked on pipe. All pipe stored on site shall be per Manufacturer's instructions at all times prior to actual installation. **Varying classes of pipe are required for this project. Refer to drawings for exact amount, location, and class of pipe.**

LATERALS
All pipe used for laterals shall be Type K Copper. One (1) inch copper service tubing shall be utilized from mains to ¾" x ¾" x 1" tee for double taps. The pipe from the tee fitting to the meter box shall be ¾" copper service. Laterals shall be buried a minimum of thirty-six (36) inches below final grade.

METER BOXES AND YOKES
Meter box shall be Carson Brooks Cat# MS1818B -18" Deep with cast iron reading lid or approved equal.

Copper setter shall be FMVBHH72-7W-41-33Q 5/8x3/4 dual check with quick set or approved equal.

TAPPING SADDLES
Ford bronze tapping saddles Model S70-603 or approved equal shall be utilized.

INSTALLING FIRE HYDRANTS
Fire hydrants will be M&H (129) traffic model type. Fire hydrants are to be re-set where they are presently located. The fire hydrant that is removed shall be inspected by the Owner/Engineer to assure that they are in proper working order. (See drawings for exact locations) If the fire hydrant in question is not in proper working order, Contractor is responsible for replacing the hydrant with a M&H (129) traffic model type or equivalent. Fire hydrants are to have two (2) two and one-half (2 ½) inch outlets and one (1) six (6) inch outlet to fit large fire department hose.

The lateral between the water main and hydrant shall have a six (6) inch M.J. Gate Valve. The valve box shall be cast iron. Concrete shall have horizontal and vertical bearing areas of no less than three (3) square feet. At least six (6) cubic feet of crushed stone is to be used around the hydrant for drainage.

Hydrants are to be set where final grade will be immediately below the breakable flange or at the indicated bury level. Hydrants must have an undamaged enamel coating and the oil reservoirs must be filled.

THRUST BLOCKS AND RESTRAINTS
Thrust blocks must be 2,500 psi poured in place concrete. The thrust blocks must be installed at all points of unbalanced pressure where pipe could pull apart. Thrust blocks shall conform to the details as shown on drawings.

When downward bends cannot be avoided the fitting shall be held in place by one of the following:

1. Steel rods and clamps which extend for two pipe lengths to each side of bend.
2. Steel rods which are anchored at least eighteen (18) inches in solid rock.
3. Poured concrete under pipe of sufficient volume to counteract unbalanced force with steel clamp anchored to concrete.
4. An approved locked flexible joint extending two (2) pipe lengths on each side.

Rods and bolts used shall be at least one-half (1/2) inch diameter and straps or clamps must be at least one-quarter (1/4) inch thick. All steel restraints shall be coated with coal tar epoxy and concrete shall be Class B.

VALVE AND VALVE BOX
Valve and valve box details shall be as illustrated on drawings.

The valve box shall be centered over the valve operating nut and installed vertically. Box shall be tall enough to extend to final grade while adjustable upper section is midway between upper and lower limits. Backfill shall be properly tamped around the upper section to prevent future settlement.

Valve box shall have 18" x 18" concrete surround with reinforcing steel as shown in details. All valve boxes in paved streets shall have a 6' x 6' concrete surround with reinforcing steel.

BLOW-OFF HYDRANT VALVE
Blow-off hydrant valve shall be #77 Mainguard two (2) inch post hydrant or approved equal. It shall have a two and one-half (2 1/2) inch nozzle cap with chain and shall be located at least twenty-four (24) inches above the ground line. Blow-off valve shall be installed as per drawings.

SEPARATION FROM SEWER LINES
Water and sewer lines must be separated at least ten (10) feet horizontally and eighteen (18) inches vertically from bottom of water main to top of sewer main as per drawings.

When water mains and sewer mains must cross, they must cross in a perpendicular fashion.

TESTING AND DISINFECTION

GENERAL

Subsequent to the completion of the construction work of the relocation project, all water lines shall be tested and disinfected. In the case that the pressure or leakage test is unsatisfactory, or bacteriological tests indicate that the disinfection process is incomplete, corrective measures shall be taken and the tests repeated until satisfactory results are obtained.

LEAKAGE AND PRESSURE TESTS
Polyvinyl chloride pipe shall be tested in accordance with ISO 2531. Testing for this project shall be performed as follows:

All constructed water lines shall be subjected to a hydrostatic pressure of 200 psi for a period of two (2) hours. Any defective work that is identified during the hydrostatic test shall be replaced and the pressure test repeated.

The quantity of leakage under the aforementioned 200 psi shall not exceed 0.002 gallons per hour for each foot of water line being subjected to the pressure test. Should the quantity of the leakage exceed the aforementioned limit, the Contractor shall locate and repair the defective area until the leakage is within the allowable limits. The CONTRACTOR shall provide all labor, tools, equipment and materials for making the test. The CONTRACTOR shall provide the Crab Orchard Utility District with a pressure chart that indicates the integrity of the pressure test being within specified allowances.

DISINFECTION
All water lines installed shall be disinfected as follows:

The water lines installed shall first be flushed with potable water to remove debris, etc. from the lines. Subsequent to the flushing process being completed, the water line shall be disinfected prior to being placed in service with a solution of HTH with a minimum of 50 parts per million of available chlorine. The Crab Orchard Utility District will provide the required potable water at an expense of $5.75 per thousand gallons. The CONTRACTOR shall provide all suitable plugs, valves or caps, etc. for the pipe, injection pumps, pipe connections, chlorine and other equipment with all labor required to properly disinfect the water line. This project will require several disinfection processes and must be approved by the Owner/Engineer prior to initiation.

NOTES:

1. **Contractor is responsible for checking the chlorine residual, 1,200 ft - 1,500 ft from farthest reach of area tested hydrostatically.**
2. **Contractor is responsible for obtaining a TN State Approved Negative Bacteriological sample within 48 hours for any existing Crab Orchard Utility District water main break. All line breaks shall be reported immediately to Mr. M.C. Deck at the COUD.**
3. **In the event of a line break, contractor is responsible for immediate restoration of service to all customers.**

While the disinfectant is being applied to any section of the pipe, the water shall be allowed to escape all extremities to the section. The method of chlorine residual testing shall be the DPD color comparator method. The disinfectant shall be allowed to remain in the pipe for a period of at least 24 hours. Subsequent to the elapsing of the 24 hour period, the water line shall be flushed thoroughly until only the chlorine residual in the potable water remains. This process shall be documented by the CONTRACTOR and submitted to the COUD for review and approval.

Sample of the water shall then be taken by methods and personnel approved by the State of Tennessee Department of Environment and Conservation (TDEC) and shall be submitted to a TDEC approved bacteriological laboratory. Note: The Crab Orchard Utility District is a TDEC approved bacteriological testing laboratory. In any instance whereas bacteriological testing test positive for the presence of coliform organisms, the disinfection procedure shall be repeated until samples of satisfactory quality are obtained. Proof of these bacteriological tests shall be submitted to and approved by Mr. M.C. Deck at the Crab Orchard Utility District. Mr. Deck can be contacted at (931) 510-8723.

SOIL AND EROSION CONTROL
The General Contractor is responsible for the soil and erosion control for this project. However, utility Contractor is responsible to assure that these measures are in place prior to the initiation of any work. Utility Contractor is also responsible for two (2) weekly inspections of the soil and erosion control measures that affect the waterline relocation project. These inspections should be documented in writing and kept on file.

INTERRUPTION OF WATER SERVICE
Utility Contractor shall make all possible efforts to limit water service interruption to two (2) hours. All planned interruptions should be reported to the COUD twenty four hours prior to the water service being interrupted.

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 the drawings shall be turned over to the Crab Orchard Utility District subsequent to the completion of the project and one set shall be submitted to Field's Engineering Consultant Services, LLC.

NOTE 1:
ALL KNOWN UTILITIES WERE FIELD LOCATED BY CRAB ORCHARD UTILITY DISTRICT (COUD). ENGINEER TAKES NO RESPONSIBILITY AS TO THE ACCURACY OF THE LOCATION OR ACTUAL QUANTITIES OF UTILITIES SHOWN.

NOTE 2:
CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ALL MATERIALS, LABOR AND EQUIPMENT TO PROPERLY DISINFECT WATER LINES PER TDEC REGULATIONS. CONTRACTOR SHALL WORK CLOSELY WITH COUD REPRESENTATIVES PERTAINING TO THE DISINFECTION OF ALL NEW WATER LINES.

COUD MAY BE CONTACTED AT 931-484-6987.

CRAB ORCHARD UTILITY DISTRICT
2089 EAST 1ST STREET
CROSSVILLE, TENNESSEE 38555

S.R. 101 (PEAVINE ROAD) WATERLINE RELOCATION

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

DETAILED SPECIFICATIONS

TYPE	YEAR	PROJECT NO.	SHEET NO.
CONSTRUCTION	2015	STP-101(16)	U3-1

CUMBERLAND COUNTY

INDEX OF DRAWINGS

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SHT NO. U3-2 STA 56+00-66+00
SHT NO. U3-3 STA 66+00-76+00
SHT NO. U3-4 STA 76+00-89+00
SHT NO. U3-5 STA 89+00-102+00
SHT NO. U3-6 STA 102+00-115+00
SHT NO. U3-7 STA 115+00-128+00
SHT NO. U3-8 STA 128+00-141+00
SHT NO. U3-9 STA 141+00-154+00
SHT NO. U3-10 STA 154+00-167+00
SHT NO. U3-11 STA 167+00-180+00
SHT NO. U3-12 STA 180+00-193+00
SHT NO. U3-13 STA 193+00-206+00
SHT NO. U3-14 STA 206+00-219+00
SHT NO. U3-15 STA 219+00-232+00
SHT NO. U3-16 SERVICE LINE PEAVINE ROAD
SHT NO. U3-17 SHORTY BARNES
FAIRVIEW DRIVE
LAKEVIEW DRIVE
SHT NO. U3-18 DETAILS
SHT NO. U3-19 DETAILED SPECIFICATIONS
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.	2425	FOOTNOTE - 1
791-02.02	2 IN MDPE GAS MAIN	L.F.	1100	FOOTNOTE - 1
791-02.04	4 IN MDPE GAS MAIN	L.F.	825	FOOTNOTE - 1
791-02.05	6 IN MDPE GAS MAIN	L.F.	15400	FOOTNOTE - 1
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	5	FOOTNOTE - 4
791-07.03	6 IN PE GAS VALVE ASSEMBLY	EACH	3	FOOTNOTE - 5
791-8.02	3/4 IN SERVICE ASSEMBLY	EACH	43	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.

NOTE 1:
ALL KNOWN UTILITIES WERE FIELD LOCATED BY MIDDLE TENNESSEE NATURAL GAS UTILITY DISTRICT (MTNGUD). ENGINEER TAKES NO RESPONSIBILITY AS TO THE ACCURACY OF THE LOCATION OR ACTUAL QUANTITIES OF UTILITIES SHOWN.

CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ALL MATERIALS, LABOR AND EQUIPMENT TO MAKE TIE-INS AS SHOWN ON PLANS. CONTRACTOR SHALL ALSO BE RESPONSIBLE FOR RECONNECTING ALL EXISTING SERVICES AS SHOWN ON PLANS. ENGINEER MAKES NO GUARANTEE AS TO THE ACCURACY OF THESE TIE-INS.

MTNGUD MAY BE CONTACTED AT 615-597-4300.

UTILITY INFORMATION

MIDDLE TENNESSEE NATURAL GAS UTILITY DISTRICT
1030 W BROAD STREET
SMITHVILLE, TENNESSEE 37166
(615) 597-4300
CONTACT: JOHN MULLEN

MIDDLE TENNESSEE NATURAL GAS
1030 W BROAD STREET
SMITHVILLE, TENNESSEE 37166

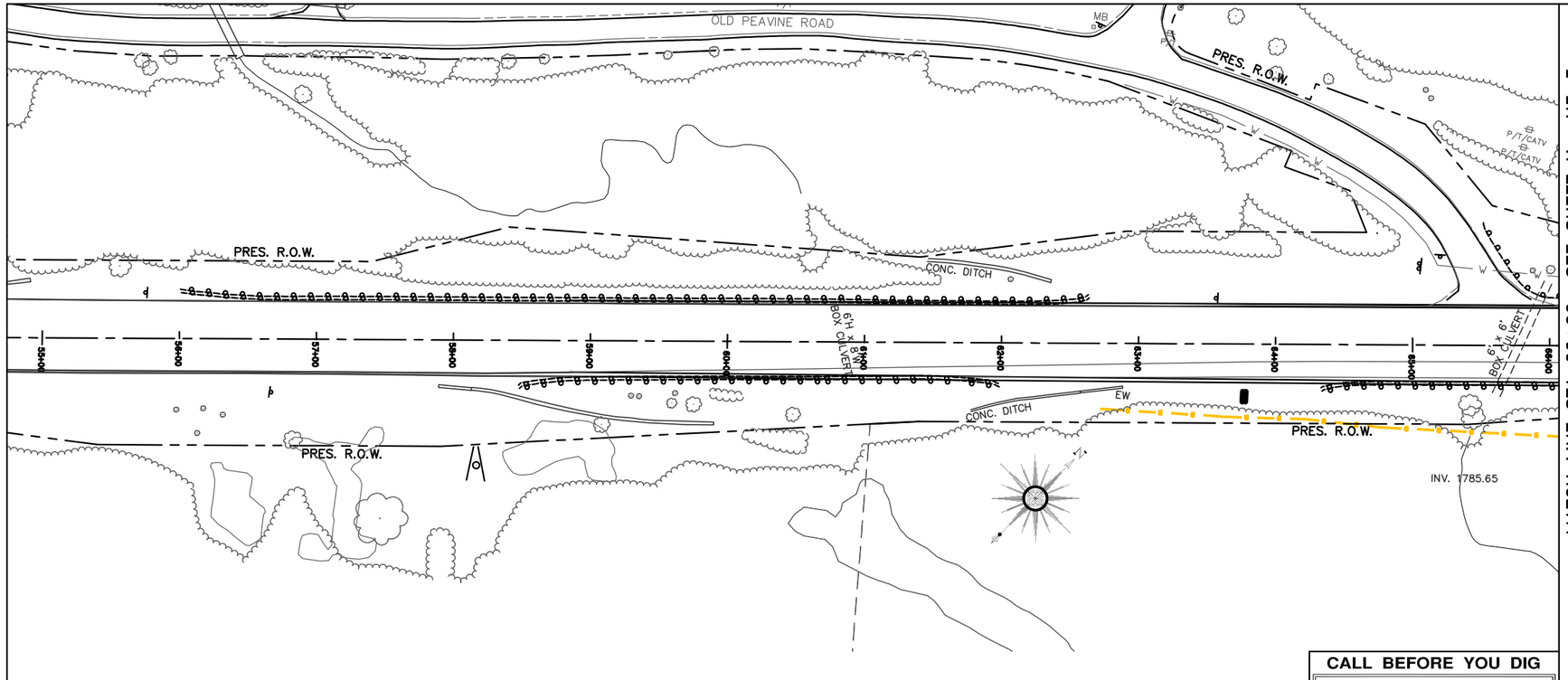
S.R. 101 (PEAVINE ROAD) GAS LINE RELOCATION

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	2015	STP-101(16)	U3-2

CUMBERLAND COUNTY



MATCH LINE STA 66+00 SEE SHEET No. U3-3

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MTNGUD MAY BE CONTACTED AT 615-597-4300.

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.

GAS LINE LEGEND

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

MIDDLE TENNESSEE NATURAL GAS UTILITY DISTRICT
1030 W BROAD STREET
SMITHVILLE, TENNESSEE 37166

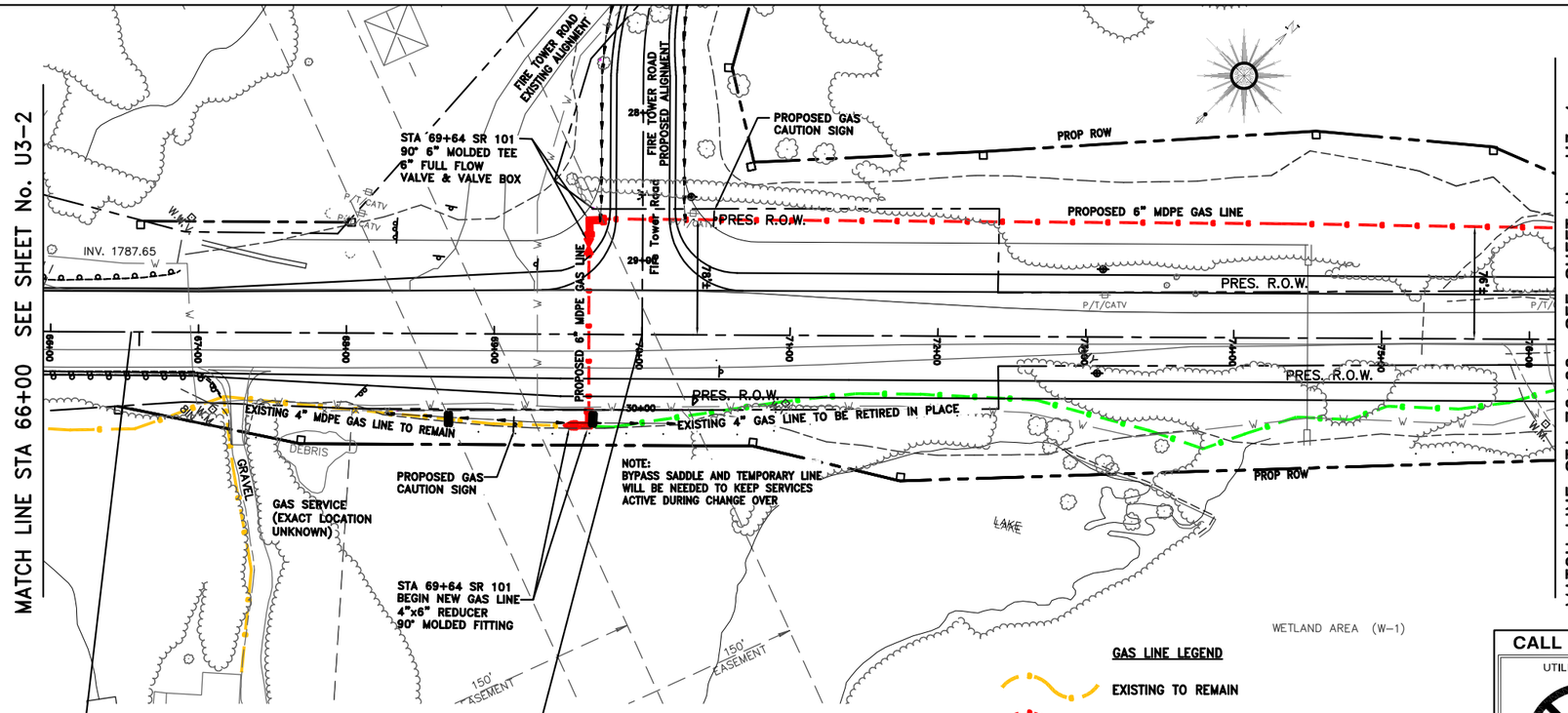
S.R. 101 (PEAVINE ROAD)
GAS LINE RELOCATION

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	2015	STP-101(16)	U3-3

CUMBERLAND COUNTY



BEGIN PROJECT No. STP-101(16) (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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MTNGUD MAY BE CONTACTED AT 615-597-4300.

GAS LINE LEGEND

- EXISTING TO REMAIN
- NEW INSTALLATION
- TEMPORARY RELOCATION
- TO BE REMOVED OR RETIRED 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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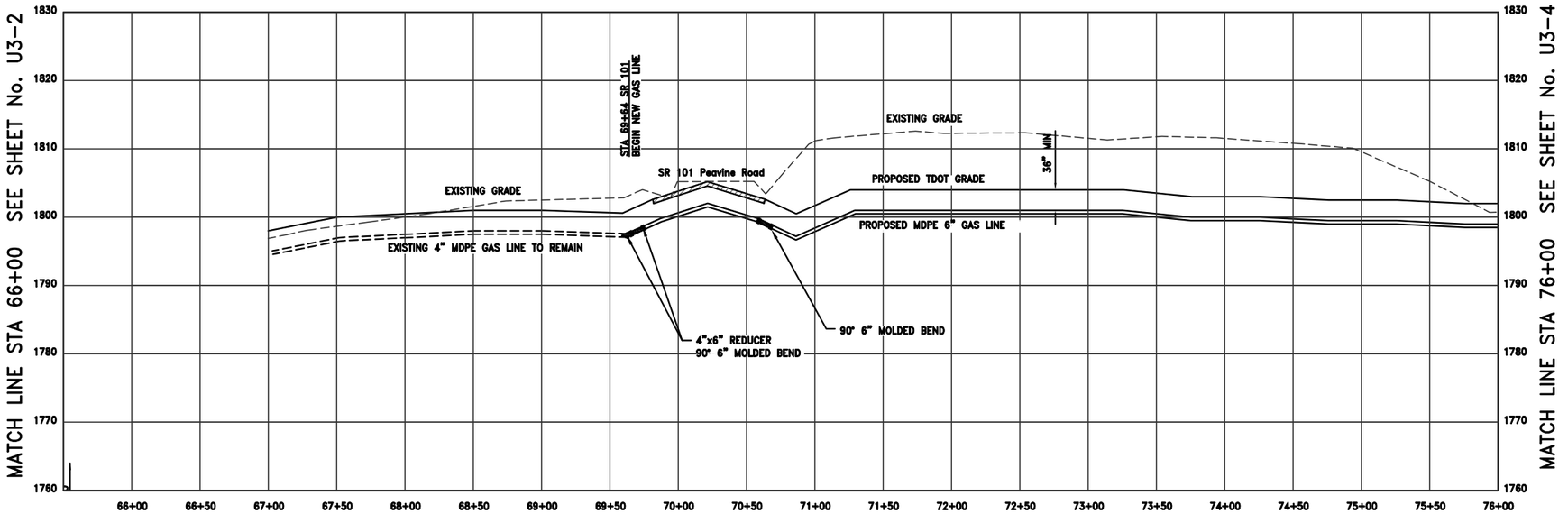


BARRY R. FIELD
REGISTERED ENGINEER
AGRICULTURE
COMMERCE
No. 21582
STATE OF TENNESSEE
5-24-15

MIDDLE TENNESSEE NATURAL GAS UTILITY DISTRICT
1030 W BROAD STREET
SMITHVILLE, TENNESSEE 37166

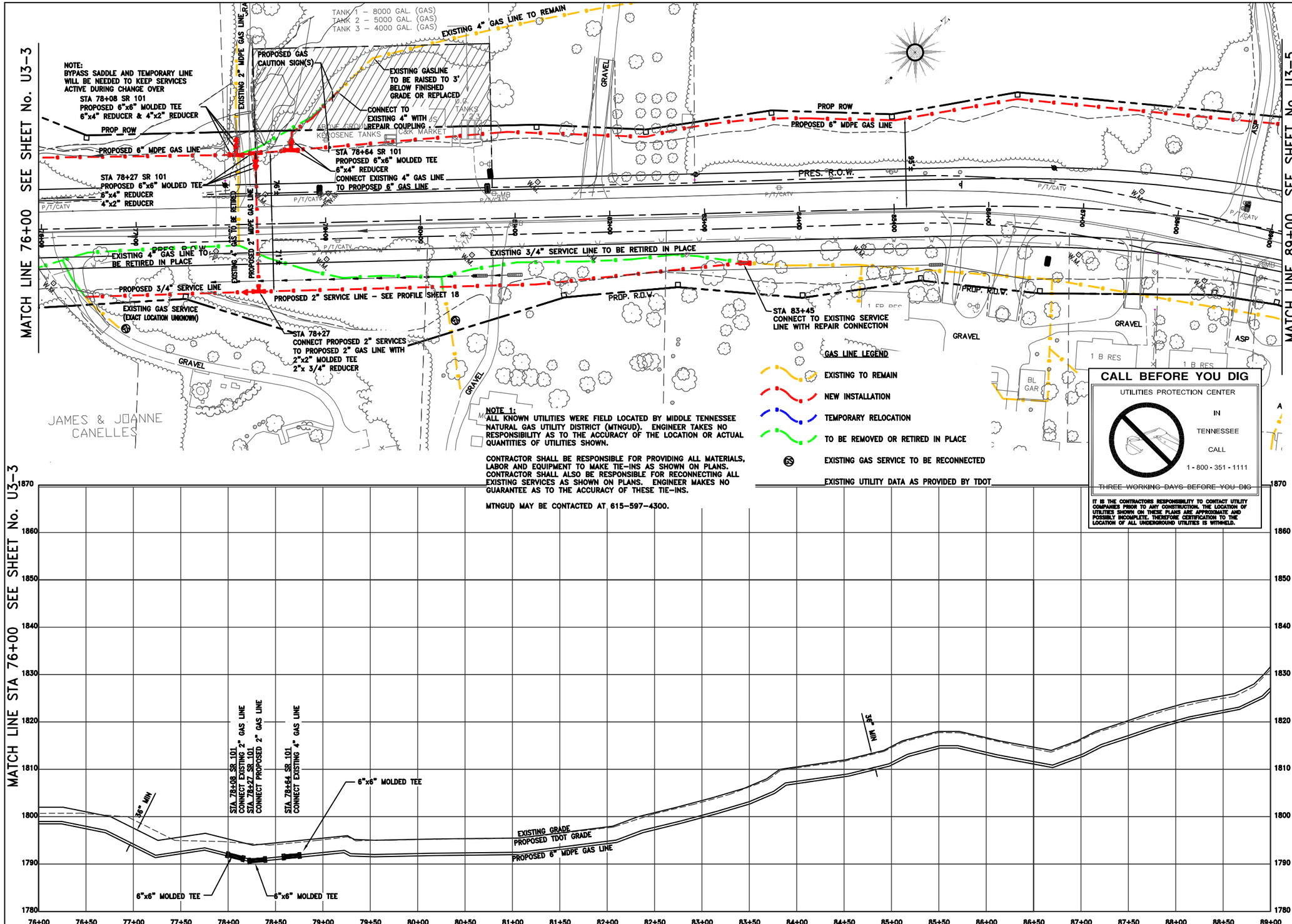
S.R. 101 (PEAVINE ROAD)
GAS LINE RELOCATION

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	2015	STP-101(16)	U3-4

CUMBERLAND COUNTY



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BARRY R. FIELD
REGISTERED ENGINEER
XVI
AGRICULTURE
COMMERCE
No. 21562
STATE OF TENNESSEE
3-24-15

MIDDLE TENNESSEE NATURAL GAS UTILITY DISTRICT
1030 W BROAD STREET
SMITHVILLE, TENNESSEE 37166

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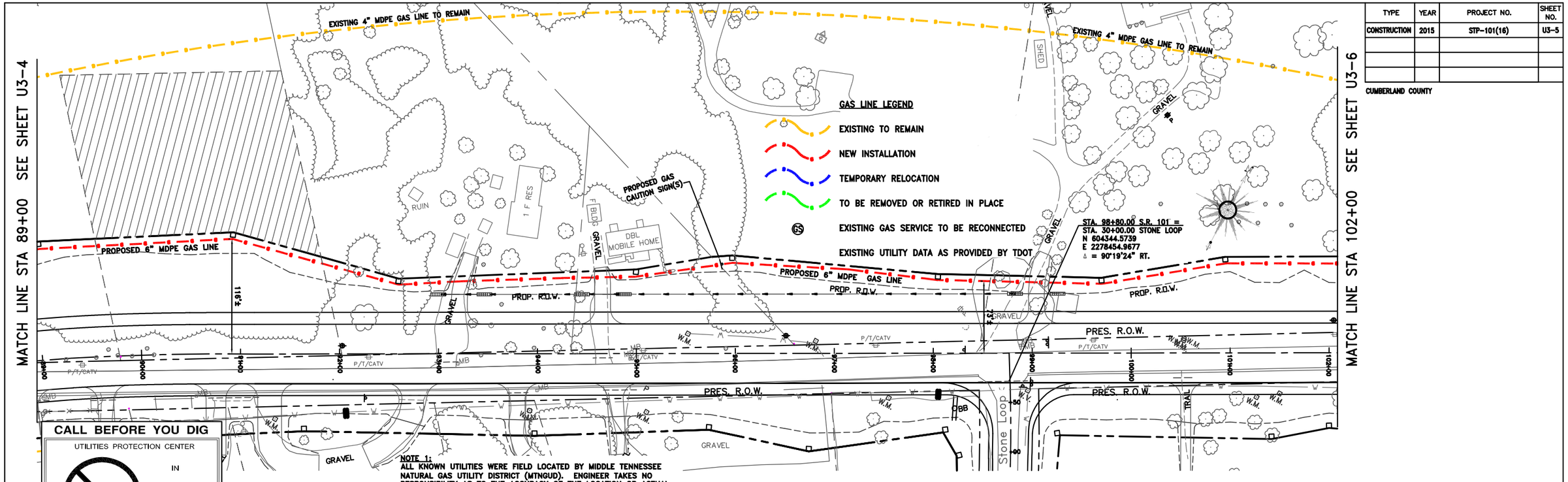
CROSSVILLE, TENNESSEE 38555
(931) 456-6071

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

TYPE	YEAR	PROJECT NO.	SHEET NO.
CONSTRUCTION	2015	STP-101(16)	U3-5

CUMBERLAND COUNTY



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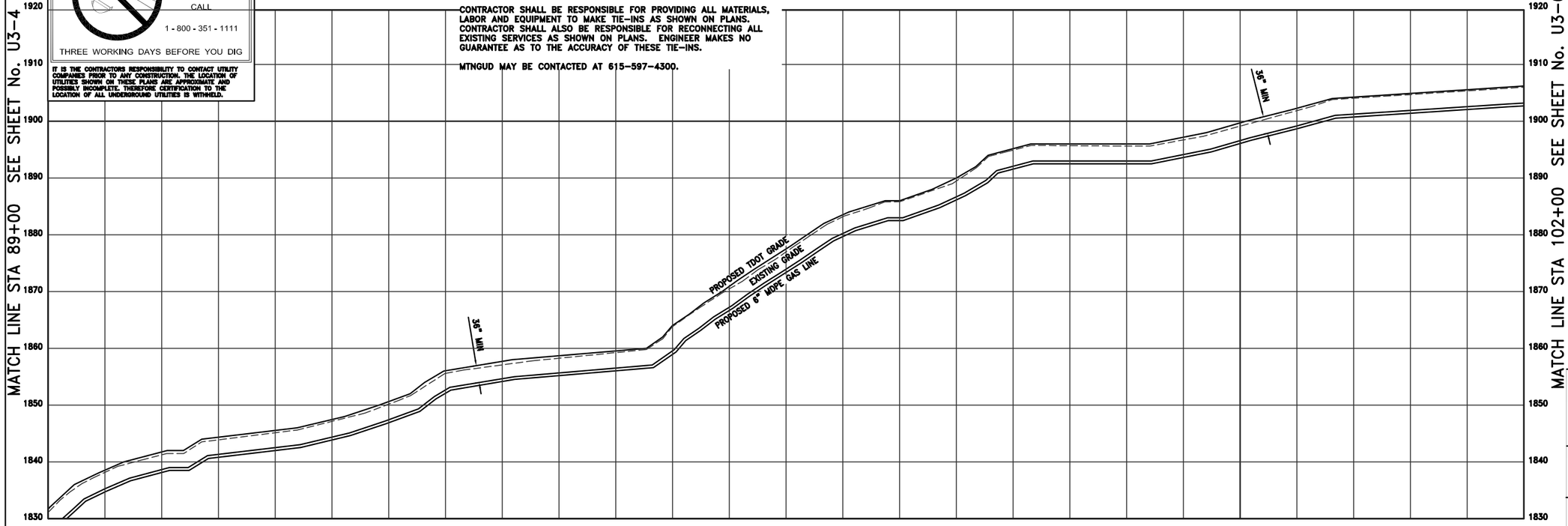

BARRY R. FIELD
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STATE OF TENNESSEE
8-24-15

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

TYPE	YEAR	PROJECT NO.	SHEET NO.
CONSTRUCTION	2015	STP-101(16)	U3-6

CUMBERLAND COUNTY

MATCH LINE STA 102+00 SEE SHEET No. U3-5

MATCH LINE STA 115+00 SEE SHEET No. U3-7

105

MICHAEL & ANGELE NIEMEN

EXISTING 4" MDPE GAS LINE TO REMAIN

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

STA 106+66 SR 101
CONNECT EXISTING 4" GAS LINE TO PROPOSED 6" GAS LINE
4"x6" REDUCER
6"x6" MOLDED TEE

PROP ROW

PROPOSED 6" MDPE GAS LINE

PROPOSED GAS CAUTION SIGN

PROPOSED 6" MDPE GAS LINE TO CONNECT TO EXISTING AS SHOWN

EXISTING 4" GAS LINE TO BE RETIRED IN PLACE

PRES. R.O.W.

P/T/CATV

GAS SERVICE (EXACT LOCATION UNKNOWN)

1 F RES

METAL BLDG/ HOMASSAULT SALES

1 F BLDG

B BLDG

GRAVEL

POOL

EXISTING 1" SERVICE LINE TO BE RETIRED IN PLACE

1" SERVICE LINE TO REMAIN

PROP. R.O.W.

SLOPE ESMT.

CONST. ESMT.

DRAINAGE ESMT.

1 STUCCO RES

1 B RES

CONC

SHED

GARAGE

FARR

PLEASANT PAINTERS

TORY

GAS LINE LEGEND

EXISTING TO REMAIN

NEW INSTALLATION

TEMPORARY RELOCATION

TO BE REMOVED OR RETIRED IN PLACE

EXISTING GAS SERVICE TO BE RECONNECTED

EXISTING UTILITY DATA AS PROVIDED BY TDOT

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1970
1960
1950
1940
1930
1920
1910
1900
1890
1880

EXISTING GRADE
PROPOSED TDOT GRADE
PROPOSED 6" MDPE GAS LINE
36" MIN
STA 106+66 SR 101 CONNECT EXISTING 4" GAS LINE TO PROPOSED 6" GAS LINE
PROPOSED 6"x6" MOLDED TEE

102+00 102+50 103+00 103+50 104+00 104+50 105+00 105+50 106+00 106+50 107+00 107+50 108+00 108+50 109+00 109+50 110+00 110+50 111+00 111+50 112+00 112+50 113+00 113+50 114+00 114+50 115+00

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FECS
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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	2015	STP-101(16)	U3-7

CUMBERLAND COUNTY

MATCH LINE 115+00 SEE SHEET No. U3-6

MATCH LINE 128+00 SEE SHEET No. U3-8

STA 102+16.06 S.R. 101 =
STA. 50+00.00 STONE LOOP
N 605311.1552
E 22280356.3435
Δ = 96°13'47" RT.

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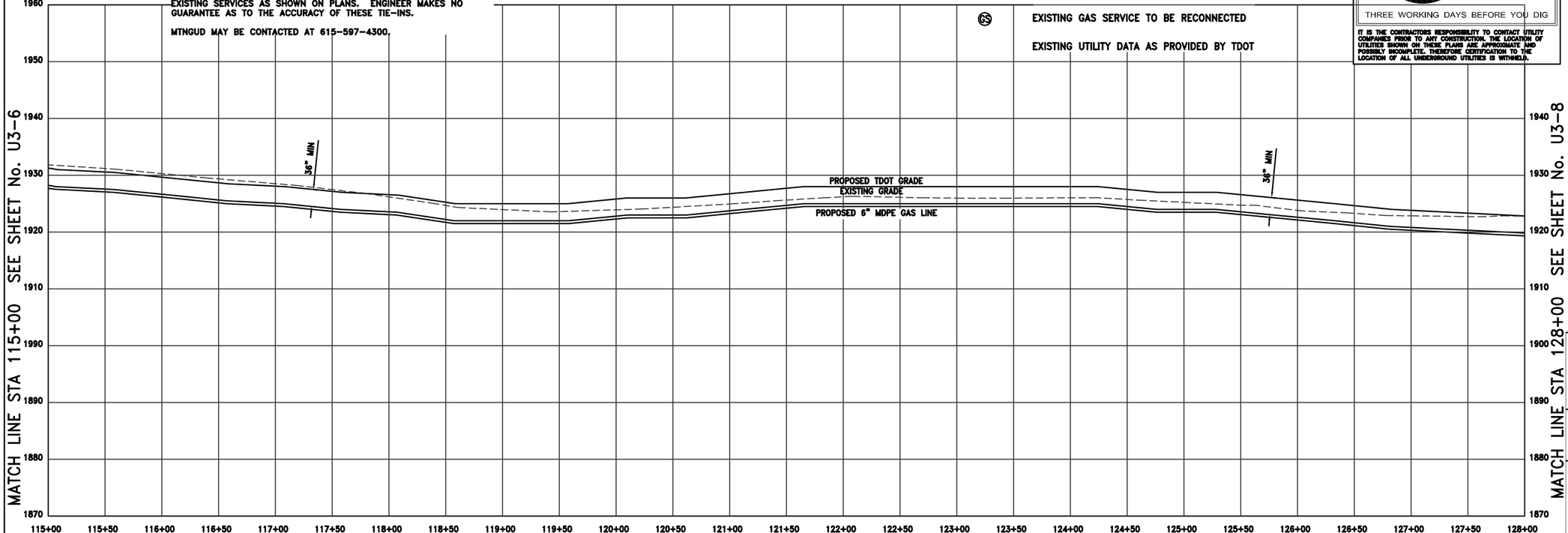

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STA. 115+00 TO STA. 128+00
SCALE: 1"=50' H
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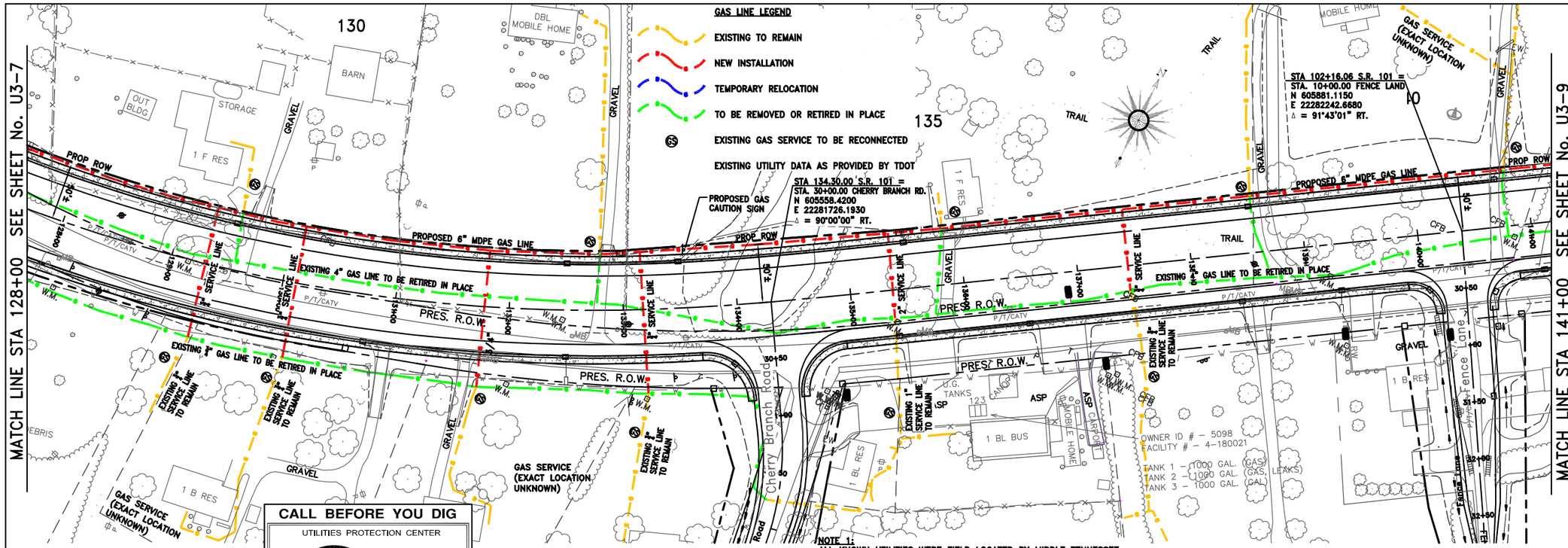

TYPE	YEAR	PROJECT NO.	SHEET NO.
CONSTRUCTION	2015	STP-101(16)	U3-8

CUMBERLAND COUNTY

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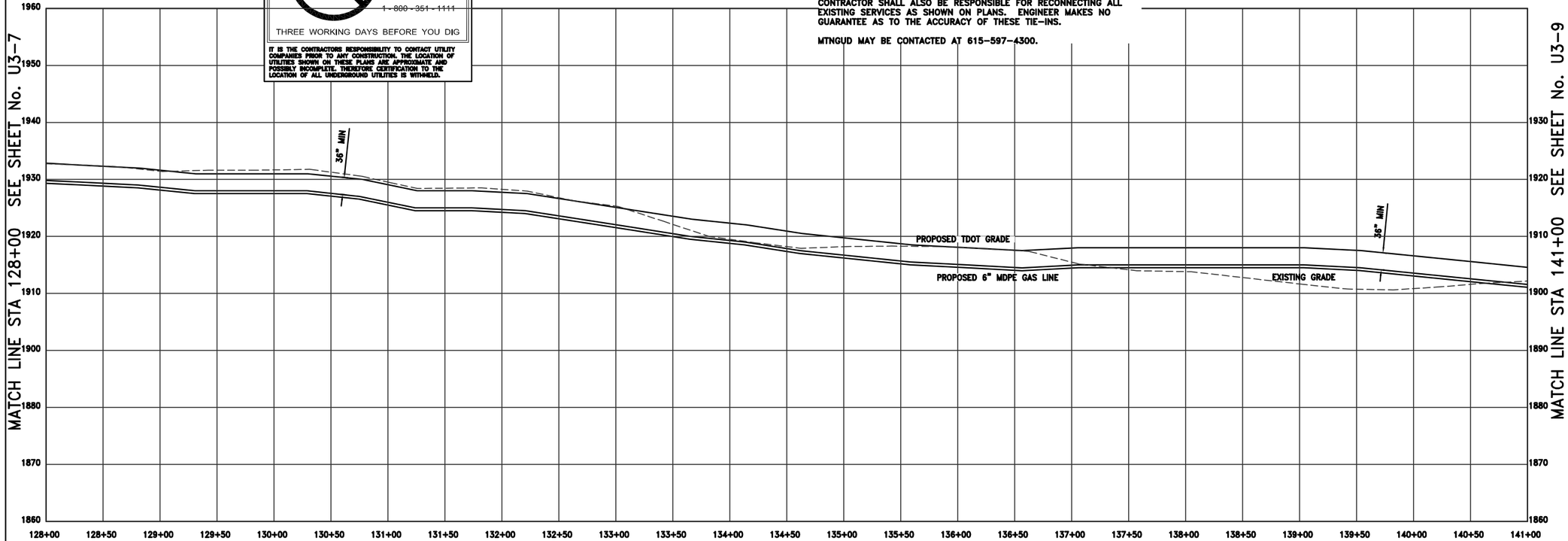

BARRY R. FIELD
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AGRICULTURE
COMMERCE
STATE OF TENNESSEE
8-24-15

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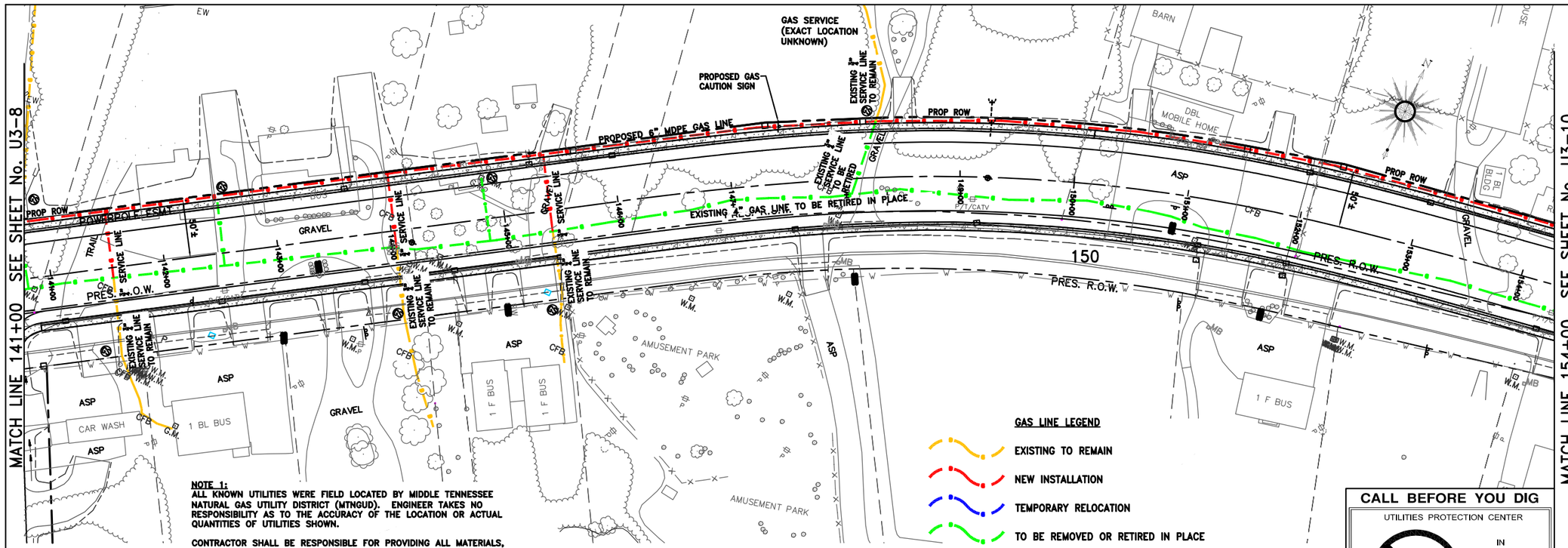
STA. 128+00 TO STA. 141+00
SCALE: 1"=50' H
1"=10' V

TYPE	YEAR	PROJECT NO.	SHEET NO.
CONSTRUCTION	2015	STP-101(16)	U3-9

CUMBERLAND COUNTY

MATCH LINE 141+00 SEE SHEET No. U3-8

MATCH LINE 154+00 SEE SHEET No. U3-10



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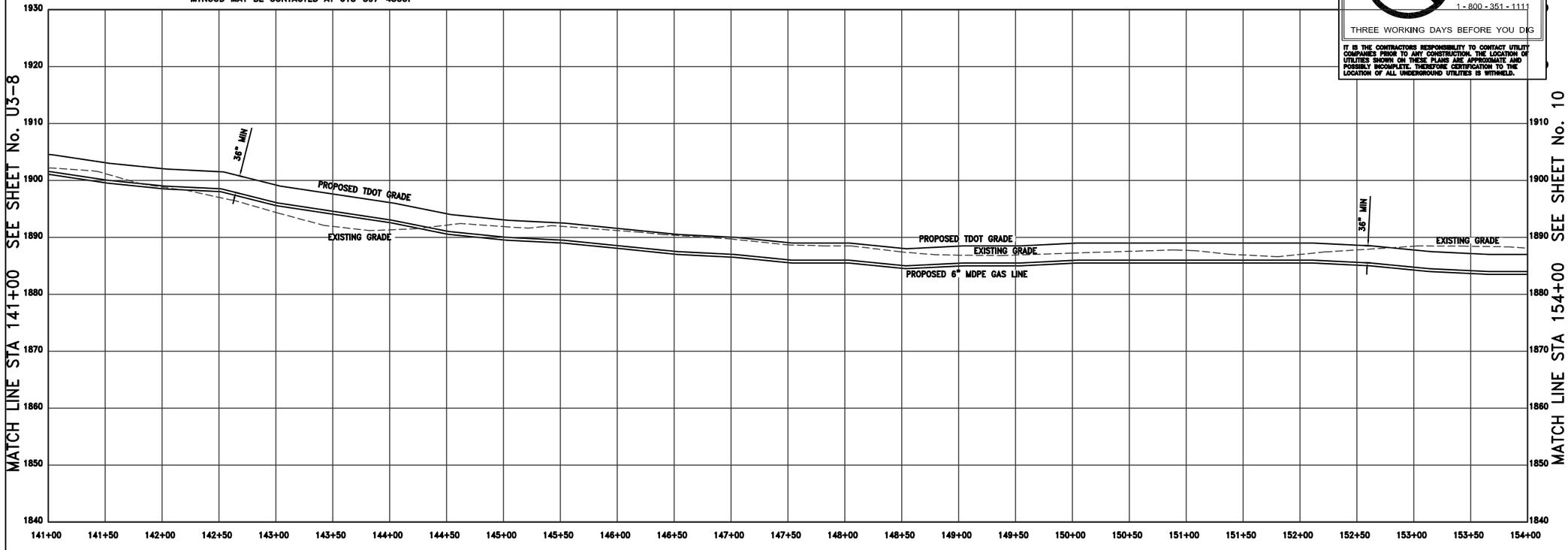

MATCH LINE STA 141+00 SEE SHEET No. U3-8

MATCH LINE STA 154+00 SEE SHEET No. 10

BARRY R. FIELD REGISTERED ENGINEER XVI AGRICULTURE COMMERCE No. 21662 STATE OF TENNESSEE

5-24-15

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GAS LINE RELOCATION

FECS
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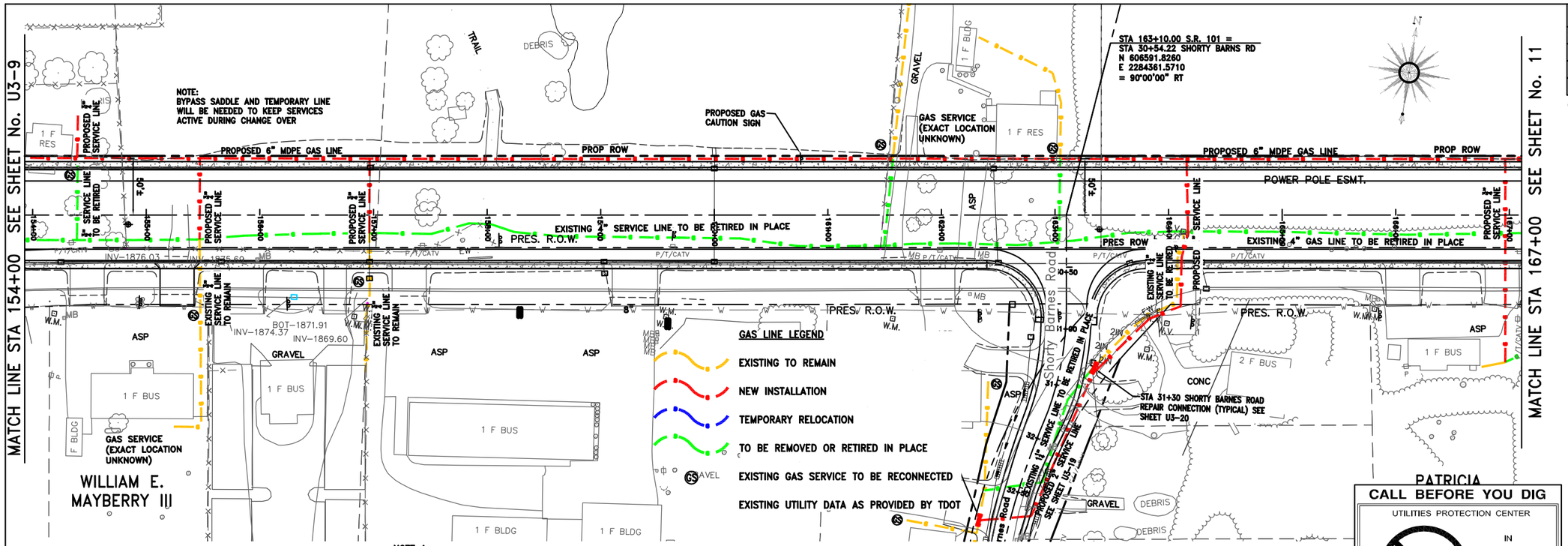
77 COTHER STREET
CROSSVILLE, TENNESSEE 38555
(931) 456-6071

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

TYPE	YEAR	PROJECT NO.	SHEET NO.
CONSTRUCTION	2015	STP-101(16)	U3-10

CUMBERLAND COUNTY



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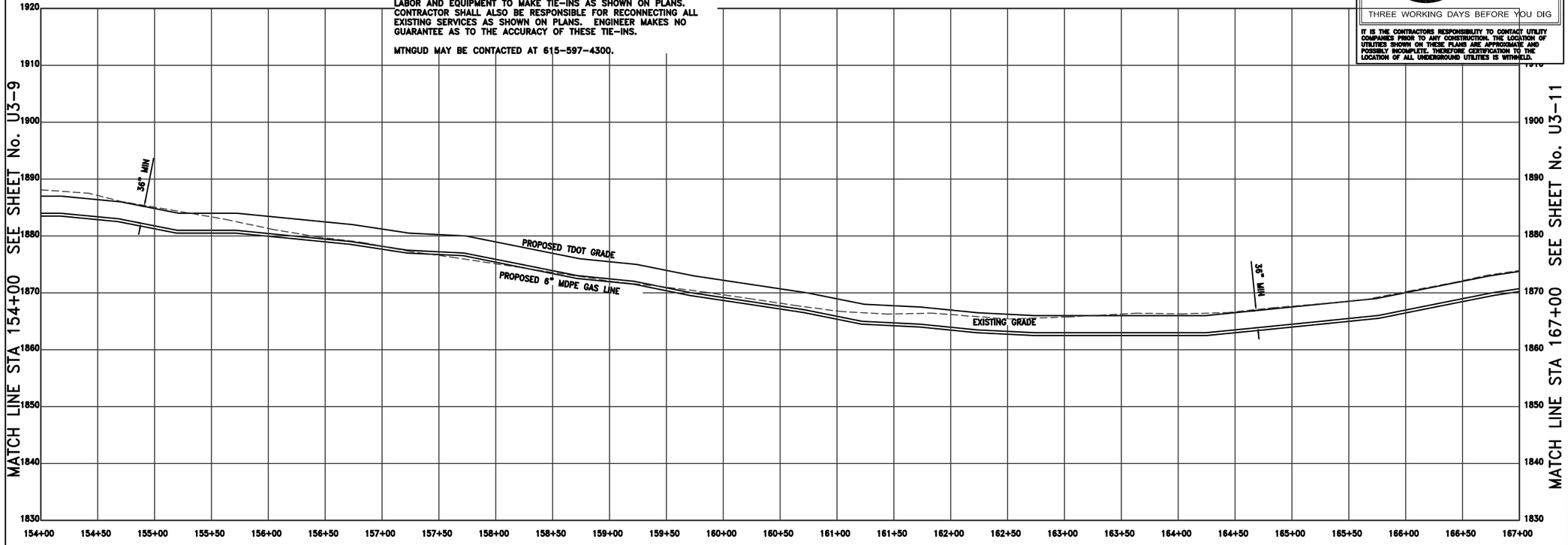

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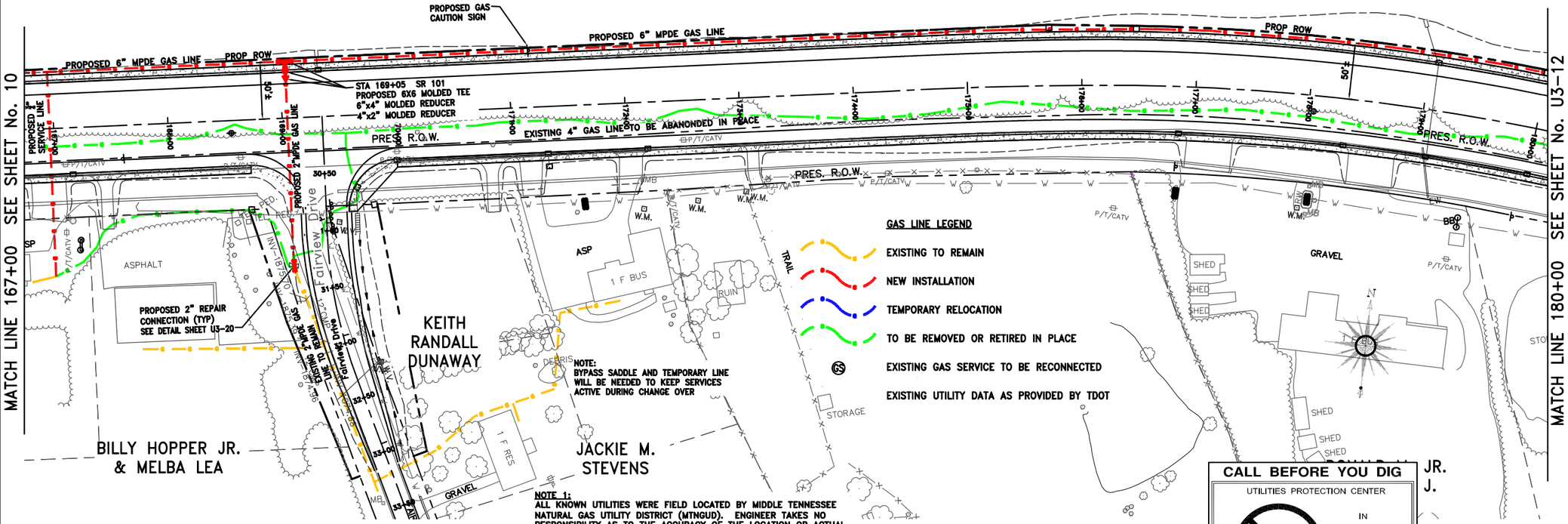
STA. 154+00 TO STA. 167+00
SCALE: 1"=50' H
1"=10' V

TYPE	YEAR	PROJECT NO.	SHEET NO.
CONSTRUCTION	2015	STP-101(16)	U3-11

CUMBERLAND COUNTY

MATCH LINE 167+00 SEE SHEET No. 10

MATCH LINE 180+00 SEE SHEET No. U3-12



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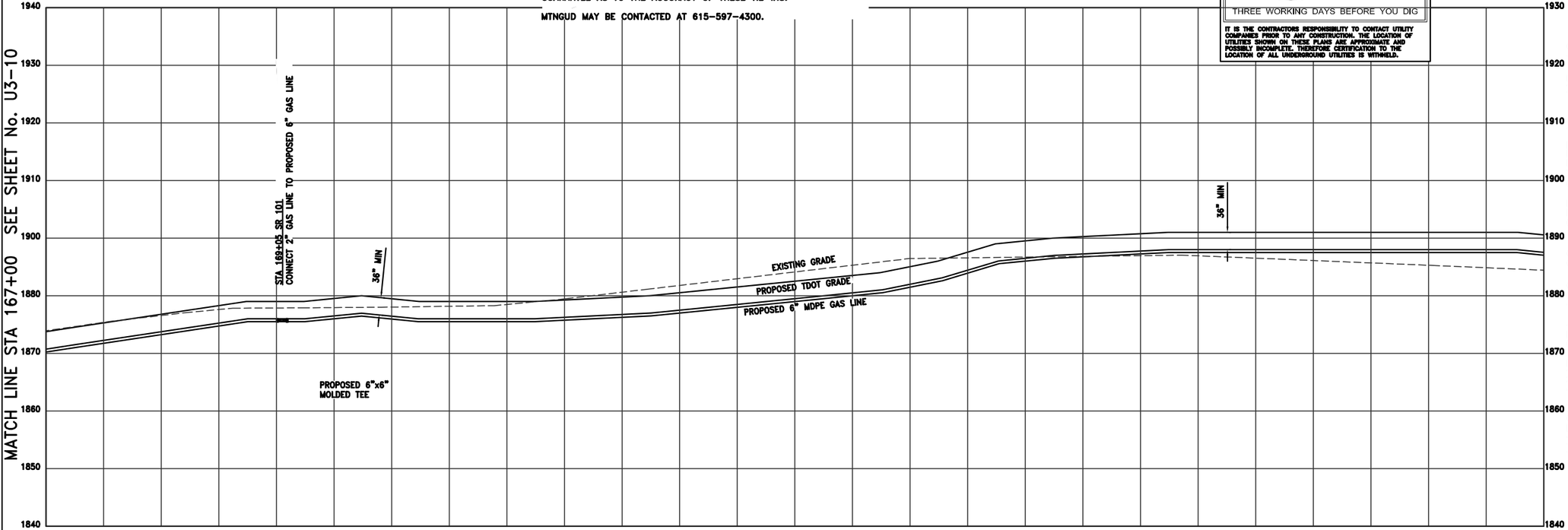

MATCH LINE STA 167+00 SEE SHEET No. U3-10

MATCH LINE STA 180+00 SEE SHEET No. U3-12

BARRY R. FIELD
REGISTERED ENGINEER
AGRICULTURE
COMMERCE
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STA. 167+00 TO STA. 180+00
SCALE: 1"=50' H
1"=10' V

TYPE	YEAR	PROJECT NO.	SHEET NO.
CONSTRUCTION	2015	STP-101(16)	U3-12

CUMBERLAND COUNTY

MATCH LINE 180+00 SEE SHEET No. U3-11

MATCH LINE 193+00 SEE SHEET No. U3-13

STA 189+56.86 S.R. 101 =
P.I. STA. 50+00.00 FAIRVIEW ROAD
N 606753.7277
E 2286983.1309
Δ = 91°06'56" RT.

STA 189+93 SR 101
PROPOSED 6X6 MOLDED TEE
6"x4" MOLDED REDUCER
4"x2" MOLDED REDUCER

PROPOSED GAS CAUTION SIGN

PROPOSED 1" SERVICE LINE

PROPOSED MDPE 6" GAS LINE

PROPOSED 2" GAS LINE

EXISTING 4" GAS LINE TO BE RETIRED IN PLACE

EXISTING SERVICE LINE TO REMAIN

STA 51+10 FAIRVIEW ROAD
REPAIR CONNECTION
SEE DETAIL SHEET U3-20

EXISTING 3" GAS LINE TO REMAIN

GERALD F. & CAROLYN P. ERAMBERT

BILLY L. & SUE HOPPER

MARY L. HULL TRUST

MID CONTINENT ENERGY INC.

Fairview Road

PROP ROW

PRES. R.O.W.

STORAGE

GRAVEL

TRAIL

SHED

DEBRIS

1 M BUS

1 F BUS

1 BL BUS

3L BUS

ASP

P/T/CATV

GAS LINE LEGEND

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

NOTE 1:
ALL KNOWN UTILITIES WERE FIELD LOCATED BY MIDDLE TENNESSEE NATURAL GAS UTILITY DISTRICT (MTNGUD). ENGINEER TAKES NO RESPONSIBILITY AS TO THE ACCURACY OF THE LOCATION OR ACTUAL QUANTITIES OF UTILITIES SHOWN.

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MTNGUD MAY BE CONTACTED AT 615-597-4300.

CALL BEFORE YOU DIG

UTILITIES PROTECTION CENTER

IN TENNESSEE CALL

1 - 800 - 351 - 1111

THREE WORKING DAYS BEFORE YOU DIG

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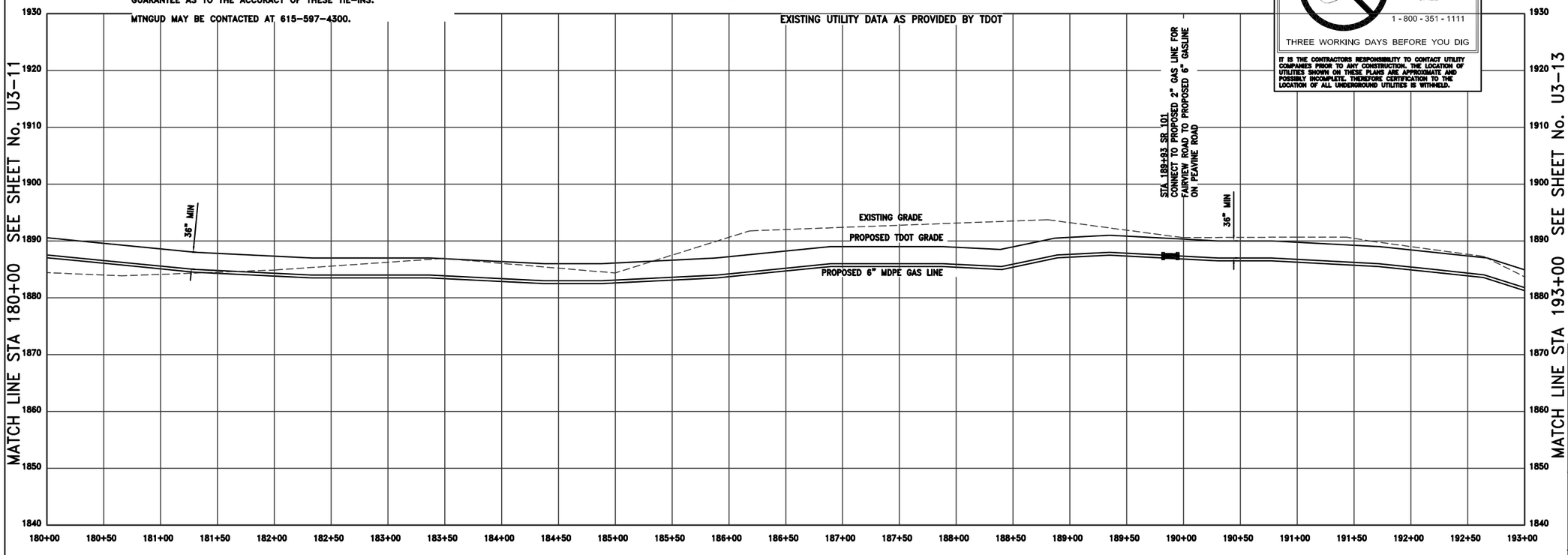
EXISTING UTILITY DATA AS PROVIDED BY TDOT



MATCH LINE STA 180+00 SEE SHEET No. U3-11

MATCH LINE STA 193+00 SEE SHEET No. U3-13

BARRY R. FIELD
REGISTERED ENGINEER
No. 21582
AGRICULTURE
COMMERCE
STATE OF TENNESSEE
3-24-15

MIDDLE TENNESSEE NATURAL GAS UTILITY DISTRICT
1030 W BROAD STREET
SMITHVILLE, TENNESSEE 37166

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	2015	STP-101(16)	U3-13

CUMBERLAND COUNTY

MATCH LINE STA 193+00 SEE SHEET No. U3-12

MATCH LINE STA 206+00 SEE SHEET No. U3-14

STA. 200+75.00 S.R. 101 =
P.L. STA. 30+00.000 ST. GEORGE RD.
N 607518.7670
E 2287754.6440
Δ = 90°00'00" RT.

STA. 31+35.04 ST. GEORGE RD. =
STA. 10+00.000 ST. GEORGE RD.
N 607518.7670
E 2287754.6440
Δ = 90°00'00" RT.

GAS SERVICE (EXACT LOCATION UNKNOWN)

STA 199+90 SR 101
PROPOSED 6" FULL FLOW VALVE AND VALVE BOX

PROPOSED GAS CAUTION SIGN

EXISTING 2" SERVICE LINE TO REMAIN

EXISTING 2" SERVICE LINE TO BE RETIRED IN PLACE

PROP ROW

PROPOSED 6" MDPE GAS LINE

EXISTING 4" GAS LINE TO BE RETIRED IN PLACE

EXISTING 4" MDPE GAS LINE TO BE RETIRED

PROPOSED 6" MDPE GAS LINE

PRES. R.O.W.

R=681.20
L=293.42

Spring Lake Drive

St. George Drive

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

GAS LINE LEGEND

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

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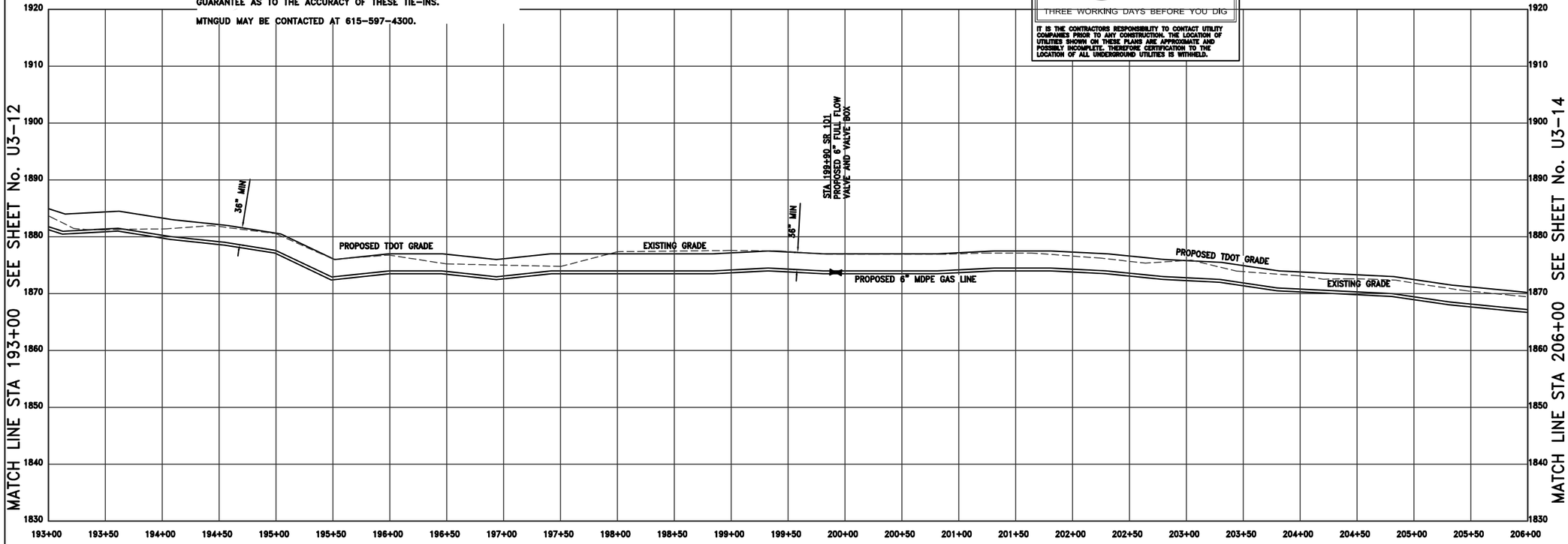


BARRY R. FIELD
REGISTERED ENGINEER
No. 21686
AGRICULTURE
COMMERCE
STATE OF TENNESSEE

3-24-15

MIDDLE TENNESSEE NATURAL GAS UTILITY DISTRICT
1030 W BROAD STREET
SMITHVILLE, TENNESSEE 37166

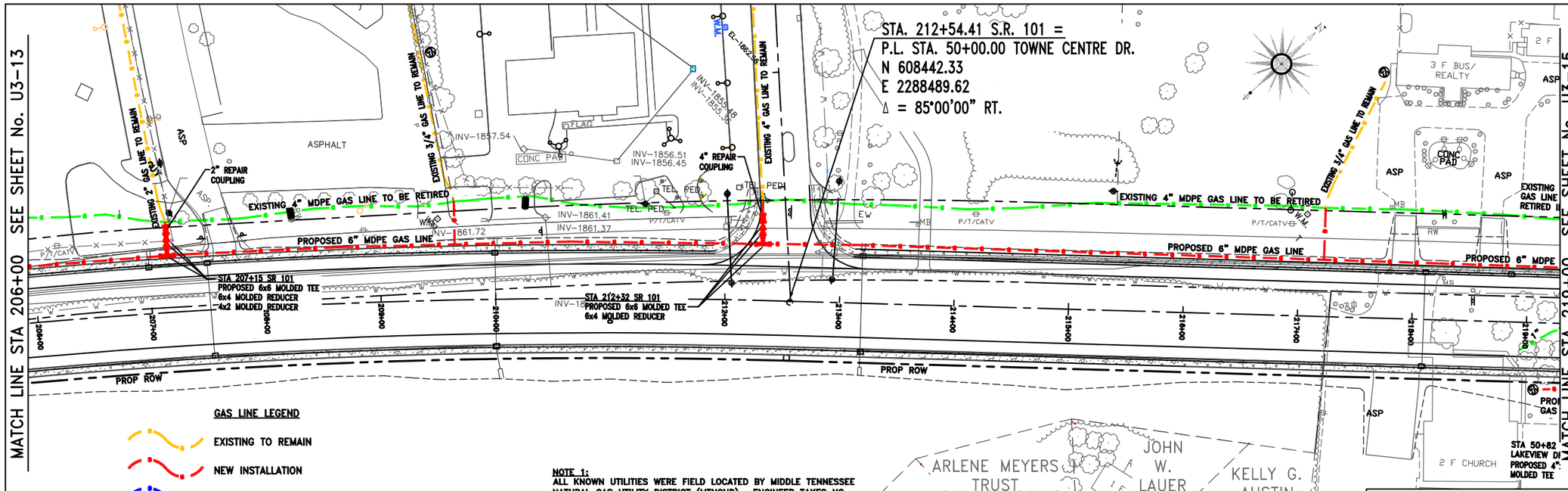
S.R. 101 (PEAVINE ROAD)
GAS LINE RELOCATION

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	2015	STP-101(16)	U3-14

CUMBERLAND COUNTY



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IN TENNESSEE CALL

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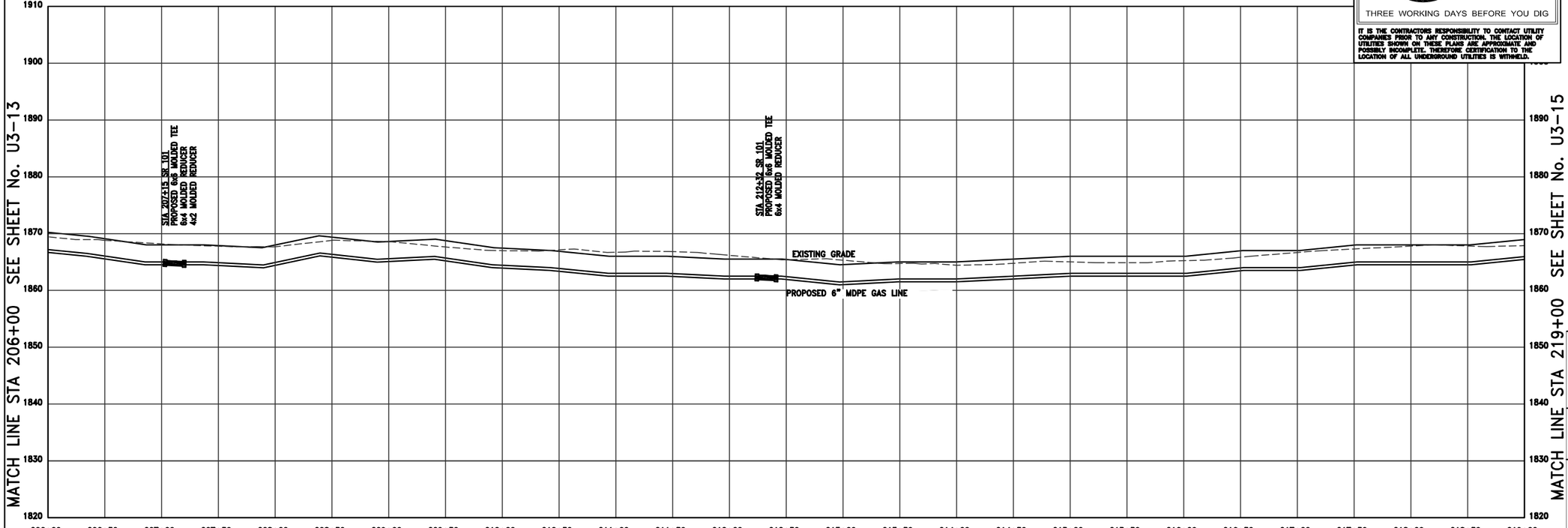

BARRY R. FIELD
REGISTERED ENGINEER
AGRICULTURE
COMMERCE
No. 21562
STATE OF TENNESSEE
8-24-15

MIDDLE TENNESSEE NATURAL GAS UTILITY DISTRICT
1030 W BROAD STREET
SMITHVILLE, TENNESSEE 37166

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

MATCH LINE STA 219+00 SEE SHEET No. U3-14

MATCH LINE STA 232+00 SEE PHASE 2 DRAWINGS

STA. 220+23.69 S.R. 101 =
P.L. STA. 50+00.00 LAKEVIEW DR.
N 609033.6210
E 2289068.6510
Δ = 90°00'00" RT.

STA 219+85 SR 101
CONNECT PROPOSED 4" GAS LINE TO PROPOSED 6" GAS LINE
6" MOLDED TEE
6x4 MOLDED REDUCER

EXISTING 4" MDPE GAS LINE TO BE RETIRED IN PLACE

EXISTING 2" SERVICE LINE TO REMAIN

STA 221+00 SR 101
6" VALVE
CAP PROPOSED 6" FOR FUTURE USE IN PHASE II

STA 223+25 SR 101
CONNECT TO EXISTING 4" GAS LINE

6" MDPE GAS LINE

EXISTING 1" GAS LINE TO BE RETIRED IN PLACE

EXISTING 4" MDPE GAS LINE TO REMAIN

PROPOSED 4" MDPE GAS LINE

PROPOSED 1" GAS LINE

STA 50+82
LAKEVIEW DRIVE
PROPOSED 4"x4"
MOLDED TEE

EXISTING 4" GAS LINE TO BE RETIRED IN PLACE

STA. 220+85.00 S.R. 101 =
P.L. STA. 30+00.00 LAKEVIEW DR.
END PHASE I PROJECT NO. STP-101(16) (ROW)
BEGIN PROJECT PHASE 2 PROJECT NO. 18038-2238-14 (ROW)

NOTE:
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IN TENNESSEE
CALL
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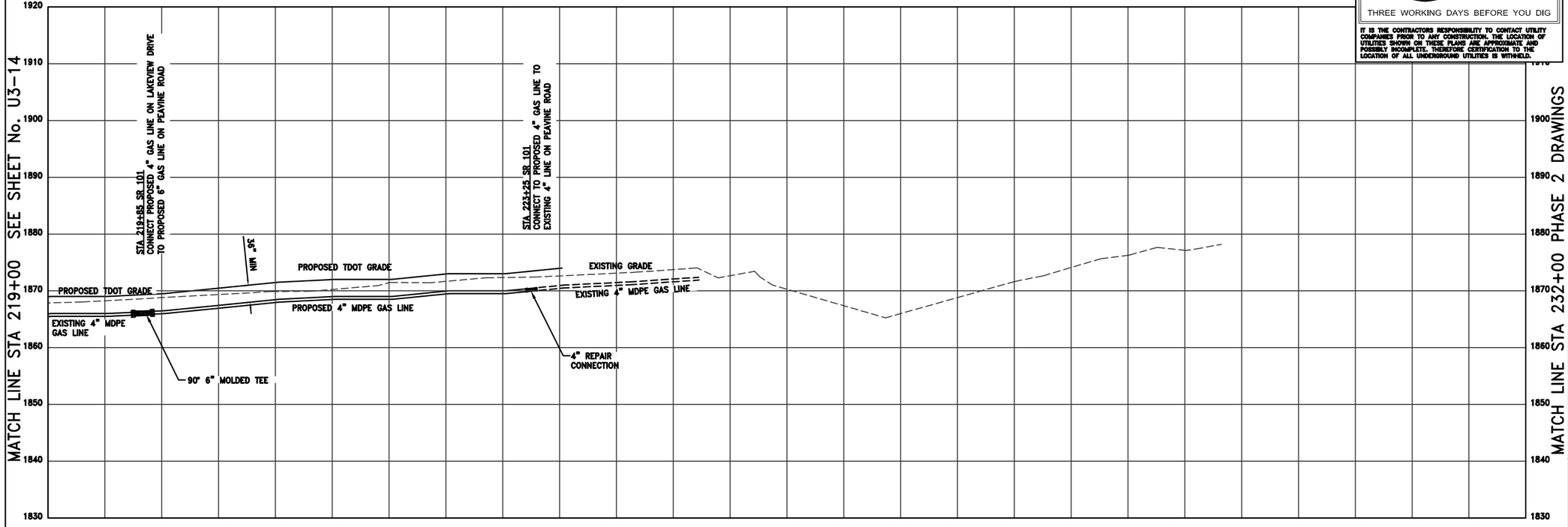


TYPE	YEAR	PROJECT NO.	SHEET NO.
CONSTRUCTION	2015	STP-101(16)	U3-15

CUMBERLAND COUNTY

BARRY R. FIELD
REGISTERED ENGINEER
AGRICULTURE
COMMISSION No. 21662
STATE OF TENNESSEE
3-24-15

MIDDLE TENNESSEE NATURAL GAS UTILITY DISTRICT
1030 W BROAD STREET
SMITHVILLE, TENNESSEE 37166

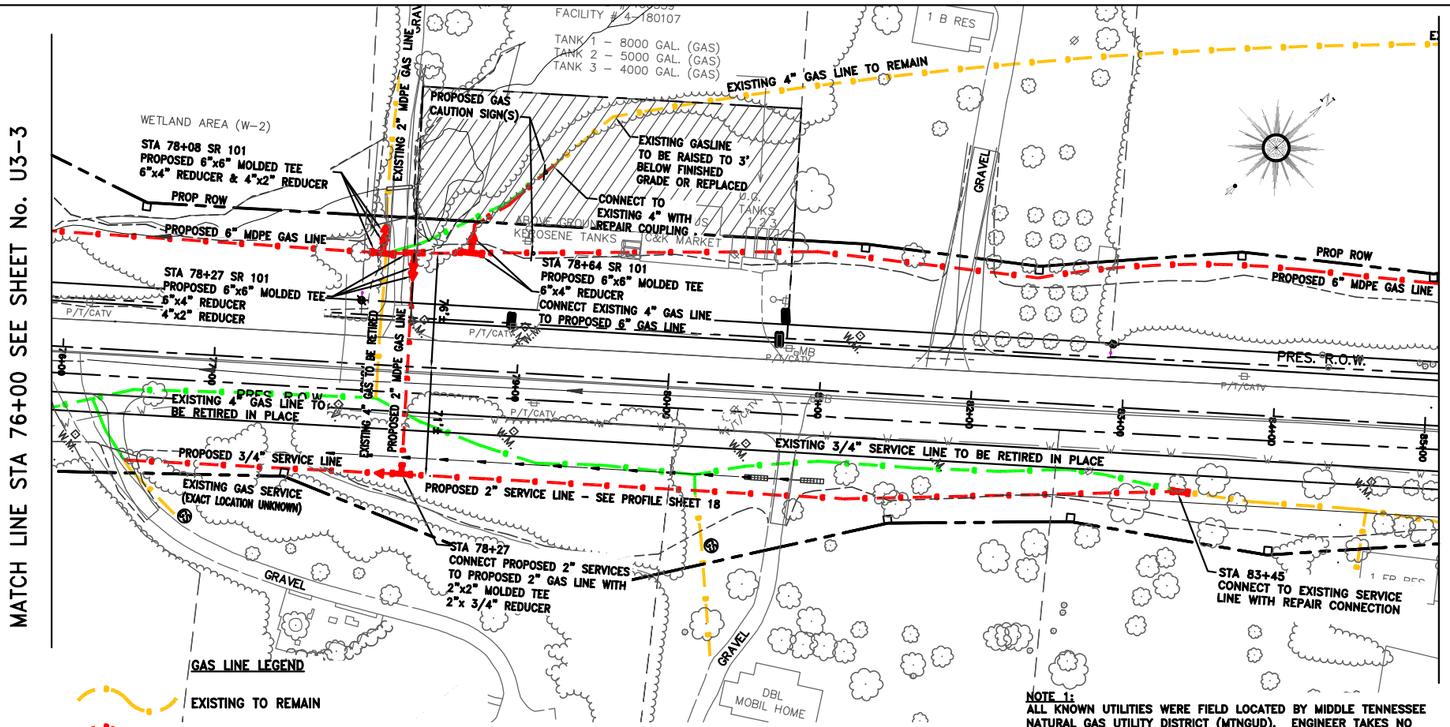
S.R. 101 (PEAVINE ROAD)
GAS LINE RELOCATION

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	2015	STP-101(16)	U3-16

CUMBERLAND COUNTY



GAS LINE LEGEND

- EXISTING TO REMAIN
- NEW INSTALLATION
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- TO BE REMOVED OR RETIRED IN PLACE

GS EXISTING GAS SERVICE TO BE RECONNECTED

EXISTING UTILITY DATA AS PROVIDED BY TDOT

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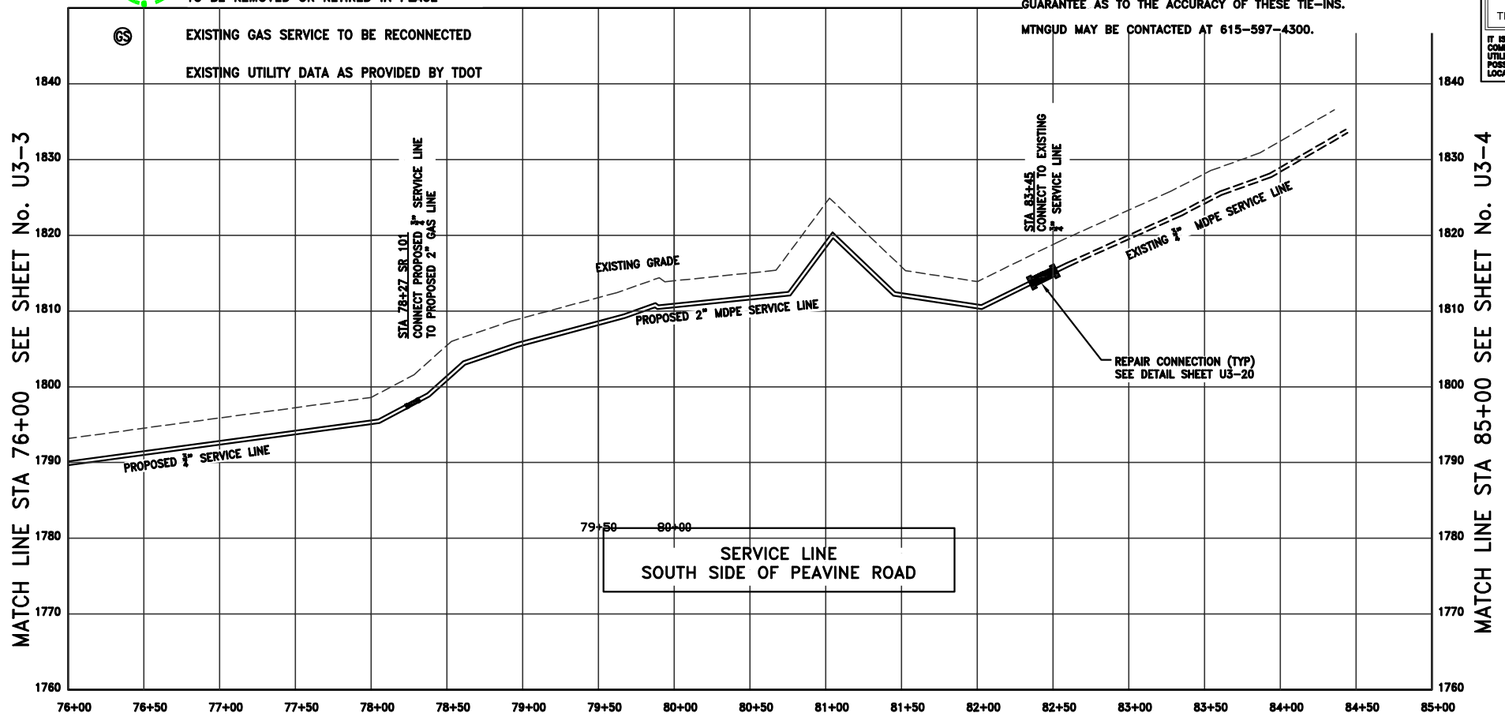

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BARRY R. FIELD
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No. 21662
STATE OF TENNESSEE
8-24-15

MIDDLE TENNESSEE NATURAL GAS UTILITY DISTRICT
1030 W BROAD STREET
SMITHVILLE, TENNESSEE 37166

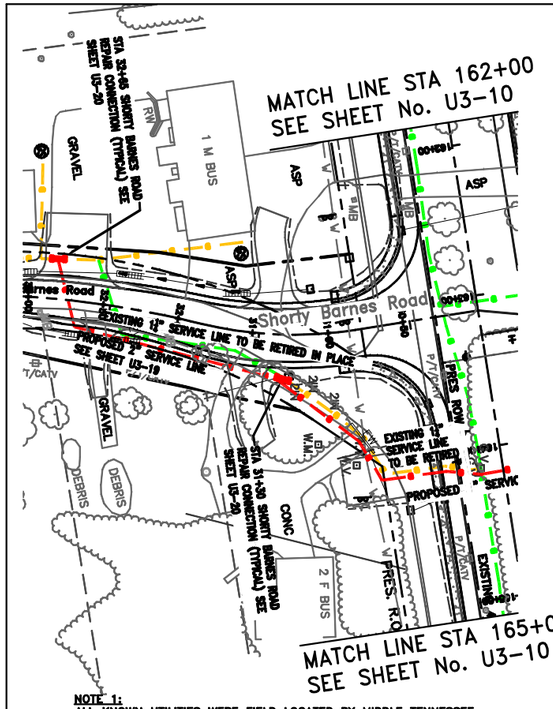
S.R. 101 (PEAVINE ROAD)
SERVICE LINE RELOCATION

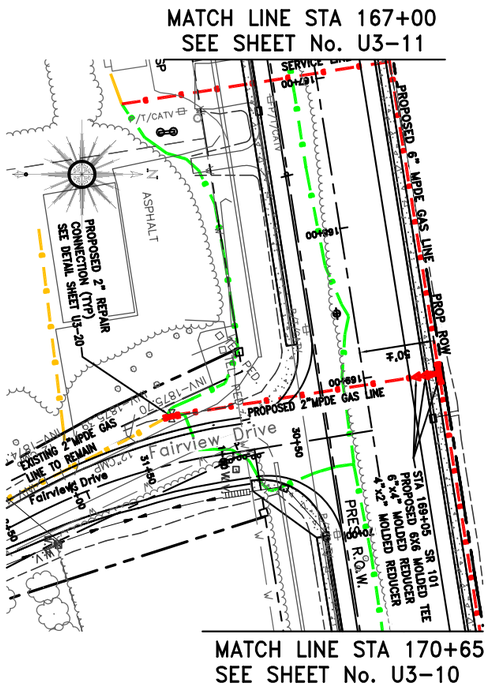
FECS
FIELD'S ENGINEERING CONSULTANT SERVICES
77 COTHER STREET
CROSSVILLE, TENNESSEE 38555
(931) 456-6071

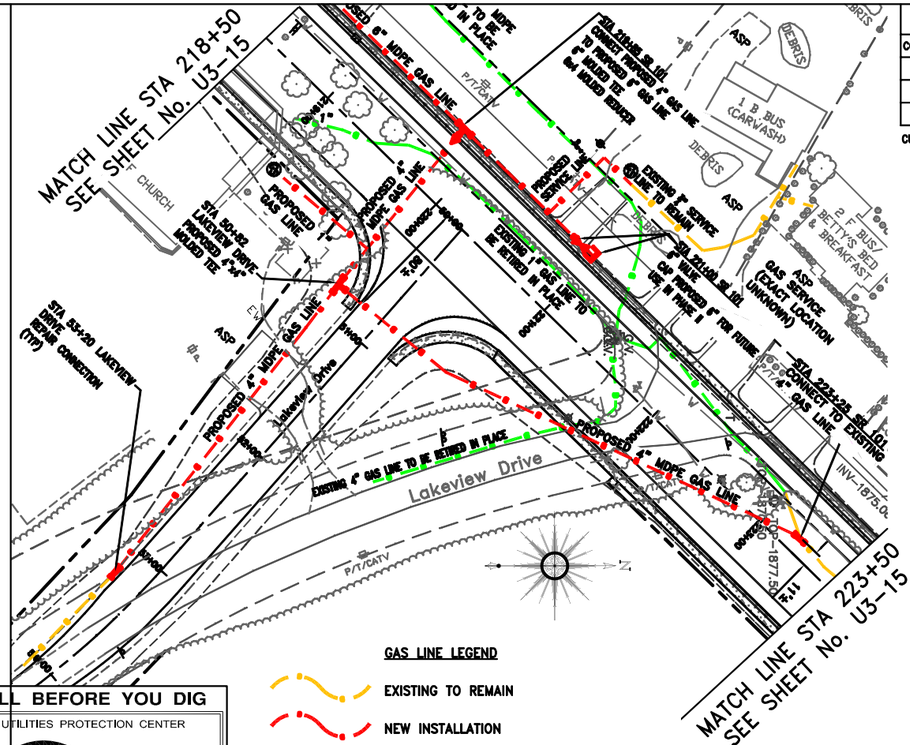
STA. 76+00 TO STA. 85+00
SCALE: 1"=50' H
1"=10' V

TYPE	YEAR	PROJECT NO.	SHEET NO.
CONSTRUCTION	2015	STP-101(16)	U3-17

CUMBERLAND COUNTY







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IN TENNESSEE CALL

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GAS LINE LEGEND

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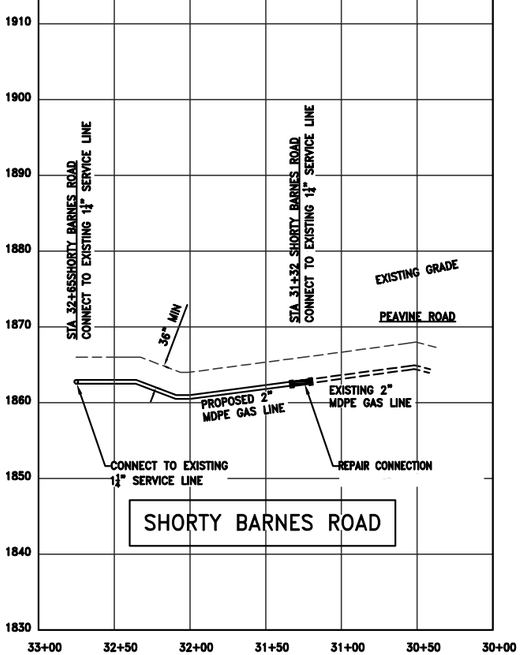
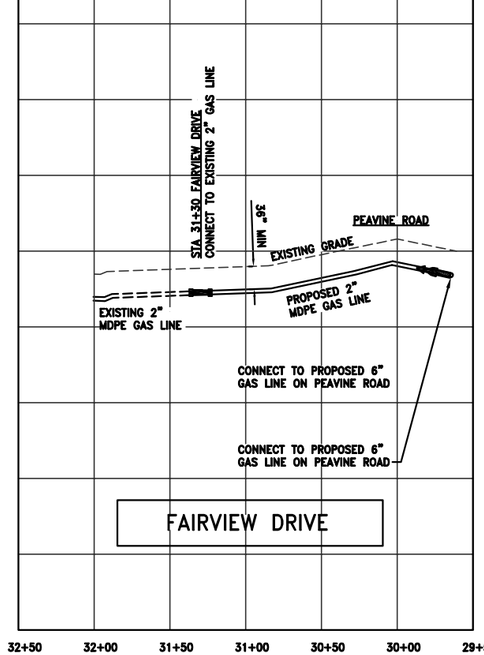
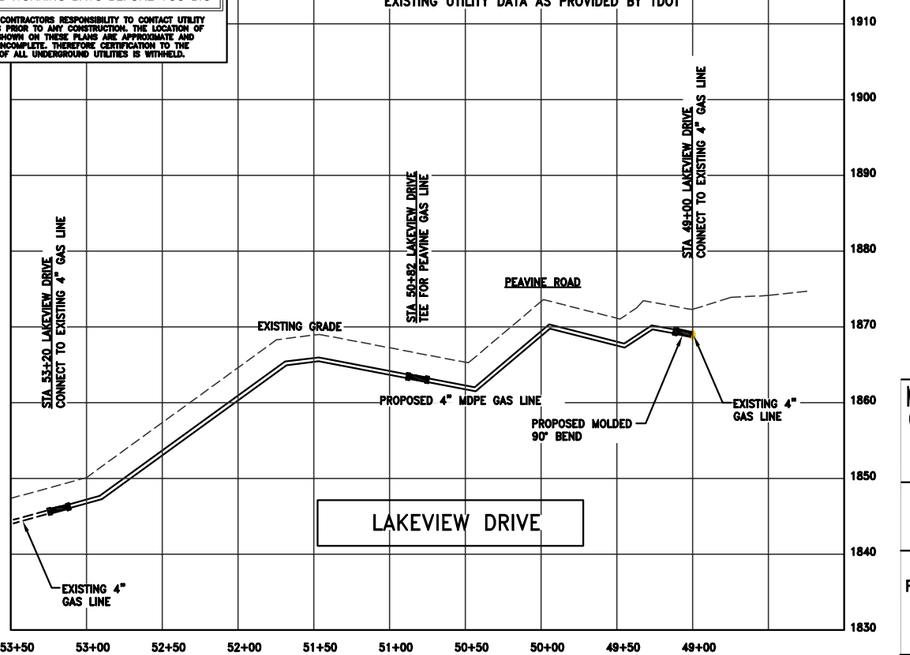






SCALE: 1"=50' H
1"=10' V

BARRY R. FIELD
REGISTERED ENGINEER
STATE OF TENNESSEE
3-24-15

MIDDLE TENNESSEE NATURAL GAS UTILITY DISTRICT
1030 W BROAD STREET
SMITHVILLE, TENNESSEE 37166

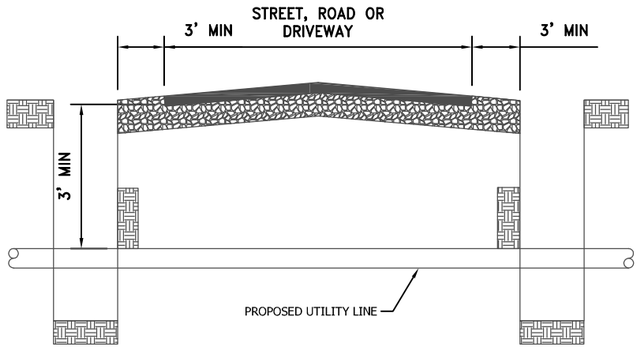
SHORTY BARNES ROAD
FAIRVIEW DRIVE
LAKEVIEW DRIVE

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

SHORTY BARNES ROAD
FAIRVIEW DRIVE
LAKEVIEW DRIVE

TYPE	YEAR	PROJECT NO.	SHEET NO.
CONSTRUCTION	2015	STP-101(16)	U3-18

CUMBERLAND COUNTY



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

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Rhino MARKING & PROTECTION SYSTEMS

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.

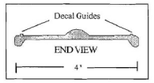
Temperature Stable
The Rhino 3-Rail™ is unaffected by temperature extremes. The Rhino 3-Rail™ will remain flexible from -40°F to +140° F.

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

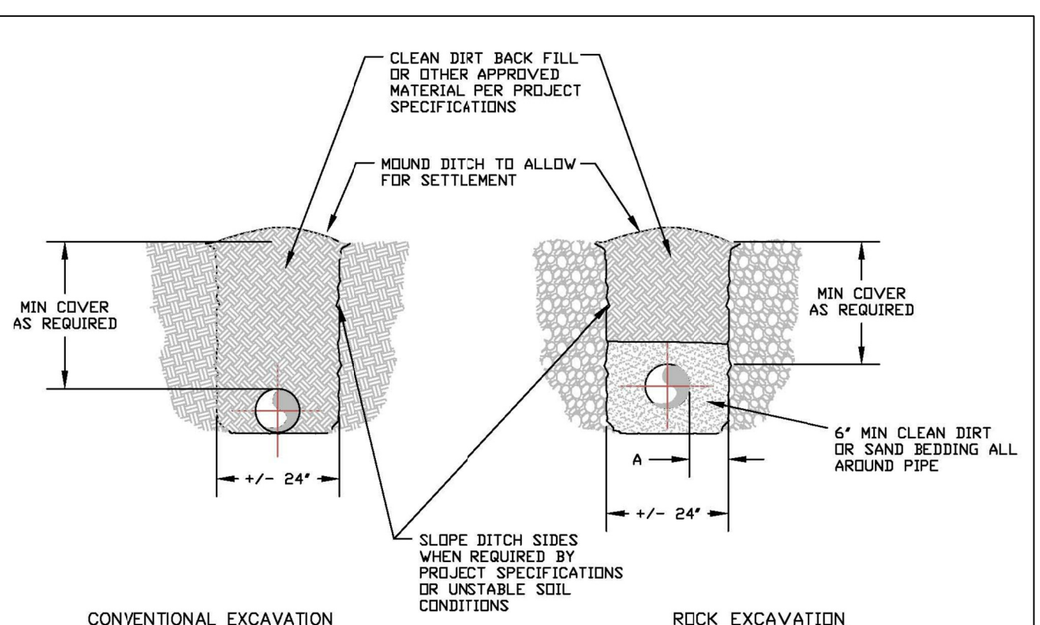
Colors
Standard colors include orange, yellow, white, blue, green, red, purple, gray and brown. Custom colors available on orders of 300 or more.

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.



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



NOTES:
TRENCH TO BE BACK FILLED AND COMPACTED IN ACCORDANCE WITH LOCAL GOVERNING BODY AND/OR PROJECT SPECIFICATIONS.

NOTE:
WRAP PIPE WITH 3/8" ROCK SHIELD IF "A" DIM IS LESS THAN 4" (STEEL PIPE ONLY)

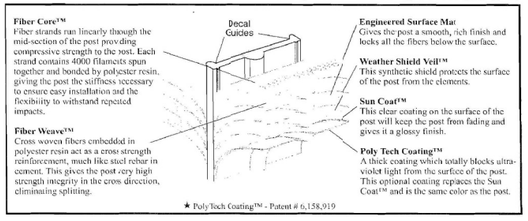
REVISIONS		Typical Trench Detail	MIDDLE TENNESSEE NATURAL GAS UTILITY DISTRICT	1030 W. Broad St. Smithville, TN 37166 (615) 597-4300 (Phone) (615) 597-5331 (Fax) mtng@mtng.com

Sheet 3.01

Rhino MARKING & PROTECTION SYSTEMS

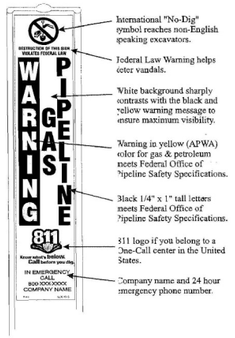
Product Fact Sheet

ENGINEERED FOR MAXIMUM PERFORMANCE

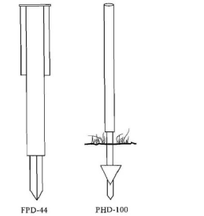


★ PolyTech Coating™ - Patent # 6,158,919

HIGH VISIBILITY DECAL



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.

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MIDDLE TENNESSEE NATURAL GAS
1030 W BROAD STREET
SMITHVILLE, TENNESSEE 37166

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	2015	STP-101(16)	U3-19

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 Middle Tennessee Natural Gas Utility District (MTNGUD) and can be contacted at (615) 597-4300. The Staff Engineer for the MTNGUD is Mr. John Mullen 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.

MATERIALS AND EQUIPMENT
Materials and Equipment Furnished by Contractor: Except as otherwise specified in this section, all other materials and equipment required for this contract shall be furnished and paid for by the Contractor. This includes all necessary tapping and inserting machines required for "hot connection(s)" and the services of manufacturer's representative, if necessary, to instruct the Contractor as to the proper installations of the special fittings required to make the "hot connection."

APPLICABLE CODES AND REGULATIONS
Install all work to comply with the following, all of which shall be considered as MINIMUM requirements:

- Tennessee Regulatory Authority Safety Requirements.
- United States Department of Transportation, Pipeline & Hazardous Materials Safety Administration (PHMSA) "Minimum Federal Safety Standards for the Transportation of Natural and Other Gas by Pipeline."
- Tennessee Valley Authority (TVA), United States Army Corps of Engineers (Corps), Tennessee Department of Environment and Conservation (TDEC), Tennessee Department of Transportation, United States Occupational Safety and Health Administration (OSHA), and all other applicable Federal, State and Local codes and regulations.
- Tennessee Underground Utility Damage Prevention Act.
- Middle Tennessee Natural Gas Utility District's Operations and Maintenance Manual, and Operator Qualification Plan.

Obtain a copy of each applicable Code and Regulation, read carefully all requirements thereof applicable to this contract, and have available for the Contractor's and Owner's use. All applicable codes and regulations referred in these specifications are included as a part of these specifications by reference.

POLYETHYLENE PIPE
All polyethylene pipe shall be manufactured from resin qualifying for a Plastic Pipe Institute Material Designation of PE2406.

All polyethylene pipe shall have a Standard Dimensional Ratio (SDR) as follows:
¾" - SDR 9.33
2" - SDR 11
4" & 6" - SDR 11 or SDR 11.5

Polyethylene pipe provided by Contractor shall not have a manufacture date older than two years prior to the actual installation date of the pipe.

POLYETHYLENE FITTINGS
All polyethylene fittings shall be butt fusion type of fittings unless otherwise noted or called for in the plans.
All polyethylene fittings shall be of compatible material to the polyethylene pipe.
All transition fittings (plastic to steel) shall be factory assembled.

EXCESS FLOW VALVES
All excess flow valves shall be manufactured by UMAC, Dresser or equivalent, designed for natural gas service. All valves shall be rated for a minimum trip of approximately 700 Scfh @ 10 psi.
Steel excess flow valves shall be installed in ¾" steel pipe and be rated for a minimum of 500 psig operating pressure.
Polyethylene excess flow valves shall be installed in in ¾" IPS SDR 9.33 tubing or shall be an integral part of a ¾" tapping tee.

POLYETHYLENE VALVES
All polyethylene valves shall have stabilizers installed to prevent excessive movement of the valve body during operation. Install stabilizers as approved by Owner.
All polyethylene valves shall be approved by Owner and compatible to pipe being installed.
All polyethylene valves shall be butt fusion type valves.
All valves shall have a pressure rating adequate for the intended service.

VALVE BOXES
Diameter of valve box shall be not less than five and one-quarter (5-1/4) inches and be as approved.
Valve boxes shall be of sufficient length so that extensions are not needed.
- Should case arise, extension shall be placed on bottom of valve box.

Valve boxes shall be installed plumb and extending above finished grade so that no water will stand around the valve box top.
As directed, valve boxes shall have a concrete collar poured around the top of the box.
Valve boxes shall be supported so that the weight of the box does not rest on the pipe or valve.

END PREPARATION
The valves shall be butt welded meeting the standard specification ANSI B31.8 (1989 edition or later). No socket fusion is allowed. See MTNGUD Technical Specifications.

TYPE OF JOINTS AND CONNECTIONS
Steel Piping
Underground :
- Connections shall be welded unless otherwise specified.
- Connections to valves and other items having flanged ends shall be flanged and bolted type.
- Connections to polyethylene piping shall be made with factory assembled, coated transition fittings.
- Underground threaded connections will not be permitted.

Above Ground :
- Connections to flanged items shall be flanged and bolted type.
- Connections to steel pipe shall be either welded or threaded.
- Stainless steel tubing shall be compression type fittings.

POLYETHYLENE PIPING
Connections shall be made by butt fusion, electrofusion or sidewall fusion. No socket fusion will be allowed.

Connections to steel piping shall be made with factory assembled transition fittings.

POLYETHYLENE PIPE FUSORS
All pipe fusion shall be done ONLY by operators qualified to make fusion joints under the Owner's approved procedures.

The Contractor shall present written proof that Contractor's pipe fusion operators are qualified under these procedures, to the Owner for his files.

When required by the Owner, a sample joint will be removed and tested inhouse or sent to an independent testing lab to be tested.

If more than two (2) joints or 10 (10) percent of the joints performed by an operator fail by destructive methods, the fuser will not be able to fuse plastic pipe on this job until sufficient proof that the fuser has re-qualified under the applicable Operator Qualification Plan along with a retest, is submitted to the Owner for approval.

FUSION CONNECTIONS
All joints and connections of polyethylene pipe, fittings, and valves shall be made by heat fusion in accordance with the Owner's or manufacturer's written fusion procedures.

Contractor shall obtain a copy of applicable polyethylene pipe fusion procedures and maintain these procedures on the job site for the Owner's inspection.

CONNECTION TO EXISTING GAS SYSTEM
The existing natural gas distribution system is owned and operated by the Middle Tennessee Natural Gas Utility District (MTNGUD). The contact for the Utility is Field's Engineering Consultant Services, LLC, (931) 456-6071 or the Staff Engineer of the Utility District, Mr. John Mullen. Mr. Mullen can be contacted at (615) 597-4300.

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 MTNGUD that the person(s) performing these connections have experience with making gas taps under similar conditions. The MTNGUD shall be notified by the utility contractor a minimum of 48 hours prior to the planned tap. In addition to notifying the MTNGUD, the Cumberland County Fire Department shall be notified as per notification of the MTNGUD. 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.

CONNECTIONS TO PRESSURIZED POLYETHYLENE PIPING
Maintain continuity of gas service. Owner or contractor will provide all necessary equipment to accomplish this per job requirement, including Mustang or equivalent squeezeoff machines.

Pipe will be properly grounded for static electric discharge before positioning squeeze-off tool on the pipe.

PE pipe size will be identified and proper gap stop on the jaw positioned. Pipe will be cleaned and inspected for surface damage.

Squeeze tool will be centered visually on the pipe by partial (10-15%) squeeze. This will be verified by determining if the upper jaw is parallel to the lower jaw and an equal space exists between the tool frame and the sides of the pipe.

The pipe will be squeezed until the hand torque on mechanical tools is "tight", or the gage pressure is as prescribed for hydraulic tools. One minute will be allowed per diameter inch of pipe size for cold flow relaxation (double this time if temperatures are below freezing).
The tool will be re-torqued one-quarter turn for mechanical tools, or hydraulic tools will be re-pumped to the original pressure to achieve complete squeeze off.

If saddle clamps are included with the tool, they are to be installed immediately to lock the jaws in place in the event of a hydraulic failure, or for additional clamping force on mechanical tools.

Purging the pipe is to be accomplished by controlled opening of the squeeze tool or tool and saddle clamp combination.

The pipe is to be marked with a clamp or tape to indicate a squeeze-off was made in that area. A second or subsequent squeeze of the pipe at the same location of a prior squeezeoff is not to be performed.

ORDER OF OPERATION
Install new mains, pressurize both old and new mains, then reconnect individual services before depressurizing mains to be retired.
Coordinate with MTNGUD personnel to re-light individual customers as required.

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.

TRENCHING, EXCAVATING, SHORING, BRACING, AND DE-WATERING
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.

Except as otherwise indicated, specified herein, or authorized, make all excavations by open cut.
- See "BORING," and "HORIZONTAL DIRECTIONAL DRILLING," hereinafter for special excavation requirements in special areas.

Excavate trenches to the indicated lines and locations to provide uniform and continuous bearing and support of the pipe on firm, undisturbed earth. Where necessary to make joints in the trench, provide ample joint holes in trench to facilitate this. Trench depths shall be as required to provide the specified MINIMUM cover over the tops of the pipes; as required to permit pipes to pass under culverts, roads, driveways, existing pipelines and other obstructions; and as required to accommodate valves and boxes. Trench widths shall be as required for the proper laying and joining of pipes and the proper placing and compacting of backfill, but in no case shall a trench be more than twenty-four (24) inches wider than the inside diameter of pipe to be laid therein. Machine or hand-cut trenches, except that in all cases
prepare the final sub grade accurately with hand tools, and, in special cases where required, cut the trenches entirely by hand. Before laying pipe where excavation is carried below proper sub grade, bring the trench bottom up to proper sub grade by backfilling with approved material placed in twelve (12) inch maximum thickness loose layers, and thoroughly compact each layer as required to provide uniform and continuous bearing and support for the pipe.

- Where rock is encountered, remove it and prepare the final sub grade as specified under "ROCK EXCAVATION AND BLASTING" hereinafter.

MINIMUM cover over tops of pipes shall be:
- Thirty-six (36) inches on mains to be operated above 60 psi, piping greater than or equal to four (4) inch nominal diameter, and all piping, regardless of pressure, size, or material installed within TDOT right-of-way.
- Twenty-four (24) inches on mains less than four (4) inch nominal diameter to be operated below 60 psi.
- Twelve (12) inches for service lines installed on private easement.
- As required, under railroads, highways, creeks and other special conditions.
- All variations to these minimums shall be approved by the Owner.

IN ALL CASES, THE SPECIFIED MINIMUM COVER OVER PIPES SHALL BE BASED UPON FINAL FINISHED SURFACES, INCLUDING PAVING, IF ANY.

Shore and brace trenches and excavations as required to protect personnel, adjacent structures, and adjacent property. Where required by the conditions encountered, brace trenches and excavations to meet all requirements of codes. Do all necessary cribbing-up required for the proper operation of trenching machines.

Provide and maintain in proper working order all necessary de-watering equipment required to remove water from the excavations. Where quicksand or other water bearing strata are encountered, install and connect piping to avoid the rise of water in the excavation until the work has been installed properly and will be unaffected by submersion.

Install pipe crossing concrete driveways, asphalt driveways, and other special conditions by tunneling or boring or, as approved, install pipes crossing dirt or gravel drives by open cut, unless otherwise authorized.

Where the trench bottom at required sub grade is found to be unstable or to include ashes, cinders, or any type of refuse, vegetable or other organic material, or large pieces or fragments of inorganic material which, in the Owner's opinion should be removed, excavate and remove such unsuitable material. Before laying pipe, bring the trench bottom up to proper sub grade by backfilling with suitable material placed in twelve (12) inch maximum thickness loose layers, and thoroughly compact each layer as required to provide uniform and continuous bearing and support for the pipe.

When authorized by Owner, pipe may be installed by Plowing. All plowing shall be performed in accordance with manufacturer's recommendation and shall meet minimum cover requirement and other requirements listed herein.

ROCK EXCAVATION AND BLASTING
Wherever used as the name of an excavated material, the term "rock" shall mean any one or more of the following materials which, in the Owner's opinion, require for their removal drilling and blasting, wedging, sledging, or barring, or breaking up with power operated tools: boulders, pieces of concrete, concrete and masonry, each weighing more than two hundred fifty pounds; and solid ledge rock, concrete, and masonry, each with more than one-half (1/2) cubic yard of volume. The following items are not considered "rock":
- Soft or disintegrated rock or gravel which can be removed with a hand pick or power operated excavator shovel;
- Loose, Shaken, or previously blasted rock or broken stone in rock fillings or elsewhere;
- Rock exterior to the limits or measurements allowed which may fall into the excavation; and/or
- The removal of existing pavement.
-

No blasting will be permitted without blasting insurance in the limits prescribed under Contractor's Insurance herein, supervisor and all local authorities approval.

Except as otherwise specified in "TRENCHING, EXCAVATING, SHORING,BRACING, AND DE-WATERING" hereinbefore where rock is encountered in pipe trenches, remove all rock from sides of trench to provide at least a six (6) inch horizontal clearance from the pipe on each side, and remove all rock from required sub grade by backfilling with sand or suitable earth which is free of rocks, stones, bricks, cinders, broken concrete, rubbish, vegetable materials, or other unapproved materials to provide uniform and continuous bearing for the pipe.

Only in special cases where authorized due to adverse field conditions where rock is encountered in pipe trenches, remove the rock only as required to clear the pipe at least four (4) inches all around, and lay the pipe with a protective wrapping of "Rock Shield". Remove all jagged rock edges which could penetrate the "Rock Shield" and puncture the pipe coating or pipe.

Where blasting is required, conduct all blasting operations only with properly qualified personnel, in accordance with all applicable ordinances and regulations. Pre-blast surveys shall be conducted at the expense of the contractor. Contractor shall repair and/or pay for all damage caused by blasting operations.

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.

NOTE 1:
ALL KNOWN UTILITIES WERE FIELD LOCATED BY MIDDLE TENNESSEE NATURAL GAS UTILITY DISTRICT (MTNGUD). ENGINEER TAKES NO RESPONSIBILITY AS TO THE ACCURACY OF THE LOCATION OR ACTUAL QUANTITIES OF UTILITIES SHOWN.

CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ALL MATERIALS, LABOR AND EQUIPMENT TO MAKE TIE-INS AS SHOWN ON PLANS. CONTRACTOR SHALL ALSO BE RESPONSIBLE FOR RECONNECTING ALL EXISTING SERVICES AS SHOWN ON PLANS. ENGINEER MAKES NO GUARANTEE AS TO THE ACCURACY OF THESE TIE-INS.

MTNGUD MAY BE CONTACTED AT 615-597-4300.

BARRY R. FIELD
REGISTERED ENGINEER
AGRICULTURE
COMMERCE
No. 21662
STATE OF TENNESSEE
3-24-15

MIDDLE TENNESSEE NATURAL GAS
1030 W BROAD STREET
SMITHVILLE, TENNESSEE 37166

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

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

DETAILED SPECIFICATIONS

TYPE	YEAR	PROJECT NO.	SHEET NO.
CONSTRUCTION	2015	STP-101(16)	U3-20

CUMBERLAND COUNTY

HIGHWAY AND ROAD CROSSINGS
Highway and Road Crossings :

- Do all work on the highway or road rights-of-way under the supervision of the Highway Department or appropriate authority and in strict accordance with their requirements. DO NOT, UNDER ANY CIRCUMSTANCES, PLACE ANY EXCAVATED MATERIALS, CONSTRUCTION MATERIALS, CONSTRUCTION EQUIPMENT, OR OTHER ITEMS ON THE HIGHWAY OR ROADWAY PAVEMENT. Arrange all work to avoid all unnecessary interference unnecessary interference with traffic. As soon as practicable after installation of each gas line across the highway or road, restore all traffic. As soon as practicable after installation of each gas line across the highway, restore all highway property at that location to at least the condition that existed prior to the beginning of work thereon.
-

All other road crossings: Install pipe in accordance with all State, County, and Local requirements, as applicable, and as specified herein under "CUTTING AND REPLACING PAVEMENT AND OTHER SPECIAL SURFACES OR BORING".

Contractor shall provide traffic controls and signage in accordance with the most recent U. S. Department of Transportation Part IV "Standards and Guides for Traffic Controls for Street and Highway Construction,Maintenance, Utility, and Incident Management Operations".

DRIVEWAY, PARKING LOTS, AND SIDEWALK CROSSINGS
Where practicable, all sidewalks, driveways, curbs, gutters, and parking lots that are concrete or asphalt shall be bored in accordance with "BORING" hereinafter.

All other concrete and asphalt structures shall be bored as required in accordance with "BORING" and/or cut in accordance with "CUTTING AND REPLACING PAVEMENT AND OTHER SPECIAL SURFACES" herelnafter.

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.

CUTTING AND REPLACING PAVEMENT AND OTHER SPECIAL SURFACES
Restore, to at least the conditions which existed before excavation, all surfaces which have been disturbed by the pipeline installation. The type of surface to be replaced in each case shall be determined by mutual agreement between owner and the contractor. As specified under section "TRENCHING, EXCAVATING, SHORING, BRACING, AND DEWATERING" hereinbefore, the Owner will pay ONLY for the actual extent of the repairs. Replace with new surfaces all existing surfaces which are cut, removed, or otherwise damaged by the work under this contract, as
specified below. All new surfaces shall conform accurately to the elevations and contours of the existing adjacent undisturbed surfaces.

- Existing Gravel Surfaces: Replace these with a six (6) inch thick compacted layer of new road gravel.
- Existing Asphalt ("Black Top") Surfaces: Replace these with a six (6) inch thick compacted base course of new road gravel, and a two (2) inch minimum thickness surface course of hot lay plant mix type asphaltic concrete conforming to the applicable road or street paving specifications of the area in which the work is located.
- Existing Double Bituminous Surface Treatment Surfaces: Replace these with a six (6) inch thick compacted base course to match the existing surface course and conforming with applicable road or street paving specifications of the area in which the work is located.
-

Where pipe is installed on the shoulders parallel to asphalt, double bituminous surface treatment, concrete or other surfaces, maintain ditches until they are firm and present no traffic hazard. When authorized, place compacted layers of new road gravel.

Do not cut streets, roads and other paved surfaces except where necessary for the gas main installation.

Road Gravel Material: Road gravel shall be of the same type and gradation as that used for street and road work by the local street or county road department in the area in which the system is located.

BORING
Where indicated on the drawings or specified hereinbefore, install pipe through holes bored under existing special surfaces.

In each case, bore the smallest practicable diameter hole by a method prescribed or approved by the authority having jurisdiction over the area involved, and install the pipe taking special precaution not to damage the coating on the casing pipe and/or carrier pipe installed in the bored hole.

All boring shall be done by an approved horizontal drilling or DRY BORE method.

HORIZONTAL DIRECTIONAL DRILLING
Contractor shall install horizontal directional drilled pipelines as required by Owner. Contractor shall seal and re-drill all or any part of the pilot hole if the completed or partially completed pilot hole is not acceptable. Also,in the event the pipeline becomes lodged and cannot be pulled out of the drilled hole during the installation, Contractor shall seal the pipe and existing hole. Contractor shall re-drill a pilot hole and again commence the pulling in of the pipeline. Cost of the coated pipe and its welding to replace the portion not retrieved shall be borne by Contractor.

The bore pipe shall be prefabricated, pressure tested, and pulled back in one section. Contractor shall provide adequate support of the pipeline during the pull back to prevent damage to the pipe and coating.

Contractor shall stake the point of bore entry and bore exit. Owner must approve of entry and exit locations prior to construction.

Ground entry angle and exit angle shall be calculated and submitted to the Owner prior to construction.

Acceptable variance from the proposed alignment shall be 6 feet measured in any direction from the exit stake but not out of the easement.

The minimum bending radius on the pipe as it is pulled under the crossing shall not produce a bending stress, which exceeds 30% of the specified minimum yield strength of the pipe material.

Contractor shall limit the longitudinal pull on the pipe to not greater than 75% of the specified minimum yield strength (SYMS) of the pipe. The drilling rig shall be equipped with functional instrumentation indicating the pulling force. Contractor shall continuously monitor the longitudinal pulling forces when installing the pipeline.

The pipe shall be adequately supported to prevent a cantilever effect. Rollers shall be in good condition, suited for fusion bonded coating,equipped with padded side rollers.

Contractor shall furnish portable fluid (mud) tanks at each end of the bores to contain all drilling fluids resulting from the boring procedure. Contractor shall properly dispose of all drilling fluids.

Contractor shall not add hydrocarbon additives to drilling fluid without approval.

Contractor shall continuously monitor the alignment and profile of the directionally drilled hole. After completion of the boring operation and prior to pulling the pipe, Contractor shall furnish to the Owner alignment and profile information of the directionally drilled portion of the pipeline based on the down hole survey tool records in the form of a tabulation showing x, y, and z coordinates related to the point of entry and the line between the entry and exit points. Coordinates shall be furnished on intervals as measured along the pipeline. After completion of the work,
Contractor shall furnish Owner with plan and profile drawings of the crossing.

INTERNAL CLEANING
Prior to testing, internally clean all new piping with a suitable "pig" type cleaner forced by air pressure through the pipe two (2) or more times until the line is thoroughly cleaned.
Steel Pipe :

- The first two cleanings shall be performed with a wire brush type pig.
- All subsequent cleanings shall be performed with a polyurethane or polyethylene type pig.
- Should water be present during pigging, the pipe shall be dried in accordance with "DEHYDRATING PIPES" herein, using a suitable squeegee type pig. Squeegee pig shall be run through the pipe until it comes out dry.

Polyethylene pipe :

- All pipes three (3) inches nominal diameter and greater shall be pigged.
- All two (2) inch nominal diameter piping projects that are 5,000 feet or longer shall be pigged. Two (2) inch nominal diameter piping projects shorter than 5,000 feet in length shall be pigged when requested by Owner.
- All pigging shall be performed with a polyurethane or polyethylene non-abrasive type pig.
- Should water be present during pigging, the pipe shall be dried in accordance with "DEHYDRATING PIPES" herein, using suitable squeegee type pig. Squeegee pig shall be run through the pipe until it comes out dry.

Provide a suitable barrier in front of the open ends of the pipe to catch the cleaners and prevent injury to personnel.

After pigging the line, air shall be forced through the pipe to ensure all smaller particles and dust is removed.

The compression used in forcing the pig through the pipe or blowing air through the pipe shall in no way inject any type of oil, lubricant or any foreign matter into the pipe.

All pipes that are not pigged shall be purged with air.

TESTING
Contractor shall furnish approved testing equipment, materials and test Contractor shall give the Owner ample advance notice of all proposed tests and conduct all tests in the Owner's presence in an approved manner.

Pressure Tests:

- Test all distribution pressure piping with a minimum of 100 psig air or inert gas pressure. Test high-pressure piping, including the high pressure side of regulator stations, with a minimum of 900 psig air or inert gas.
- Test gauge shall show no drop in pressure after the source of test pressure has been disconnected from the pipeline involved in the test and the temperature of the test medium has been allowed to equalize. Record test medium, test pressure, and test duration on the appropriate line order. Line order must be signed by Contractor. Test durations are as follows:

a. 1 Hour Gauge Test:
0-1 mile PE piping 4" diameter and smaller, or
0-1,000 feet Steel piping 6" diameter and smaller, or
0-1,000 feet PE piping 6" diameter.
b. 24 Hour Chart Test:
Over 1 mile PE piping 4" diameter and smaller, or
Over 1,000 feet Steel piping 6" diameter and smaller, or
Over 1,000 feet PE piping 6" diameter, or
All Steel piping greater than 6" diameter.

Locate and repair all leaks, which may be disclosed by the tests, and repeat the tests as required for approval.

All charts used in the tests shall be identified with the test date, section of pipeline involved, and test pressure. All test charts must be signed by Contractor.

- Deliver test chart to Owner.

All test gauges shall be a minimum of two and one-half (2-1/2) inches in diameter or bigger, depending on the accuracy required for the test..

All tests shall have a gauge at the point where the air or inert gas is being put into the pipe.

Service pipes shall be tested for a period of no less than ten (10) minutes at a minimum pressure of 100 psig.

Piping shall in no case show any drop in pressure during the test.

It is strongly recommended that once the pipe has been pressurized to the proper pressure that it sit for a period of time to allow pressure and temperature equalization.

Compressors used in pressuring the pipe shall in no way inject any type of oil lubricant, or any foreign matter into the pipe.

At the request of the Owner, a sample weld (steel or plastic) shall be cut and submitted for testing by an independent testing lab.

- Owner shall pay for the test at no cost to the Contractor.

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

LOCATING PIPING
Polyethylene (PE) piping shall have 12-guage coated copper tracer wire (or equivalent) installed over the polyethylene pipe. Larger gauge wire may be required for special installations. This wire shall be installed above the pipe for the full length of all PE pipe installed. Tracer wire shall be within six (6) inches, but no closer than three (3) inches to the pipe at all locations. All PE pipe installations are to be backfilled at a minimum of three (3) inches before the tracer wire is placed in ditch. The tracer wire shall not touch the pipe at any location. Tracer wire shall be connected to riser at each meter set, but shall not be electrically connected to the riser.

A sacrificial anode shall be installed on tracer wire. One anode shall be installed on the tracer wire on each service line and one for each 1,000 feet or fraction thereof of tracer wire on main extensions. Tracer wire shall be materially joined with an epoxy joining system at each extension or intersection of service and main lines or main line with mainline.

Owner shall place "Gas Line" markers along newly installed lines.

Owner shall paint all tops to valve boxes yellow after all clean up and work in area is complete.

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

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.

EXISTING UTILITIES
At all times, maintain a minimum of one (1) foot clearance between gas piping and all other underground utilities.

To the greatest extent possible, maintain a minimum clearance of three (3) to five (5) feet between proposed piping and existing utilities.

Coordinate all work with other utility personnel to assist them in maintaining service to their customers.

Contractor must notify all utilities for line location in accordance with Tennessee State law. It shall be Contractor's responsibility to determine the existence and exact location of all utilities and to use every precaution to avoid interferences with existing utilities.

Contractor shall repair or pay for all damage caused by his operations to all existing utility property, public property, and private property, and he shall settle in total cost all damage suits which may arise as a result of his operations.

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 Middle Tennessee Natural Gas Utility District subsequent to the completion of the project. and one set submitted to Field's Engineering Consultant Services, LLC.

NOTE 1:
ALL KNOWN UTILITIES WERE FIELD LOCATED BY MIDDLE TENNESSEE NATURAL GAS UTILITY DISTRICT (MTNGUD). ENGINEER TAKES NO RESPONSIBILITY AS TO THE ACCURACY OF THE LOCATION OR ACTUAL QUANTITIES OF UTILITIES SHOWN.

CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ALL MATERIALS, LABOR AND EQUIPMENT TO MAKE TIE-INS AS SHOWN ON PLANS. CONTRACTOR SHALL ALSO BE RESPONSIBLE FOR RECONNECTING ALL EXISTING SERVICES AS SHOWN ON PLANS. ENGINEER MAKES NO GUARANTEE AS TO THE ACCURACY OF THESE TIE-INS.

MTNGUD MAY BE CONTACTED AT 615-597-4300.

BARRY R. FIELD
REGISTERED ENGINEER
No. 21686
AGRICULTURE
COMMERCE
STATE OF TENNESSEE
5-24-15

MIDDLE TENNESSEE NATURAL GAS
1030 W BROAD STREET
SMITHVILLE, TENNESSEE 37166

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

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

DETAILED SPECIFICATIONS

TYPE	YEAR	PROJECT NO.	SHEET NO.
CONST.	2015	STP-101(16)	U4-1

S.R. 101 CUMBERLAND CO.

UTILITIES INDEX

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ESTIMATED UTILITY QUANTITIES

ITEM NO.	DESCRIPTION	UNIT	UNIT PRICE	QUANTITY	% Utility Betterment
790-01.05	POLE 30FT CLASS 6 WOOD	EACH		1	0.00%
790-02.04	POLE 35FT CLASS 5 WOOD	EACH		1	0.00%
790-03.02	POLE 40FT CLASS 3 WOOD	EACH		9	0.00%
790-03.03	POLE 40FT CLASS 4 WOOD	EACH		11	0.00%
790-04.03	POLE 45FT CLASS 3 WOOD	EACH		3	0.00%
790-05.02	POLE 50FT CLASS 2 WOOD	EACH		4	0.00%
790-06.02	POLE 55FT CLASS 2 WOOD	EACH		61	0.00%
790-07.01	POLE 60FT CLASS 1 WOOD	EACH		13	0.00%
790-20.01	POLE 65FT CLASS 1 WOOD	EACH		3	0.00%
790-22.01	SINGLE PHASE SINGLE PRIMARY SUPPORT 25KV	EACH		2	0.00%
790-22.10	SINGLE PHASE SUSPENSION, ANGLE 25KV	EACH		1	0.00%
790-22.11	SINGLE PHASE PRIMARY DOUBLE SUPPORT 25KV	EACH		3	0.00%
790-22.13	SINGLE PHASE DEADEND 25KV	EACH		12	0.00%
790-22-14	SINGLE PHASE TAP	EACH		3	0.00%
790-22.12	SINGLE PHASE DEADEND MISCELLANEOUS 25KV	EACH		41	0.00%
790-22.16	SINGLE PHASE DOUBLE DEADEND, TANGENT 25KV	EACH		2	0.00%
790-24.08	TWO PHASE DEADEND, CROSSARM 25KV	EACH		3	0.00%
790-24.10	TWO PHASE DOUBLE DEADEND, CROSSARM 25KV	EACH		1	0.00%
790-26.02	THREE PHASE CROSSARM 25KV	EACH		8	0.00%
790-26.03	THREE PHASE CROSSARM SINGLE LARGE CONDUCTOR 25KV	EACH		35	0.00%
790-26.15	THREE PHASE CROSSARM DOUBLE 10FT LARGE CONDUCTOR	EACH		9	0.00%
790-26.20	THREE PHASE VERTICAL ANGLE LARGE CONDUCTOR 25KV	EACH		4	0.00%
790-26.18	THREE PHASE SMALL ANGLE SUSPENSION BRACKET 25KV	EACH		3	0.00%
790-26.21	THREE PHASE VERTICAL DOUBLE DEADEND ANGLE 25KV	EACH		2	0.00%
790-26.24	THREE PHASEVERTICALDEADEND LARGE CONDUCTOR 25KV	EACH		6	0.00%
790-26.26	THREE PHASE CROSSARM DEADEND 25KV	EACH		6	0.00%
790-26.27	THREE PHASE CROSSARM DOUBLE DEADEND 25KV	EACH		3	0.00%
790-26.28	THREE PHASE DOUBLE 10FT CROSSARM DOUBLE DEADEND 25KV	EACH		1	0.00%
790-32.01	DOWN GUY THROUGH BOLT TYPE	EACH		78	0.00%
790-32.06	DOWN GUY INSULATED	EACH		52	0.00%
790-32.23	GUY GUARD	EACH		133	0.00%
790-33.18	ROCK ANCHOR GUY BOLT TYPE	EACH		126	0.00%
790-46.01	SINGLE PHASE TRANSFORMER NO ADDED FUSE OR LIGHTNING ARRESTER	EACH		9	0.00%
790-47.02	2-PHASE TRANSFORMER BANK POLE	EACH			0.00%
790-49.01	3 PHASE TRANSFORMER BANK	EACH		1	0.00%
790-30.03	SECONDARY ASSEMBLIES DEADEND	EACH		2	0.00%
790-64.10	SECONDARY METERING THREE PHASE 120/240VOLTS (4WIRE DELTA)	EACH		3	0.00%
790-58.06	GROUP OPERATED AIR BREAK SWITCH	EACH		1	0.00%

NOTES

All material must be approved by Volunteer Energy Cooperative and meet "List of Materials" as shown in RUS Publications 202-1

Guy wire shall be 3/8" or 7/16" extra high strength steel (EHSS)

Guy attachment must meet or exceed an ultimate strength of 70,000 lbs.

See specification section 1 for pole top unit & hardware strength requirements.

Retired Items to be located in one staging area and returned to Volunteer Energy Cooperative for disposal (Crossvile Service Center, 235 O'Brien Dr., Crossville, TN 38555).

Retired service and secondary conductors shall be coiled up in a manner to prevent uncoiling. Retired primary conductors shall be coiled on reels. Conductor sizes shall not be mixed on the reels.

All work shall be done under energized conditions. All switching activities and energization of new line construction shall be coordinated with Volunteer Energy Cooperative.

Contractor is responsible to maintain minimum NESC (latest addition) code requirements during construction

All new distribution construction shall adhere to Volunteer Electric Cooperative's "Engineering Specification Handbook".

New pole installations are based on the "final" grade construction. If poles are installed before final grade, contact Volunteer Energy Cooperative. Any temporary poles needed due to the construction process are the responsibility of the contractor.

No items shall be reused without the prior written approval of Volunteer Energy Cooperative.

All items needed for construction of this project as shown on the plans and/or detailed in the specifications are the sole responsibility of the contractor.

The project shall be constructed consecutively. Any piecemeal construction must be approved prior to construction by Volunteer Energy Cooperative. Any line angles created where not shown on the plans due to piecemeal construction will be fixed at the contractor's expense.

The anchors and pole symbols are pictorial representations only. The unit callouts shall be used for construction, not the picture.

Pole equipment and switching tags shall be located on all poles as shown on the removal poles.

Design based upon imbedded depth of power pole in rock. Increase pole heights 5' where solid rock is not encountered and set according to section 1.3 "Pole Setting"

BRIAN P. KING REGISTERED ENGINEER AGRICULTURE No. 111988 STATE OF TENNESSEE

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VOLUNTEER ENERGY COOPERATIVE

ELECTRIC RELOCATION

ESTIMATED QUANTITIES

SCALE: 1"=50'

TYPE	YEAR	PROJECT NO.	SHEET NO.
CONST.	2015	STP-101(16)	U4-2

S.R. 101 CUMBERLAND CO.

ESTIMATED UTILITY QUANTITIES

ITEM NO.	DESCRIPTION	UNIT	UNIT PRICE	QUANTITY	% Utility Betterment
790-31.02	SERVICE ASSEMBLIES, POLE TYPE	EACH		62	0.00%
790-64.14	PRIMARY METERING 3 PHASE CLUSTER MOUNT	EACH		3	0.00%
790-68.01	GROUNDING ASSEMBLY GROUND ROD TYPE	EACH		91	0.00%
790-69.21	1-SINGLE PHASE RECLOSER	EACH		2	0.00%
790-60.04	2 SINGLE PHASE SECTIONALIZERS OR RECLOSERS 25KV	EACH		2	0.00%
790-61.05	3-SINGLE PHASE SECTIONALIZERS OR RECLOSERS 25KV	EACH		1	0.00%
790-61.10	THREE PHASE SECTIONALIZER OR RECLOSER WITH BYPASS SW	EACH		1	0.00%
790-65.06	LIGHTNING ARRESTER POLE MOUNTED 18KV	EACH		2	0.00%
790-61.01	SINGLE PHASE FUSE CUTOUT CROSSARM MOUNT 25KV	EACH		2	0.00%
790-73.02	INSULATOR STRING	EACH		1	0.00%
790-43.59	SECONDARY CABLE TERMINAL POLE - UM5	EACH		4	0.00%
790-64.01	SECONDARY METERING SINGLE PHASE 120/240 VOLTS	EACH		2	0.00%
790-68.12	LARGE BRACE	EACH		1	
790-70.12	STREET LIGHT HIGH PRESSURE SODIUM 100 WATT	EACH		10	0.00%
790-70.13	STREET LIGHT HIGH PRESSURE SODIUM 200 WATT	EACH		1	0.00%
790-70.14	STREET LIGHT HIGH PRESSURE SODIUM 400 WATT	EACH		1	0.00%
790-70.20	STREET LIGHT MERCURY VAPOR 200 WATT	EACH		2	0.00%
790-70.21	STREET LIGHT MERCURY VAPOR 400 WATT	EACH		3	0.00%
790-62.03	3 SINGLE PHASE SECTIONALIZERS OR RECLOSERS 25KV	EACH		4	0.00%
790-62.08	3 SINGLE PHASE SECT OR RECL WITH BYPASS SWITCH 25KV	EACH		1	0.00%
790-31.04	SERVICE CONDUCTOR 6 ALUMINUM DUPLEX	LF		95	0.00%
790-31.11	SERVICE CONDUCTOR 2 ALUMINUM TRIPLEX	LF		1321	0.00%
790-31.13	SERVICE CONDUCTOR 2/0 ALUMINUM TRIPLEX	LF		96	0.00%
790-31.20	SERVICE CONDUCTOR 1/0 ALUMINUM QUADRUPLEX	LF		364	0.00%

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VOLUNTEER ENERGY COOPERATIVE

ELECTRIC RELOCATION

ESTIMATED QUANTITIES

SCALE: 1"=50'

TYPE	YEAR	PROJECT NO.	SHEET NO.
CONST.	2015	STP-101 (16)	U4-3
			___
			___
			___

S.R. 101 CUMBERLAND CO.

POLE TABLE				POLE TABLE			
POLE #	PAGE #	NORTHING	EASTING	POLE #	PAGE #	NORTHING	EASTING
1	U4-17	609395.81	2289319.31	52	U4-13	606656.38	2285288.00
2	U4-17	609204.40	2289125.06	53	U4-13	606640.62	2285103.72
3	U4-17	609119.73	2289189.21	54	U4-13	606613.34	2284930.86
5	U4-17	609064.90	2288988.99	55	U4-13	606589.68	2284780.95
8	U4-17	609005.80	2288930.89	59	U4-12	606567.23	2284638.71
9	U4-16	608809.71	2288738.19	60	U4-12	606515.42	2284310.39
11	U4-16	608716.33	2288878.75	61	U4-12	606353.87	2284318.18
12	U4-16	608719.54	2288756.81	65	U4-12	606639.22	2284203.52
14	U4-16	608715.47	2288609.39	67	U4-12	606471.70	2284033.30
15	U4-16	608612.61	2288544.68	68A	U4-12	606318.54	2283998.98
16	U4-16	608415.27	2288360.26	69	U4-12	606429.46	2283765.65
17	U4-16	608209.91	2288192.44	70	U4-12	606386.17	2283491.32
18	U4-16	608096.00	2288064.96	70A	U4-12	606484.71	2283493.49
22	U4-16	608003.69	2288021.41	72	U4-11	606360.68	2283329.78
23	U4-15	607825.40	2287873.49	72A	U4-11	606339.71	2283196.92
25	U4-15	607565.06	2287705.19	74	U4-11	606492.13	2283195.08
26	U4-15	607399.91	2288008.13	75	U4-11	606263.91	2283019.80
28	U4-15	607304.73	2287536.89	76	U4-11	606423.24	2282986.92
30	U4-15	607052.79	2287374.02	77	U4-11	606117.94	2282757.71
32	U4-15	606850.17	2287407.85	78	U4-11	605993.96	2282799.77
33	U4-14	606756.89	2287249.36	79	U4-11	606023.50	2282604.47
34	U4-14	606699.54	2287034.38	81	U4-11	605917.77	2282534.80
39	U4-14	606646.77	2286730.01	83	U4-11	605954.15	2282491.94
39A	U4-14	606672.06	2286880.66	83A	U4-11	605892.29	2282391.57
43	U4-14	606654.49	2286559.20	83B	U4-11	605984.93	2282332.25
46	U4-14	606663.64	2286263.14	85	U4-10	605841.85	2282309.72
48	U4-13	606675.25	2285971.85	89	U4-10	605718.10	2282108.92
49	U4-13	606686.81	2285677.55	90	U4-10	605697.71	2282382.82
50	U4-13	606695.85	2285453.76	91	U4-10	605556.54	2282441.66
51	U4-13	606666.61	2285268.42	93	U4-10	605529.22	2281802.45

POLE TABLE				POLE TABLE			
POLE #	PAGE #	NORTHING	EASTING	POLE #	PAGE #	NORTHING	EASTING
93A	U4-10	605695.50	2281874.61	135	U4-7	604341.68	2278278.69
93B	U4-10	605615.90	2281943.10	138	U4-7	604231.45	2278071.14
94	U4-10	605470.05	2281706.43	140	U4-7	604138.16	2277912.45
97	U4-10	605351.06	2281435.70	141	U4-7	604007.90	2277972.63
99	U4-10	605316.16	2281298.95	144	U4-7	603908.59	2277808.45
102	U4-9	605402.18	2281106.79	144A	U4-7	604072.68	2277719.64
104A	U4-9	605287.36	2280996.32	145	U4-6	603963.11	2277532.50
106	U4-9	605401.14	2280944.56	149	U4-6	603788.40	2277308.86
109	U4-9	605399.17	2280638.93	152	U4-6	603705.71	2277525.19
112	U4-9	605398.06	2280466.63	153	U4-6	603604.24	2277425.69
114	U4-9	605362.25	2280300.87	154	U4-6	603515.31	2277296.70
118	U4-9	605298.56	2280110.79	155	U4-6	603419.55	2277190.62
118A	U4-9	605190.29	2280161.70	157	U4-6	603531.10	2277083.01
119	U4-9	605196.14	2279909.92	158	U4-6	603386.71	2276929.12
120	U4-8	605090.51	2279704.84	159	U4-6	603207.37	2277049.20
122	U4-8	605002.42	2279532.95	162	U4-6	603099.05	2276978.63
124	U4-8	604885.69	2279616.59	164	U4-6	603231.53	2276763.75
125	U4-8	604860.49	2279256.00	168	U4-6	603073.89	2276596.01
126	U4-8	604744.49	2279037.52	168A	U4-6	602952.09	2276705.60
127	U4-8	604668.53	2278894.43	170	U4-5	602869.65	2276378.21
128	U4-8	604566.58	2278702.40	172	U4-5	602690.16	2276186.81
129	U4-7	604617.92	2279160.85	173	U4-5	602503.12	2276024.47
130	U4-7	604466.15	2278513.23	175	U4-4	602385.57	2275817.25
132	U4-7	604132.71	2278575.48	177	U4-4	602249.96	2275582.30

GUY LOCATION TABLE				GUY LOCATION TABLE			
POLE #	GUY WIRE	NORTHING	EASTING	POLE #	GUY WIRE	NORTHING	EASTING
2	GUY 2	609222.7429	2289111.6357	33	GUY 33A	606734.9044	2287260.4084
3	GUY 3A	609127.2563	2289213.1162	33	GUY 33B	606740.2411	2287257.7267
3	GUY 3B	609125.9640	2289209.9330	34	guy 34A	606723.8566	2287030.6230
5	GUY 5	609046.7588	2289008.3713	34	guy 34B	606676.2403	2287042.2766
9	GUY 9A	608823.1695	2288717.5971	35	guy 35	606576.9173	2287048.7492
9	GUY 9B	608785.3461	2288747.6179	39	GUY 39A	606622.6945	2286725.0535
9	GUY 9C	608788.5608	2288746.4060	39	GUY 39B	606622.4562	2286732.5666
11	GUY 11	608703.1166	2288899.5003	40	GUY 40	606843.4836	2286763.5011
14	GUY 14A	608732.8805	2288587.0835	50	GUY 50	606720.4426	2285452.9254
14	GUY 14B	608729.6554	2288591.1489	54	GUY 54	606635.1911	2284919.5609
18	GUY 18	608119.0874	2288073.4622	60	GUY 60A	606539.9761	2284308.8244
22	GUY 22	607980.9776	2288011.9539	60	GUY 60B	606497.6101	2284327.3605
23	GUY 23	607840.6896	2287854.2201	62	GUY 62A	606157.8368	2284311.4371
25	GUY 25A	607573.1173	2287688.3367	62	GUY 62B	606117.9867	2284332.2159
25	GUY 25B	607571.5961	2287691.4181	63	GUY 63A	606115.6139	2284396.0460
28	GUY 28	607295.5750	2287551.4212	63	GUY 63B	606076.3839	2284415.3123
29	GUY 29	607389.2708	2287427.5947	65	GUY 65A	606614.9067	2284207.2773
30	GUY 30A	607032.1415	2287360.6421	65	GUY 65B	606658.1949	2284187.8571
30	GUY 30B	607035.0531	2287362.4658	66	GUY 66	606829.4760	2284168.4782
30	GUY 30C	607076.5700	2287367.7641	67	GUY 67	606496.2262	2284031.4053
30	GUY 30D	607073.3266	2287368.8855	72	GUY 72	606362.5392	2283187.7423
30	GUY 30E	607028.5853	2287378.4207	75	BUY 75A	606242.8648	2283032.5481
30	GUY 30F	607031.9557	2287377.7546	75	GUY 75B	606239.7818	2283024.6220
32	GUY 32A	606863.8474	2287428.2998	78	GUY 78	605980.8656	2282820.5998
32	GUY 32B	606861.1030	2287424.1972	81	GUY 81	605897.3139	2282521.1371
32	GUY 32C	606874.4413	2287403.8345	83	GUY 83B	606000.2324	2282313.6749
32	GUY 32D	606869.1537	2287404.7093	85	GUY 85A	605863.8644	2282298.7323
32	GUY 32E	606826.0342	2287412.6333	85	GUY 85B	605822.2508	2282324.5923
32	GUY 32F	606830.8759	2287411.6737	86	GUY 86	606117.9182	2282112.3715
32A	GUY 32AA	606737.3113	2287446.8738	90	GUY 90	605708.0031	2282405.1675

GUY LOCATION TABLE				GUY LOCATION TABLE				GUY LOCATION TABLE			
POLE #	GUY WIRE	NORTHING	EASTING	POLE #	GUY WIRE	NORTHING	EASTING	POLE #	GUY WIRE	NORTHING	EASTING
91	GUY 91	605546.0698	2282419.4013	135	GUY 135	604320.8739	2278291.9457	177	GUY 177B	602239.4218	2275560.0709
89	GUY 89	605695.9863	2282119.7069	141	GUY 141	604021.9373	2277994.8545	177	GUY 177C	602240.9399	2275563.1529
93	GUY 93A	605714.1472	2281858.5682	144	GUY 144	603896.9431	2277786.7800	175	GUY 175A	602398.3479	2275838.2798
93	GUY 93B	605597.7816	2281959.7386	144	GUY 144A	603887.2008	2277820.6157	175	GUY 175B	602375.1533	2275794.9655
94	GUY 94A	605447.7225	2281716.7718	149	GUY 149	603808.6595	2277294.9047				
94	GUY 94B	605450.8407	2281715.3277	149	GUY 149B	603799.0324	2277286.6767				
97	GUY 97A	605327.1157	2281441.3672	155	GUY 155	603403.2112	2277172.2301				
97	GUY 97B	605326.7264	2281439.3488	157	GUY 157	603549.7208	2277066.9210				
99	GUY 99A	605340.7844	2281300.4575	158	GUY 158	603406.9331	2276915.1124				
99	GUY 99B	605292.1643	2281293.6653	158	GUY 158B	603362.1578	2276927.5413				
99	GUY 99C	605295.5369	2281294.3200	160	GUY 160	603608.8325	2276970.5966				
120	GUY 120	605426.4046	2281111.0951	162	GUY 162	603086.7407	2276998.8965				
104	GUY 104A	605274.4669	2280975.3611	168	GUY 168	603092.7894	2276579.9826				
109	GUY 109A	605383.2304	2280620.1879	168	GUY 168A	602955.0410	2276681.1760				
109	GUY 109B	605423.5525	2280642.2307	168	GUY 168B	602934.7852	2276723.0867				
112	GUY 112	605422.3347	2280462.5991	172	GUY 172	602707.2148	2276169.0745				
114	GUY 114	605385.2055	2280292.0243	173	GUY 173	602518.4682	2276005.2398				
118	GUY 118	605320.8622	2280100.4009	173	GUY 173B	602478.6628	2276026.5989				
118A	GUY 118A	605168.2125	2280172.5649	173	GUY 173C	602482.0869	2276026.3078				
119	GUY 119	605175.4486	2279923.3741	173	GUY 173D	602478.8081	2276044.4589				
120	GUY 120	605066.4153	2279709.8121	173	GUY 173E	602481.4925	2276042.3148				
122	GUY 122	605013.9087	2279511.1936	173	GUY 173F	602484.1769	2276040.1707				
124	GUY 124	604866.0382	2279631.3868	173	GUY 173G	602486.8613	2276038.0266				
126	GUY 126	604761.6048	2279019.8406	177	GUY 177A	602264.5349	2275601.7295				

COORDINATE VALUES ARE NAD/83(1995) AND ARE DATUM ADJUSTED BY THE FACTOR 1.00___ & TIED TO THE TGRN.

VOLUNTEER ENERGY COOPERATIVE

ELECTRIC RELOCATION

POLE LOCATION TABLULATION

FISHER & ARNOLD, INC.
9180 Crestwyn Hills Drive • Memphis, Tennessee 38125
901-748-1811 • Fax: 901-748-3115 • Web: www.fisherarnold.com
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Layout Name: U4-3
Plotted: Tuesday, September 15, 2015 - 9:51 am
By: BookerS

TYPE	YEAR	PROJECT NO.	SHEET NO.
CONST.	2015	STP-101 (16)	U4-3

S.R. 101 CUMBERLAND CO.

POLE TABLE				POLE TABLE			
POLE #	PAGE #	NORTHING	EASTING	POLE #	PAGE #	NORTHING	EASTING
1	U4-17	609395.81	2289319.31	52	U4-13	606656.38	2285288.00
2	U4-17	609204.40	2289125.06	53	U4-13	606640.62	2285103.72
3	U4-17	609119.73	2289189.21	54	U4-13	606613.34	2284930.86
5	U4-17	609064.90	2288988.99	55	U4-13	606589.68	2284780.95
8	U4-17	609005.80	2288930.89	59	U4-12	606567.23	2284638.71
9	U4-16	608809.71	2288738.19	60	U4-12	606515.42	2284310.39
11	U4-16	608716.33	2288878.75	61	U4-12	606353.87	2284318.18
12	U4-16	608719.54	2288756.81	65	U4-12	606639.22	2284203.52
14	U4-16	608715.47	2288609.39	67	U4-12	606471.70	2284033.30
15	U4-16	608612.61	2288544.68	68A	U4-12	606318.54	2283998.98
16	U4-16	608415.27	2288360.26	69	U4-12	606429.46	2283765.65
17	U4-16	608209.91	2288192.44	70	U4-12	606386.17	2283491.32
18	U4-16	608096.00	2288064.96	70A	U4-12	606484.71	2283493.49
22	U4-16	608003.69	2288021.41	72	U4-11	606360.68	2283329.78
23	U4-15	607825.40	2287873.49	72A	U4-11	606339.71	2283196.92
25	U4-15	607565.06	2287705.19	74	U4-11	606492.13	2283195.08
26	U4-15	607399.91	2288008.13	75	U4-11	606263.91	2283019.80
28	U4-15	607304.73	2287536.89	76	U4-11	606423.24	2282986.92
30	U4-15	607052.79	2287374.02	77	U4-11	606117.94	2282757.71
32	U4-15	606850.17	2287407.85	78	U4-11	605993.96	2282799.77
33	U4-14	606756.89	2287249.36	79	U4-11	606023.50	2282604.47
34	U4-14	606699.54	2287034.38	81	U4-11	605917.77	2282534.80
39	U4-14	606646.77	2286730.01	83	U4-11	605954.15	2282491.94
39A	U4-14	606672.06	2286880.66	83A	U4-11	605892.29	2282391.57
43	U4-14	606654.49	2286559.20	83B	U4-11	605984.93	2282332.25
46	U4-14	606663.64	2286263.14	85	U4-10	605841.85	2282309.72
48	U4-13	606675.25	2285971.85	89	U4-10	605718.10	2282108.92
49	U4-13	606686.81	2285677.55	90	U4-10	605697.71	2282382.82
50	U4-13	606695.85	2285453.76	91	U4-10	605556.54	2282441.66
51	U4-13	606666.61	2285268.42	93	U4-10	605529.22	2281802.45

POLE TABLE				POLE TABLE			
POLE #	PAGE #	NORTHING	EASTING	POLE #	PAGE #	NORTHING	EASTING
93A	U4-10	605695.50	2281874.61	135	U4-7	604341.68	2278278.69
93B	U4-10	605615.90	2281943.10	138	U4-7	604231.45	2278071.14
94	U4-10	605470.05	2281706.43	140	U4-7	604138.16	2277912.45
97	U4-10	605351.06	2281435.70	141	U4-7	604007.90	2277972.63
99	U4-10	605316.16	2281298.95	144	U4-7	603908.59	2277808.45
102	U4-9	605402.18	2281106.79	144A	U4-7	604072.68	2277719.64
104A	U4-9	605287.36	2280996.32	145	U4-6	603963.11	2277532.50
106	U4-9	605401.14	2280944.56	149	U4-6	603788.40	2277308.86
109	U4-9	605399.17	2280638.93	152	U4-6	603705.71	2277525.19
112	U4-9	605398.06	2280466.63	153	U4-6	603604.24	2277425.69
114	U4-9	605362.25	2280300.87	154	U4-6	603515.31	2277296.70
118	U4-9	605298.56	2280110.79	155	U4-6	603419.55	2277190.62
118A	U4-9	605190.29	2280161.70	157	U4-6	603531.10	2277083.01
119	U4-9	605196.14	2279909.92	158	U4-6	603386.71	2276929.12
120	U4-8	605090.51	2279704.84	159	U4-6	603207.37	2277049.20
122	U4-8	605002.42	2279532.95	162	U4-6	603099.05	2276978.63
124	U4-8	604885.69	2279616.59	164	U4-6	603231.53	2276763.75
125	U4-8	604860.49	2279256.00	168	U4-6	603073.89	2276596.01
126	U4-8	604744.49	2279037.52	168A	U4-6	602952.09	2276705.60
127	U4-8	604668.53	2278894.43	170	U4-5	602869.65	2276378.21
128	U4-8	604566.58	2278702.40	172	U4-5	602690.16	2276186.81
129	U4-7	604617.92	2279160.85	173	U4-5	602503.12	2276024.47
130	U4-7	604466.15	2278513.23	175	U4-4	602385.57	2275817.25
132	U4-7	604132.71	2278575.48	177	U4-4	602249.96	2275582.30

GUY LOCATION TABLE				GUY LOCATION TABLE			
POLE #	GUY WIRE	NORTHING	EASTING	POLE #	GUY WIRE	NORTHING	EASTING
2	GUY 2	609222.7429	2289111.6357	33	GUY 33A	606734.9044	2287260.4084
3	GUY 3A	609127.2563	2289213.1162	33	GUY 33B	606740.2411	2287257.7267
3	GUY 3B	609125.9640	2289209.9330	34	guy 34A	606723.8566	2287030.6230
5	GUY 5	609046.7588	2289008.3713	34	guy 34B	606676.2403	2287042.2766
9	GUY 9A	608823.1695	2288717.5971	35	guy 35	606576.9173	2287048.7492
9	GUY 9B	608785.3461	2288747.6179	39	GUY 39A	606622.6945	2286725.0535
9	GUY 9C	608788.5608	2288746.4060	39	GUY 39B	606622.4562	2286732.5666
11	GUY 11	608703.1166	2288899.5003	40	GUY 40	606843.4836	2286763.5011
14	GUY 14A	608732.8805	2288587.0835	50	GUY 50	606720.4426	2285452.9254
14	GUY 14B	608729.6554	2288591.1489	54	GUY 54	606635.1911	2284919.5609
18	GUY 18	608119.0874	2288073.4622	60	GUY 60A	606539.9761	2284308.8244
22	GUY 22	607980.9776	2288011.9539	60	GUY 60B	606497.6101	2284327.3605
23	GUY 23	607840.6896	2287854.2201	62	GUY 62A	606157.8368	2284311.4371
25	GUY 25A	607573.1173	2287688.3367	62	GUY 62B	606117.9867	2284332.2159
25	GUY 25B	607571.5961	2287691.4181	63	GUY 63A	606115.6139	2284396.0460
28	GUY 28	607295.5750	2287551.4212	63	GUY 63B	606076.3839	2284415.3123
29	GUY 29	607389.2708	2287427.5947	65	GUY 65A	606614.9067	2284207.2773
30	GUY 30A	607032.1415	2287360.6421	65	GUY 65B	606658.1949	2284187.8571
30	GUY 30B	607035.0531	2287362.4658	66	GUY 66	606829.4760	2284168.4782
30	GUY 30C	607076.5700	2287367.7641	67	GUY 67	606496.2262	2284031.4053
30	GUY 30D	607073.3266	2287368.8855	72	GUY 72	606362.5392	2283187.7423
30	GUY 30E	607028.5853	2287378.4207	75	BUY 75A	606242.8648	2283032.5481
30	GUY 30F	607031.9557	2287377.7546	75	GUY 75B	606239.7818	2283024.6220
32	GUY 32A	606863.8474	2287428.2998	78	GUY 78	605980.8656	2282820.5998
32	GUY 32B	606861.1030	2287424.1972	81	GUY 81	605897.3139	2282521.1371
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32	GUY 32F	606830.8759	2287411.6737	86	GUY 86	606117.9182	2282112.3715
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GUY LOCATION TABLE				GUY LOCATION TABLE				GUY LOCATION TABLE			
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93	GUY 93A	605714.1472	2281858.5682	144	GUY 144	603896.9431	2277786.7800	175	GUY 175A	602398.3479	2275838.2798
93	GUY 93B	605597.7816	2281959.7386	144	GUY 144A	603887.2008	2277820.6157	175	GUY 175B	602375.1533	2275794.9655
94	GUY 94A	605447.7225	2281716.7718	149	GUY 149	603808.6595	2277294.9047				
94	GUY 94B	605450.8407	2281715.3277	149	GUY 149B	603799.0324	2277286.6767				
97	GUY 97A	605327.1157	2281441.3672	155	GUY 155	603403.2112	2277172.2301				
97	GUY 97B	605326.7264	2281439.3488	157	GUY 157	603549.7208	2277066.9210				
99	GUY 99A	605340.7844	2281300.4575	158	GUY 158	603406.9331	2276915.1124				
99	GUY 99B	605292.1643	2281293.6653	158	GUY 158B	603362.1578	2276927.5413				
99	GUY 99C	605295.5369	2281294.3200	160	GUY 160	603608.8325	2276970.5966				
120	GUY 120	605426.4046	2281111.0951	162	GUY 162	603086.7407	2276998.8965				
104	GUY 104A	605274.4669	2280975.3611	168	GUY 168	603092.7894	2276579.9826				
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114	GUY 114	605385.2055	2280292.0243	173	GUY 173	602518.4682	2276005.2398				
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118A	GUY 118A	605168.2125	2280172.5649	173	GUY 173C	602482.0869	2276026.3078				
119	GUY 119	605175.4486	2279923.3741	173	GUY 173D	602478.8081	2276044.4589				
120	GUY 120	605066.4153	2279709.8121	173	GUY 173E	602481.4925	2276042.3148				
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124	GUY 124	604866.0382	2279631.3868	173	GUY 173G	602486.8613	2276038.0266				
126	GUY 126	604761.6048	2279019.8406	177	GUY 177A	602264.5349	2275601.7295				

COORDINATE VALUES ARE NAD/83(1995) AND ARE DATUM ADJUSTED BY THE FACTOR 1.00___ & TIED TO THE TGRN.

VOLUNTEER ENERGY COOPERATIVE

ELECTRIC RELOCATION

POLE LOCATION TABULATION

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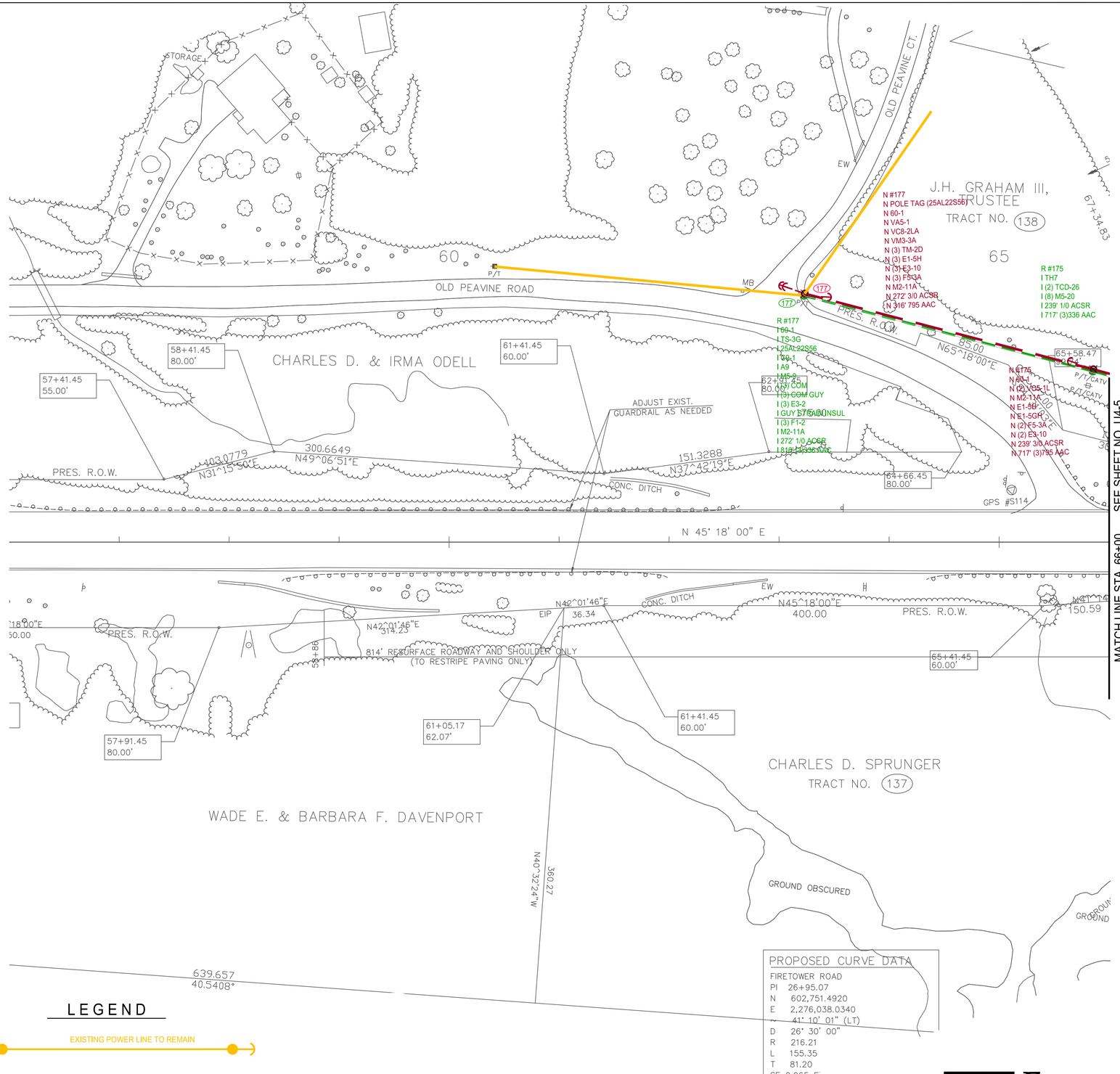
Layout Name: U4-3
Plotted: Wednesday, September 16, 2015 - 9:28 am
By: BookerS

TYPE	YEAR	PROJECT NO.	SHEET NO.
CONST.	2015	STP-101 (16)	U4-4

S.R. 101 CUMBERLAND CO.



PROPOSED CURVE DATA

FIRETOWER ROAD
PI 26+95.07
N 602,751.4920
E 2,276,038.0340
41° 10' 01" (LT)
D 26° 30' 00"
R 216.21
L 155.35
T 81.20
SE 0.065

LEGEND

(EX) EXISTING POWER LINE TO REMAIN

(I) (ITEM TO BE REMOVED)

(N) NEW CONSTRUCTION - LINE CHANGES

EXISTING POLES	
OUTSIDE R.O.W.	INSIDE R.O.W.
2	0

(SEE SHEET U4-1 FOR DETAILED NOTES)

COORDINATE VALUES ARE NAD/83(1995) AND ARE DATUM ADJUSTED BY THE FACTOR 1.00___ & TIED TO THE TGRN.

VOLUNTEER ENERGY COOPERATIVE

ELECTRIC RELOCATION

STA. 56+00 TO STA. 66+00

SCALE: FULL 1"= 50', HALF 1"= 100'

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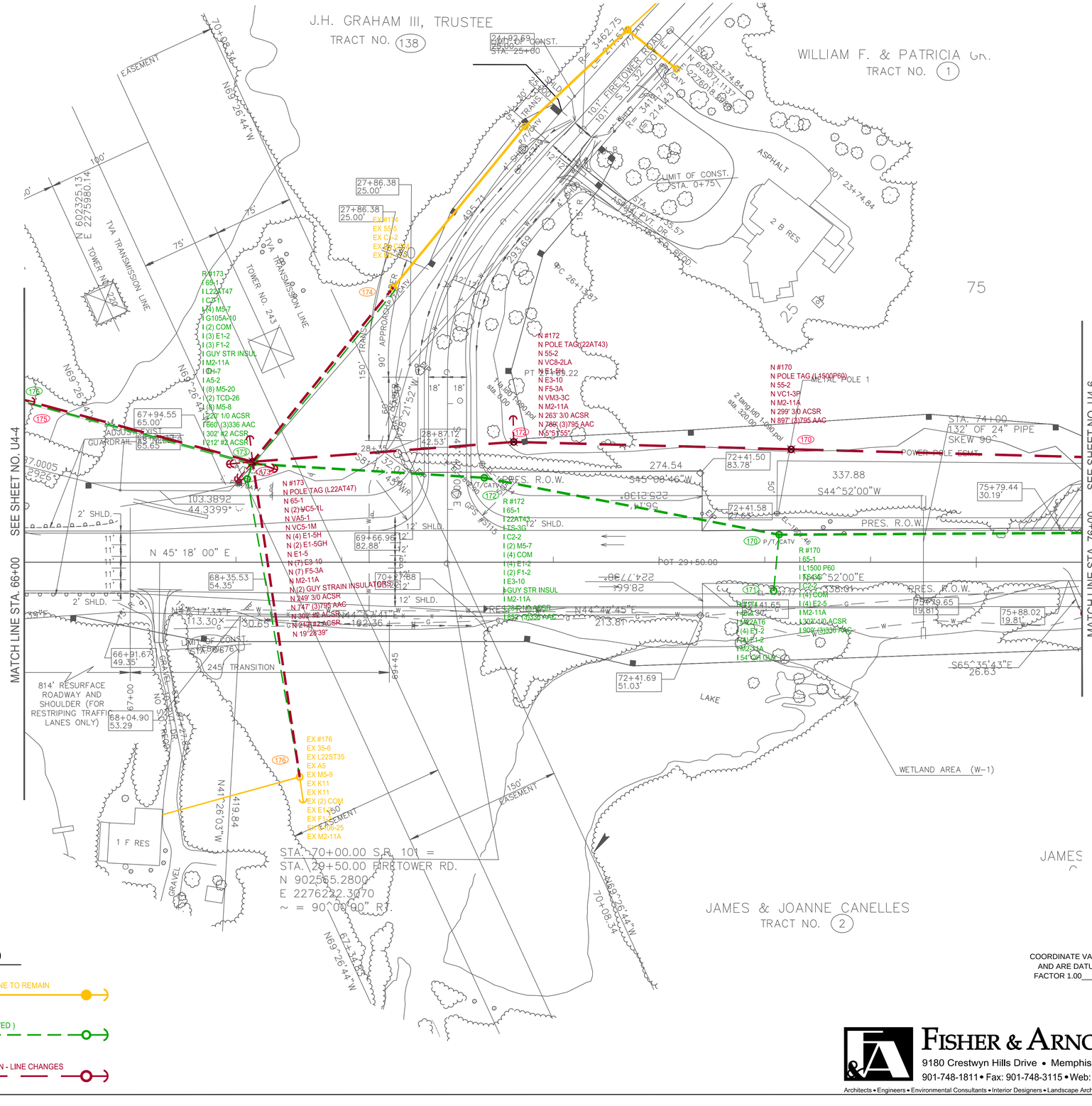
Layout Name: U4-4
Plotted: Wednesday, September 16, 2015 - 9:30 am
By: BookerS

TYPE	YEAR	PROJECT NO.	SHEET NO.
CONST.	2015	STP-101 (16)	U4-5

S.R. 101 CUMBERLAND CO.



LEGEND

(EX) EXISTING POWER LINE TO REMAIN

(I) (ITEM TO BE REMOVED)

(N) NEW CONSTRUCTION - LINE CHANGES

EXISTING POLES	
OUTSIDE R.O.W.	INSIDE R.O.W.
4	3

(SEE SHEET U4-1 FOR DETAILED NOTES)

COORDINATE VALUES ARE NAD/83(1995) AND ARE DATUM ADJUSTED BY THE FACTOR 1.00___ & TIED TO THE TGRN.

VOLUNTEER ENERGY COOPERATIVE

ELECTRIC RELOCATION

STA. 66+00 TO STA. 76+00

SCALE: FULL 1"= 50', HALF 1"= 100'

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BRIAN P. KING — REGISTERED ENGINEER — No. 111935 — STATE OF TENNESSEE

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Layout Name: U4-5
Plotted: Wednesday, September 16, 2015 - 9:32 am
By: BookerS

TYPE	YEAR	PROJECT NO.	SHEET NO.
CONST.	2015	STP-101 (16)	U4-6

S.R. 101 CUMBERLAND CO.

NOTE:

* POLE N #164 LOCATED INSIDE WETLAND AREA (W-2).

* THE CONTRACTOR SHALL KEEP WETLAND DISTURBANCE TO A MINIMUM AND AS NEEDED FOR UTILITY RELOCATION. THE DISTURBED AREA SHALL BE RESTORED TO EXISTING CONDITIONS.

(SEE SHEET U4-1 FOR DETAILED NOTES)

LEGEND

(EX)	EXISTING POWER LINE TO REMAIN
(I)	(ITEM TO BE REMOVED)
(N)	NEW CONSTRUCTION - LINE CHANGES

EXISTING POLES	
OUTSIDE R.O.W.	INSIDE R.O.W.
15	5

COORDINATE VALUES ARE NAD/83(1995) AND ARE DATUM ADJUSTED BY THE FACTOR 1.00___ & TIED TO THE TGRN.

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VOLUNTEER ENERGY COOPERATIVE

ELECTRIC RELOCATION

STA. 76+00 TO STA. 89+00

SCALE: FULL 1"= 50', HALF 1"= 100'

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Filename: W:\7703\Electrical\PLANS\7703-PoleLocate.dwg
Layout Name: U4-6
Plotted: Wednesday, September 16, 2015 - 9:34 am
By: BookerS

TYPE	YEAR	PROJECT NO.	SHEET NO.
CONST.	2015	STP-101 (16)	U4-7

S.R. 101   CUMBERLAND CO.

LEGEND

(EX) EXISTING POWER LINE TO REMAIN

(I) (ITEM TO BE REMOVED)

(N) NEW CONSTRUCTION - LINE CHANGES

EXISTING POLES	
OUTSIDE R.O.W.	INSIDE R.O.W.
0	0

(SEE SHEET U4-1 FOR DETAILED NOTES)

COORDINATE VALUES ARE NAD/83(1995) AND ARE DATUM ADJUSTED BY THE FACTOR 1.00___ & TIED TO THE TGRN.

BRIAN P. KING REGISTERED ENGINEER AGRICULTURE COMMERCE No. 111965 STATE OF TENNESSEE

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9180 Crestwyn Hills Drive • Memphis, Tennessee 38125
901-748-1811 • Fax: 901-748-3115 • Web: www.fisherarnold.com
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VOLUNTEER ENERGY COOPERATIVE

ELECTRIC RELOCATION

STA. 89+00 TO STA. 102+00

SCALE: FULL 1"= 50', HALF 1"= 100'

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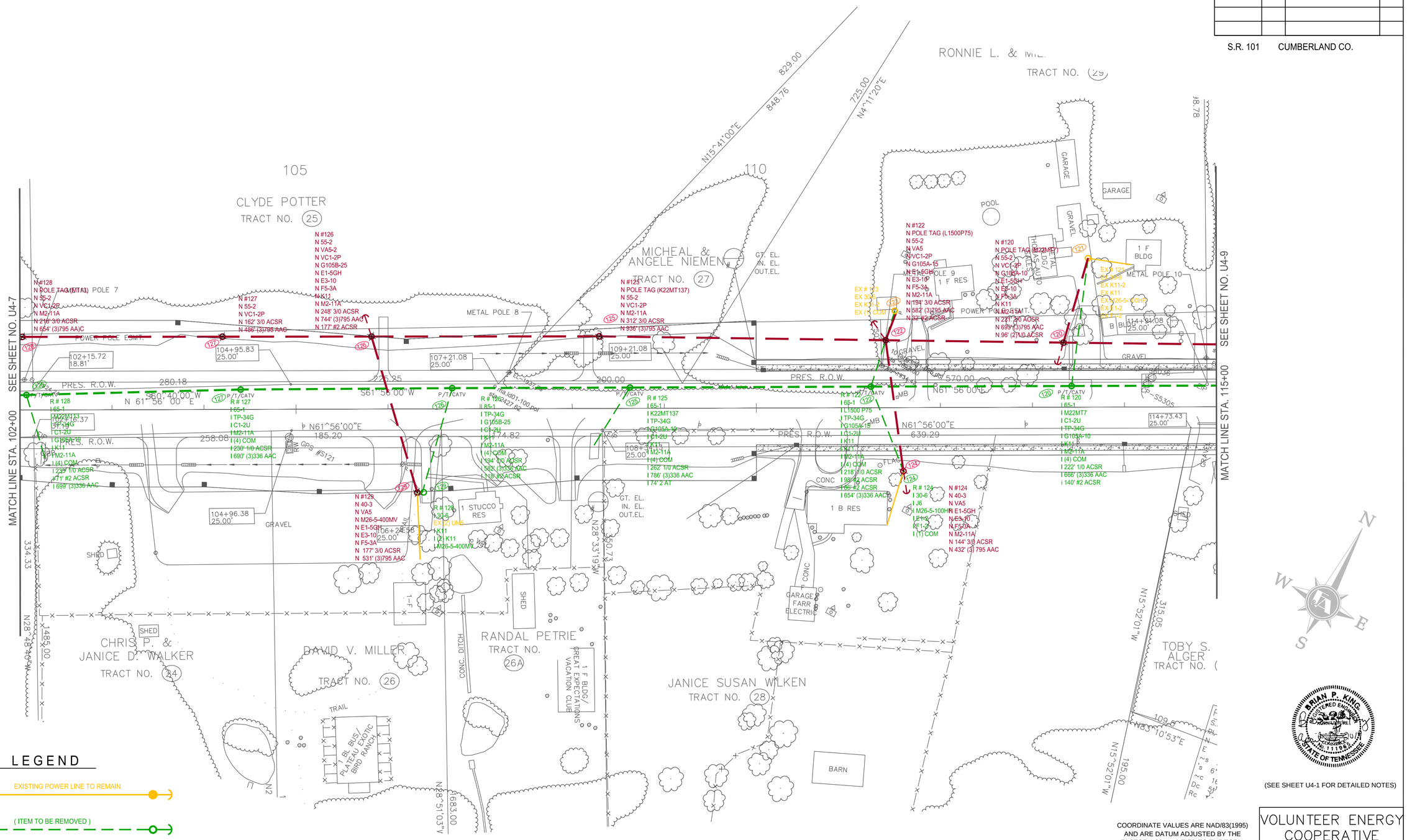
Filename: W:\7703\Electrical\PLANS\7703-PoleLocate.dwg
Layout Name: U4-7
Plotted: Wednesday, September 16, 2015 - 9:36 am
By: BookerS

TYPE	YEAR	PROJECT NO.	SHEET NO.
CONST.	2015	STP-101 (16)	U4-8

S.R. 101 CUMBERLAND CO.



LEGEND

(EX) EXISTING POWER LINE TO REMAIN

(I) (ITEM TO BE REMOVED)

(N) NEW CONSTRUCTION - LINE CHANGES

EXISTING POLES	
OUTSIDE R.O.W.	INSIDE R.O.W.
3	6

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Filename: W:\7703\Electrical\PLANS\7703-PoleLocate.dwg
Layout Name: U4-8
Plotted: Wednesday, September 16, 2015 - 9:40 am
By: BrookeS

BRIAN P. KING REGISTERED ENGINEER 25281 AGRICULTURE STATE OF TENNESSEE

(SEE SHEET U4-1 FOR DETAILED NOTES)

COORDINATE VALUES ARE NAD/83(1995) AND ARE DATUM ADJUSTED BY THE FACTOR 1.00___ & TIED TO THE TGRN.

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VOLUNTEER ENERGY COOPERATIVE

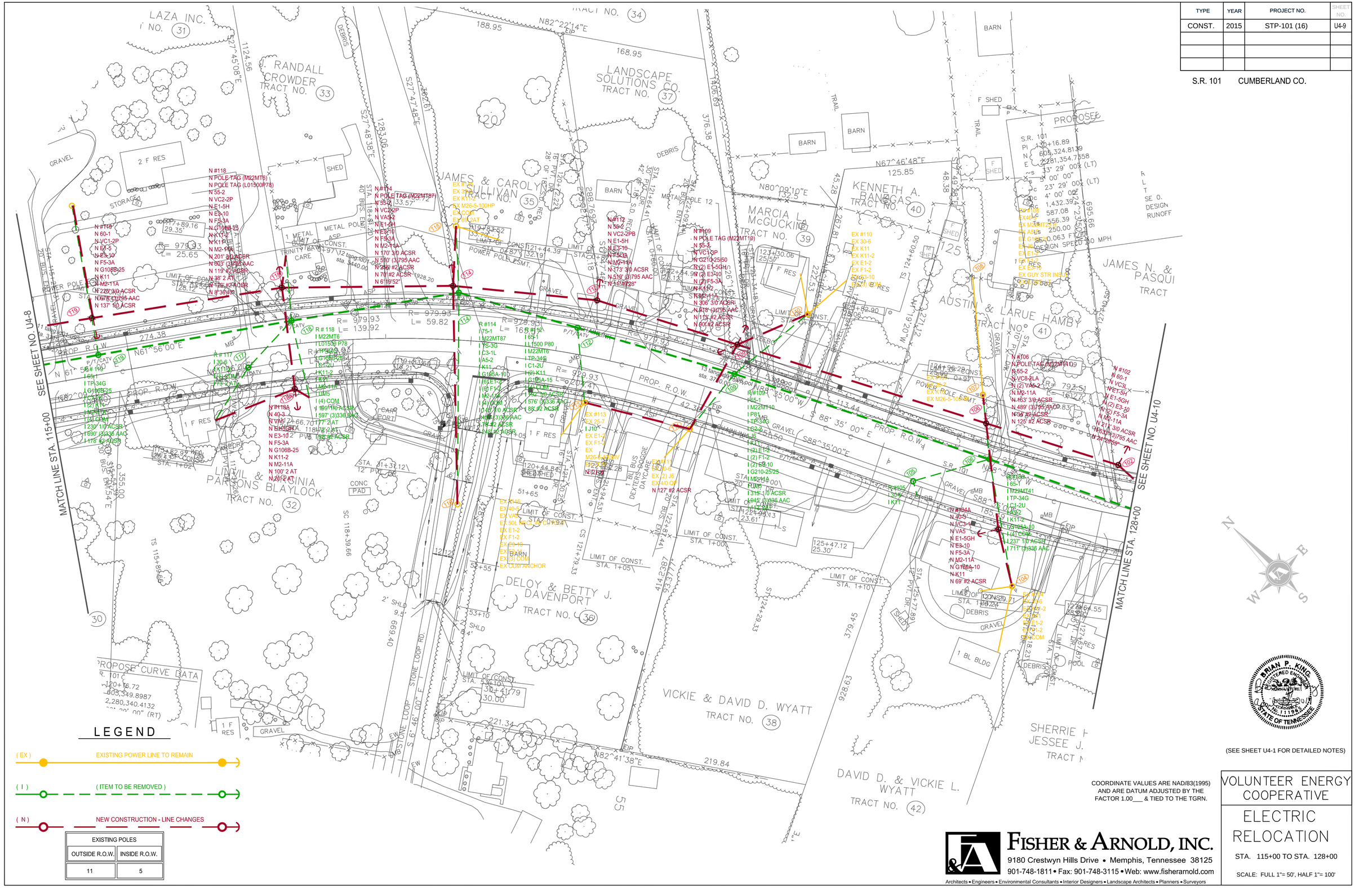
ELECTRIC RELOCATION

STA. 102+00 TO STA. 115+00

SCALE: FULL 1"= 50', HALF 1"= 100'

TYPE	YEAR	PROJECT NO.	SHEET NO.
CONST.	2015	STP-101 (16)	U4-9

S.R. 101 CUMBERLAND CO.



(SEE SHEET U4-1 FOR DETAILED NOTES)

COORDINATE VALUES ARE NAD/83(1995) AND ARE DATUM ADJUSTED BY THE FACTOR 1.00___ & TIED TO THE TGRN.

VOLUNTEER ENERGY COOPERATIVE

ELECTRIC RELOCATION

STA. 115+00 TO STA. 128+00

SCALE: FULL 1"= 50', HALF 1"= 100'

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Layout Name: U4-9
Plotted: Wednesday, September 16, 2015 - 9:43 am
By: Brooke S

TYPE	YEAR	PROJECT NO.	SHEET NO.
CONST.	2015	STP-101 (16)	U4-10

S.R. 101 CUMBERLAND CO.

LEGEND

(EX) EXISTING POWER LINE TO REMAIN

(I) (ITEM TO BE REMOVED)

(N) NEW CONSTRUCTION - LINE CHANGES

EXISTING POLES	
OUTSIDE R.O.W.	INSIDE R.O.W.
9	8

(SEE SHEET U4-1 FOR DETAILED NOTES)

COORDINATE VALUES ARE NAD/83(1995) AND ARE DATUM ADJUSTED BY THE FACTOR 1.00___ & TIED TO THE TGRN.

BRIAN P. KING REGISTERED ENGINEER AGRICULTURE COMMERCE No. 111965 STATE OF TENNESSEE

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VOLUNTEER ENERGY COOPERATIVE

ELECTRIC RELOCATION

STA. 128+00 TO STA. 141+00

SCALE: FULL 1"= 50', HALF 1"= 100'

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Filename: W:\7703\Electrical\PLANS\7703-PoleLocate.dwg
Layout Name: U4-10
Plotted: Wednesday, September 16, 2015 - 9:59 am
By: BookerS

TYPE	YEAR	PROJECT NO.	SHEET NO.
CONST.	2015	STP-101 (16)	U4-11

S.R. 101 CUMBERLAND CO.

.063 FT/FT
DESIGN SPEED 50 MPH

SEE SHEET NO. U4-10

MATCH LINE STA. 141+00

SEE SHEET NO. U4-12

MATCH LINE STA. 154+00

CALVIN L. & SUSAN K. SMART TRACT NO. 58

WILLIAM ALFRED & HELEN FRANCIS WATSON TRACT NO. 59

STONE FAMILY LP OF CUMBERLAND CO. TRACT NO. 34

RUSSELL W. III & FAYE L. LEWIS TRACT NO. 60

JOHN A. & PAMELA P. FOUNTAIN TRACT NO. 61

LARRY DEAN COTTRELL TRACT NO. 62

ANTHONY A. MARTIN TRACT NO. 57

KENNETH R. & CLAUDIA C. BEASURE

T.B.I. ENTERPRISES

FRANKLIN M. & CECILIA A. HUFF, TRUSTEE

MICHAEL & NELDIA CARUFE

AMUSEMENT PARK

LIMIT OF CONST. STA. 0+80

LIMIT OF CONST. STA. 0+98

LIMIT OF CONST. STA. 0+87

LIMIT OF CONST. STA. 0+81

LIMIT OF CONST. STA. 1+40

LIMIT OF CONST. STA. 0+92

LIMIT OF CONST. STA. 0+45

LIMIT OF CONST. STA. 0+75

LIMIT OF CONST. STA. 0+30

PRES. R.O.W.

POWER LINE

1 F BUS

1 F RES

1 METAL BUS

METAL BLDG

CARPORT

DBL MOBILE HOME

BARN

EXISTING POLES	
OUTSIDE R.O.W.	INSIDE R.O.W.
6	4

LEGEND

(EX) EXISTING POWER LINE TO REMAIN

(I) (ITEM TO BE REMOVED)

(N) NEW CONSTRUCTION - LINE CHANGES

(SEE SHEET U4-1 FOR DETAILED NOTES)

COORDINATE VALUES ARE NAD/83(1995) AND ARE DATUM ADJUSTED BY THE FACTOR 1.00___ & TIED TO THE TGRN.

VOLUNTEER ENERGY COOPERATIVE

ELECTRIC RELOCATION

STA. 141+00 TO STA. 154.00

SCALE: FULL 1"= 50', HALF 1"= 100'

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BRIAN P. KING — REGISTERED ENGINEER — 115231 — STATE OF TENNESSEE

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Layout Name: U4-11
Plotted: Wednesday, September 16, 2015 - 10:00 am
By: BookerS

TYPE	YEAR	PROJECT NO.	SHEET NO.
CONST.	2015	STP-101 (16)	U4-12

S.R. 101 CUMBERLAND CO.

EXISTING POLES	
OUTSIDE R.O.W.	INSIDE R.O.W.
8	3

LEGEND

(EX) EXISTING POWER LINE TO REMAIN

(I) (ITEM TO BE REMOVED)

(N) NEW CONSTRUCTION - LINE CHANGES

COORDINATE VALUES ARE NAD/83(1995) AND ARE DATUM ADJUSTED BY THE FACTOR 1.00___ & TIED TO THE TGRN.

(SEE SHEET U4-1 FOR DETAILED NOTES)

BRIAN P. KING REGISTERED ENGINEER AGRICULTURE COMMERCE No. 111965 STATE OF TENNESSEE

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VOLUNTEER ENERGY COOPERATIVE

ELECTRIC RELOCATION

STA. 154+00 TO STA. 167+00

SCALE: FULL 1"= 50', HALF 1"= 100'

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Filename: W:\7703\Electrical\PLANS\7703-PoleLocate.dwg
Layout Name: U4-12
Plotted: Wednesday, September 16, 2015 - 10:03 am
By: BookerS

TYPE	YEAR	PROJECT NO.	SHEET NO.
CONST.	2015	STP-101 (16)	U4-13

S.R. 101 CUMBERLAND CO.

LEGEND

(EX) EXISTING POWER LINE TO REMAIN

(I) (ITEM TO BE REMOVED)

(N) NEW CONSTRUCTION - LINE CHANGES

EXISTING POLES	
OUTSIDE R.O.W.	INSIDE R.O.W.
2	7

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Filename: W:\7703\Electrical\PLANS\7703-PoleLocate.dwg
Layout Name: U4-13
Plotted: Wednesday, September 16, 2015 - 10:05 am
By: BookerS

(SEE SHEET U4-1 FOR DETAILED NOTES)

COORDINATE VALUES ARE NAD/83(1995)
AND ARE DATUM ADJUSTED BY THE
FACTOR 1.00___ & TIED TO THE TGRN.

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VOLUNTEER ENERGY COOPERATIVE

ELECTRIC RELOCATION

STA. 167+00 TO STA. 180+00

SCALE: FULL 1"= 50', HALF 1"= 100'

TYPE	YEAR	PROJECT NO.	SHEET NO.
CONST.	2015	STP-101 (16)	U4-14

S.R. 101 CUMBERLAND CO.

LEGEND

(EX) EXISTING POWER LINE TO REMAIN

(I) (ITEM TO BE REMOVED)

(N) NEW CONSTRUCTION - LINE CHANGES

EXISTING POLES	
OUTSIDE R.O.W.	INSIDE R.O.W.
0	0

(SEE SHEET U4-1 FOR DETAILED NOTES)

COORDINATE VALUES ARE NAD/83(1995) AND ARE DATUM ADJUSTED BY THE FACTOR 1.00___ & TIED TO THE TGRN.

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VOLUNTEER ENERGY COOPERATIVE

ELECTRIC RELOCATION

STA. 180+00 TO STA. 193+00

SCALE: FULL 1"= 50', HALF 1"= 100'

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Layout Name: U4-14
Plotted: Wednesday, September 16, 2015 - 10:08 am
By: BookerS

TYPE	YEAR	PROJECT NO.	SHEET
CONST.	2015	STP-101 (16)	U4-15

S.R. 101 CUMBERLAND CO.

LEGEND

(EX)	EXISTING POWER LINE TO REMAIN	
(I)	(ITEM TO BE REMOVED)	
(N)	NEW CONSTRUCTION - LINE CHANGES	

EXISTING POLES	
OUTSIDE R.O.W.	INSIDE R.O.W.
7	0

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Filename: W:\7703\Electrical\PLANS\7703-PoleLocate.dwg
Layout Name: U4-15
Plotted: Wednesday, September 16, 2015 - 10:11 am
By: BookerS

BRIAN P. KING REGISTERED ENGINEER AGRICULTURE COMMERCE No. 111965 STATE OF TENNESSEE

(SEE SHEET U4-1 FOR DETAILED NOTES)

COORDINATE VALUES ARE NAD/83(1995) AND ARE DATUM ADJUSTED BY THE FACTOR 1.00___ & TIED TO THE TGRN.

VOLUNTEER ENERGY COOPERATIVE

ELECTRIC RELOCATION

STA. 193+00 TO STA. 206+00

SCALE: FULL 1"= 50', HALF 1"= 100'

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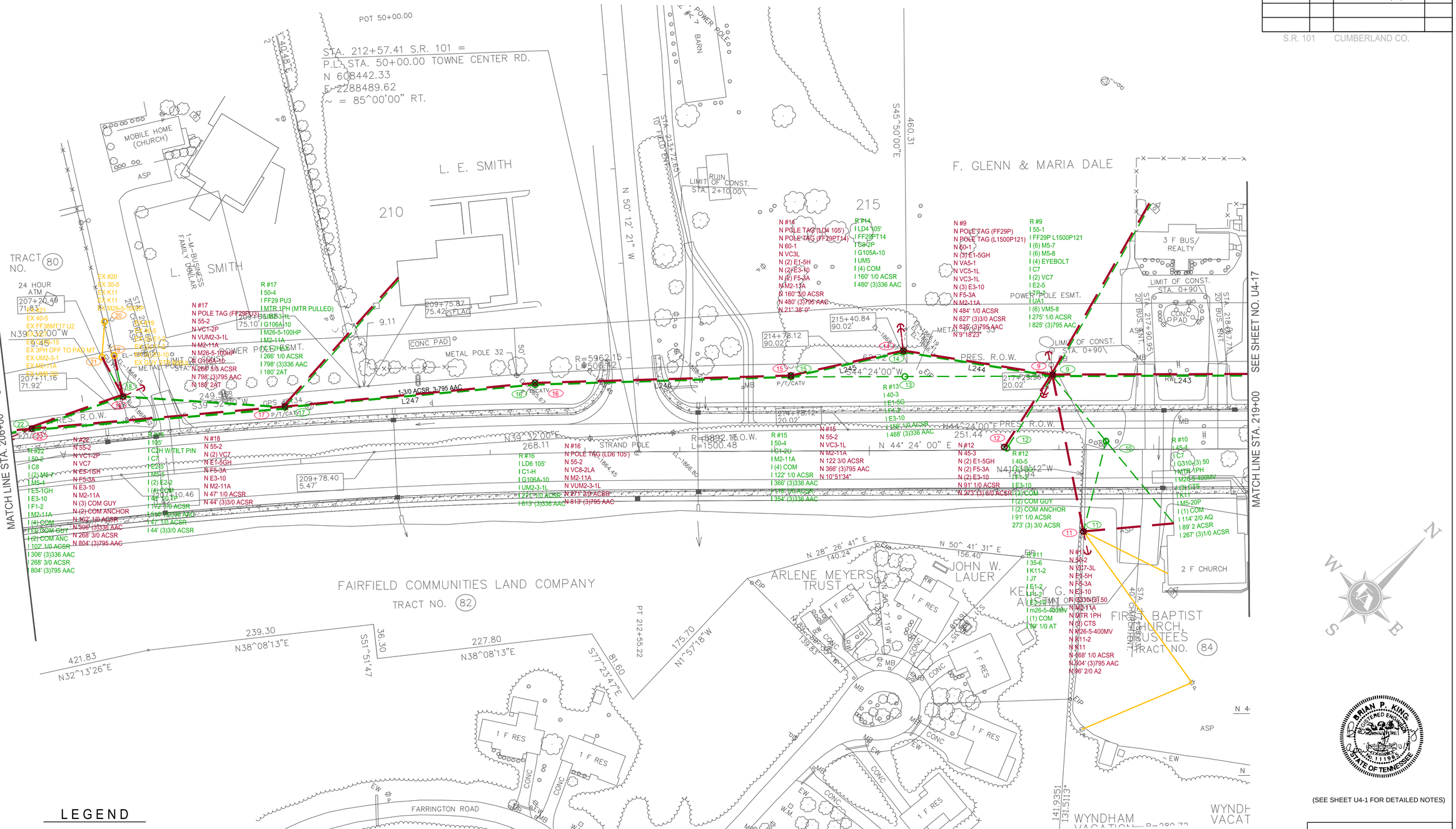
TYPE	YEAR	PROJECT NO.	SHEET NO.
CONST.	2015	STP-101 (16)	U4-16

S.R. 101 CUMBERLAND CO.



LEGEND

(EX) EXISTING POWER LINE TO REMAIN

(I) (ITEM TO BE REMOVED)

(N) NEW CONSTRUCTION - LINE CHANGES

EXISTING POLES	
OUTSIDE R.O.W.	INSIDE R.O.W.
4	5

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Filename: W_V7203-16 Electrical\PLANS\V7203-PoleLocate.dwg
Layout: Layout1 Plotted: Wednesday, September 16, 2015 - 1:17 pm
By: BookerS

BRIAN P. KING — REGISTERED ENGINEER — 102995 — LICENSED PROFESSIONAL ENGINEER — STATE OF TENNESSEE

(SEE SHEET U4-1 FOR DETAILED NOTES)

COORDINATE VALUES ARE NAD/83(1995) AND ARE DATUM ADJUSTED BY THE FACTOR 1.00___ & TIED TO THE TGRN.

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VOLUNTEER ENERGY COOPERATIVE

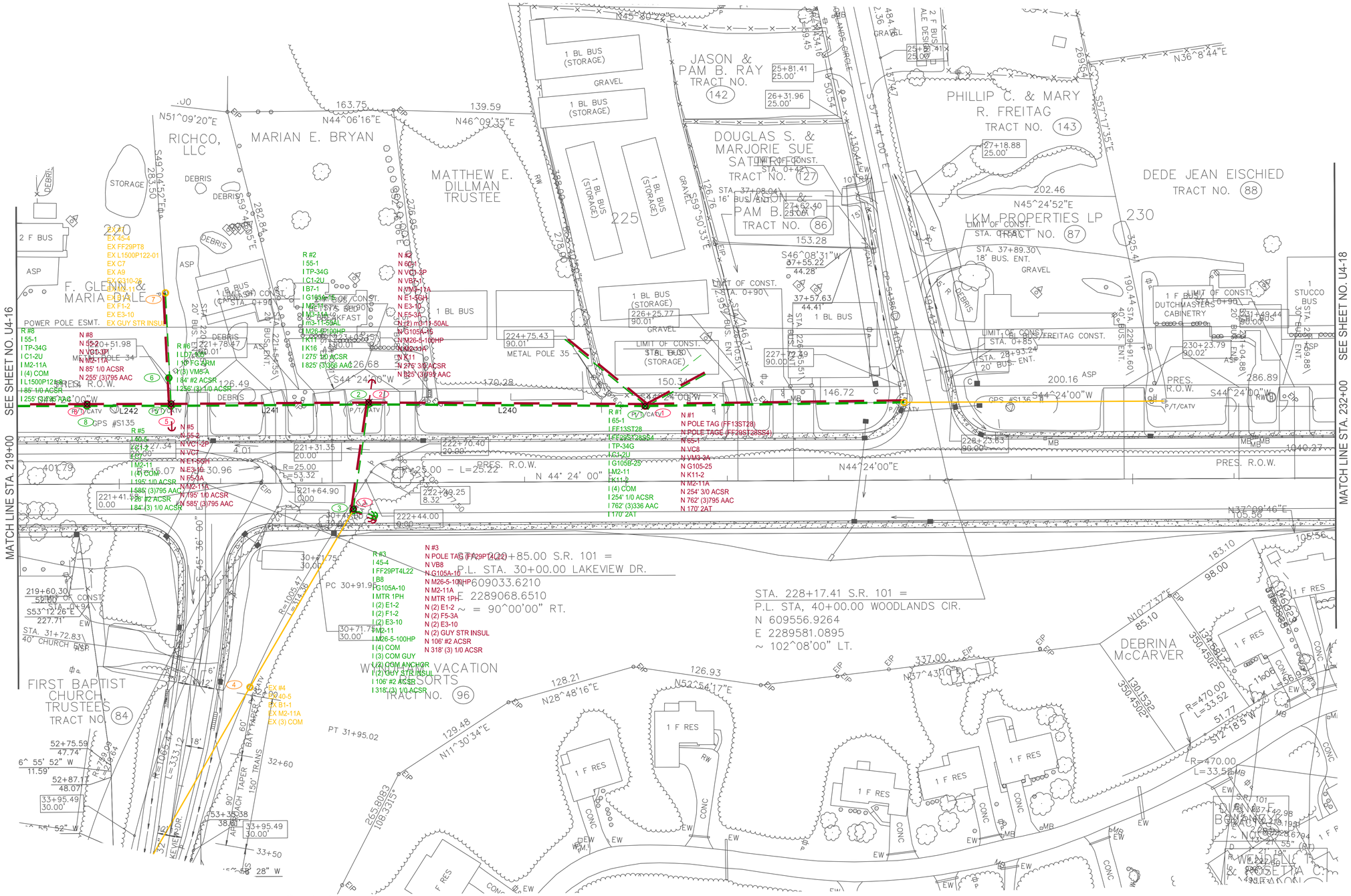
ELECTRIC RELOCATION

STA. 206+00 TO STA. 219+00

SCALE: FULL 1"= 50', HALF 1"= 100'

TYPE	YEAR	PROJECT NO.	SHEET NO.
CONST.	2015	STP-101 (16)	U4-17

S.R. 101 CUMBERLAND CO.



(SEE SHEET U4-1 FOR DETAILED NOTES)

LEGEND

(EX) EXISTING POWER LINE TO REMAIN

(I) (ITEM TO BE REMOVED)

(N) NEW CONSTRUCTION - LINE CHANGES

EXISTING POLES	
OUTSIDE R.O.W.	INSIDE R.O.W.
2	5

COORDINATE VALUES ARE NAD/83(1995) AND ARE DATUM ADJUSTED BY THE FACTOR 1.00___ & TIED TO THE TGRN.

VOLUNTEER ENERGY COOPERATIVE

ELECTRIC RELOCATION

STA. 219+00 TO STA. 232+00

SCALE: FULL 1"= 50', HALF 1"= 100'

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Layout Name: U4-17
Plotted: Wednesday, September 16, 2015 - 9:17 am
By: BookerS

TYPE	YEAR	PROJECT NO.	SHEET NO.
CONSTRUCTION	2015	STP-101(16)	U7-1

CUMBERLAND COUNTY

INDEX OF DRAWINGS

SHT NO. U7-1 NOTES & UTILITY OWNER
SHT NO. U7-2 STA 100+00-112+00
SHT NO. U7-3 STA 112+00-117+00
SHT NO. U7-4 DETAILS
SHT NO. U7-5 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)
797-03.04	2 IN PVC FORCE MAIN	L.F.	330	FOOTNOTE #1
797-03.06	4 IN PVC FORCE MAIN	L.F.	300	FOOTNOTE #1
797-06.72	BORE/JACK 6 IN STEEL CASING PIPE ROCK	L.F.	90	FOOTNOTE#10
797-06.74	BORE/JACK 10 IN STEEL CASING PIPE ROCK	L.F.	110	FOOTNOTE#10
797-08.01	DI FITTINGS	Lbs	527	INCLUDES FITTINGS, GLANDS AND RESTRANT DEVISES DESCRIBED IN POUNDS
797-08.02	PVC FITTINGS	Lbs	5	INCLUDES FITTINGS, GLANDS AND RESTRANT DEVISES DESCRIBED IN POUNDS
797-09.28	4 IN AIR/VAC VALVE ASSEMBLY	EACH	1	FOOTNOTE #6

FOOTNOTE 1:
INCLUDES ALL MATERIALS, LABOR, EQUIPMENT FOR COMPLETE EXCAVATION INCLUDING BUT NOT LIMITED TO BEDDING, BACKFILLING, THRUST BLOCKING, PIPE FUSION, APPURTENANCES, FLOWABLE FILL, MAINTAINING THE TRENCH, TESTING, CHECK DAMS, AND ANY OTHER LABOR OR MATERIAL REQUIRED TO COMPLETE FOR GRAVITY SEWER LINES OR FORCE MAINS AS SPECIFIED ON THE PLANS. DUCTILE IRON PIPE GRAVITY SEWER LINES SHALL BE EPOXY LINED.

FOOTNOTE 6:
INCLUDES ALL MATERIALS, LABOR, EQUIPMENT, INCLUDING BUT NOT LIMITED TO MACHINERY, TOOLS OR APPARATUS NECESSARY FOR INSTALLATION OF ASSEMBLIES AS DESCRIBED AND DETAILED IN THE PLANS AND SPECS.

FOOTNOTE 10:
INCLUDES ALL MATERIALS, LABOR, AND EQUIPMENT INCLUDING BUT NOT LIMITED TO CASING PIPE, PIPE SPACERS, CASING END SEALS, ANY OTHER APPURTENANCE TO COMPLETE THE WORK AS SPECIFIED ON THE PLANS, AND TRAFFIC CONTROL IF CASING PIPE HAS CARRIER PIPE, THE CARRIER PIPE SHALL BE PAID AT THE OPEN CUT ITEM.

NOTE 1:
ALL KNOWN UTILITIES WERE FIELD LOCATED BY THE TDOT. ENGINEER TAKES NO RESPONSIBILITY AS TO THE ACCURACY OF THE LOCATION OR ACTUAL QUANTITIES OF UTILITIES SHOWN.

NOTE 2:
CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ALL MATERIALS, LABOR AND EQUIPMENT TO PROPERLY HYDROSTATICALLY TEST THE SEWER LINE INSTALLATION. CONTRACTOR SHALL WORK CLOSELY WITH THE CITY OF CROSSVILLE REPRESENTATIVES PERTAINING TO THE INSTALLATION OF ALL NEW SEWER LINES.

FAIRFIELD GLADE COMMUNITY CLUB MAY BE CONTACTED AT 931-484-3780.

UTILITY INFORMATION

FAIRFIELD GLADE COMMUNITY CLUB
POST OFFICE BOX 2000
FAIRFIELD GLADE, TENNESSEE 38558
CONTACT: TIM MARTIN
931-484-3780

BARRY R. FIELD
REGISTERED ENGINEER
AGRICULTURE
No. 21088
STATE OF TENNESSEE
10-24-15

FAIRFIELD GLADE COMMUNITY CLUB
P.O. BOX 2000 FAIRFIELD GLADE, TENNESSEE 38558

S.R. 101 (PEAVINE ROAD) SEWERLINE 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	2015	STP-101(16)	U7-2

CUMBERLAND COUNTY

MATCH LINE STA 204+00
SEE SHEET No. U7-3

MATCH LINE STA 195+50 BEGIN SANITARY SEWER RELOCATION

MATCH LINE STA 203+00 SEE SHEET No. U7-3

PROPOSED 10" STEEL CASING UNDER ROAD (TYPICAL)

402 MJ TEE

STA 30+95 ST GEORGE DRIVE
STA 10+48 SPRING LAKE DRIVE
CONNECT PROPOSED 2" LPS TO PROPOSED 4" LPS

PROPOSED 4" SDR 21 CLASS 200 BLUE PIPE

2" MJ GATE VALVE

STA 32+25 PROPOSED ARV TO BE RELOCATED AS SHOWN

STA 32+40 EXIST 2" LPS TO BE CAPPED AT THIS POINT

STA 32+50 ST GEORGE DRIVE
CONNECT TO EXISTING 4" LPS WITH REPAIR COUPLING

2 45° MJ BENDS

STA 201+42 PEAVINE ROAD
STA 29+60 ST GEORGE DRIVE
CONNECT TO EXISTING 4" LPS
4" FLANGED TAPPING SADDLE AND VALVE

4" CAP WITH THRUST BLOCK

EXISTING ARV TO BE REMOVED AND RELOCATED TO ST. GEORGE DRIVE AS SHOWN

NOTE: CONTRACTOR TO MAKE ARRANGEMENTS WITH CUSTOMERS ON THIS EXISTING SERVICE LINE FOR INTERRUPTED SERVICE. IF NEEDED, CONTRACTOR TO PROVIDE PUMP TRUCK TO CAPTURE EFFLUENT.

MATCH LINE STA 199+00
SEE THIS SHEET

METAL POLE 30

METAL POLE 29

PROP ROW

PRES. R.O.W.

PROPOSED GAS

EXIST 2" LPS TO REMAIN

EXIST 2" LPS TO BE RETIRED

IN EL. 1863.58

OUT EL. 1863.15

PROPOSED 2" SDR 21 CLASS 200 BLUE PIPE

Spring Lake Drive

STA 6+53
CONNECT TO EXIST 2" LPS WITH REPAIR COUPLING

PROPOSED 6" STEEL CASING UNDER ROAD (TYPICAL)

EXIST 2" LPS TO BE RETIRED

F RES

SANITARY SEWER LINE LEGEND

EXISTING TO REMAIN

NEW INSTALLATION

TEMPORARY RELOCATION

TO BE REMOVED OR RETIRED IN PLACE

EXISTING UTILITY DATA AS PROVIDED BY TDOT

CALL BEFORE YOU DIG

UTILITIES PROTECTION CENTER

IN TENNESSEE CALL

1 - 800 - 351 - 1111

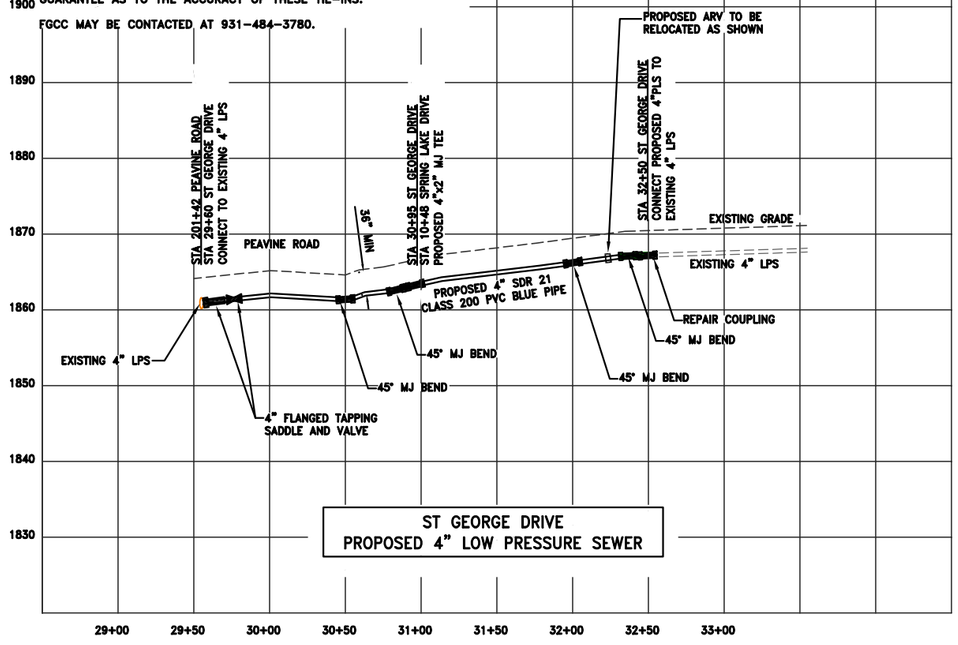
THREE WORKING DAYS BEFORE YOU DIG

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.

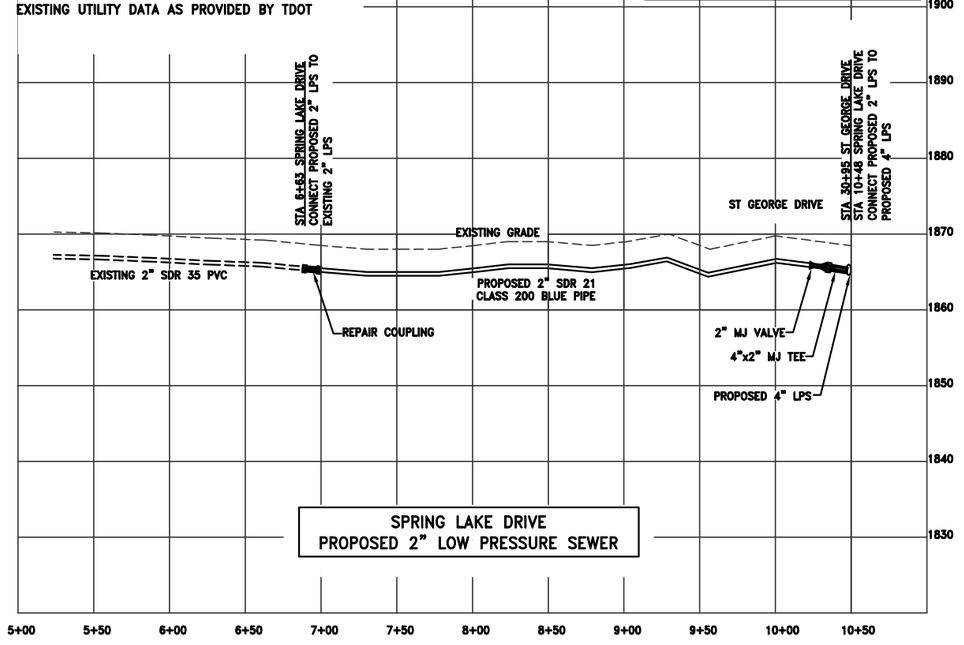
NOTE 1:
ALL KNOWN UTILITIES WERE FIELD LOCATED BY FAIRFIELD GLADE COMMUNITY CLUB (FGCC). ENGINEER TAKES NO RESPONSIBILITY AS TO THE ACCURACY OF THE LOCATION OR ACTUAL QUANTITIES OF UTILITIES SHOWN.

CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ALL MATERIALS, LABOR AND EQUIPMENT TO MAKE TIE-INS AS SHOWN ON PLANS. CONTRACTOR SHALL ALSO BE RESPONSIBLE FOR RECONNECTING ALL EXISTING SERVICES AS SHOWN ON PLANS. ENGINEER MAKES NO GUARANTEE AS TO THE ACCURACY OF THESE TIE-INS.

FGCC MAY BE CONTACTED AT 931-484-3780.



ST GEORGE DRIVE
PROPOSED 4" LOW PRESSURE SEWER



SPRING LAKE DRIVE
PROPOSED 2" LOW PRESSURE SEWER

BARRY R. FIELD
REGISTERED ENGINEER
AGRICULTURE
COMMERCE
STATE OF TENNESSEE
5-24-15

FAIRFIELD GLADE COMMUNITY CLUB
POST OFFICE BOX 2000
FAIRFIELD GLADE, TENNESSEE 38558

S.R. 101 (PEAVINE ROAD) SANITARY SEWER RELOCATION

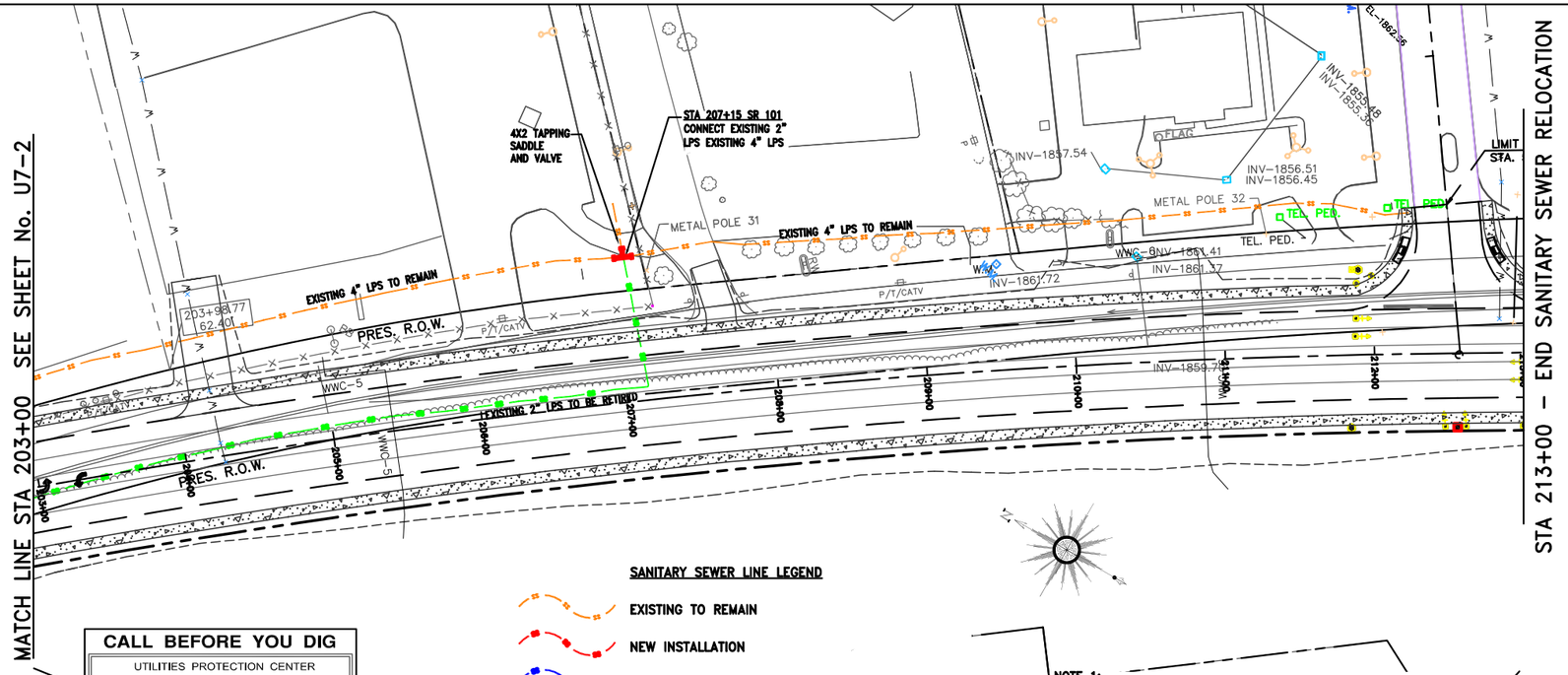
FIELD'S ENGINEERING CONSULTANT SERVICES, LLC
77 COTHER STREET
CROSSVILLE, TENNESSEE 38555
(931) 456-6071

STA. 193+00 TO STA. 206+00

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

TYPE	YEAR	PROJECT NO.	SHEET NO.
CONSTRUCTION	2015	STP-101(16)	U7-3

CUMBERLAND COUNTY



SANITARY SEWER LINE LEGEND

EXISTING TO REMAIN

NEW INSTALLATION

TEMPORARY RELOCATION

TO BE REMOVED OR RETIRED IN PLACE

EXISTING UTILITY DATA AS PROVIDED BY TDOT

CALL BEFORE YOU DIG

UTILITIES PROTECTION CENTER

IN

TENNESSEE

CALL

1 - 800 - 351 - 1111

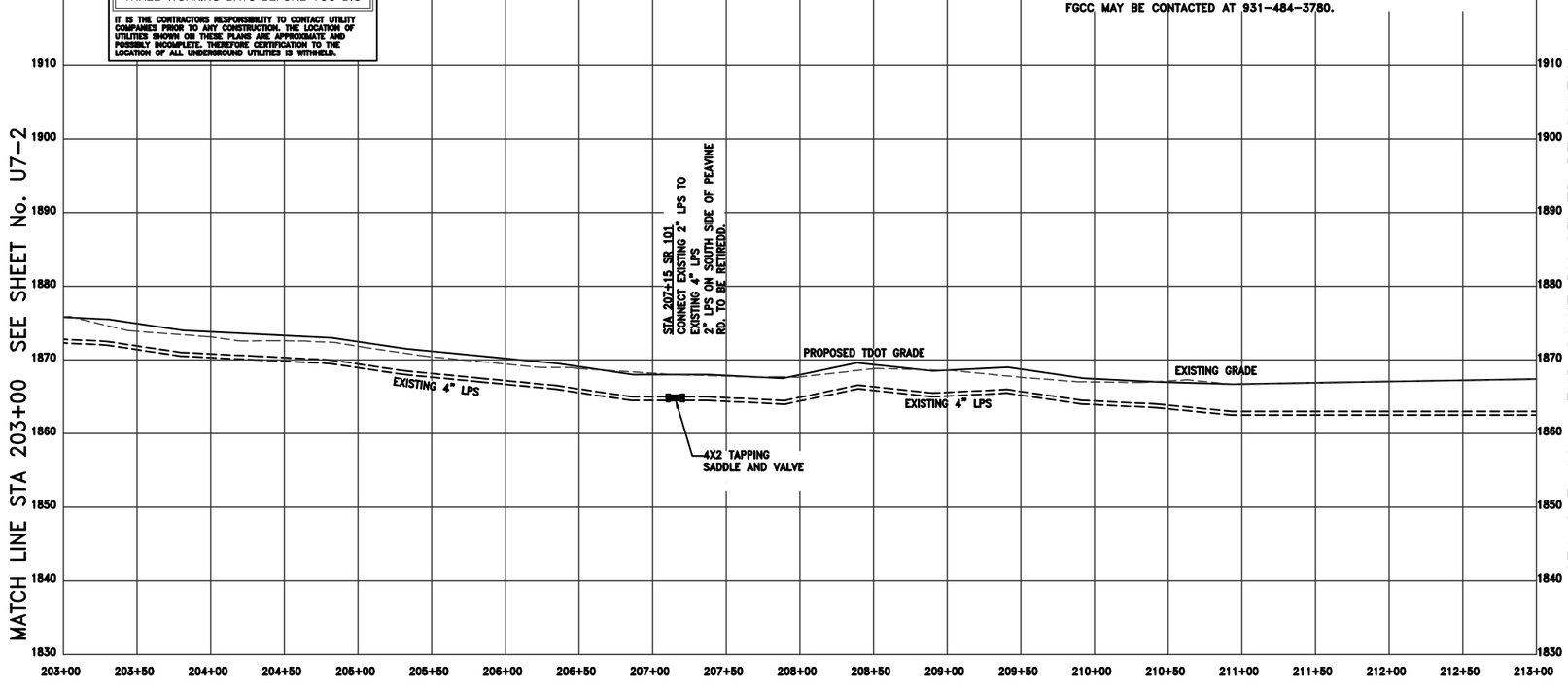
THREE WORKING DAYS BEFORE YOU DIG

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.

NOTE 1:
ALL KNOWN UTILITIES WERE FIELD LOCATED BY FAIRFIELD GLADE COMMUNITY CLUB (FGCC). ENGINEER TAKES NO RESPONSIBILITY AS TO THE ACCURACY OF THE LOCATION OR ACTUAL QUANTITIES OF UTILITIES SHOWN.

CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ALL MATERIALS, LABOR AND EQUIPMENT TO MAKE TIE-INS AS SHOWN ON PLANS. CONTRACTOR SHALL ALSO BE RESPONSIBLE FOR RECONNECTING ALL EXISTING SERVICES AS SHOWN ON PLANS. ENGINEER MAKES NO GUARANTEE AS TO THE ACCURACY OF THESE TIE-INS.

FGCC MAY BE CONTACTED AT 931-484-3780.



BARRY R. FIELD
REGISTERED ENGINEER
AGRICULTURE
CERTIFICATE NO. 21982
STATE OF TENNESSEE
5-24-15

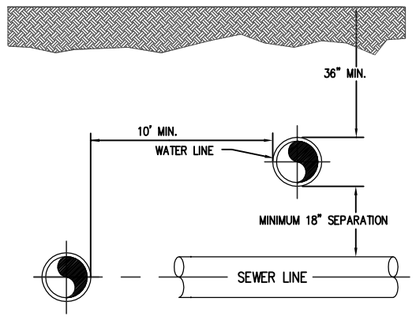
FAIRFIELD GLADE
COMMUNITY CLUB
POST OFFICE BOX 2000
FAIRFIELD GLADE, TENNESSEE 38558

S.R. 101 (PEAVINE ROAD)
SANITARY SEWER RELOCATION

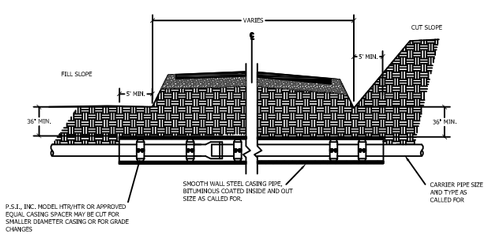
FIELD'S ENGINEERING CONSULTANT SERVICES, LLC
77 COTHER STREET
CROSSVILLE, TENNESSEE 38555
(931) 456-6071

STA. 203+00 TO STA. 216+00

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

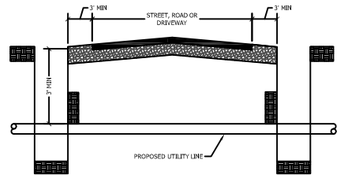


SEPARATION OF PIPED UTILITIES



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

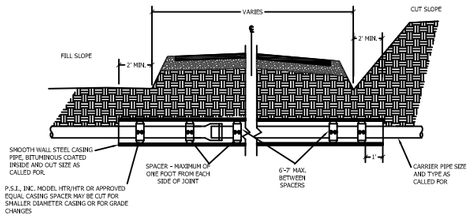
ALL CASINGS AND CONDUITS INSTALLED UNDER STATE ROADS SHALL MEET OR EXCEED THE MINIMUM AASHTO REQUIREMENTS.



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

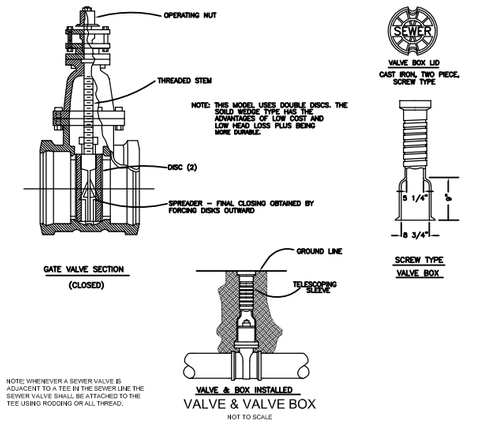
B 10 **BORE & JACK DETAILS**
SCALE: N.T.S.

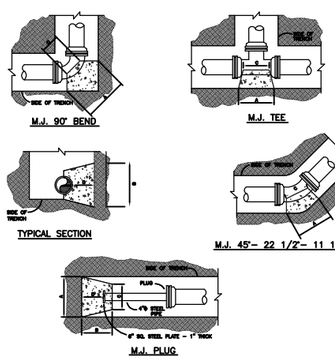


C **CITY / COUNTY ROADS AND PAVED DRIVEWAY**
SCALE: N.T.S.

TYPE	YEAR	PROJECT NO.	SHEET NO.
CONSTRUCTION	2015	STP-101(16)	U7-4

CUMBERLAND COUNTY





90° BEND						
SIZE	2"	4"	6"	8"	10"	12"
A	15"	15"	20"	25"	30"	35"
B	15"	20"	25"	30"	35"	40"
C	9"	9"	12"	15"	16"	20"
D	9"	9"	12"	16"	20"	24"

45° BEND						
SIZE	2"	4"	6"	8"	10"	12"
A	12"	12"	15"	20"	25"	30"
B	12"	12"	18"	24"	30"	36"
C	9"	9"	12"	15"	16"	20"
D	9"	9"	12"	15"	16"	20"

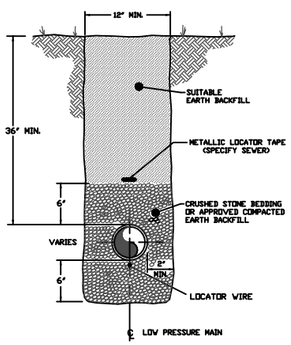
22-1/2° BEND						
SIZE	2"	4"	6"	8"	10"	12"
A	9"	9"	12"	15"	20"	25"
B	12"	12"	18"	24"	30"	36"
C	9"	9"	12"	15"	16"	20"
D	9"	9"	12"	15"	16"	20"

11-1/4° BEND						
SIZE	2"	4"	6"	8"	10"	12"
A	9"	9"	11"	13"	15"	18"
B	9"	9"	11"	13"	15"	18"
C	9"	9"	12"	15"	16"	20"
D	9"	9"	9"	9"	9"	9"

THRUST BLOCK DETAILS & DIMENSIONS
NOTE: M.J. = MECHANICAL JOINT.
THRUST BLOCK TO BE POURED AGAINST UNDISTURBED EARTH.

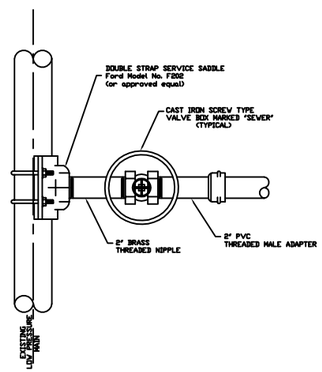
TEE						
SIZE						
Main	2"-6"	8"-12"	2"-6"	8"-10"	12"	15"
Branch	2"-6"	8"-12"	8"-10"	12"	15"	18"
A	24"	24"	43"	24"	43"	52"
B	24"	24"	43"	24"	43"	52"
C	12"	12"	12"	12"	12"	12"
D	12"	12"	12"	12"	12"	12"

PLUG						
SIZE	2"	4"	6"	8"	10"	12"
A	24"	24"	24"	34"	43"	52"
B	24"	24"	24"	34"	43"	52"
C	12"	12"	12"	12"	12"	12"
D	11"	11"	11"	15"	22"	26"

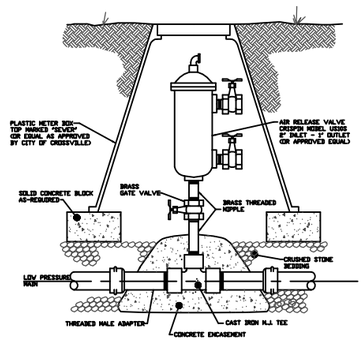


TYPICAL BEDDING DETAIL

NOTE: METALLIC LOCATOR TAPE (SEWER) TO BE INSTALLED IN TRENCH 6" - 8" ABOVE SEWER LINE.



SERVICE CONNECTION TO EXISTING MAIN
NO SCALE



AUTOMATIC AIR RELEASE VALVE
NO SCALE

BARRY R. FIELD
REGISTERED ENGINEER
AGRICULTURE
COMMISSION NO. 21682
STATE OF TENNESSEE
3-24-15

FAIRFIELD GLADE COMMUNITY CLUB

P.O. BOX 2000 FAIRFIELD GLADE, TENNESSEE 38558

S.R. 101 (PEAVINE ROAD) SEWERLINE 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	2015	STP-101(16)	U7-5

CUMBERLAND COUNTY

DETAILED SPECIFICATIONS

Scope of Work
Project consists of the construction of a Sanitary Sewer Collection System Relocation Project to serve the Fairfield Glade Community Club (FGCC). The Relocation Project is being performed to accommodate the relocation and widening of Peavine Road, State Route 101. Field's Engineering Consultant Services, LLC and the Fairfield Glade Community Club will coordinate with utility contractor pertaining to all work performed. The Fairfield Glade Community Club can be contacted at (931) 484-3780 and Field's Engineering Consultant Services, LLC at (931) 456-6071. As detailed on the drawings, the relocation project will begin at Peavine Fire Tower Road and end at the intersection of Lakeview Drive. **The Fairfield Glade Community Club only has Sewer Collection Mains in the St. George Drive area.**

Easement & Rights-of-Way
All work will be performed on properties owned by the State of Tennessee. However, Contractor is required to consult with Owner prior to any initiation of work in an area that is not located in the new Rights-of-Way of Peavine Road.

Rip-Rap
Where rip-rap (not shown on plans) is ordered by Engineer, it shall be considered as a separate/extra pay item.

Connecting to Existing Sewer Appurtenances
Contractor is responsible for properly tapping existing Sanitary Sewer mains to new main where applicable. This appurtenance is the property of the Fairfield Glade Community Club.

Mr. Ken Fore, Fairfield Glade Community Club, Sewer Department Foreman, shall be contacted prior to any work on any existing Sewer appurtenance. Telephone Number: (931) 200-9295.

Subsurface Conditions
Engineer and/or Owner assume **NO** responsibility of subsurface conditions. Contractor shall be responsible for determining requirements for dissevering, rock excavation, unstable ground conditions, sheeting/shoring, etc. **NO** item pertaining to Contractor's misjudgment of subsurface conditions will be a separate/extra pay item. Contractor assumes **all** responsibility pertaining to subsurface conditions. **In no way will any unexpected subsurface conditions due to excessive rock, topsoil depth, or any other condition be considered an extra pay item.**

Safety
Contractor is solely responsible for complying with all prevailing local, state, and federal safety procedures. All work under this contract shall be done in strict compliance with the Occupational Safety and Health Act (OSHA) of 1970 (PL 91-596) and under Section 107 of the Work Hours and Safety Standards Act (PL 91-54).

Engineer and/or Owner assume **NO** responsibility as to assure that Contractor abides by said safety procedures.

GENERAL
The Sanitary Sewer System shall conform to the Rules of Tennessee Dept. of Environment and Conservation, Division of Water Pollution Control, Minimum Design Criteria for Public Sewer Systems.

The Sewer pipe shall be furnished and installed as illustrated in the details and drawings while maintaining not less than thirty six (36) inches of cover. All work is to be performed by an experienced worker. All materials and accessories are to be installed in accordance with the following specifications and by the manufacturer's recommendations.

The **CONTRACTOR** is to use top quality materials and shall practice proper storage, handling, and installation methods. The trench bottoms should be properly graded and bedded to provide proper, continuous support for the pipe except at the bell where holes should be dug to allow for bell.

LOCATOR WIRE
Locator wire shall be number twelve (#12) solid bare copper. Wire shall be buried continuously and four inches (4") below Sewer main.

LOCATOR TAPE
Locator tape shall be approximately 3-inches wide with "SEWER" or equal repetitively printed on entire length of tape. Tape shall be of a magnetic variety to allow for future locating with pertinent metal detection equipment. Tape shall be buried continuously twelve inches (12") above Sewer main.

HANDLING OF MATERIALS AND ACCESSORIES
All materials shall be stored in a location where contamination or physical damage will not be possible. All materials must be delivered and unloaded by proper method as to not damage them in any way.

All equipment required to safely handle pipe and accessories shall be provided at the construction site when pipe laying is in progress. All pipe and joints **must** be properly inspected for defects and cleaned immediately before installation.

POLYVINYL CHLORIDE PIPE FOR SEWER MAINS
Pipe for this project shall be of polyvinyl chloride variety colored BLUE. Pipe for the sewer mains shall be a variety of sizes and specifications as shown on the drawings. All pipe shall have push together elastomeric bell and joints designed so that pipe and fittings may be connected without the utilization of solvent cement or special equipment. All pipe shall be furnished in nominal lengths of 20 feet. Every length of pipe shall have size, class, and Manufacturer plainly marked on pipe. All pipe stored on site shall be per Manufacturer's instructions at all times prior to actual installation. **Varying classes of pipe are required for this project. Refer to drawings for exact amount, location, and class of pipe.**

THRUST BLOCKS AND RESTRAINTS
Thrust blocks must be 2,500 psi poured in place concrete. The thrust blocks must be installed at all points of unbalanced pressure where pipe could pull apart. Thrust blocks shall conform to the details as shown on drawings.

When downward bends cannot be avoided the fitting shall be held in place by one of the following:

1. Steel rods and clamps which extend for two pipe lengths to each side of bend.
2. Steel rods which are anchored at least eighteen (18) inches in solid rock.
3. Poured concrete under pipe of sufficient volume to counteract unbalanced force with steel clamp anchored to concrete.
4. An approved locked flexible joint extending two (2) pipe lengths on each side.

Rods and bolts used shall be at least one-half (1/2) inch diameter and straps or clamps must be at least one-quarter (1/4) inch thick. All steel restraints shall be coated with coal tar epoxy and concrete shall be Class B.

VALVE AND VALVE BOX (TOP MARKED "SEWER")
Valve and valve box details shall be as illustrated on drawings.

The valve box shall be centered over the valve operating nut and installed vertically. Box shall be tall enough to extend to final grade while adjustable upper section is midway between upper and lower limits. Backfill shall be properly tamped around the upper section to prevent future settlement.

Valve box shall have 18" x 18" concrete surround with reinforcing steel as shown in details. All valve boxes in paved streets shall have a 6' x 6' concrete surround with reinforcing steel.

SEPARATION FROM SEWER LINES
Sewer and sewer lines must be separated at least ten (10) feet horizontally and eighteen (18) inches vertically from bottom of Sewer main to top of sewer main as per drawings.

When Sewer mains and sewer mains must cross, they must cross in a perpendicular fashion.

TESTING AND DISINFECTION

GENERAL

Subsequent to the completion of the construction work of the relocation project, all Sewer lines shall be hydrostatically tested. In the case that the pressure or leakage test is unsatisfactory, corrective measures shall be taken and the tests repeated until satisfactory results are obtained.

LEAKAGE AND PRESSURE TESTS
Polyvinyl chloride pipe shall be tested in accordance with ISO 2531. Testing for this project shall be performed as follows:

All constructed Sewer lines shall be subjected to a hydrostatic pressure of 150 psi for a period of two (2) hours. Any defective work that is identified during the hydrostatic test shall be replaced and the pressure test repeated.

The quantity of leakage under the aforementioned 200 psi shall not exceed 0.002 gallons per hour for each foot of Sewer line being subjected to the pressure test. Should the quantity of the leakage exceed the aforementioned limit, the Contractor shall locate and repair the defective area until the leakage is within the allowable limits. The CONTRACTOR shall provide all labor, tools, equipment and materials for making the test. The CONTRACTOR shall provide the Fairfield Glade Community Club with a pressure chart that indicates the integrity of the pressure test being within specified allowances.

SOIL AND EROSION CONTROL
The General Contractor is responsible for the soil and erosion control for this project. However, utility Contractor is responsible to assure that these measures are in place prior to the initiation of any work. Utility Contractor is also responsible for two (2) weekly inspections of the soil and erosion control measures that affect the Sewerline relocation project. These inspections should be documented in writing and kept on file.

INTERRUPTION OF SEWER SERVICE
Utility Contractor shall make all possible efforts to limit Sewer service interruption to two (2) hours. All planned interruptions should be reported to the FGCC twenty four hours prior to the Sewer service being interrupted. Contractor is responsible for keeping sewer flowing and preventing any "bypass" events. In the event of a bypass event, Mr. Tim Martin of the FGCC shall be notified immediately.

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 a set of "As-Built" drawings for the project. The drawings shall be turned over to the Fairfield Glade Community Club subsequent to the completion of the project.

BARRY A. FIELD — REGISTERED ENGINEER — AGRICULTURE — COMMERCE — No. 21862 — STATE OF TENNESSEE
8-24-15

NOTE 1:
ALL KNOWN UTILITIES WERE FIELD LOCATED BY THE TDOT. ENGINEER TAKES NO RESPONSIBILITY AS TO THE ACCURACY OF THE LOCATION OR ACTUAL QUANTITIES OF UTILITIES SHOWN.

NOTE 2:
CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ALL MATERIALS, LABOR AND EQUIPMENT TO PROPERLY HYDROSTATICALLY TEST THE SEWER LINE INSTALLATION. CONTRACTOR SHALL WORK CLOSELY WITH THE CITY OF CROSSVILLE REPRESENTATIVES PERTAINING TO THE INSTALLATION OF ALL NEW SEWER LINES.

FAIRFIELD GLADE COMMUNITY CLUB MAY BE CONTACTED AT 931-484-3780.

FAIRFIELD GLADE COMMUNITY CLUB
P.O. BOX 2000 FAIRFIELD GLADE, TENNESSEE 38558

S.R. 101 (PEAVINE ROAD) SEWERLINE RELOCATION

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DETAILED SPECIFICATIONS