

| | | |
|--------------------|---------------|-----------|
| TENN. | YEAR | SHEET NO. |
| | 2015 | U1-1 |
| FED. AID PROJ. NO. | STP/NH-7(16) | |
| STATE PROJ. NO. | 28002-3223-14 | |

| INDEX OF SHEETS | |
|-----------------------------------|---------------|
| SHEET NAME | SHEET NUMBER |
| UTILITIES INDEX, UTILITIES OWNERS | UI-1 TO UI-13 |
| TARPLEY SHOP UTILITY DISTRICT | U2-1 TO U2-15 |
| CITY OF PULASKI WATER | U3-1 TO U3-12 |
| CITY OF PULASKI SEWER | U4-1 TO U4-14 |
| CITY OF PULASKI GAS | U5-1 TO U5-17 |

STATE OF TENNESSEE DEPARTMENT OF TRANSPORTATION BUREAU OF ENGINEERING

GILES COUNTY

SR 7 (US 31) FROM BUNKER HILL ROAD TO SR 15 (US 64 - PULASKI BYPASS)

STATE HIGHWAY NO. 7 F.A.H.S. NO. 31

STANDARD LEGEND

EXISTING UTILITIES

| | |
|---|------------------------|
| POWER ——— P ——— P ——— P ——— | POWER POLE ⊕ |
| UNDERGROUND POWER ——— P (UG) ——— | TELEPHONE POLE ⊕ |
| TELEPHONE ——— T ——— T ——— T ——— | POWER/TELEPHONE POLE ⊕ |
| UNDERGROUND TELEPHONE ——— T (UG) ——— | MANHOLE ⊕ |
| WATER ——— W ——— W ——— W ——— | WATER METER □ W.M. |
| CABLE TV ——— C ——— C ——— C ——— | WATER VALVE □ W.V. |
| UNDERGROUND CABLE TV ——— C (UG) ——— | LIGHT POLE ⊕ |
| SANITARY SEWER ——— SA ——— SA ——— SA ——— | |
| GAS ——— G ——— G ——— G ——— | |
| FORCE MAIN SEWER ——— FMS ——— FMS ——— | |
| POWER/TELEPHONE/CABLE ——— P/T/C ——— | |

PROPOSED UTILITIES

| | |
|---|------------------------|
| POWER ——— P ——— P ——— P ——— | POWER POLE ● P |
| UNDERGROUND POWER ——— P (UG) ——— | TELEPHONE POLE ● T |
| TELEPHONE ——— T ——— T ——— T ——— | WATER METER ■ W.M. |
| UNDERGROUND TELEPHONE ——— T (UG) ——— | WATER VALVE □ W.V. |
| WATER ——— W ——— W ——— W ——— | FIRE HYDRANT ■ F.H. |
| POWER/TELEPHONE/CABLE ——— P/T/C ——— | GAS VALVE ■ G.V. |
| GAS ——— G ——— G ——— G ——— | GAS METER ■ G.M. |
| SANITARY SEWER ——— SA ——— SA ——— SA ——— | |

UTILITY OWNERS AND CONTACTS

| | | | |
|-------------------------|---|-------------------|---|
| POWER: | PULASKI ELECTRIC 128 SOUTH 1ST STREET PULASKI, TN 38478 RICHARD KELLEY (931) 363-7011 | WATER: | TARPLEY SHOP UTILITY DISTRICT 1202 CARROLL STREET PULASKI, TN 38478 CLEVELAND BYRD (931) 363-6229 |
| GAS: | CITY OF PULASKI 203 SOUTH 1ST STREET PULASKI, TN 38478 BUDDY BUSBY (931) 363-1752 | TELEPHONE: | AT&T 116 SOUTH CANON AVENUE MURFREESBORO, TN 37129 KENNETH LEE KORNEGAY (615) 848-2082 |
| WATER AND SEWER: | CITY OF PULASKI 203 SOUTH 1ST STREET PULASKI, TN 38478 CURT ALSUP (931) 363-2147 | CABLE: | CHARTER COMMUNICATIONS 215 INDUSTRIAL BOULEVARD TULLAHOMA, TN 37388 RICHARD RIDDLE (931) 461-4315 |

SPECIAL NOTES

SOME UTILITIES CAN BE LOCATED BY CALLING THE
TENNESSEE ONE CALL SYSTEM, INC.
AT 1-800-351-1111

| TYPE | YEAR | PROJECT NO. | SHEET NO. |
|--------|------|--------------|-----------|
| CONST. | 2015 | STP/NH-7(16) | U1-2 |
| | | | |
| | | | |

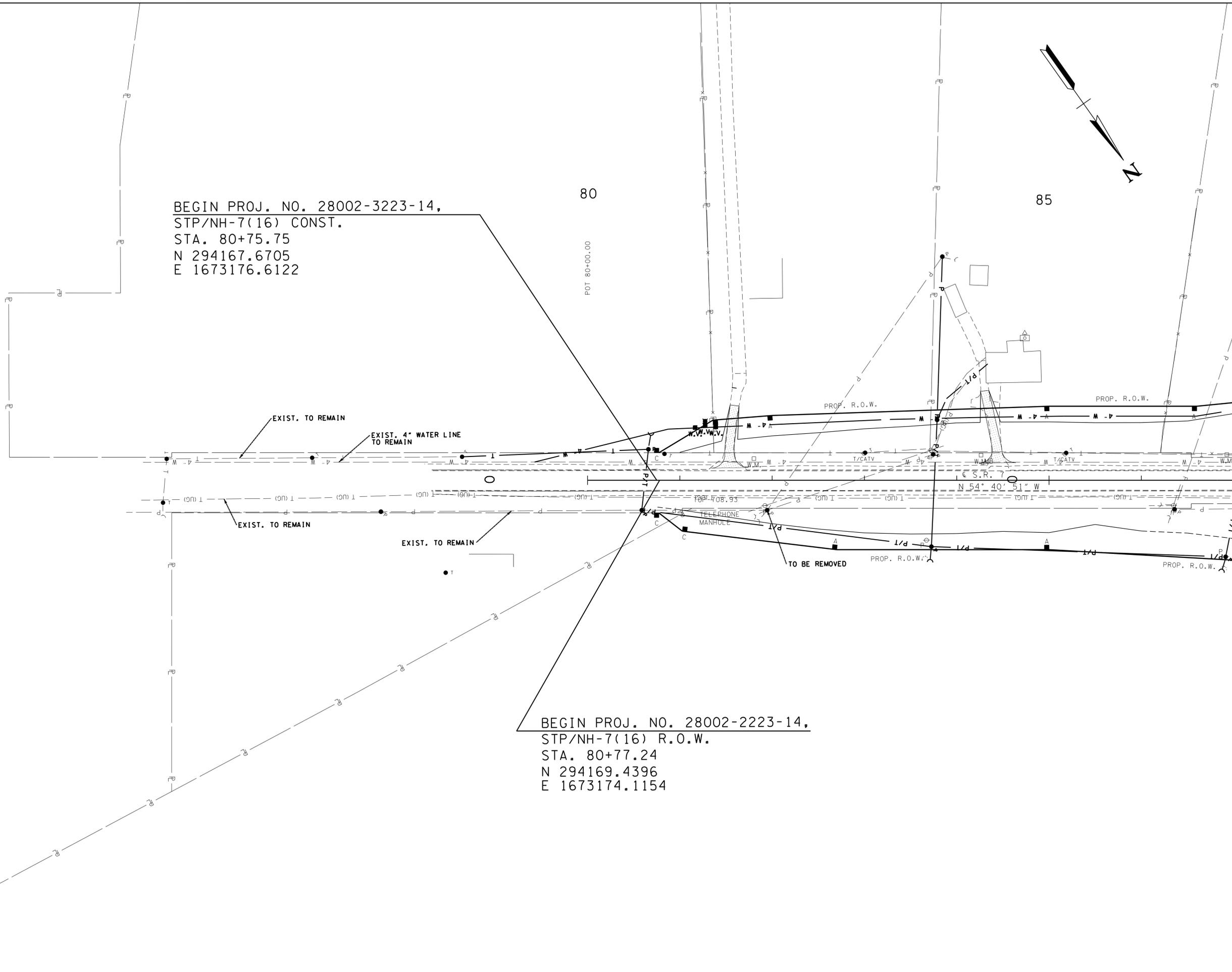
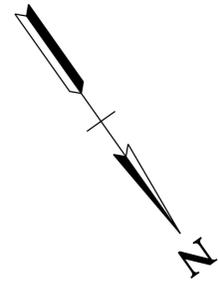
REV. 11-11-04; REVISED PROPERTY OWNER NAMES FOR TRACT NO. 1G & 1H.

BEGIN PROJ. NO. 28002-3223-14,
STP/NH-7(16) CONST.
STA. 80+75.75
N 294167.6705
E 1673176.6122

80

85

POT 80+00.00



EXIST. TO REMAIN

EXIST. 4" WATER LINE TO REMAIN

EXIST. TO REMAIN

EXIST. TO REMAIN

TO BE REMOVED

BEGIN PROJ. NO. 28002-2223-14,
STP/NH-7(16) R.O.W.
STA. 80+77.24
N 294169.4396
E 1673174.1154

MATCH LINE STA. 87+00 SEE SHEET NO. U1-3

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COORDINATE VALUES ARE NAD/83 (1995) AND ARE DATUM ADJUSTED BY THE FACTOR 1.000011 & TIED TO THE TGRN.

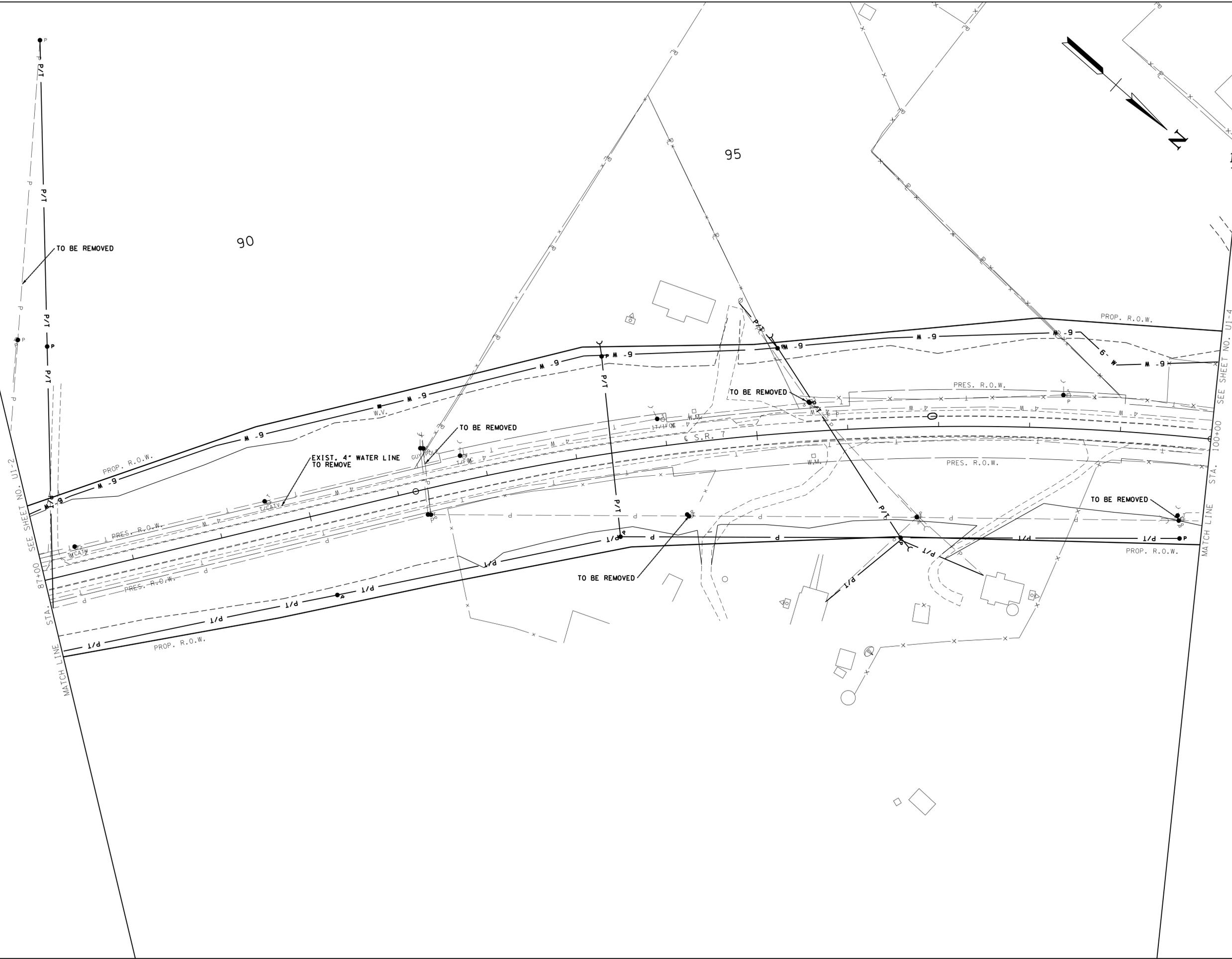
STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

UTILITIES

STA. 80+00 TO STA. 87+00

SCALE: 1" = 50'

| TYPE | YEAR | PROJECT NO. | SHEET NO. |
|--------|------|--------------|-----------|
| CONST. | 2015 | STP/NH-7(16) | U1-3 |
| | | | |
| | | | |



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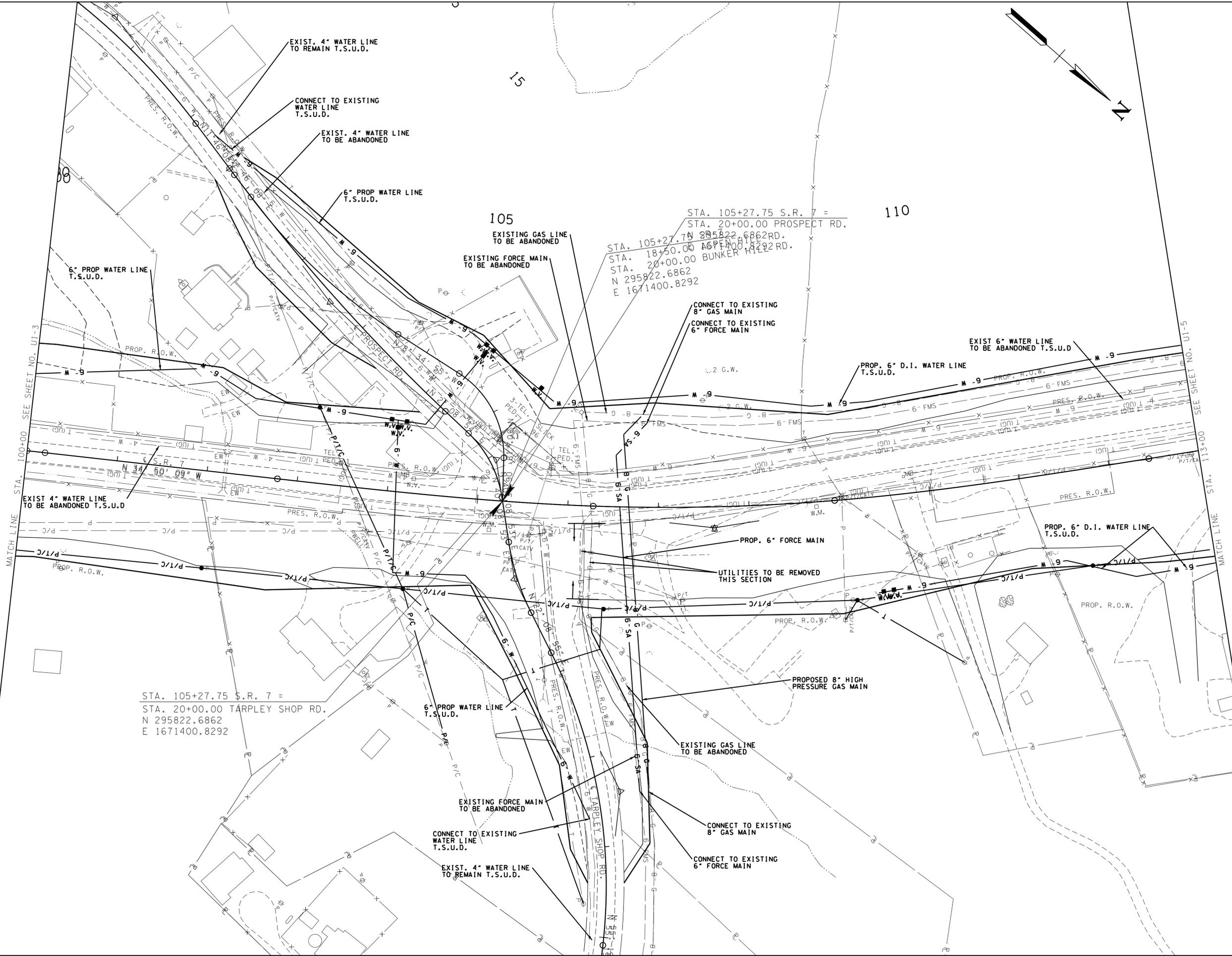
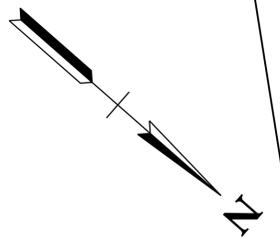
STATE OF TENNESSEE
 DEPARTMENT OF TRANSPORTATION
 BUREAU OF PLANNING & DEVELOPMENT

UTILITIES

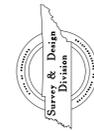
STA. 87+00 TO STA. 100+00

SCALE: 1" = 50'

| TYPE | YEAR | PROJECT NO. | SHEET NO. |
|--------|------|--------------|-----------|
| CONST. | 2015 | STP/NH-7(16) | U1-4 |
| | | | |
| | | | |



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AREA TO BE SCARIFIED AND OBLITERATED

COORDINATE VALUES ARE NAD/83 (1995) AND ARE DATUM ADJUSTED BY THE FACTOR 1.000011 & TIED TO THE TGRN.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

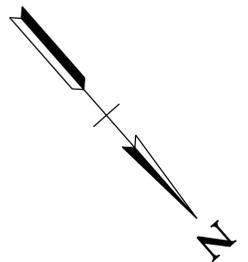
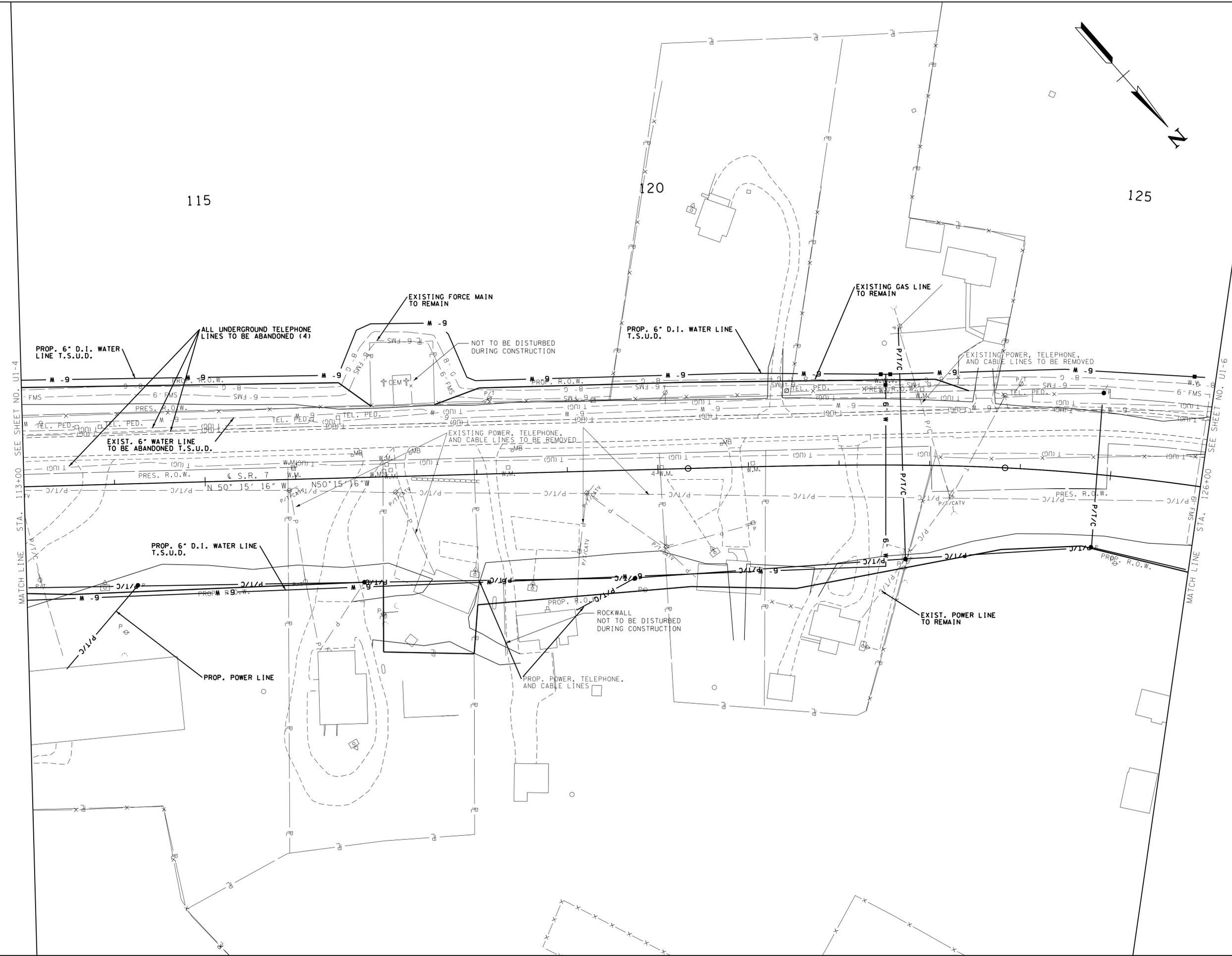
UTILITIES

STA. 100+00 TO STA. 113+00

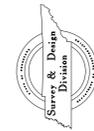
SCALE: 1" = 50'

| TYPE | YEAR | PROJECT NO. | SHEET NO. |
|--------|------|--------------|-----------|
| CONST. | 2015 | STP/NH-7(16) | U1-5 |
| | | | |
| | | | |

REV. 11-11-04: WIDENED DRIVE TO TRACT 16.
REV. 11-28-05: RELOCATED PVT DR TO TRACT 18



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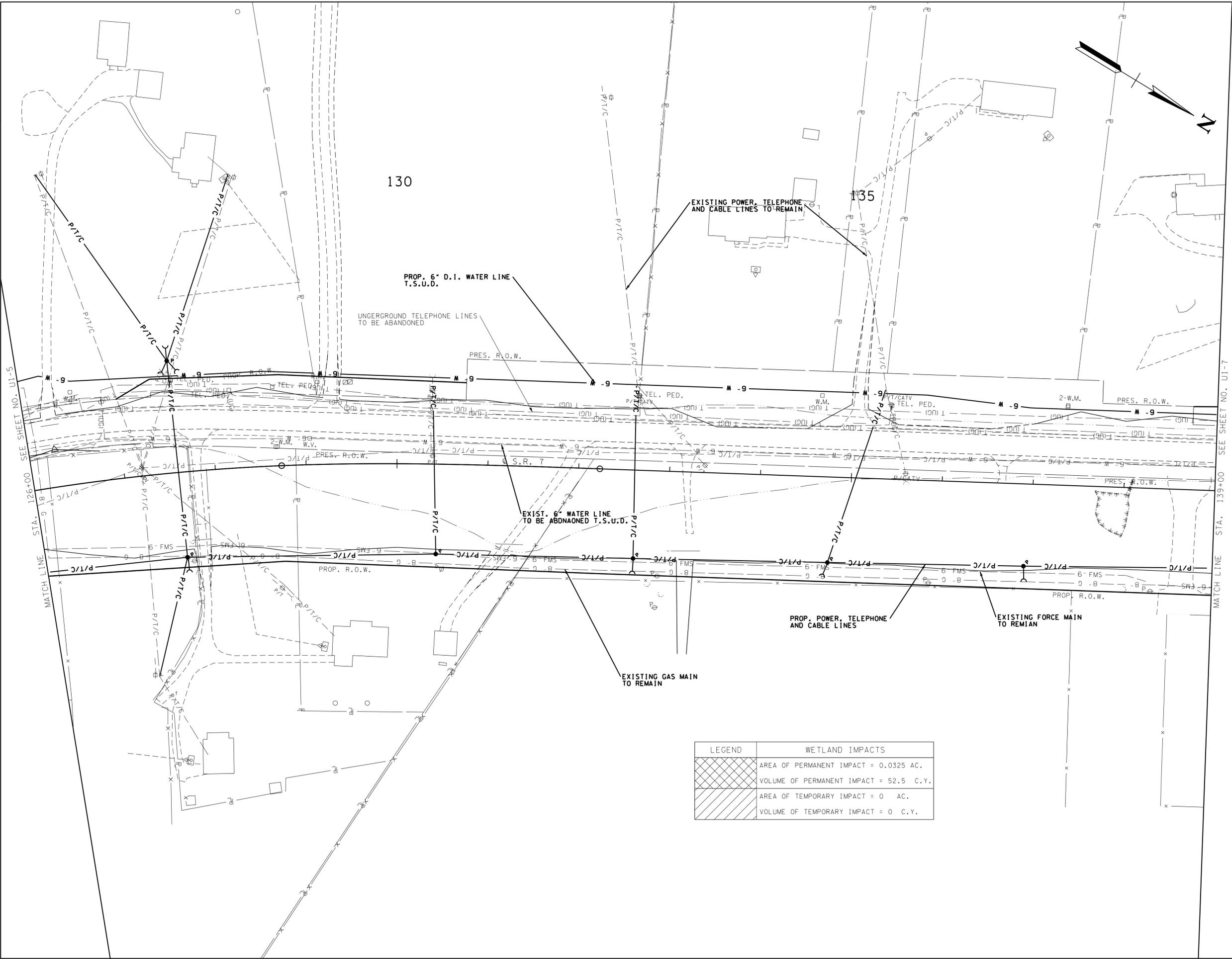
STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

UTILITIES

STA. 113+00 TO STA. 126+00

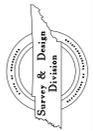
SCALE: 1" = 50'

| TYPE | YEAR | PROJECT NO. | SHEET NO. |
|--------|------|--------------|-----------|
| CONST. | 2015 | STP/NH-7(16) | U1-6 |
| | | | |
| | | | |



| LEGEND | WETLAND IMPACTS |
|--------|---|
| | AREA OF PERMANENT IMPACT = 0.0325 AC. VOLUME OF PERMANENT IMPACT = 52.5 C.Y. |
| | AREA OF TEMPORARY IMPACT = 0 AC. VOLUME OF TEMPORARY IMPACT = 0 C.Y. |

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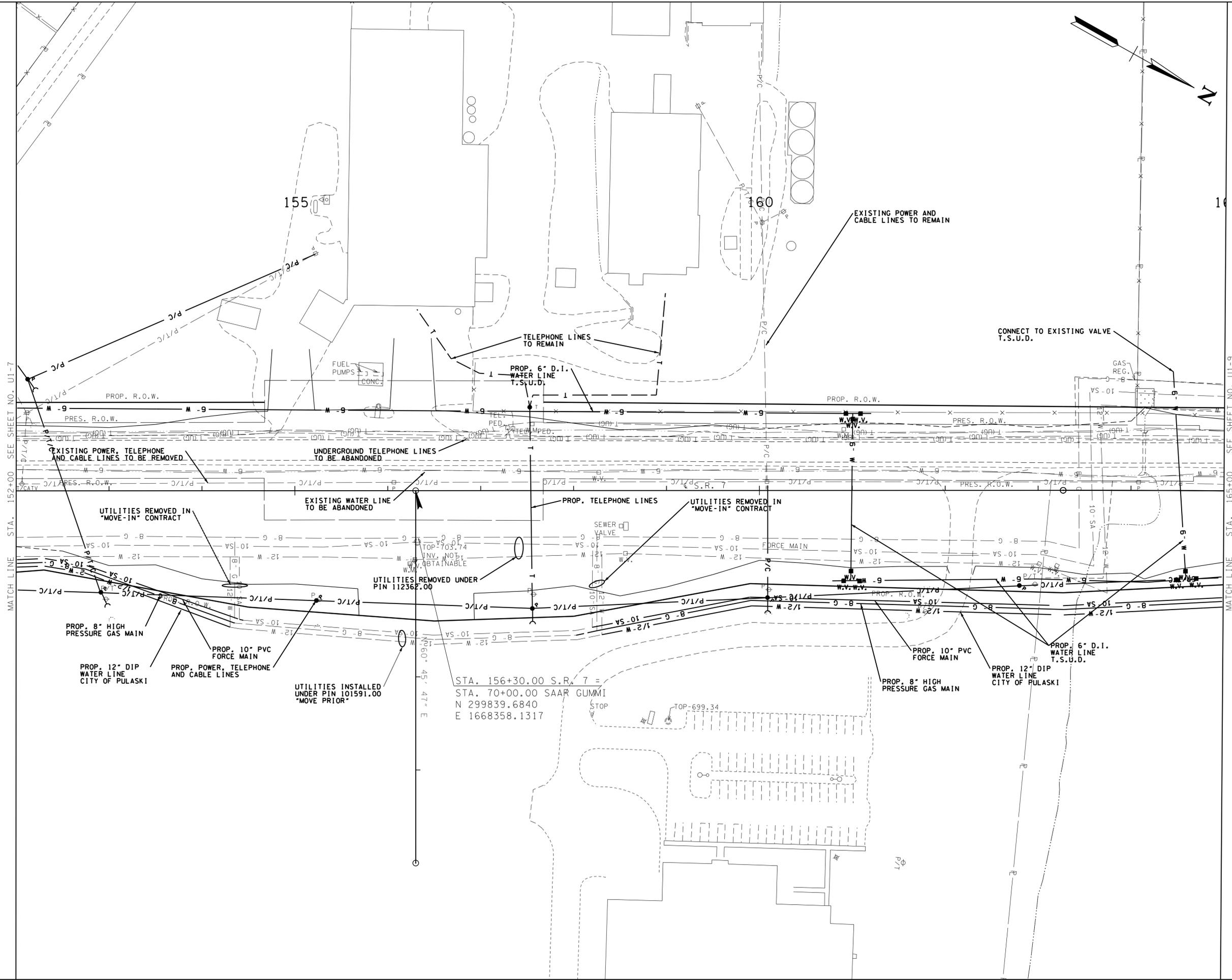
STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

UTILITIES

STA. 126+00 TO STA. 139+00

SCALE: 1" = 50'

| TYPE | YEAR | PROJECT NO. | SHEET NO. |
|--------|------|--------------|-----------|
| CONST. | 2015 | STP/NH-7(16) | U1-8 |
| | | | |
| | | | |



MATCH LINE STA. 152+00 SEE SHEET NO. U1-7

MATCH LINE STA. 165+00 SEE SHEET NO. U1-9

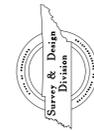
STA. 156+30.00 S.R. 7 =
STA. 70+00.00 SAAR GUMMI
N 299839.6840
E 1668358.1317

COORDINATE VALUES ARE NAD/83 (1995)
AND ARE DATUM ADJUSTED BY THE
FACTOR 1.000011 & TIED TO THE TGRN.

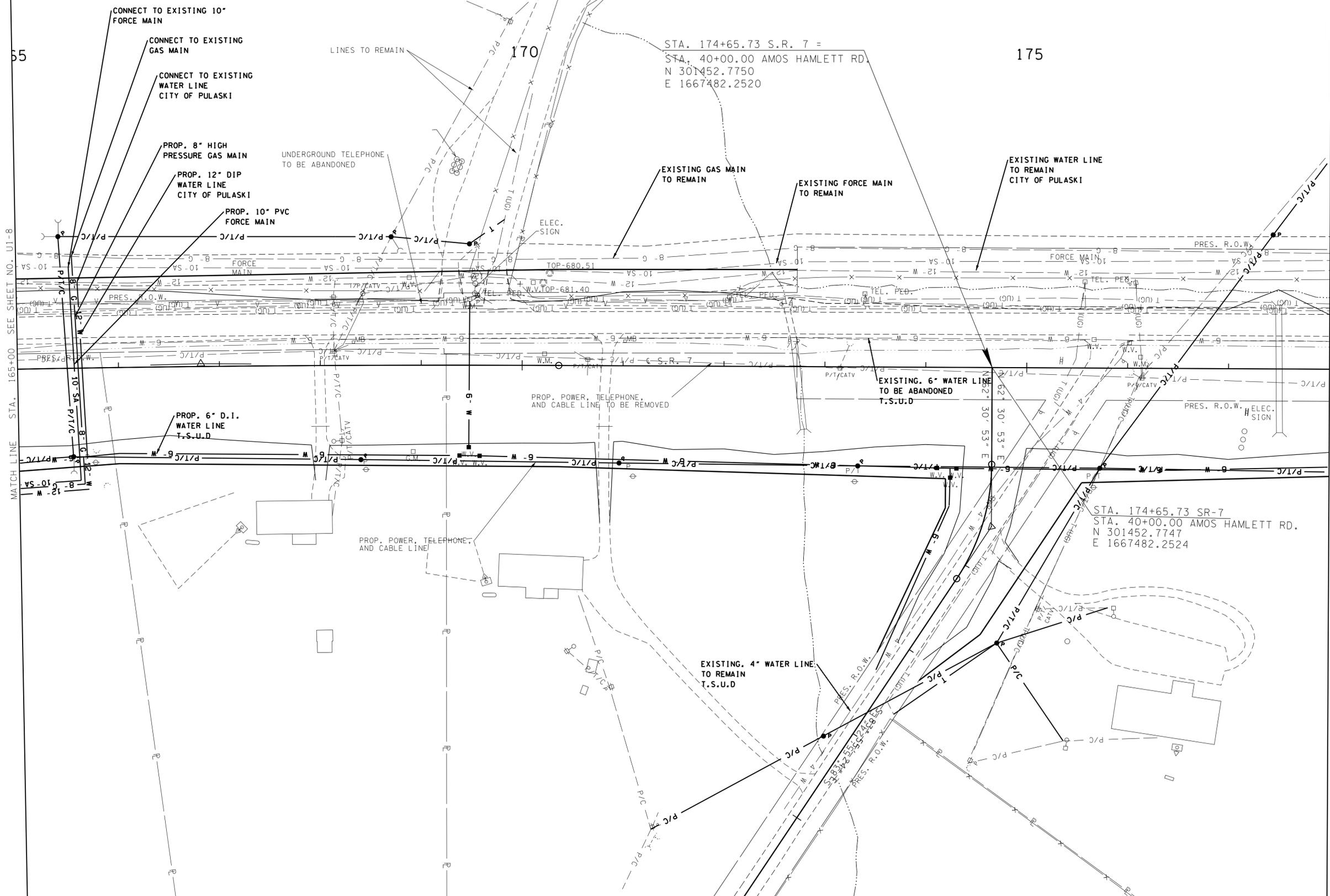
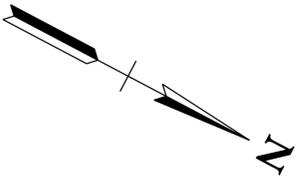
STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

UTILITIES
STA. 152+00 TO STA. 165+00
SCALE: 1" = 50'

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| TYPE | YEAR | PROJECT NO. | SHEET NO. |
|--------|------|--------------|-----------|
| CONST. | 2015 | STP/NH-7(16) | U1-9 |
| | | | |
| | | | |



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AND ARE DATUM ADJUSTED BY THE
FACTOR 1.000011 & TIED TO THE TGRN.

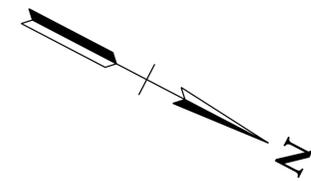
STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

UTILITIES

STA. 165+00 TO STA. 178+00

SCALE: 1" = 50'

| TYPE | YEAR | PROJECT NO. | SHEET NO. |
|--------|------|--------------|-----------|
| CONST. | 2015 | STP/NH-7(16) | U1-10 |
| | | | |
| | | | |

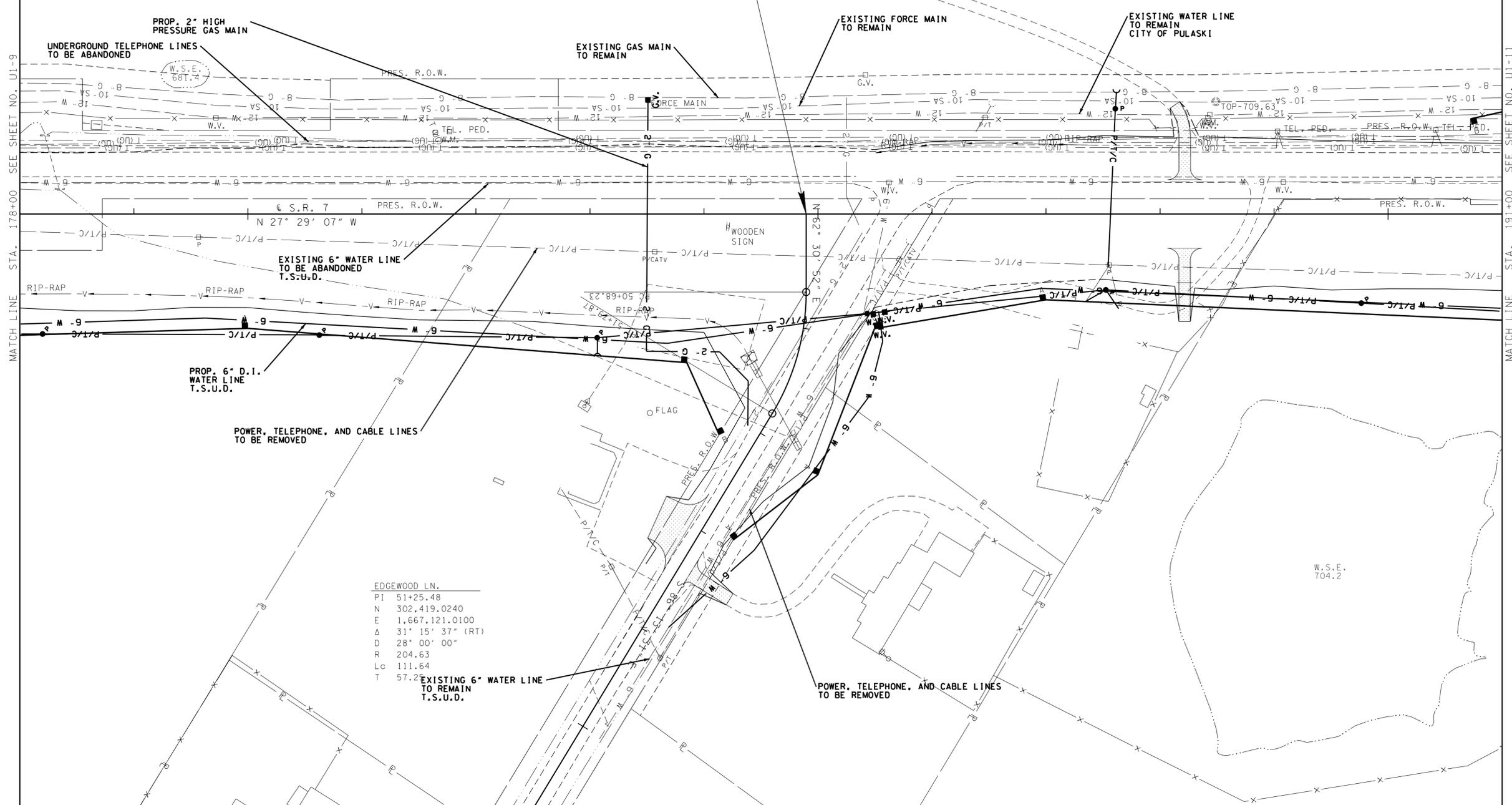


180

185

190

STA. 184+89.64 S.R. 7 =
STA. 50+00.00 EDGEWOOD LN.
N 302361.1143
E 1667009.6975



EDGEWOOD LN.
PI 51+25.48
N 302,419.0240
E 1,667,121.0100
Δ 31° 15' 37" (RT)
D 28° 00' 00"
R 204.63
Lc 111.64
T 57.2

MATCH LINE STA. 178+00 SEE SHEET NO. U1-9

MATCH LINE STA. 191+00 SEE SHEET NO. U1-11

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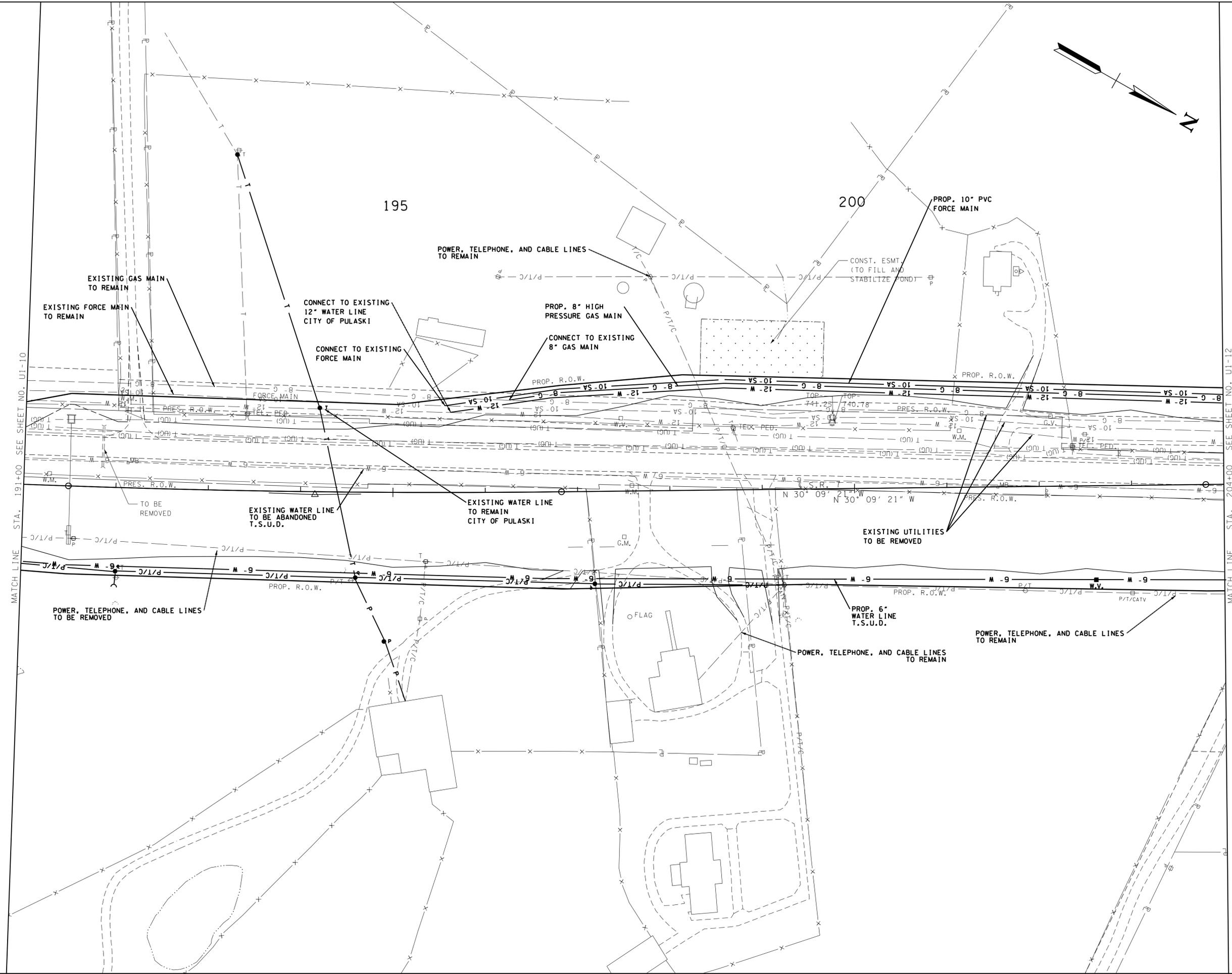
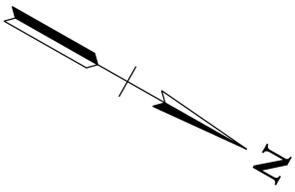
STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

UTILITIES

STA. 178+00 TO STA. 191+00

SCALE: 1" = 50'

| TYPE | YEAR | PROJECT NO. | SHEET NO. |
|--------|------|--------------|-----------|
| CONST. | 2015 | STP/NH-7(16) | U1-11 |
| | | | |
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COORDINATE VALUES ARE NAD/83 (1995)
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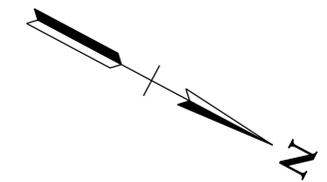
STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

UTILITIES

STA. 191+00 TO STA. 204+00

SCALE: 1" = 50'

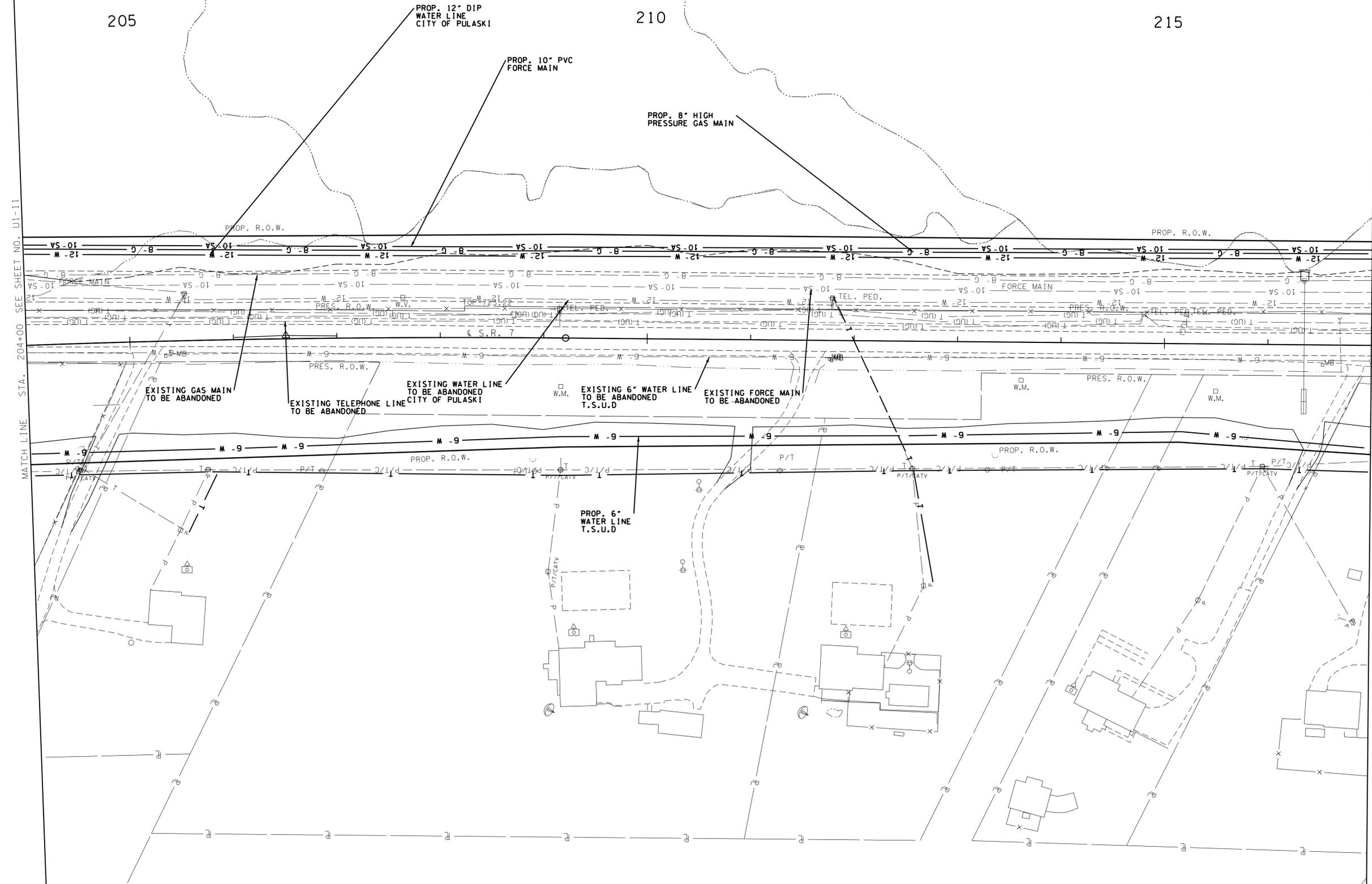
| TYPE | YEAR | PROJECT NO. | SHEET NO. |
|--------|------|--------------|-----------|
| CONST. | 2015 | STP/NH-7(16) | U1-12 |
| | | | |
| | | | |



205

210

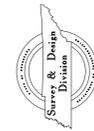
215



MATCH LINE STA. 204+00 SEE SHEET NO. U1-11

MATCH LINE STA. 217+00 SEE SHEET NO. U1-13

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COORDINATE VALUES ARE NAD/83 (1995)
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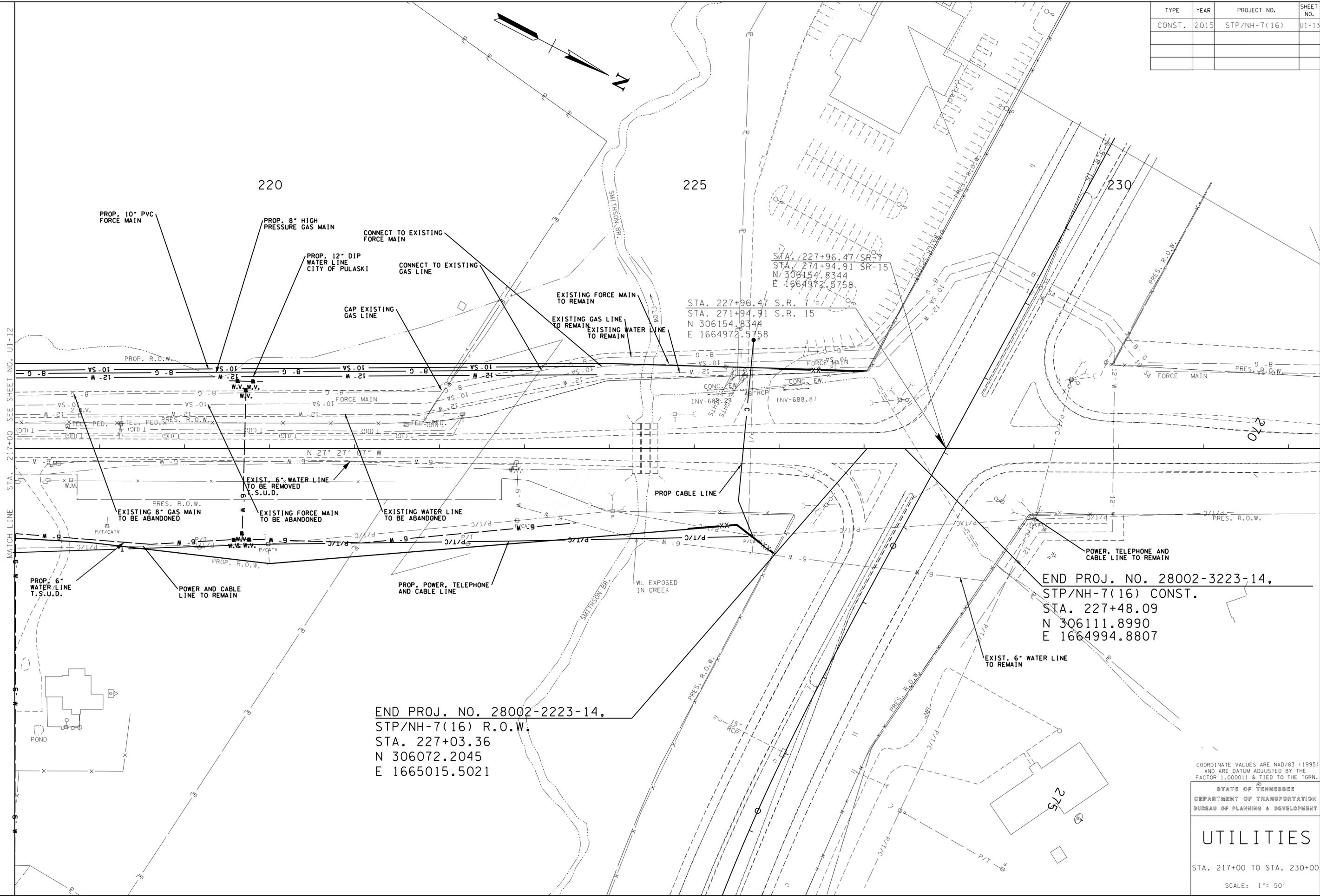
STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

UTILITIES

STA. 204+00 TO STA. 217+00

SCALE: 1" = 50'

| TYPE | YEAR | PROJECT NO. | SHEET NO. |
|--------|------|--------------|-----------|
| CONST. | 2015 | STP/NH-7(16) | U1-13 |
| | | | |
| | | | |



MATCH LINE STA. 217+00 SEE SHEET NO. U1-12

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END PROJ. NO. 28002-2223-14,
 STP/NH-7(16) R.O.W.
 STA. 227+03.36
 N 306072.2045
 E 1665015.5021

END PROJ. NO. 28002-3223-14,
 STP/NH-7(16) CONST.
 STA. 227+48.09
 N 306111.8990
 E 1664994.8807

COORDINATE VALUES ARE NAD/83 (1995)
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STATE OF TENNESSEE
 DEPARTMENT OF TRANSPORTATION
 BUREAU OF PLANNING & DEVELOPMENT

UTILITIES

STA. 217+00 TO STA. 230+00

SCALE: 1" = 50'

| TYPE | YEAR | PROJECT NO. | SHEET NO. |
|--------|------|--------------|-----------|
| CONST. | 2015 | STP/NH-7(16) | U2-1 |
| | | | |
| | | | |

| T.S.U.D. UTILITY QUANTITIES | | | | | |
|-----------------------------|---|------|----------|-----------|----------|
| ITEM NO. | DESCRIPTION | UNIT | QUANTITY | % Utility | %Project |
| ① 795-01.04 | 6IN DIP SLIP JOINT WATER LINE | FT | 18000 | 95.00% | 5.00% |
| ① 795-01.26 | 2IN DIP SLIP JOINT WATER LINE | FT | 155 | 95.00% | 5.00% |
| ② 795-05.60 | BORE/JACK 6IN STEEL CASING PIPE-UNCON, | FT | 145 | 95.00% | 5.00% |
| ② 795-05.63 | BORE/JACK 12IN STEEL CASING PIPE-UNCON. | FT | 2165 | 95.00% | 5.00% |
| ③ 795-08.01 | 2IN GATE VALVE ASSEMBLY | EA | 1 | 95.00% | 5.00% |
| ③ 795-08.04 | 6IN GATE VALVE ASSEMBLY | EA | 44 | 95.00% | 5.00% |
| ④ 795-11.02 | FIRE HYDRANT ASSEMBLY | EA | 3 | 95.00% | 5.00% |
| ⑤ 795-13.01 | DI FITTINGS | LBS | 4565 | 95.00% | 5.00% |

GENERAL NOTES TO BE INCLUDED IN ALL UTILITY PLANS:

- EXCEPT FOR EROSION SEDIMENT CONTROL ITEMS, NO ROADWAY OR BRIDGE ITEMS SHALL BE UTILIZED TO COMPENSATE FOR WORK METHODS OR MATERIALS ASSOCIATED WITH AND/OR SPECIFIED FOR THE UTILITY INSTALLATION, EVEN THOUGH THE SAME OR SIMILAR ROADWAY OR BRIDGE MATERIALS MAY HAVE BEEN CALLED FOR IN THE UTILITY SPECIFICATIONS OR DRAWINGS.
- ALL MATERIALS, METHODS, AND/OR INTEGRAL MATERIALS OUTLINED IN THE UTILITY SPECIFICATIONS OR DRAWING NECESSARY TO PROVIDE A COMPLETE AND FUNCTIONAL INSTALLATION MUST BE INCLUDED IN THE UNIT PRICE FOR THE ASSOCIATED UTILITY WORK ITEM.
- THE CONTRACTOR MUST MAINTAIN ALL SERVICES DURING THE CONSTRUCTION OF THE FACILITY. ANY COSTS ASSOCIATED WITH INSTALLATION OF REQUIRED TEMPORARY SERVICE LINES DUE TO THE ROADWAY CONSTRUCTION SEQUENCE OF WORK (I.E., CUTS, FILLS, PHASING, ETC.) SHALL BE INCLUDED IN THE COST OF THE PERMANENT UTILITY ITEMS. (NOTE TO UTILITY: THE UTILITY RELOCATION PLANS SHALL PROVIDE TO THE CONTRACTOR THE UTILITY 5*32S REQUIREMENTS FOR TEMPORARY TIE-INS (INCLUDING NECESSARY TESTING AND STERILIZATION TO ACCOMPLISH THE TIE-IN) AND ALSO ANY RESTRICTIONS FOR TAKING LINES OUT OF SERVICE. IF A TEMPORARY LINE WILL BE A MAJOR ITEM OF WORK, A SPECIFIC TEMPORIZATION PLAN AND ITEM MUST BE INCLUDED IN THE UTILITY 5*32S PLANS.)
- IT SHALL BE THE RESPONSIBILITY OF THE PRIME CONTRACTOR 5*32S SURVEYOR TO LAY OUT ALL THE FACILITIES BEING RELOCATED WITHIN THE CONTRACT.
- FOR BURIED UTILITIES, THE PRIME CONTRACTOR OR SUBCONTRACTOR SHALL BE REQUIRED TO PROVIDE TO THE UTILITY UPON COMPLETION OF THE UTILITY 5*32S RELOCATION WORK A SET OF AS-BUILT DRAWINGS FOR THEIR RECORDS. THESE AS-BUILT DRAWINGS SHOULD BE PREPARED AS THE JOB PROGRESSES TO ENSURE THEIR ACCURACY.
- WHERE EROSION CONTROL MEASURES ARE NEEDED FOR THE UTILITY RELOCATION WORK OCCURRING INSIDE OR OUTSIDE STATE RIGHT-OF-WAY, THE CONTRACTOR SHALL SUBMIT TO THE TDOT PROJECT SUPERVISOR FOR APPROVAL A PROPOSED EROSION AND SEDIMENT CONTROL PLAN PRIOR TO BEGINNING THE WORK. TDOT APPROVAL MUST BE RECEIVED BEFORE THE EROSION CONTROL PAY ITEMS FOR ROADWAY CONSTRUCTION CAN BE USED FOR ANY ADDITIONAL EROSION CONTROL MEASURES REQUIRED FOR THE UTILITY RELOCATION WORK.
- DRIVEWAY, SIDEWALK AND ROADWAY TEMPORARY RESTORATION SHALL BE PART OF THE IN-PLACE COST OF PLACING THE UTILITY ITEM WITHIN THE ROW. WHEN APPLICABLE, THE UTILITY RELOCATION PLANS WILL SHOW ANY STREAM CROSSINGS AND CROSS-SECTIONS OF THE STREAMS CROSSINGS WITH THE FOLLOWING NOTE:
- ANY EXCAVATION OF THE STREAM CHANNEL AREA SHALL BE SEPARATED FROM FLOWING WATER AND ACCOMPLISHED DURING LOW FLOW CONDITIONS. THIS SHALL BE ACCOMPLISHED BY THE USE OF FLUMES, LINED DIVERSION CHANNEL WITH SANDBAG BERM, DIVERSION PIPE WITH SANDBAG DAM AT PIPE INLET, OR IN SOME CASES COFFERDAMS. ALTERNATIVELY, BASED ON FIELD CONDITIONS AND CONTRACTOR SELECTION, THE UTILITY RELOCATION MAY BE ACCOMPLISHED USING BORE TECHNOLOGY WITH NO STREAM CHANNEL IMPACTS.

FOOTNOTES:

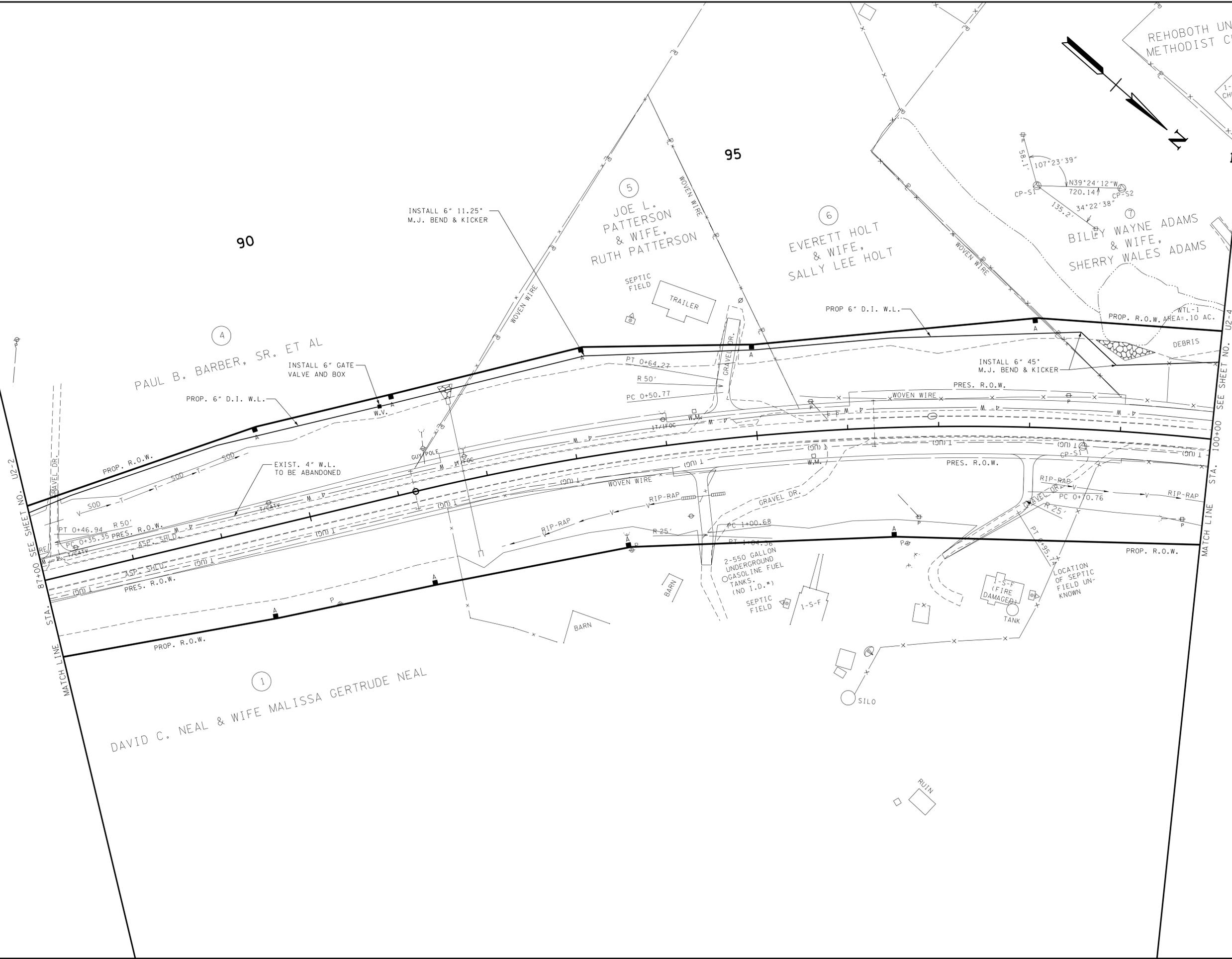
- INCLUDES ALL MATERIALS, LABOR, EQUIPMENT FOR COMPLETE INSTALLATION OF PIPE INCLUDING BUT NOT LIMITED TO TRAFFIC CONTROL, MATERIALS, EQUIPMENT, EXCAVATION IN BOTH UNCONSOLIDATED AND ROCK, REMOVAL AND REPLACEMENT OF UNSUITABLE SOIL, ENVELOPE/BEDDING MATERIAL, BACKFILLING, FLOWABLE FILL, THRUST BLOCKING, 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.
- 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.
- 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.
- 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.
- INCLUDES FITTINGS, GLANDS AND RESTRAINT DEVICES DESCRIBED IN POUNDS.



STATE OF TENNESSEE
 DEPARTMENT OF TRANSPORTATION

T.S.U.D.
 UTILITIES
 QUANTITIES

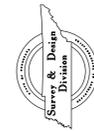
| TYPE | YEAR | PROJECT NO. | SHEET NO. |
|--------|------|--------------|-----------|
| CONST. | 2015 | STP/NH-7(16) | U2-3 |
| | | | |
| | | | |



MATCH LINE STA. 87+00 SEE SHEET NO. U2-2

MATCH LINE STA. 100+00 SEE SHEET NO. U2-4

8/12/2015 11:52:00 AM
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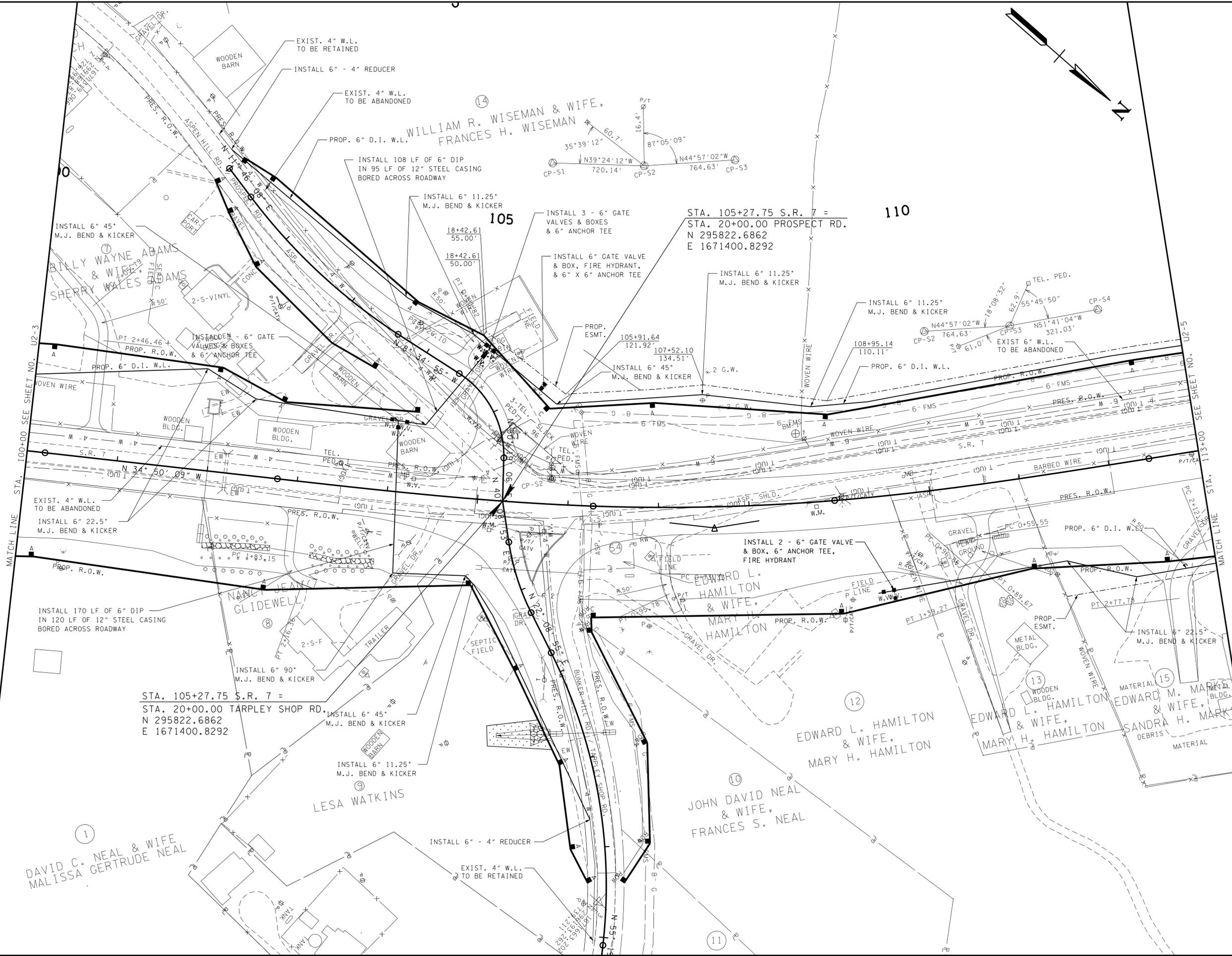
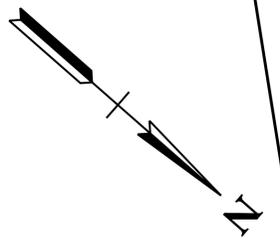


COORDINATE VALUES ARE NAD/83 (1995)
AND ARE DATUM ADJUSTED BY THE
FACTOR 1.000011 & TIED TO THE TGRN.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

**T.S.U.D.
UTILITIES
SHEET**
SCALE: 1" = 50'

| TYPE | YEAR | PROJECT NO. | SHEET NO. |
|--------|------|--------------|-----------|
| CONST. | 2015 | STP/NH-7(16) | U2-4 |
| | | | |
| | | | |



8/12/2015 11:52:35 AM
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COORDINATE VALUES ARE NAD/83 (1995)
AND ARE DATUM ADJUSTED BY THE
FACTOR 1.000011 & TIED TO THE TGRN.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

T.S.U.D.
UTILITIES
SHEET
SCALE: 1" = 50'

| TYPE | YEAR | PROJECT NO. | SHEET NO. |
|--------|------|--------------|-----------|
| CONST. | 2015 | STP/NH-7(16) | U2-5 |
| | | | |
| | | | |

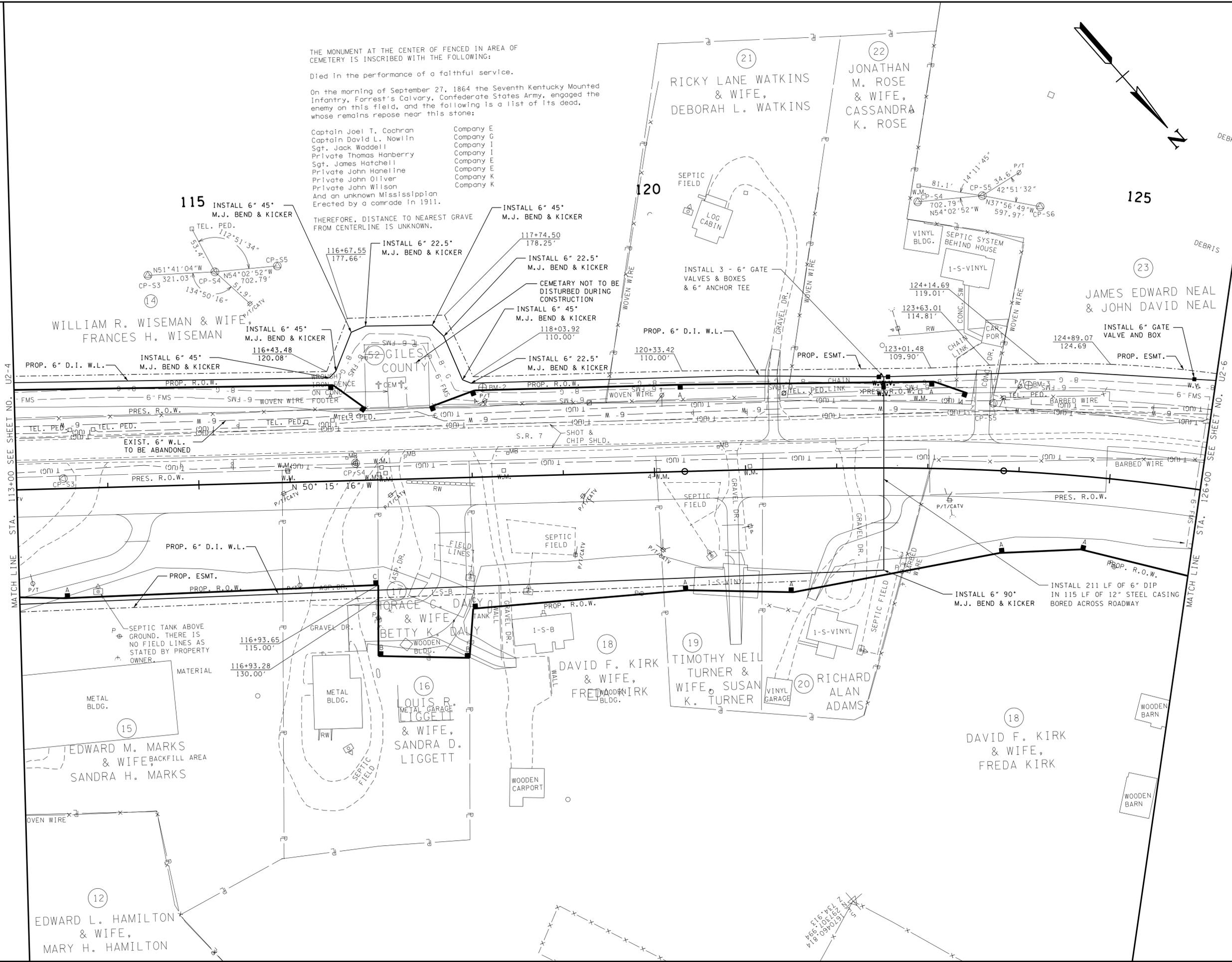
THE MONUMENT AT THE CENTER OF FENCED IN AREA OF CEMETERY IS INSCRIBED WITH THE FOLLOWING:

Died in the performance of a faithful service.

On the morning of September 27, 1864 the Seventh Kentucky Mounted Infantry, Forrest's Cavalry, Confederate States Army, engaged the enemy on this field, and the following is a list of its dead, whose remains repose near this stone:

- | | |
|------------------------------|-----------|
| Captain Joel T. Cochran | Company E |
| Captain David L. Nowlin | Company G |
| Sgt. Jack Waddell | Company I |
| Private Thomas Hanberry | Company I |
| Sgt. James Hatchell | Company E |
| Private John Haneline | Company E |
| Private John Oliver | Company K |
| Private John Wilson | Company K |
| And an unknown Mississippian | |

Erected by a comrade in 1911.
THEREFORE, DISTANCE TO NEAREST GRAVE FROM CENTERLINE IS UNKNOWN.



MATCH LINE STA. 113+00 SEE SHEET NO. U2-4

MATCH LINE STA. 126+00 SEE SHEET NO. U2-6

8/12/2015 11:53:45 AM
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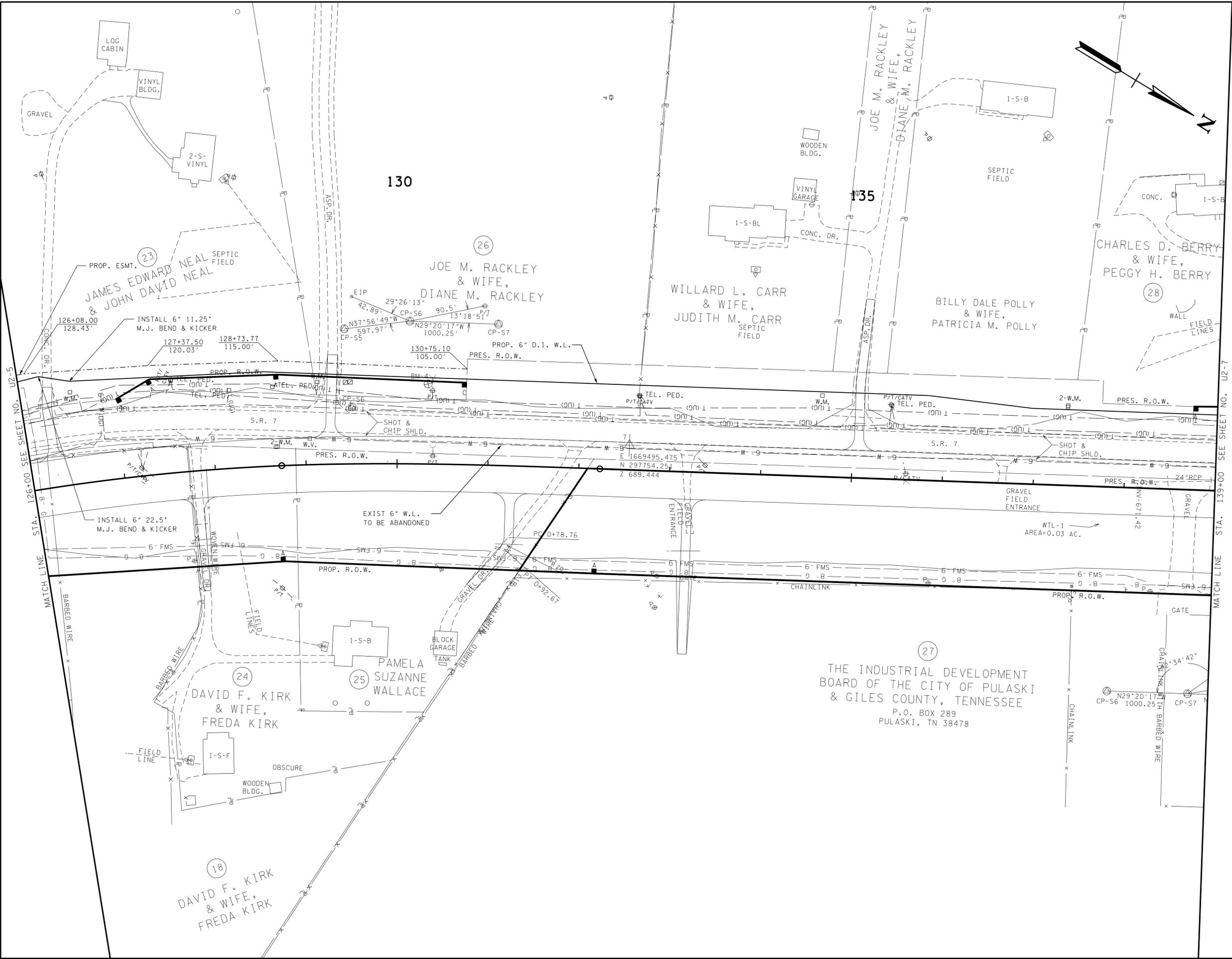


COORDINATE VALUES ARE NAD/83 (1995) AND ARE DATUM ADJUSTED BY THE FACTOR 1.000011 & TIED TO THE TGRN.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

T.S.U.D.
UTILITIES
SHEET
SCALE: 1" = 50'

| TYPE | YEAR | PROJECT NO. | SHEET NO. |
|--------|------|--------------|-----------|
| CONST. | 2015 | STP/NH-7(16) | U2-6 |
| | | | |
| | | | |



8/12/2015 11:54:18 AM
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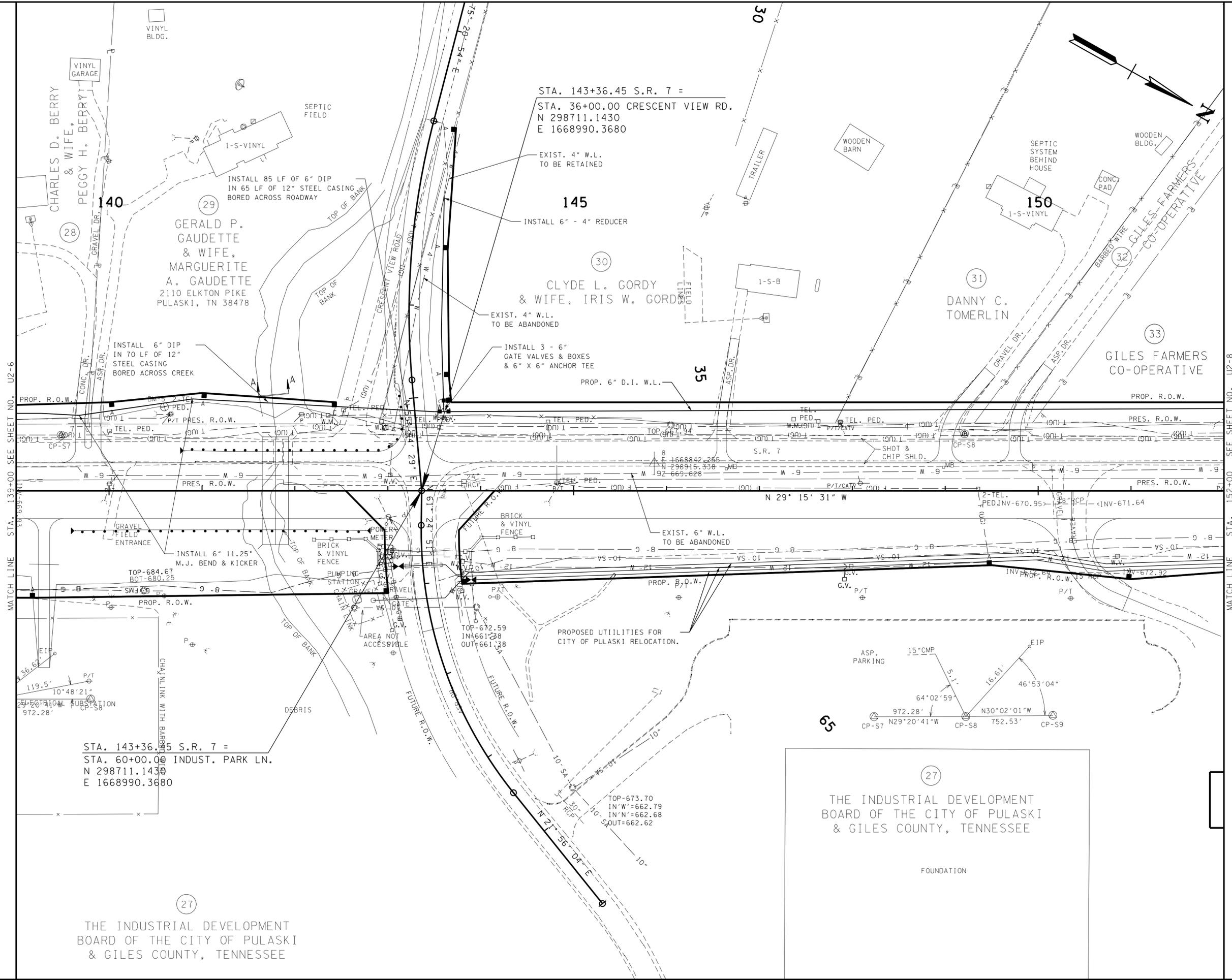


COORDINATE VALUES ARE NAD/83 (1995)
AND ARE DATUM ADJUSTED BY THE
FACTOR 1.000011 & TIED TO THE TGRN.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

T.S.U.D.
UTILITIES
SHEET
SCALE: 1" = 50'

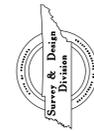
| TYPE | YEAR | PROJECT NO. | SHEET NO. |
|--------|------|--------------|-----------|
| CONST. | 2015 | STP/NH-7(16) | U2-7 |
| | | | |
| | | | |



MATCH LINE STA. 139+00 SEE SHEET NO. U2-6

MATCH LINE STA. 152+00 SEE SHEET NO. U2-8

8/12/2015 11:54:54 AM
P:\2003\03152\soin\structure\CAD\GISR007u2-07.sht



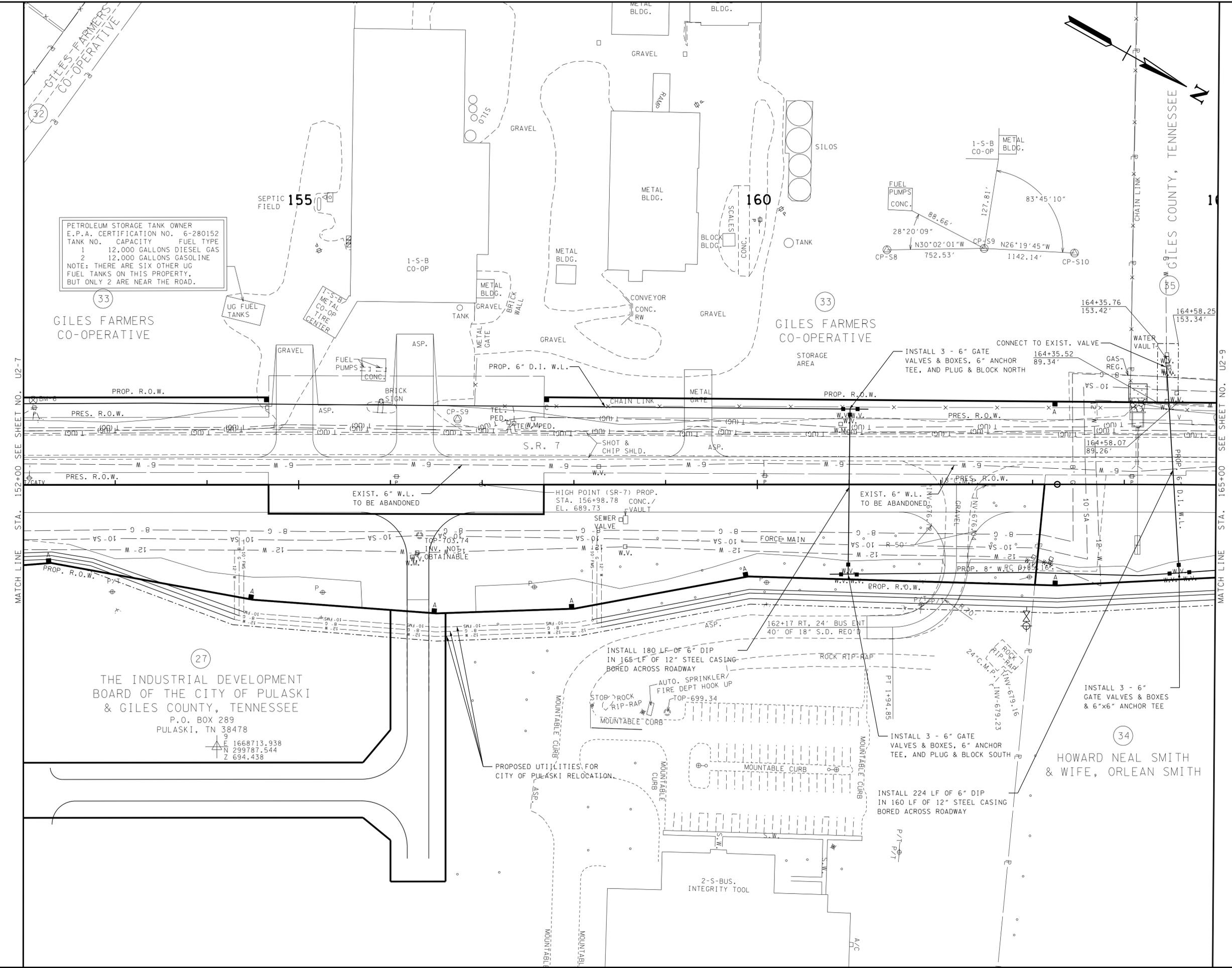
COORDINATE VALUES ARE NAD/83 (1995)
AND ARE DATUM ADJUSTED BY THE
FACTOR 1.000011 & TIED TO THE TGRN.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

T.S.U.D.
UTILITIES
SHEET
SCALE: 1" = 50'

(27)
THE INDUSTRIAL DEVELOPMENT
BOARD OF THE CITY OF PULASKI
& GILES COUNTY, TENNESSEE
FOUNDATION

| TYPE | YEAR | PROJECT NO. | SHEET NO. |
|--------|------|--------------|-----------|
| CONST. | 2015 | STP/NH-7(16) | U2-8 |
| | | | |
| | | | |



PETROLEUM STORAGE TANK OWNER
E.P.A. CERTIFICATION NO. 6-280152
TANK NO. CAPACITY FUEL TYPE
1 12,000 GALLONS DIESEL GAS
2 12,000 GALLONS GASOLINE
NOTE: THERE ARE SIX OTHER UG
FUEL TANKS ON THIS PROPERTY,
BUT ONLY 2 ARE NEAR THE ROAD.

27
THE INDUSTRIAL DEVELOPMENT
BOARD OF THE CITY OF PULASKI
& GILES COUNTY, TENNESSEE
P.O. BOX 289
PULASKI, TN 38478
E 1668713.938
N 299787.544
Z 694.438

34
HOWARD NEAL SMITH
& WIFE, ORLEAN SMITH

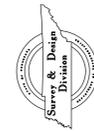


COORDINATE VALUES ARE NAD/83 (1995)
AND ARE DATUM ADJUSTED BY THE
FACTOR 1.000011 & TIED TO THE TGRN.

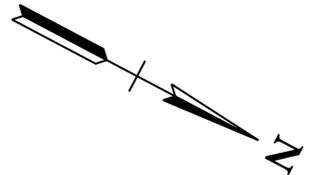
STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

T.S.U.D.
UTILITIES
SHEET
SCALE: 1" = 50'

8/12/2015 1:20:14 PM
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| TYPE | YEAR | PROJECT NO. | SHEET NO. |
|--------|------|--------------|-----------|
| CONST. | 2015 | STP/NH-7(16) | U2-9 |
| | | | |
| | | | |



55

35

170

175

37

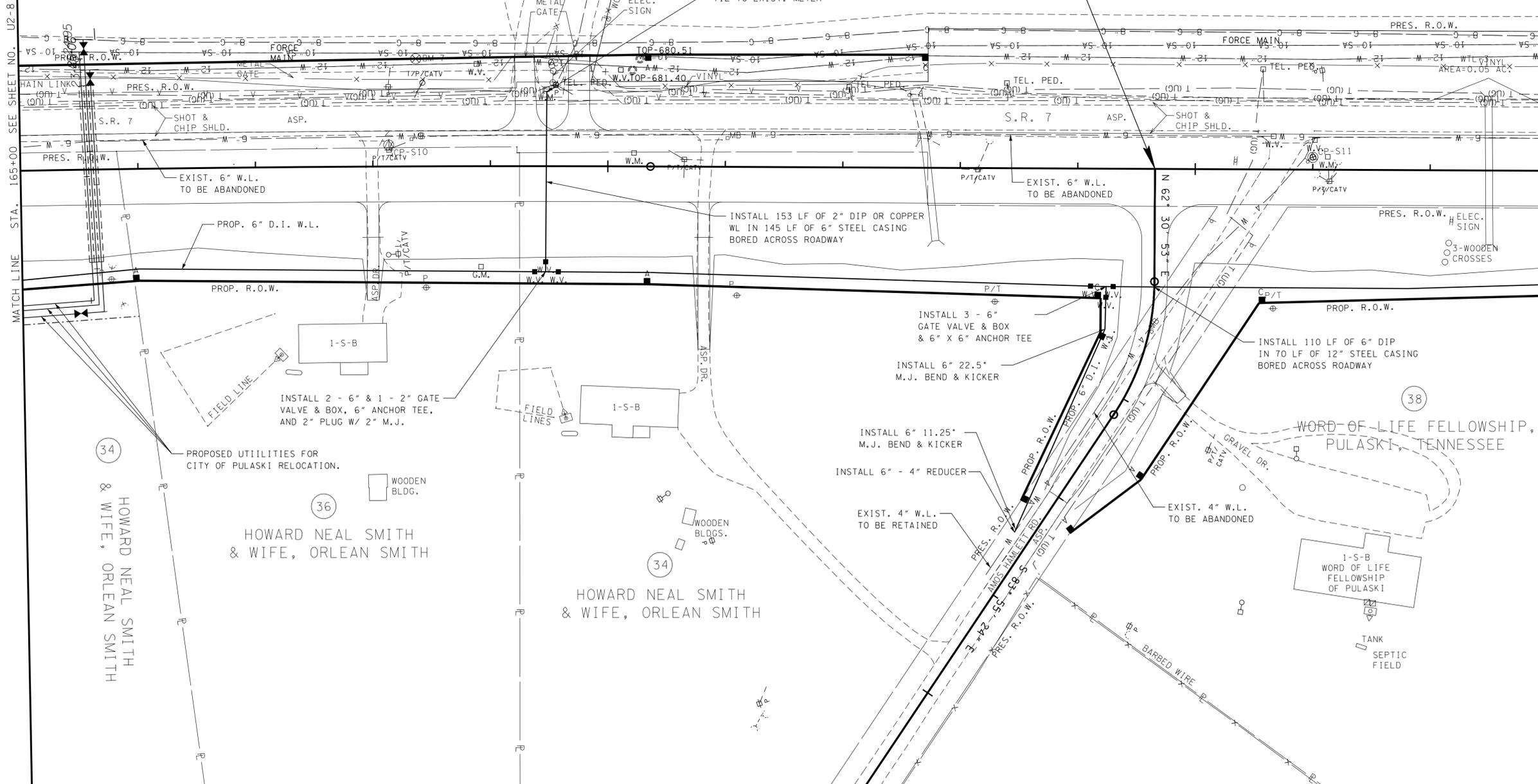
GILES COUNTY, TENNESSEE

WILLIAM RILEY RACKLEY II
& TRACI BROWN RACKLEY

MATCH LINE STA. 165+00 SEE SHEET NO. U2-8

MATCH LINE STA. 178+00 SEE SHEET NO. U2-10

STA. 174+65.73 S.R. 7 =
STA. 40+00.00 AMOS HAMLETT RD.
N 301452.7750
E 1667482.2520



34
HOWARD NEAL SMITH
& WIFE, ORLEAN SMITH

36
HOWARD NEAL SMITH
& WIFE, ORLEAN SMITH

34
HOWARD NEAL SMITH
& WIFE, ORLEAN SMITH

38
WORD OF LIFE FELLOWSHIP,
PULASKI, TENNESSEE

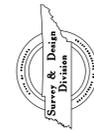


COORDINATE VALUES ARE NAD/83 (1995)
AND ARE DATUM ADJUSTED BY THE
FACTOR 1.000011 & TIED TO THE TGRN.

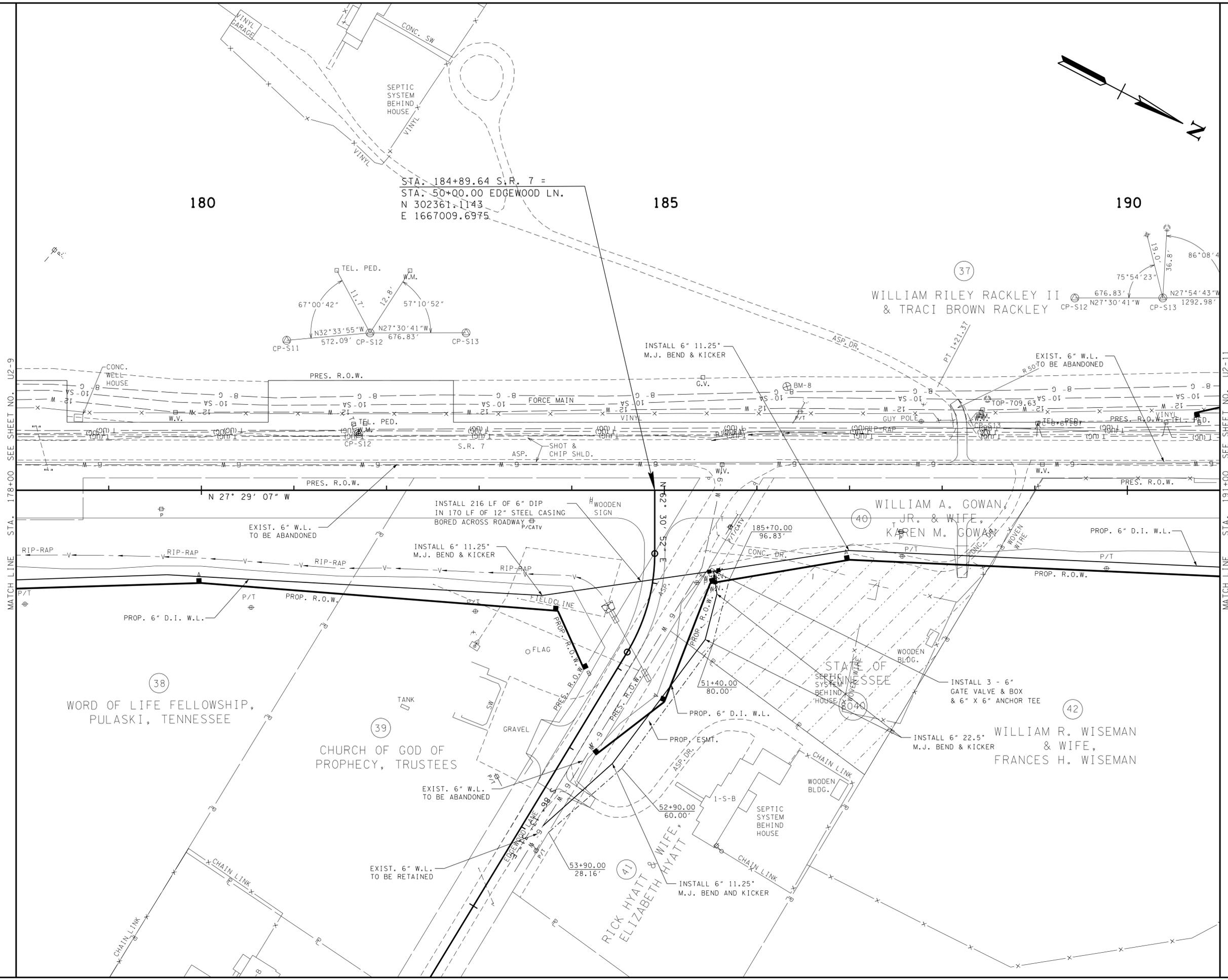
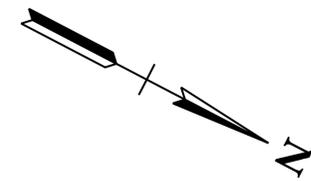
STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

T.S.U.D.
UTILITIES
SHEET

SCALE: 1" = 50'



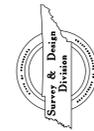
| TYPE | YEAR | PROJECT NO. | SHEET NO. |
|--------|------|--------------|-----------|
| CONST. | 2015 | STP/NH-7(16) | U2-10 |
| | | | |
| | | | |



MATCH LINE STA. 178+00 SEE SHEET NO. U2-9

MATCH LINE STA. 191+00 SEE SHEET NO. U2-11

8/12/2015 11:56:49 AM
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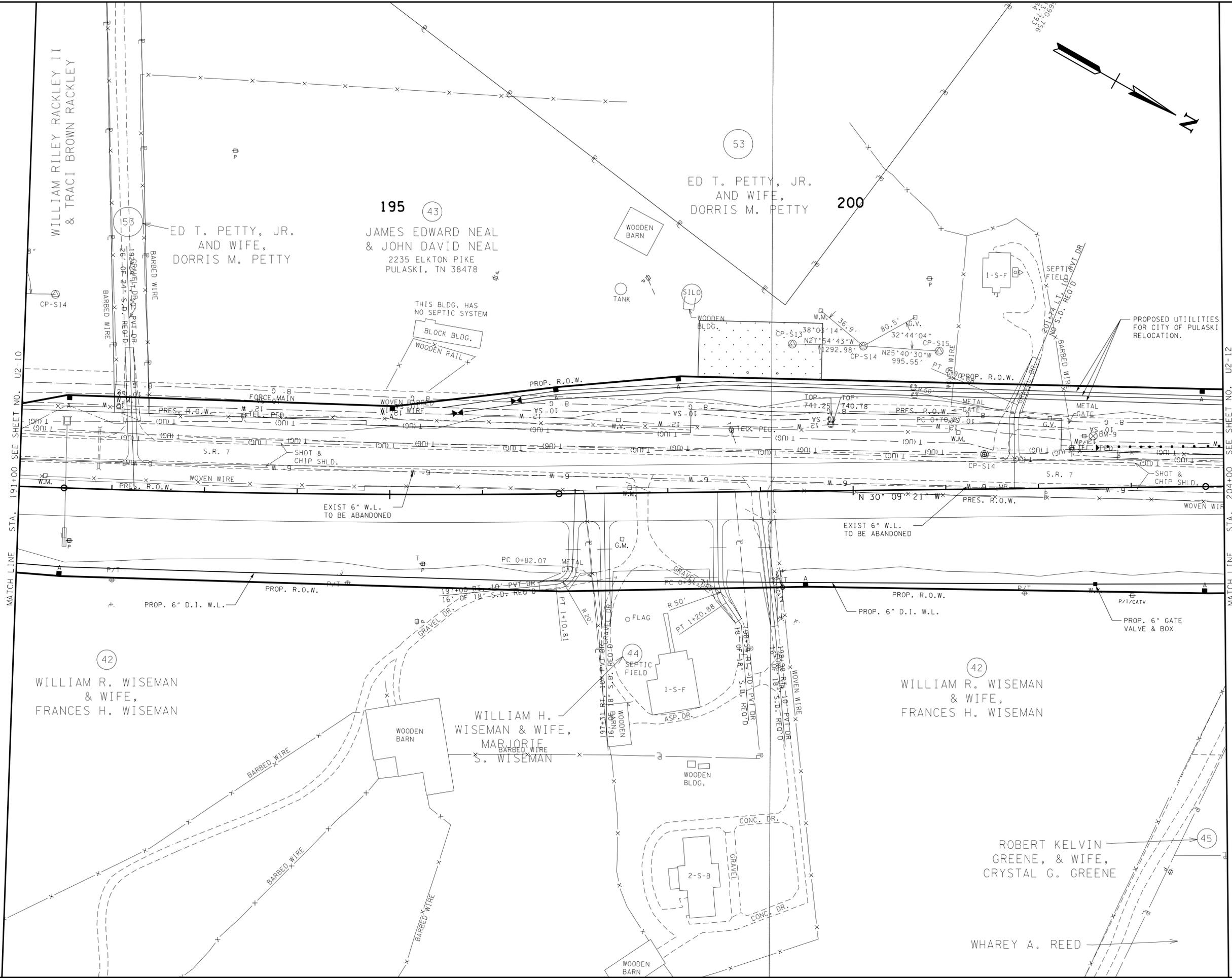
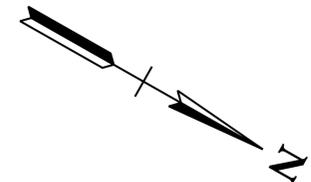


COORDINATE VALUES ARE NAD/83 (1995)
AND ARE DATUM ADJUSTED BY THE
FACTOR 1.000011 & TIED TO THE TGN.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

T.S.U.D.
UTILITIES
SHEET
SCALE: 1" = 50'

| TYPE | YEAR | PROJECT NO. | SHEET NO. |
|--------|------|--------------|-----------|
| CONST. | 2015 | STP/NH-7(16) | U2-11 |
| | | | |
| | | | |



8/12/2015 11:57:37 AM
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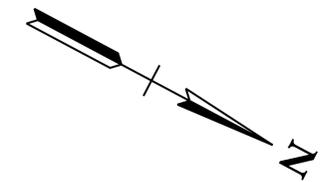


COORDINATE VALUES ARE NAD/83 (1995) AND ARE DATUM ADJUSTED BY THE FACTOR 1.000011 & TIED TO THE TGRN.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

T.S.U.D.
UTILITIES
SHEET
SCALE: 1" = 50'

| TYPE | YEAR | PROJECT NO. | SHEET NO. |
|--------|------|--------------|-----------|
| CONST. | 2015 | STP/NH-7(16) | U2-12 |
| | | | |
| | | | |



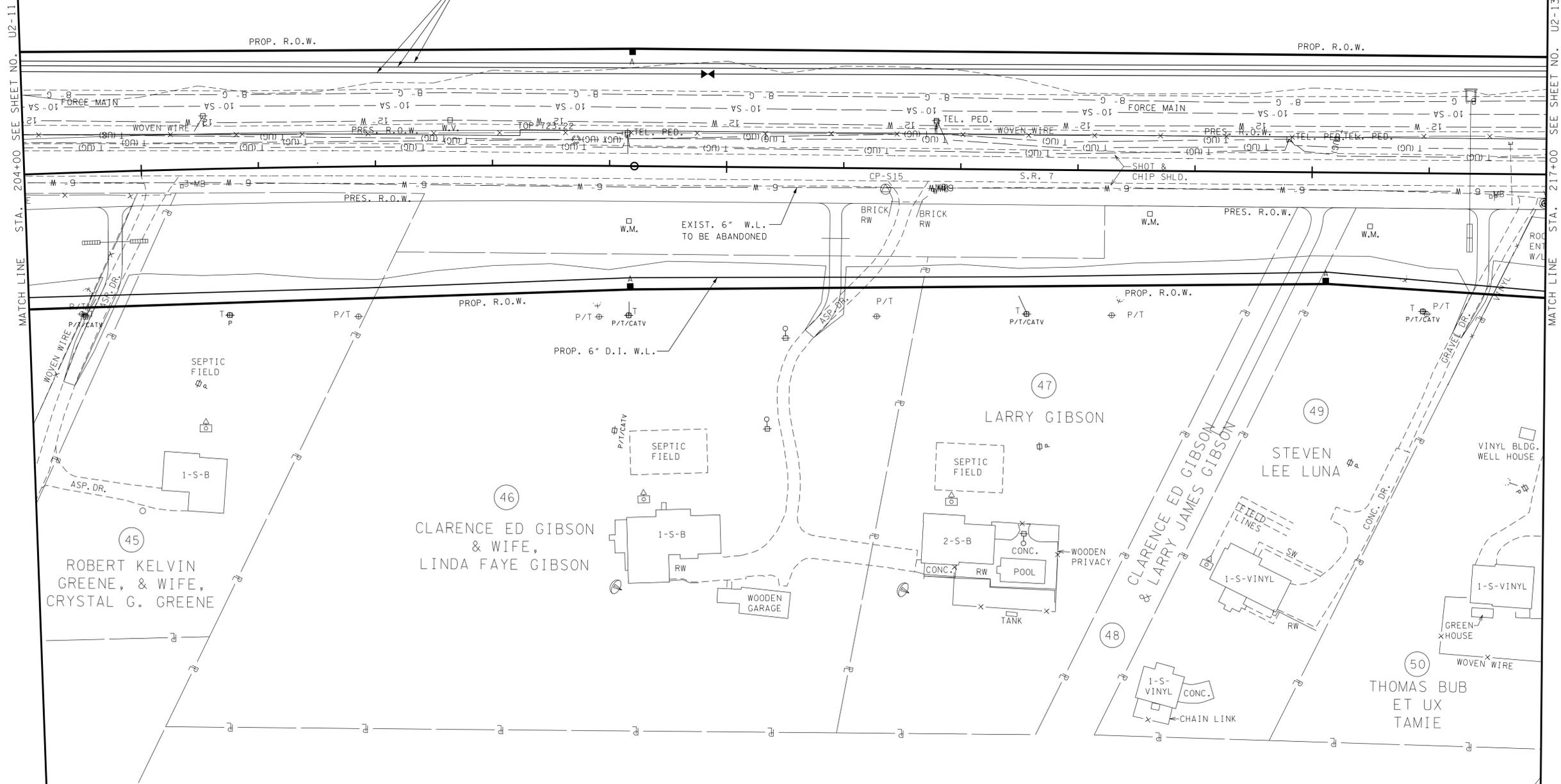
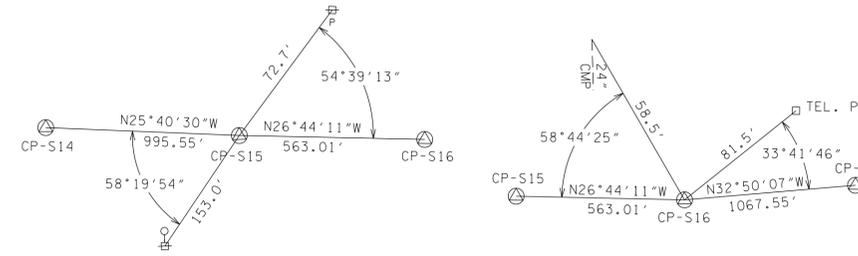
205

210

215

43
JAMES EDWARD NEAL
& JOHN DAVID NEAL
2235 ELKTON PIKE
PULASKI, TN 38478

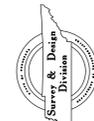
PROPOSED UTILITIES FOR
CITY OF PULASKI RELOCATION.



MATCH LINE STA. 204+00 SEE SHEET NO. U2-11

MATCH LINE STA. 217+00 SEE SHEET NO. U2-13

8/12/2015 11:58:12 AM
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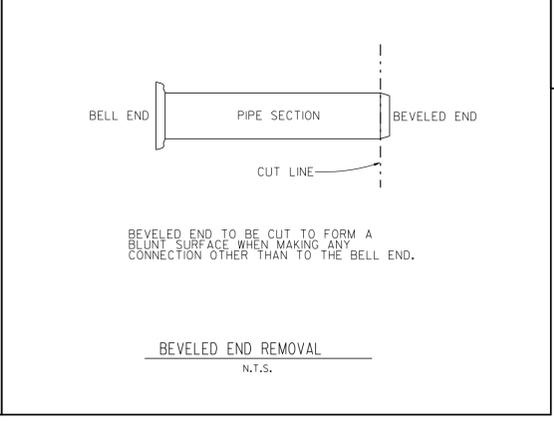
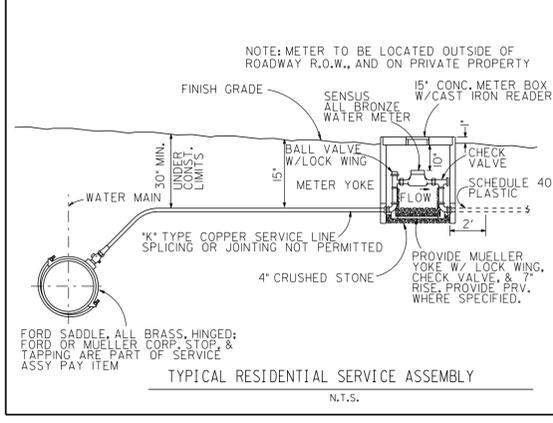
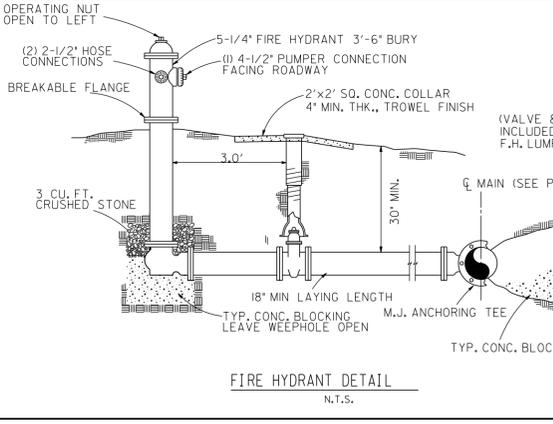
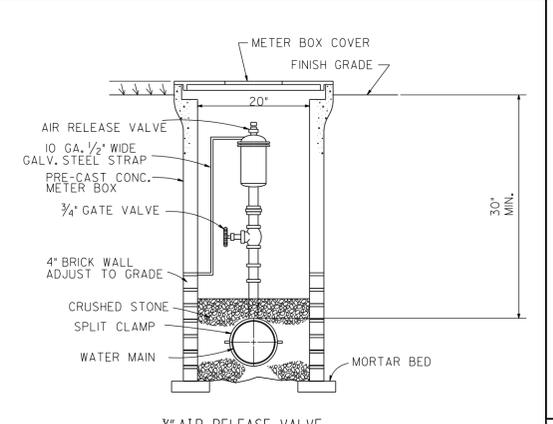
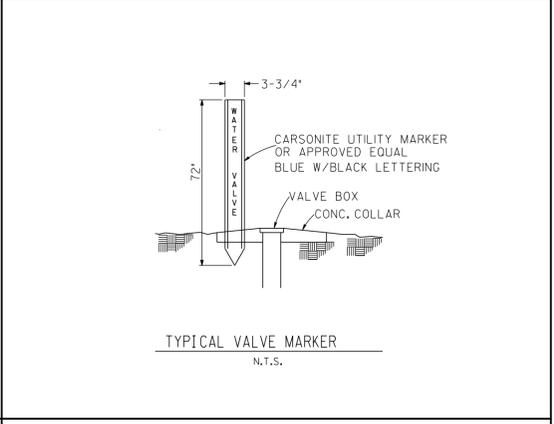
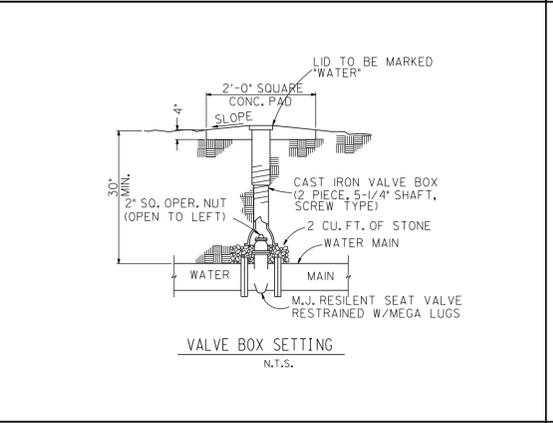
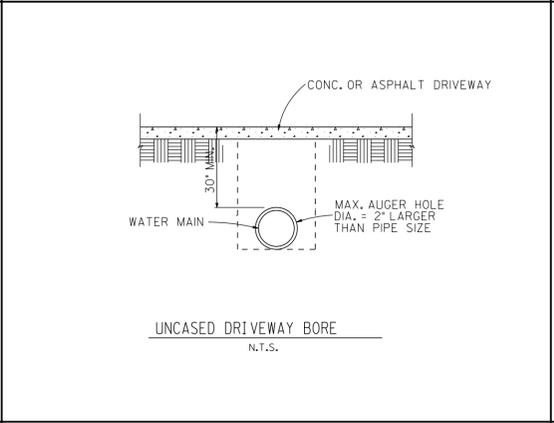
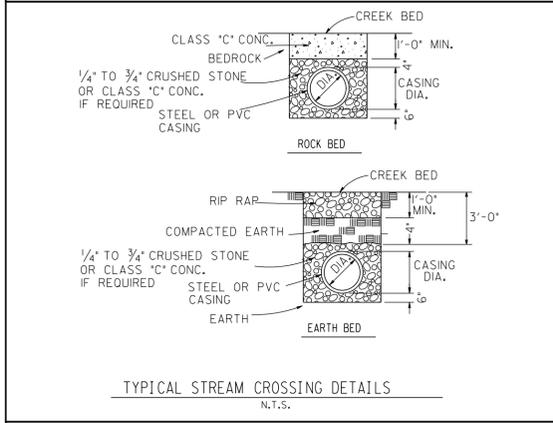
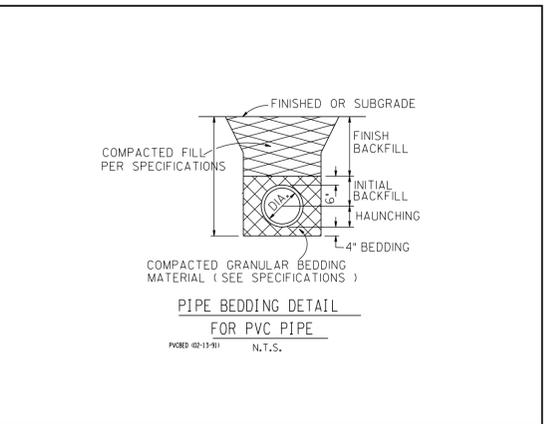
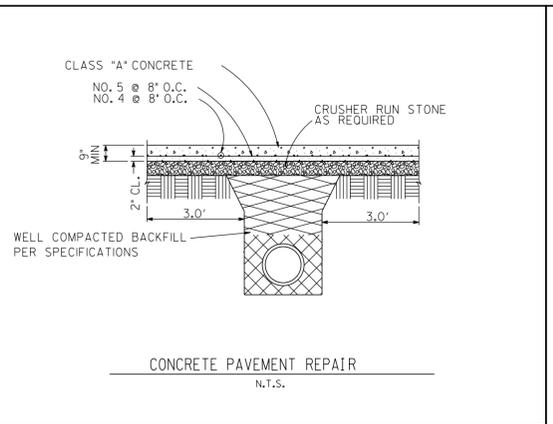
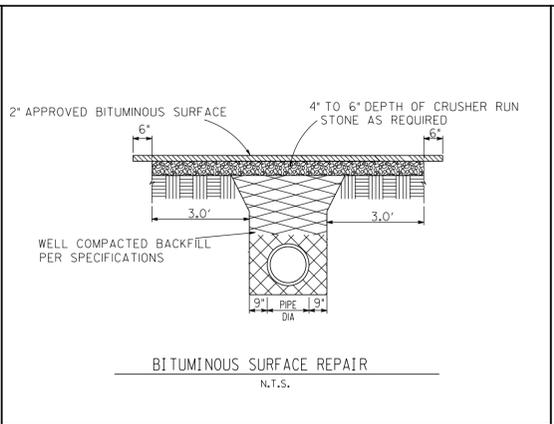
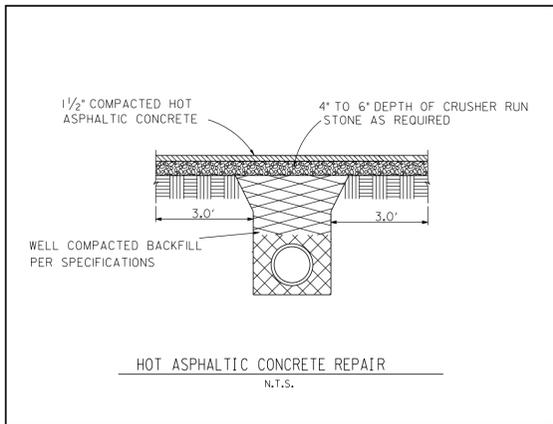


COORDINATE VALUES ARE NAD/83 (1995)
AND ARE DATUM ADJUSTED BY THE
FACTOR 1.000011 & TIED TO THE TGRN.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

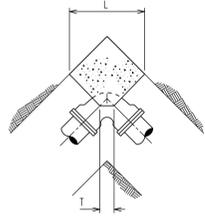
T.S.U.D.
UTILITIES
SHEET
SCALE: 1" = 50'

| TYPE | YEAR | PROJECT NO. | SHEET NO. |
|--------|------|--------------|-----------|
| CONST. | 2015 | STP/NH-7(16) | J2-14 |
| | | | |
| | | | |

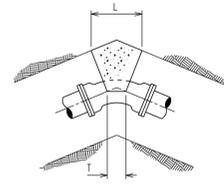


| TYPE | YEAR | PROJECT NO. | SHEET NO. |
|--------|------|--------------|-----------|
| CONST. | 2015 | STP/NH-7(16) | U2-15 |
| | | | |
| | | | |

| 90° BEND | | | | | | | | |
|----------|-----|-----|-----|-----|-----|-----|-----|-----|
| SIZE | 6" | 8" | 10" | 12" | 16" | 18" | 20" | 24" |
| D | 8" | 10" | 12" | 12" | 12" | 16" | 20" | 20" |
| L | 24" | 27" | 30" | 34" | 48" | 51" | 54" | 70" |
| W | 12" | 16" | 20" | 24" | 28" | 34" | 40" | 44" |
| T | 16" | 18" | 20" | 22" | 36" | 40" | 44" | 50" |

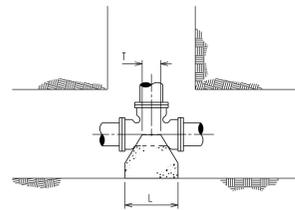


90° BEND
N.T.S.

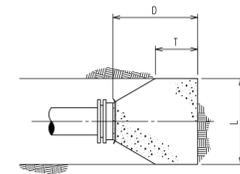


45° & 22 1/2° BEND
N.T.S.

| 45° & 22 1/2° BEND | | | | | | | | |
|--------------------|-----|-----|-----|-----|-----|-----|-----|-----|
| SIZE | 6" | 8" | 10" | 12" | 16" | 18" | 20" | 24" |
| D | 6" | 6" | 6" | 6" | 6" | 8" | 8" | 16" |
| L | 18" | 20" | 22" | 24" | 34" | 40" | 45" | 52" |
| W | 12" | 14" | 16" | 18" | 22" | 25" | 28" | 32" |
| T | 16" | 16" | 18" | 18" | 28" | 33" | 37" | 46" |

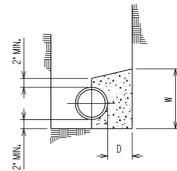


TEE
N.T.S.



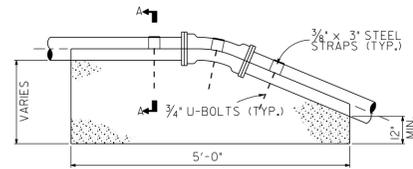
PLUG
N.T.S.

| 11 1/4° BEND | | | | | | | | |
|--------------|-----|-----|-----|-----|-----|-----|-----|-----|
| SIZE | 6" | 8" | 10" | 12" | 16" | 18" | 20" | 24" |
| D | 6" | 6" | 6" | 6" | 6" | 8" | 16" | 16" |
| L | 14" | 16" | 18" | 20" | 30" | 36" | 41" | 48" |
| W | 12" | 14" | 16" | 18" | 22" | 25" | 28" | 32" |
| T | 14" | 14" | 16" | 16" | 26" | 31" | 35" | 44" |



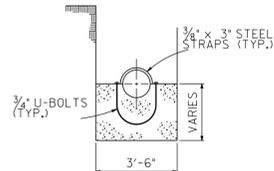
TYPICAL SECTION
N.T.S.

| TEE | | | | | | | | |
|------|-----|-----|-----|-----|-----|-----|-----|-----|
| SIZE | 6" | 8" | 10" | 12" | 16" | 18" | 20" | 24" |
| D | 8" | 10" | 12" | 12" | 12" | 16" | 38" | 38" |
| L | 18" | 18" | 22" | 27" | 28" | 30" | 46" | 48" |
| W | 12" | 16" | 20" | 24" | 28" | 34" | 48" | 48" |
| T | 12" | 12" | 16" | 18" | 20" | 22" | 24" | 24" |



VERTICAL BEND ANCHOR DETAIL
N.T.S.

| PLUG | | | | | | | | |
|------|-----|-----|-----|-----|-----|-----|-----|-----|
| SIZE | 6" | 8" | 10" | 12" | 16" | 18" | 20" | 24" |
| D | 18" | 24" | 30" | 30" | 30" | 30" | 30" | 30" |
| L | 18" | 24" | 30" | 30" | 48" | 48" | 48" | 48" |
| W | 18" | 18" | 24" | 24" | 30" | 30" | 48" | 48" |
| T | 12" | 12" | 12" | 12" | 12" | 18" | 24" | 24" |



SECTION A - A
N.T.S.



STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

T.S.U.D.
TYPICAL
DETAILS

| TYPE | YEAR | PROJECT NO. | SHEET NO. |
|--------|------|--------------|-----------|
| CONST. | 2015 | STP/NH-7(16) | U3-1 |
| | | | |
| | | | |

| PULASKI WATER UTILITY QUANTITIES | | | | | |
|----------------------------------|--|------|----------|-----------|----------|
| ITEM NO. | DESCRIPTION | UNIT | QUANTITY | % Utility | %Project |
| ① 795-01.10 | 12IN DIP SLIP JOINT WATER LINE | L.F. | 4870 | 9.00% | 91.00% |
| ② 795-05.71 | BORE/JACK 22IN STEEL CASING PIPE - UNCON | L.F. | 150 | 9.00% | 91.00% |
| ③ 795-06.07 | CONNECT TO 12IN WATER LINE | EACH | 4 | 9.00% | 91.00% |
| ④ 795-07.15 | 12IN X 12IN TAPPING SLEEVE AND VALVE | EACH | 6 | 9.00% | 91.00% |
| ⑤ 795-07.34 | INSERTION VALVE (12IN) | EACH | 6 | 9.00% | 91.00% |
| ⑤ 795-08.09 | 12IN GATE VALVE ASSEMBLY | EACH | 8 | 9.00% | 91.00% |
| ⑥ 795-10.01 | 3/4IN AUTO AIR RELEASE VALVE ASSEMBLY | EACH | 1 | 9.00% | 91.00% |
| ⑦ 795-13.01 | DI FITTINGS | LBS | 2580 | 9.00% | 91.00% |
| ⑧ 795-14.01 | CONCRETE FLUME REPAIR | S.F. | 18 | 9.00% | 91.00% |

FOOTNOTES:

- 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.
- 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.
- INCLUDES ALL MATERIALS, LABOR, AND EQUIPMENT NECESSARY FOR CONNECTING TO AN EXISTING WATER LINE INCLUDING TRAFFIC CONTROL.
- 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 EXISTING LINE, AND TRAFFIC CONTROL.
- 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.
- 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 SEPERATELY FOR EACH FOOT INSTALLED.
- INCLUDES FITTINGS, GLANDS AND RESTRAINT DEVICES DESCRIBED IN POUNDS.
- INCLUDES ALL MATERIALS, LABOR AND EQUIPMENT FOR COMPLETE INSTALLATION OF UNIT OR LUMP SUM ITEM AS SPECIFIED ON BID FORM.

REMOVAL OF EXISTING UTILITY LINES TO BE PAID FOR UNDER ITEM# 202-01 - "REMOVAL OF STRUCTURES AND OBSTRUCTIONS" IN S.R. 7 PROJECT PIN# 101591.00.

GENERAL NOTES TO BE INCLUDED IN ALL UTILITY PLANS:

- EXCEPT FOR EROSION SEDIMENT CONTROL ITEMS, NO ROADWAY OR BRIDGE ITEMS SHALL BE UTILIZED TO COMPENSATE FOR WORK METHODS OR MATERIALS ASSOCIATED WITH AND/OR SPECIFIED FOR THE UTILITY INSTALLATION, EVEN THOUGH THE SAME OR SIMILAR ROADWAY OR BRIDGE MATERIALS MAY HAVE BEEN CALLED FOR IN THE UTILITY SPECIFICATIONS OR DRAWINGS.
- ALL MATERIALS, METHODS, AND/OR INTEGRAL MATERIALS OUTLINED IN THE UTILITY SPECIFICATIONS OR DRAWING NECESSARY TO PROVIDE A COMPLETE AND FUNCTIONAL INSTALLATION MUST BE INCLUDED IN THE UNIT PRICE FOR THE ASSOCIATED UTILITY WORK ITEM.
- THE CONTRACTOR MUST MAINTAIN ALL SERVICES DURING THE CONSTRUCTION OF THE FACILITY. ANY COSTS ASSOCIATED WITH INSTALLATION OF REQUIRED TEMPORARY SERVICE LINES DUE TO THE ROADWAY CONSTRUCTION SEQUENCE OF WORK (I.E., CUTS, FILLS, PHASING, ETC.) SHALL BE INCLUDED IN THE COST OF THE PERMANENT UTILITY ITEMS. (NOTE TO UTILITY: THE UTILITY RELOCATION PLANS SHALL PROVIDE TO THE CONTRACTOR THE UTILITY 5*32S REQUIREMENTS FOR TEMPORARY TIE-INS (INCLUDING NECESSARY TESTING AND STERILIZATION TO ACCOMPLISH THE TIE-IN) AND ALSO ANY RESTRICTIONS FOR TAKING LINES OUT OF SERVICE. IF A TEMPORARY LINE WILL BE A MAJOR ITEM OF WORK, A SPECIFIC TEMPORIZATION PLAN AND ITEM MUST BE INCLUDED IN THE UTILITY 5*32S PLANS.)
- IT SHALL BE THE RESPONSIBILITY OF THE PRIME CONTRACTOR 5*32S SURVEYOR TO LAY OUT ALL THE FACILITIES BEING RELOCATED WITHIN THE CONTRACT.
- FOR BURIED UTILITIES, THE PRIME CONTRACTOR OR SUBCONTRACTOR SHALL BE REQUIRED TO PROVIDE TO THE UTILITY UPON COMPLETION OF THE UTILITY 5*32S RELOCATION WORK A SET OF AS-BUILT DRAWINGS FOR THEIR RECORDS. THESE AS-BUILT DRAWINGS SHOULD BE PREPARED AS THE JOB PROGRESSES TO ENSURE THEIR ACCURACY.
- WHERE EROSION CONTROL MEASURES ARE NEEDED FOR THE UTILITY RELOCATION WORK OCCURRING INSIDE OR OUTSIDE STATE RIGHT-OF-WAY, THE CONTRACTOR SHALL SUBMIT TO THE TDOT PROJECT SUPERVISOR FOR APPROVAL A PROPOSED EROSION AND SEDIMENT CONTROL PLAN PRIOR TO BEGINNING THE WORK. TDOT APPROVAL MUST BE RECEIVED BEFORE THE EROSION CONTROL PAY ITEMS FOR ROADWAY CONSTRUCTION CAN BE USED FOR ANY ADDITIONAL EROSION CONTROL MEASURES REQUIRED FOR THE UTILITY RELOCATION WORK.
- DRIVEWAY, SIDEWALK AND ROADWAY TEMPORARY RESTORATION SHALL BE PART OF THE IN-PLACE COST OF PLACING THE UTILITY ITEM WITHIN THE ROW. WHEN APPLICABLE, THE UTILITY RELOCATION PLANS WILL SHOW ANY STREAM CROSSINGS AND CROSS-SECTIONS OF THE STREAMS CROSSINGS WITH THE FOLLOWING NOTE:
- ANY EXCAVATION OF THE STREAM CHANNEL AREA SHALL BE SEPARATED FROM FLOWING WATER AND ACCOMPLISHED DURING LOW FLOW CONDITIONS. THIS SHALL BE ACCOMPLISHED BY THE USE OF FLUMES, LINED DIVERSION CHANNEL WITH SANDBAG BERM, DIVERSION PIPE WITH SANDBAG DAM AT PIPE INLET, OR IN SOME CASES COFFERDAMS. ALTERNATIVELY, BASED ON FIELD CONDITIONS AND CONTRACTOR SELECTION, THE UTILITY RELOCATION MAY BE ACCOMPLISHED USING BORE TECHNOLOGY WITH NO STREAM CHANNEL IMPACTS.

GENERAL NOTES FOR UTILITY LINE CONSTRUCTION:

- NEW WATER LINE SHALL MAINTAIN MINIMUM OF 42-INCHES OF COVER IN ALL ROADWAY FINISHED CUT AREAS.
- NEW WATER LINE SHALL MAINTAIN MINIMUM OF 36-INCHES OF COVER IN ALL DRIVEWAY FINISHED CUT AREAS.
- NEW SERVICE LINES SHALL MAINTAIN MINIMUM OF 24-INCHES OF COVER IN ALL ROADWAY FINISHED CUT AREAS.
- THE CONTRACTOR SHALL RESTORE ALL CULVERTS, FENCES, WALLS, HEDGES, SHRUBS, FLOWERING TREES, FRUIT TREES, SIGNS, LIGHT POSTS, POWER POLES, STREET MARKERS, MAIL BOXES, WATER LINES, GAS LINES, GAS AND WATER METERS AND BOXES (INCLUDING SHUTOFFS), PROPERTY CORNER MARKERS, AND LAWNS DISTURBED BY CONSTRUCTION OPERATIONS TO THEIR ORIGINAL CONDITIONS.
- IN EASEMENTS, CONTRACTOR SHALL PROTECT AND RESTORE SAID PROPERTY TO A CONDITION SIMILAR OR EQUAL TO THAT EXISTING AT THE BEGINNING OF CONSTRUCTION.
- THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK IN EACH AREA, AND HE AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT OCCUR BY HIS FAILURE TO DO SO.
- PERMANENT PAVEMENT REPAIR SHALL BE DESIGNATED AS A PART OF THIS CONTRACT. THE CONTRACTOR SHALL ALSO BE RESPONSIBLE FOR THE TEMPORARY REPAIR AND MAINTENANCE OF STREETS AND DRIVEWAYS UNTIL THE PROJECT IS SUBSTANTIALLY COMPLETE. THIS ALSO INCLUDES THE PULLING OF DITCHES AND RESTORING SHOULDERS DAMAGED DURING CONSTRUCTION.
- CONTRACTOR SHALL CLOSELY COORDINATE ALL CONSTRUCTION WITH TDOT, UTILITY OWNER OR DESIGNATED PROJECT REPRESENTATIVE.
- CONTRACTOR SHALL NOTIFY TDOT, UTILITY OWNER AT LEAST ONE DAY IN ADVANCE PRIOR TO WORK WHICH WILL PLACE RESIDENTS OUT OF WATER, SEWER, OR, GAS SERVICE.
- ALL MATERIALS REMOVED OR REPLACED SHALL BE RETURNED TO THE UTILITY OWNER OR TDOT (I.E., VALVES, VALVE BOXES, HYDRANTS, ETC.).
- CONTRACTOR SHALL NOTIFY THE PULASKI WATER, SEWER, AND GAS DEPARTMENT, PRIOR TO INITIATING CONSTRUCTION ON THE WATER, SEWER, OR GAS SYSTEM AND SHALL BE RESPONSIBLE FOR ISOLATING PROJECT AREAS FROM REMAINDER OF WATER, SEWER, AND GAS SYSTEM DURING CONSTRUCTION.
- EXISTING SERVICE LINES ARE TO BE UTILIZED WHEREVER POSSIBLE IN ORDER TO MINIMIZE ROAD CUTS. SERVICES ARE TO BE TAPPED INTO THE NEW LINE USING THE PROPER SADDLE AND CORPORATION STOP.
- ALL EXISTING UTILITIES ARE TO REMAIN IN SERVICE WHILE THE PROPOSED LINE IS BEING LAID AND PLACED INTO SERVICE. NEW LINE SHALL BE TESTED PRIOR TO CUT-IN TO EXISTING LINE. SERVICE RELOCATIONS SHALL OCCUR AT TIME OF TIE OVER OF NEW LINE. MAIN LINE TIE IN SHALL BE COORDINATED WITH THE CITY OF PULASKI FOR TIMING OF WATER, SEWER, AND GAS SERVICE OUTAGE. IN NO CIRCUMSTANCE, SHALL WATER, SEWER, OR GAS SERVICE BE INTERRUPTED FOR MORE THAN 8 HOURS.
- ALL WATER, SEWER, AND GAS LINE INSTALLATION AND TESTING SHALL BE IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS.

GENERAL NOTES FOR CREEK CROSSING:

- ALL SURFACE WATER FLOWING TOWARD THE EXCAVATION OR FILL WORK SHALL BE DIVERTED, PIPED OR FLUMED TO THE DOWNSTREAM SIDE OF THE WORK. THIS CAN BE ACCOMPLISHED THROUGH UTILIZATION OF COFFERDAMS OR CONSTRUCTED BERMS IN CONJUNCTION WITH A PIPE OR FLUME. COFFERDAMS MUST BE CONSTRUCTED OF SAND BAGS, CLEAN ROCK, STEEL SHEETING OR OTHER NON-ERODIBLE MATERIAL.
- TEMPORARY EROSION CONTROL MEASURES MUST BE IN PLACE BEFORE EARTH MOVING OPERATIONS BEGIN, MAINTAINING THROUGHOUT THE CONSTRUCTION PERIOD AND REPAIRED, IF NECESSARY AFTER RAINFALL. STRAW OR HAY BALES AND/OR CUTS FENCE MUST BE INSTALLED ALONG THE BASE OF ALL FILLS AND CUTS, ON THE DOWNHILL SIDE OF STOCKPILED SOIL, AND ALONG STREAM BANKS IN CLEARED AREAS TO PREVENT EROSION INTO STREAMS. THEY MUST BE INSTALLED PARALLEL TO THE STREAM CHANNEL, ENTRENCHED AND STAKED, AND EXTEND THE WIDTH OF THE AREA TO BE CLEARED. THE BALES AND/OR SILT FENCE MAY BE REMOVED AT THE BEGINNING OF THE WORK DAY, BUT MUST BE REPLACED AT THE END OF THE WORKDAY.
- BACKFILL ACTIVITIES MUST BE ACCOMPLISHED IN A MANNER WHICH STABILIZES THE STREAM BED AND BANKS TO PREVENT EROSION. BACKFILL MATERIALS SHALL CONSIST OF SUITABLE MATERIALS FREE OF CONTAMINANTS. ALL CONTOURS MUST BE RETURNED TO PRE-POST CONDITIONS. THE COMPLETED WORK MAY NOT DISRUPT OR IMPOUND STREAM FLOW.
- SLURRY WATER PUMPED FROM WORK AREAS AND EXCAVATIONS MUST BE HELD IN SETTLING BASINS OR TREATED BY FILTRATION PRIOR TO INITIAL DISCHARGE INTO SURFACE WATERS. WATER MUST BE HELD IN SEDIMENT BASINS UNTIL AT LEAST AS CLEAR AS THE RECEIVING WATERS. SEDIMENTATION BASINS SHALL NOT BE LOCATED CLOSER THAN 20 FEET FROM THE TOP BANK OF A STREAM. SEDIMENT BASINS AND TRAPS SHALL BE PROPERLY DESIGNED ACCORDING TO THE SIZE OF THE DRAINAGE AREAS OR VOLUME OF WATER TO BE TREATED.
- CHECKDAMS SHALL BE UTILIZED WHERE RUNOFF IS CONCENTRATED. CLEAN ROCK, LOG, SANDBAG OR STRAW BALE CHECKDAMS SHALL BE PROPERLY CONSTRUCTED TO DETAIN RUNOFF AND TRAP SEDIMENT.
- CLEARING, GRUBBING AND OTHER DISTURBANCE TO RIPARIAN VEGETATION SHALL BE LIMITED TO THE MINIMUM NECESSARY FOR SLOPE CONSTRUCTION AND EQUIPMENT OPERATIONS. UNNECESSARY VEGETATION REMOVAL IS PROHIBITED. ALL DISTURBED AREAS SHALL BE PROPERLY STABILIZED AS SOON AS PRACTICABLE.
- STREAMS SHALL NOT BE USED AS TRANSPORTATION ROUTES FOR HEAVY EQUIPMENT.
- CONSTRUCTION DEBRIS MUST BE KEPT FROM ENTERING THE STREAM CHANNEL.
- ALL SPILLS OF PETROLEUM PRODUCTS OR OTHER POLLUTANTS MUST BE REPORTED TO THE APPROPRIATE EMERGENCY MANAGEMENT AGENCY AND MEASURES SHALL BE TAKEN IMMEDIATELY TO PREVENT THE POLLUTION OF WATERS OF THE STATE, INCLUDING GROUNDWATER.
- UPON ACHIEVEMENT OF FINAL GRADE, THE DISTURBED STREAMBANK SHALL BE STABILIZED WITH RIP-RAP (MIN. SIZE=2"). ALL OTHER DISTURBED SOILS MUST BE STABILIZED AND RE-VEGETATED WITHIN 30 DAYS BY SODDING OR SEEDING AND MULCHING. SEED TO BE UTILIZED SHALL INCLUDE COMBINATION OF ANNUAL GRAINS AND GRASSES, LEGUMES, AND PERENNIAL GRASSES. LIME AND FERTILIZER SHALL BE APPLIED AS NEEDED TO ACHIEVE A VEGETATIVE COLOR.
- UPON COMPLETION OF CONSTRUCTION, THE STREAM SHALL BE RETURNED AS NEARLY AS POSSIBLE TO ITS ORIGINAL, NATURAL CONDITION.

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STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

CITY OF PULASKI
STATE ROUTE 7
**UTILITY
RELOCATION**
QUANTITIES &
GENERAL NOTES

| TYPE | YEAR | PROJECT NO. | SHEET NO. |
|--------|------|--------------|-----------|
| CONST. | 2015 | STP/NH-7(16) | U3-2 |
| | | | |
| | | | |

I. BORING AND CASING FOR UTILITIES

PART 1 - GENERAL

1 SECTION INCLUDES

- A. The work to be performed under this section shall consist of the installation of a casing pipe for the purpose of installing a high pressure steel gas line, water line, or sewer line as shown on the drawings or as called for in these specifications. It shall include the excavation of a boring pit, auger boring between the points specified on the drawings, furnishing and installing of the carrier pipe and disposing of the excavated materials.

PART 2 - PRODUCTS

2.02 CASING PIPE

- A. The casing pipe shall be of steel meeting the latest approved American Railway Engineering Association "Specifications for Pipelines for Carrying Flammable and Nonflammable Substances". The steel casing pipe shall have a minimum yield strength of 35,000 psi and shall have the minimum wall thickness shown in the following table:

TABLE OF MINIMUM WALL THICKNESS FOR STEEL CASING PIPE FOR E72 LOADING

| Carrier Pipe | Casing Pipe | Nominal Thickness |
|--------------|-------------|-------------------|
| 4 | 8 | 0.250" |
| 6 | 12 | 0.250" |
| 8 | 16 | 0.312" |
| 10 | 20 | 0.312" |
| 12 | 22 | 0.312" |
| 14 | 24 | 0.344" |
| 16 | 26 | 0.375" |
| 18 | 28 | 0.406" |

- B. When the casing pipe is installed without benefit of a protective coating, the wall thickness shown above shall be increased to the nearest standard size or a minimum of 0.063" greater than the thickness shown.
- C. Carrier Pipe: The carrier pipe shall be as specified on the drawings or elsewhere in these specifications.
- D. Casing Spacers: Casing spacers shall be manufactured from high impact strength, UV resistant polypropylene and be assembled with non-metallic fasteners. Spacers shall be configured to concentrically locate carrier pipes inside carrier pipes.

PART 3 - EXECUTION

3.01 BORING

- A. The boring shall be accomplished by means of auger. Bore the tunnel to the size, line and grade needed to accommodate the casing size shown on the drawings.

3.02 INSTALLATION OF CASING PIPE

- A. Jack the steel casing pipe into place as the boring proceeds. Weld sections of casing pipe together to provide watertight joints.
- B. Do not remove unacceptable casing without prior approval from TDOT. If the removal of casing pipe is permitted, make proper provisions to prevent caving in of the earth surrounding the casing.

3.03 INSTALLATION OF CARRIER PIPE

- A. The carrier pipe shall be furnished by the Contractor. After acceptance of the casing by TDOT, install the carrier pipe in the casing by jacking it through the casing. As the carrier pipe is being inserted into the casing pipe, locate spacers per spacer manufacturer recommendations.

3.04 LAYOUT OF WORK

- A. TDOT will provide the necessary control points required by the Contractor for this construction. The Contractor will provide the detailed layout required to keep the tunnel or bore on grade.

3.05 GUARANTEE OF WORK

- A. Guarantee a usable completed casing between the points specified and to the line and grade specified. The allowable tolerance at the downstream end point of the bore shall be such that the invert of the carrier pipe may be positioned within a vertical area limited on the top by an elevation no higher than the elevation shown on the drawings and on the bottom by an elevation no lower than the existing inlet pipe invert.
- B. The allowable tolerance at the upstream end point of the bore shall be such that the invert of the carrier pipe may be positioned at the elevation shown on the drawings.

END OF SECTION

II. WATER LINES

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Trenching includes excavating, backfilling, compacting, disposing of surplus material, and all other work incidental to the construction of trenches for utilities, and buried appurtenances, including additional excavation which may be required for structures forming a part of the pipe line.
- B. Excavation includes removal of quicksand, hardpan, boulders, rock, native soils, clay, rubbish, unforeseen obstacles, underground conduits, pipe, drain tile, trees, roots, timber or masonry structures, pavements, sidewalks and all other obstacles encountered. No claim for additional payment will be accepted because of the character of the ground in which the excavation is made. Excavation will be unclassified.
- C. The Contractor shall be responsible for safely storing materials needed for the work that have been accepted by him until they have been incorporated into the completed project. Keep the interiors of all pipes, fittings, and other accessories free from dirt and foreign matter at all times.
- D. Wherever reaction blocking is necessary, it shall be considered an integral part of the water line work, and no separate payment shall be made for it.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Bedding and backfill material shall be size No. 67 in accordance with the Tennessee Department of Transportation's Standard Specifications for Road and Bridge Construction or satisfactory soil materials of clay, rock or gravel that is free of debris, waste, frozen materials, vegetable and other deleterious matter that has a size of no more than 2".
- B. Portland cement, ASTM C150, Type 1.
- C. Steelbar reinforcing, ASTM A615, Grade 60.
- D. Concrete aggregate, ASTM C33.

2.02 DUCTILE IRON PIPE AND FITTINGS

- A. Ductile cast iron pipe shall be made of good quality ductile iron that meets the requirements for modular iron castings of ASTM E8. It shall be plain end ductile iron pipe with push-on, single gasket joints. The design thickness shall be that specified by ANSI A21.51/AWWA C151. All pipe with a diameter of 12" or less shall have a rated pressure class of 350 and all pipe with a diameter of 14" to 20" shall have a rated pressure class of 250 minimum.
- B. Ductile iron pipe shall be centrifugally cast in metal or sand-lined molds and shall conform to the specifications of ANSI A21.51/AWWA C151. It shall be made and tested in accordance with ASTM A339 and shall be subjected to and able to withstand a hydrostatic pressure of 500 psi. The maximum depth of pits shall be half that allowed in the AWWA specifications.
- C. The length of each individual piece of ductile iron pipe shipped must be plainly marked on that piece of pipe.
- D. The push-on, single gasket joints shall be either Fastite (manufactured by American Cast Iron Company), Tyton (U.S. Pipe and Foundry Company), Super Bell-Tite (Clow Corporation), or other joints of similar type and equal quality. They shall be UL approved and able to withstand 200 psi of operating pressure.
- E. The bell of each pipe shall have a tapered annular opening and a cast or machined retaining groove for the gasket. The gasket groove shall have a flared design so that maximum deflection will be provided. The plain spigot end of the pipe shall be beveled in order to simplify its entry into and centering within the bell and the compression of the gasket.
- F. The gasket shall be of high quality vulcanized rubber made in the form of a solid ring to exact dimensions. The design of the gasket groove in the bell of the pipe and the design, hardness, and other properties of the gasket itself shall be such that the joint is liquid tight for all pressures from a vacuum to a maximum rating of 350 psi of internal liquid pressure.
- G. Enough lubricant shall be furnished with each order to provide a thin coat on the spigot end of each pipe. This lubricant shall be nontoxic, impart no taste or smell to the water, and have no harmful effect on the rubber gasket. It shall have a consistency that will allow it to be easily applied to the pipe in either hot or cold weather and that will enable it to adhere to either wet or dry pipe.
- H. Standard and special fittings shall be ductile iron. Use compact mechanical joint fittings (4"-12"). All fittings shall conform to the specifications of either ANSI A21.53/AWWA C1153 or ANSI A21.10/AWWA C110.
- I. Pipe and fittings shall be lined with enamel or a thin cement lining as specified in ANSI A21.4/AWWA C104. In addition, a bituminous seal coat or asphalt emulsion spray coat approximately 1 mil thick shall be applied to the cement lining in accordance with the pipe manufacturer's standard practices.
- J. Fittings shall be in accordance with the standard mechanical joint fittings manufactured by the U.S. Pipe and Foundry Company, American Cast Iron Pipe Company, Clow Corporation, or equal.
- K. The pipe manufacturer is to furnish the Owner a certificate of inspection, sworn to by the factory inspector in the presence of a notary public, stating that the pieces of pipe in the shipment were made and tested in accordance with ANSI A21.51 and that they were subjected to and withstood a hydrostatic pressure of 500 psi. Each statement is to give the number of pieces of pipe in the shipment, the length of each piece of pipe, and the serial number of each piece of pipe making up the shipment. In addition, the weight of each individual piece of pipe making up the shipment is to be listed opposite the serial number of each pipe length and attached to the certificate of inspection.

2.03 COPPER WIRE FOR DETECTION

- A. All non-metallic waterlines shall be installed with a 12 gauge, blue coated copper wire, installed 12" to 18" below finished grade directly above the pipe. In cases where this cannot be accomplished as determined by TDOT, the wire shall be fastened to the outside of the pipe.

2.04 PVC/DIP CONNECTION

- A. Where PVC transitions to DIP, use appropriate dresser couplings suitable for the pressure class of the pipe minimum.

PART 3 - EXECUTION

3.01 EXCAVATION FOR PIPELINE TRENCHES

- A. Unclassified excavation for pipelines shall consist of the excavation necessary for the construction of water lines and their appurtenances (including valves, fittings, collars, concrete saddles, and pipe protection) that are called for by the drawings. It shall include clearing and grubbing where necessary, backfilling and tamping pipe trenches and around structures, and disposing of waste materials, all of which shall conform to the applicable provisions set forth elsewhere in these specifications.
- B. The Contractor may, if he chooses, use a motor powered trenching machine. If he does, however, he shall be fully responsible for the preservation or repair of existing utility service connections.
- C. Unless the construction of lines by tunneling, jacking, or boring is called for by the drawings or specifically authorized by TDOT, make excavation for pipelines in open cut and true to the lines and grades shown on the drawings or established by TDOT on the ground. Cut the banks of trenches between vertical parallel planes equidistant from the pipe centerline. The horizontal distance between the vertical planes (or, if sheeting is used, between the inside faces of that sheeting) shall vary with the size of the pipe to be installed, but shall not be more than the distance determined by the following formula: $4/3d + 15$, where "d" represents the internal diameter of the pipe in inches. When approved in writing by TDOT, the banks of trenches from the ground surface down to a depth not closer than 1' above the top of the pipe may be excavated to non-vertical and non-parallel planes, provided the excavation below that depth is made with vertical and parallel sides equidistant from the pipe centerline in accordance with the formula given above. Any cut made in excess of the formula $4/3d + 15$ shall be at the expense of the Contractor and may be caused by TDOT to require that stronger pipe and/or a higher class of bedding be used at no cost to TDOT.
- D. For pipe in non-rock trenches, shape the bottom of all trenches to provide uniform bearing for the bottom of the pipe barrel.
- E. Excavate bellholes for bell and spigot pipe at proper intervals so that the barrel of the pipe will rest for its entire length upon the bottom of the trench. Bellholes shall be large enough to permit proper jointing of the pipe. Do not excavate bellholes more than 2 joints ahead of pipe laying operations.
- F. Do not excavate trenches more than 200' ahead of the pipe laying operations or leave the pipe trench open more than two hundred (200) feet behind the pipe laying operations. Perform work in a manner that will cause the least inconvenience to the public. Construct temporary bridges or crossings when and where TDOT deems necessary to maintain vehicular or pedestrian traffic.
- G. In all cases where materials are deposited along open trenches, place them so that the materials, work and adjacent property will not be damaged in the event of rain.

3.02 INSTALLATION OF WATER LINES

- A. Lay water lines to and maintain at the lines and grades required by the drawings. All fittings, valves, and hydrants shall be at the required locations, the spigots centered in the bells, and all valves and hydrant stems plumb.
- B. Unless otherwise indicated by the drawings, all water pipes shall have at least 36" of cover. No departure from this policy shall be made except with the approval of TDOT.
- C. Provide and use tools and facilities that are satisfactory to TDOT and that will allow the work to be done in a safe and convenient manner. All pipe, fittings, valves, and hydrants are to be unloaded from the trucks using suitable tools and equipment. Use a derrick, ropes, or other suitable tools or equipment to lower all pipe, fittings, valves, and hydrants into the trench one piece at a time. Lower each piece carefully so that neither it nor any protective coating or lining it may have will be damaged. Under no circumstances drop or dump water line materials into the trench.
- D. Any pipes strung out along the route of the proposed lines before the installation of those lines begins shall not be lowered into the trench until the lines have been swabbed to remove any mud, debris, etc., that may have accumulated within them. Pipe shall be strung out a maximum of one day ahead of pipe laying. Remove all unnecessary material from the bell and spigot end of each pipe. Before any pipe is laid, brush and wipe clean the outside of its spigot end and the inside of its bell, and leave dry and oil-free.

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STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

CITY OF PULASKI
STATE ROUTE 7
UTILITY
RELOCATION
SPECIFICATIONS

- E. Take every precaution to keep foreign material from getting into the pipe while it is being placed in the line. If the crew laying the pipe cannot put it into the trench and in place without allowing earth to get inside, then put a heavy, tightly woven canvas bag of suitable size over each end of the pipe, and leave in place until it is time to connect that pipe to the one adjacent to it.
- F. Place no debris, tools, clothing, or other materials in the pipe during laying operations.
- G. After a length of pipe has been placed in the trench, center the spigot end in the bell of the adjacent pipe, and then insert to the depth specified by the manufacturer and bring to the correct line and grade. Secure the pipe in place by tamping an approved backfill material around it.
- H. Bellholes shall be big enough so that there is ample room for the pipe joints to be properly made. Between bell holes, carefully grade the bottom of the trench so that each pipe barrel will rest on a solid foundation for its entire length.
- I. Whenever pipe laying is not in progress, close the open ends of pipe either with a watertight plug or by other means approved by TDOT. If the joints of any pipe in the trench cannot be completed until a later time, caulk them with packing in order to make them as watertight as possible; this shall be done not only at the end of each working day but also before work is stopped for lunch periods, bad weather, or any other reason. If there is water in a trench, leave this seal in place until the trench has been pumped completely dry.
- J. Cut pipe so that valves, fittings, or closure pieces can be inserted in a neat and workmanlike manner and without any damage to the pipe. Follow the manufacturer's recommendations concerning how to cut and machine the ends of the pipe in order to leave a smooth end at right angles to the pipe's axis.
- K. Lay pipe with the bell ends facing in the direction of laying unless otherwise directed by TDOT.
- L. Wherever pipe must be deflected from a straight line (in either the vertical or horizontal plane) in order to avoid obstructions or plumb stems, or wherever long radius curves are permitted, the amount of deflection shall not exceed that necessary for the joint to be satisfactorily made, nor that recommended by the pipe manufacturer, and shall be approved by TDOT.
- M. Lay no pipe in water or when it is TDOT's opinion that trench conditions are unsuitable. If crushed stone is used to improve trench conditions or as backfill for bedding the pipe, its use is considered incidental to the project, and no separate payment will be made for its use unless prior written approval is obtained from TDOT.
- N. Where a water line crosses over a sanitary sewer, use a full joint of pipe with a standard mechanical joint, and center over the sewer. Where a water line is to be parallel to a sanitary or storm sewer, lay it at least 10' from the sewer. If it is not practical for the water and sewer lines to be separated as described above, then lay the water line at least 18' above the top of the sewer.
- O. Joint all pipe in the exact manner specified by the manufacturer of the pipe and jointing materials.
- P. The Contractor shall conduct a pressure test every two to three thousand feet of pipe in accordance with the specifications. Only after satisfactory completion of testing can the Contractor continue laying pipe. If at any time the quality of the pipe installation becomes suspect, TDOT can direct the Contractor to test the section of suspect pipe at no additional charge.
- Q. A coated copper wire shall be buried 12" to 18" below the surface and directly above all non-metallic pipe used (both main and service line).
- R. Connecting to Existing Lines and Structures:
 1. Connection new lines to existing lines and structures where shown on the Plans and/or directed by TDOT. Connecting new lines to existing lines is considered incidental to this work and no separate payment will be made for this task.
 2. The Contractor shall be responsible for determining existing pipeline materials, ordering proper fittings for the connection, and making the connections.

3.03 WATER CROSSINGS (WHERE PIPE IS NOT DIRECTIONAL BORED)

- A. At water crossings, creeks or streams, Contractor may use dikes, cofferdams, culverts, or pilings to separate the work area from the flowing stream. The minimum depth of the pipe below the existing stream shall be five (5) feet; however, at the option of TDOT, two (2) feet may be acceptable in consolidated rock; however, the pipe shall be encased in concrete. Spoil may be deposited on either side of the water crossing. After the pipe has been placed in the ditch all spoilbanks shall be placed back over the line in the stream. The banks of the crossing shall be restored to their original condition and to prevent erosion, rip-rap material may be required. All excavation work shall conform to the terms of federal, state, and local permits and right-of-way easements.
- B. Weights will be installed if required. Contractor will either furnish weights or weight material.
- C. Contractor shall use due diligence to install crossing and shall be responsible for complying with all environmental agency requirements.

3.04 BACKFILLING

- A. Begin backfilling after the line construction is completed and then inspected and approved by TDOT. On each side of the line, from the bottom of barrel to 1' above the top of the pipe, the backfill material shall be select backfill consisting of fine, loose earth like sandy silt or loam or of granular material that is free from clods, vegetable matter, debris, stone, and/or other objectionable materials and that has a size of no more than 2". Place this backfill simultaneously on either side of the pipe in even layers that are no more than 6" deep before compaction. Thoroughly and completely tamp each layer into place before placing additional layers. When backfilling at locations beneath or closely adjacent to pavement No. 67 (TDOT) crushed stone shall be used as backfill.
- B. If pipe is installed in a rock trench, install a 6" bedding of No. 67 (TDOT) crushed stone prior to installing the pipe. Then add additional No. 67 stone backfill up to 1' above the top of the pipe as shown on the plans.
- C. From 1' above the pipe to the top of the trench, up to 2% of the backfill material may be broken stones. However, if this type of backfill is used, there must be enough earthen fill materials to fill all voids. The maximum diameter of the stones in the backfill shall not exceed 6". The backfill material shall be placed and spread in even layers not more than 12" deep.

At locations beneath or closely adjacent to pavement or near improvements that may be subject to damage by placement of the backfill, No. 67 stone shall be used as backfill. After placement of backfill, tamp and thoroughly compact backfill. Before compaction, fill layers shall not be greater than six inches deep.

In other areas, backfill placed in the upper portion of trenches may be placed without tamping; however, after placement, the backfill density shall not be less than that of the adjacent earth. The density of the compacted fill material and the insitu material shall be determined using standard TDOT soil testing procedures.
- D. Copper Wire for Detection (Non-Metallic Pipe): Contractor shall furnish and install a 12 gauge blue coated copper wire over the pipe. Copper wire shall be between 12" to 18" below ground surface to assist in future pipe location. Where 2 sections of wire connect a 12 inch minimum twisted overlap is required with adequate bore wire connection for continuity. The bore wire connection shall be suitably coated to protect wire from corrosion. The copper wire shall extend up into all valve boxes so it is accessible for connection to locating equipment. At uncased road crossings the Contractor shall install copper wire onto the top of the plastic pipe.
- E. Water Jetting: If earth material for backfills, in the opinion of the TDOT, too dry to allow thorough compaction, add enough water so backfill can be properly compacted. Do not place earth material TDOT considers too wet or otherwise unsuitable.
- F. Wherever excavation has been made within easements across private property, the top 1' of backfill material shall consist of fine loose earth free from large clods, vegetable matter, debris, stone, and/or other objectionable materials.
- G. Wherever trenches have been cut across or along existing pavement, temporarily place Class A, Grade D, crushed stone in the upper twelve inches of the trench. Maintain this temporary pavement until either the permanent pavement is restored or the project is accepted by TDOT.
- H. Whenever the pipe being installed is fifteen inches in diameters or less, do not use power operated tampers within one foot of the pipe.
- I. The Contractor shall not disturb or damage any pipe and/or structure when placing backfill material. If the pipe or structure is damaged or disturbed when placing backfill, the Contractor shall repair or replace the impacted pipe or structure.
- J. The Contractor shall backfill all trenches and clean-up all areas disturbed by pipe laying operations immediately after pipe laying operations are complete. If the Contractor fails to comply with this provision, TDOT may require the Contractor to suspend all other construction activities until all backfilling and clean-up is complete.

3.05 PRESSURE TEST

- A. After pipe has been laid and backfilled as specified above, pressure test all newly laid pipe to a pressure of 200 psi. All services are to be laid to testing the main and tested as part of the test of the main.
- B. Conduct pressure test for at least a two (2) hour period. To prevent pipe movement, place sufficient backfill to stabilize the pipe prior to testing the pipe. When conditions require placement of backfill before conducting pressure test, completely backfill trenches; however do not place permanent surfacing.
- C. Slowly fill the section of pipe to be tested with water and apply the specified test pressure (based on the elevation of the lowest point of the line or section under test and corrected to the elevation of the test gauge) with a pump connected to the pipe in a manner satisfactory to the TDOT and the City of Pulaski. The Contractor shall furnish all pumps, pipes, connections, gauges and other required apparatus.
- D. Before applying the specified test pressure, expel all air from the pipe. If hydrants or blowoffs are not available at high places, make the necessary taps at the points of highest elevation before testing, and insert plugs after the test has been completed.
- E. Carefully examine all exposed pipe, fittings, valves, and hydrants during the test. Remove any cracked or defective pipes, fittings, valves, or hydrants discovered in consequence of this pressure test, and replace with sound material in the manner specified. Repeat the test until the results are satisfactory to TDOT.

3.06 LEAKAGE TEST

- A. Conduct the leakage test after the pressure test has been satisfactorily completed. Furnish pump, pipe, connections, gauges, measuring devices, and all other necessary apparatus as well as all necessary assistance to conduct test.
- B. The duration of each leakage test shall be 2 hours; during the test, subject the main to a pressure of 150 psi.
- C. Leakage is defined as the amount of water which must be supplied to the newly laid pipe or any isolated section in order to maintain the specified leakage test pressure after the pipe has been filled with water and the air expelled.
- D. No pipe installation will be accepted until the leakage is less than the number of gallons per 2 hour period listed below:

| Pipe Sizes | Gallons per 1,000 Feet of Pipe |
|-------------|--------------------------------|
| 2" - 2 1/4" | 0.2 |
| 3" | 0.5 |
| 4" | 0.6 |
| 6" | 0.9 |
| 8" | 1.2 |
| 10" | 1.5 |
| 12" | 1.9 |
| 14" | 2.2 |
| 16" | 2.6 |
| 18" | 2.9 |
| 20" | 3.2 |
| 24" | 3.8 |
| 30" | 4.4 |
- E. Should any test of pipe laid disclose leakage greater than that specified, the Contractor shall, at his own expense, locate and repair the defective joints until the leakage is within the specified allowance.

3.07 DISINFECTION

- A. During construction, take precautions to protect pipe interiors, fittings, and valves against contamination. When pipe laying is not in progress (e.g., at end of day's work), place watertight plugs in the ends of all pipe already in the trench; if water accumulates in the trench, leave the plugs in place until the trench is dry, complete the joints of all pipes in the trench before stopping work for any reason.
 - B. If dirt or other foreign material that has gotten into a pipe cannot, in the opinion of TDOT, be removed by flushing, Contractor shall clean the interior of the pipe and swab with a disinfecting solution of 5% hypochlorite.
 - C. Fill the the newly laid pipeline with water from a source approved by TDOT. Add chlorine to the newly installed line as it is being filled. Feed water and chlorine into the pipe at constant and measured rates so that the chlorine residual is never less than 50 mg/l of available chlorine. To ensure that this concentration is maintained, measure the chlorine residual at regular intervals.
 - D. Table 1 defines the amount of chlorine that is needed for each 100' of line of pipe of various diameters. A 1 1/2 chlorine solution may be prepared either with 1 pound of calcium hypochlorite for each 8.5 gallons of water or with sodium hypochlorite - assuming the calcium hypochlorite is fresh.
- TABLE 1
CHLORINE REQUIRED TO PRODUCE A 50 MG/L CONCENTRATION
IN 100' OF PIPE, BY DIAMETER

| Pipe Size (Inches) | 100% Chlorine (Pounds) | 1 1/2 Chlorine Solutions (Gallons) |
|--------------------|------------------------|------------------------------------|
| 4 | 0.027 | 0.33 |
| 6 | 0.061 | 0.73 |
| 8 | 0.108 | 1.30 |
| 10 | 1.170 | 2.04 |
| 12 | 0.240 | 2.88 |
| 14 | 0.328 | 3.96 |
| 16 | 0.428 | 5.12 |
| 18 | 0.540 | 6.48 |
| 20 | 0.680 | 8.00 |
| 24 | 0.980 | 11.52 |
- E. While chlorine is being applied, manipulate valves so that the treatment dosage will not flow back into the line that is supplying water. Continue the application of chlorine until the entire line being treated is filled with the chlorine solution. Then retain the chlorinated water in the line for at least 24 hours. During the disinfection period, all valves and hydrants in the line being treated shall be operated so that appurtenances can also be disinfected. After 24 hours, the treated water shall have a chlorine concentration of at least 25 mg/l throughout the line.
 - F. After the disinfection period is complete, flush the heavily chlorinated water from the line until the chlorine concentration in the water leaving the main is no higher than the chlorine residual that generally prevails in the system or less than 1 mg/l. Perform such flushing only at sites where there is adequate drainage.
 - G. The velocity of the water used to flush a line shall be at least 2.5 fps. Flow rates required to produce this velocity in various sizes of pipe are shown in Table 2.

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STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

CITY OF PULASKI
STATE ROUTE 7
**UTILITY
RELOCATION**
SPECIFICATIONS

TABLE 2
REQUIRED OPENINGS TO FLUSH PIPELINES
(40 PSI RESIDUAL PRESSURE)

| Pipe Size (Inches) | Flow Required To Produce 2.5fps Velocity (gpm) | Orifice Size (Inches) | Hydrant Outlet Nozzles Number | Hydrant Outlet Nozzles Size (Inches) |
|--------------------|--|-----------------------|-------------------------------|--------------------------------------|
| 4 | 100 | 15/16 | 1 | 2-1/2 |
| 6 | 220 | 1-3/8 | 1 | 2-1/2 |
| 8 | 390 | 1-7/8 | 1 | 2-1/2 |
| 10 | 610 | 2-5/16 | 1 | 2-1/2 |
| 12 | 880 | 2-13/16 | 1 | 2-1/2 |
| 14 | 1,200 | 3-1/4 | 2 | 2-1/2 |
| 16 | 1,565 | 3-5/8 | 2 | 2-1/2 |
| 18 | 1,980 | 4-3/16 | 2 | 2-1/2 |
| 20 | 2,440 | ----- | 2 | 2-1/2 |
| 24 | 3,470 | ----- | 2 | 2-1/2 |

- H. Once a line has been flushed, test to confirm that the residual chlorine in the water is within acceptable limits.
- I. Care should be taken to prevent the deposition of contaminants in lines before and during pipe laying activities. Regardless of the degree of difficulty associated with the process, all contaminants caked or deposited in lines must be removed either by flushing or other means. Flushing is no substitute for taking preventative measures before and during the laying of water line.

3.08 BACTERIOLOGICAL TESTS

- A. After a water line has been flushed and before it is placed into service, collect bacteriological samples from the end of that line. In cases where the line being tested is extremely long, take additional samples if so directed by TDOT.
- B. Store all collected samples in sterile bottles that contain sodium thiosulfate. Do not collect samples from hoses or fire hydrants. Instead, it is suggested that an assembly consisting of a standard corporation cock and copper tube gooseneck be used to collect samples - the assembly can be removed and retained for later use.
- C. Take the samples to an approved laboratory and have the samples tested for coliform contamination. If coliform bacteria are found to be present, repeat disinfection and sampling process until satisfactory samples are obtained.
- D. If the samples indicate a line is free of coliform contamination, the line may be placed into service.

3.09 DISINFECTION PROCEDURE AFTER CUTTING INTO OR REPAIRING EXISTING LINES

- A. The procedures outlined above apply primarily to cases in which the lines are wholly or partially dewatered.
- B. However, lines that remain full of water and under a positive pressure when leaks or breaks are being repaired present little danger of contamination and require no disinfection.
- C. When an existing line is opened, whether by accident or design, and lies in a damp excavated area that could have been wetted by sewage, apply liberal quantities of hypochlorite to the wetted area. Use tablets for disinfection in such.
- D. Where practical, treat lines by the slug method in accordance with AWWA C651.
- E. The following disinfection procedure is considered the minimum that may be used when existing lines are repaired:
- Swab the interior of all pipes and fittings (particularly couplings and tapping sleeves) that are to be used to repair an existing line with a solution of 5% hypochlorite before installing them.
 - To remove contamination from that has just been repaired, flush the line. If the locations of valves and hydrants make it impossible to flush the repaired line segment from one location, flush the line from at least two directions. Start flushing as soon as repairs are completed and continue until all discolored water is eliminated.

3.10 CLEANUP

- A. After completing each section of water line, immediately remove all debris, excess fill material and all construction materials from work site. Then grade and smooth over surface on both sides of the line. Leave the entire area clean and in a condition satisfactory to TDOT. If the Contractor fails to promptly cleanup, TDOT may, at their discretion, direct the Contractor to stop work on other areas of the work and assign all Contractor personnel to cleanup activities until TDOT judge's cleanup to be satisfactory.

3.11 PAYMENT

- A. No additional payment will be made for pressure testing, water jetting, leakage testing, flushing, bacteriological testing, water for testing, material, labor and equipment to perform testing.

END OF SECTION

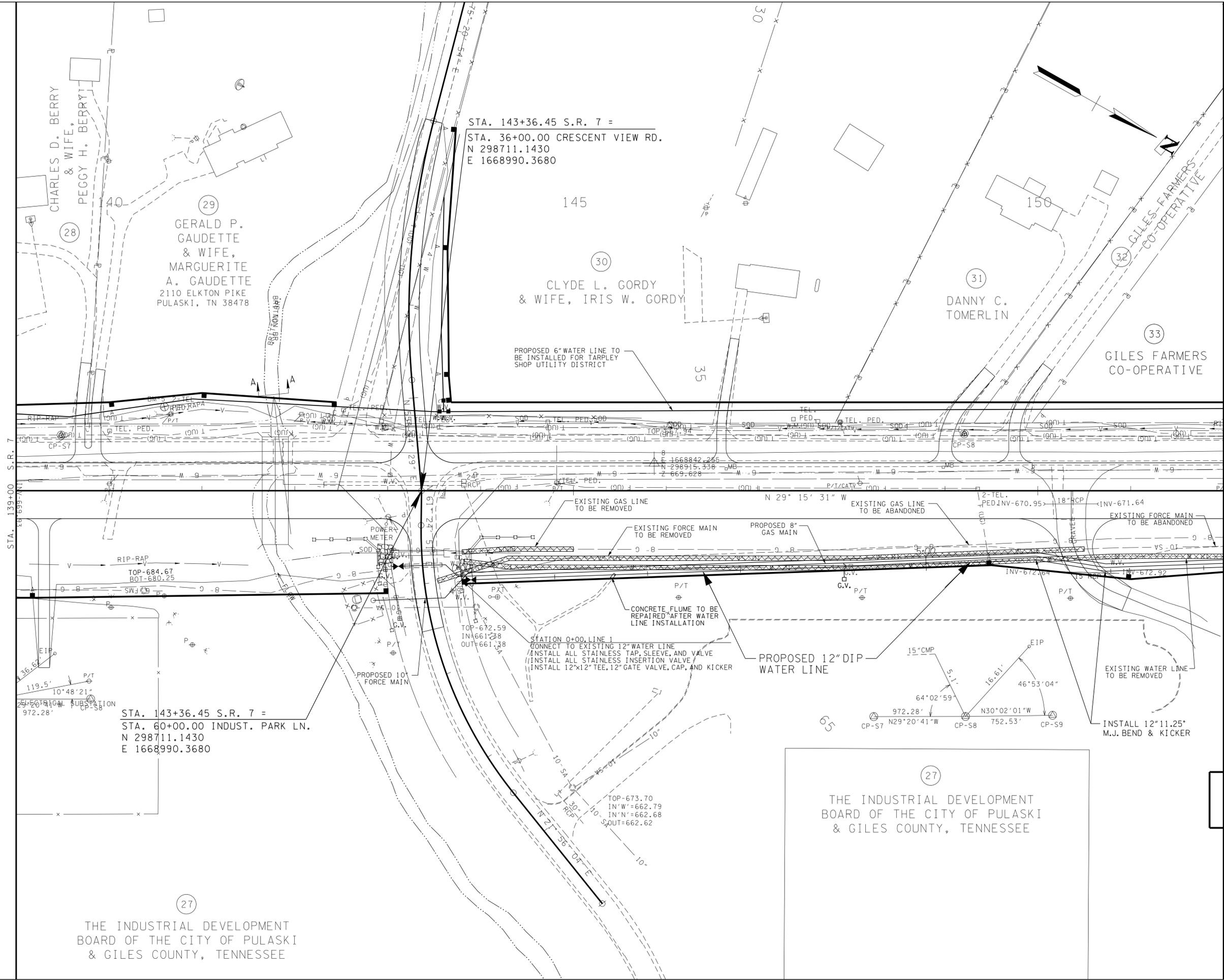
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STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

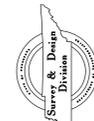
CITY OF PULASKI
STATE ROUTE 7
UTILITY
RELOCATION
SPECIFICATIONS

| TYPE | YEAR | PROJECT NO. | SHEET NO. |
|--------|------|--------------|-----------|
| CONST. | 2015 | STP/NH-7(16) | U3-5 |
| | | | |
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MATCH LINE - LINE 1 WATER LINE STA. 139+00 S.R. 7 =
MATCH LINE - LINE 1 WATER LINE STA. 152+00 S.R. 7 =
SEE SHEET NO. U3-6

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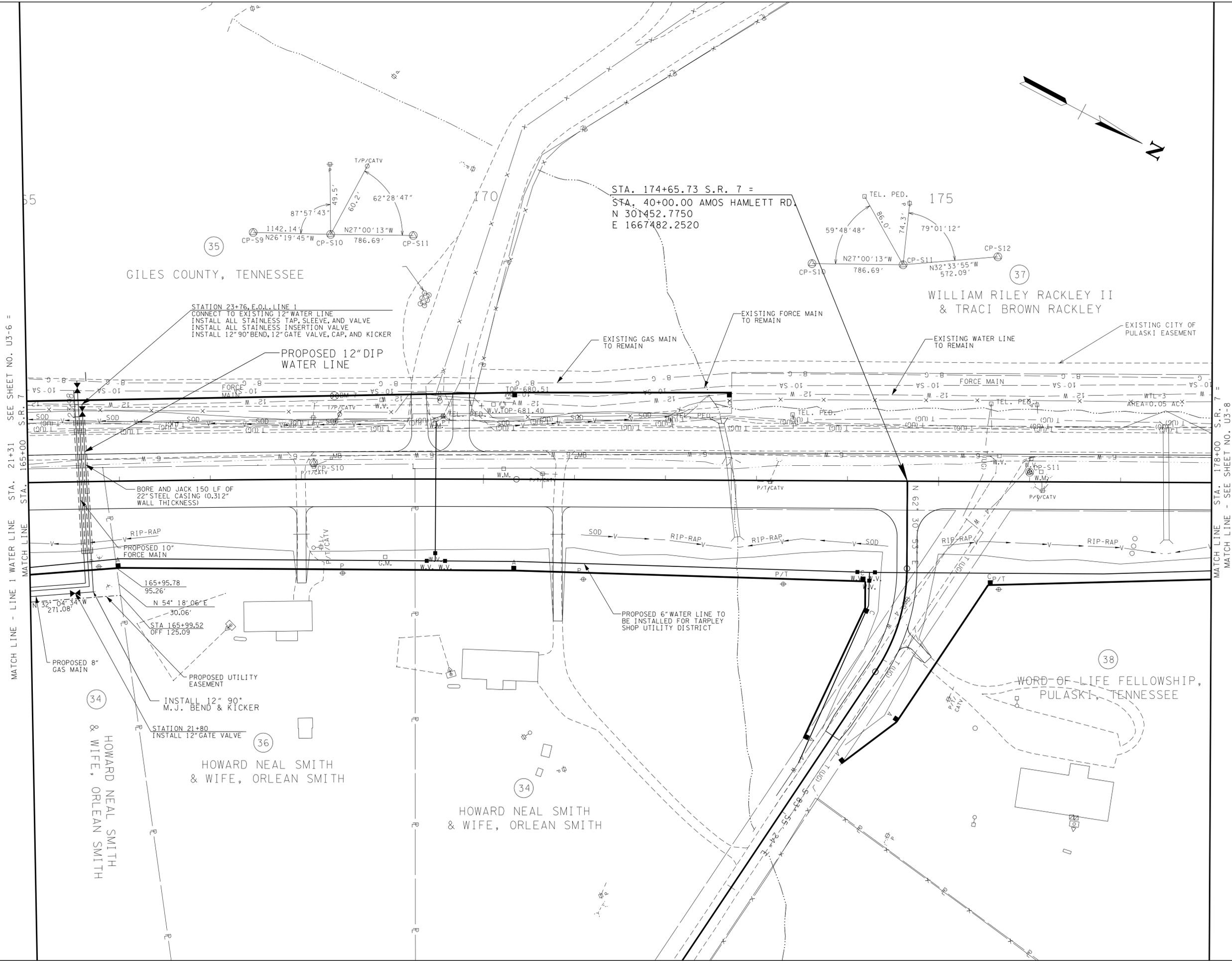


COORDINATE VALUES ARE NAD/83 (1995)
AND ARE DATUM ADJUSTED BY THE
FACTOR 1.000011 & TIED TO THE TORN.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

CITY OF PULASKI
STATE ROUTE 7
**UTILITY
RELOCATION**
WATER - LINE 1
STA. 0+00 TO STA. 8+21
SCALE: 1" = 50'

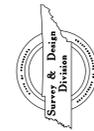
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|--------|------|--------------|-----------|
| CONST. | 2015 | STP/NH-7(16) | U3-7 |
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SEE SHEET NO. U3-6 =
STA. 21+31
STA. 165+00 S.R. 7

MATCH LINE - STA. 178+00 S.R. 7 =
MATCH LINE - SEE SHEET NO. U3-8

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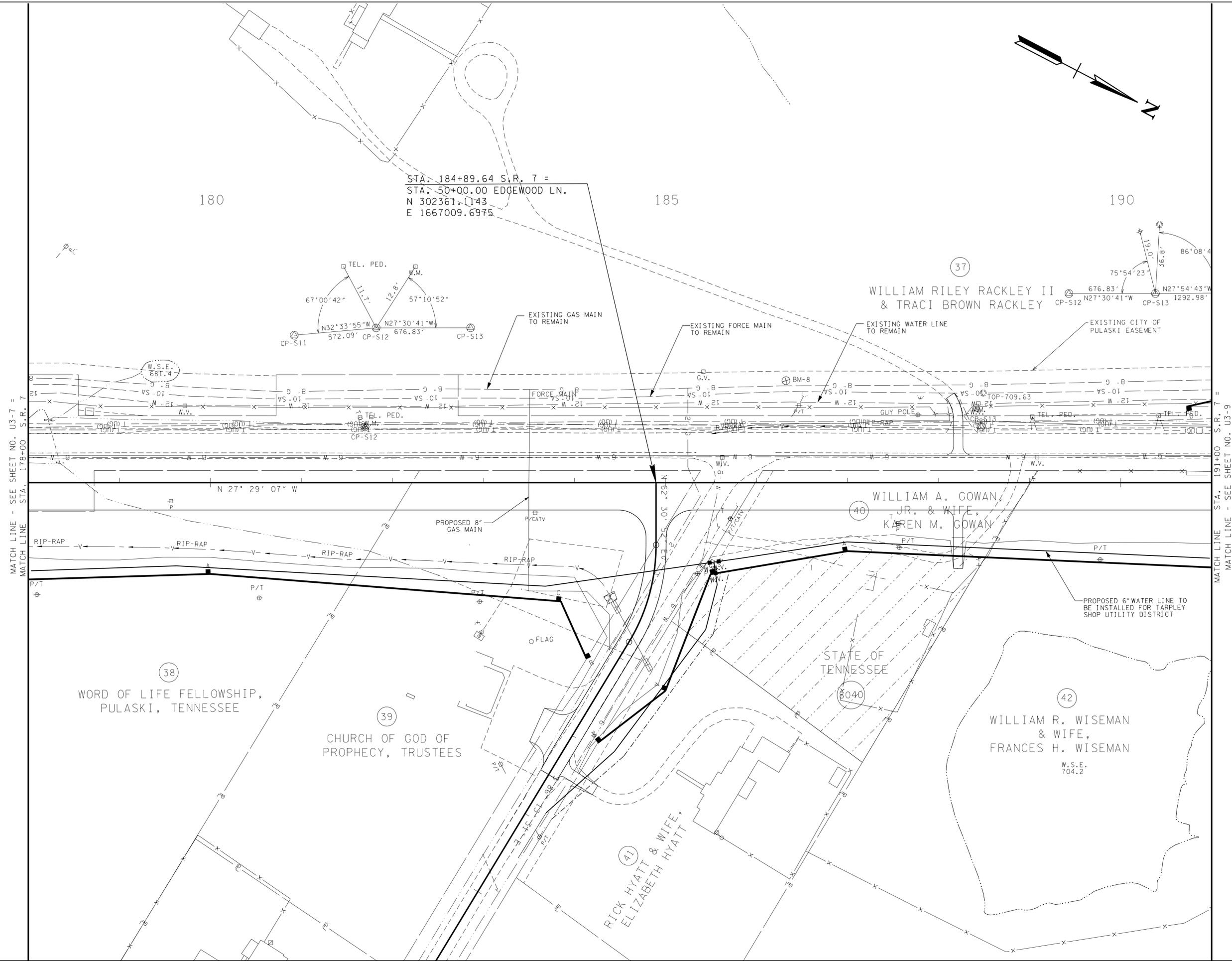
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STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

CITY OF PULASKI
STATE ROUTE 7
**UTILITY
RELOCATION**
WATER - LINE 1
STA. 21+31 TO STA. 23+98
SCALE: 1" = 50'

RDWY. STA. 165+00 TO STA. 178+00

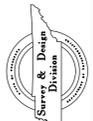
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| CONST. | 2015 | STP/NH-7(16) | U3-8 |
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MATCH LINE - SEE SHEET NO. U3-7 =
STA. 178+00 S.R. 7

MATCH LINE - SEE SHEET NO. U3-9 =
STA. 191+00 S.R. 7

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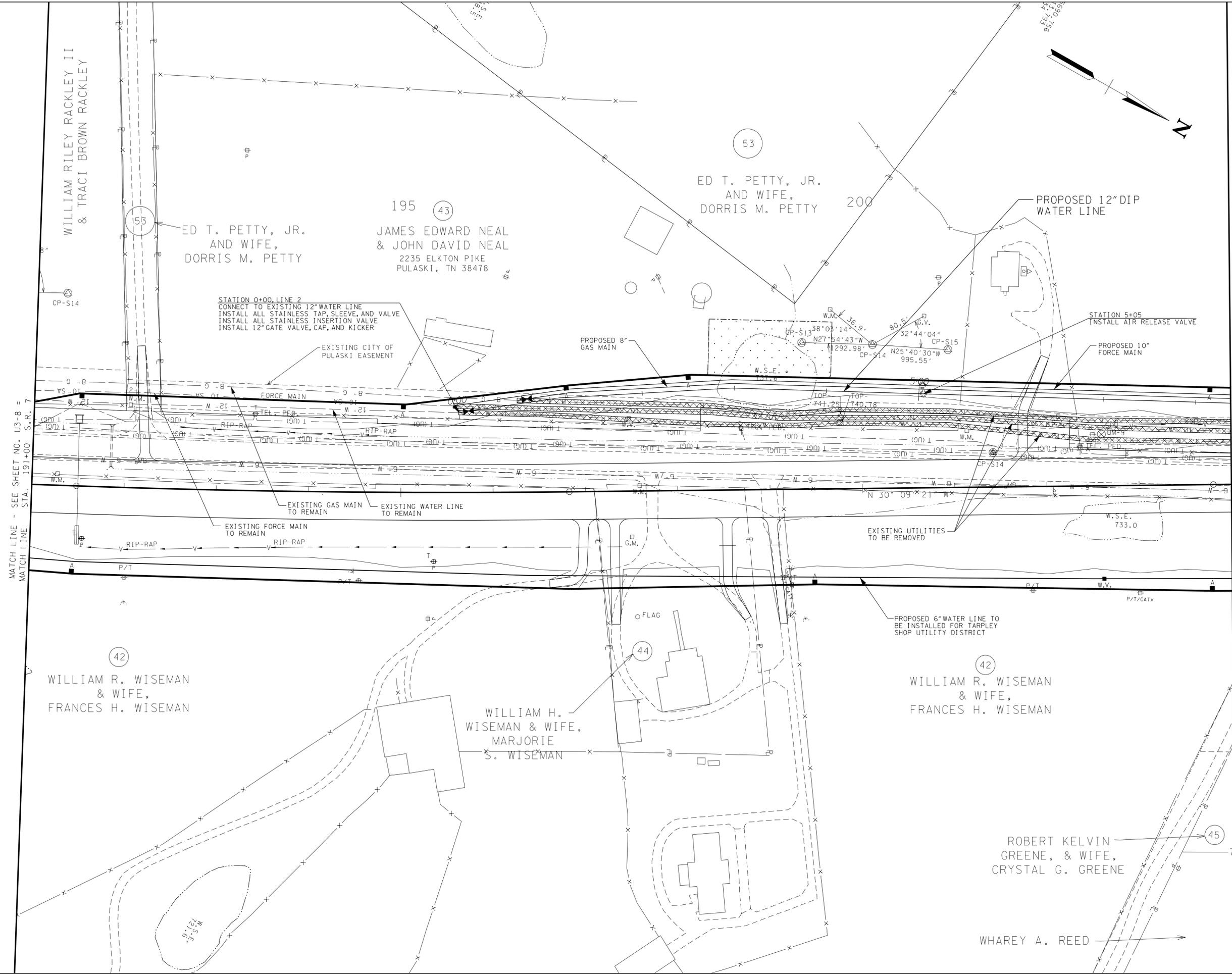
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STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

CITY OF PULASKI
STATE ROUTE 7
UTILITY
RELOCATION

WATER - LINE 1
SCALE: 1" = 50'

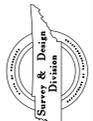
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| CONST. | 2015 | STP/NH-7(16) | U3-9 |
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MATCH LINE - SEE SHEET NO. U3-8 - STA. 191+00 S.R. 7
MATCH LINE

MATCH LINE - LINE 2 WATER LINE STA. 204+00 S.R. 7 =
MATCH LINE - SEE SHEET NO. U3-10 STA. 8+38

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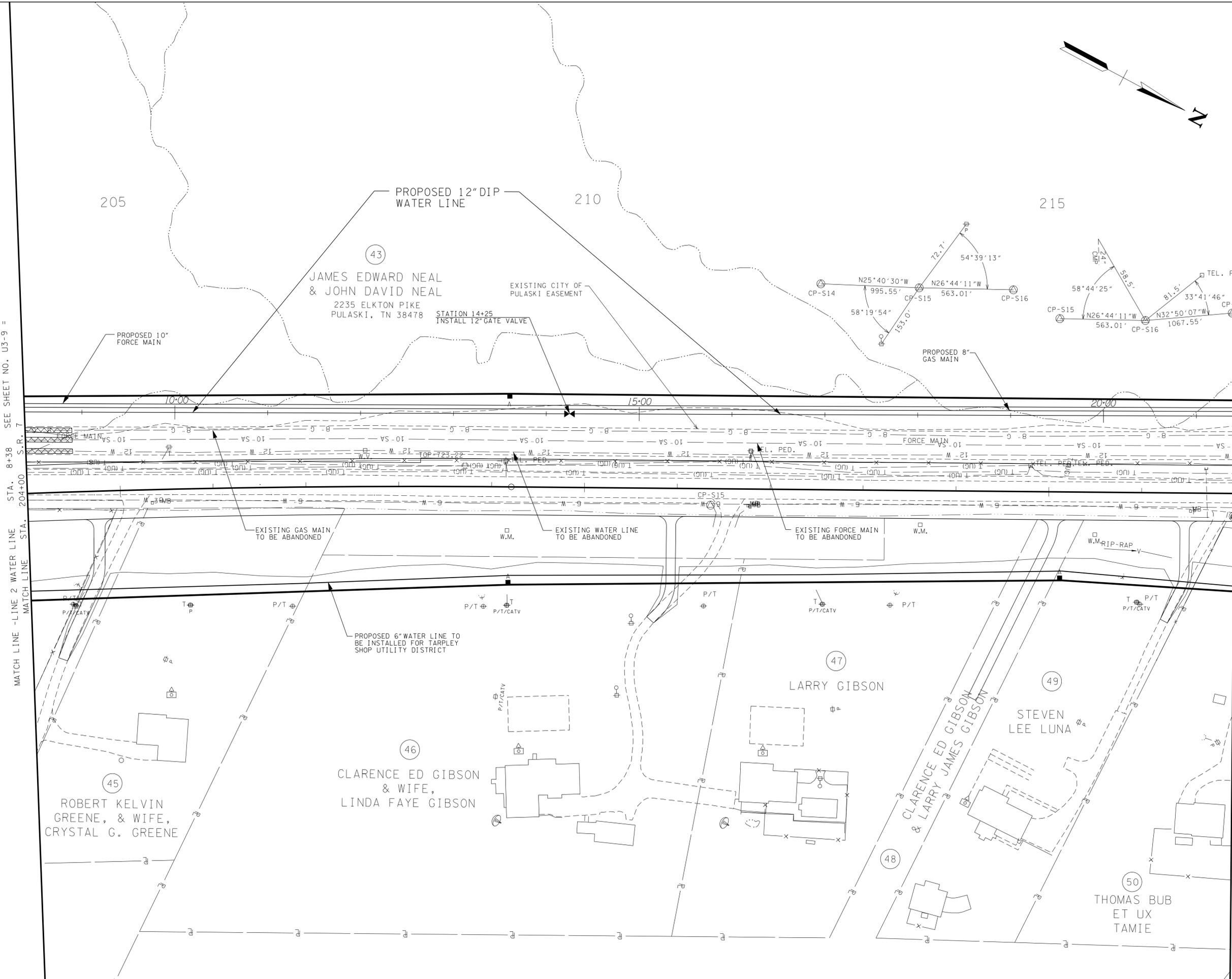


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STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

CITY OF PULASKI
STATE ROUTE 7
UTILITY
RELOCATION
WATER - LINE 2
STA. 0+00 TO STA. 8+38
SCALE: 1" = 50'

| TYPE | YEAR | PROJECT NO. | SHEET NO. |
|--------|------|--------------|-----------|
| CONST. | 2015 | STP/NH-7(16) | U3-10 |
| | | | |
| | | | |



SEE SHEET NO. U3-9 =

STA. 8+38 S.R. 7

MATCH LINE - LINE 2 WATER LINE STA. 204+00

MATCH LINE - LINE 2 WATER LINE STA. 217+00

MATCH LINE - LINE 2 WATER LINE STA. 21+42

MATCH LINE - LINE 2 WATER LINE STA. 21+42

SEE SHEET NO. U3-11

STA. 217+00 S.R. 7 =

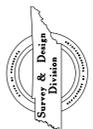
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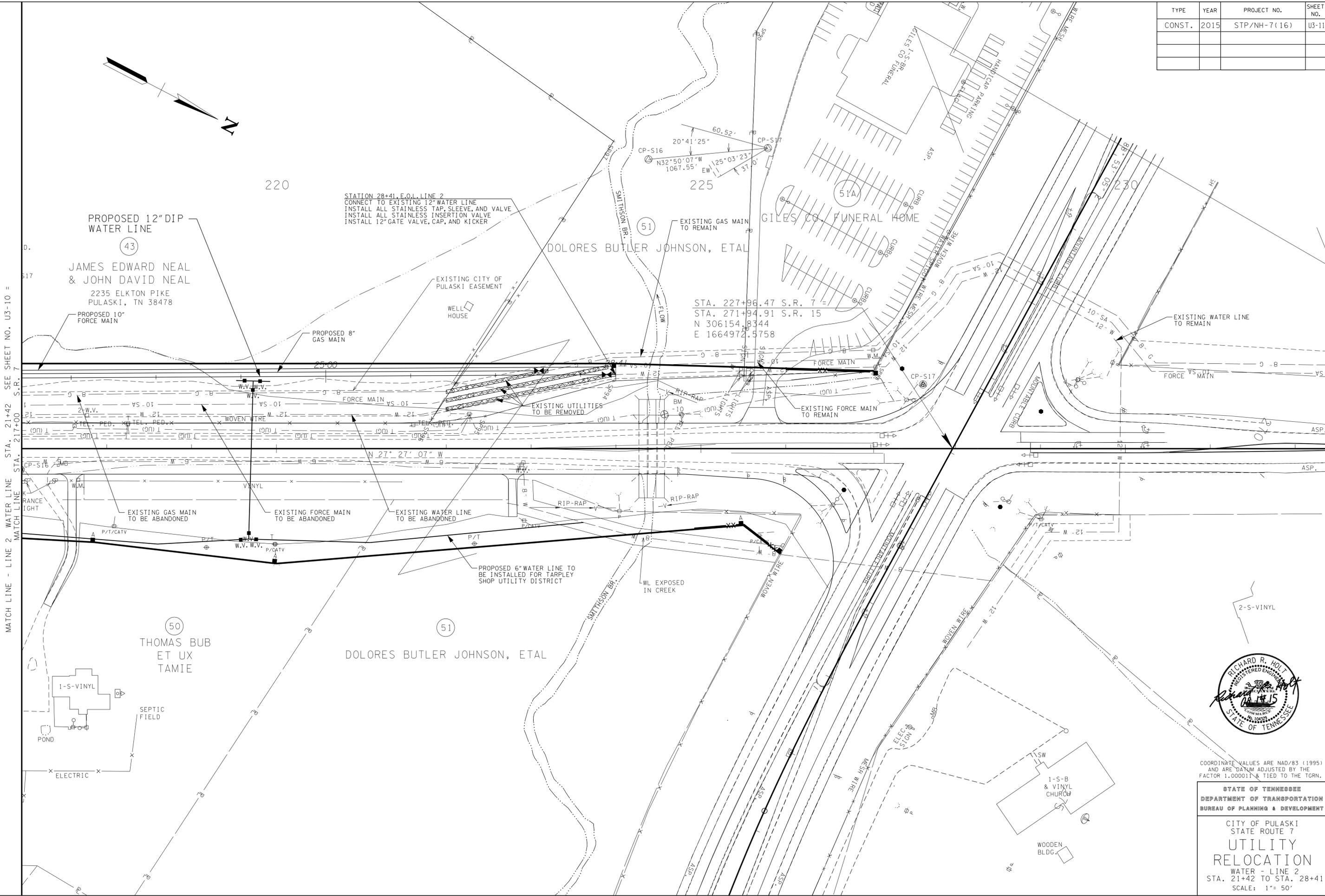
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STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

CITY OF PULASKI
STATE ROUTE 7
UTILITY
RELOCATION
WATER - LINE 2
STA. 8+38 TO STA. 21+42
SCALE: 1" = 50'

RDWY. STA.204+00 TO STA.217+00

| TYPE | YEAR | PROJECT NO. | SHEET NO. |
|--------|------|--------------|-----------|
| CONST. | 2015 | STP/NH-7(16) | U3-11 |
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| | | | |



MATCH LINE - LINE 2 WATER LINE STA. 21+42 SEE SHEET NO. U3-10 =
MATCH LINE STA. 21+00 S.R. 7

STATION 28+41, E.O.L. LINE 2
CONNECT TO EXISTING 12" WATER LINE
INSTALL ALL STAINLESS TAP, SLEEVE, AND VALVE
INSTALL ALL STAINLESS INSERTION VALVE
INSTALL 12" GATE VALVE, CAP, AND KICKER

PROPOSED 12" DIP WATER LINE
(43)

JAMES EDWARD NEAL & JOHN DAVID NEAL
2235 ELKTON PIKE
PULASKI, TN 38478

PROPOSED 10" FORCE MAIN

PROPOSED 8" GAS MAIN

EXISTING CITY OF PULASKI EASEMENT
WELL HOUSE

DOLORES BUTLER JOHNSON, ETAL

EXISTING GAS MAIN TO REMAIN

GILES CO. FUNERAL HOME

STA. 227+96.47 S.R. 7 =
STA. 271+94.91 S.R. 15
N 306154.8344
E 1664972.5758

EXISTING WATER LINE TO REMAIN

EXISTING GAS MAIN TO BE ABANDONED

EXISTING FORCE MAIN TO BE ABANDONED

EXISTING WATER LINE TO BE ABANDONED

PROPOSED 6" WATER LINE TO BE INSTALLED FOR FARLEY SHOP UTILITY DISTRICT

WL EXPOSED IN CREEK

THOMAS BUB ET UX TAMIE

DOLORES BUTLER JOHNSON, ETAL

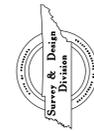


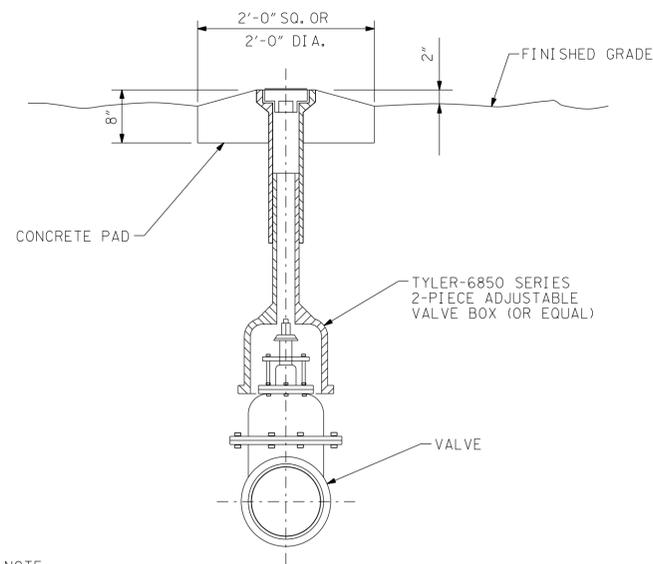
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STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

CITY OF PULASKI
STATE ROUTE 7
UTILITY
RELOCATION
WATER - LINE 2
STA. 21+42 TO STA. 28+41
SCALE: 1" = 50'

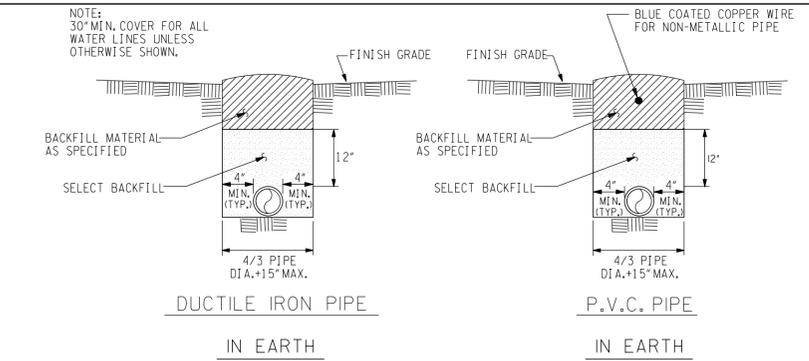
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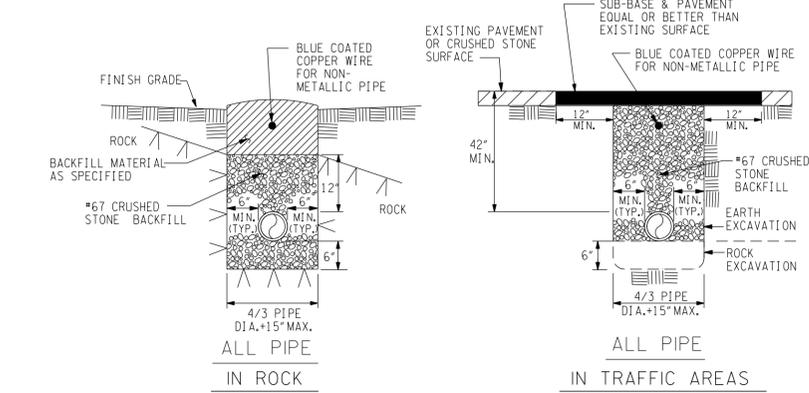


NOTE:
CAST AROUND THE TOP OF EACH VALVE BOX A CONCRETE DISK 2'-0" IN DIAMETER OR 2'-0" SQUARE AND 8" THICK WHEN VALVES ARE LOCATED IN UNPAVED AREAS. NOT REQUIRED IN PAVED AREAS.

1 TYPICAL VALVE BOX SETTING
NOT TO SCALE

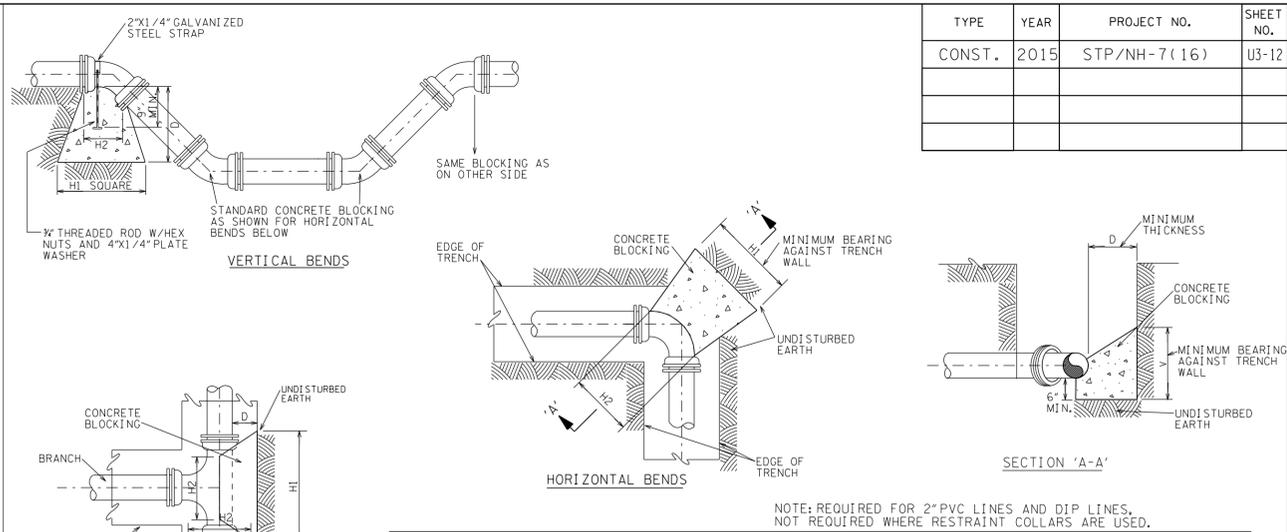


NOTE:
30" MIN. COVER FOR ALL WATER LINES UNLESS OTHERWISE SHOWN.



NOTE: UNTIL REPAVING IS COMPLETED USE A DENSE GRADED STONE FOR THE TOP 6" FOR TEMPORARY SURFACE.
CRUSHED STONE SURFACE EQUAL TO EXISTING SURFACE OR 6" MIN.

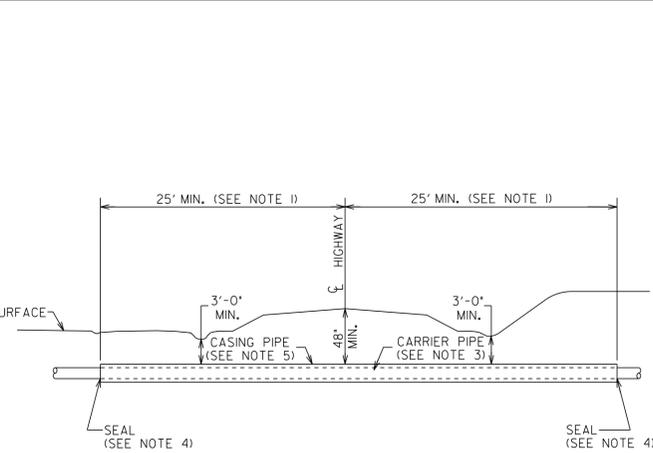
2 STANDARD WATER MAIN BEDDING AND BACKFILLING
NOT TO SCALE



NOTE: REQUIRED FOR 2" PVC LINES AND DIP LINES. NOT REQUIRED WHERE RESTRAINT COLLARS ARE USED.

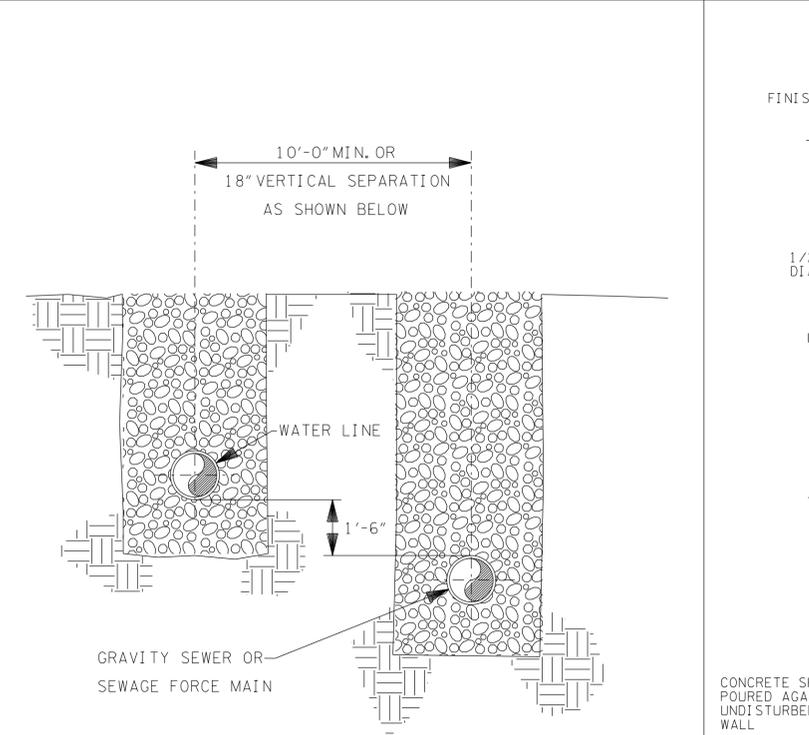
| TEES, CROSSES & PLUGS | | 90° BENDS | | | 45° BENDS | | | 22-1/2° BENDS | | | 11-1/4° BENDS | | | PIPE SIZE |
|-----------------------|-----|-----------|-----|------|-----------|-----|-----|---------------|-------|-----|---------------|-----|-----|-----------|
| H1 | H2 | V | D | C.F. | H1 | H2 | V | D | C.F. | H1 | H2 | V | D | |
| 18" | 10" | 12" | 18" | 1.90 | 18" | 10" | 12" | 18" | 1.90 | 18" | 6" | 12" | 18" | 1.50 |
| 18" | 10" | 12" | 18" | 1.90 | 18" | 10" | 12" | 18" | 1.90 | 18" | 6" | 12" | 18" | 1.50 |
| 24" | 12" | 12" | 18" | 2.25 | 24" | 12" | 12" | 18" | 2.25 | 18" | 8" | 12" | 18" | 1.60 |
| 24" | 12" | 12" | 18" | 2.25 | 24" | 12" | 12" | 18" | 2.25 | 18" | 8" | 12" | 18" | 1.60 |
| 24" | 16" | 18" | 18" | 3.50 | 30" | 16" | 18" | 18" | 4.05 | 24" | 10" | 16" | 18" | 3.20 |
| 24" | 16" | 18" | 18" | 3.50 | 30" | 16" | 18" | 18" | 4.05 | 24" | 10" | 16" | 18" | 3.20 |
| 36" | 18" | 18" | 18" | 5.05 | 39" | 18" | 24" | 18" | 7.30 | 30" | 11" | 18" | 18" | 3.95 |
| 36" | 18" | 18" | 18" | 5.05 | 39" | 18" | 24" | 18" | 7.30 | 30" | 11" | 18" | 18" | 3.95 |
| 48" | 24" | 18" | 24" | 7.15 | 54" | 32" | 24" | 18" | 10.25 | 24" | 18" | 21" | 18" | 4.60 |
| 48" | 24" | 18" | 24" | 7.15 | 54" | 32" | 24" | 18" | 10.25 | 24" | 18" | 21" | 18" | 4.60 |
| 54" | 30" | 24" | 24" | 13.4 | 54" | 32" | 36" | 24" | 18.15 | 42" | 18" | 24" | 24" | 9.60 |
| 54" | 30" | 24" | 24" | 13.4 | 54" | 32" | 36" | 24" | 18.15 | 42" | 18" | 24" | 24" | 9.60 |
| 60" | 32" | 30" | 24" | 17.9 | 60" | 40" | 42" | 24" | 25.00 | 44" | 24" | 30" | 24" | 13.2 |
| 60" | 32" | 30" | 24" | 17.9 | 60" | 40" | 42" | 24" | 25.00 | 44" | 24" | 30" | 24" | 13.2 |
| 66" | 34" | 36" | 24" | 22.5 | 69" | 48" | 48" | 24" | 29.00 | 48" | 30" | 36" | 24" | 17.0 |
| 66" | 34" | 36" | 24" | 22.5 | 69" | 48" | 48" | 24" | 29.00 | 48" | 30" | 36" | 24" | 17.0 |
| 66" | 36" | 40" | 24" | 27.5 | 69" | 48" | 48" | 24" | 33.00 | 48" | 30" | 36" | 24" | 17.0 |
| 66" | 36" | 40" | 24" | 27.5 | 69" | 48" | 48" | 24" | 33.00 | 48" | 30" | 36" | 24" | 17.0 |
| 38" | 24" | | | | 48" | 24" | | | | 40" | 24" | | | 36" |
| 42" | 24" | | | | 60" | 24" | | | | 48" | 24" | | | 42" |
| 58" | 24" | | | | 96" | 24" | | | | 72" | 24" | | | 48" |

3 TYPICAL CONCRETE KICKERS
NOT TO SCALE

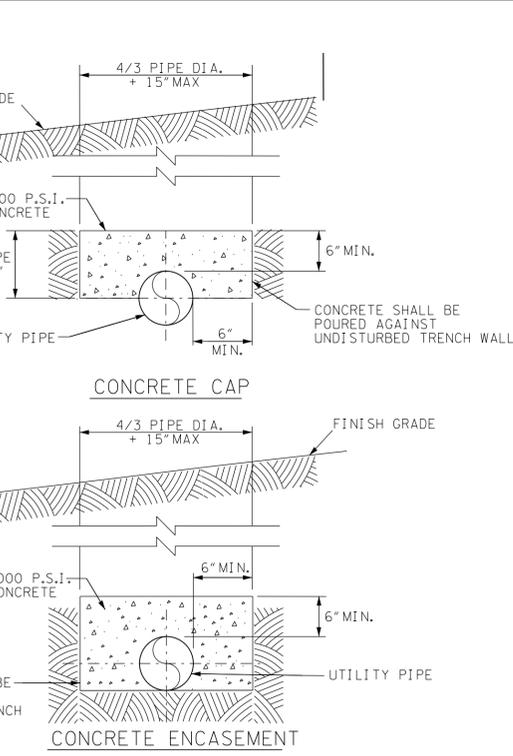


NOTES:
1. CASING SHALL EXTEND TO THE GREATER OF THE FOLLOWING DISTANCES:
A. 2' BEYOND TOE OF SLOPE
B. 5' BEYOND CENTERLINE OF DITCH
C. MIN. OF 25' WHEN CASING IS SEALED AT BOTH ENDS
D. AS NOTED ON PLANS.
2. BORED CROSSINGS SHALL BE PERMITTED AND INSTALLED TO MEET THE REQUIREMENTS OF TENNESSEE DEPARTMENT OF TRANSPORTATION AND/OR GILES COUNTY HIGHWAY DEPT.
3. CARRIER PIPE SHALL BE DUCTILE IRON PIPE OR PVC AS SHOWN ON DRAWINGS. CARRIER PIPE SHALL BE CENTERED IN THE CASING PIPE. CARRIER PIPE SHALL BE INSTALLED USING CARBON STEEL CASING SPACERS. SPACERS SHALL BE PLACED AT PIPE JOINT MIDPOINT AND 1' FROM EACH END OF PIPE JOINT.
4. ENDS OF CASING PIPE SHALL BE SEALED UTILIZING SYNTHETIC RUBBER SEALS WITH STAINLESS STEEL BINDING STRAPS.
5. REFER TO SPECIFICATION SECTION 02725 FOR CASING PIPE THICKNESS.

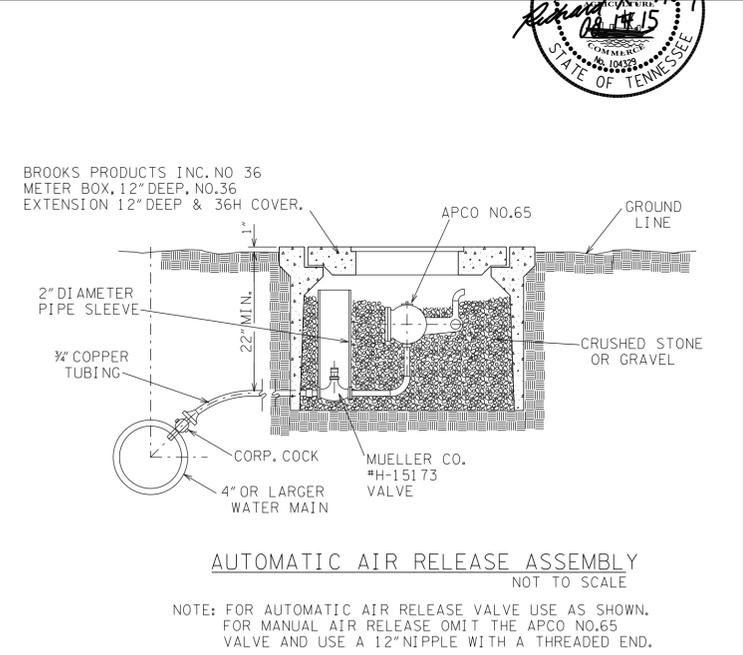
4 UTILITY LINE CROSSING UNDER HIGHWAY
NOT TO SCALE



5 PIPELINE SEPARATION DETAIL
NOT TO SCALE



6 CONCRETE PROTECTION FOR BURIED UTILITIES
NOT TO SCALE



7 AUTOMATIC AIR RELEASE ASSEMBLY
NOT TO SCALE



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| TYPE | YEAR | PROJECT NO. | SHEET NO. |
|--------|------|--------------|-----------|
| CONST. | 2015 | STP/NH-7(16) | U4-1 |
| | | | |
| | | | |

| PULASKI SEWER UTILITY QUANTITIES | | | | | |
|----------------------------------|---|------|----------|-----------|----------|
| ITEM NO. | DESCRIPTION | UNIT | QUANTITY | % Utility | %Project |
| ① 797-03.09 | 10IN PVC FORCE MAIN | L.F. | 5020 | 9.00% | 91.00% |
| ② 797-06.66 | BORE/JACK 20IN STEEL CASING PIPE - UNCON. | L.F. | 370 | 9.00% | 91.00% |
| ③ 797-08.02 | PVC FITTINGS | LBS | 305 | 9.00% | 91.00% |
| ④ 797-09.26 | 2IN AIR/VAC VALVE ASSEMBLY | EACH | 1 | 9.00% | 91.00% |
| ⑤ 797-10.17 | CONNECT TO 6IN FORCE MAIN | EACH | 1 | 9.00% | 91.00% |
| ⑤ 797-10.19 | CONNECT TO 10IN FORCE MAIN | EACH | 4 | 9.00% | 91.00% |

FOOTNOTES:

1. INCLUDES ALL MATERIALS, LABOR AND 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.
2. 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.
3. INCLUDES FITTINGS, GLANDS AND RESTRAINT DEVICES DESCRIBED IN POUNDS.
4. INCLUDES ALL MATERIALS, LABOR AND EQUIPMENT, INCLUDING BUT NOT LIMITED TO MACHINERY, TOOLS, OR APPARATUS NECESSARY FOR INSTALLATION OF ASSEMBLIES AS DESCRIBED AND DETAILED IN THE PLANS AND SPECS.
5. INCLUDES ALL MATERIALS, LABOR, AND EQUIPMENT NECESSARY FOR CONNECTING TO AN EXISTING FORCE MAIN, SEWER LINE, PUMP STATION, OR MANHOLE AS SPECIFIED ON PLANS, INCLUDING TRAFFIC CONTROL.

REMOVAL OF EXISTING UTILITY LINES TO BE PAID FOR UNDER ITEM# 202-01 - "REMOVAL OF STRUCTURES AND OBSTRUCTIONS" IN S.R. 7 PROJECT PIN# 101591.00

GENERAL NOTES TO BE INCLUDED IN ALL UTILITY PLANS:

1. EXCEPT FOR EROSION SEDIMENT CONTROL ITEMS, NO ROADWAY OR BRIDGE ITEMS SHALL BE UTILIZED TO COMPENSATE FOR WORK METHODS OR MATERIALS ASSOCIATED WITH AND/OR SPECIFIED FOR THE UTILITY INSTALLATION, EVEN THOUGH THE SAME OR SIMILAR ROADWAY OR BRIDGE MATERIALS MAY HAVE BEEN CALLED FOR IN THE UTILITY SPECIFICATIONS OR DRAWINGS.
2. ALL MATERIALS, METHODS, AND/OR INTEGRAL MATERIALS OUTLINED IN THE UTILITY SPECIFICATIONS OR DRAWING NECESSARY TO PROVIDE A COMPLETE AND FUNCTIONAL INSTALLATION MUST BE INCLUDED IN THE UNIT PRICE FOR THE ASSOCIATED UTILITY WORK ITEM.
3. THE CONTRACTOR MUST MAINTAIN ALL SERVICES DURING THE CONSTRUCTION OF THE FACILITY. ANY COSTS ASSOCIATED WITH INSTALLATION OF REQUIRED TEMPORARY SERVICE LINES DUE TO THE ROADWAY CONSTRUCTION SEQUENCE OF WORK (I.E., CUTS, FILLS, PHASING, ETC.) SHALL BE INCLUDED IN THE COST OF THE PERMANENT UTILITY ITEMS. (NOTE TO UTILITY: THE UTILITY RELOCATION PLANS SHALL PROVIDE TO THE CONTRACTOR THE UTILITY 5*32S REQUIREMENTS FOR TEMPORARY TIE-INS (INCLUDING NECESSARY TESTING AND STERILIZATION TO ACCOMPLISH THE TIE-IN) AND ALSO ANY RESTRICTIONS FOR TAKING LINES OUT OF SERVICE. IF A TEMPORARY LINE WILL BE A MAJOR ITEM OF WORK, A SPECIFIC TEMPORIZATION PLAN AND ITEM MUST BE INCLUDED IN THE UTILITY 5*32S PLANS.)
4. IT SHALL BE THE RESPONSIBILITY OF THE PRIME CONTRACTOR 5*32S SURVEYOR TO LAY OUT ALL THE FACILITIES BEING RELOCATED WITHIN THE CONTRACT.
5. FOR BURIED UTILITIES, THE PRIME CONTRACTOR OR SUBCONTRACTOR SHALL BE REQUIRED TO PROVIDE TO THE UTILITY UPON COMPLETION OF THE UTILITY 5*32S RELOCATION WORK A SET OF AS-BUILT DRAWINGS FOR THEIR RECORDS. THESE AS-BUILT DRAWINGS SHOULD BE PREPARED AS THE JOB PROGRESSES TO ENSURE THEIR ACCURACY.
6. WHERE EROSION CONTROL MEASURES ARE NEEDED FOR THE UTILITY RELOCATION WORK OCCURRING INSIDE OR OUTSIDE STATE RIGHT-OF-WAY, THE CONTRACTOR SHALL SUBMIT TO THE TDOT PROJECT SUPERVISOR FOR APPROVAL A PROPOSED EROSION AND SEDIMENT CONTROL PLAN PRIOR TO BEGINNING THE WORK. TDOT APPROVAL MUST BE RECEIVED BEFORE THE EROSION CONTROL PAY ITEMS FOR ROADWAY CONSTRUCTION CAN BE USED FOR ANY ADDITIONAL EROSION CONTROL MEASURES REQUIRED FOR THE UTILITY RELOCATION WORK.
7. DRIVEWAY, SIDEWALK AND ROADWAY TEMPORARY RESTORATION SHALL BE PART OF THE IN-PLACE COST OF PLACING THE UTILITY ITEM WITHIN THE ROW. WHEN APPLICABLE, THE UTILITY RELOCATION PLANS WILL SHOW ANY STREAM CROSSINGS AND CROSS-SECTIONS OF THE STREAMS CROSSINGS WITH THE FOLLOWING NOTE:
8. ANY EXCAVATION OF THE STREAM CHANNEL AREA SHALL BE SEPARATED FROM FLOWING WATER AND ACCOMPLISHED DURING LOW FLOW CONDITIONS. THIS SHALL BE ACCOMPLISHED BY THE USE OF FLUMES, LINED DIVERSION CHANNEL WITH SANDBAG BERM, DIVERSION PIPE WITH SANDBAG DAM AT PIPE INLET, OR IN SOME CASES COFFERDAMS. ALTERNATIVELY, BASED ON FIELD CONDITIONS AND CONTRACTOR SELECTION, THE UTILITY RELOCATION MAY BE ACCOMPLISHED USING BORE TECHNOLOGY WITH NO STREAM CHANNEL IMPACTS.

GENERAL NOTES FOR UTILITY LINE CONSTRUCTION:

1. NEW WATER LINE SHALL MAINTAIN MINIMUM OF 42-INCHES OF COVER IN ALL ROADWAY FINISHED CUT AREAS.
2. NEW WATER LINE SHALL MAINTAIN MINIMUM OF 36-INCHES OF COVER IN ALL DRIVEWAY FINISHED CUT AREAS.
3. NEW SERVICE LINES SHALL MAINTAIN MINIMUM OF 24-INCHES OF COVER IN ALL ROADWAY FINISHED CUT AREAS.
4. THE CONTRACTOR SHALL RESTORE ALL CULVERTS, FENCES, WALLS, HEDGES, SHRUBS, FLOWERING TREES, FRUIT TREES, SIGNS, LIGHT POSTS, POWER POLES, STREET MARKERS, MAIL BOXES, WATER LINES, GAS LINES, GAS AND WATER METERS AND BOXES (INCLUDING SHUTOFFS), PROPERTY CORNER MARKERS, AND LAWNS DISTURBED BY CONSTRUCTION OPERATIONS TO THEIR ORIGINAL CONDITIONS.
5. IN EASEMENTS, CONTRACTOR SHALL PROTECT AND RESTORE SAID PROPERTY TO A CONDITION SIMILAR OR EQUAL TO THAT EXISTING AT THE BEGINNING OF CONSTRUCTION.
6. THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK IN EACH AREA, AND HE AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT OCCUR BY HIS FAILURE TO DO SO.
7. PERMANENT PAVEMENT REPAIR SHALL BE DESIGNATED AS A PART OF THIS CONTRACT. THE CONTRACTOR SHALL ALSO BE RESPONSIBLE FOR THE TEMPORARY REPAIR AND MAINTENANCE OF STREETS AND DRIVEWAYS UNTIL THE PROJECT IS SUBSTANTIALLY COMPLETE. THIS ALSO INCLUDES THE PULLING OF DITCHES AND RESTORING SHOULDERS DAMAGED DURING CONSTRUCTION.
8. CONTRACTOR SHALL CLOSELY COORDINATE ALL CONSTRUCTION WITH TDOT, UTILITY OWNER OR DESIGNATED PROJECT REPRESENTATIVE.
9. CONTRACTOR SHALL NOTIFY TDOT, UTILITY OWNER AT LEAST ONE DAY IN ADVANCE PRIOR TO WORK WHICH WILL PLACE RESIDENTS OUT OF WATER, SEWER, OR, GAS SERVICE.
10. ALL MATERIALS REMOVED OR REPLACED SHALL BE RETURNED TO THE UTILITY OWNER OR TDOT (I.E., VALVES, VALVE BOXES, HYDRANTS, ETC.).
11. CONTRACTOR SHALL NOTIFY THE PULASKI WATER, SEWER, AND GAS DEPARTMENT, PRIOR TO INITIATING CONSTRUCTION ON THE WATER, SEWER, OR GAS SYSTEM AND SHALL BE RESPONSIBLE FOR ISOLATING PROJECT AREAS FROM REMAINDER OF WATER, SEWER, AND GAS SYSTEM DURING CONSTRUCTION.
12. EXISTING SERVICE LINES ARE TO BE UTILIZED WHEREVER POSSIBLE IN ORDER TO MINIMIZE ROAD CUTS. SERVICES ARE TO BE TAPPED INTO THE NEW LINE USING THE PROPER SADDLE AND CORPORATION STOP.
13. ALL EXISTING UTILITIES ARE TO REMAIN IN SERVICE WHILE THE PROPOSED LINE IS BEING LAID AND PLACED INTO SERVICE. NEW LINE SHALL BE TESTED PRIOR TO CUT-IN TO EXISTING LINE. SERVICE RELOCATIONS SHALL OCCUR AT TIME OF TIE OVER OF NEW LINE. MAIN LINE TIE IN SHALL BE COORDINATED WITH THE CITY OF PULASKI FOR TIMING OF WATER, SEWER, AND GAS SERVICE OUTAGE. IN NO CIRCUMSTANCE, SHALL WATER, SEWER, OR GAS SERVICE BE INTERRUPTED FOR MORE THAN 8 HOURS.
14. ALL WATER, SEWER, AND GAS LINE INSTALLATION AND TESTING SHALL BE IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS.

GENERAL NOTES FOR CREEK CROSSING:

1. ALL SURFACE WATER FLOWING TOWARD THE EXCAVATION OR FILL WORK SHALL BE DIVERTED, PIPED OR FLUMED TO THE DOWNSTREAM SIDE OF THE WORK. THIS CAN BE ACCOMPLISHED THROUGH UTILIZATION OF COFFERDAMS OR CONSTRUCTED BERMS IN CONJUNCTION WITH A PIPE OR FLUME. COFFERDAMS MUST BE CONSTRUCTED OF SAND BAGS, CLEAN ROCK, STEEL SHEETING OR OTHER NON-ERODIBLE MATERIAL.
2. TEMPORARY EROSION CONTROL MEASURES MUST BE IN PLACE BEFORE EARTH MOVING OPERATIONS BEGIN, MAINTAINING THROUGHOUT THE CONSTRUCTION PERIOD AND REPAIRED, IF NECESSARY AFTER RAINFALL. STRAW OR HAY BALES AND/OR CUTS FENCE MUST BE INSTALLED ALONG THE BASE OF ALL FILLS AND CUTS, ON THE DOWNHILL SIDE OF STOCKPILED SOIL, AND ALONG STREAM BANKS IN CLEARED AREAS TO PREVENT EROSION INTO STREAMS. THEY MUST BE INSTALLED PARALLEL TO THE STREAM CHANNEL, ENTRENCHED AND STAKED, AND EXTEND THE WIDTH OF THE AREA TO BE CLEARED. THE BALES AND/OR SILT FENCE MAY BE REMOVED AT THE BEGINNING OF THE WORK DAY, BUT MUST BE REPLACED AT THE END OF THE WORKDAY.
3. BACKFILL ACTIVITIES MUST BE ACCOMPLISHED IN A MANNER WHICH STABILIZES THE STREAM BED AND BANKS TO PREVENT EROSION. BACKFILL MATERIALS SHALL CONSIST OF SUITABLE MATERIALS FREE OF CONTAMINANTS. ALL CONTOURS MUST BE RETURNED TO PRE-POST CONDITIONS. THE COMPLETED WORK MAY NOT DISRUPT OR IMPOUND STREAM FLOW.
4. SLURRY WATER PUMPED FROM WORK AREAS AND EXCAVATIONS MUST BE HELD IN SETTLING BASINS OR TREATED BY FILTRATION PRIOR TO INITIAL DISCHARGE INTO SURFACE WATERS. WATER MUST BE HELD IN SEDIMENT BASINS UNTIL AT LEAST AS CLEAR AS THE RECEIVING WATERS. SEDIMENTATION BASINS SHALL NOT BE LOCATED CLOSER THAN 20 FEET FROM THE TOP BANK OF A STREAM. SEDIMENT BASINS AND TRAPS SHALL BE PROPERLY DESIGNED ACCORDING TO THE SIZE OF THE DRAINAGE AREAS OR VOLUME OF WATER TO BE TREATED.
5. CHECKDAMS SHALL BE UTILIZED WHERE RUNOFF IS CONCENTRATED. CLEAN ROCK, LOG, SANDBAG OR STRAW BALE CHECKDAMS SHALL BE PROPERLY CONSTRUCTED TO DETAIN RUNOFF AND TRAP SEDIMENT.
6. CLEARING, GRUBBING AND OTHER DISTURBANCE TO RIPARIAN VEGETATION SHALL BE LIMITED TO THE MINIMUM NECESSARY FOR SLOPE CONSTRUCTION AND EQUIPMENT OPERATIONS. UNNECESSARY VEGETATION REMOVAL IS PROHIBITED. ALL DISTURBED AREAS SHALL BE PROPERLY STABILIZED AS SOON AS PRACTICABLE.
7. STREAMS SHALL NOT BE USED AS TRANSPORTATION ROUTES FOR HEAVY EQUIPMENT.
8. CONSTRUCTION DEBRIS MUST BE KEPT FROM ENTERING THE STREAM CHANNEL.
9. ALL SPILLS OF PETROLEUM PRODUCTS OR OTHER POLLUTANTS MUST BE REPORTED TO THE APPROPRIATE EMERGENCY MANAGEMENT AGENCY AND MEASURES SHALL BE TAKEN IMMEDIATELY TO PREVENT THE POLLUTION OF WATERS OF THE STATE, INCLUDING GROUNDWATER.
10. UPON ACHIEVEMENT OF FINAL GRADE, THE DISTURBED STREAMBANK SHALL BE STABILIZED WITH RIP-RAP (MIN. SIZE=2"). ALL OTHER DISTURBED SOILS MUST BE STABILIZED AND RE-VEGETATED WITHIN 30 DAYS BY SODDING OR SEEDING AND MULCHING. SEED TO BE UTILIZED SHALL INCLUDE COMBINATION OF ANNUAL GRAINS AND GRASSES, LEGUMES, AND PERENNIAL GRASSES. LIME AND FERTILIZER SHALL BE APPLIED AS NEEDED TO ACHIEVE A VEGETATIVE COLOR.
11. UPON COMPLETION OF CONSTRUCTION, THE STREAM SHALL BE RETURNED AS NEARLY AS POSSIBLE TO ITS ORIGINAL, NATURAL CONDITION.

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STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT
CITY OF PULASKI
STATE ROUTE 7
**UTILITY
RELOCATION**
QUANTITIES &
GENERAL NOTES

I. BORING AND CASING FOR UTILITIES

PART 1 - GENERAL

1 SECTION INCLUDES

- A. The work to be performed under this section shall consist of the installation of a casing pipe for the purpose of installing a high pressure steel gas line, water line, or sewer line as shown on the drawings or as called for in these specifications. It shall include the excavation of a boring pit, auger boring between the points specified on the drawings, furnishing and installing of the carrier pipe and disposing of the excavated materials.

PART 2 - PRODUCTS

2.02 CASING PIPE

- A. The casing pipe shall be of steel meeting the latest approved American Railway Engineering Association "Specifications for Pipelines for Carrying Flammable and Nonflammable Substances". The steel casing pipe shall have a minimum yield strength of 35,000 psi and shall have the minimum wall thickness shown in the following table:

TABLE OF MINIMUM WALL THICKNESS FOR STEEL CASING PIPE FOR E72 LOADING

| Carrier Pipe | Casing Pipe | Nominal Thickness |
|--------------|-------------|-------------------|
| 4 | 8 | 0.250" |
| 6 | 12 | 0.250" |
| 8 | 16 | 0.312" |
| 10 | 20 | 0.312" |
| 12 | 22 | 0.312" |
| 14 | 24 | 0.344" |
| 16 | 26 | 0.375" |
| 18 | 28 | 0.406" |

- B. When the casing pipe is installed without benefit of a protective coating, the wall thickness shown above shall be increased to the nearest standard size or a minimum of 0.063" greater than the thickness shown.
- C. Carrier Pipe: The carrier pipe shall be as specified on the drawings or elsewhere in these specifications.
- D. Casing Spacers: Casing spacers shall be manufactured from high impact strength, UV resistant polypropylene and be assembled with non-metallic fasteners. Spacers shall be configured to concentrically locate carrier pipes inside carrier pipes.

PART 3 - EXECUTION

3.01 BORING

- A. The boring shall be accomplished by means of auger. Bore the tunnel to the size, line and grade needed to accommodate the casing size shown on the drawings.

3.02 INSTALLATION OF CASING PIPE

- A. Jack the steel casing pipe into place as the boring proceeds. Weld sections of casing pipe together to provide watertight joints.
- B. Do not remove unacceptable casing without prior approval from TDOT. If the removal of casing pipe is permitted, make proper provisions to prevent caving in of the earth surrounding the casing.

3.03 INSTALLATION OF CARRIER PIPE

- A. The carrier pipe shall be furnished by the Contractor. After acceptance of the casing by TDOT, install the carrier pipe in the casing by jacking it through the casing. As the carrier pipe is being inserted into the casing pipe, locate spacers per spacer manufacturer recommendations.

3.04 LAYOUT OF WORK

- A. TDOT will provide the necessary control points required by the Contractor for this construction. The Contractor will provide the detailed layout required to keep the tunnel or bore on grade.

3.05 GUARANTEE OF WORK

- A. Guarantee a usable completed casing between the points specified and to the line and grade specified. The allowable tolerance at the downstream end point of the bore shall be such that the invert of the carrier pipe may be positioned within a vertical area limited on the top by an elevation no higher than the elevation shown on the drawings and on the bottom by an elevation no lower than the existing inlet pipe invert.
- B. The allowable tolerance at the upstream end point of the bore shall be such that the invert of the carrier pipe may be positioned at the elevation shown on the drawings.

END OF SECTION

II. SEWAGE FORCEMAINS

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Furnish all material, equipment, tools, and labor in connection with sewage force main, complete and in accordance with the drawings and these specifications.
- B. It shall be the Contractor's responsibility to ensure that all necessary materials are furnished to him and that those found to be defective in manufacture are replaced at no extra cost to TDOT. Materials damaged in handling after being delivered by the manufacturer shall be replaced at the Contractor's own expense. If installed materials found to be defective before the final acceptance of the work, the cost of both the material and labor needed to replace it shall not be passed on to TDOT.
- C. The Contractor shall be responsible for safely storing materials needed for the work that have been accepted by him until they have been incorporated into the completed project. Keep the interiors of all pipes, fittings, and other accessories free from dirt and foreign matter at all times.
- D. Magnetic type detector tape shall be installed above nonmetallic force main. This tape shall be a minimum of 2" wide and be marked as indicating a sewage utility line. This tape shall be installed 12" above the force main wherever PVC pipe is utilized.
- E. Refer to other sections for work related to that specified by this section. Coordinate this work with that required by other sections for timely execution.

PART 2 - PRODUCTS

2.01 PVC PIPE

- A. All 10-inch and smaller (pressure sewer) forcemain shall be SDR 21 PVC CL 200 and all 16-inch or greater forcemain shall be C905 PVC. PVC pipe used to transport sewage shall be green in color.
- B. All Class 200, 250, or 315 pipe shall have NSF approval and be manufactured in accordance with ASTM D2241. The following tests shall be run for each machine on each size and type of pipe being produced, as specified below:
 1. Flattening Test: Once per shift in accordance with ASTM D2412. Upon completion of the test, the specimen shall not be split, cracked or broken.
 2. Acetone Test (Extrusion Quality Test): Once per shift in accordance with ASTM D2152. There shall be no flaking, peeling, cracking, or visible deterioration on the inside or outside surface after completion of the tests.
 3. Quick Burst Test: Once per 24 hours in accordance with ASTM 5199.

| SDR | Minimum Bursting Pressure Rating | Pressure, psi |
|------|----------------------------------|---------------|
| 13.5 | 315 | 1,200 |
| 17 | 250 | 1,000 |
| 21 | 200 | 800 |

- 4. Impact Test: For 6" and larger, once per shift in accordance with ASTM D2444; for 4" and smaller, once each 2 hours in accordance with ASTM D2444.
- 5. Wall Thickness and Outside Dimensions Tests: Once per hour in accordance with ASTM D2122.
- 6. Bell Dimensions Test: Once per hour in accordance with ASTM D3139.
- C. All C905 DR25 pipe shall be pressure treated to a minimum of 110 psi.
- D. If any specimen fails to meet any of the above mentioned tests, all pipe of that size and type manufactured between the test periods must be scrapped and a full set of tests rerun.
- E. Furnish a certificate from the pipe manufacturer stating that he is fully competent to manufacture PVC pipe of uniform texture and strength and in full compliance with these specifications and further stating that he has manufactured such pipe and done so in sufficient quantities to be certain that it will meet all normal field conditions. In addition, the manufacturer's equipment and quality control facilities must be adequate to ensure that each extrusion of pipe is uniform in texture, dimensions, and strength. Also furnish a certificate from the manufacturer certifying that the pipe furnished for this project meets the requirements of these specifications. If required by TDOT, the Contractor shall provide copies of the actual test performed in accordance with this section.
- F. All pipe shall be manufactured in the United States. All PVC pipe gaskets and fittings for any one project shall be made by the same manufacturer.
- G. All pipe 6" in diameter and less may be furnished in the manufacturer's standard laying lengths of 20', 38', or 40'. Pipe 8" and larger shall be furnished in 20' lengths. The Contractor's methods of storing and handling the pipe shall be approved by TDOT. All pipe shall be supported within 5' of each end; in between the end supports, there shall be additional supports at least every 15'. The pipe shall be stored away from heat or direct sunlight. The practice of stringing pipes out along the proposed water line routes will not be allowed.
- H. Certain information shall be applied to each piece of pipe. At the least, this shall consist of:
 1. Nominal size
 2. Type of material
 3. SDR or class
 4. Manufacturer
 5. NSF Seal of Approval

- I. Pipe that fails to comply with the requirements set forth in these specifications shall be rejected.
- J. Pipe 2" and larger shall have push-on joints designed with grooves in which continuous molded rubber ring gaskets can be placed. Gaskets shall be made of vulcanized natural or synthetic rubber; no reclaimed rubber will be allowed. Gaskets shall be of size the manufacturer's standard design dimensions and of such size and shape as to provide a positive seal under all combinations of joint and gasket tolerance. The gasket and annular groove shall be designed and shaped so that when the joint is assembled, the gasket will be radially compressed to the pipe and locked in place against displacement, thus forming a positive seal.

- K. The spigot end of each pipe shall be beveled so that it can be easily inserted into the gasket joint, which in turn shall be designed so that the spigot end may move in the socket as the pipe expands or contracts. The spigot end shall be striped to indicate the distance into which it is to be inserted into the socket. Each joint shall be able to accommodate the thermal expansions and contractions experienced with a temperature shift of at least 75 degrees F.
- L. Enough lubricant shall be furnished with each order to provide a coat on the spigot end of each pipe. This lubricant shall be nontoxic, impart no taste or smell to the water, have no harmful effect on the gasket or pipe material, and support no bacterial growth. The lubricant containers shall be labeled with the manufacturer's name.
- M. Joints shall be manufactured in accordance with ASTM D3139 except that the thickness of the bell shall be, as a minimum, equal to that of the barrel. Joints shall be either integral bell and ring joints with rubber compression gaskets as manufactured by the Clow Corp., Johns-Manville, or Vulcan Plastic Corp.; twin gasket couplings as manufactured by the Certain-Teed Products Corp.; or equal. However, the pipe and bell must be made by the same manufacturer.
- N. Standard and special fittings shall be gray iron or ductile iron. Use compact mechanical joint fittings. All fittings shall conform to the specifications of ANSI A21.10/AWWA C153. The gaskets shall be ducked tipped transition gaskets for use with PVC pipe.
- O. Fittings shall be lined with enamel or a thin cement lining as specified in ANSI A21.4/AWWA C104; this lining is to be furnished at no extra cost. In addition, a bituminous seal coat or asphalt emulsion spray coat approximately 1 mil thick shall be applied to the cement lining in accordance with the pipe manufacturer's standard practices.
- P. Fittings shall be in accordance with the standard mechanical joint fittings manufactured by the U.S. Pipe and Foundry Company, American Cast Iron Pipe Company, Clow Corporation, or equal.

2.03 COPPER WIRE FOR DETECTION

- A. All nonmetallic force main shall be installed with a 12 gauge green coated copper wire, installed 12" to 18" below finished grade directly above the pipe.

2.04 HDPE DIRECTIONAL BORING

- A. HDPE pipe for directional boring shall comply with HDPE specification for water lines except pipe color shall be green and use a green coated copper wire.

PART 3 - EXECUTION

3.01 EXCAVATION FOR SEWAGE FORCE MAINS

- A. Unclassified excavation for pipelines shall consist of the excavation necessary for the construction of sewage force mains and their appurtenances (including valves, fittings, collars, concrete saddles, and pipe protection) that are called for by the drawings. It shall include clearing and grubbing where necessary, backfilling and tamping pipe trenches and around structures, and disposing of waste materials, all of which shall conform to the applicable provisions set forth elsewhere in these specifications.
- B. The Contractor may, if he chooses, use a motor powered trenching machine. If he does, however, he shall be fully responsible for the preservation or repair of existing utility service connections.
- C. Unless the construction of lines by tunneling, jacking, or boring is called for by the drawings or specifically authorized by TDOT, make excavation for pipelines in open cut and true to the lines and grades shown on the drawings or established by TDOT on the ground. Cut the banks of trenches between vertical parallel planes equidistant from the pipe centerline. The horizontal distance between the vertical planes (or, if sheeting is used, between the inside faces of that sheeting) shall vary with the size of the pipe to be installed, but shall not be more than the distance determined by the following formula: $4/3d + 15'$, where "d" represents the internal diameter of the pipe in inches. When approved in writing by TDOT, the banks of trenches from the ground surface down to a depth not closer than 1' above the top of the pipe may be excavated to nonvertical and nonparallel planes, provided the excavation below that depth is made with vertical and parallel sides equidistant from the pipe centerline in accordance with the formula given above. Any cut made in excess of formula $4/3d + 15'$ shall be at the expense of the Contractor and may be cause for TDOT to require that stronger pipe and/or a higher class of bedding be used at no cost to TDOT.
- D. For all pipe in non-rock trenches, shape the bottom of all trenches to provide uniform bearing for the bottom of the pipe barrel.
- E. Excavate bellholes for bell and spigot pipe at proper intervals so that the barrel of the pipe will rest for its entire length upon the bottom of the trench. Bellholes shall be large enough to permit proper jointing of the pipe. Do not excavate bellholes more than 2 joints ahead of pipe laying.
- F. Do not excavate pipe trenches more than 200' ahead of the pipe laying, and not more than two hundred (200) feet of open ditch shall be left behind the pipe laying, and perform all work so as to cause the least possible inconvenience to the public. Construct temporary bridges or crossings when and where TDOT deems necessary to maintain vehicular or pedestrian traffic.
- G. In all cases where materials are deposited along open trenches, place them so that in the event of rain no damage will result to the work and/or to adjacent property.

| TYPE | YEAR | PROJECT NO. | SHEET NO. |
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STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

CITY OF PULASKI
STATE ROUTE 7
UTILITY
RELOCATION
SPECIFICATIONS

| TYPE | YEAR | PROJECT NO. | SHEET NO. |
|--------|------|--------------|-----------|
| CONST. | 2015 | STP/NH-7(16) | U4-3 |
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3.02 INSTALLATION OF FORCE MAIN

- A. Lay the force main to and keep it at the lines and grades required by the drawings. All fittings shall be at the required locations, and spigots well centered in the bells. Where the grades are 0.2% or less, either use batterboards or a laser to maintain the required slopes.
- B. Unless otherwise indicated by the drawings, all force main shall have at least 36" of cover. The pipe shall slope continuously between high and low points and have a minimum of 60" cover at the high points. No departure from this policy shall be made except at the order of TDOT.
- C. Provide and use tools and facilities that are satisfactory to TDOT and that will allow the work to be done in a safe and convenient manner. Use a derrick, ropes, or other suitable equipment to lower all pipe and fittings into the trench one piece at a time. Carefully lower each piece so that neither it nor any protective coating or lining it may have will be damaged. Under no circumstances, drop or dump force main materials into the trench.
- D. Lower no pipes and fittings into the trench until they have been swabbed to remove any mud, debris, etc., that may have accumulated within them. After the pipe has been lowered, remove all unnecessary materials from it. Before any pipe is laid, brush and wipe clean the outside of its spigot end and the inside of its bell and ensure that the pipe is dry and oil-free.
- E. Take every precaution to keep foreign material from getting into the pipe while it is being placed in the line. If the crew laying the pipe cannot put it into the trench and in place without allowing earth to get inside it, then place a heavy, tightly woven canvas bag of suitable size over each end of the pipe and leave it there until it is time to connect that pipe to the one adjacent to it.
- F. Place no debris, tools, clothing, or other materials in pipe during laying operations.
- G. After a length of pipe has been placed in the trench, center the spigot end in the bell of the adjacent pipe, and then insert to the depth specified by the manufacturer and bring to the correct line and grade. Secure the pipe in place by tamping an approved backfill material around it.
- H. Bellholes shall be big enough so that there is ample room for the pipe joints to be properly made. Between bellholes, carefully grade the bottom of the trench so that each pipe barrel will rest on a solid foundation for its entire length.
- I. Whenever pipe laying is not in progress, close the open ends of pipe in the trench with a watertight plug or by other means approved by TDOT. Caulk the joints of any pipe in the trench that cannot be completed until a later time with packing in order to make them as watertight as possible; this shall be done not only at the end of each working day but also before work is stopped for lunch periods, bad weather, or any other reason. If there is water in a trench, this seal shall remain in place until the trench has been pumped completely dry.
- J. The cutting of pipe so that fittings or closure pieces can be inserted shall be done in a neat and workmanlike manner and without any damage to the pipe. Follow the manufacturer's recommendations concerning how to cut and machine the ends of the pipe in order to leave a smooth end at right angles to the pipe's axis.
- K. The flame cutting of pipe by means of an oxyacetylene torch will not be allowed.
- L. Unless otherwise directed by TDOT, lay pipe with the bell ends facing in the direction of laying.
- M. Wherever pipe must be deflected from a straight line (in either the vertical or horizontal plane) to avoid obstructions or plumb stems or wherever long radius curves are permitted, the amount of deflection shall not exceed that necessary for the joint to be satisfactorily made, nor that recommended by the pipe manufacturer, and shall be approved by TDOT.
- N. Lay no pipe in water or when it is TDOT's opinion that trench conditions are unsuitable. If crushed stone is used to improve trench conditions or as backfill for bedding the pipe, this shall be considered incidental to the project, and no separate payment will be made for its use.
- O. Install thrust blocks wherever the force main changes direction (e.g., at tees and bends), at dead ends, or at any other point where the manufacturer recommends and/or TDOT indicates that they are to be used.
- P. Make all joints, whether standard mechanical or push-on joints, in conformance with recommendations of the joint manufacturer as approved by TDOT.
- Q. A green coated copper wire shall be buried 12" to 18" below the surface and directly above all non-metallic pipe used (both main and service lines).

3.03 WATER CROSSINGS (CONVENTIONAL METHOD)

- A. At water crossings, creeks or streams, Contractor may use dikes, cofferdams, culverts, or pilings to separate the work area from the flowing stream. The minimum depth of the pipe below the existing stream shall be three (3) feet. However, at the option of TDOT, two (2) feet may be acceptable in consolidated rock. The spoil shall be deposited on either side of the water crossing. After the pipe has been placed in the ditch all spoil banks shall be placed back over the line in the stream. The banks of the crossing shall be restored to their original condition and to prevent erosion, rip-rap material may be required. All excavation work shall conform to the terms of federal, state, and local permits and right-of-way easements.
- B. Weights will be installed if required. Contractor will either furnish weights or weight material.
- C. Contractor shall use due diligence to install crossing and shall be responsible for complying with all environmental agency requirements.

3.04 BACKFILLING

- A. Begin backfilling after the line construction is completed, inspected and approved by TDOT. On each side of the line, from the bottom of barrel to 1' above the top of the pipe, the backfill material shall be select backfill consisting of either of fine, loose earth like sandy soil or loam or of granular material that is free from clods, vegetable matter, debris, stone, and/or other objectionable materials and that has a size of not more than 2". Place this backfill simultaneously on either side of the pipe in even layers that are no more than 6" deep before compaction. Thoroughly and completely tamp each layer into place before placing additional layers. At locations beneath or closely adjacent to pavement this backfill shall consist of No. 67 (TDOT) crushed stone.
- B. If pipe is installed in a rock trench, install a 6" bedding of No. 67 (TDOT) crushed stone. Then add additional No. 67 stone backfill up to 1' above the top of the pipe as shown on the plans.
- C. From 1' above the pipe upward, the backfill material may contain broken stones that make up approximately 3/4 of the backfill's total volume. However, if this type of backfill is used, there must be enough spalls and earth materials to fill all voids completely. The maximum dimension of individual stones in such backfill shall not exceed 6", and the backfill material shall be placed and spread in even layers not more than 12" deep. At locations beneath or closely adjacent to pavement or at locations of improvements subject to damage by displacement the backfill shall be entirely No. 67 stone. Tamp and thoroughly compact the backfill in layers that, before compaction, are 6" deep. In other areas, the backfill for the upper portion of the trenches may be placed without tamping but shall be compacted to a density equivalent to that of adjacent earth materials as determined by laboratory tests. Use special care to prevent the operation of backfilling equipment from causing any damage to the pipe.
- D. Copper Wire for Detection: The Contractor shall furnish and install a 12 gauge green coated copper wire over the pipe. The copper wire shall be between 12" to 18" below the ground surface to assist in future pipe location. Where two sections of wire connect a 12 inch minimum twisted overlap is required with adequate bare wire connection for continuity. The bare wire connection shall be suitably coated to protect the wire from corrosion. The copper wire shall extend up into all valve boxes so it is accessible for connection to locating equipment. At uncased road crossings the Contractor shall install the copper wire onto the top of the plastic pipe.
- E. If earth material for backfills, in the opinion of TDOT, too dry to allow thorough compaction, then add enough water so that the backfill can be properly compacted. Do not place earth material that TDOT considers too wet or otherwise unsuitable.
- F. Wherever excavation has been made within easements across private property, the top 1' of backfill material shall consist of fine loose earth free from large clods, vegetable matter, debris, stone, and/or other objectionable materials.
- G. Wherever trenches have been cut across or along existing pavement, temporarily pave the backfill of such trenches by placing Class A, Grade D, crushed stone as the top of 12" of the backfill. Maintain this temporary pavement either until the permanent pavement is restored or until the project is accepted by TDOT.
- H. Wherever pipes have diameters of 15" or less, do not use power operated tampers to tamp that portion of the backfill around the pipe within 1' above the pipe.
- I. Perform backfilling so as not to disturb or injure any pipe and/or structure against which the backfill is being placed. If any pipe or structure is damaged and/or displaced during backfilling, open up the backfill and make whatever repairs are necessary.
- J. Backfilling and clean-up operations shall closely follow pipe laying; failure to comply with this provision will result in TDOT's requiring that the Contractor's other activities be suspended until backfilling and clean-up operations catch up with pipe laying.

3.04 HYDROSTATIC TESTS

- A. Pressure Test:
 - 1. After pipe has been laid and backfilled as specified above, subject all newly laid pipe or any isolated section to a pressure of 150 psi. All services are to be laid prior to testing the main and tested as part of the test of the main.
 - 2. The duration of each pressure test shall be at least one hour.
 - 3. Slowly fill each isolated section of pipe with water, and apply the specified test pressure (based on the elevation of the lowest point of the line or section under test and corrected to the elevation of the test gauge) with a pump connected to the pipe in a manner satisfactory to TDOT. Furnish pump, pipe, connections, gauges, and all necessary apparatus.
 - 4. Before applying the specified test pressure, expel all air from the pipe. If hydrants or blowoffs are not available at high places, make the necessary taps at the points of highest elevation before testing, and insert plugs after the test has been completed.
 - 5. Carefully examine all exposed pipes, fittings, valves, and hydrants during the test. Remove any cracked or defective pipes, fittings, valves, or hydrants discovered in consequence of this pressure test, and replace with sound material in the manner specified. Repeat the test until the results are satisfactory to TDOT.
- B. Leakage Test:
 - 1. Conduct the leakage test after the pressure test has been satisfactorily completed. Furnish the pump, pipe, connections, gauges, measuring devices, and all other necessary apparatus as well as all necessary assistance to conduct the test.
 - 2. The duration of each leakage test shall be 2 hours; during the test, subject the main to a pressure of 150 psi.
 - 3. Leakage is defined as the amount of water which must be supplied to the newly laid pipe or any isolated section in order to maintain the specified leakage test pressure after the pipe has been filled with water and the air expelled.
 - 4. No pipe installation will be accepted until the leakage is less than the number of gallons per 2 hour period listed below:

| Pipe Sizes | Gallons per 1,000 Feet of Pipe |
|-----------------|--------------------------------|
| 1-1/4" - 1-1/2" | 0.1 |
| 2" - 2-1/4" | 0.2 |
| 3" | 0.5 |
| 4" | 0.6 |
| 6" | 0.9 |
| 8" | 1.2 |
| 10" | 1.5 |
| 12" | 1.9 |
| 14" | 2.2 |
| 16" | 2.6 |
| 18" | 2.9 |
| 20" | 3.2 |
| 24" | 3.8 |

- 5. Should any test of pipe laid disclose leakage greater than that specified, the Contractor shall, at his own expense, locate and repair the defective joints until the leakage is within the specified allowance.
- C. Cleanup
 - 1. After completing each section of force main, remove all debris and all construction materials and equipment from the work site. Then grade and smooth over the surface on both sides of the main. The entire area shall be clean and left in a condition satisfactory to TDOT.

END OF SECTION

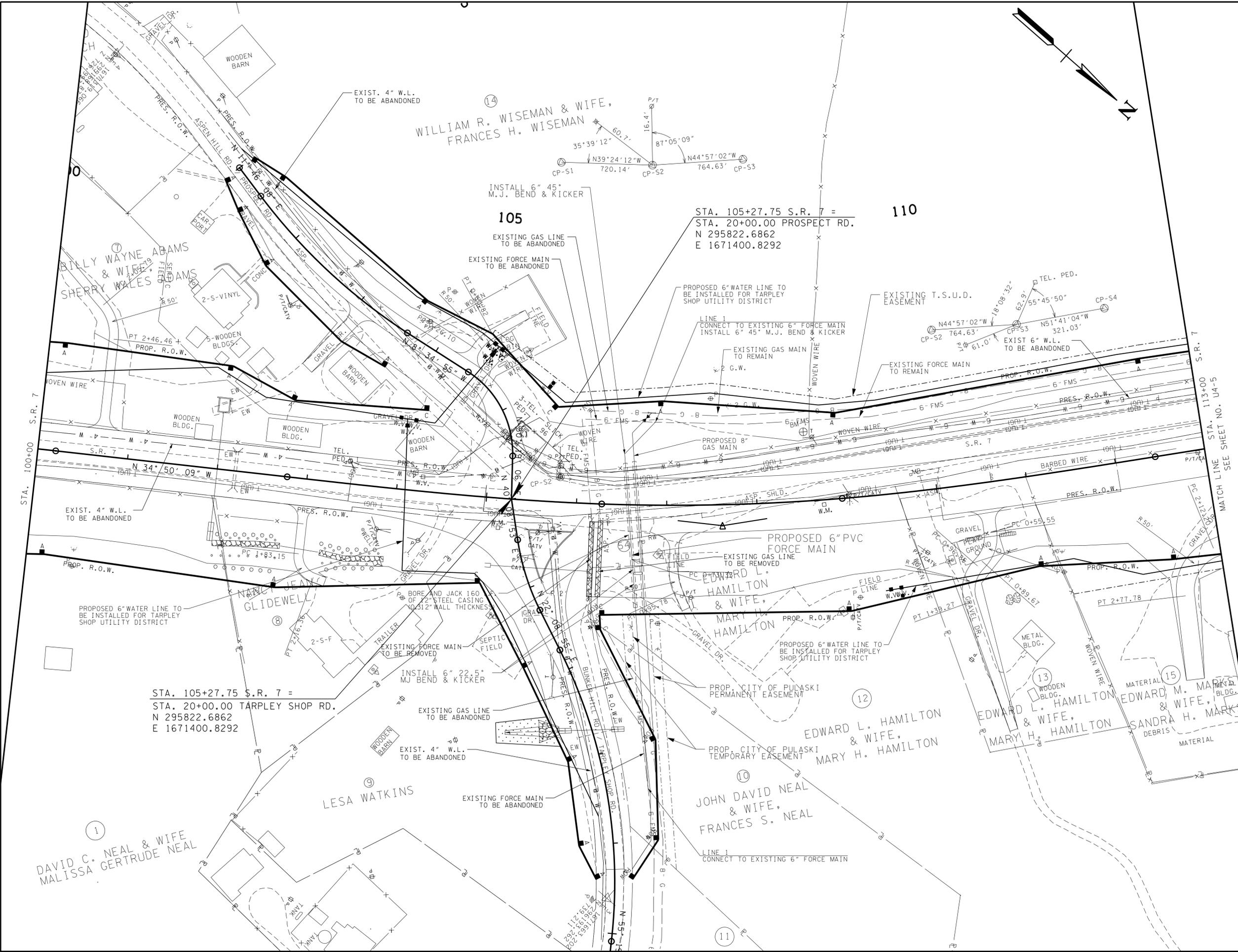
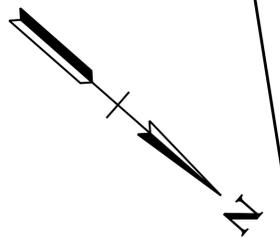
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STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

CITY OF PULASKI
STATE ROUTE 7
UTILITY
RELOCATION
SPECIFICATIONS

| TYPE | YEAR | PROJECT NO. | SHEET NO. |
|--------|------|--------------|-----------|
| CONST. | 2015 | STP/NH-7(16) | U4-4 |
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E 1671400.8292

STA. 105+27.75 S.R. 7 =
STA. 20+00.00 PROSPECT RD.
N 295822.6862
E 1671400.8292

STA. 100+00 S.R. 7

STA. 113+00 S.R. 7
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COORDINATE VALUES ARE NAD/83 (1995)
AND ARE DATUM ADJUSTED BY THE
FACTOR 1.000011 & TIED TO THE TGRN.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT
CITY OF PULASKI
STATE ROUTE 7
**UTILITY
RELOCATION**
FORCE MAIN - LINE 1
SCALE: 1" = 50'

| TYPE | YEAR | PROJECT NO. | SHEET NO. |
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| CONST. | 2015 | STP/NH-7(16) | U4-5 |
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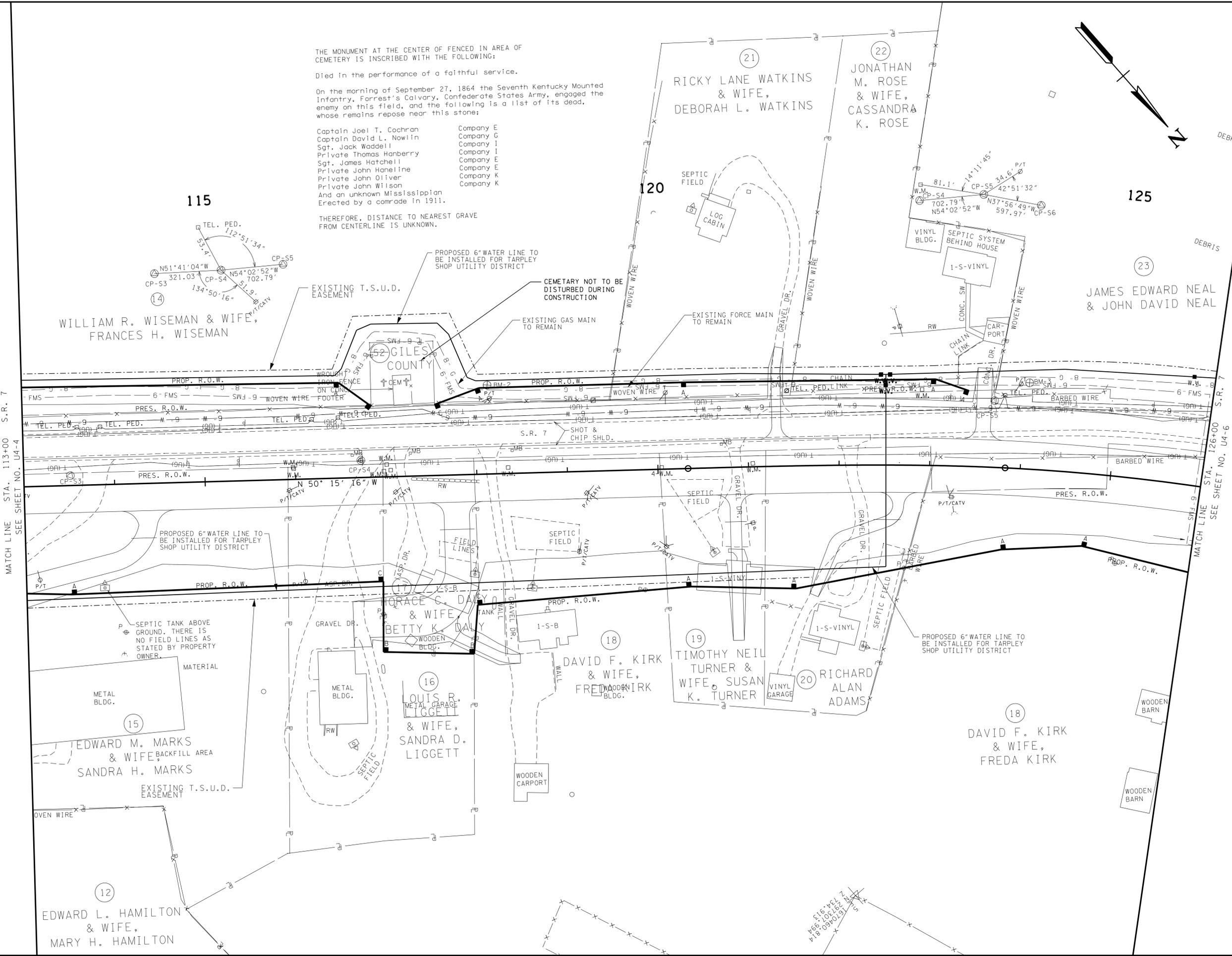
THE MONUMENT AT THE CENTER OF FENCED IN AREA OF CEMETERY IS INSCRIBED WITH THE FOLLOWING:

Died in the performance of a faithful service.

On the morning of September 27, 1864 the Seventh Kentucky Mounted Infantry, Forrest's Cavalry, Confederate States Army, engaged the enemy on this field, and the following is a list of its dead, whose remains repose near this stone:

- | | |
|------------------------------|-----------|
| Captain Joel T. Cochran | Company E |
| Captain David L. Nowlin | Company G |
| Sgt. Jack Waddell | Company I |
| Private Thomas Hanberry | Company I |
| Sgt. James Hatchell | Company E |
| Private John Haneline | Company E |
| Private John Oliver | Company K |
| Private John Wilson | Company K |
| And an unknown Mississippian | |
- Erected by a comrade in 1911.

THEREFORE, DISTANCE TO NEAREST GRAVE FROM CENTERLINE IS UNKNOWN.



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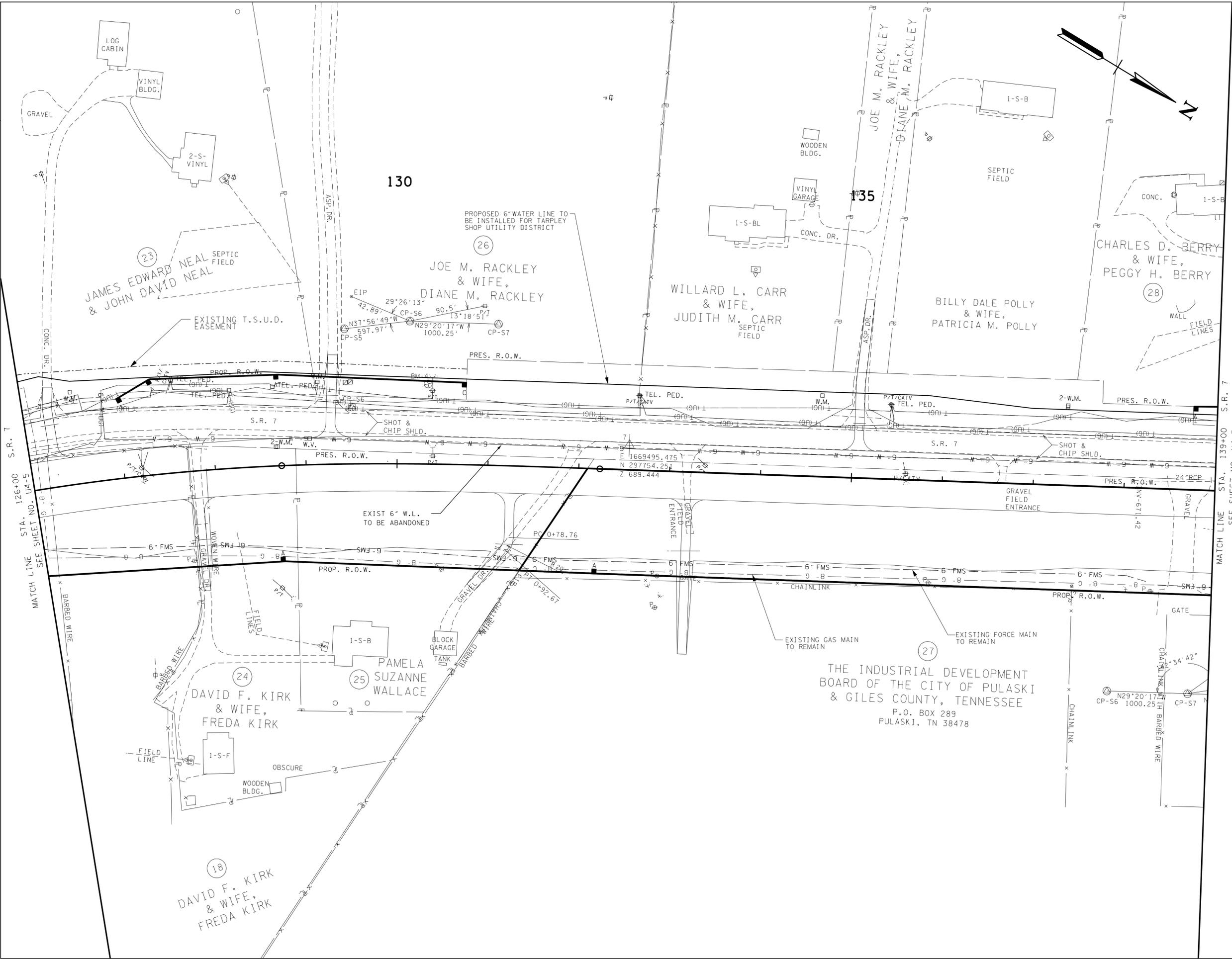


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STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
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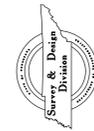
CITY OF PULASKI
STATE ROUTE 7
UTILITY RELOCATION
FORCE MAIN
SCALE: 1" = 50'

| TYPE | YEAR | PROJECT NO. | SHEET NO. |
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| CONST. | 2015 | STP/NH-7(16) | U4-6 |
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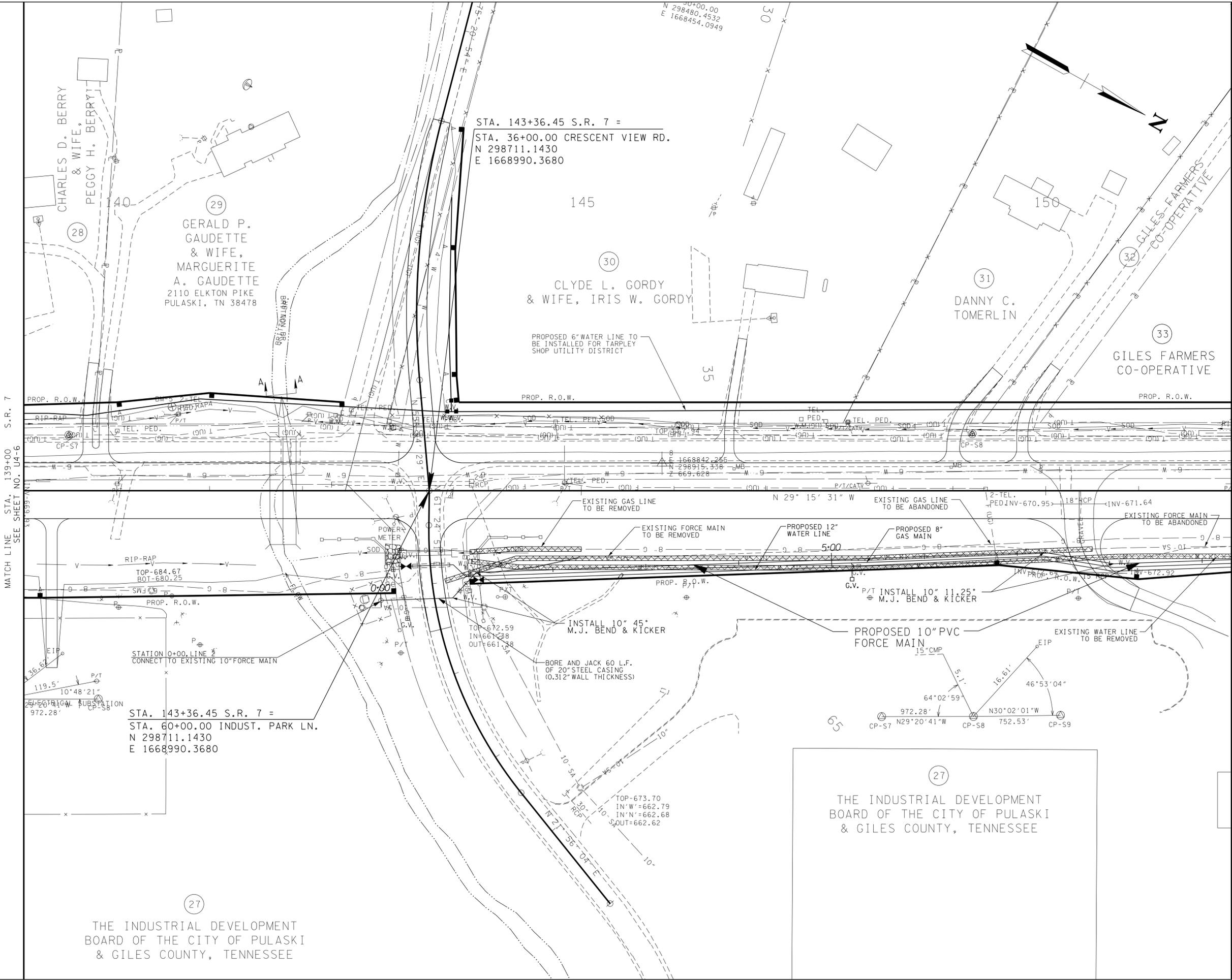


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STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

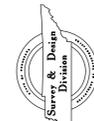
CITY OF PULASKI
STATE ROUTE 7
UTILITY RELOCATION
FORCE MAIN
SCALE: 1" = 50'

| TYPE | YEAR | PROJECT NO. | SHEET NO. |
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| CONST. | 2015 | STP/NH-7(16) | U4-7 |
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MATCH LINE - LINE 2 FORCE MAIN STA. 152+00 SEE SHEET NO. U4-8
MATCH LINE - LINE 1 FORCE MAIN STA. 9+32 SEE SHEET NO. U4-8

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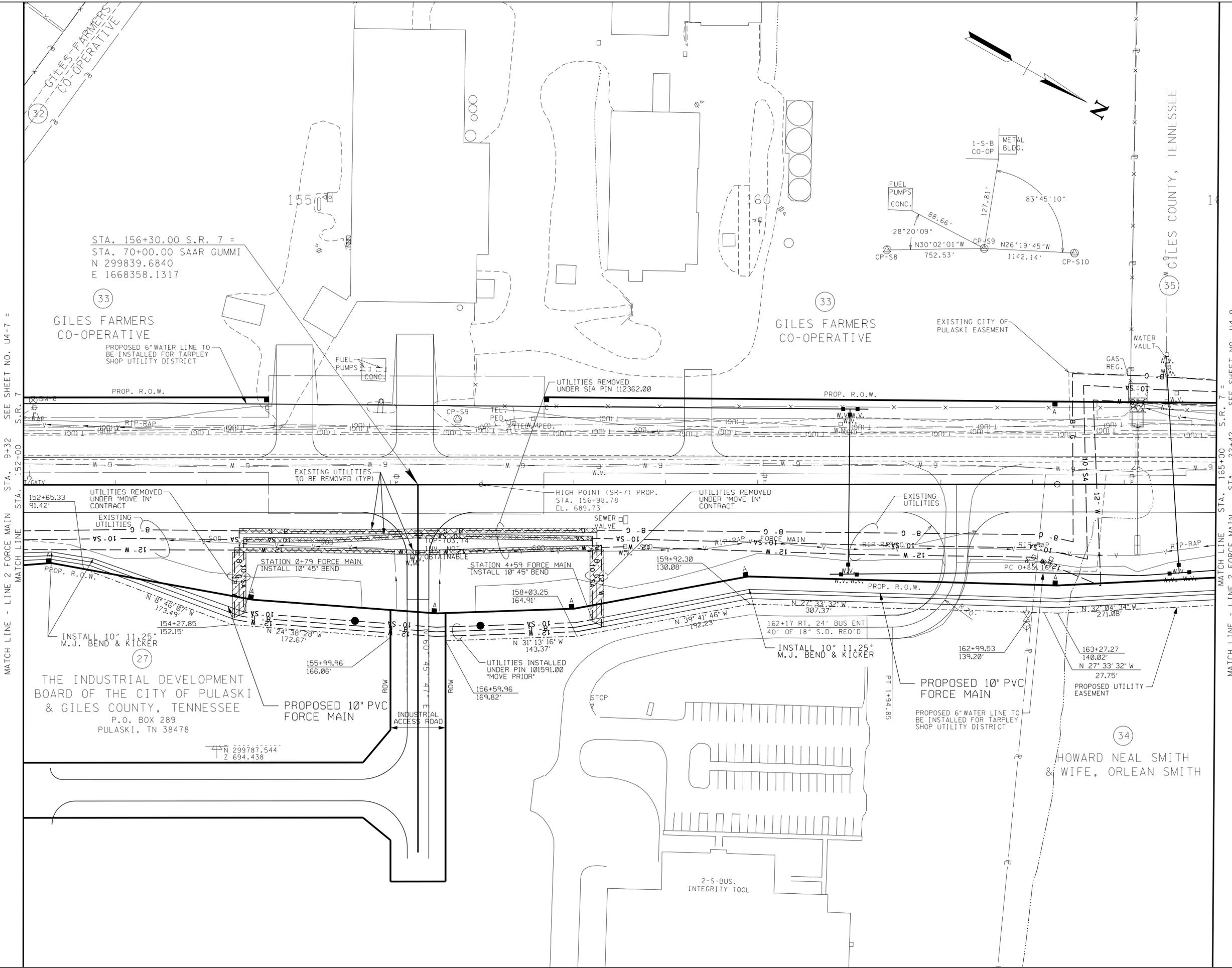


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STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

CITY OF PULASKI
STATE ROUTE 7
UTILITY
RELOCATION
FORCE MAIN - LINE 2
STA. 0+00 TO STA. 9+32
SCALE: 1" = 50'

| TYPE | YEAR | PROJECT NO. | SHEET NO. |
|--------|------|--------------|-----------|
| CONST. | 2015 | STP/NH-7(16) | U4-8 |
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MATCH LINE - LINE 2 FORCE MAIN STA. 152+00 SEE SHEET NO. U4-7 =

MATCH LINE - LINE 2 FORCE MAIN STA. 22+42 SEE SHEET NO. U4-9

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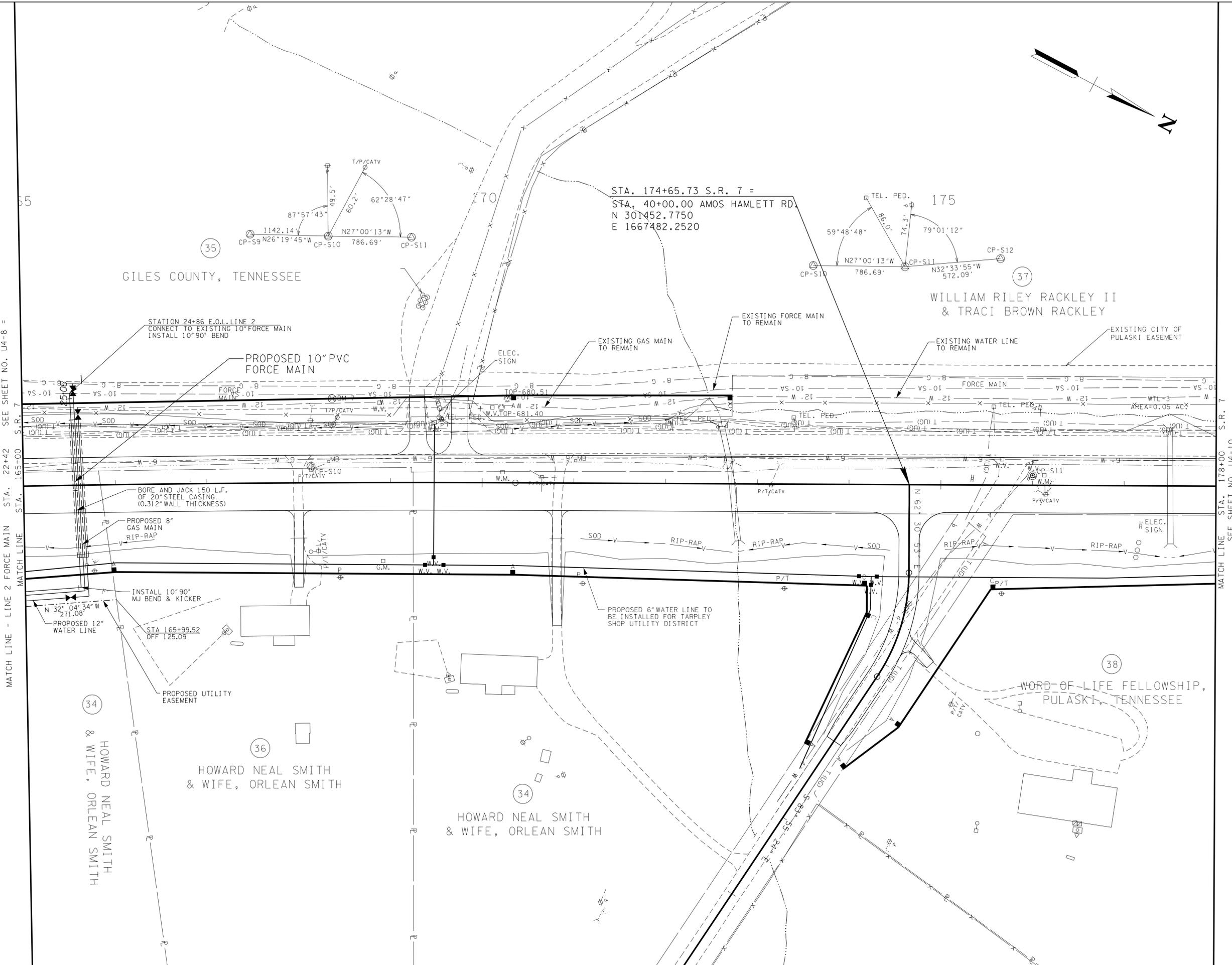
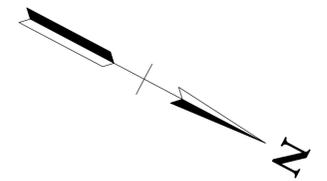
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DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

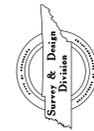
CITY OF PULASKI
STATE ROUTE 7
UTILITY RELOCATION
FORCE MAIN - LINE 2
STA. 9+32 TO STA. 22+42
SCALE: 1" = 50'

RDWY. STA. 152+00 TO STA. 165+00

| TYPE | YEAR | PROJECT NO. | SHEET NO. |
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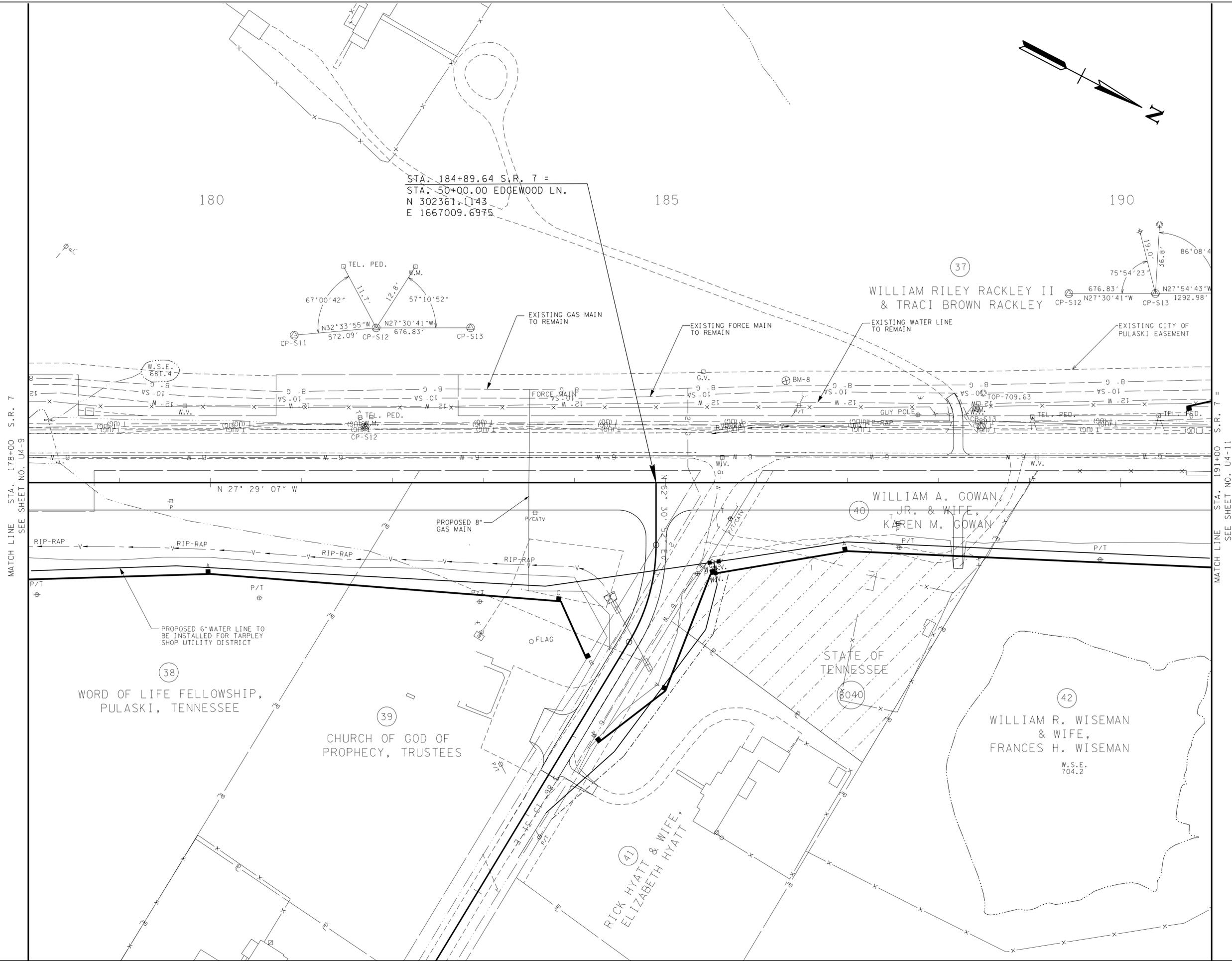


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STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

CITY OF PULASKI
STATE ROUTE 7
UTILITY
RELOCATION
FORCE MAIN - LINE 2
STA. 22+42 TO STA. 25+06
SCALE: 1" = 50'

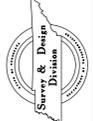
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MATCH LINE STA. 178+00 S.R. 7
SEE SHEET NO. U4-9

MATCH LINE STA. 191+00 S.R. 7
SEE SHEET NO. U4-11

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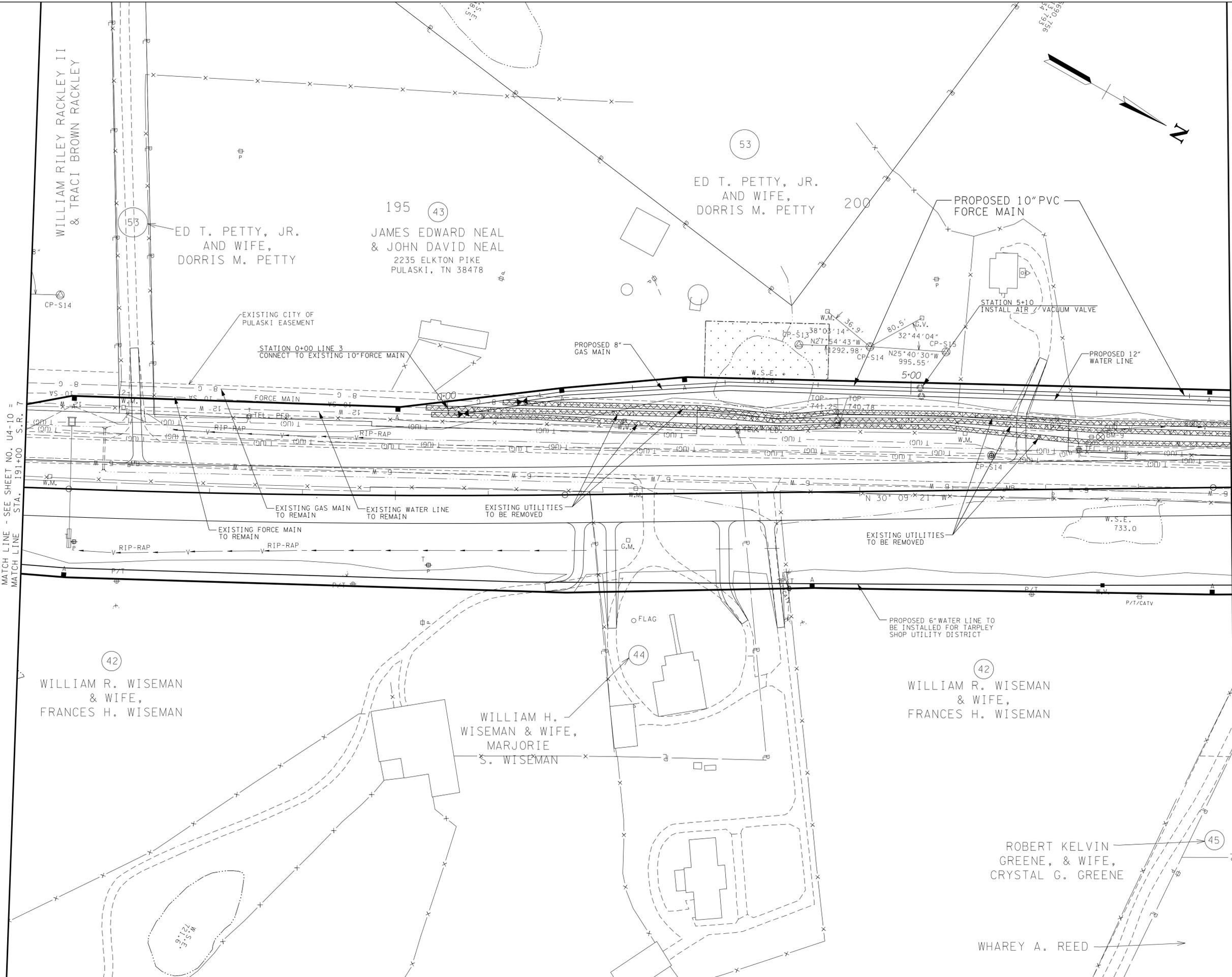


COORDINATE VALUES ARE NAD/83 (1995)
AND ARE DATUM ADJUSTED BY THE
FACTOR 1.000011 & TIED TO THE TGRN.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

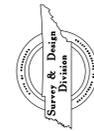
CITY OF PULASKI
STATE ROUTE 7
UTILITY
RELOCATION
FORCE MAIN - LINE 2
SCALE: 1" = 50'

| TYPE | YEAR | PROJECT NO. | SHEET NO. |
|--------|------|--------------|-----------|
| CONST. | 2015 | STP/NH-7(16) | U4-11 |
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MATCH LINE - SEE SHEET NO. U4-10 = STA. 191+00 S.R. 7
MATCH LINE - LINE 3 FORCE MAIN STA. 204+00 S.R. 7 = SEE SHEET NO. U4-12

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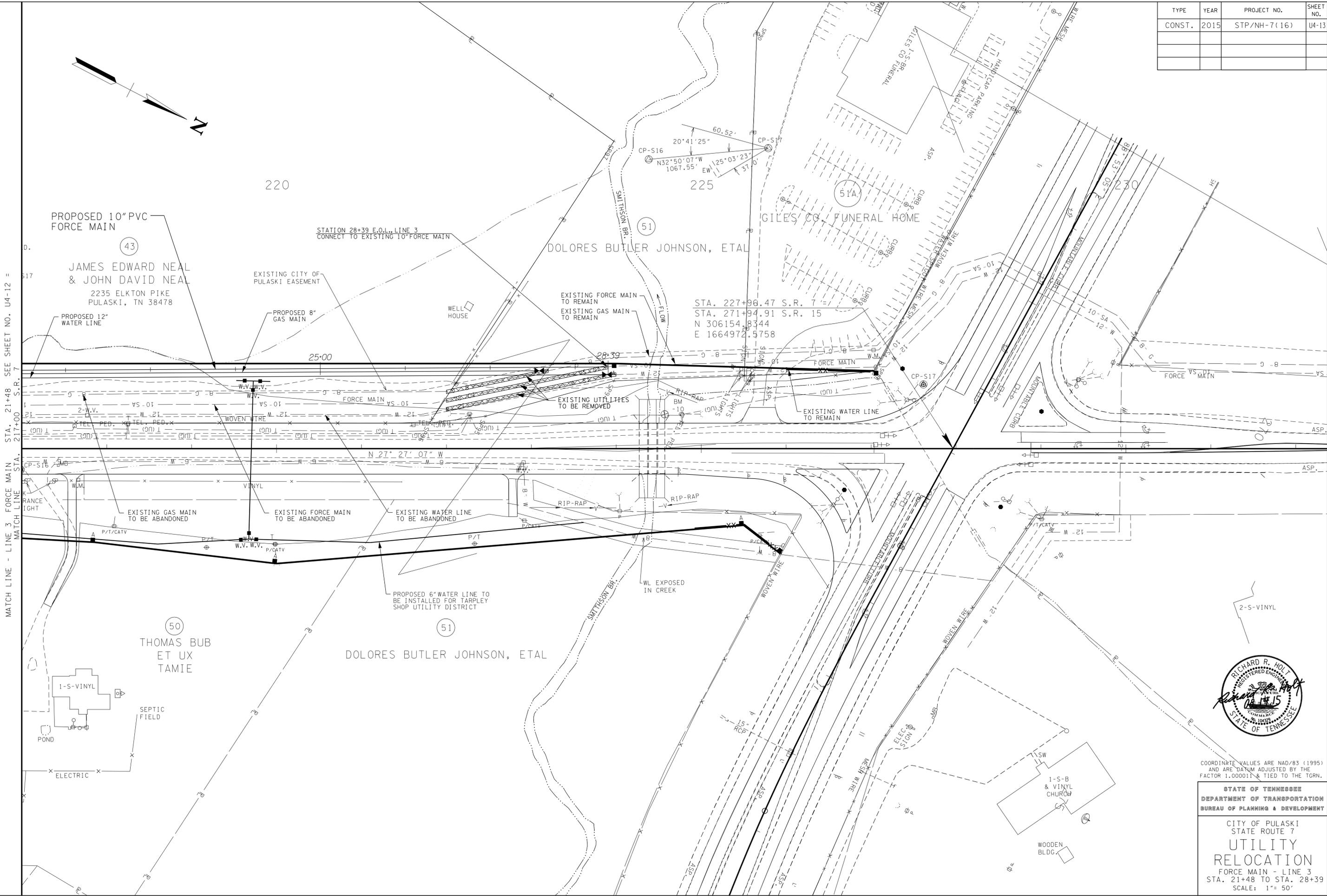


COORDINATE VALUES ARE NAD/83 (1995) AND ARE DATUM ADJUSTED BY THE FACTOR 1.000011 & TIED TO THE TGRN.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

CITY OF PULASKI
STATE ROUTE 7
UTILITY
RELOCATION
FORCE MAIN - LINE 3
STA. 0+00 TO STA. 8+44
SCALE: 1" = 50'

| TYPE | YEAR | PROJECT NO. | SHEET NO. |
|--------|------|--------------|-----------|
| CONST. | 2015 | STP/NH-7(16) | U4-13 |
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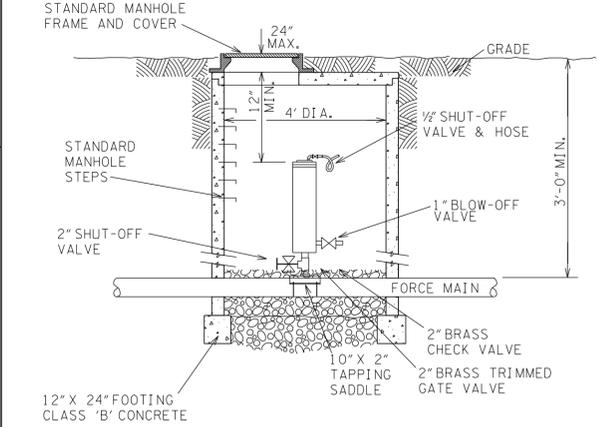
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AND ARE DATUM ADJUSTED BY THE
FACTOR 1.000011 & TIED TO THE TORN.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

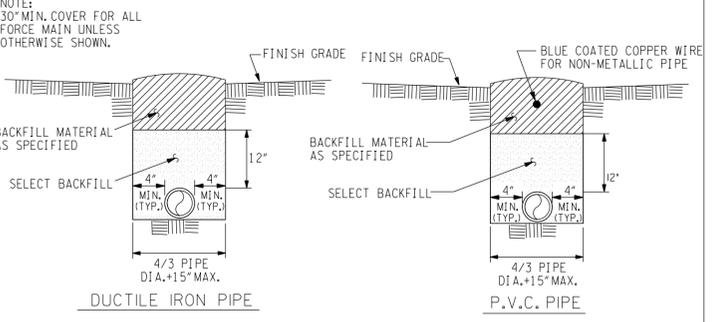
CITY OF PULASKI
STATE ROUTE 7
**UTILITY
RELOCATION**
FORCE MAIN - LINE 3
STA. 21+48 TO STA. 28+39
SCALE: 1" = 50'



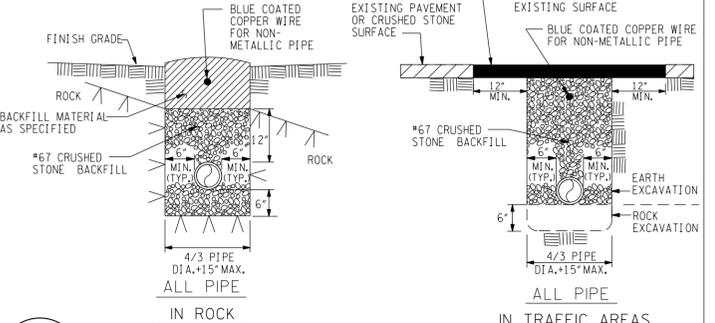
NOTE: SEWAGE AIR AND VACUUM VALVES SHALL ALLOW UNRESTRICTED VENTING OR RE-ENTRY OF AIR THROUGH IT, DURING FILLING OR DRAINING OF THE FORCE MAIN, TO PREVENT VACUUM. THE SEWAGE AIR AND VACUUM VALVE SHALL INCORPORATE (2) STAINLESS STEEL FLOATS DIRECTLY CONNECTED BY A STAINLESS STEEL FLOAT GUIDE, TO MAINTAIN AN AIR GAP BETWEEN THE BOTTOM FLOAT AND TOP SHUT-OFF FLOAT. THE AIR GAP SHALL RETARD WASTE SOLIDS FROM FOULING OR CLOGGING THE TOP SHUT-OFF FLOAT. THE INTERNAL Baffle SHALL BE FITTED WITH A GUIDE BUSHING AND ACT TO PROTECT THE SHUTOFF FLOAT FROM DIRECT AIR FLOW. THE Baffle SHALL RETAIN THE 45° DUROMETER BUNA-N SEAT IN PLACE, WITHOUT DISTORTION, FOR TIGHT SHUT-OFF. VALVE SHALL BE APCO SERIES 400 AS MANUFACTURED BY VALVE AND PRIMER CORPORATION, R APPROVED EQUAL. ALL INTERNALS SHALL BE EASILY REMOVED THROUGH THE TOP COVER WITHOUT REMOVING THE MAIN VALVE FROM THE LINES. THE COMPLETE VALVE SHALL WITHSTAND 500 P.S.I. TEST. INLET AND BLOW-OFF VALVES, QUICK-DISCONNECT COUPLINGS AND MINIMUM 5' HOSE FOR FLUSHING.

ADJUST SEWER LINE GRADE AS NECESSARY SO THAT THE VALVE IS INSTALLED AT THE HIGH POINT OF THE LINE.

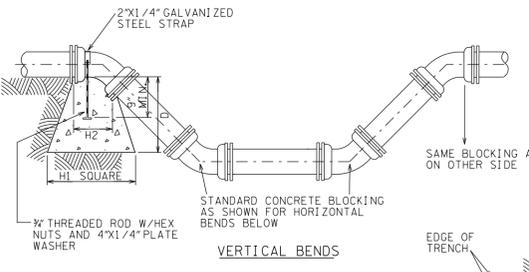
1 AIR VACUUM VALVE DETAIL
NOT TO SCALE



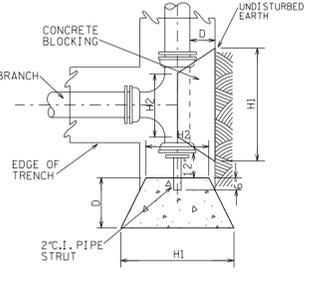
NOTE: UNTIL REPAVING IS COMPLETED USE A DENSE GRADED STONE FOR THE TOP 6" FOR TEMPORARY SURFACE.



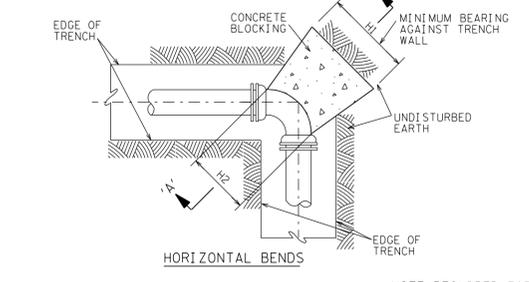
2 FORCE-MAIN BEDDING AND BACKFILLING
NOT TO SCALE



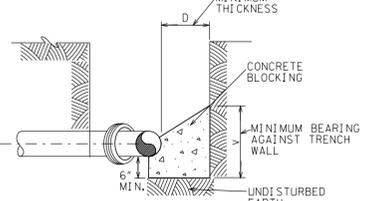
3 TYPICAL CONCRETE KICKERS
NOT TO SCALE



TEES, CROSSES AND PLUGS



HORIZONTAL BENDS

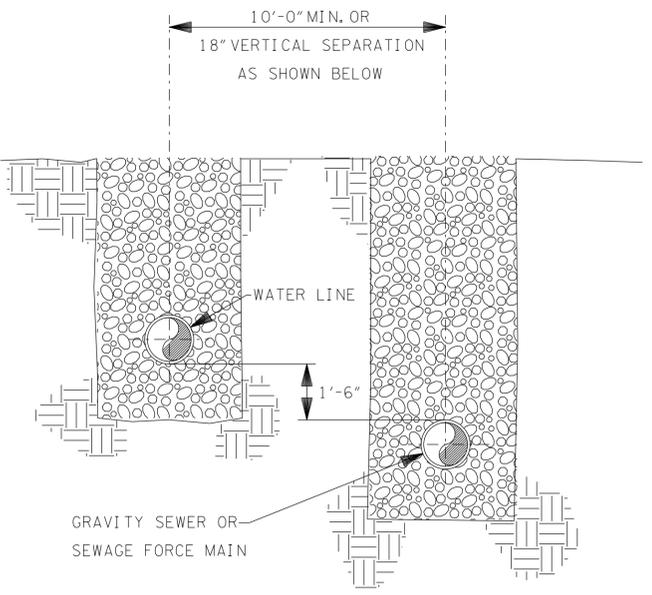


SECTION 'A-A'

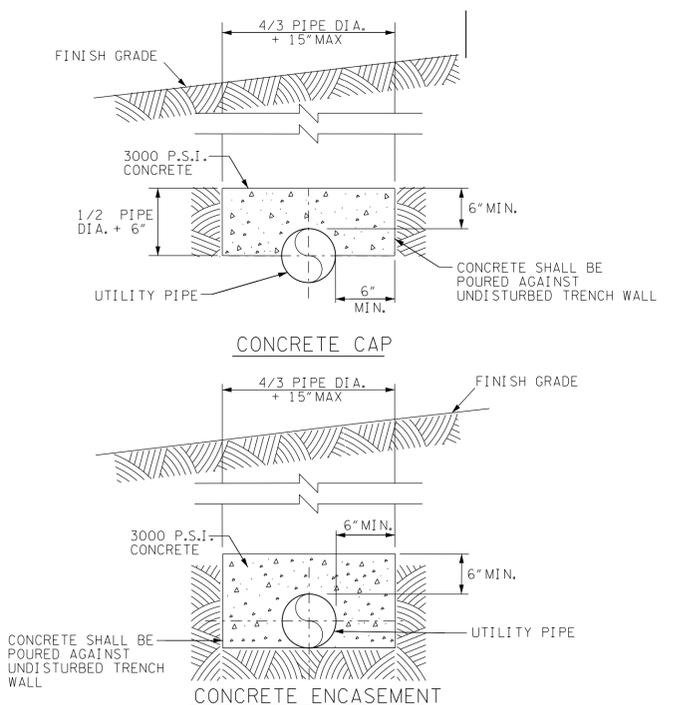
NOTE: REQUIRED FOR 2" PVC LINES AND DIP LINES. NOT REQUIRED WHERE RESTRAINT COLLARS ARE USED.

| TABLE OF DIMENSIONS FOR CONCRETE BLOCKERS | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|-----|-----|-----|------|-----------|-----|-----|-----|-----------|-----|-----|-----|---------------|------|-----|-----|---------------|-----|-------|-----|-----------|-----|-----|------|-------------|
| TEES, CROSSES & PLUGS | | | | | 90° BENDS | | | | 45° BENDS | | | | 22-1/2° BENDS | | | | 11-1/4° BENDS | | | | PIPE SIZE | | | | |
| H1 | H2 | V | D | C.F. | H1 | H2 | V | D | C.F. | H1 | H2 | V | D | C.F. | H1 | H2 | V | D | C.F. | | | | | | |
| 18" | 10" | 12" | 18" | 1.90 | 18" | 10" | 12" | 18" | 1.90 | 18" | 6" | 12" | 18" | 1.50 | 18" | 6" | 12" | 18" | 1.50 | 18" | 6" | 12" | 18" | 1.50 | 2" & 2-1/4" |
| 24" | 12" | 12" | 18" | 2.25 | 24" | 12" | 12" | 18" | 2.25 | 18" | 8" | 12" | 18" | 1.60 | 18" | 8" | 12" | 18" | 1.60 | 18" | 8" | 12" | 18" | 1.60 | 3" & 4" |
| 24" | 16" | 18" | 18" | 3.50 | 30" | 16" | 18" | 18" | 4.05 | 24" | 10" | 16" | 18" | 3.20 | 24" | 10" | 16" | 18" | 3.20 | 24" | 10" | 16" | 18" | 3.20 | 6" |
| 36" | 18" | 18" | 18" | 5.05 | 39" | 18" | 24" | 18" | 7.30 | 30" | 11" | 18" | 18" | 3.95 | 30" | 11" | 18" | 18" | 3.95 | 24" | 11" | 16" | 18" | 3.40 | 8" |
| 48" | 24" | 18" | 24" | 7.15 | 54" | 32" | 24" | 18" | 10.25 | 24" | 18" | 21" | 18" | 4.60 | 24" | 18" | 21" | 18" | 4.60 | 24" | 18" | 21" | 18" | 4.60 | 10" |
| 54" | 30" | 24" | 24" | 13.4 | 54" | 32" | 36" | 24" | 18.15 | 42" | 18" | 24" | 24" | 9.60 | 24" | 18" | 24" | 24" | 9.60 | 24" | 18" | 24" | 24" | 9.60 | 12" |
| 60" | 32" | 30" | 24" | 17.9 | 60" | 40" | 42" | 24" | 25.00 | 44" | 24" | 30" | 24" | 13.2 | 30" | 24" | 24" | 24" | 13.2 | 30" | 24" | 24" | 24" | 13.2 | 14" |
| 66" | 34" | 36" | 24" | 22.5 | 69" | 48" | 48" | 24" | 29.00 | 48" | 30" | 36" | 24" | 17.0 | 36" | 30" | 27" | 24" | 11.80 | 27" | 24" | 27" | 24" | 9.10 | 16" |
| 66" | 36" | 40" | 24" | 27.5 | 69" | 48" | 48" | 24" | 33.00 | 48" | 30" | 36" | 24" | 17.0 | 36" | 30" | 29" | 24" | 13.0 | 27" | 30" | 29" | 24" | 11.0 | 18" |
| 38" | | 24" | | | 48" | | 24" | | | 40" | | 24" | | | 36" | | 24" | | | 30" | | 40" | | 28" | 20" |
| 42" | | 24" | | | 60" | | 24" | | | 48" | | 24" | | | 42" | | 24" | | | 42" | | 32" | | 24" | 24" |
| 58" | | 24" | | | 96" | | 24" | | | 72" | | 24" | | | 72" | | 24" | | | 48" | | 36" | | 36" | 36" |

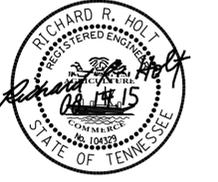
3 TYPICAL CONCRETE KICKERS
NOT TO SCALE



4 PIPELINE SEPARATION DETAIL
NOT TO SCALE



5 CONCRETE PROTECTION FOR BURIED UTILITIES
NOT TO SCALE



| TYPE | YEAR | PROJECT NO. | SHEET NO. |
|--------|------|--------------|-----------|
| CONST. | 2015 | STP/NH-7(16) | U5-1 |
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| PULASKI GAS UTILITY QUANTITIES | | | | | |
|--------------------------------|--|------|----------|-----------|----------|
| ITEM NO. | DESCRIPTION | UNIT | QUANTITY | % Utility | %Project |
| ① 791-01.02 | 2IN STEEL GAS MAIN | L.F. | 365 | 9.00% | 91.00% |
| ① 791-01.06 | 8IN STEEL GAS MAIN | L.F. | 5255 | 9.00% | 91.00% |
| 791-01.40 | RELOCATE SERVICE | EACH | 1 | 9.00% | 91.00% |
| ② 791-05.02 | BORE/JACK 6IN STEEL CASING PIPE - UNCON | L.F. | 70 | 9.00% | 91.00% |
| ② 791-05.05 | BORE/JACK 16IN STEEL CASING PIPE - UNCON | L.F. | 365 | 9.00% | 91.00% |
| ③ 791-06.13 | CONNECT TO 8IN EX. STL MAIN | EACH | 6 | 9.00% | 91.00% |
| ④ 791-07.12 | 8IN STEEL GAS VALVE ASSEMBLY | EACH | 8 | 9.00% | 91.00% |
| ⑤ 791-08.02 | 3/4IN SERVICE ASSEMBLY | EACH | 1 | 9.00% | 91.00% |
| ⑤ 791-08.12 | 3/4 IN STEEL SERVICE PIPE | L.F. | 250 | 9.00% | 91.00% |
| ⑥ 791-10.07 | RETIRE IN PLACE 8IN SERV CUT & PLUG | EACH | 5 | 9.00% | 91.00% |

FOOTNOTES:

- 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 CROSSINGS 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.
- INCLUDES ALL MATERIALS, LABOR, AND EQUIPMENT, NECESSARY FOR BORE & JACK OF GAS LINE CASING PIPE INCLUDING BUT NOT LIMITED TO ENTRY AND EXIT PITS, B&J EQUIPMENT AND TRAFFIC CONTROL. CARRIER PIPE SHALL BE PAID AT THE OPEN CUT ITEM PRICE.
- INCLUDES ALL MATERIALS, LABOR, AND EQUIPMENT, NECESSARY FOR CONNECTING TO EXISTING GAS LINE INCLUDING TRAFFIC CONTROL.
- 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.
- 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.
- INCLUDES ALL MATERIALS, LABOR, AND EQUIPMENT FOR RETIREMENT OF ITEM INCLUDING STABILIZING THE ITEM OF PLANT PER UTILITY SPECIFICATIONS.

REMOVAL OF EXISTING UTILITY LINES TO BE PAID FOR UNDER ITEM# 202-01 - "REMOVAL OF STRUCTURES AND OBSTRUCTIONS" IN S.R. 7 PROJECT PIN# 101591.00

GENERAL NOTES TO BE INCLUDED IN ALL UTILITY PLANS:

- EXCEPT FOR EROSION SEDIMENT CONTROL ITEMS, NO ROADWAY OR BRIDGE ITEMS SHALL BE UTILIZED TO COMPENSATE FOR WORK METHODS OR MATERIALS ASSOCIATED WITH AND/OR SPECIFIED FOR THE UTILITY INSTALLATION, EVEN THOUGH THE SAME OR SIMILAR ROADWAY OR BRIDGE MATERIALS MAY HAVE BEEN CALLED FOR IN THE UTILITY SPECIFICATIONS OR DRAWINGS.
- ALL MATERIALS, METHODS, AND/OR INTEGRAL MATERIALS OUTLINED IN THE UTILITY SPECIFICATIONS OR DRAWING NECESSARY TO PROVIDE A COMPLETE AND FUNCTIONAL INSTALLATION MUST BE INCLUDED IN THE UNIT PRICE FOR THE ASSOCIATED UTILITY WORK ITEM.
- THE CONTRACTOR MUST MAINTAIN ALL SERVICES DURING THE CONSTRUCTION OF THE FACILITY. ANY COSTS ASSOCIATED WITH INSTALLATION OF REQUIRED TEMPORARY SERVICE LINES DUE TO THE ROADWAY CONSTRUCTION SEQUENCE OF WORK (I.E., CUTS, FILLS, PHASING, ETC.) SHALL BE INCLUDED IN THE COST OF THE PERMANENT UTILITY ITEMS. (NOTE TO UTILITY: THE UTILITY RELOCATION PLANS SHALL PROVIDE TO THE CONTRACTOR THE UTILITY 5*32S REQUIREMENTS FOR TEMPORARY TIE-INS (INCLUDING NECESSARY TESTING AND STERILIZATION TO ACCOMPLISH THE TIE-IN) AND ALSO ANY RESTRICTIONS FOR TAKING LINES OUT OF SERVICE. IF A TEMPORARY LINE WILL BE A MAJOR ITEM OF WORK, A SPECIFIC TEMPORIZATION PLAN AND ITEM MUST BE INCLUDED IN THE UTILITY 5*32S PLANS.)
- IT SHALL BE THE RESPONSIBILITY OF THE PRIME CONTRACTOR 5*32S SURVEYOR TO LAY OUT ALL THE FACILITIES BEING RELOCATED WITHIN THE CONTRACT.
- FOR BURIED UTILITIES, THE PRIME CONTRACTOR OR SUBCONTRACTOR SHALL BE REQUIRED TO PROVIDE TO THE UTILITY UPON COMPLETION OF THE UTILITY 5*32S RELOCATION WORK A SET OF AS-BUILT DRAWINGS FOR THEIR RECORDS. THESE AS-BUILT DRAWINGS SHOULD BE PREPARED AS THE JOB PROGRESSES TO ENSURE THEIR ACCURACY.
- WHERE EROSION CONTROL MEASURES ARE NEEDED FOR THE UTILITY RELOCATION WORK OCCURRING INSIDE OR OUTSIDE STATE RIGHT-OF-WAY, THE CONTRACTOR SHALL SUBMIT TO THE TDOT PROJECT SUPERVISOR FOR APPROVAL A PROPOSED EROSION AND SEDIMENT CONTROL PLAN PRIOR TO BEGINNING THE WORK. TDOT APPROVAL MUST BE RECEIVED BEFORE THE EROSION CONTROL PAY ITEMS FOR ROADWAY CONSTRUCTION CAN BE USED FOR ANY ADDITIONAL EROSION CONTROL MEASURES REQUIRED FOR THE UTILITY RELOCATION WORK.
- DRIVEWAY, SIDEWALK AND ROADWAY TEMPORARY RESTORATION SHALL BE PART OF THE IN-PLACE COST OF PLACING THE UTILITY ITEM WITHIN THE ROW. WHEN APPLICABLE, THE UTILITY RELOCATION PLANS WILL SHOW ANY STREAM CROSSINGS AND CROSS-SECTIONS OF THE STREAMS CROSSINGS WITH THE FOLLOWING NOTE:
- ANY EXCAVATION OF THE STREAM CHANNEL AREA SHALL BE SEPARATED FROM FLOWING WATER AND ACCOMPLISHED DURING LOW FLOW CONDITIONS. THIS SHALL BE ACCOMPLISHED BY THE USE OF FLUMES, LINED DIVERSION CHANNEL WITH SANDBAG BERM, DIVERSION PIPE WITH SANDBAG DAM AT PIPE INLET, OR IN SOME CASES COFFERDAMS. ALTERNATIVELY, BASED ON FIELD CONDITIONS AND CONTRACTOR SELECTION, THE UTILITY RELOCATION MAY BE ACCOMPLISHED USING BORE TECHNOLOGY WITH NO STREAM CHANNEL IMPACTS.

GENERAL NOTES FOR UTILITY LINE CONSTRUCTION:

- NEW WATER LINE SHALL MAINTAIN MINIMUM OF 42-INCHES OF COVER IN ALL ROADWAY FINISHED CUT AREAS.
- NEW WATER LINE SHALL MAINTAIN MINIMUM OF 36-INCHES OF COVER IN ALL DRIVEWAY FINISHED CUT AREAS.
- NEW SERVICE LINES SHALL MAINTAIN MINIMUM OF 24-INCHES OF COVER IN ALL ROADWAY FINISHED CUT AREAS.
- THE CONTRACTOR SHALL RESTORE ALL CULVERTS, FENCES, WALLS, HEDGES, SHRUBS, FLOWERING TREES, FRUIT TREES, SIGNS, LIGHT POSTS, POWER POLES, STREET MARKERS, MAIL BOXES, WATER LINES, GAS LINES, GAS AND WATER METERS AND BOXES (INCLUDING SHUTOFFS), PROPERTY CORNER MARKERS, AND LAWNS DISTURBED BY CONSTRUCTION OPERATIONS TO THEIR ORIGINAL CONDITIONS.
- IN EASEMENTS, CONTRACTOR SHALL PROTECT AND RESTORE SAID PROPERTY TO A CONDITION SIMILAR OR EQUAL TO THAT EXISTING AT THE BEGINNING OF CONSTRUCTION.
- THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK IN EACH AREA, AND HE AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT OCCUR BY HIS FAILURE TO DO SO.
- PERMANENT PAVEMENT REPAIR SHALL BE DESIGNATED AS A PART OF THIS CONTRACT. THE CONTRACTOR SHALL ALSO BE RESPONSIBLE FOR THE TEMPORARY REPAIR AND MAINTENANCE OF STREETS AND DRIVEWAYS UNTIL THE PROJECT IS SUBSTANTIALLY COMPLETE. THIS ALSO INCLUDES THE PULLING OF DITCHES AND RESTORING SHOULDERS DAMAGED DURING CONSTRUCTION.
- CONTRACTOR SHALL CLOSELY COORDINATE ALL CONSTRUCTION WITH TDOT, UTILITY OWNER OR DESIGNATED PROJECT REPRESENTATIVE.
- CONTRACTOR SHALL NOTIFY TDOT, UTILITY OWNER AT LEAST ONE DAY IN ADVANCE PRIOR TO WORK WHICH WILL PLACE RESIDENTS OUT OF WATER, SEWER, OR GAS SERVICE.
- ALL MATERIALS REMOVED OR REPLACED SHALL BE RETURNED TO THE UTILITY OWNER OR TDOT (I.E., VALVES, VALVE BOXES, HYDRANTS, ETC.).
- CONTRACTOR SHALL NOTIFY THE PULASKI WATER, SEWER, AND GAS DEPARTMENT, PRIOR TO INITIATING CONSTRUCTION ON THE WATER, SEWER, OR GAS SYSTEM AND SHALL BE RESPONSIBLE FOR ISOLATING PROJECT AREAS FROM REMAINDER OF WATER, SEWER, AND GAS SYSTEM DURING CONSTRUCTION.
- EXISTING SERVICE LINES ARE TO BE UTILIZED WHEREVER POSSIBLE IN ORDER TO MINIMIZE ROAD CUTS. SERVICES ARE TO BE TAPPED INTO THE NEW LINE USING THE PROPER SADDLE AND CORPORATION STOP.
- ALL EXISTING UTILITIES ARE TO REMAIN IN SERVICE WHILE THE PROPOSED LINE IS BEING LAID AND PLACED INTO SERVICE. NEW LINE SHALL BE TESTED PRIOR TO CUT-IN TO EXISTING LINE. SERVICE RELOCATIONS SHALL OCCUR AT TIME OF TIE OVER OF NEW LINE. MAIN LINE TIE IN SHALL BE COORDINATED WITH THE CITY OF PULASKI FOR TIMING OF WATER, SEWER, AND GAS SERVICE OUTAGE. IN NO CIRCUMSTANCE, SHALL WATER, SEWER, OR GAS SERVICE BE INTERRUPTED FOR MORE THAN 8 HOURS.
- ALL WATER, SEWER, AND GAS LINE INSTALLATION AND TESTING SHALL BE IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS.

GENERAL NOTES FOR CREEK CROSSING:

- ALL SURFACE WATER FLOWING TOWARD THE EXCAVATION OR FILL WORK SHALL BE DIVERTED, PIPED OR FLUMED TO THE DOWNSTREAM SIDE OF THE WORK. THIS CAN BE ACCOMPLISHED THROUGH UTILIZATION OF COFFERDAMS OR CONSTRUCTED BERMS IN CONJUNCTION WITH A PIPE OR FLUME. COFFERDAMS MUST BE CONSTRUCTED OF SAND BAGS, CLEAN ROCK, STEEL SHEETING OR OTHER NON-ERODIBLE MATERIAL.
- TEMPORARY EROSION CONTROL MEASURES MUST BE IN PLACE BEFORE EARTH MOVING OPERATIONS BEGIN, MAINTAINING THROUGHOUT THE CONSTRUCTION PERIOD AND REPAIRED, IF NECESSARY AFTER RAINFALL. STRAW OR HAY BALES AND/OR CUTS FENCE MUST BE INSTALLED ALONG THE BASE OF ALL FILLS AND CUTS, ON THE DOWNHILL SIDE OF STOCKPILED SOIL, AND ALONG STREAM BANKS IN CLEARED AREAS TO PREVENT EROSION INTO STREAMS. THEY MUST BE INSTALLED PARALLEL TO THE STREAM CHANNEL, ENTRENCHED AND STAKED, AND EXTEND THE WIDTH OF THE AREA TO BE CLEARED. THE BALES AND/OR SILT FENCE MAY BE REMOVED AT THE BEGINNING OF THE WORK DAY, BUT MUST BE REPLACED AT THE END OF THE WORKDAY.
- BACKFILL ACTIVITIES MUST BE ACCOMPLISHED IN A MANNER WHICH STABILIZES THE STREAM BED AND BANKS TO PREVENT EROSION. BACKFILL MATERIALS SHALL CONSIST OF SUITABLE MATERIALS FREE OF CONTAMINANTS. ALL CONTOURS MUST BE RETURNED TO PRE-POST CONDITIONS. THE COMPLETED WORK MAY NOT DISRUPT OR IMPOUND STREAM FLOW.
- SLURRY WATER PUMPED FROM WORK AREAS AND EXCAVATIONS MUST BE HELD IN SETTLING BASINS OR TREATED BY FILTRATION PRIOR TO INITIAL DISCHARGE INTO SURFACE WATERS. WATER MUST BE HELD IN SEDIMENT BASINS UNTIL AT LEAST AS CLEAR AS THE RECEIVING WATERS. SEDIMENTATION BASINS SHALL NOT BE LOCATED CLOSER THAN 20 FEET FROM THE TOP BANK OF A STREAM. SEDIMENT BASINS AND TRAPS SHALL BE PROPERLY DESIGNED ACCORDING TO THE SIZE OF THE DRAINAGE AREAS OR VOLUME OF WATER TO BE TREATED.
- CHECKDAMS SHALL BE UTILIZED WHERE RUNOFF IS CONCENTRATED. CLEAN ROCK, LOG, SANDBAG OR STRAW BALE CHECKDAMS SHALL BE PROPERLY CONSTRUCTED TO DETAIN RUNOFF AND TRAP SEDIMENT.
- CLEARING, GRUBBING AND OTHER DISTURBANCE TO RIPARIAN VEGETATION SHALL BE LIMITED TO THE MINIMUM NECESSARY FOR SLOPE CONSTRUCTION AND EQUIPMENT OPERATIONS. UNNECESSARY VEGETATION REMOVAL IS PROHIBITED. ALL DISTURBED AREAS SHALL BE PROPERLY STABILIZED AS SOON AS PRACTICABLE.
- STREAMS SHALL NOT BE USED AS TRANSPORTATION ROUTES FOR HEAVY EQUIPMENT.
- CONSTRUCTION DEBRIS MUST BE KEPT FROM ENTERING THE STREAM CHANNEL.
- ALL SPILLS OF PETROLEUM PRODUCTS OR OTHER POLLUTANTS MUST BE REPORTED TO THE APPROPRIATE EMERGENCY MANAGEMENT AGENCY AND MEASURES SHALL BE TAKEN IMMEDIATELY TO PREVENT THE POLLUTION OF WATERS OF THE STATE, INCLUDING GROUNDWATER.
- UPON ACHIEVEMENT OF FINAL GRADE, THE DISTURBED STREAMBANK SHALL BE STABILIZED WITH RIP-RAP (MIN. SIZE=2"). ALL OTHER DISTURBED SOILS MUST BE STABILIZED AND RE-VEGETATED WITHIN 30 DAYS BY SODDING OR SEEDING AND MULCHING. SEED TO BE UTILIZED SHALL INCLUDE COMBINATION OF ANNUAL GRAINS AND GRASSES, LEGUMES, AND PERENNIAL GRASSES. LIME AND FERTILIZER SHALL BE APPLIED AS NEEDED TO ACHIEVE A VEGETATIVE COLOR.
- UPON COMPLETION OF CONSTRUCTION, THE STREAM SHALL BE RETURNED AS NEARLY AS POSSIBLE TO ITS ORIGINAL, NATURAL CONDITION.

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STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT
CITY OF PULASKI
STATE ROUTE 7
UTILITY
RELOCATION
QUANTITIES &
GENERAL NOTES

| TYPE | YEAR | PROJECT NO. | SHEET NO. |
|--------|------|--------------|-----------|
| CONST. | 2015 | STP/NH-7(16) | U5-2 |
| | | | |
| | | | |

I. BORING AND CASING FOR UTILITIES

PART 1 - GENERAL

1 SECTION INCLUDES

- A. The work to be performed under this section shall consist of the installation of a casing pipe for the purpose of installing a high pressure steel gas line, water line, or sewer line as shown on the drawings or as called for in these specifications. It shall include the excavation of a boring pit, auger boring between the points specified on the drawings, furnishing and installing of the carrier pipe and disposing of the excavated materials.

PART 2 - PRODUCTS

2.02 CASING PIPE

- A. The casing pipe shall be of steel meeting the latest approved American Railway Engineering Association "Specifications for Pipelines for Carrying Flammable and Nonflammable Substances". The steel casing pipe shall have a minimum yield strength of 35,000 psi and shall have the minimum wall thickness shown in the following table:

TABLE OF MINIMUM WALL THICKNESS FOR STEEL CASING PIPE FOR E72 LOADING

| Carrier Pipe | Casing Pipe | Nominal Thickness |
|--------------|-------------|-------------------|
| 4 | 8 | 0.250" |
| 6 | 12 | 0.250" |
| 8 | 16 | 0.312" |
| 10 | 20 | 0.312" |
| 12 | 22 | 0.312" |
| 14 | 24 | 0.344" |
| 16 | 26 | 0.375" |
| 18 | 28 | 0.406" |

- B. When the casing pipe is installed without benefit of a protective coating, the wall thickness shown above shall be increased to the nearest standard size or a minimum of 0.063" greater than the thickness shown.
- C. Carrier Pipe: The carrier pipe shall be as specified on the drawings or elsewhere in these specifications.
- D. Casing Spacers: Casing spacers shall be manufactured from high impact strength, UV resistant polypropylene and be assembled with non-metallic fasteners. Spacers shall be configured to concentrically locate carrier pipes inside carrier pipes.

PART 3 - EXECUTION

3.01 BORING

- A. The boring shall be accomplished by means of auger. Bore the tunnel to the size, line and grade needed to accommodate the casing size shown on the drawings.

3.02 INSTALLATION OF CASING PIPE

- A. Jack the steel casing pipe into place as the boring proceeds. Weld sections of casing pipe together to provide watertight joints.
- B. Do not remove unacceptable casing without prior approval from TDOT. If the removal of casing pipe is permitted, make proper provisions to prevent caving in of the earth surrounding the casing.

3.03 INSTALLATION OF CARRIER PIPE

- A. The carrier pipe shall be furnished by the Contractor. After acceptance of the casing by TDOT, install the carrier pipe in the casing by jacking it through the casing. As the carrier pipe is being inserted into the casing pipe, locate spacers per spacer manufacturer recommendations.

3.04 LAYOUT OF WORK

- A. TDOT will provide the necessary control points required by the Contractor for this construction. The Contractor will provide the detailed layout required to keep the tunnel or bore on grade.

3.05 GUARANTEE OF WORK

- A. Guarantee a usable completed casing between the points specified and to the line and grade specified. The allowable tolerance at the downstream end point of the bore shall be such that the invert of the carrier pipe may be positioned within a vertical area limited on the top by an elevation no higher than the elevation shown on the drawings and on the bottom by an elevation no lower than the existing inlet pipe invert.
- B. The allowable tolerance at the upstream end point of the bore shall be such that the invert of the carrier pipe may be positioned at the elevation shown on the drawings.

END OF SECTION

II. GAS VALVES AND APPURTENANCES

PART 1 - PRODUCTS

1.01 MAIN LINE VALVES

- A. Valves for Steel Lines: All main line valves to be used for steel line service shall be steel weld end (for buried and above ground service) or flanged (for above ground service), wrench operated, long weld end, maintenance free ball valves. All valves shall:
 1. Open fully with only one quarter turn of the valve actuator
 2. Be provided with shear pin free over torque protection system
 3. Be designed for underground service
 4. Be provided with an open/close position indicator
 5. Be fully compatible the pressure conditions which it will be required to perform under
 6. Be of all welded construction and
 7. Come complete with standard size wrench squares.
 8. Materials of manufacture shall be:
 - a) body, ASTM A53, Grade A steel;
 - b) ball, AISI 304 stainless steel (hollow design for Class 150 and solid design for Class 300);
 - c) stem, AISI 303 stainless steel;
 - d) stop collar, ASTM A252, Grade B steel;
 - e) weld end, ASTM A53, Grade A steel;
 - f) flanges, ASTM A283, Grade D steel;
 - g) seat rings, carbonized PTFE;
 - h) stem bearing, coated steel;
 - i) stop plate, ASTM A252, Grade B steel;
 - j) o-rings, BUNA-N;
 - k) support ring, AISI 316 stainless steel;
 - l) cup spring, ASTM A682 steel.

Valves must meet or exceed the applicable requirements of the Code of Federal Regulations, Title 49, Part 192 and API 6D. Valve pressure/temperature ratings must comply with API 6D. Valve production testing results must meet or exceed the minimum requirements of the Code of Federal Regulations and API 6D. All valves shall be ISO 9001 certified. All valve production welding must meet the requirements of the ASME Boiler and Pressure Vessel Code, Section IX. All valves shall be warranted for a minimum of three years for defects in materials and workmanship.

All valves shall have a permanently attached stainless steel nameplate which clearly defines the name of the manufacturer, the valve model number, date of manufacture, serial number and material of construction and pressure rating.

All valves to be used for steel transmission/distribution line service shall be Kerotest Manufacturing Corporation Weldball Full Port Valves or approved equal.

- B. Valves for Polyethylene Gas Line Service: All main line valves to be used for polyethylene line service shall be butt fusion end; wrench operated; designed for buried service; maintenance free polyethylene ball valves. All valves shall:
 1. Open fully with only one quarter turn of the valve actuator;
 2. Be provided with butt fusion ends that match pipe SDR's;
 3. Be designed for underground service;
 4. Be fully compatible with pressure rating of the polyethylene pipe to which the valves will be fused;
 5. Be manufactured of polyethylene materials that match the materials used in the piping system.
 6. Materials of manufacture shall be:
 - a. body, polyethylene compatible with the pipeline polyethylene material;
 - b. ball, polypropylene;
 - c. retaining ring, polypropylene;
 - d. ball seat, BUNA-N;
 - e. stem seals, dual o-rings.
 7. Valves shall be ISO 9001 certified.

All valves used for polyethylene line service shall be Nordstrom Valves, Inc. Polyvalve polyethylene valves or approved equal.

- C. All valve box castings shall be made accurately to the required dimensions, and shall be sound, smooth, clean and free from blisters and other defects. Defective castings which have been plugged or otherwise treated to remedy defects shall be rejected. Contact surfaces of frames and covers shall be machined so that the covers rest securely in the frames with no rocking and with the cover in contact with the frames for the entire perimeter of the contact surface. All castings shall be thoroughly cleaned subsequent to machining and before rusting begins, painted with a bituminous coating so as to present a smooth finish, tough and tenacious when cold, but not tacky with no tendency to scale. Install valve boxes on each proposed valve in accordance with the details shown on the standard drawings.

1.02 CATHODIC PROTECTION TEST STATIONS

- A. Contractor shall provide and install an approved cathodic protection test stations where directed by the City of Pulaski, Tennessee's gas department. The stations shall consist of two (2) 12 gauge solid wire leads, individually CAD welded to the gas main one pipe diameter apart. As shown on the drawings.

PART 2 - EXECUTION

NOT USED

END OF SECTION

III. GAS LINES

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Trenching includes excavating, backfilling, compacting, disposing of surplus material, and all other work incidental to the construction of trenches for utilities, and buried appurtenances, including additional excavation which may be required for structures forming a part of the pipe line.

- B. Excavation includes removal of quicksand, hardpan, boulders, clay, rubbish, unforeseen obstacles, underground conduits, pipe, drain tile, trees, roots, timber or masonry structures, pavements, sidewalks, and all other obstacles encountered. No claim for additional payment will be accepted because of the character of the ground in which the excavation is made. Excavation will be unclassified unless provided otherwise in the Contract.

- C. The Contractor shall be responsible for safely storing materials needed for the work that have been accepted by him until they have been incorporated into the completed project. Keep the interiors of all pipes, fittings, and other accessories free from dirt and foreign matter at all times.

1.02 JOB CONDITIONS

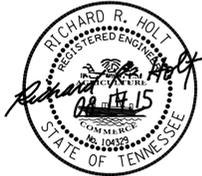
- A. If existing gas or water pipes, buried electrical, telephone, and telegraph ducts, conduits, sewers, drains, or poles are blocked or interfered with by the excavation required on this project, maintain them in continuous operation and restore them to their original condition if damaged.
- B. Preserve from damage surveying monuments, property pins, and similar items. If disturbed or damaged by construction operations, pay the cost of restoration by a registered surveyor.
- C. Costs for locating, maintaining, and protecting existing facilities shall be merged in the unit price of the pipeline.

1.03 PROTECTION

- A. Protect excavations by shoring, bracing, sheet piling, underpinning, or other methods required to prevent cave-in or loose soil from falling into excavation.
- B. Underpin adjacent structures which may be damaged by excavation work, including service utilities and pipe chases.
- C. Notify the Tennessee Department of Transportation (TDOT) of unexpected subsurface conditions and discontinue work in affected area until notification to resume work is issued by TDOT.
- D. Protect bottom of excavations and soil adjacent to and beneath foundations from frost.
- E. Grade excavation top perimeter to prevent surface water run-off into excavation.
- F. Protect excavation bottoms against freezing when atmospheric temperature is less than 35°F.
- G. Protect trees, shrubbery, fences, poles, and all other property and surface structures during construction operations unless their removal for purposes of construction is authorized by TDOT. Fences, poles, or other man made surface improvements which are moved or disturbed shall be restored to the original conditions after construction is completed. Trees, shrubbery, or other vegetation which are approved for removal in order to facilitate construction operations shall be removed completely, including stumps and main roots. Responsibility for damage or claims for damage caused by construction operations to shrubbery or other landscape improvements which were not authorized for removal by TDOT shall be assumed by Contractor.

1.04 SAFETY

- A. Barricades, Guards, and Safety Provisions: Place and maintain barricades, fences, construction signs, torches, flashing lights, lanterns, guards, and flagmen as required during the progress of the construction work and until it is safe for traffic to use the roads and streets. Material piles, equipment, and pipe which may serve as obstructions to traffic shall be enclosed by fences or barricades and shall be protected by proper lights when the visibility is poor. The rules and regulations of OSHA, the Manual for Uniform Traffic Control Devices (MUTCD), and appropriate authorities regarding safety provisions shall be observed.
- B. Structure Protection: Provide temporary support, protection, and maintenance of underground and surface structures, drains, sewers, and other obstructions encountered during the progress of the work. Structures which may have been disturbed shall be restored upon completion of the work.
- C. Fire Prevention
 1. Maintain suitable approved fire extinguishing equipment near the locations where work involving natural gas or other combustible materials in progress, and especially in the vicinity of "hot connection" and purging operations.
 2. Use every possible safety precaution to prevent fire and explosions and comply with all applicable safety and fire prevention codes.
 3. Portable fire extinguishing equipment shall conform to National Fire Protection Association's Standards Section 10.
 4. The storage and use of flammable and explosive liquids, solids, and devices shall be in accordance with the applicable sections of the National Fire Protection Association's Codes, Standards and Recommended Practices.
 5. Section 1 of the NFPA standards shall be followed at all times.



STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

CITY OF PULASKI
STATE ROUTE 7
UTILITY
RELOCATION
SPECIFICATIONS



| TYPE | YEAR | PROJECT NO. | SHEET NO. |
|--------|------|--------------|-----------|
| CONST. | 2015 | STP/NH-7(16) | U5-3 |
| | | | |
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1.05 DEVIATIONS OCCASIONED BY STRUCTURES OR UTILITIES

- A. Wherever obstructions are encountered during the progress of the work which conflict with the proposed pipeline location, the Contractor shall not deviate from the intent of the Plans without TDOT's and the owner of obstruction approval to do so.
- B. Where gas, water, telephone, electrical or other existing utilities directly interfere with the vertical or horizontal alignment of the pipeline, changes in grade or alignment shall not be made without approval from TDOT.

1.06 MAINTENANCE OF TRAFFIC AND CLOSING OF STREETS

- A. Carry on the work in a manner which will cause a minimum of interruption to traffic, and do not close to through travel more than two consecutive blocks, including the cross street intersected. Where traffic must cross open trenches, provide bridges at street intersections and driveways. Post signs indicating that a street is closed and necessary detour signs for the proper maintenance of traffic. Before closing any streets notify TDOT. Comply with TDOT requirements.

PART 2 - PRODUCTS

2.01 LINE PIPE

- A. The gas supply main shall be API-5L, X-42, ERW line pipe, in at least 20' lengths and fabricated for butt welding. All 8" and 4" line pipe shall be new and have a 0.250-inch wall thickness unless other noted. All 2" pipe shall be new and have a 0.154-inch wall thickness unless otherwise noted. All steel pipe must meet all applicable specifications as called out in the Department of Transportation Federal Standard 192.55.

2.02 WELD FITTINGS

- A. All 90 degree elbows, 45 degree elbows, tees, concentric reducers, etc. shall be wrought carbon steel, grade B, schedule 40 minimum, standard weight fittings and shall conform to ASA 16.9. The wall thickness of a weld fitting must be equal or thicker than that of the pipe to which it is to be welded.

2.03 PIPE COATING

- A. All underground pipe, main line or service piping shall be externally coated for the purpose of external corrosion control. This coating shall be Scotchkote Brand 206N fusion bonded epoxy coating, 12 mils minimum and 20 mils maximum thickness, or equivalent coating material. The coating must be applied on a properly prepared surface and have sufficient adhesion to the metal surface to effectively resist under-film migration of moisture. The coating must be sufficiently ductile to resist cracking and have sufficient strength to resist damage due to handling and soil stress. All service tees and any attached appurtenances shall be coated with Polyken #927 pipeline primer or equivalent and field wrapped with Polyken #932 joint wrap tape or equivalent.
- B. All weld joints (field joints) shall be sealed with window-weld wrapped sleeve 12" width as manufactured by Canusa or approved equal.
- C. All external protective coating must be inspected just prior to lowering the pipe into the ditch and backfilling, and any damage detrimental to effective corrosion control must be repaired.
- D. If coated pipe is installed by boring, driving, or other similar method, precautions must be taken to minimize damage to the coating during installation.
- E. Contractor must furnish a means for a representative of TDOT to inspect the line pipe during its coating and testing.
- F. All buried materials shall be coated. The field coating or repair shall be at least equal to the mill-applied coating in thickness, bond and electrical resistance.
- G. All field coating and wrapping shall be done in the manner recommended by the manufacturer of the coating and wrapping materials, and as accepted by TDOT. One copy of the approved instruction for coating and wrapping the pipe shall be at the job site at all times.
- H. Before applying field coating and wrapping, remove from the surfaces to be coated and wrapped all dirt, mud, moisture, loose rust, scale, welding spag, oil, grease, and other foreign matter which may adversely affect the coating and wrapping. Use scrapping, wire brushing, or power buffing to remove encrusted or adhered foreign matter. Remove oil, grease, or other soluble materials by wiping or brushing with coal tar solvent or Xyol. Clean out corners, crevices, depressions, wrinkles, or other places which harbor foreign matter.
- I. Prime the cleaned surfaces and apply tape in accordance with the manufacturer's instructions. Overlap the field applied coating at least 3 inches over the mill-applied coating.
- J. Recoat or repair remaining flaws after holiday testing or damage incurred in the trench.

PART 3 - EXECUTION

3.01 RIGHT-OF-WAY

- A. Contractor shall observe all of the provisions and restrictions contained in the easements granted to the City of Pulaski, Tennessee or TDOT.
- B. Contractor will have ingress and egress to the right-of-way where the pipeline crosses public roads, but any arrangements for the use of private roads or private property shall be the sole responsibility of Contractor and at the Contractor's sole expense.
- C. Contractor shall clear necessary right-of-way to permit construction; however, Contractor shall confine his operations to the easement right-of-way when working within an easement. When right-of-way passes through farm yards, lawns or other improved areas, the Contractor shall only use the minimum ditch width needed for the installation of the pipeline and shall minimize, to the greatest degree possible, damage to areas not impacted by trenching operations. Contractor shall perform all necessary grading at roads, streams, gullies and other locations needed to permit the passage of equipment, cars and trucks.

- D. Contractor shall use precaution when clearing and grading along the right-of-way to minimize any damage or disturbance to the natural grass, shrubs, and trees that are off the right-of-way. Repair of any of right-of-way damage shall be the sole responsibility of the Contractor.

- E. Dirt, small timber and/or brush that is moved off the right-of-way by the Contractor during the course of the Work shall immediately be removed and placed back on right-of-way. Contractor shall dispose of this material in an acceptable manner and in accordance with any restrictions noted by an easement or required by TDOT.

- F. When the utilities being constructed as part of this work will be laid adjacent to or across existing utilities that are owned by the City of Pulaski or others, it will be the responsibility of the Contractor to protect the existing utilities. If the Contractor is aware that existing utilities will be encountered, notification shall be given to the owners of these utilities by the Contractor at least forty-eight hours to beginning ditching and utility installation operations. The Contractor shall be responsible for locating and protecting these utilities. Should the subject utilities be damaged by the Contractor, the Contractor shall repair the damaged utilities at his expenses.

3.02 HANDLING OF MATERIALS

- A. Contractor shall indemnify TDOT against any charge for demurrage or other charges which may arise out of the Contractor's failure to promptly unload materials. In the event Contractor requests diversion of materials shipped from one destination to another and such request is granted by TDOT, all expense incident to such diversion shall be paid by Contractor.
- B. In the event it becomes necessary to rack pipe to be used on project, Contractor shall do so at his expense and in a manner that will prevent damage to the pipe.
- C. Contractor shall string pipe on right-of-way, streets and highways so as to cause the least interference possible. Gaps shall be left at intervals if necessary.
- D. Contractor shall promptly repair all property damaged by him in the progress of the work such as public roads, bridges, private roads, rail sidings, fences, hedges, buildings, etc.
- E. All materials shall be inspected for quantity and condition by representative of Contractor upon arrival at delivery points. After the subject inspection, the materials shall be the responsibility of the Contractor and, if any of the materials damaged, lost, stolen or misplaced, all cost to repair or replace the subject material shall be borne by the Contractor.
- F. Contractor shall take custody of the pipe at the delivery point. Contractor shall carefully inspect pipe for the following defects and shall make appropriate remedies.
 1. Bevel Damage: Bevels which have been damaged during handling, such that they cannot be repaired by grinding, shall be cut off with a beveling machine at no cost to TDOT.
 2. Pipe Wall Defects: The pipe wall shall contain no dents, nicks, gouges, or any other noticeable defects. All defects shall be completely removed by cutting from line at no cost to TDOT.

3.03 WELDING

- A. All welding shall be in accordance with minimum Federal Safety Standards (D.O.T.) Part 192 Subpart E and with the Standard For Welding Pipe Lines and Related Facilities, API Standard 1104-1973 Edition.
- B. All welding with the exception of pipe 2" and under shall be done by the manual, electric shield-arc process unless written approval of an alternate method has been obtained from TDOT prior to commencement of the work. If alternate welding process is proposed by Contractor, Contractor shall submit a complete set of proposed welding specifications for review and approval by the TDOT. Pipe 2" and under may be either manual arc welded or oxy-acetylene welded.
- C. Contractor shall use only skilled workmen for welding that have satisfactorily passed the qualification test outlined in Section 3 of API Standard 1104 or Section IX of the ASME Boiler and Pressure Vessel Code. Each welder shall perform the subject test at the project site prior to beginning work on the project in the presence of a TDOT representative. The Contractor shall advise TDOT when and where the testing will take place at least forty-eight hours prior to conducting the test. At the Contractor's sole expense, the Contractor shall furnish pipe for testing, prepare pipe specimens, furnish welding materials, beveling machine, coupon cutter, welding machine and the testing of pipe specimens at a TDOT approved testing laboratory.

- D. Should any welder perform work that is not satisfactory to TDOT, the welder shall not be employed by the Contractor for this project.

- E. Line-up clamps must be used whenever practical. If an external line-up clamp is used, as much as possible of the root bead shall be completed before the clamp may be removed. The root bead shall be uniformly spaced around the circumference of the pipe and shall have an accumulative length of not less than fifty (50) percent of the circumference.

- F. The adjoining lengths of pipe shall be accurately aligned so that all welding shall be at right angles to the axis of the pipe and accurately spaced before applying the stringer bead. Pipe shall be supported so that there is no strain on the stringer bead. The pipe support shall remain in place until the weld is complete and has cooled.

- G. Before placing a joint of pipe in alignment, all dirt, mill scale and foreign materials shall be removed from the inside of the pipe.

- H. Prior to aligning pipe, all point, rust, scale, dirt or other foreign materials that might affect the welding operation shall be removed by machine buffing the entire circumference of the pipe joint. Contractor shall re-cut, trim or re-bevel all pipe ends as may be necessary to maintain correct alignment and spacing of the pipe using an approved beveling machine.

- I. The welding operation shall be protected from weather conditions that would impair the quality of the complete weld.

- J. When done by the shielded metal arc process, welding shall be performed in the vertical down direction. The current used for depositing the filler metal shall be direct reverse polarity. The pipe material shall be on the negative side of the line. The stringer bead shall be deposited, using a drag technique, so as to completely fuse the abutting edges of the lands and beveled parts of the joint. There shall be complete penetration with a minimum inside buildup. Stringer bead shall be made with 1/8" AWS E-6010 (Fleetweld 5, 5P or equivalent). The stringer bead shall be thoroughly cleaned before starting the Hot Pass. Power brushing may be sufficient; however, disc grinding may be required.

- K. The Hot Pass shall be started more or less immediately after completion and cleaning of the stringer bead, but before the stringer bead can cool - always within five minutes to completion of the bead. The 1/8" Hot Pass shall be made with AWS Class E-6010 (Fleetweld 5, 5P or equivalent) or AWS Class E-7010 (Shield-Arc 85 or equivalent). The Hot Pass shall be cleaned by power brushing or disc grinding. Stripper passes may be used if required. The Cover Pass shall be made using 1/2" AWS Class E-6010 (Fleetweld 5, 5P or equivalent) or AWS Class E-7010 Shield Arc 85 or equivalent, a weaving motion - and should be 1/2" to 3/4" higher than the pipe wall and overlay the groove by 1/8" on each side. The completed weld shall be thoroughly brushed and cleaned. All welds that have been started shall be finished by the completion of the work day.

- L. If more than one welder is used, then codes shall be assigned to each welder. Welder's code shall be stenciled on top quarter of the pipe adjacent to each weld. Contractor shall furnish TDOT with a list of all code numbers the welders to which they were assigned. No numbers shall be reassigned another welder. Metallic dies shall not be used to mark the pipe.

- M. Contractor shall cut out any weld questioned by TDOT. Contractor shall repair or replace any unsatisfactory welds at his own expense.

- N. The intent and purpose of these specifications is to insure a one hundred (100) percent weld strength, ductility, fusion and penetration. Each completed weld shall be free of scale, oxides, gas pockets, air pockets, pin holes, non-metallic inclusions, rivers, undercutting, dirt, slag, or other foreign inclusions or any other defects.

- O. Arc burns outside the area of the finished weld shall be cause for rejection of the weld. Weld spatter from the welding process shall not be considered an arc burn. Cracked welds shall be rejected. Pin holes, cold laps, rivers, undercutting or any defects whatsoever occurring in any weld shall be repaired or cut out and completely re-welded at no expense to TDOT.

- P. If a weld is repairable, the defective area will be completely removed and the area preheated before re-welding. If a defect is then observed in the repaired area, the entire weld shall be cut out and replaced. Replacement shall be made by welding into the line a pup joint having a minimum length of two (2) feet. Replacement shall be at the expense of the Contractor.

- Q. At the end of each day's work and at the end of sections of pipe that are not tied in, pipe shall be capped. The cap shall be water tight and shall remain in place until work is resumed or pipe sections are tied in.

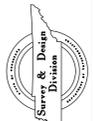
- R. Contractor shall include (in his bid) the cost for non-destructive testing of 10% of the project welds. Testing shall be conducted by a TDOT approved testing firm. The Contractor shall bear all costs associated with non-destructive testing of welds.

3.04 BENDING AND LAYING PIPE

- A. Contractor shall make all necessary field pipe bends required in the construction of the pipeline, but the TDOT may, at its option, direct the Contractor to provide fabricated bends (weld ells) for installation at points where, in TDOT's judgment, the use of such bends is required. If such bends are used the arc length, as measured along the crotch, must be at least one (1) inch. Contractor shall provide and install such bends at no addition cost to TDOT.

- B. All bending shall be done by the cold stretch method. Bends shall be made by using a type of bending machine approved by the TDOT. Pipe with buckles, wrinkles, or flat spots will not be permitted in the pipeline.

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STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT
CITY OF PULASKI
STATE ROUTE 7
UTILITY
RELOCATION
SPECIFICATIONS

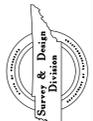
| TYPE | YEAR | PROJECT NO. | SHEET NO. |
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| CONST. | 2015 | STP/NH-7(16) | U5-4 |
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| | | | |

- C. The distance between center lines of bending points shall be one (1) pipe diameter. The maximum degree of bending at each bending point shall be one and one half (1-1/2) degrees. An accurate method of measurement shall be used. No bend shall be made nearer than four (4) feet to the end of the joint of pipe. When pipe is double jointed before bending, bend shall not be closer to the weld than three (3) feet. Departure from pipe roundness (the difference between the long and short diameters of the pipe) in any bend shall not exceed two and one half (2-1/2) percent of the nominal diameter of the pipe. On pipe containing a longitudinal weld, the longitudinal weld must be as near as practicable to the neutral axis of the bend.
 - D. All pups five (5) feet and over shall be moved ahead daily and installed in line. There shall be a full joint of pipe installed between pups.
 - E. Any pipe that is buckled, wrinkled, flattened, or distorted shall be cut out and replaced at Contractor's expense.
 - F. The Contractor shall lay all pipe so that it conforms with the contour of the ditch. Over-bends shall be made in such a manner that the middle of the bend shall clear the high point of the bottom of the ditch.
 - G. Sag bends shall fit the bottom of the ditch. Side bends shall conform to the outside of the ditch. There shall be no points in the ditch where it is necessary to scrub or force the pipe into the ditch to obtain proper depth or lineup. Pipe shall fit the ditch without the use of external force to hold it in place until the backfill is completed.
 - H. Contractor shall furnish a high voltage electric holiday detector and shall operate this detector at the voltage setting required by TDOT for that type coating. Contractor shall make a detailed inspection of the coating for holidays and imperfections immediately preceding the lowering in of the pipe. All holidays and damaged places in the coating shall be repaired by Contractor until the detector is passed over the entire pipe without disclosing any holidays or imperfections in the coating.
 - I. Coated pipe shall be handled at all times with equipment designed to prevent damage to the coating. Chain or cable slings or other pipe handling equipment found to be injurious to the coating are not to be used. Contractor shall repair any coating damaged in the handling, lowering or moving of the pipe in the ditch so as to leave it in a condition equal to that of the undamaged coating. In lowering coated pipe in rock areas a four (4) inch limestone dust or sand shall be placed in the bottom of the ditch and the ditch shall be thoroughly padded above the pipe with twelve (12) inches of limestone dust or sand to protect coating.
 - J. All mains shall have a minimum cover of 36 inches of cover. State regulations on amount of cover will apply within and/or along State highway Rights-of-Way.
 - K. The pipeline must be installed with at least twelve (12) inches of clearance from any other underground structure not associated with the pipeline. If this clearance cannot be attained, approval must be obtained from TDOT's representative before installing the pipeline with less clearance; the pipeline must be protected from damage that might result from the proximity of the other structure.
- 3.05 PIPE BEDDING
- A. All gas main pipe shall be supported on a bed of well compacted earth, dirt, or clay. Bedding material shall be acceptable to the Owner and free from rock, stones, bricks, concrete chunks, organic matter, frozen or other objectionable material. In no case shall pipe be supported directly on rock. When rock is encountered in the trench, bottom bedding shall consist of lime dust or sand only installed to provide uniform and continuous bearing for the pipe.
- 3.06 HIGHWAY CROSSINGS
- A. Contractor shall install a pipeline at all highway and street crossings in strict accordance with the specifications required by TDOT engineers, city engineers, or any other authority having proper jurisdiction over such installations, but only after TDOT shall have secured necessary permits.
 - B. If casings are required, they shall be installed by Contractor. Casing spacers and end seals shall be installed with the insulators spaced at proper intervals on the pipe between the pipe and casing. Vents to be installed at required locations. All casing installations must pass electric resistance tests.
 - C. All highways, county roads, and driveways shall be crossed by either boring and jacking or by directional boring as specified in the attached boring and jacking specifications.
 - D. All necessary barricades, safety signs, lights, etc., required by Federal, State, City, County, or other governmental authority shall be furnished and maintained by Contractor.
 - E. The pipe at all road crossings shall be buried to a depth to insure that the top of the pipe or casing shall be at least sixty (60) inches below the lowest point in the bottom of the drainage ditch.
- 3.07 WATER CROSSINGS (MINOR CROSSINGS)
- A. At minor water crossings, Contractor may use dikes, cofferdams, culverts, or pilings to separate the work area from the flowing stream. The minimum depth of the pipe below the existing stream shall be five (5) feet; however, at the option of Owner, two (2) feet may be acceptable if the crossing is in consolidated rock. If the depth of the crossing is two feet and the pipe will bed on rock, the pipe shall be encased in concrete for the length of the crossing plus a length of four feet. The spoil rock shall be deposited on either side of the water crossing. After the pipe has been placed in the ditch all spoil banks shall be placed back over the line in the stream. The banks of the crossing shall be restored to their original condition and to prevent erosion, rip-rap material will be required where noted on the plans. All excavation work shall conform to the terms of federal, state, and local permits and right-of-way easement requirements. The Contractor may at his option, directional bore water crossings.

- B. Weights will be installed if required. Contractor will either furnish weights or weight material.
 - C. Contractor shall use due diligence to install crossing and shall be responsible for complying with all environmental agency requirements.
 - D. Minor creek crossings are classified as either a stream less than fifteen (15) feet in width or a dry crossing.
- 3.08 BACKFILL CLEAN UP AND PAVING
- A. After the pipe has been placed at the bottom of the trench, but before backfilling; the ditch must be inspected by TDOT insure that no debris is in the ditch.
 - B. After the pipe has been inspected in the ditch, all damage to the protective coating and wrapping has been repaired and TDOT has inspected the trench; the Contractor may backfill the ditch. Rock, gravel or like materials shall not be placed directly onto the pipe. The Contractor shall first provide a compacted dirt, limestone dust or sand bed and eight (8) inches of compacted dirt, limestone dust or sand over the pipe before backfilling the trench.
 - C. Backfill shall not include debris such as stumps, brush, large rock, etc.
 - D. As backfill progresses, cleanup shall follow a reasonable distance behind. Excess rock, dirt, materials and debris will be removed and disposed of immediately. At no time will the construction of the line progress to the point that final cleanup has not been completed on the major portion of the ditch.
 - E. Compaction of the backfill material shall meet TDOT's requirements and shall follow good industry practice. Wheel rolling or multi-lift mechanical compaction may be used depending on locations and requirements. Contractor shall repair any trench depressions immediately at Contractor's expense. After backfill is initially placed, a crown eight to twelve inches high may be left on cross-country trenches; however, after final clean-up, the crown shall not exceed two inches in height. The crown left on TDOT right-of-ways shall not exceed two inches at any time. TDOT regulations regarding backfill apply along state highway right-of-way.
 - F. The backfilling of trenches or excavations across or along federal, state, city or county roadways shall comply with the regulations of the governmental entity responsible for maintaining the roadway. Roadway crossings must be maintained by the Contractor in a manner acceptable to the regulating entity until the pipeline is accepted by TDOT.
 - G. Where federal, state, county or city requirements dictate that crushed rock is to be used as backfill material, backfill shall be completed by Contractor at no additional expense to TDOT.
 - H. Temporary paving may be used to temporarily repair road crossings at the convenience of the Contractor or where directed to do so by TDOT. Cost associated with the temporary repair of pavement is considered incidental to the pipe installation work and, thus, will not be paid for separately.
 - I. Permanent Pavement repair shall comply with TDOT requirements.
 - J. State highways, county roadways, and/or city streets may be directionally bored or bored and jacked. Where boring is not feasible and TDOT permits pavement to be cut, replacement pavement will be installed in accordance with TDOT's requirements.
- Payment for pavement replacement will be made per linear foot of pavement replaced. The length of which will be determined by measuring along the centerline of the pipe trench. The pavement replacement price shall include all cost of concrete, asphaltic paving, binder and reinforcing materials. Directional boring will be paid per linear foot of directional boring as measured along the centerline of the directional bore. Payment for bored and jacked crossings will be addressed elsewhere.
- K. Placement of grass seed, straw or sod is considered incidental to the installation of pipe and no separate payment will be made for these items.
- 3.09 DEHYDRATING THE PIPE LINES
- A. At all points of entry for pigging, pour 10 gallons of methanol (or an amount as required) into the line in front of the pig. At all purging entry points, pour 20 gallons of methanol (or an amount as required) into the line. Use a suitable squeeze type pig to push the methanol through the line as required.
- 3.10 INTERNAL CLEANING
- A. Prior to testing, internally clean all new piping with a suitable "pig" type cleaner forced by air pressure through the pipe line three or more times until the line is thoroughly cleaned.
 1. The first two cleanings shall be performed with a wire brush type pig.
 2. All subsequent cleanings may be performed with a polyurethane or polyethylene type pig.
 3. If a large amount of water is present during pigging, the line shall be dried in accordance with the Section on "DEHYDRATING THE PIPE LINES" described herein, using a suitable squeeze type pig.
 - B. Provide a suitable barrier in front of the open ends of the pipe to catch the cleaners in order to prevent injury to personnel.
 - C. Air shall be forced through the line after pigging to ensure that all smaller particles and dust are removed. Compressed air used for forcing the pig through the line or blowing air through the line shall not inject any type of oil, lubricant or other foreign matter into the line.
- 3.11 TESTING
- A. Furnish testing equipment approved by TDOT and give TDOT forty-eight hours advance notice before beginning testing.

- B. Pressure Tests:
 1. Test all steel pipe with water, air or inert gas to 500 PSIG (MAOP 250 psi) and measure the pressure with an accurate recording pressure gauge. Test results shall be recorded on a chart capable of recording a minimum of 24 hours of data.
 2. The minimum test duration shall be 24-hours. During the test period, there shall be no drop in pressure after the pressurizing device is disconnected from the pipeline and the temperature of the test medium has been allowed to stabilize.
 3. Repair any leaks disclosed by the tests and repeat the tests until all leaks are repaired.
 4. The test date, section of line being tested, beginning test pressure, ending test pressure, the time the test began, the time the test ended and Contractor's signature shall be noted on all pressure test charts used during testing. No chart can be used for more than one test. All charts on which data was recorded during testing shall be kept including charts for sections that failed testing. All charts shall be delivered to TDOT after testing is complete. All test charts shall record a minimum of 24 hours of test data.
 5. Test gauges shall be a minimum of 4-1/2 inches in diameter or larger depending on the accuracy required for the test.
 6. The test chart and gauge range shall be 1-1000 PSI for all transmission pipe. The test pressure shall be 500 PSI.
 7. All tests shall be conducted with gauges located at the recording chart and the point on the line being tested that is the most distant from the chart. There shall be no less than 2 gauges on any line being tested.
 8. The only pressure drop allowed during testing shall be due to a temperature change.
 9. The device used to pressurize the line shall not inject oil, lubricant or any other foreign matter into the line being tested. If it is determined that the device injects oil or foreign matter into the line, the Contractor must re-clean and re-test the line in accord with the requirement outlined above and at no additional cost to TDOT.
 10. Hydrostatic testing shall conform to PFI-ES4.
 - C. Liquid Leak Tests (Soap Test)
 1. All above ground fittings, valves, equipment, gages, piping and joints shall be tested with a suitable liquid leak detection solution before any paint or coating is applied.
 2. To be a valid test, no signs of bubbling will be allowed
 3. All test results shall be recorded.
 - D. Coating Tests (Steel Pipe)
 1. Test all pipe coating including mill applied and field applied coating with an "Electric Holiday Detector", using the proper test voltage as recommended by the coating manufacturer for the type of coating involved.
 2. Repair all "holidays" which may be disclosed by the tests and repeat the test as required for approval.
 3. All coating tests shall conform with ANSI/ASTM G62.
 - E. When requested by TDOT, a sample weld shall be cut and submitted for testing to an approved independent testing laboratory.
 1. The Contractor shall pay for the test.
 2. If 10% of the welds or any two welds fail the test, the welder will be prevented from welding on the job until he has satisfactorily been retested and recertified.
- 3.12 PURGING
- A. Before placing in service, purge all new lines with gas to remove all air and explosive mixtures. Use and follow all safety precautions for the type of work being done. The Contractor shall furnish and pay for all purging gas used. The Contractor is encouraged to use an inert gas during the purging process to limit the amount of wasted gas.
- 3.13 PIPELINE MARKERS
- A. The Contractor shall furnish and install pipeline markers at locations to be selected in the field by TDOT. In general, the use of line markers is to reduce the possibility of damage to the pipeline and to enhance safety for the public or others as they work around the installed pipeline.
 - B. The following are guidelines for the locations of markers:
 1. Place in areas accessible to the public.
 2. Place in rural areas.
 - a) At each crossing of a public road, railroad, or navigable waterway.
 - b) When in close proximity to other utilities in the area.
 - c) Crossing power or other utilities.
 - d) In areas subject to cultivation, frequent maintenance or dredging.
 - e) Place at crossings of fence lines rather than in fields when possible.
 - f) Place at or near buried valve locations.
 - g) Place at or near test stations.
 - h) Desirable for angular changes in pipe direction.
 - 3. Avoid placing the marker where it becomes an eyesore or a hazard in itself.
- C. Gas pipeline marker posts shall be of glass reinforced polyester composite material. Each post shall have an outside width of 3.75 inches, 3/8 inch thickness and a minimum overall length of 6 feet. Pipeline marker posts shall be J. Miller Industries, Inc. (800/771-7752) Marker, JMI-375-072-YL or approved equal (see Standard Detail). Marker posts shall bear a permanent message meeting requirements of Section 192.707 under Part 192, Title 499, Code of Federal Regulations. The marker shall also contain the name and phone number of Tennessee one call (800) 351-1111.
 - D. Installation of the pipeline marker posts shall be a pay item.
- 3.14 LOCATING VALVES
- A. After clean-up in the area is complete, the Contractor shall paint the top of all valve boxes yellow.

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STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

CITY OF PULASKI
STATE ROUTE 7
UTILITY
RELOCATION
SPECIFICATIONS

| TYPE | YEAR | PROJECT NO. | SHEET NO. |
|--------|------|--------------|-----------|
| CONST. | 2015 | STP/NH-7(16) | U5-5 |
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3.15 SEEDING AND MULCHING

- A. Provide all labor, materials, equipment and tests for all seeding and mulching in accordance with all applicable codes. When seeding areas are not involved in erosion control, fertilizer, topsoil or lime will not be required.
- B. Deliver grass seed to the site in original containers showing analysis of the seed mixture, percentages of pure seed, year of production, net weight, date of packaging and location of packaging.
- C. Deliver fertilizer in waterproof bags showing weight, chemical analysis and name of the manufacturer.
- D. Deliver straw or mulch in original bales or bags properly stored in original bales or bags.
- E. All grass areas damaged by the Contractor outside of the normal limits of construction shall be repaired at the Contractor's expense.

3.16 CATHODIC PROTECTION TEST STATIONS

- A. Test stations shall be J. Miller Industries, Inc., Model JMI-TDF-072-WH or approved equal. The station shall include #12 AWG wire and warning decals similar to pipeline markers. Contractor shall install two (2) #12 AWG wires to the terminals and CAD weld (with #15 shot) to the gas main one pipe diameter apart. One wire shall be white and the other wire shall be black. The black wire shall be west of the white wire.

3.17 INSTRUCTION, MANUALS AND MAINTENANCE INFORMATION

- A. The Contractor shall supply the City of Pulaski with instruction, repair, maintenance and general information booklets and manuals for all equipment installed including parts lists, local suppliers and sales representatives for all pipe valves, regulators, meters, gauges and all other appurtenances.

3.18 PIPELINE TIE-INS

- A. The Contractor shall make a tie-in to the existing piping as shown on the plans. However, should the underground piping be discovered to be different than shown on plans the Contractor will make tie-in at the direction of TDOT and the City of Pulaski. All items are to be made only by certified operators as required by law.

3.19 CLEAN UP

- A. The Contractor shall not allow the site of the work to become littered with trash and waste material, but shall maintain the same in a neat orderly condition throughout the construction period. TDOT shall have the right to determine what is, or is not, waste material or rubbish and the place and manner of disposal.
- B. On or before completion of the work, the Contractor shall thoroughly clean all sites, remove all temporary structures built by him, remove rubbish of all kinds from any of the areas he has worked in or occupied and leave them in a neat and clean condition.

3.20 RECTIFIER BED

- A. Contractor shall hire Mid-South Corrosion Control of Paris, Tennessee to construct a rectifier bed to be located where directed by TDOT and the City of Pulaski, Tennessee's gas department. The rectifier bed shall be configured to comply with the requirements established by the City of Pulaski, Tennessee's gas department and Mid-South Corrosion Control.
- B. A not-to-exceed allowance of \$12,000 shall be allocated for the rectifier bed's construction.

3.21 PAINTING

- A. All metallic piping, valves, hangers, supports, vents, control boxes, etc., exposed above ground shall be painted as follows:
 1. Remove pipe coating material (except galvanizing), rust, dirt, grease, scale, slag, and foreign matter by sandblasting and/or wire brush cleaning. Preparation of the surface shall conform with SSPC-SP-6. Surfaces to be painted shall be dry and free from moisture.
 2. Apply two prime coats of Tnemec Pota-Pox Series 20, 2.0 to 4.0 mils per coat. Allow proper drying between coats. Follow manufacturer's recommendations.
 3. Apply one finish coat of Tnemec Endura-Shield Series 70, 1.5 to 2.5 mils per coat. Allow proper drying time between coats. Follow manufacturer's recommendations.
 4. Color Schemes:
 - a) Piping Exposed: Yellow.

END OF SECTION

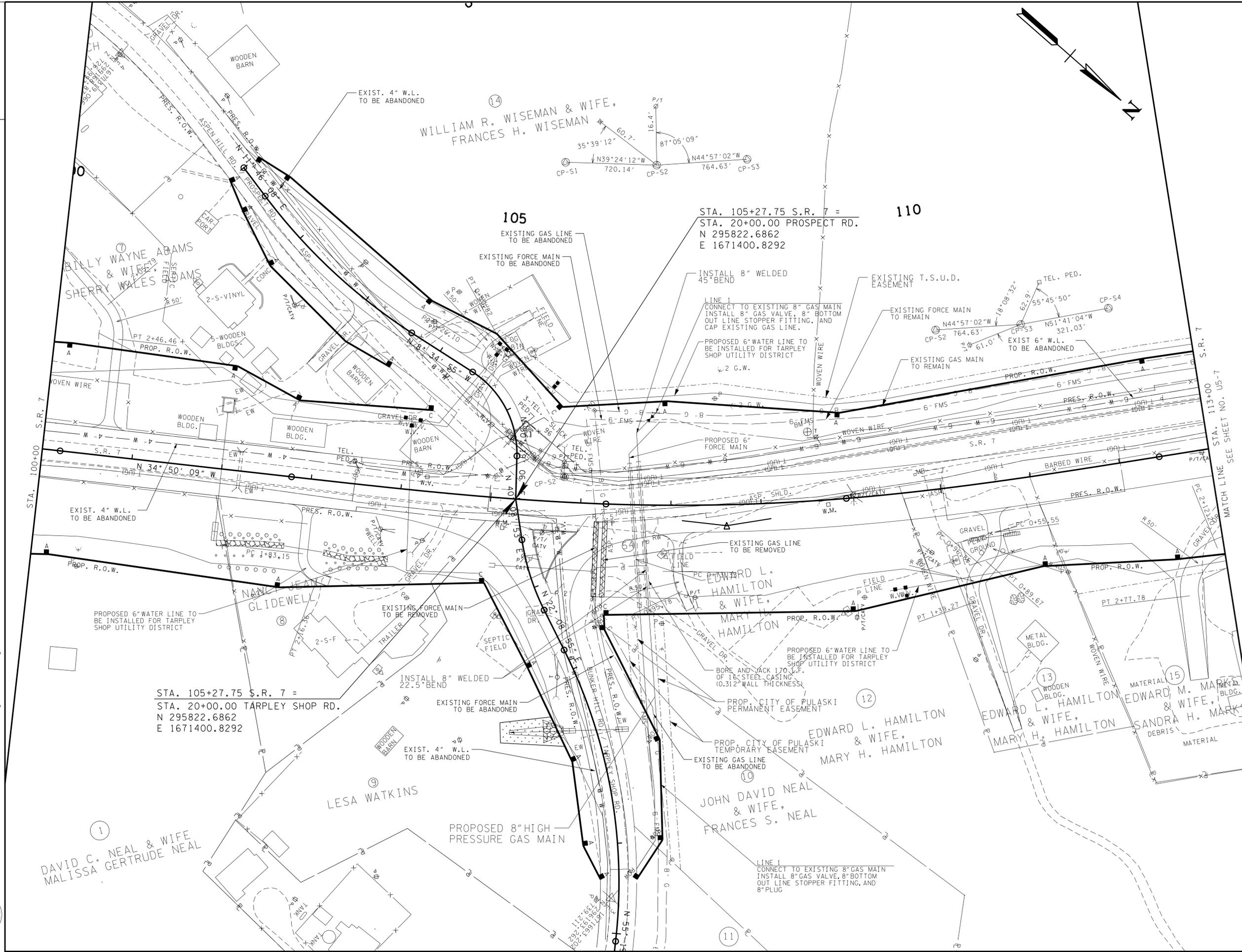
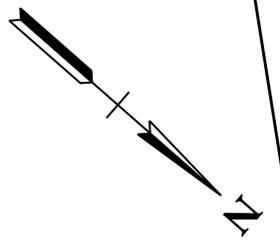
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STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

CITY OF PULASKI
STATE ROUTE 7
UTILITY
RELOCATION
SPECIFICATIONS

| TYPE | YEAR | PROJECT NO. | SHEET NO. |
|--------|------|--------------|-----------|
| CONST. | 2015 | STP/NH-7(16) | U5-6 |
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COORDINATE VALUES ARE NAD/83 (1995) AND ARE DATUM ADJUSTED BY THE FACTOR 1.000011 & TIED TO THE TGRN.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

CITY OF PULASKI
STATE ROUTE 7
UTILITY RELOCATION
GAS - LINE 1
SCALE: 1" = 50'

| TYPE | YEAR | PROJECT NO. | SHEET NO. |
|--------|------|--------------|-----------|
| CONST. | 2015 | STP/NH-7(16) | U5-7 |
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THE MONUMENT AT THE CENTER OF FENCED IN AREA OF CEMETERY IS INSCRIBED WITH THE FOLLOWING:

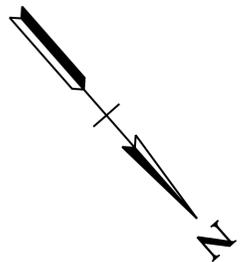
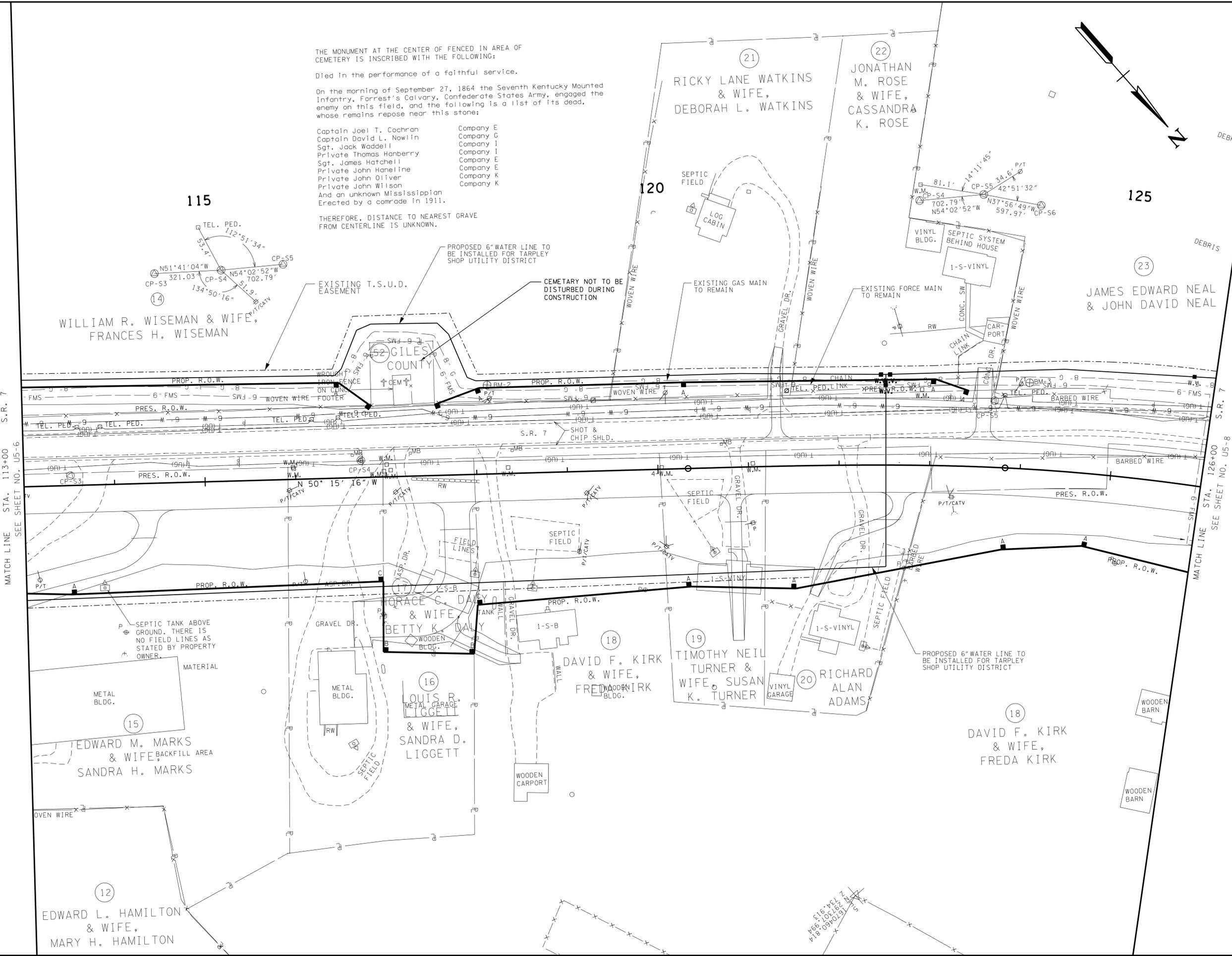
Died in the performance of a faithful service.

On the morning of September 27, 1864 the Seventh Kentucky Mounted Infantry, Forrest's Cavalry, Confederate States Army, engaged the enemy on this field, and the following is a list of its dead, whose remains repose near this stone:

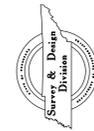
- | | |
|------------------------------|-----------|
| Captain Joel T. Cochran | Company E |
| Captain David L. Nowlin | Company G |
| Sgt. Jack Waddell | Company I |
| Private Thomas Hanberry | Company I |
| Sgt. James Hatchell | Company E |
| Private John Haneline | Company E |
| Private John Oliver | Company K |
| Private John Wilson | Company K |
| And an unknown Mississippian | |

Erected by a comrade in 1911.

THEREFORE, DISTANCE TO NEAREST GRAVE FROM CENTERLINE IS UNKNOWN.



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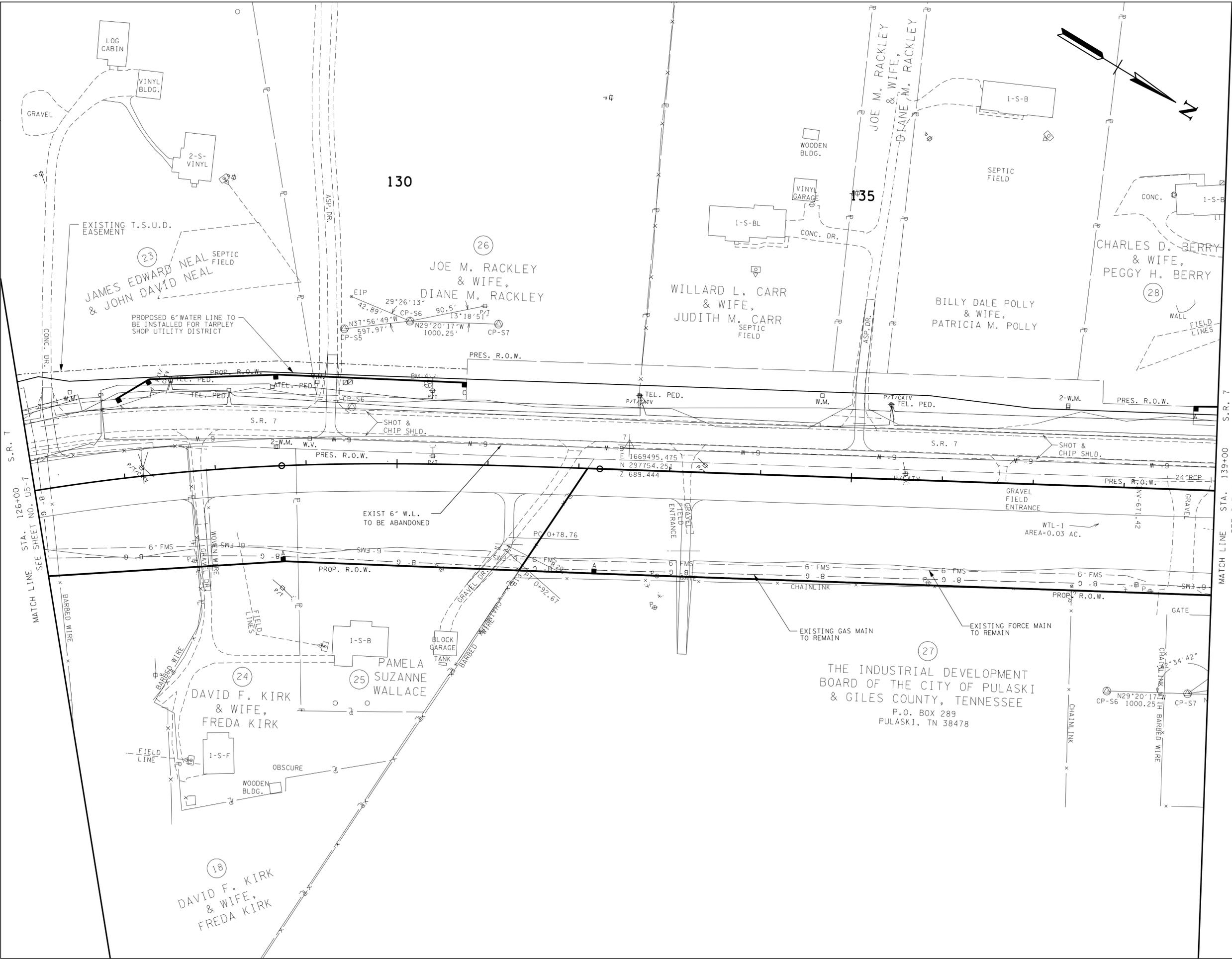


COORDINATE VALUES ARE NAD/83 (1995) AND ARE DATUM ADJUSTED BY THE FACTOR 1.000011 & TIED TO THE TGRN.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

CITY OF PULASKI
STATE ROUTE 7
UTILITY RELOCATION
GAS
SCALE: 1" = 50'

| TYPE | YEAR | PROJECT NO. | SHEET NO. |
|--------|------|--------------|-----------|
| CONST. | 2015 | STP/NH-7(16) | U5-8 |
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MATCH LINE STA. 139+00 SEE SHEET NO. U5-9

THE INDUSTRIAL DEVELOPMENT BOARD OF THE CITY OF PULASKI & GILES COUNTY, TENNESSEE
P.O. BOX 289
PULASKI, TN 38478

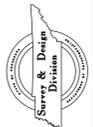


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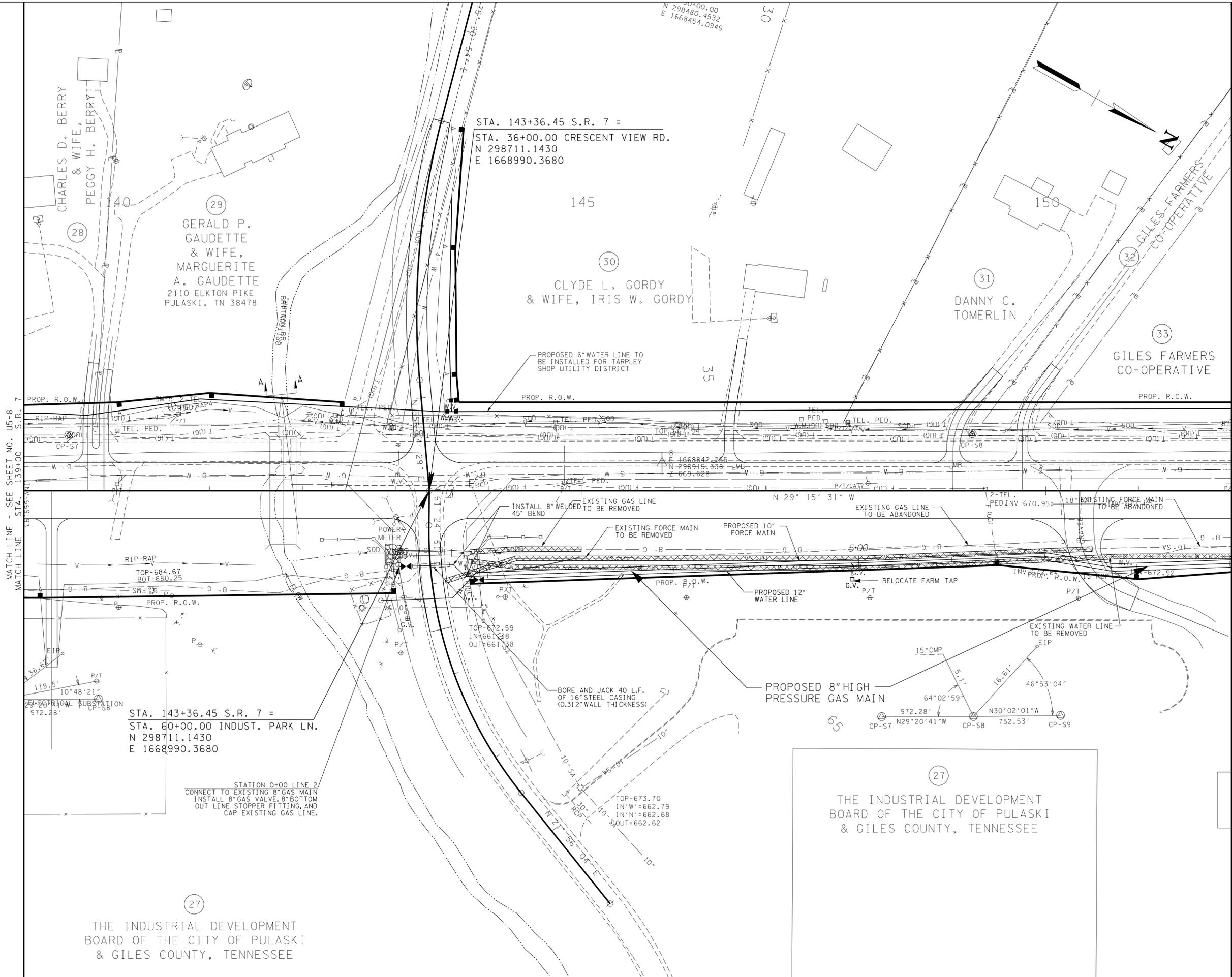
STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

CITY OF PULASKI
STATE ROUTE 7
UTILITY
RELOCATION

GAS
SCALE: 1" = 50'



| TYPE | YEAR | PROJECT NO. | SHEET NO. |
|--------|------|--------------|-----------|
| CONST. | 2015 | STP/NH-7(16) | U5-9 |
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MATCH LINE - LINE 2 GAS MAIN STA. 152+00 SEE SHEET NO. U5-10
 STA. 139+00 S.R. 7
 STA. 9+02

STA. 143+36.45 S.R. 7 =
 STA. 60+00.00 INDUST. PARK LN.
 N 298711.1430
 E 1668990.3680

STA. 143+36.45 S.R. 7 =
 STA. 36+00.00 CRESCENT VIEW RD.
 N 298711.1430
 E 1668990.3680

THE INDUSTRIAL DEVELOPMENT
 BOARD OF THE CITY OF PULASKI
 & GILES COUNTY, TENNESSEE

THE INDUSTRIAL DEVELOPMENT
 BOARD OF THE CITY OF PULASKI
 & GILES COUNTY, TENNESSEE



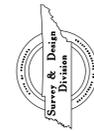
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 AND ARE DATUM ADJUSTED BY THE
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STATE OF TENNESSEE
 DEPARTMENT OF TRANSPORTATION
 BUREAU OF PLANNING & DEVELOPMENT

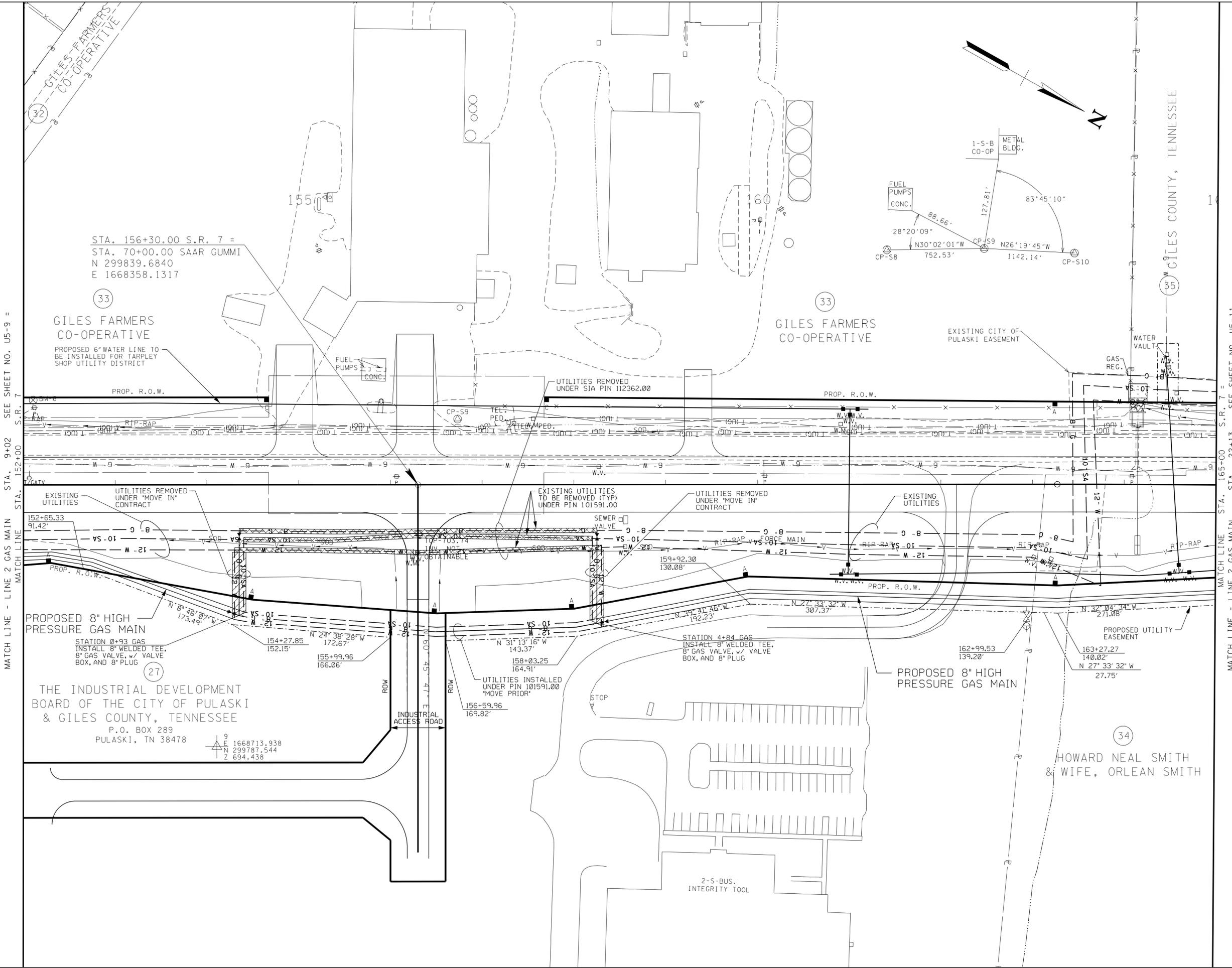
CITY OF PULASKI
 STATE ROUTE 7
 UTILITY
 RELOCATION
 GAS - LINE 2
 STA. 0+00 TO STA. 9+02
 SCALE: 1" = 50'

RDWY. STA. 139+00 TO STA. 152+00

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| TYPE | YEAR | PROJECT NO. | SHEET NO. |
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| CONST. | 2015 | STP/NH-7(16) | U5-10 |
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STA. 9+02 SEE SHEET NO. U5-9 =
STA. 152+00 S.R. 7
MATCH LINE - LINE 2 GAS MAIN
MATCH LINE - LINE 2 GAS MAIN
STA. 165+00 S.R. 7 = SEE SHEET NO. U5-11

STA. 156+30.00 S.R. 7 =
STA. 70+00.00 SAAR GUMMI
N 299839.6840
E 1668358.1317

GILES FARMERS
CO-OPERATIVE
PROPOSED 6" WATER LINE TO
BE INSTALLED FOR TARPLEY
SHOP UTILITY DISTRICT

PROPOSED 8" HIGH
PRESSURE GAS MAIN
STATION 0+93 GAS
INSTALL 8" WELDED TEE,
8" GAS VALVE, w/ VALVE
BOX, AND 8" PLUG

THE INDUSTRIAL DEVELOPMENT
BOARD OF THE CITY OF PULASKI
& GILES COUNTY, TENNESSEE
P.O. BOX 289
PULASKI, TN 38478

1668713.938
299787.544
694.438

HOWARD NEAL SMITH
& WIFE, ORLEAN SMITH



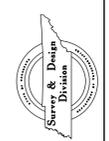
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STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

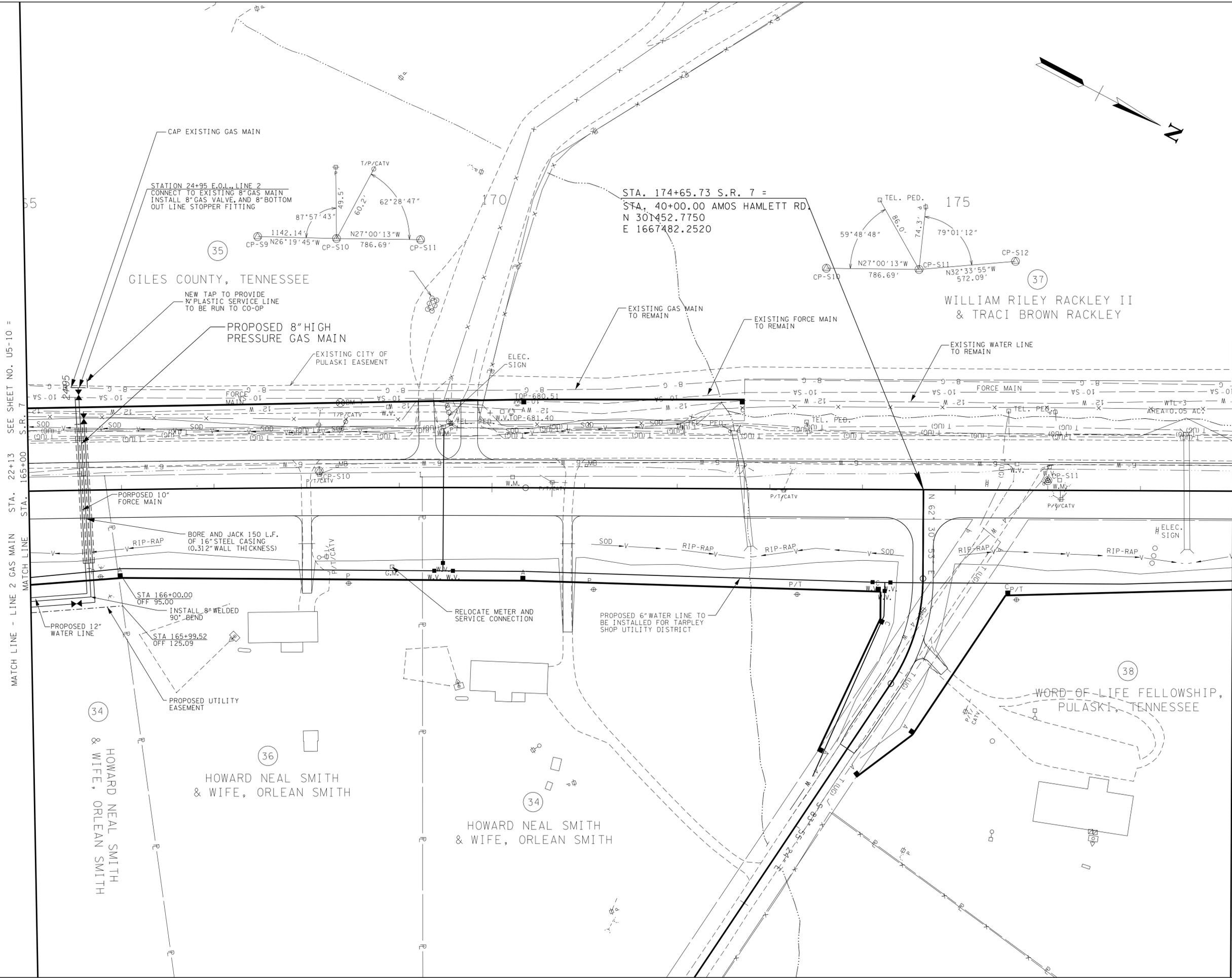
CITY OF PULASKI
STATE ROUTE 7
UTILITY
RELOCATION
GAS - LINE 2
STA. 9+02 TO STA. 22+13
SCALE: 1" = 50'

RWDY. STA. 152+00 TO STA. 165+00

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SEE SHEET NO. U5-10 =
STA. 22+13
MATCH LINE - LINE 2 GAS MAIN STA. 165+00
MATCH LINE - LINE 2 GAS MAIN STA. 24+95

STA. 178+00
MATCH LINE - SEE SHEET NO. U5-12

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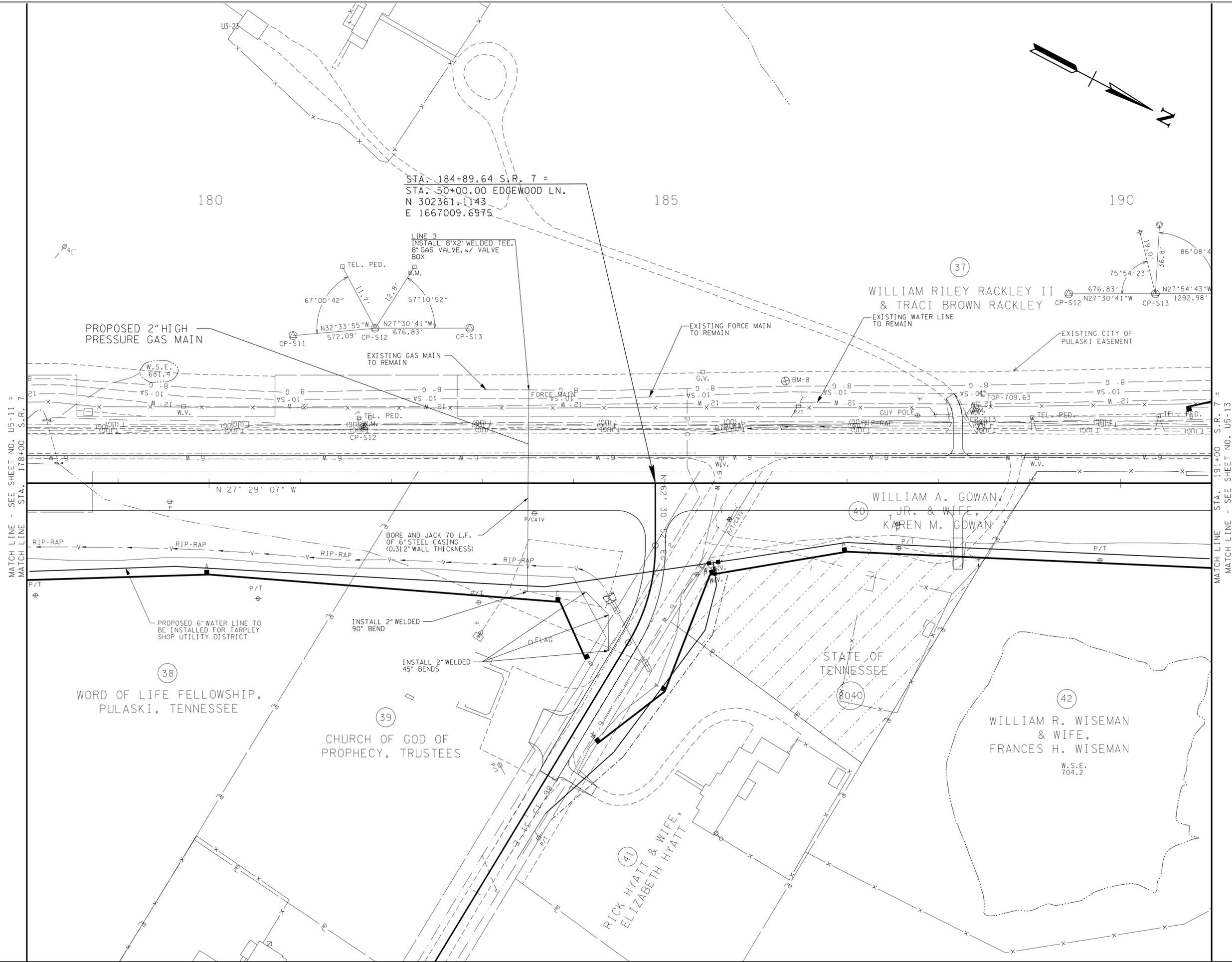
COORDINATE VALUES ARE NAD/83 (1995) AND ARE DATUM ADJUSTED BY THE FACTOR 1.000011 & TIED TO THE TGRN.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

CITY OF PULASKI
STATE ROUTE 7
UTILITY RELOCATION
GAS - LINE 2
STA. 22+13 TO STA. 24+95
SCALE: 1" = 50'

RDWY. STA. 165+00 TO STA. 178+00

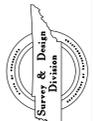
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MATCH LINE - SEE SHEET NO. U5-11 = STA. 178+00 S.R. 7
MATCH LINE

MATCH LINE STA. 191+00 S.R. 7 = SEE SHEET NO. U5-13

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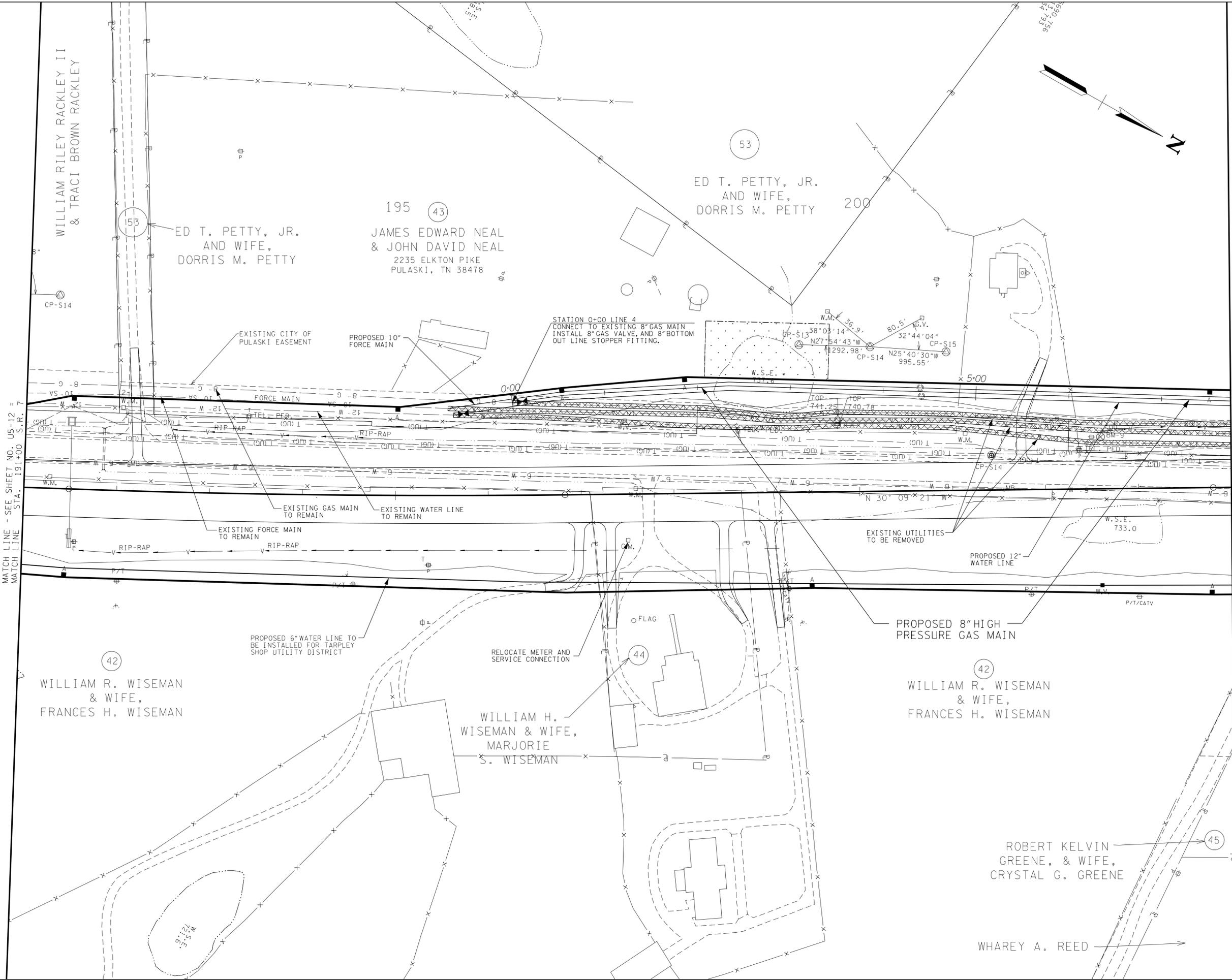


COORDINATE VALUES ARE NAD/83 (1995) AND ARE DATUM ADJUSTED BY THE FACTOR 1.000011 & TIED TO THE TGRN.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

CITY OF PULASKI
STATE ROUTE 7
UTILITY
RELOCATION
GAS - LINE 3
SCALE: 1" = 50'

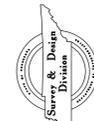
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MATCH LINE - SEE SHEET NO. U5-12 =
MATCH LINE STA. 191+00 S.R. 7

MATCH LINE STA. 204+00 S.R. 7 =
MATCH LINE - LINE 4 GAS MAIN STA. 7+74 SEE SHEET NO. U5-14

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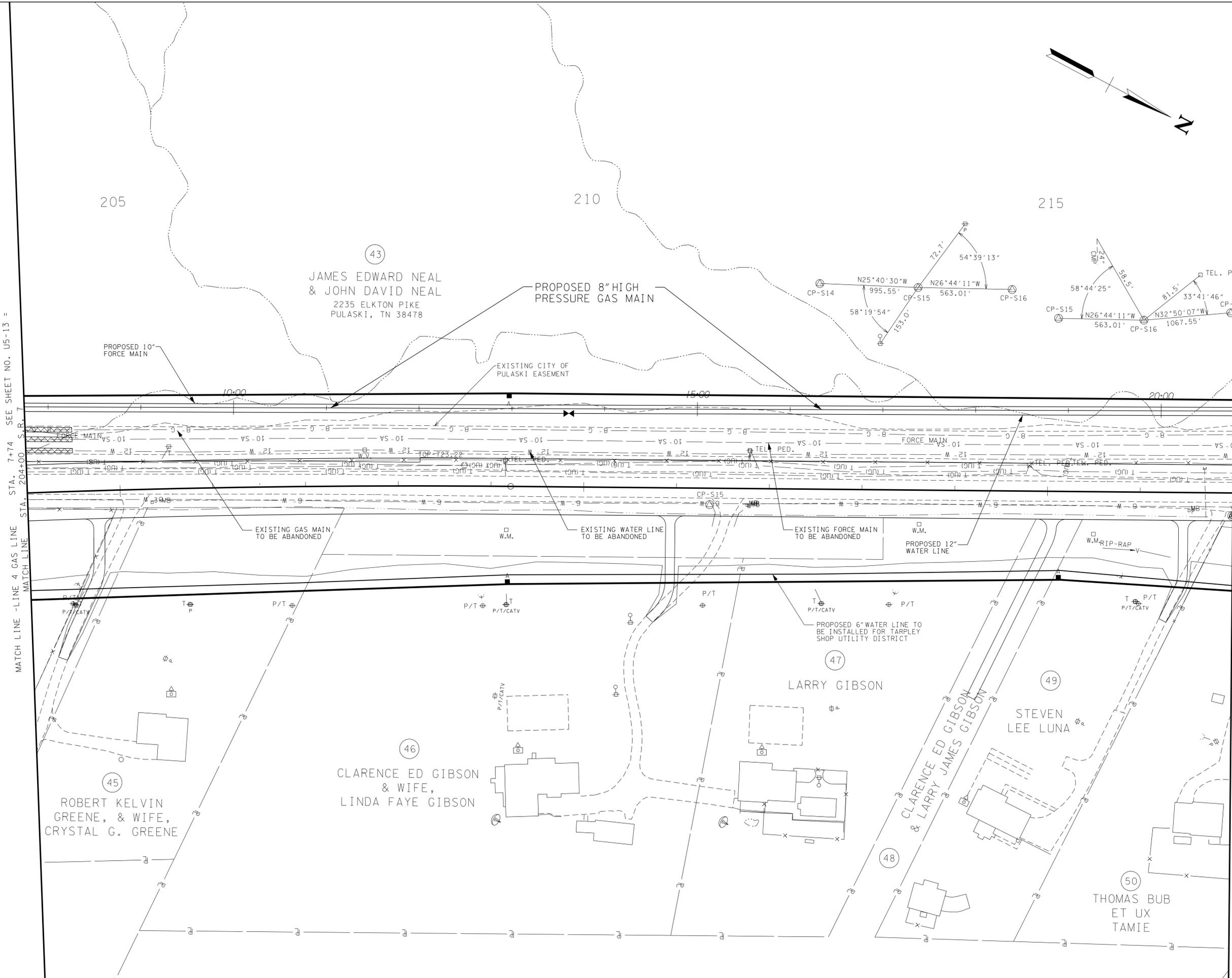


COORDINATE VALUES ARE NAD/83 (1995)
AND ARE DATUM ADJUSTED BY THE
FACTOR 1.000011 & TIED TO THE TGRN.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

CITY OF PULASKI
STATE ROUTE 7
UTILITY
RELOCATION
GAS - LINE 4
STA. 0+00 TO STA. 7+74
SCALE: 1" = 50'

| TYPE | YEAR | PROJECT NO. | SHEET NO. |
|--------|------|--------------|-----------|
| CONST. | 2015 | STP/NH-7(16) | U5-14 |
| | | | |
| | | | |



SEE SHEET NO. U5-13 =
STA. 7+74 S.R. 7
MATCH LINE - LINE 4 GAS LINE STA. 204+00

MATCH LINE - LINE 4 GAS MAIN STA. 217+00
S.R. 7 = SEE SHEET NO. U5-15

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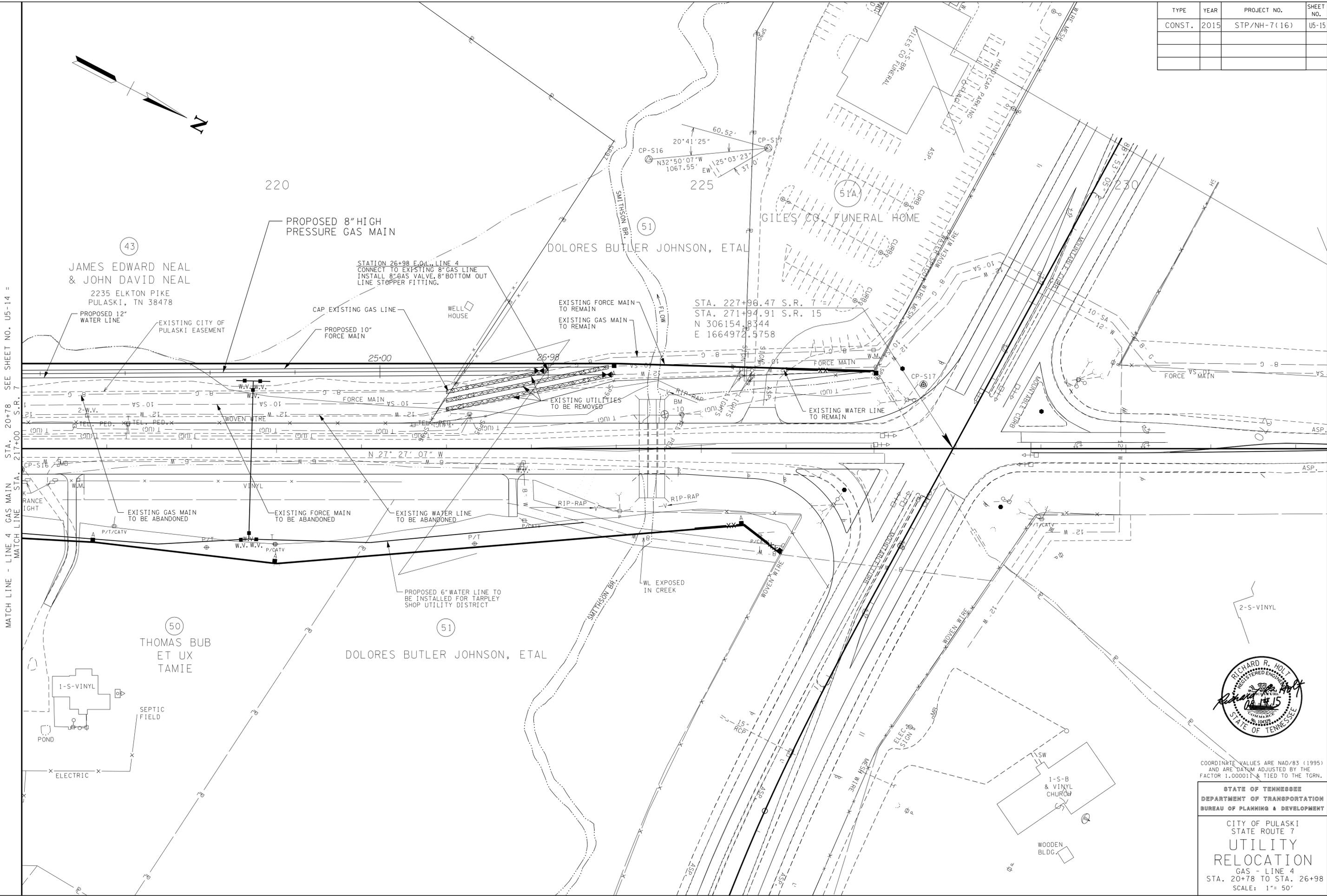
COORDINATE VALUES ARE NAD/83 (1995)
AND ARE DATUM ADJUSTED BY THE
FACTOR 1.000011 & TIED TO THE TGRN.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

CITY OF PULASKI
STATE ROUTE 7
UTILITY
RELOCATION
GAS - LINE 4
STA. 7+74 TO STA. 20+78
SCALE: 1" = 50'

RDWY. STA. 204+00 TO STA. 217+00

| TYPE | YEAR | PROJECT NO. | SHEET NO. |
|--------|------|--------------|-----------|
| CONST. | 2015 | STP/NH-7(16) | U5-15 |
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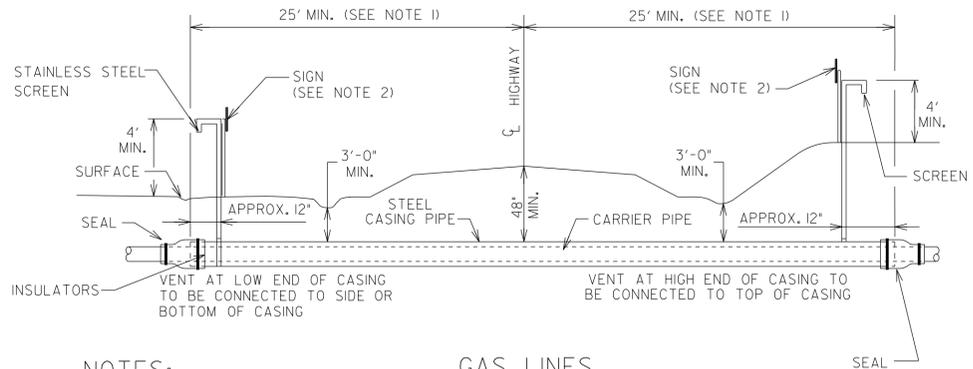


COORDINATE VALUES ARE NAD/83 (1995)
AND ARE DATUM ADJUSTED BY THE
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STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

CITY OF PULASKI
STATE ROUTE 7
**UTILITY
RELOCATION**
GAS - LINE 4
STA. 20+78 TO STA. 26+98
SCALE: 1" = 50'

| | | | |
|--------|------|--------------|-----------|
| TYPE | YEAR | PROJECT NO. | SHEET NO. |
| CONST. | 2015 | STP/NH-7(16) | U5-16 |
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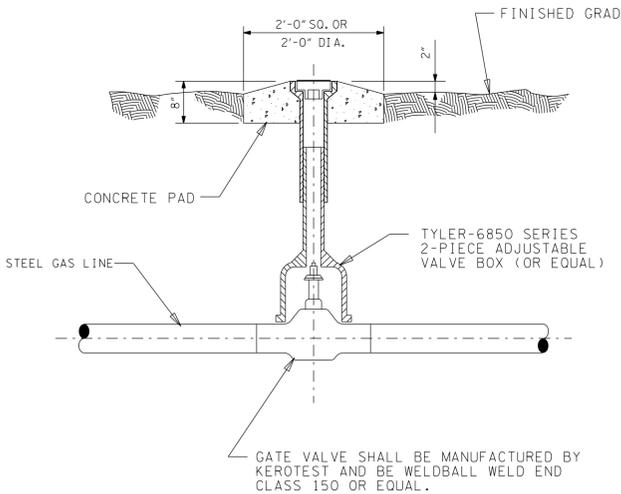
NOTES:

GAS LINES

- CASING SHALL EXTEND TO THE GREATER OF THE FOLLOWING DISTANCES:
A. 2' BEYOND TOE OF SLOPE
B. 3' BEYOND DITCH LINE
C. MIN. OF 25' WHEN CASING IS SEALED AT BOTH ENDS.
- SIGN TO INDICATE LOCATION OF PIPE LINE AT R.O.W. LINE, KIND OWNERSHIP, AND DEPTH OF PIPE LINE.
- POLYETHYLENE SPACERS ARE TO BE INSTALLED IN ALL CASINGS. SPACING IS TO BE AT 6 TO 8 FEET.
- VENT PIPES ARE TO BE INSTALLED USING SERVICE SADDLE.
- VENT PIPE SHALL BE SCHEDULE 80 STEEL PIPE PAINTED YELLOW. (MINIMUM 2" DIAMETER).

1 GAS LINE HIGHWAY CROSSING DETAIL (BORE AND JACK)

NOT TO SCALE

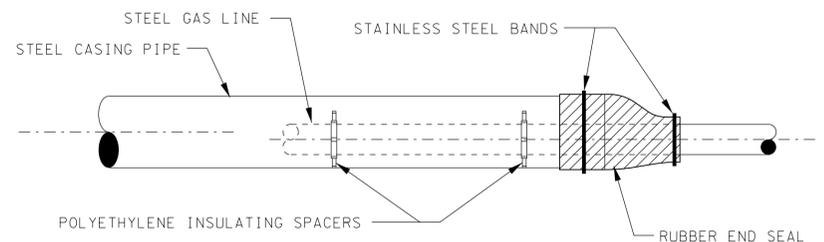


NOTES:

- CAST AROUND THE TOP OF EACH VALVE BOX A CONCRETE DISK 2'-0" IN DIAMETER OR 2'-0" SQUARE AND 2" THICK WHEN VALVES ARE LOCATED IN UNPAVED AREAS. (NOT REQUIRED IN PAVED AREAS)
- VALVE BOX IS TO BE INSTALLED SO IT DOES NOT TRANSMIT ANY LOAD ON THE VALVE OR GAS LINE.
- LID IS TO BE MARKED "GAS".

2 TYPICAL VALVE BOX SETTING

NOT TO SCALE

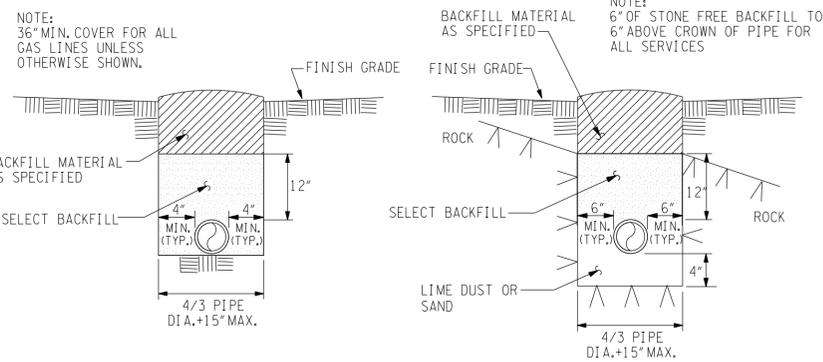


NOTES:

- POLYETHYLENE SPACERS ARE TO BE INSTALLED IN ALL CASINGS. SPACING IS TO BE AT 6 TO 8 FEET.
- SPACERS SHALL ELECTRICALLY ISOLATE CASING FROM CARRIER PIPE.

3 END SEAL DETAIL

NOT TO SCALE



IN EARTH

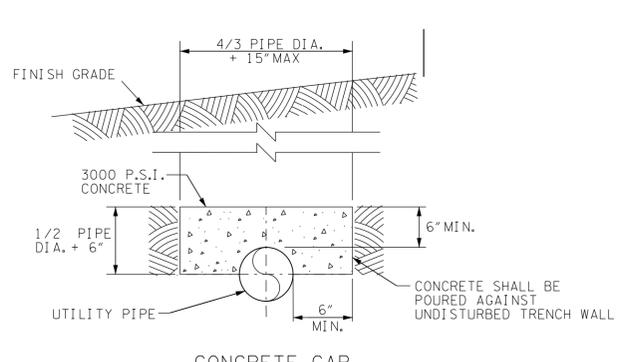
IN ROCK

NOTE: UNTIL REPAVING IS COMPLETED USE A DENSE GRADED STONE FOR THE TOP 6" FOR TEMPORARY SURFACE

CRUSHED STONE SURFACE EQUAL TO EXISTING SURFACE OR 6" MIN.

4 STANDARD GAS LINE BEDDING AND BACKFILLING

NOT TO SCALE

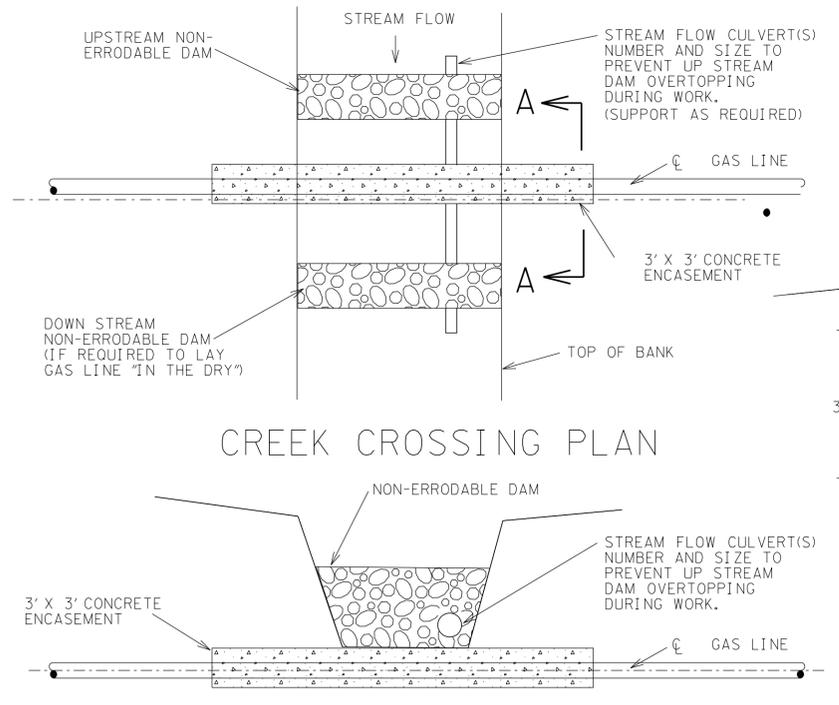


CONCRETE CAP

CONCRETE ENCASEMENT

5 CONCRETE PROTECTION FOR BURIED UTILITIES

NOT TO SCALE



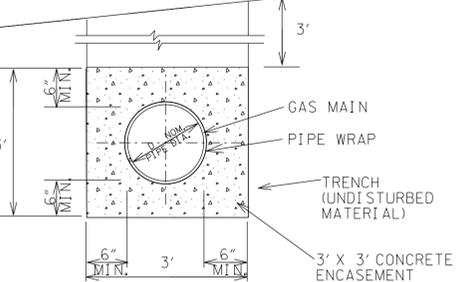
CREEK CROSSING PLAN

PROFILE

- NOTES: (1) MINIMIZE BANK DISTURBANCE.
(2) MINIMIZE STREAM SILTATION (MUDDY WATER)
(3) DAM(S) TO BE REMOVED FOLLOWING LINE INSTALLATION.

6 CONVENTIONAL CREEK CROSSING DETAIL WHERE DIRECTED BY ENGINEER

NOT TO SCALE



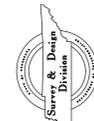
SECTION A-A

3000 P.S.I. CONCRETE TO BE PLACED 16 HOURS BEFORE BACKFILL IS PLACED AND IN SUCH A MANNER AS TO PREVENT PIPE FROM FLOATING.

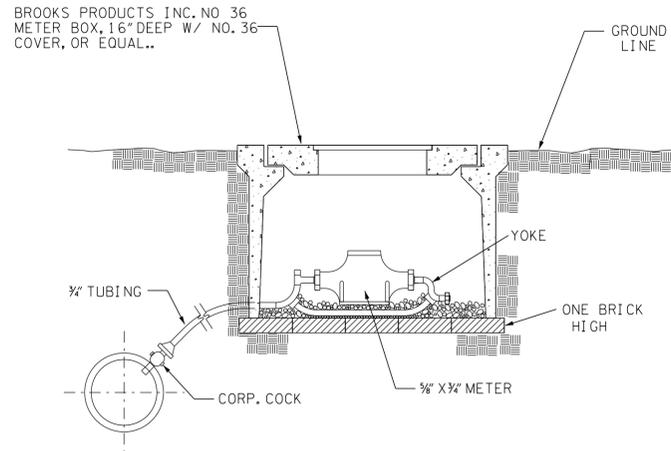
STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING & DEVELOPMENT

CITY OF PULASKI
STATE ROUTE 7
UTILITY RELOCATION
GAS DETAILS

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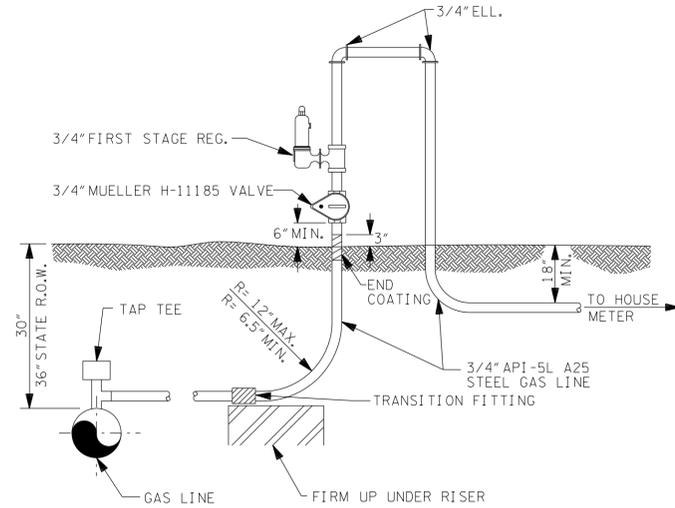
| TYPE | YEAR | PROJECT NO. | SHEET NO. |
|--------|------|--------------|-----------|
| CONST. | 2015 | STP/NH-7(16) | U5-17 |
| | | | |
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NOTES:
1. FOR TAPS IN METAL PIPE LESS THAN 4" IN DIAMETER, USE SADDLE.
2. PLACE 3" DEEP OR CLEANER TO 3/4" CRUSHED STONE IN BOTTOM OF METER BOX.

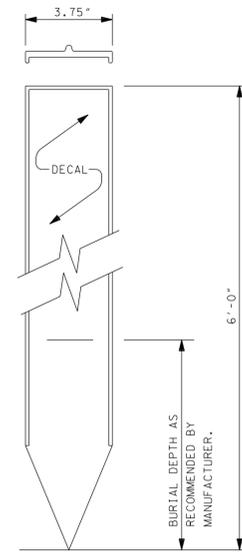
FITTINGS:
SADDLE H-13400 SERVICES CORPORATION COK H-15008
YOKE H-1418 W/ H-14227 INLET
UBING-POLYBUTLENE SERVICE LINE
METER-DIRECT READIN, MAGNETIC DRIVE, ROCKWELL OR EQUAL.

7 3/4" SERVICE ASSEMBLY
NOT TO SCALE



NOTE:
1. INSTALL BARRICADE AROUND FARM TAP.
2. PAINT ALL PIPING.

8 FARM TAP DETAIL
NOT TO SCALE



CAUTION
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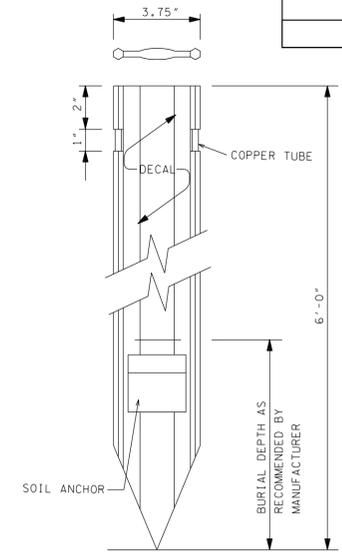
DECAL

P9T8
U3N0
L1 0
A-0-
S3N3
K6E5
I3 1
-C-
G1A1
A7L1
S5L1
2 1

DECAL

NOTES:
1. ALL DECALS ARE TO BE FACTORY APPLIED.
2. TEST STATIONS SHALL BE J. MILLER INDUSTRIES, INC. MODEL JMI-375 FIBERGLASS COMPOSITE PIPELINE MARKERS OR EQUAL
3. PIPELINE MARKERS SHALL BE MOLDED IN YELLOW.

9 LINE MARKER POST DETAIL
NOT TO SCALE



CAUTION
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BURIED BELOW

CATHODIC PROTECTION TEST STATION

DECAL

P9T8
U3N0
L1 0
A-0-
S3N3
K6E5
I3 1
-C-
G1A1
A7L1
S5L1
2 1

CATHODIC PROTECTION TEST STATION

DECAL

NOTES:
1. ALL DECALS ARE TO BE FACTORY APPLIED.
2. TEST STATIONS SHALL BE J. MILLER INDUSTRIES, INC. MODEL TEST-O-FLEX CATHODIC PROTECTION TEST STATIONS OR EQUAL.
3. TEST STATIONS SHALL BE MOLDED IN WHITE.

10 CATHODIC PROTECTION TEST STATION
NOT TO SCALE

