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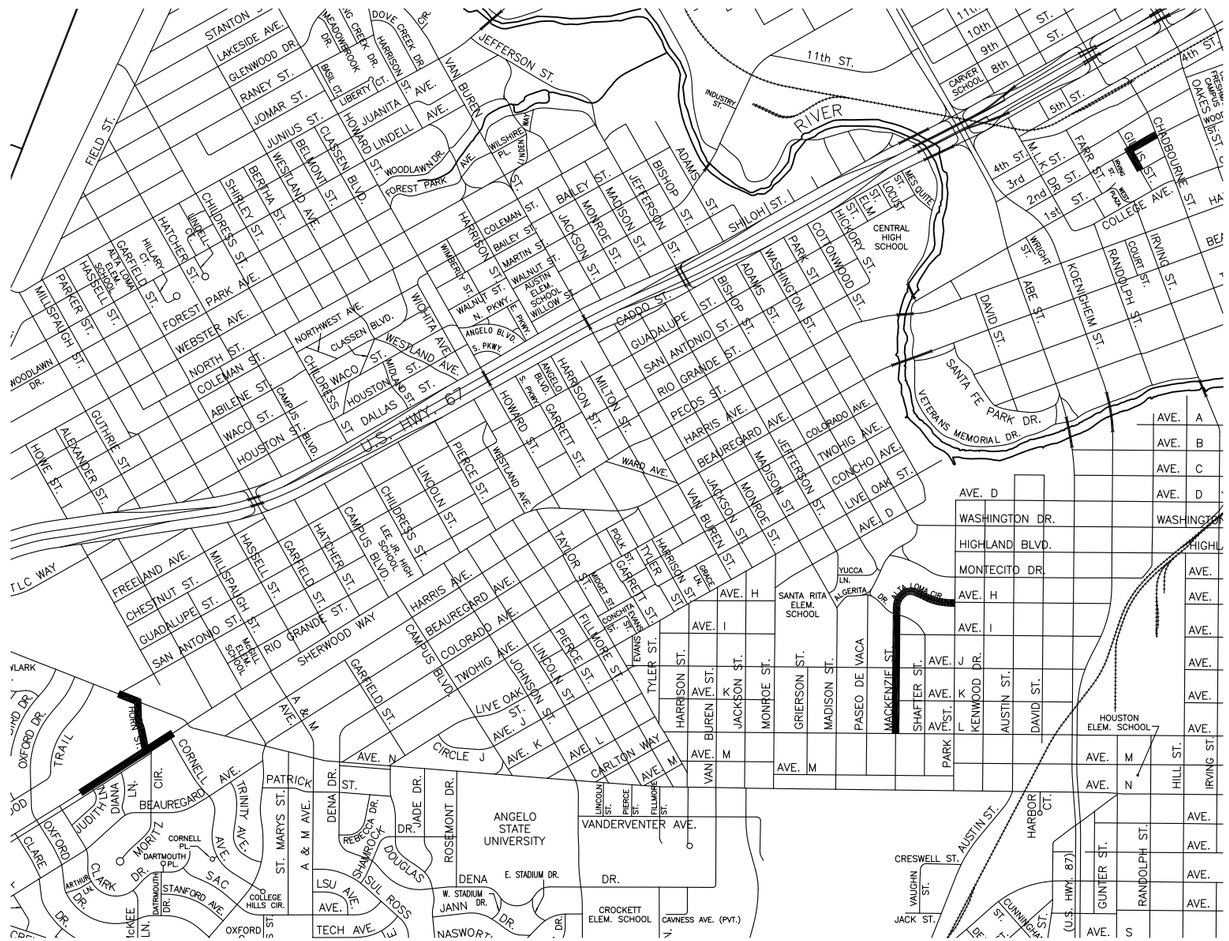
PREPARED BY

THE CITY OF SAN ANGELO
DEPARTMENT OF ENGINEERING SERVICES



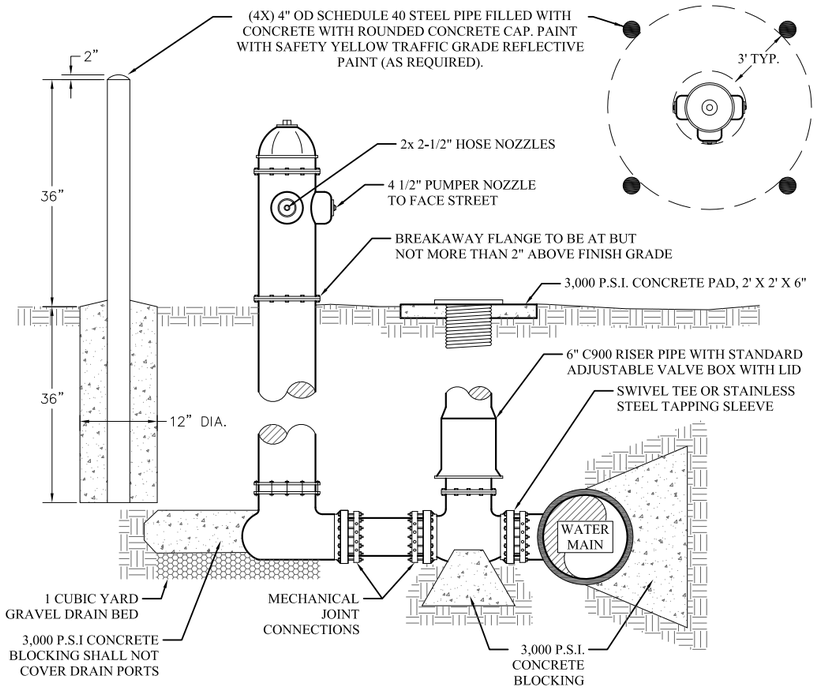
LEGEND

PROJECT LOCATIONS

CITY OF SAN ANGELO
2016 WATER LINE IMPROVEMENTS
CONTRACT 1
2016-04-240

Know what's below.
Call before you dig.

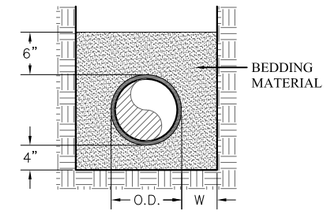
FIRE HYDRANT INSTALLATION
WITH PIPE BOLLARD PROTECTION



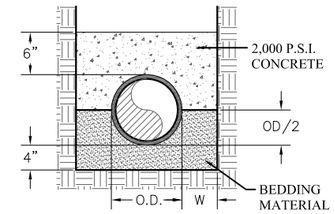
NOTES

1. CONCRETE BLOCKING TO BE POURED TO UNDISTURBED SOIL.
2. PUMPER NOZZLE CAP TO BE NOT LESS THAN 18" NOR MORE THAN 36" BEHIND CURB.
3. WRAP ALL VALVES & FITTINGS WITH 3 MIL. POLYETHYLENE SHEET PLASTIC.
4. FIRE HYDRANT SHALL BE FACTORY PAINTED YELLOW.
5. ALL MECHANICAL JOINT CONNECTIONS SHALL BE MECHANICALLY RESTRAINED.
6. ALL PIPE SECTIONS SHALL BE A MINIMUM OF 10' IN LENGTH, UNLESS TOTAL LENGTH OF FIRE HYDRANT LEAD IS LESS THAN 10', OR UNLESS APPROVED OTHERWISE BY THE CITY.
7. BOLLARDS REQUIRED IN AREAS WHERE HYDRANT IS SUSCEPTIBLE TO VEHICULAR DAMAGE OR SPECIFIED ON THE PLANS.

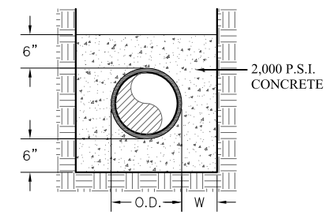
PIPE EMBEDMENT ZONE
WATER AND SEWER MAINS



GRAVEL EMBEDMENT



CONCRETE CAP



CONCRETE ENCASEMENT

STANDARD TRENCH WIDTH	
PIPE SIZE	W
16" OR LESS	6"
GREATER THAN 16"	AS SPECIFIED BY PIPE MFG. & APPROVED BY CITY ENGINEER

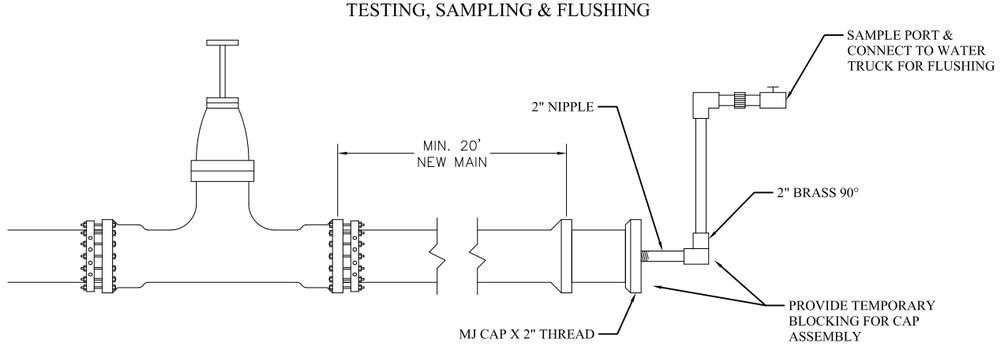
NOTES:

1. BEDDING MATERIAL FOR THE INSTALLATION OF WATER AND SEWER MAINS SHALL BE CRUSHED STONE OR PEA GRAVEL THAT WILL REMAIN FIRM AND NOT PERMIT DISPLACEMENT OF THE PIPE EITHER DURING PIPE LAYING OR BACKFILLING OR FOLLOWING THE COMPLETION OF CONSTRUCTION.
2. BEDDING MATERIAL SHALL BE FROM AN APPROVED BEDDING MATERIAL SOURCE PER THE LIST OF APPROVED BEDDING SUPPLIERS OR BE APPROVED BY THE CITY ENGINEER.
3. TRENCH SPOILS ARE NOT ACCEPTABLE FOR "EMBEDMENT ZONE MATERIAL"

LEGEND

- = EXISTING FIRE HYDRANT
- = PROPOSED FIRE HYDRANT
- = EXISTING WATER VALVE
- = PROPOSED WATER VALVE
- 8" — — W — = EXISTING 8" WATER MAIN
- —6"— W — = PROPOSED 6" WATER MAIN
- 8" — — SA— = EXISTING 8" SEWER MAIN
- (MH) = EXISTING SEWER MANHOLE
- X = EXISTING SEWER CLEANOUT
- [W] = EXISTING WATER METER
- — GAS — = EXISTING GAS LINE
- (G) = EXISTING GAS METER
- — TEL — = EXISTING TELEPHONE LINE
- (TE) = EXISTING TELEPHONE MANHOLE
- [T] = EXISTING TELEPHONE PEDESTAL
- 1"SL [W] = 1" SERVICE LINE WITH 1" SERVICE
- 2"SL [W] = 2" SERVICE LINE WITH 2" SERVICE
- 1"SL [W], 1"SL [W], 2" = 2" SERVICE LINE WITH TWO - 1" SERVICES

TEMPORARY CONNECTION
TESTING, SAMPLING & FLUSHING



NOTES

1. LOCATION OF EXISTING AND PROPOSED UTILITIES SHOWN ARE MERELY SCHEMATIC. THE CONTRACTOR IS RESPONSIBLE FOR LOCATION OF ALL UTILITIES PRIOR TO COMMENCING CONSTRUCTION.

2. KILL OUT AND ABANDON EXISTING LINE AT THE MAIN. THIS WORK INCLUDES REMOVAL OF ALL OLD VALVE STANDS AND FIRE HYDRANTS THAT ARE NO LONGER NEEDED AND THE REPAIR OF ALL PAVEMENT AND CONCRETE DAMAGED BY THE WORK. (LOCATION AS SHOWN ON PLANS.)

3. PIPE EMBEDMENT SHALL BE AS SHOWN UNLESS NOTED OTHERWISE.

4. PAVEMENT CUTS SHALL BE REPAIRED ACCORDING TO CITY OF SAN ANGELO UTILITY TRENCH REPAIR SPECIFICATIONS.

5. WHEN WATER LINES ARE INSTALLED WITH LESS THAN 9 FEET SEPARATION FROM ANY PART OF THE WASTE WATER COLLECTION SYSTEM, THE INSTALLATION SHALL BE IN ACCORDANCE WITH 30 TAC 290. 44(E)

6. CONNECT TO EXISTING MAIN WITH A WET TAP. CONTRACTOR SHALL PROVIDE ALL MATERIAL, EQUIPMENT, LABOR AND MAKE TAP. THE CONTRACTOR SHALL PRESSURE TEST THE SADDLE AGAINST THE VALVE PRIOR TO TAPPING THE LINE. (LOCATION AS SHOWN ON PLANS.)

7. TIE-IN TO EXISTING WATER LINE.

8. ALL SERVICE LINES & FIRE HYDRANTS TO BE FIELD LOCATED.

9. CONNECT NEW SERVICE LINE TO EXISTING METER. REMOVE OLD SERVICE LINE FROM THE METER BOX. THE CONTRACTOR SHALL PROVIDE & INSTALL NEW METER BOXES. WHERE THE EXISTING METER LOCATION IS MORE THAN 5 FEET BEHIND THE CURB LINE, AT THE DIRECTION OF THE OWNER, THE CONTRACTOR SHALL RELOCATE THE METER TO WITHIN 5 FEET OF THE CURB; INCLUDING RE-PLUMBING OF THE CUSTOMER SERVICE LINE. RELOCATION OF METERS REQUIRING RELOCATION OF CUSTOMER SERVICES WILL BE PAID AS PARTIAL PLUMBER RELOCATED SERVICES AT THE RATE INDICATED ON THE BID SHEET. ALL SERVICE LINE RELOCATES SHALL BE A MINIMUM OF 1 1/2" SCHEDULE 40 PVC ON CUSTOMER SIDE OF METER.

10. INSTALL A NEW FIRE HYDRANT AT THIS LOCATION WITH SWIVEL TEE AT THE MAIN ON ALL FIRE HYDRANTS.

11. INSTALL TEMPORARY 2" FLUSH LINE WHERE NEEDED FOR TESTING & SAMPLING. CONNECT TO EXISTING MAIN. WATER SAMPLES TO BE TAKEN AT NEW MAIN TIE-IN. (LOCATION AS SHOWN ON PLANS)

12. NEW WATER LINES SHALL BE LOCATED ADJACENT TO THE SOUTH OR WEST CURB OR EDGE OF PAVEMENT OR AS DETERMINED BY OWNER.

13. ALL NEW WATER LINES SHALL COMPLY FULLY WITH THE SPECIFICATIONS.

14. THE CONTRACTOR SHALL RELOCATE EXISTING SERVICES SERVED IN THE ALLEYS TO STREET SERVICES. THE CONTRACTOR SHALL RUN NEW SERVICE LINES (MINIMUM OF 1-1/2") UNDER THE DIRECTION OF A LICENSED PLUMBER. TYPICAL, BUT NOT LIMITED TO, REPLACEMENT OF THE CUSTOMER SERVICE LINE SHALL BE FROM THE CURB TO THE BACK OF THE RESIDENCE. (LOCATION AS SHOWN ON PLANS.)

15. REMOVE EXISTING FIRE HYDRANT AND REPLACE WITH NEW FIRE HYDRANT. CONNECT NEW HYDRANT TO NEW MAIN AT THIS LOCATION. (LOCATION AS SHOWN ON PLANS.)

16. ALL WORK ON THE CUSTOMER SERVICE LINE SHALL BE DONE BY A LICENSED PLUMBER IN FULL COMPLIANCE WITH THE C.O.S.A. PERMIT REQUIREMENTS.

17. ALL MECHANICAL JOINTS SHALL BE INSTALLED WITH EBBA IRON "MEGA LUG" PIPE RESTRAINERS OR EQUAL AS APPROVED BY THE OWNER. ALL TRANSITION COUPLINGS OR SOLID SLEEVES SHALL BE LONG BARREL (MIN. 12").

18. PAVEMENT CUTS SHALL BE BACKFILLED AND A TEMPORARY ASPHALT PATCH PLACED TO STABILIZE THE CUT WITHIN 48 HOURS OF CONSTRUCTION. (LOCATION AS SHOWN ON PLANS.)

19. ALL VALVES SHALL BE MARKED ON NEAREST CURB WITH MEASUREMENT AND SYMBOL .

20. CONTRACTOR TO REPLACE ALL TRAFFIC BUTTONS, REFLECTORS, STRIPING & PAINTING.

DRAWN BY:	MT
CHECKED BY:	RP
HORIZONTAL SCALE:	N/A
VERTICAL SCALE:	N/A
JOB NUMBER:	2016-04-240
DATE:	NOVEMBER 2016

ENGINEERING SERVICES DEPARTMENT

THE CITY OF SAN ANGELO TEXAS

2016 WATER LINE IMPROVEMENTS

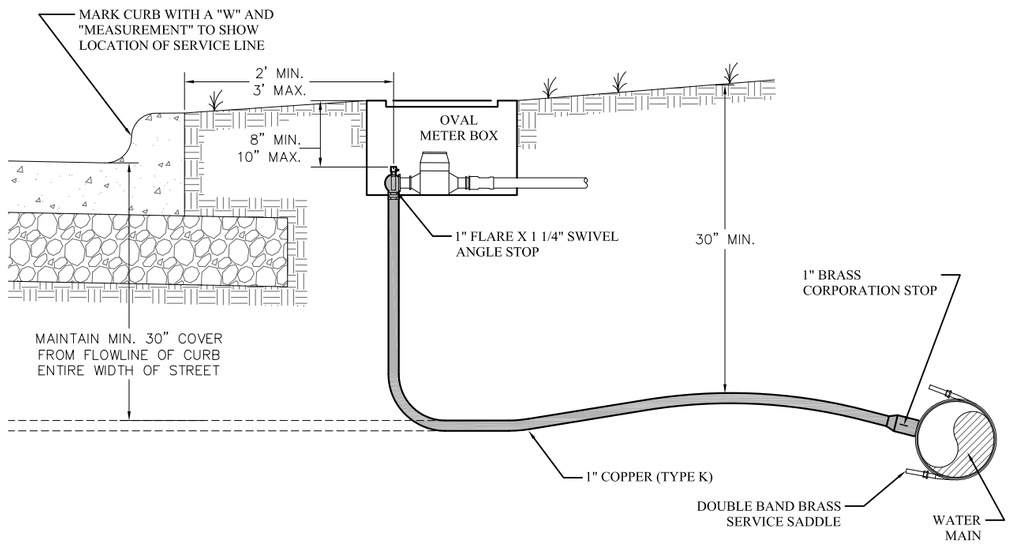
TYPICAL SECTIONS & DETAILS 1

The Seal appearing on this document was authorized by Russell J. Pehl, P.E. 104755 on: November 4, 2016

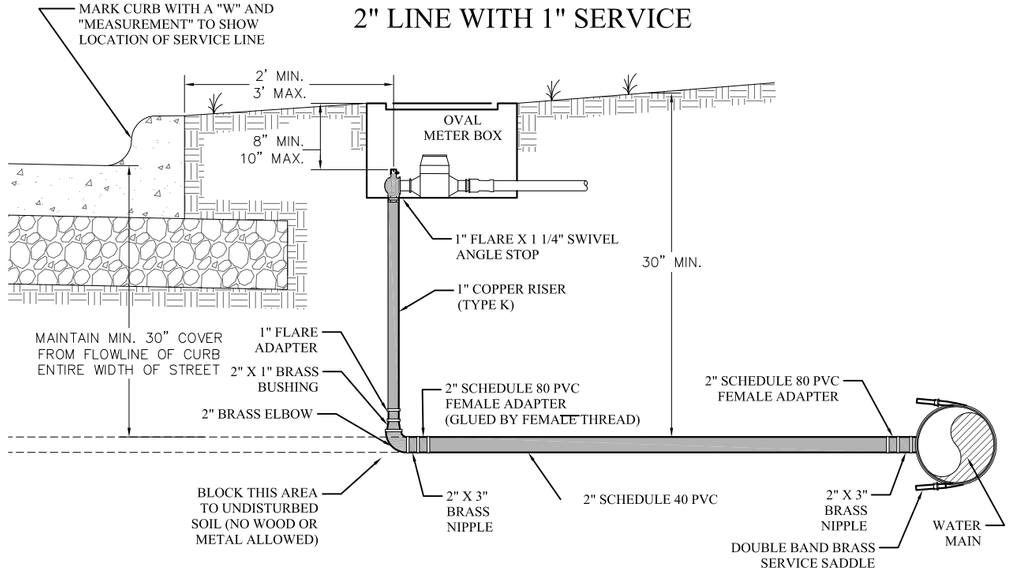
STATE OF TEXAS RUSSELL J. PEHL 104755 REGISTERED PROFESSIONAL ENGINEER

M-911-1

1" SERVICE LINE



2" LINE WITH 1" SERVICE

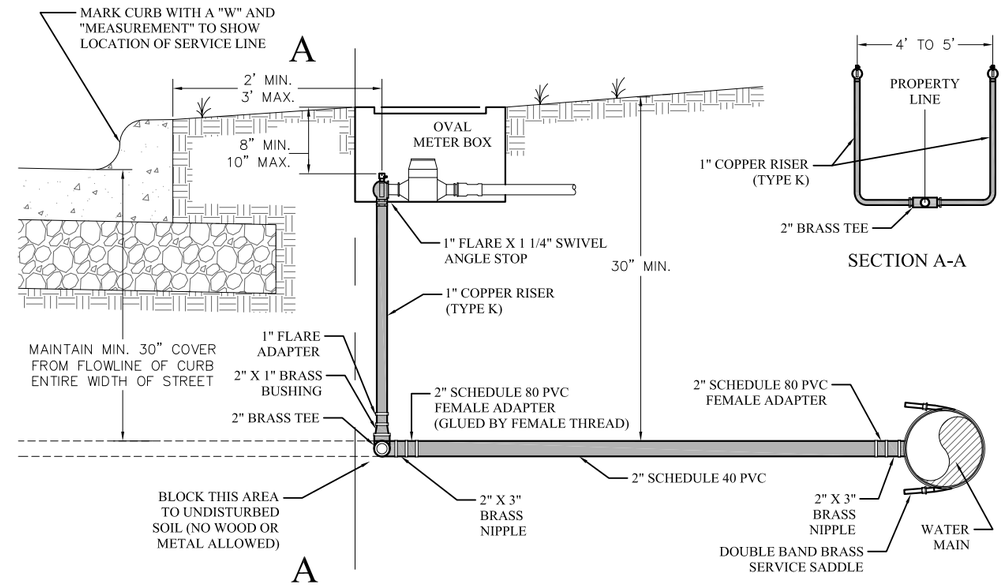


NOTES

1. ALL CONNECTIONS TO COPPER TUBING SHALL BE FLARED FITTINGS.
2. ALL PVC FITTINGS SHALL BE SCHEDULE 80 WITH GLUED JOINTS.
3. ANY BUSHINGS REQUIRED SHALL BE BRASS WITH NEOPRENE GASKET.
4. ANGLE STOP SHALL BE LOCATED BETWEEN 2' AND 5' FROM BACK OF CURB.

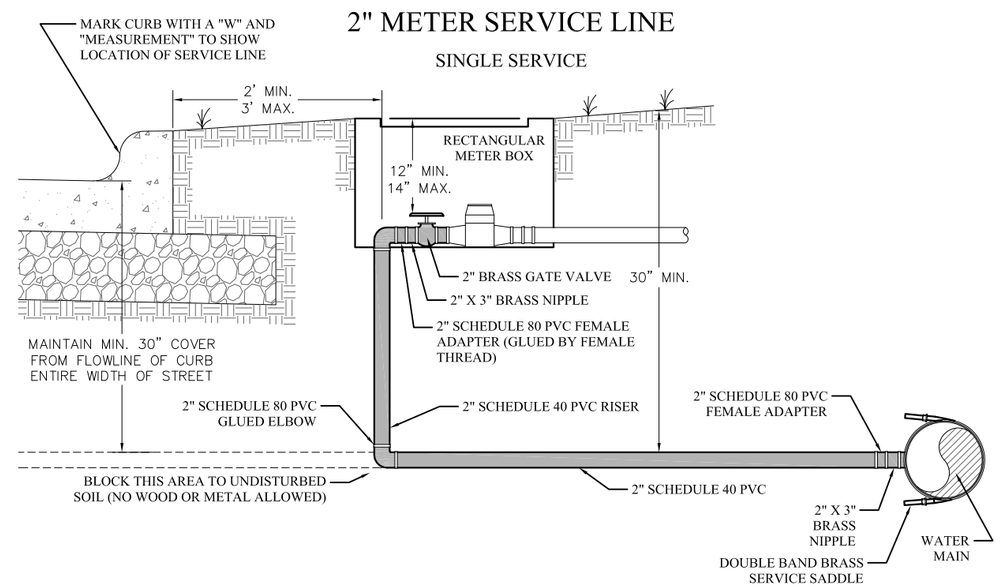
2" SERVICE LINE

DOUBLE 1" SERVICES



2" METER SERVICE LINE

SINGLE SERVICE



NOTES

1. ALL CONNECTIONS TO COPPER TUBING SHALL BE FLARED FITTINGS.
2. ALL PVC FITTINGS SHALL BE SCHEDULE 80 WITH GLUED JOINTS.
3. ANY BUSHINGS REQUIRED SHALL BE BRASS WITH NEOPRENE GASKET.
4. ANGLE STOP SHALL BE LOCATED BETWEEN 2' AND 5' FROM BACK OF CURB.

DRAWN BY:	MT
CHECKED BY:	RP
HORIZONTAL SCALE:	1"=100'
VERTICAL SCALE:	N/A
JOB NUMBER:	2016-04-240
DATE:	NOVEMBER 2016

ENGINEERING SERVICES DEPARTMENT

THE CITY OF SAN ANGELO TEXAS

2016 WATER LINE IMPROVEMENTS

TYPICAL SECTIONS & DETAILS 2

The Seal appearing on this document was authorized by Russell J. Pehl, P.E. 104755 on: November 4, 2016

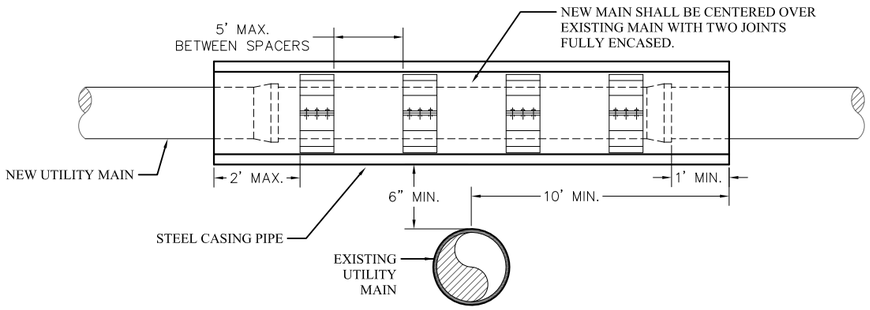
STATE OF TEXAS RUSSELL J. PEHL 104755 REGISTERED PROFESSIONAL ENGINEER

M-911-2

L:\Engineering\Projects\Water Utilities\Water\2016\2016-04-240 2016 Water Line Improvement Project\1 DESIGN\DWG\2016 WL Improv.1 - DETAILS

UTILITY CROSSING

WATER AND SEWER MAINS

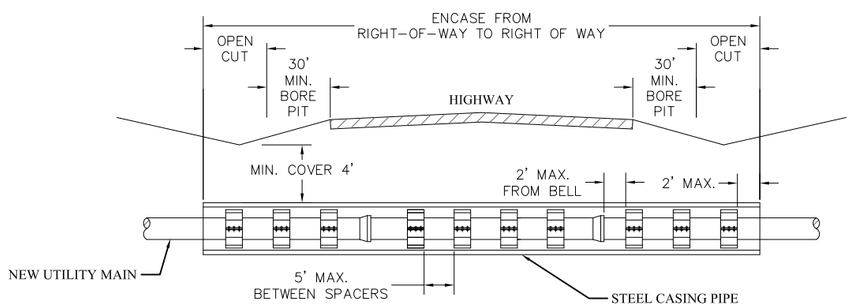


NOTES:

1. ALL WATER-SEWER CROSSING SITUATIONS WHERE A NEW MAIN WILL CROSS WITHIN 2' VERTICALLY OF AN EXISTING MAIN SHALL BE ENCASED AS SHOWN ABOVE.
2. CASING PIPE SHALL BE A MINIMUM 20' LENGTH OF DUCTILE IRON, STEEL OR C-900 PVC PIPE WITH GASKETED OR WELDED JOINTS AND BE TWO NOMINAL PIPE SIZES LARGER THAN THE CARRIER PIPE.
3. EACH END OF CASING SHALL BE SEALED WITH WATERTIGHT NON-SHRINK GROUT OR A MANUFACTURED WATERTIGHT SEAL.
4. HDPE CASING SPACERS SHALL BE PLACED AT MAXIMUM 5' INTERVALS AND WITHIN 2' FROM EACH BELL AND END OF CASING.
5. CROSSING SITUATIONS NOT COVERED BY THIS DETAIL SHALL BE ACCOMPLISHED IN ACCORDANCE WITH COSA DESIGN STANDARDS AND TCEQ CHAPTERS 217 AND 290.

HIGHWAY CROSSING

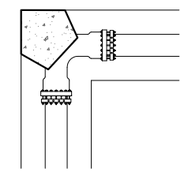
WATER AND SEWER MAINS



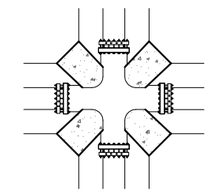
NOTES

1. ALL HIGHWAY CROSSINGS AND STREET CROSSINGS WHERE REQUIRED SHALL BE MADE BY BORING OR TUNNELING.
2. CASING PIPE SHALL BE MINIMUM 3/8" STEEL PIPE WITH WELDED JOINTS AND BE TWO NOMINAL PIPE SIZES LARGER THAN THE CARRIER PIPE.
3. CASING SHALL EXTEND FROM EDGE OF RIGHT-OF-WAY TO EDGE OF RIGHT-OF-WAY OR AS SPECIFIED IN THE PLANS.
4. EACH END OF CASING SHALL BE SEALED WITH WATERTIGHT NON-SHRINK GROUT OR A MANUFACTURED WATERTIGHT SEAL.
5. ALL OVER CUTTING IN EXCESS OF 1" AROUND CASING PIPE SHALL BE PRESSURE GROUTED.
6. GROUT SHALL HAVE A MINIMUM STRENGTH OF 1,800 P.S.I. IN 28 DAYS WITH A SLUMP OF 10" OR GREATER.
7. HDPE CASING SPACERS SHALL BE PLACED AT MAXIMUM 5' INTERVALS AND 2' FROM EACH BELL AND END OF CASING.
8. BORE PITS SHALL BE LOCATED AND CONFINED TO THE WORK EASEMENT AND SHALL BE CONSTRUCTED IN SUCH A MANNER AS TO NOT INTERFERE WITH HIGHWAY STRUCTURAL INTEGRITY OR SAFE TRAFFIC OPERATIONS. IF NECESSARY, SHORING SHALL BE USED.

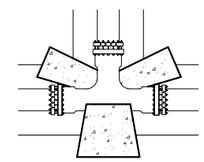
THRUST BLOCKING



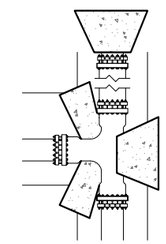
BEND



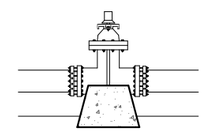
CROSS



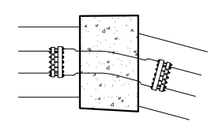
TEE



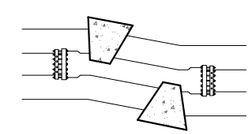
TEE WITH STUBOUT



VALVE



VERTICAL BEND



OFFSET

NOTES:

1. ALL MECHANICAL JOINT CONNECTIONS ON BENDS AND VALVES SHALL BE MECHANICALLY RESTRAINED AND CONCRETE BLOCKED AS SHOWN.
2. ALL CONCRETE SHALL BE 3,000 P.S.I.
3. ALL STUB OUT PIPE SECTIONS SHALL BE A MINIMUM OF 20' IN LENGTH UNLESS APPROVED OTHERWISE BY THE CITY
4. IF STUBOUT ENCOMPASSES MORE THAN ONE JOINT, BELL JOINT RESTRAINTS SHALL BE USED.
5. ALL DUCTILE IRON SHALL BE WRAPPED IN MINIMUM 3 MIL. POLY SHEETING

DRAWN BY:	MT
CHECKED BY:	RP
HORIZONTAL SCALE:	1"=100'
VERTICAL SCALE:	N/A
JOB NUMBER:	2016-04-240
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ENGINEERING SERVICES DEPARTMENT

THE CITY OF SAN ANGELO TEXAS

2016 WATER LINE IMPROVEMENTS

TYPICAL SECTIONS & DETAILS 3

The Seal appearing on this document was authorized by Russell J. Pehl, P.E. 104755 on: November 4, 2016

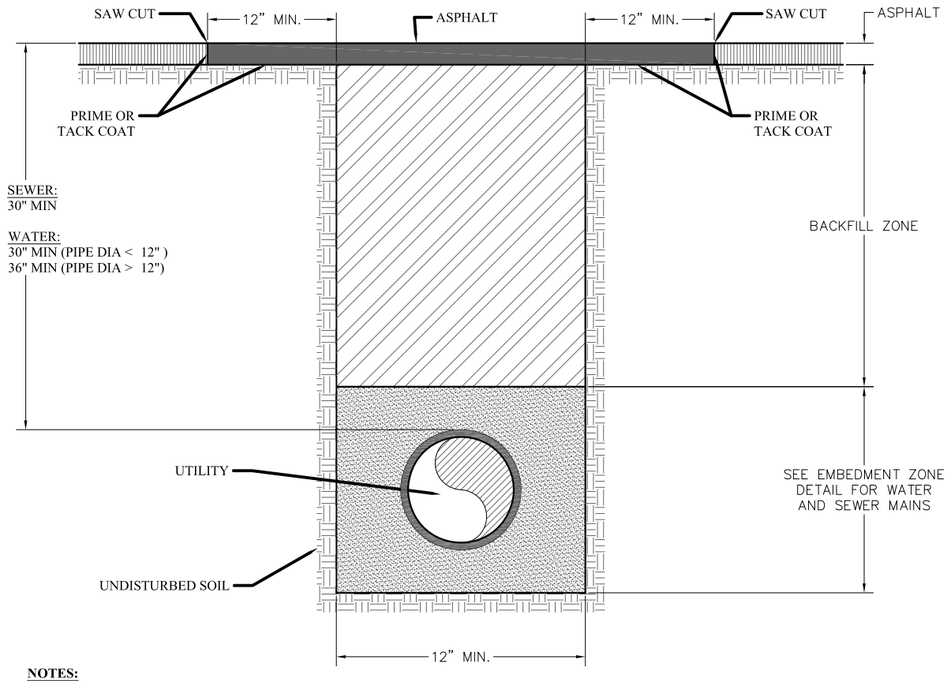
STATE OF TEXAS RUSSELL J. PEHL 104755 REGISTERED PROFESSIONAL ENGINEER

M-911-3

L:\Engineering\Projects\Water Utilities\Water\2016\2016-04-240 2016 Water Line Improvement Project\1 DESIGN\DWG\2016 WL Improv.1 - DETAILS

UTILITY TRENCH SECTION

ASPHALT PAVEMENT

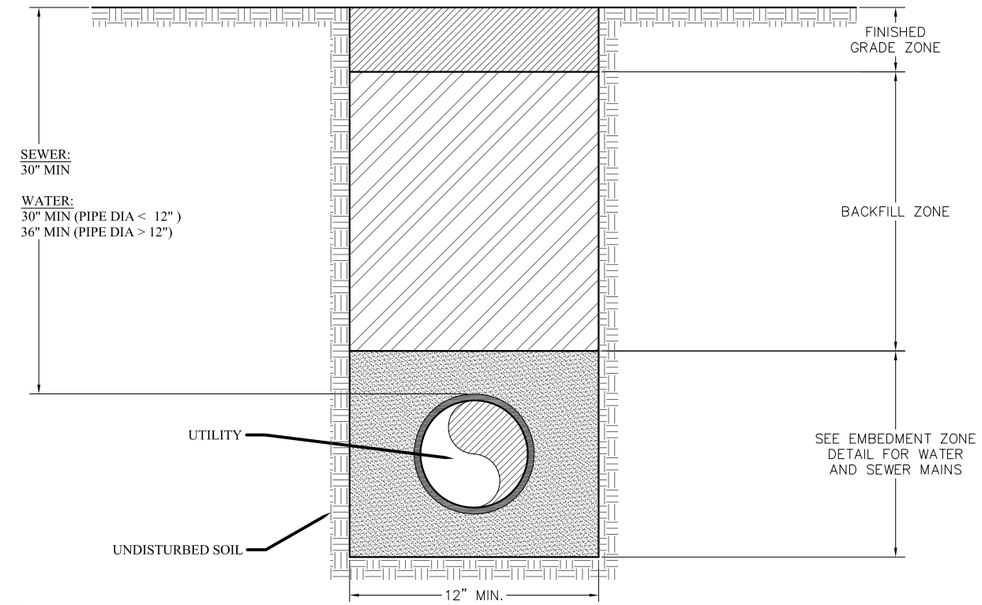


NOTES:

ASPHALT:	2" LAYER TYPE D, TxDOT HOT MIX OR TYPE D, TxDOT HOT MIX - COLD LAID (MUST HAVE PRIOR CITY APPROVAL)
PRIME COAT:	TXDOT MC-30 OR AE-P ASPHALT AT THE RATE OF 0.25 TO 0.35 GALLON PER SQUARE YARD OF SURFACE
TACK COAT:	SHALL MEET THE REQUIREMENTS OF TXDOT ITEM 300 "ASPHALTS, OILS, AND EMULSIONS".
BACKFILL ZONE:	FLEXIBLE BASE PER CITY OF SAN ANGELO SPECIFICATIONS COMPACTED IN 6" HORIZONTAL LAYERS. MINIMUM DENSITY 95% MODIFIED PROCTOR.
COVER:	WATER OR SEWER MAINS AND SERVICES WITH LESS THAN 30" OF COVER AT ANY LOCATION SHALL REQUIRE C.O.S.A. APPROVAL PRIOR TO CONSTRUCTION.

UTILITY TRENCH SECTION

OTHER UNPAVED AREAS



NOTES:

BACKFILL ZONE:

OPTION #1: WHERE PULVERIZED OR GRANULAR MATERIAL IS AVAILABLE FROM EXCAVATION WHICH IS FREE OF SHARP EDGED STONES, OR STONES LARGER THAN 3" IN DIAMETER, CLAY, ORGANIC MATTER, OR OTHER UNSUITABLE SUBSTANCES, HAS A PI<=20 AND LL<=40, AND MEETS THE APPROVAL OF THE CITY SUCH MATERIAL MAY BE USED FOR BACKFILL MATERIAL AS INSTRUCTED BY THE OWNER. BACKFILL SHALL BE COMPACTED TO DENSITIES EQUAL TO OR GREATER THAN THAT OF SURROUNDING SOIL.

OPTION #2: FLEXIBLE BASE PER CITY OF SAN ANGELO SPECIFICATIONS COMPACTED IN 6" HORIZONTAL LAYERS TO MINIMUM DENSITY 95% MODIFIED PROCTOR.

FINISHED GRADE ZONE:

BACKFILL SHALL MATCH EXISTING GROUND CONDITIONS (SEE OPTIONS BELOW) OR AS DIRECTED BY THE OWNER.

OPTION A: UTILIZE BACKFILL ZONE MATERIAL FROM OPTION #1

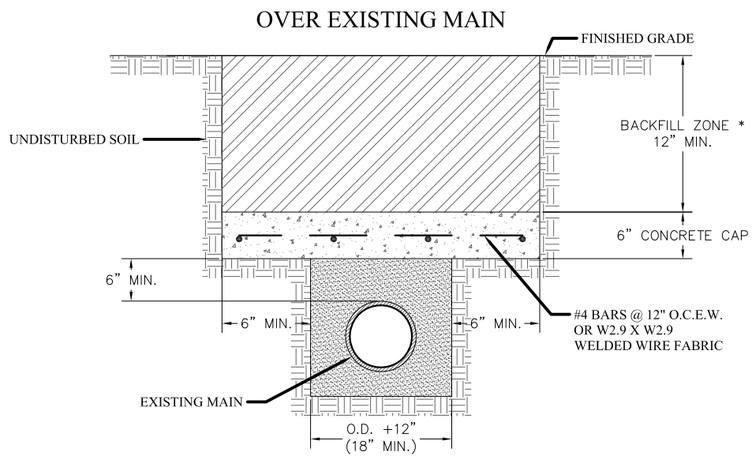
OPTION B: 6" TOP SOIL.

OPTION C: 8" FLEXIBLE BASE

COVER: WATER OR SEWER MAINS AND SERVICES WITH LESS THAN 30" OF COVER AT ANY LOCATION SHALL REQUIRE C.O.S.A. APPROVAL PRIOR TO CONSTRUCTION.

CONCRETE CAP

OVER EXISTING MAIN



NOTES:

1. CONTRACTOR SHALL POT-HOLE EXISTING MAIN TO BE CAPPED A MINIMUM OF EVERY 50' TO DETERMINE EXACT DEPTH PRIOR TO EXCAVATING FOR PLACEMENT OF CONCRETE CAP. DEPTH VARIATIONS WILL REQUIRE ADDITIONAL POT-HOLING TO ENSURE THE EXISTING MAIN IS NOT DAMAGED.
2. CONCRETE CAPS SHALL BE PLACED ON FIRM UNDISTURBED SOIL. ANY DISTURBED SOILS SHALL BE RECOMPACTED AT OPTIMUM MOISTURE TO MATCH OR EXCEED SURROUNDING UNDISTURBED SOIL'S DENSITY PRIOR TO PLACING OF CAP.

* REFER TO UTILITY TRENCH SECTION REPAIR DETAILS FOR BACKFILL AND SURFACE REPAIR REQUIREMENTS.

DRAWN BY:	MT
CHECKED BY:	RP
HORIZONTAL SCALE:	1"=100'
VERTICAL SCALE:	N/A
JOB NUMBER:	2016-04-240
DATE:	NOVEMBER 2016

ENGINEERING SERVICES DEPARTMENT

THE CITY OF SAN ANGELO TEXAS

2016 WATER LINE IMPROVEMENTS

TYPICAL SECTIONS & DETAILS 4

The Seal appearing on this document was authorized by Russell J. Pehl, P.E. 104755 on: November 4, 2016

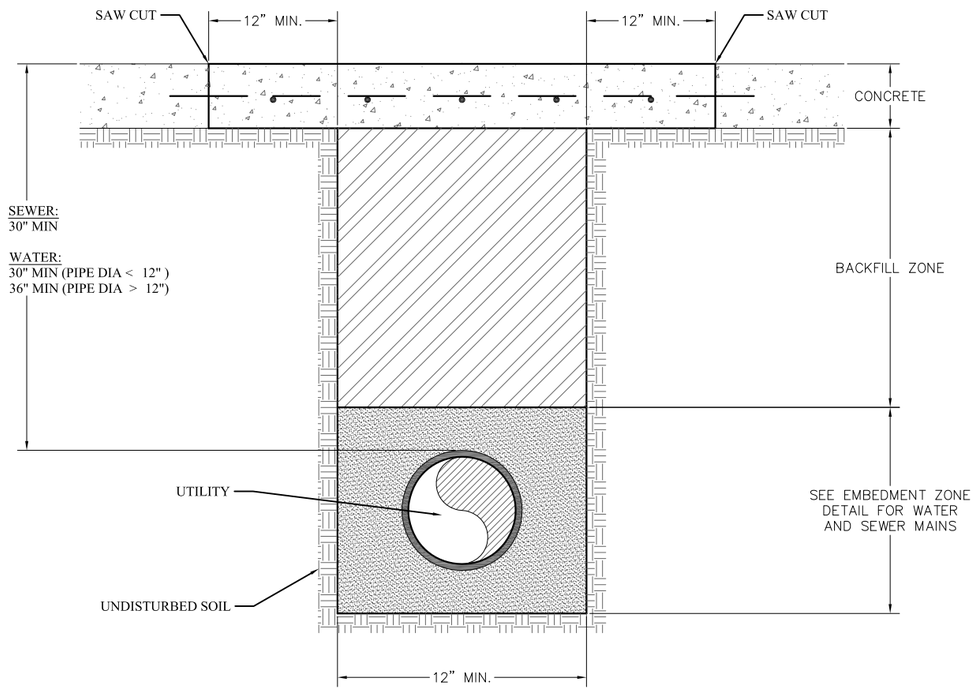
STATE OF TEXAS RUSSELL J. PEHL 104755 REGISTERED PROFESSIONAL ENGINEER

M-911-4

L:\Engineering\Projects\Water Utilities\Water\2016\2016-04-240 2016 Water Line Improvement Project\1 DESIGN\DWG\2016 WL Improv.1 - DETAILS

UTILITY TRENCH SECTION

RIGID PAVEMENT



NOTES:

1. WATER OR SEWER MAINS AND SERVICES WITH LESS THAN 30" OF COVER AT ANY LOCATION SHALL REQUIRE C.O.S.A. APPROVAL PRIOR TO CONSTRUCTION.

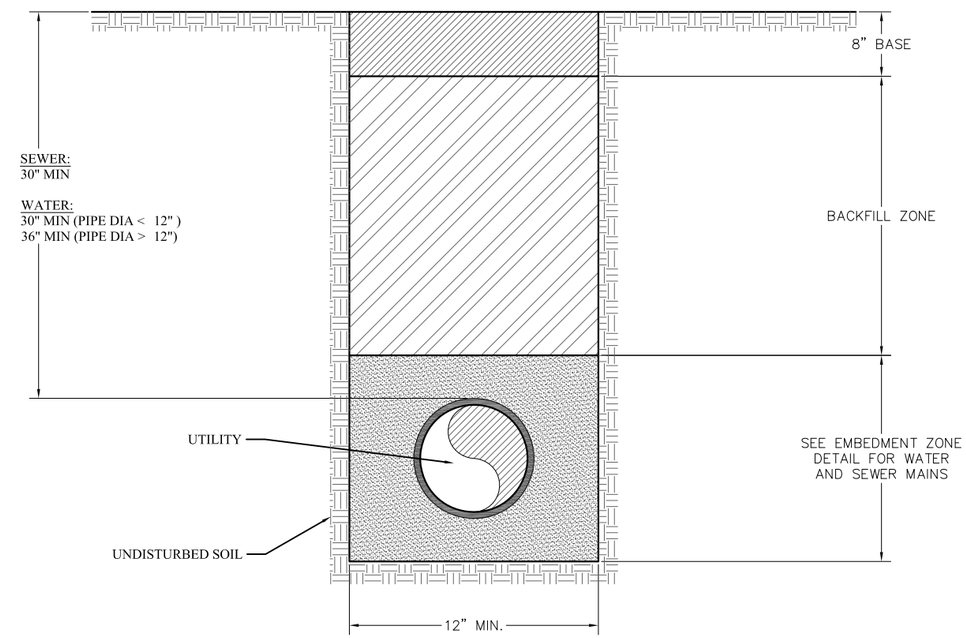
2. CLASS P, 4,400 P.S.I. COMPRESSIVE; 680 P.S.I, FLEXURAL AT 28 DAY TEST. BEND EXISTING REBAR INTO CENTER OF NEW CONCRETE. REPLACE AS NECESSARY WITH #4 REBAR ON 12" CENTERS EACH WAY AND DOWEL IN #4 REBAR 9" DEEP WITH 24" LAP SPLICE AND MUST BE ALLOWED TO CURE FOR A PERIOD OF NOT LESS THAN 72 HOURS, OR CLASS P, 4,400 P.S.I. WITH 36 POUNDS OF NOVAMESH 850 PER CUBIC YARD WITH #4 REBAR DOWELS 9" DEEP AND 9" INTO THE TRENCH ON 18" CENTERS AND MUST BE ALLOWED TO CURE FOR A PERIOD OF NOT LESS THAN 72 HOURS.

3. CLASS K, 4,400 P.S.I. COMPRESSIVE; 680 P.S.I., FLEXURAL AT 28 DAY TEST. BEND EXISTING REBAR INTO CENTER OF NEW CONCRETE. REPLACE AS NECESSARY WITH #4 REBAR ON 12" CENTERS EACH WAY AND DOWEL IN #4 REBAR 9" DEEP WITH 24" LAP SPLICE AND MUST BE ALLOWED TO CURE FOR A PERIOD OF NOT LESS THAN 24 HOURS, OR CLASS K, 4,400 P.S.I. WITH 36 POUNDS OF NOVAMESH 850 PER CUBIC YARD WITH #4 REBAR DOWELS 9" DEEP AND 9" INTO THE TRENCH ON 18" CENTERS AND MUST BE ALLOWED TO CURE FOR A PERIOD OF NOT LESS THAN 24 HOURS.

4. FLEXIBLE BASE PER CITY OF SAN ANGELO SPECIFICATIONS COMPACTED IN 6" HORIZONTAL LAYERS. MINIMUM DENSITY 95% MODIFIED PROCTOR. (UNLESS APPROVED OTHERWISE IN WRITING).

UTILITY TRENCH SECTION

UNPAVED STREETS, ALLEYS & DRIVEWAYS



NOTES:

BASE: FLEXIBLE BASE PER CITY OF SAN ANGELO SPECIFICATIONS. COMPACTED IN 6" LAYERS. MINIMUM DENSITY 95% MODIFIED PROCTOR.

BACKFILL ZONE: WHERE PULVERIZED OR GRANULAR MATERIAL IS AVAILABLE FROM EXCAVATION WHICH IS FREE OF SHARP EDGED STONES, OR STONES LARGER THAN 3" IN DIAMETER, CLAY, ORGANIC MATTER, OR OTHER UNSUITABLE SUBSTANCES, HAS A PI<= 20 AND LL<=40, AND MEETS THE APPROVAL OF THE CITY. SUCH MATERIAL MAY BE USED FOR BACKFILL MATERIAL AS INSTRUCTED BY THE OWNER.

COVER: WATER OR SEWER MAINS AND SERVICES WITH LESS THAN 30" COVER AT ANY LOCATION SHALL REQUIRE C.O.S.A. APPROVAL PRIOR TO CONSTRUCTION.

DRAWN BY:	MT
CHECKED BY:	RP
HORIZONTAL SCALE:	1"=100'
VERTICAL SCALE:	N/A
JOB NUMBER:	2016-04-240
DATE:	NOVEMBER 2016

ENGINEERING SERVICES DEPARTMENT

THE CITY OF SAN ANGELO TEXAS

2016 WATER LINE IMPROVEMENTS

TYPICAL SECTIONS & DETAILS 5

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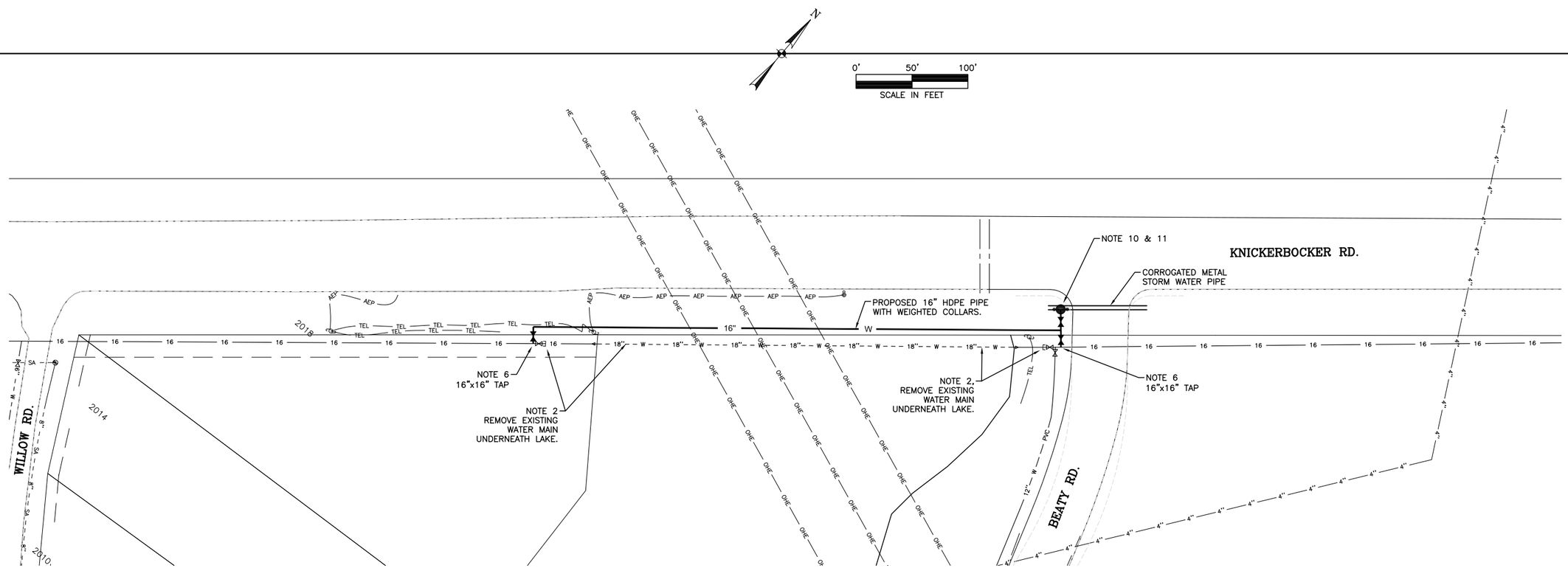
STATE OF TEXAS RUSSELL J. PEHL 104755 REGISTERED PROFESSIONAL ENGINEER

M-911-5

L:\Engineering\Projects\Water Utilities\Water\2016\2016-04-240 2016 Water Line Improvement Project\1 DESIGN\DWG\2016 WL Improv.1 - DETAILS



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HORIZONTAL SCALE:	1"=100'
VERTICAL SCALE:	N/A
JOB NUMBER:	2016-04-240
DATE:	NOVEMBER 2016

ENGINEERING SERVICES DEPARTMENT

THE CITY OF SAN ANGELO TEXAS

2016 WATER LINE IMPROVEMENTS

KNICKERBOCKER RD. FROM BEATY RD. TO THE SOUTHWEST

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STATE OF TEXAS RUSSELL J. PEHL 104755 REGISTERED PROFESSIONAL ENGINEER

W-816

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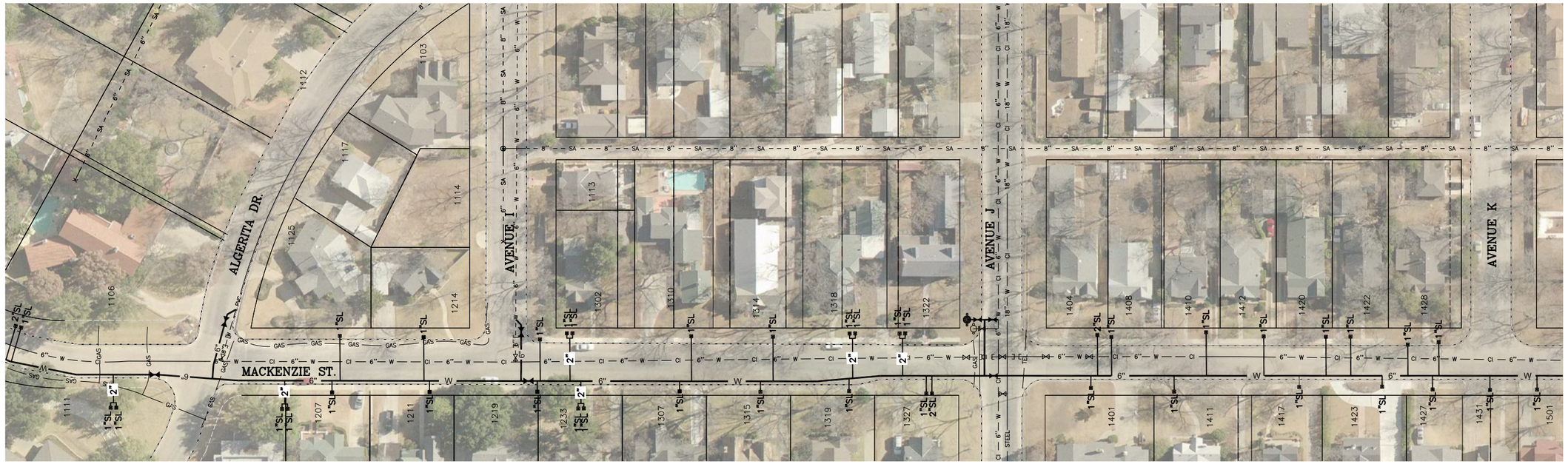

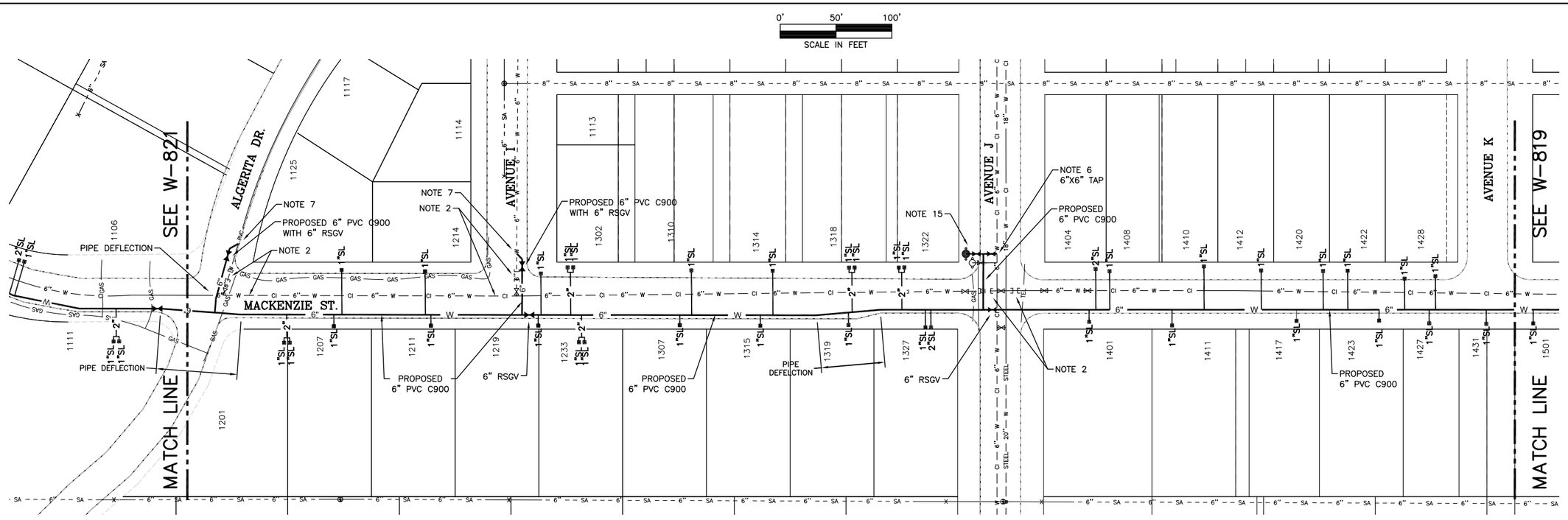

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HORIZONTAL SCALE:	1"=100'
VERTICAL SCALE:	N/A
JOB NUMBER:	2016-04-240
DATE:	NOVEMBER 2016

ENGINEERING SERVICES DEPARTMENT

THE CITY OF SAN ANGELO TEXAS

2016 WATER LINE IMPROVEMENTS

MACKENZIE ST. FROM ALGERITA DR. TO AVENUE K

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W-817

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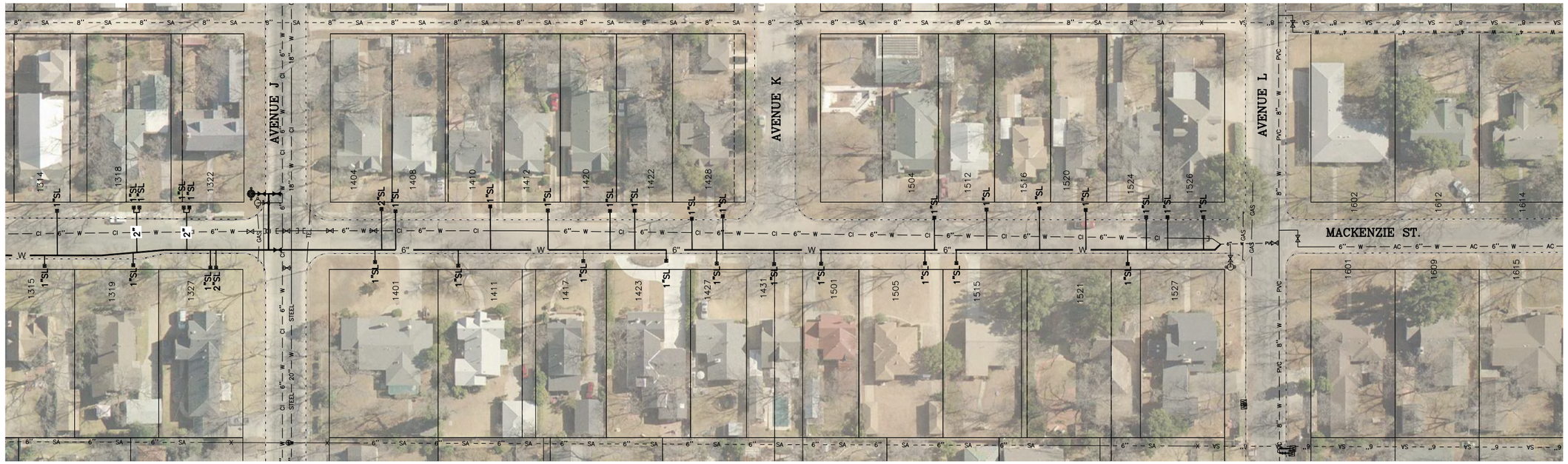

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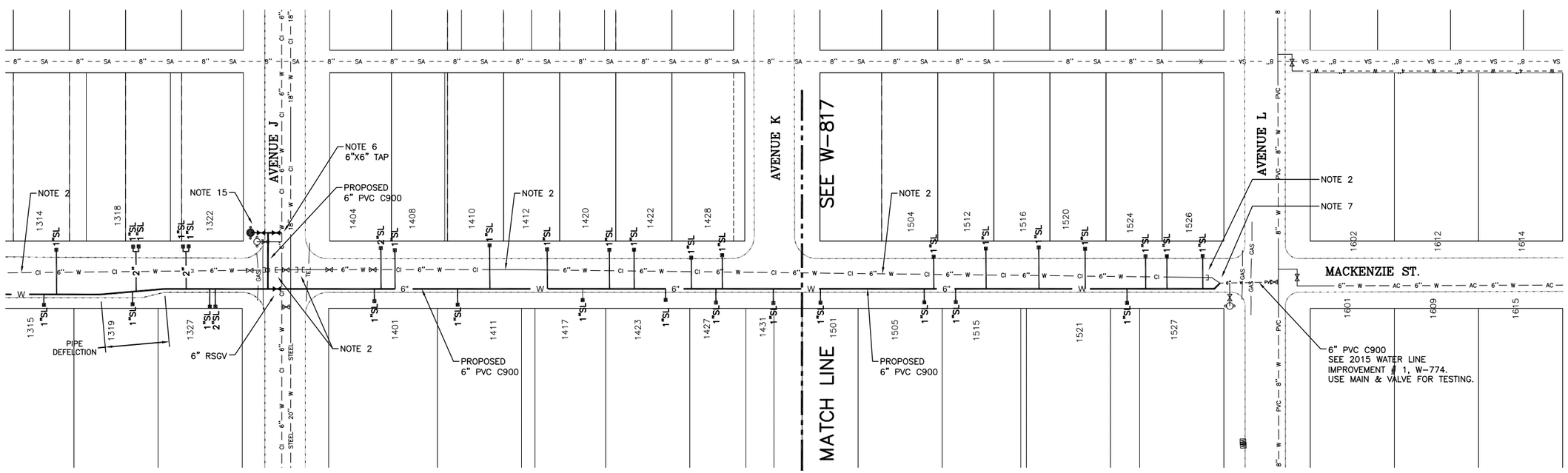
0' 50' 100'
SCALE IN FEET



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JOB NUMBER:	2016-04-240
DATE:	NOVEMBER 2016

ENGINEERING SERVICES DEPARTMENT

THE CITY OF SAN ANGELO TEXAS

2016 WATER LINE IMPROVEMENTS

MACKENZIE ST. FROM ALGERITA DR. TO AVENUE L

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STATE OF TEXAS
RUSSELL J. PEHL
104755
REGISTERED PROFESSIONAL ENGINEER

W-819

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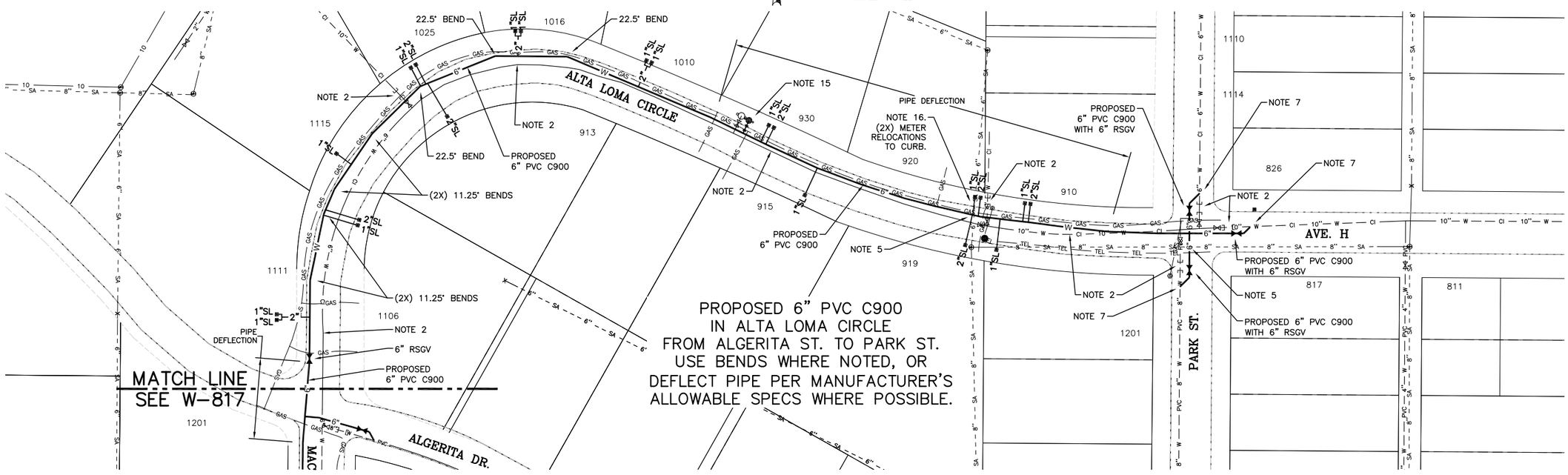
N

0' 50' 100'
SCALE IN FEET



PROPOSED 6" PVC C900
IN ALTA LOMA CIRCLE
FROM ALGERITA ST. TO PARK ST.
USE BENDS WHERE NOTED, OR
DEFLECT PIPE PER MANUFACTURER'S
ALLOWABLE SPECS WHERE POSSIBLE.

DRAWN BY:	MT
CHECKED BY:	RP
HORIZONTAL SCALE:	1"=100'
VERTICAL SCALE:	N/A
JOB NUMBER:	2016-04-240
DATE:	NOVEMBER 2016

ENGINEERING
SERVICES
DEPARTMENT

THE CITY OF SAN ANGELO TEXAS

2016 WATER LINE IMPROVEMENTS

ALTA LOMA CIRCLE FROM ALGERITA DR. TO PARK ST.

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W-821

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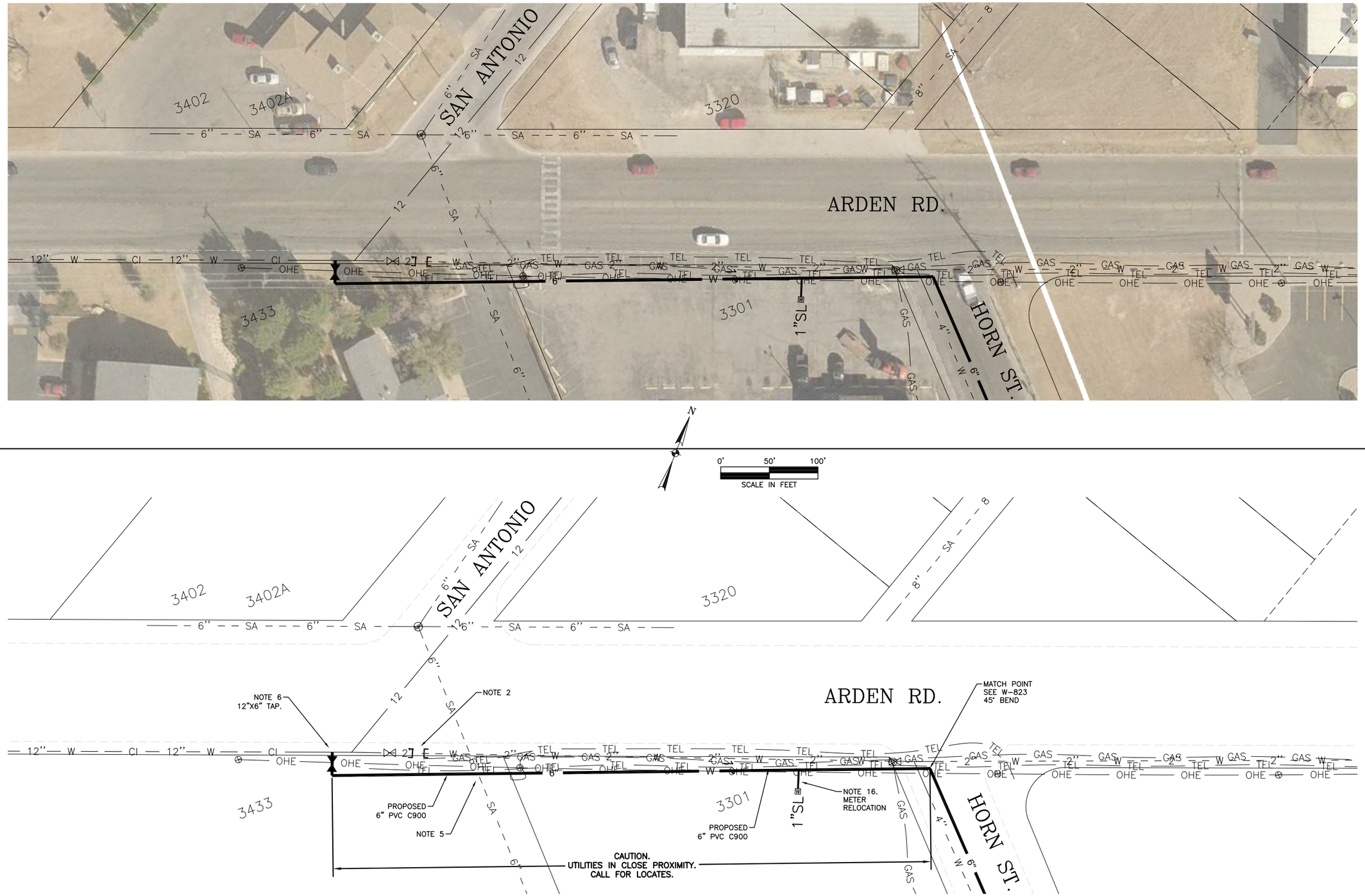

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HORIZONTAL SCALE:	1"=50'
VERTICAL SCALE:	N/A
JOB NUMBER:	2016-04-240
DATE:	NOVEMBER 2016

ENGINEERING SERVICES DEPARTMENT

THE CITY OF SAN ANGELO TEXAS

2016 WATER LINE IMPROVEMENTS

ARDEN ROAD FROM SAN ANTONIO ST. TO HORN ST.

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W-822

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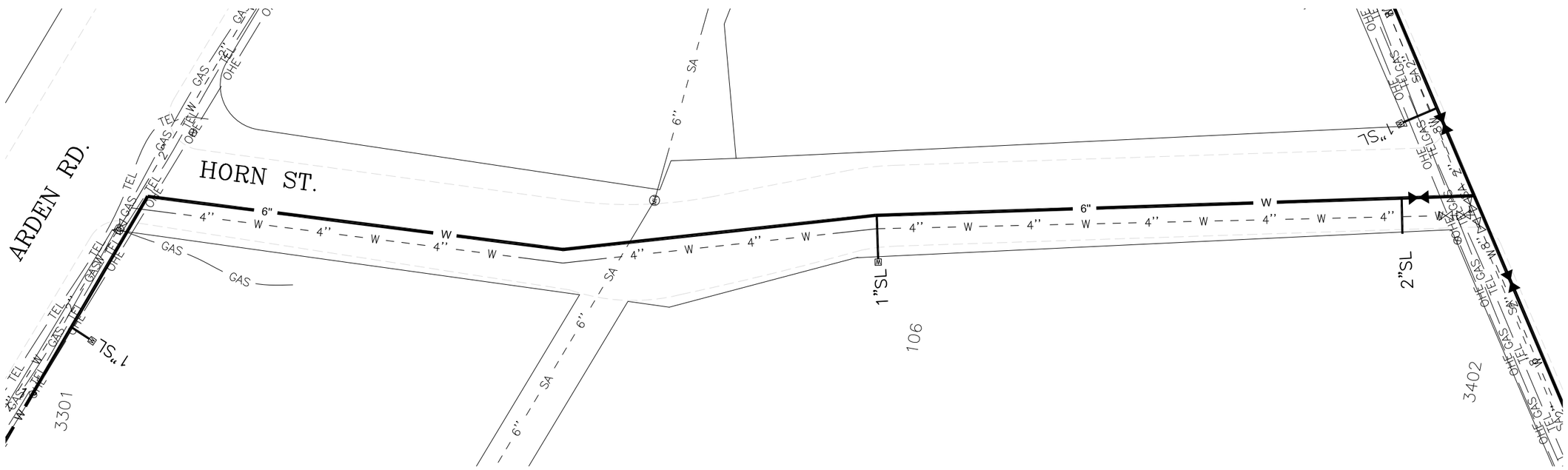

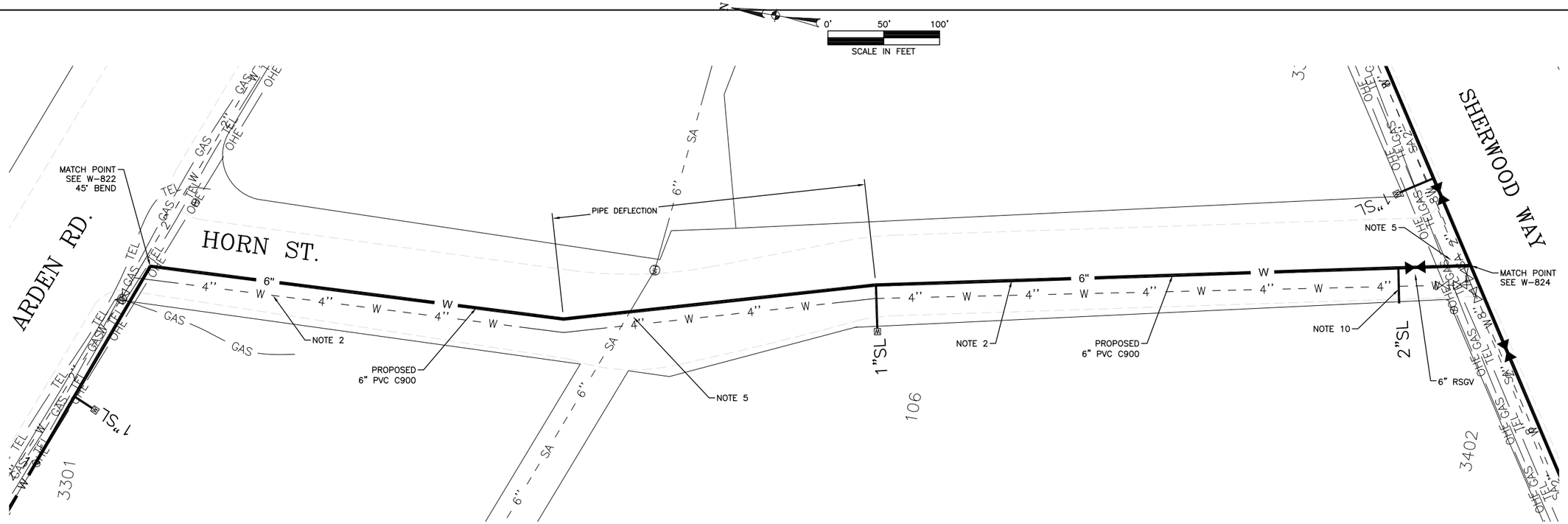

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HORIZONTAL SCALE:	1"=50'
VERTICAL SCALE:	N/A
JOB NUMBER:	2016-04-240
DATE:	NOVEMBER 2016

ENGINEERING SERVICES DEPARTMENT

THE CITY OF SAN ANGELO TEXAS

2016 WATER LINE IMPROVEMENTS

HORN ST. FROM ARDEN RD. TO SHERWOOD WAY

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W-823

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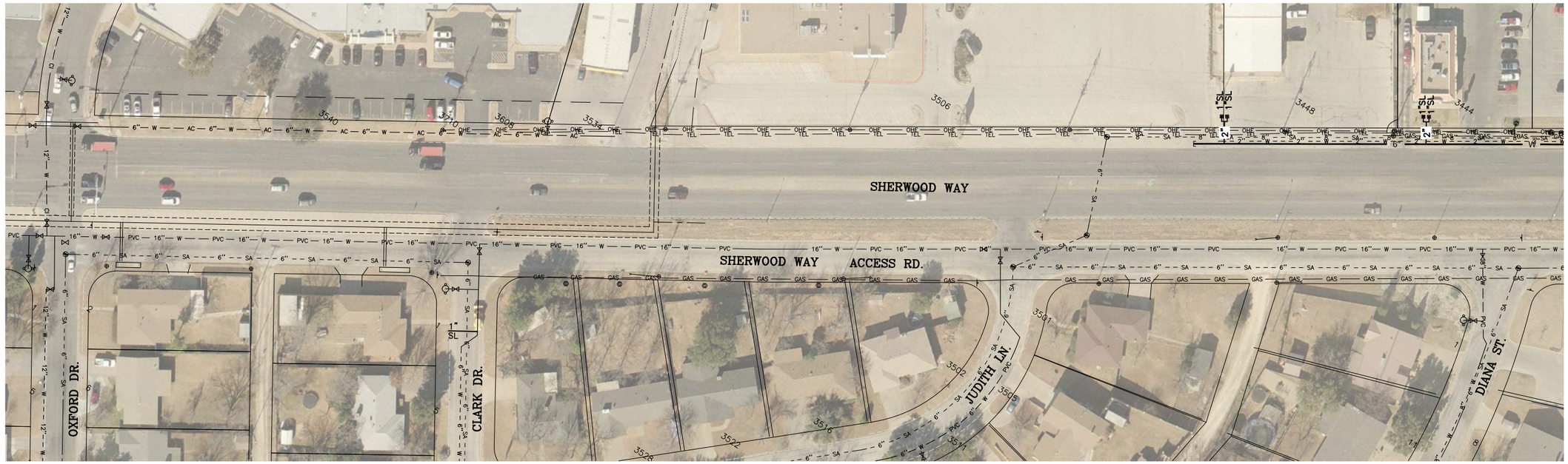

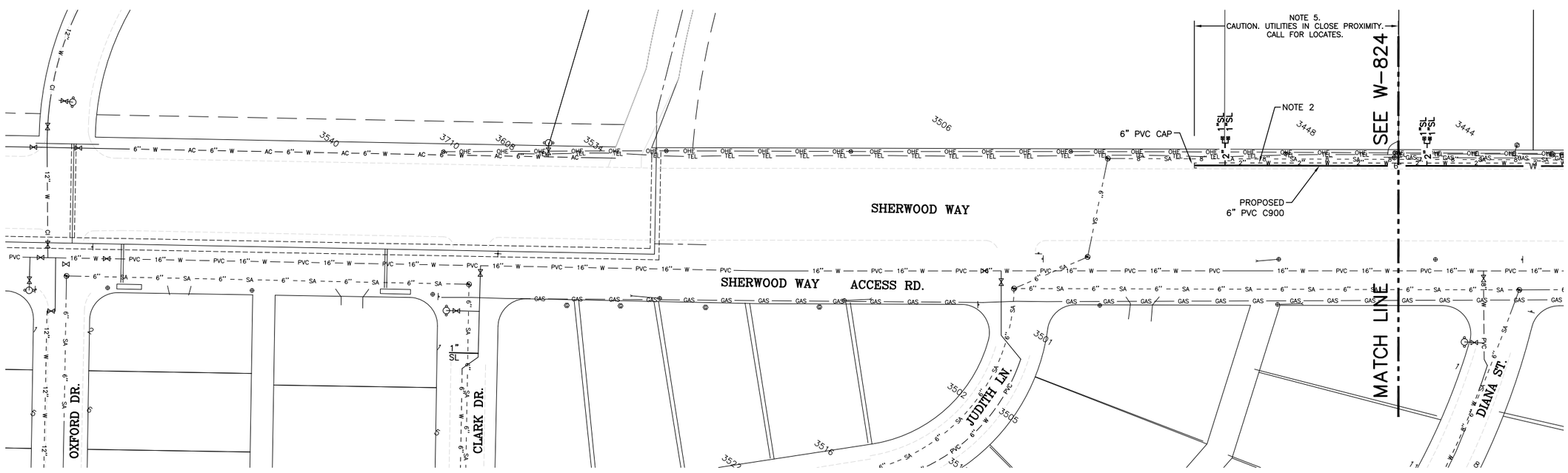

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HORIZONTAL SCALE:	1"=100'
VERTICAL SCALE:	N/A
JOB NUMBER:	2016-04-240
DATE:	NOVEMBER 2016

ENGINEERING SERVICES DEPARTMENT

THE CITY OF SAN ANGELO TEXAS

2016 WATER LINE IMPROVEMENTS

SHERWOOD WAY
FROM DIANA ST. TO CLARK ST.

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STATE OF TEXAS
RUSSELL J. PEHL
104755
REGISTERED PROFESSIONAL ENGINEER

W-825

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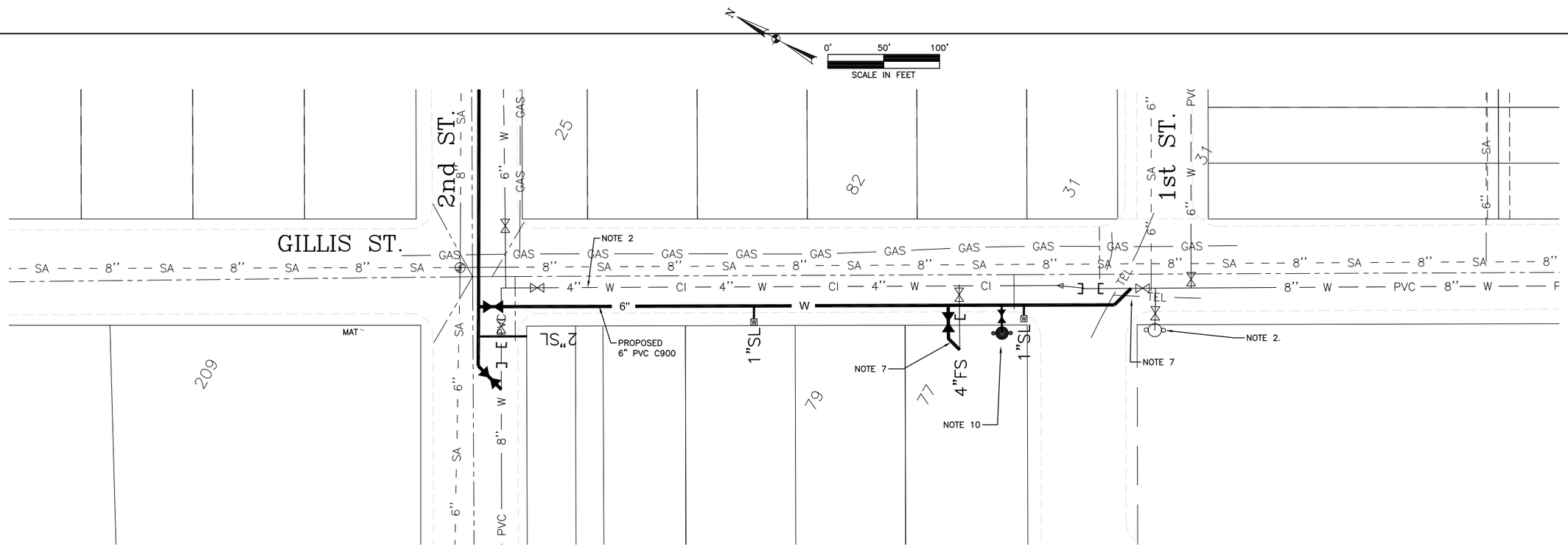

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JOB NUMBER:	2016-04-240
DATE:	NOVEMBER 2016

ENGINEERING SERVICES DEPARTMENT

THE CITY OF SAN ANGELO TEXAS

2016 WATER LINE IMPROVEMENTS

GILLIS ST.
FROM 1ST TO 2ND ST.

STATE OF TEXAS

W-826

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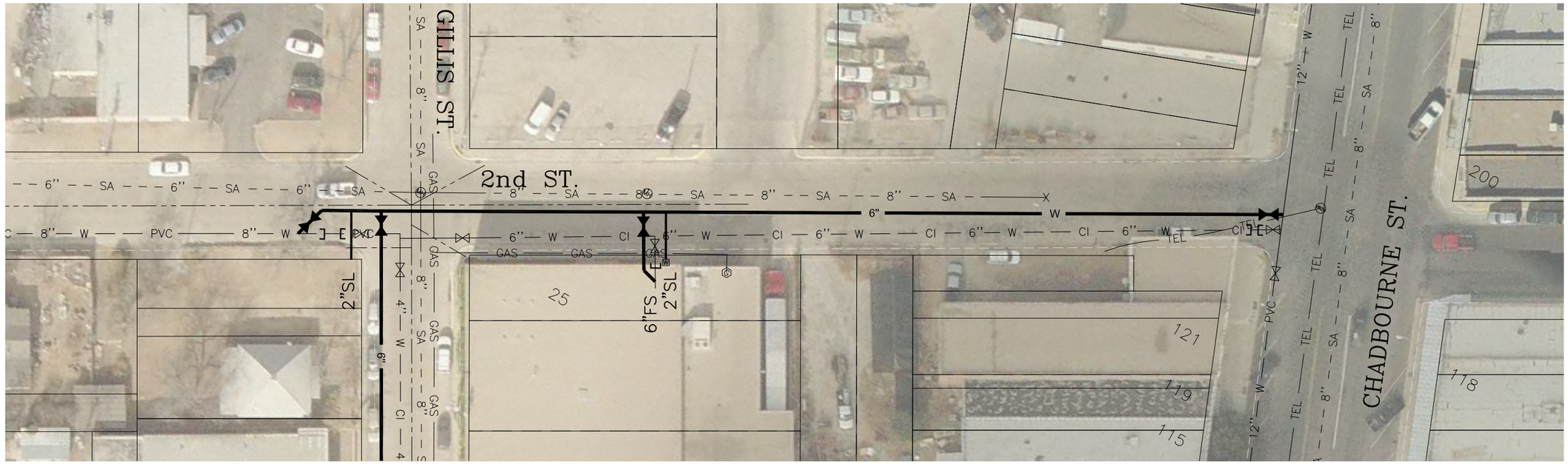

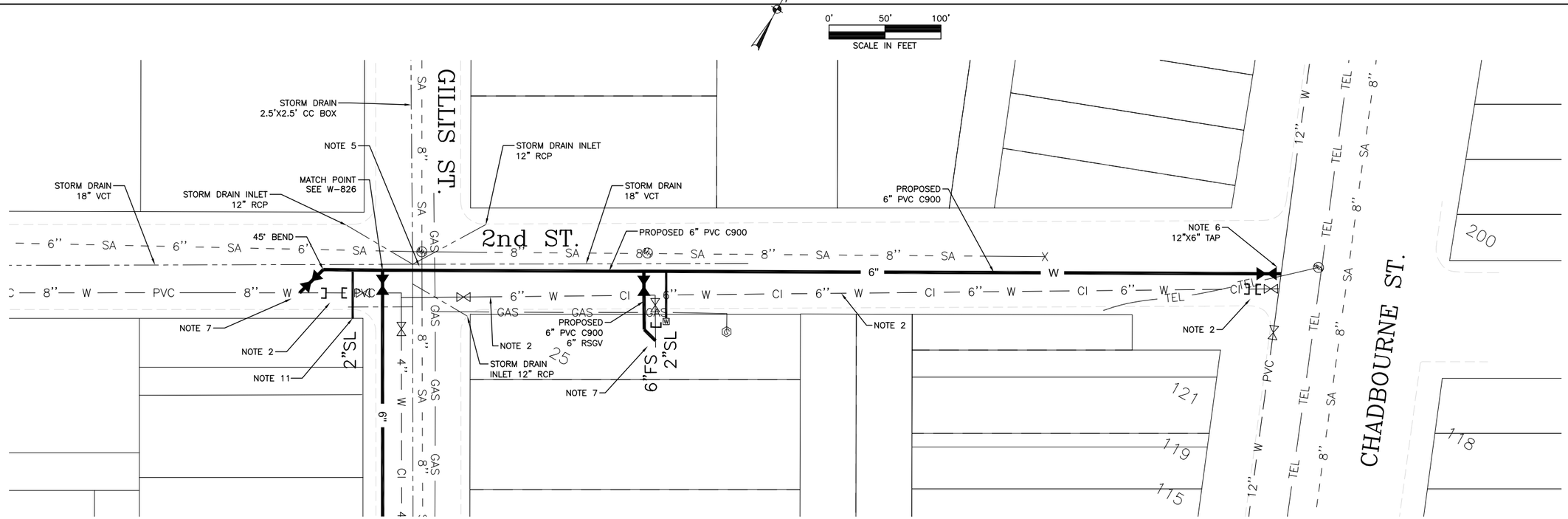

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VERTICAL SCALE:	N/A
JOB NUMBER:	2016-04-240
DATE:	NOVEMBER 2016

ENGINEERING SERVICES DEPARTMENT

THE CITY OF SAN ANGELO TEXAS

2016 WATER LINE IMPROVEMENTS

2ND ST. FROM GILLIS ST. TO CHADBOURNE ST.

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W-827

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