SURVEY CONTROL DATA

1. HORIZONTAL CONTROL MONUMENTS
   OKLAHOMA STATE PLANE COORDINATE SYSTEM – LAMBERT NORTH PROJECTION
2. BASIS OF BEARING:
   LOCAL GRID BEARING
3. VERTICAL CONTROLS (BM):
   NAVD 1988
4. SECTION NUMERICAL DESCRIPTION (S-T-R):
   SECTION 32, T–19–N, R–14–E
   SECTION 4 & 5, T–18–N, R–14–E

BEFORE YOU DIG! CALL OKIE 1-800-522-6543

UTILITIES LOCATION SHOWN ON PLAN AND PROFILE WERE OBTAINED FROM INFORMATION PROVIDED BY UTILITY SYSTEM OWNER IN CONJUNCTION WITH EXISTING PHYSICAL FEATURES VISIBLE AT THE TIME OF THE TOPOGRAPHIC SURVEY. LOCATIONS MUST BE VERIFIED BY THE CONTRACTOR PRIOR TO CONSTRUCTION.

UTILITY CONTACTS

CITY OF BROKEN ARROW, OKLAHOMA
CITY ENGINEER, TOM HENDRIX P.E.
485 N. POPLAR. AVE
BROKEN ARROW, OKLAHOMA 74012
(918) 259–7000 EXT. 5414
(918)259–8453 (FAX)

CITY OF BROKEN ARROW, OKLAHOMA
WATER & SEWER, ANTHONY DANIEL
485 N. POPLAR. AVE
BROKEN ARROW, OKLAHOMA 74012
(918) 259–7000 X7380
(918) 251–3383 (FAX)

CITY OF BROKEN ARROW, OKLAHOMA
STREETS/STORMWATER, STEVE ARANT P.E.
485 N. POPLAR. AVE
BROKEN ARROW, OKLAHOMA 74012
(918) 259–7000 X7380
(918) 251–3383 (FAX)

OKLAHOMA NATURAL GAS (CON'T RELOCATIONS)
ATTN.: JONATHON MEADOWS
5848 EAST 15TH STREET
TULSA, OKLAHOMA 74112
(918) 831–8215
(918) 949–5735 (CELL)

COX COMMUNICATIONS
ATTN.: GARY HAMILTON
11811 E. 51ST STREET
TULSA, OK 74146
(918) 286–4666
(918) 286–4018 (FAX)

OKLAHOMA NATURAL GAS (EXISTING CONST.)
ATTN.: BILL MORGAN
P.O. BOX 871
TULSA, OKLAHOMA 74102
(918) 451–3814
(918) 451–0899 (FAX)

WINDSTREAM COMMUNICATION
ATTN.: GEORGE WHITE
2300 SOUTH 1ST PLACE
BROKEN ARROW, OKLAHOMA 74012
(918) 451–3431
(918) 451–1865 (FAX)

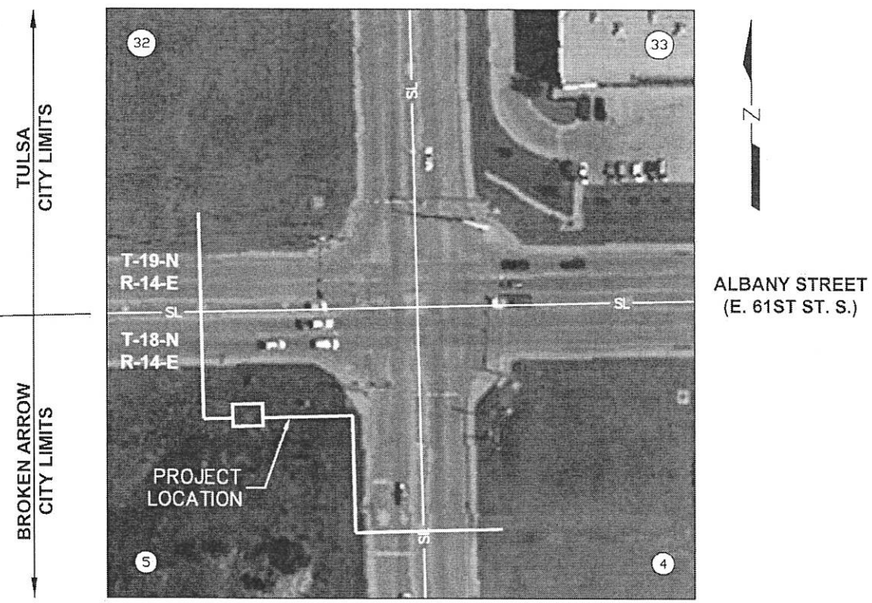
AEP / PSO
ATTN.: JIM WILSON
5223 S GARNETT
TULSA, OK 74149
(918) 599–2912
(918) 247–8466 (FAX)

BROKEN ARROW
Municipal Authority

30" WATER LINE

TULSA WATER CONNECTION AT ALBANY STREET AND OLIVE AVENUE

PROJECT NUMBER WL 1611



PROJECT LOCATION SECTION 5, T-18-N, R-14-E, TULSA COUNTY

Holloway, Updike and Bellen, Inc.
Muskogee - Broken Arrow
CA No. 219 Expires 06/30/2017

CITY OF BROKEN ARROW STANDARD CONSTRUCTION SPECIFICATIONS, AUGUST 19, 1999, SHALL GOVERN ALL CONSTRUCTION AS SUPPLEMENTED BY OKLAHOMA STANDARD SPECIFICATION FOR HIGHWAY CONSTRUCTION, APPROVED BY THE DEPARTMENT OF TRANSPORTATION 2009.

FUNDING SOURCE: BAMA UTILITIES WATER RNC

INDEX OF SHEETS

BROKEN ARROW MUNICIPAL AUTHORITY

CHAIRMAN	CRAIG THURMOND
VICE CHAIRMAN	RICHARD CARTER
MEMBER	MIKE LESTER
MEMBER	SCOTT EUDEY
MEMBER	JOHNNIE PARKS

APPROVED

_____ DATE _____
MICHAEL L. SPURGEON
CITY MANAGER

RECOMMENDED FOR APPROVAL

_____ DATE _____
JEFF T. BIGBY, P.E., CFM
ACTING DIRECTOR OF ENGINEERING & CONSTRUCTION

_____ DATE _____
ANTHONY DANIEL
DIRECTOR OF UTILITIES DEPARTMENT

REGISTERED PROFESSIONAL ENGINEER
LOYD STEPHEN TOLAR
20679
OKLAHOMA
4/20/16

STEPHEN TOLAR, P.E.
OK 20679
HOLLOWAY, UPDIKE & BELLEN

PROJECT NO. WL1611

WATER LINE NOTES:

1. ALL WATER DISTRIBUTION SYSTEMS SHALL BE DESIGNED IN ACCORDANCE WITH THE CURRENT CITY OF BROKEN ARROW ENGINEERING DESIGN CRITERIA MANUAL LAND SUBDIVISION CODE AND CONSTRUCTED IN ACCORDANCE WITH STANDARD CONSTRUCTION SPECIFICATIONS.
2. PRIOR TO STARTING CONSTRUCTION THE CONTRACTOR SHALL PARTICIPATE IN A PRE-CONSTRUCTION CONFERENCE WITH THE ENGINEERING AND CONSTRUCTION DEPARTMENT. AT THIS CONFERENCE THE CONTRACTOR SHALL FURNISH CERTIFICATION FROM THE MANUFACTURER/SUPPLIER THAT ALL MATERIALS MEET APPLICABLE SPECIFICATIONS. CERTIFICATIONS SHALL BE SUPPLIED IN FIVE (5) COPIES WITH THREE (3) COPIES STAMPED AND APPROVED, BY THE CITY, RETURNED TO THE CONTRACTOR. MATERIALS SHALL NOT BE INSTALLED UNTIL THEY HAVE BEEN APPROVED BY THE CITY.
3. ALL WATER DISTRIBUTION SYSTEM SHALL BE INSPECTED BY THE ENGINEERING AND CONSTRUCTION DEPARTMENT UTILITY INSPECTORS, IN ACCORDANCE WITH THE CITY OF BROKEN ARROW ADMINISTRATIVE REGULATION 11-15.
4. DIG THOUGH LOCATOR TAPE WILL BE BURIED 2 FEET ABOVE THE LINE.
5. WHEN C-905 PVC IS USED, A NO. 12 COATED COPPER WIRE SHALL BE TAPED TO THE TOP SURFACE OF THE PIPE AND CONNECTED TO EACH FIRE HYDRANT BY ATTACHING TO A BOLT, JUST ABOVE GROUND LEVEL.
6. ALL IRON PIPE AND FITTINGS SHALL BE POLYWRAPPED.
7. STREET CROSSINGS FOR MAIN LINES TWELVE (12) INCHES AND LARGER, SHALL BE PLACED IN CONDUIT.
8. ALL DISTRIBUTION LINES IN CONDUIT AND AT DRAINAGE FEATURE CROSSINGS SHALL BE CONSTRUCTED WITH RESTRAINED JOINTS.
9. BEDDING, BACKFILL AND COMPACTION OVER WATER LINES SHALL BE IN ACCORDANCE WITH STANDARD DRAWING W01.
10. SERVICE LINES SHALL BE TAPPED TO MAIN LINES USING SOLID BRASS SADDLES.
11. SERVICE LINES SHALL BE SEAMLESS COPPER WATER TUBE MEETING THE REQUIREMENTS OF ASTM-B88.
12. ALL SERVICE LINE FITTINGS SHALL BE BRASS WITH FLARED, COMPRESSION, SOLDERED OR THREADED CONNECTIONS.
13. WHEN CONDUIT IS PROVIDED FOR SERVICE LINES IT SHALL BE SCHEDULE 40 PVC OR STRONGER.
14. FIRE HYDRANTS
    A. FIRE HYDRANTS SHALL BE MUELLER CENTURION OR AN APPROVED EQUAL.
    B. EACH HYDRANT SHALL BE SET WITH THE STREAMER NOZZLE FACING THE STREET AND WITH A MINIMUM CLEARANCE OF EIGHTEEN INCHES ABOVE THE FINISHED GRADE.
    C. ALL EXPOSED PORTIONS OF FIRE HYDRANTS SHALL BE PAINTED WITH A BRIGHT RED ENAMEL AS MANUFACTURED BY GLIDDEN OR DUPONT.
15. WHEN WORKING IN OR ADJACENT TO EXISTING SUBDIVISIONS ONLY ONE (1) DAYS WORTH OF TRENCH MAY BE OPEN AT A GIVEN TIME, THIS REQUIREMENT MAY BE MODIFIED, IN WRITING BY THE CONTRACT ADMINISTRATOR, FOR A SPECIFIC PROJECT.
16. ROAD CLOSURES MUST BE COORDINATED A MINIMUM OF TWENTY FOUR (24) HOURS IN ADVANCE. ROADS WILL NOT BE CLOSED FOR OVER EIGHT (8) HOURS WITHOUT WRITTEN PERMISSION FROM THE STREET AND STORMWATER DIRECTOR.
17. IN ACCORDANCE WITH OAC 252:626-19-2(C) PROVIDE THE WATER LINE WITH A MINIMUM OF 36 INCHES OF COVER WITH SUFFICIENT INSULATION TO PREVENT FREEZING.
18. IN ACCORDANCE WITH OAC 252:626-19-2(E),TEST THE INSTALLED PIPE FOR LEAKAGE IN ACCORDANCE WITH AWWA STANDARD SPECIFICATIONS. LEAKAGE MUST NOT EXCEED 10 GAL/INCH DIAMETER PER MILE OF PIPE PER 24 HOURS AT 150 PSI TESTING PRESSURE.
19. IN ACCORDANCE WITH OAC 252:626-19-2(F), DISINFECT ALL WATER LINES ACCORDING TO AWWA STANDARD SPECIFICATIONS. OBTAIN SAFE BACTERIOLOGICAL SAMPLES ON TWO CONSECUTIVE DAYS BEFORE PLACING THE WATERLINE INTO SERVICE.
20. IN ACCORDANCE WITH OAC 252:626-19-2(H) MAINTAIN THE FOLLOWING MINIMUM SEPARATION DISTANCES BETWEEN WATER LINES AND OTHER UTILITIES.
    A. TEN FEET HORIZONTALLY AND TWO FEET VERTICALLY FROM SEWER LINES. WHEN IT IS IMPOSSIBLE TO OBTAIN SUCH HORIZONTAL SEPARATION BETWEEN THE WATER AND SEWER LINES, CONSTRUCT THE SEWER LINE OF WATER PIPE AND PRESSURE TEST IT TO ASSURE TIGHTNESS.
    B. FIVE FEET HORIZONTALLY FROM EXISTING OR PROPOSED STORM SEWERS, RAW WATER LINES, PETROLEUM PRODUCT LINES, NATURAL GAS LINES AND OTHER BURIED UTILITY LINES.
    C. LOCATE CAST IRON WATER LINES AT LEAST 10 FEET FROM ANY GASOLINE STORAGE TANKS AND PVC WATER LINES AT LEAST 50 FEET HORIZONTALLY FROM ANY GASOLINE STORAGE TANKS AND LINES.
    D. FIFTEEN FEET FROM ALL PARTS OF SEPTIC TANKS, ADSORPTION FIELDS OR OTHER SEWAGE TREATMENT AND DISPOSAL SYSTEMS.
21. WATER WILL BE PROVIDED VIA THE NEAREST CITY OF BROKEN ARROW HYDRANT AT NO COST TO THE CONTRACTOR. THE CONTRACTOR WILL BE RESPONSIBLE TO OBTAIN A CONSTRUCTION METER FROM THE CITY, PAYING $1200.00 (ONE THOUSAND, TWO HUNDRED) ESCROW DEPOSIT FOR USE OF THE METER. THE ESCROW MONEY WILL BE RETURNED TO THE CONTRACTOR WHEN THE CONSTRUCTION METER IS RETURNED. FAILURE TO RETURN THE METER WITHIN 2 WORKING DAYS AFTER THE CONTRACT ADMINISTRATOR DETERMINES THE METER IS NO LONGER REQUIRED ON THE PROJECT, COULD RESULT IN WATER CHARGES AND LOSS OF SOME OR ALL OF THE ESCROW DEPOSIT AND CONTRACTOR EARNINGS WITHHELD. CONTRACTOR IS RESPONSIBLE FOR ANY DAMAGES TO METER OR HYDRANT HE MAY CAUSE. CONTRACTOR IS RESPONSIBLE FOR TRANSPORT AND DISTRIBUTION OF WATER AS NEEDED. IF WATER IS OBTAINED FROM ANOTHER ENTITY THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING PERMITS, FEES AND ALL OTHER INCIDENTALS FROM THE ENTITY.

PAY QUANTITY NOTES

1. TO BE USED AT ENGINEER'S DIRECTION DOES NOT INCLUDE METER VAULT SUBGRADE.
2. UNIT PRICE BID TO INCLUDE COST OF TEMPORARY SEDIMENT REMOVAL AND RESTORATION ON ERODED SLOPES.
3. SOLID SLAB SODDING SHALL BE U3, BERMUDA, PRICE BID SHALL INCLUDE FERTILIZING (10-20-10) AT THE RATE OF 100 LB. PER ACRE OF SODDING.
4. UNIT PRICE BID SHALL INCLUDE REMOVAL AND DISPOSAL OF TREES AND ALL OTHER DEBRIS NOT INCLUDED IN OTHER ITEMS OF WORK.
5. THIS ITEM INCLUDES BORE OF STREETS AND UTILITIES. UNIT PRICE INCLUDES SPACERS, VENTS AND SEALS.
6. REFER TO METER VAULT DRAWING FOR LIMITS OF WORK TO INCLUDE IN THIS LUMP SUM BID ITEM.
7. UNIT PRICE BID SHALL INCLUDE EXCAVATION BEDDING, BACKFILLING, DEWATERING, SEEDING AND ALL INCIDENTALS.
8. UNIT PRICE BID SHALL INCLUDE POLY-WRAPPING DUCTILE IRON PIPE AND FITTINGS.
9. INSTALL PER ODOT STANDARD DRAWING TSD-2
10. 22.5° BENDS SHALL BE INSTALLED AT DIRECTION OF ENGINEER TO ADJUST ELEVATION IF REQUIRED. BENDS ARE NOT SHOWN ON PLANS.
11. PLAIN CONCRETE USED FOR THRUST BLOCKING SHALL BE INSTALLED AS DIRECTED BY ENGINEER IF NECESSARY.
12. CONSTRUCTION ALLOWANCE FOR UNFORESEEN WORK NOT INCLUDED IN CONTRACT DOCUMENTS. ALLOWANCE MAY ONLY BE UTILIZED WITH PRIOR WRITTEN APPROVAL OF OWNER.

GENERAL NOTES

1. ALL PIPE, VALVES AND FITTINGS SHALL UTILIZE RESTRAINED JOINTS. COSTS FOR RESTRAINED JOINTS SHALL BE INCLUDED IN RESPECTIVE BID ITEMS. RESTRAINED JOINTS SHALL BE AMERICAN "FAST GRIP", U.S. PIPE "FIELD LOK 350" OR APPROVED EQUAL
2. ALL GASKETS SHALL BE CERTIFIED AS SUITABLE FOR USE WITH CHLORAMINATED POTABLE WATER.
3. ALL FASTENERS SHALL BE TYPE 304 SS ASTM A320/A320M, GRADE B8 BOLTS AND ASTM A194/A194M GRADE 8 NUTS. THIS APPLIES TO ALL BURIED AND IN-VAULT FITTINGS.

PAY QUANTITIES

ITEM	SPEC NO.	DESCRIPTION	UNIT	QUANTITIY
1.	BA204.03	Class A Aggregate Base (Trench Stabilization)(1)	CY	50
2.	BA221(B)	Temporary Silt Dike (2) (9)	LF	120
3.	BA221(C)	Temporary Silt Fence (2)	LF	350
4.	BA230(A)	Solid Slab Sodding (3)	SY	2,600
5.	BA310ROW	Clearing (4)	SF	24,000
6.	BA314	Bored Street Crossing (42" Steel Casing 0.50" Wall) (5)	LF	120
7.	BA314	Bored Street Crossing (48" Steel Casing 0.50" Wall) (5)	LF	80
8.	BA330(C)	Plain Concrete (Thrust Blocking) (2500 psi) (11)	CY	15
9.	BA401	30" PVC C905 DR21 (7)	LF	240
10.	BA402	30" DIP CLASS 51 (7) (8)	LF	140
11.	BA402	24" PVC C905 DR18 (7)	LF	10
12.	BA410(A1)	30" 90° BEND (7) (8)	EA	2
13.	BA410(A2)	30" 22.5° BEND (7) (8) (10)	EA	2
14.	BA410(B1)	30" TEE (7) (8)	EA	3
15.	BA410(D1)	24" SLEEVE (7) (8)	EA	2
16.	BA410(G1)	30"x24" REDUCER (7) (8)	EA	2
17.	BA410(G2)	30" MJ CAP (7) (8)	EA	2
18.	BA420(A1)	30" BUTTERFLY VALVE (7) (8)	EA	3
19.	SPECIAL	METER VAULT COMPLETE (6)	LS	1
20.	SPECIAL	CONSTRUCTION ALLOWANCE (12)	ALLOW	1

TMUA CONTACTS

CALVIN WILLIAMS	MANAGER OF WATER DISTRIBUTION EAST YARD	918-596-8152
RYAN McKASKLE, P.E.	LEAD ENGINEER WATER DESIGN	918-596-9566
ANTHONY WILKINS, P.E.	Sr. SPECIAL PROJECTS ENGINEER, WATER	918-596-2412

REGISTERED PROFESSIONAL ENGINEER
LOYD STEPHEN TOLAR
20679
OKLAHOMA
4/20/16

DATE	REVISIONS

BROKEN ARROW Municipal Authority

N W E S 0 0 0 0

30" WATER LINE TULSA WATER CONNECTION AT ALBANY ST AND OLIVE AVE

NOTES & QUANTITIES

PROFILE SCALE:	DESIGN	DATE	DRAFTED	DATE
HORZ.	LST		JME	4/16
VERT.	REVIEWED	DATE	APPROVED	DATE
DRAWING NAME: PLAN	SHEET 2 OF 8		PROJECT NO. WL 1611	

STANDARD ABBREVIATIONS

AC	ASBESTOS CEMENT PIPE	LS	LUMP SUM
ASP	ASPHALT	LT	LEFT
AWWA	AMERICAN WATER WORKS ASSOC.	MAX	MAXIMUM
BM	BENCH MARK – ELEVATION	MIN	MINIMUM
CI	CAST IRON INLET	MJ	MECHANICAL JOINT PIPE FITTING
C–C	CENTER TO CENTER	MSL	MEAN SEA LEVEL
CFS	CUBIC FEET PER SECOND	O.C.	ON CENTER
CIP	CAST IRON PIPE	OD	OUTSIDE DIAMETER
CL	CENTER LINE	ODEQ	OK. DEPT. OF ENV. QUALITY
CMP	CORRUGATED METAL PIPE	ODOT	OK. DEPT. OF TRANSPORTATION
CMPA	CORRUGATED METAL PIPE – ARCH	PE	POLYETHYLENE PIPE
CONC	CONCRETE	PL	PROPERTY LINE
CP	SURVEY CONTROL POINT	PP	POWER POLE
CPVC	CHLORINATED POLYVINYL CHLORIDE PIPE	PSI	POUNDS PER SQUARE INCH
CY	CUBIC YARD	PVC	POLYVINYL CHLORIDE PIPE
D/E	DRAINAGE EASEMENT	Q100	100 YR FLOW
DIP	DUCTILE IRON PIPE	RCB	REINFORCED CONCRETE BOX
EA	EACH	RCP	REINFORCED CONCRETE PIPE
EL	ELEVATION	RJ	RESTRAINED JOINT – PIPE
E–W	EACH WAY	RT	RIGHT
FG	FINISHED GROUND ELEVATION	RW	RIGHT OF WAY LINE
FH	FIRE HYDRANT	SS	SANITARY SEWER
FL	FLOW LINE	STA	STATION
FM	FORCE MAIN (SEWER)	STM	STORM SEWER LINE
GV	GATE VALVE	SY	SQUARE YARD
HW	HEADWALL	TYP	TYPICAL
HYD	FIRE HYDRANT	U/E	UTILITY EASEMENT
ID	INSIDE DIAMETER	WL	WATER LINE
IP	IRON PIN		
LF	LINEAL FEET		

SURVEY SYMBOLS

SYMBOL	DESCRIPTION
WM	WATER METER
	WATER VALVE
	FIRE HYDRANT
	IRON PIN FOUND
S	SANITARY SEWER MANHOLE
T	TELEPHONE PEDESTAL
F	FIBER OPTIC PEDESTAL
E	ELECTRICAL BOX
	BENCH MARK
	POWER POLE
	GUY WIRE
	LIGHT POLE
D	STORM SEWER MANHOLE
	TRAFFIC SIGN
C	SANITARY SEWER CLEANOUT

FLOW STREAM IDENTIFICATION

ALP – AIR, LOW PRESSURE
CGP – CHLORINE GAS, PRESSURE
CGV – CHLORINE GAS, VACUUM
CS – CHLORINE SOLUTION
DR – DRAIN (PLANT PROCESS)
DS – DIGESTED SLUDGE
GR – GRIT
MLSS – MIXED LIQUOR SUSPENDED SOLIDS
NPW – NONPOTABLE WATER (SAME AS W3)
PEW – PLANT EFFLUENT WATER (NONPOTABLE)
PLE – PLANT EFFLUENT
PO – LIQUID POLYMER
PSW – PLANT SERVICE WATER (NONPOTABLE)
PW – POTABLE WATER
RS – RAW SEWAGE
RAS/WAS – RETURN/WASTE ACITVATED SLUDGE
RAS – RETURN ACTIVATED SLUDGE
SCUM – SCUM
SDS – SULFUR DIOXIDE SOLUTION
SE – SECONDARY EFFLUENT
SHX – SODIUM HYDROXIDE
SS – SANITARY SEWER
STM – STORMWATER
W3 – EQUIPMENT WATER (NONPOTABLE)
WAS – WASTE ACTIVATED SLUDGE

MISCELLANEOUS SYMBOLS AND ABBREVIATIONS

SYMBOL	ABBREV.	DESCRIPTION
021 S 12	PF	PARSHALL FLUME
	LL	LINE LABELS
M	FM	FLOW METER
	GV	GATE VALVE
	BFV	BUTTERFLY VALVE
	BV	BALL VALVE
	BCV	BALL CHECK VALVE
	CV	CHECK VALVE
	PV	PLUG VALVE
	PRV	PRESSURE RELIEF VALVE
	PCV	PRESSURE CONTROL VALVE
		VALVE w/ MECHANICAL OPERATOR
	DV	DIAPHRAGM VALVE
	BFP	BACK FLOW PREVENTER
	ARV	AIR RELIEF VALVE
	SW	STRUCTURE WALL
	ES	EXISTING STRUCTURE
	B	BLOWER
	P	PUMPS
	MV	MUD VALVE
	FC	FLEXIBLE COUPLING
	FC	FLEXIBLE METAL COUPLING
S		SAMPLER
	TV	TELESCOPIC VALVE
M		MOTOR OPERATOR
P		PRESSURE GAUGE
T		TEMPERATURE GAUGE
	SA	SURFACE AERATOR
	PT	PRESSURE TRANSDUCER
	BF	BLIND FLANGE
		HOSE CONNECTION
		"Y" TYPE STRAINER
		EXPANSION JOINT
		AIR RELEASE VALVE

SYMBOL	DESCRIPTION
	FENCE
	SECTION LINE
P	PROPERTY LINE
	POWER POLE
	TRAFFIC SIGN
	LIGHT POLE
700	PROPOSED CONTOUR
	EXIST. CONTOUR
	TREES
	℄ SWALE & FLOW
	CREEK OR DITCH SWALE
	DRIVES & MINOR ROADS
	RAILROAD
	EXIST. RIGHT OF WAY
	REFERENCE POINT
B–3	BORING LOCATION
	SURVEY BASE LINE
	PROPOSED LINE
	CONDUIT
	IRON PIN
	EXISTING TREE LINE
	PROPOSED CLEARING LIMIT
	PIPING (TO BE ABANDONED)
	MATCHLINE
A	SECTION NUMBER OR DETAIL LETTER
A	SHEET NUMBER WHERE SECTION OR DETAIL APPEARS

EXISTING UTILITY LINE SYMBOLS

SYMBOL	DESCRIPTION
WL	WATER LINE
SS	SANITARY SEWER LINE
STM	STORM SEWER
UGE	UNDERGROUND ELECTRIC
GAS	GAS LINE
OHE	OVERHEAD ELECTRIC
TUG	UNDERGROUND TELEPHONE
FOC	FIBER OPTIC CABLE
PL	PROPERTY LINE
FM	SANITARY SEWER FORCE MAIN

PIPE FITTINGS AND PLUMBING ITEMS

DOUBLE LINE	SINGLE LINE	DESCRIPTION	ABBREV.
		WELDED JOINT	
		GROOVED END JOINT	
		BELL & SPIGOT JOINT	
		FLANGED COUPLING ADAPTER WITH THRUST TIES	
		FLEXIBLE COUPLING	FLW. CPLG.
		FLEXIBLE COUPLING WITH THRUST TIES	
		ELASTOMETER BELLOWS EXP. JOINT	EXP. JT.
		ELBOW UP	ELL
		ELBOW DOWN	ELL
		ELBOW 90 DEGREE	ELL
		ELBOW 45 DEGREE	
		LATERAL	
		TEE	TEE
		TEE UP	TEE
		TEE DOWN	TEE
		CROSS	CROSS
		Y–STRAINER	YS
		COUPLING	CPLG
		LATERAL UP	
		LATERAL DOWN	
		CONCENTRIC REDUCER	CONC. RED.
		ECCENTRIC REDUCER	ECC. RED.
		UNION	UN
		CAP	
		FLANGED JOINT	FLG
		FLANGED COUPLING ADAPTER	FCA
		MECHANICAL JOINT	MJ
		MJ w/ RETAINER GLAND	RJ

REGISTERED PROFESSIONAL ENGINEER
LOYD STEPHEN TOLAR
20679
OKLAHOMA
4/20/16

DATE	REVISIONS

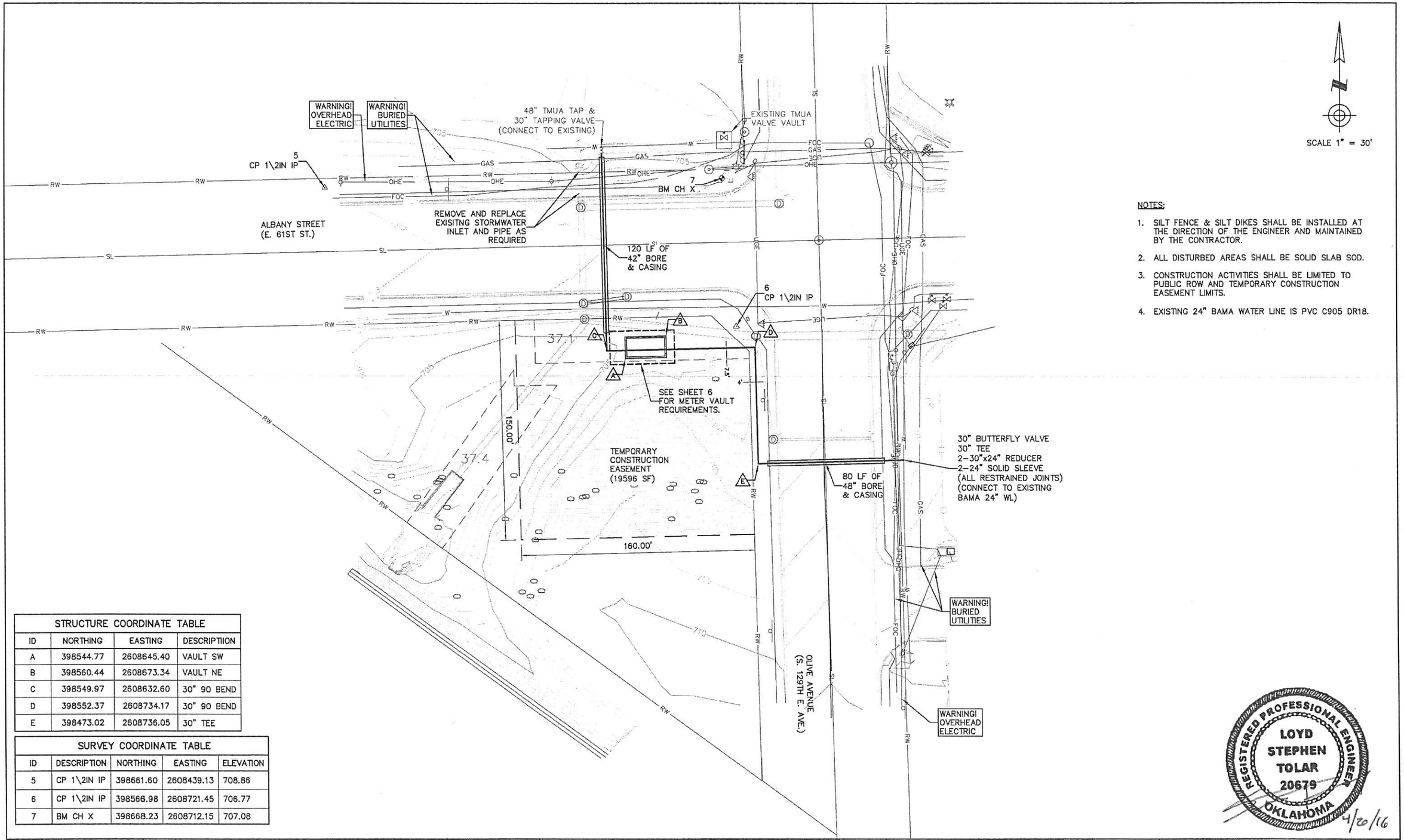
BROKEN ARROW
Municipal Authority

N W E S
0 2' 4' 6'

30" WATER LINE
TULSA WATER CONNECTION
AT ALBANY ST AND OLIVE AVE

LEGEND AND SYMBOLS

PROFILE SCALE:	DESIGN	DATE	DRAFTED	DATE
HORZ.	LST		JME	4/16
VERT.	REVIEWED	DATE	APPROVED	DATE
DRAWING NAME: PLAN	SHEET 3 OF 8		PROJECT NO. WL 1611	



NOTES:

1. SILT FENCE & SILT DIKES SHALL BE INSTALLED AT THE DIRECTION OF THE ENGINEER AND MAINTAINED BY THE CONTRACTOR.
2. ALL DISTURBED AREAS SHALL BE SOLID SLAB SOD.
3. CONSTRUCTION ACTIVITIES SHALL BE LIMITED TO PUBLIC ROW AND TEMPORARY CONSTRUCTION EASEMENT LIMITS.
4. EXISTING 24" BAMA WATER LINE IS PVC C905 DR18.

STRUCTURE COORDINATE TABLE			
ID	NORTHING	EASTING	DESCRIPTIION
A	398544.77	2608645.40	VAULT SW
B	398560.44	2608673.34	VAULT NE
C	398549.97	2608632.60	30" 90 BEND
D	398552.37	2608734.17	30" 90 BEND
E	398473.02	2608736.05	30" TEE

SURVEY COORDINATE TABLE				
ID	DESCRIPTION	NORTHING	EASTING	ELEVATION
5	CP 1\2IN IP	398661.60	2608439.13	708.86
6	CP 1\2IN IP	398566.98	2608721.45	706.77
7	BM CH X	398668.23	2608712.15	707.08

REGISTERED PROFESSIONAL ENGINEER
LOYD STEPHEN TOLAR
20679
OKLAHOMA
4/20/16

DATE	REVISIONS

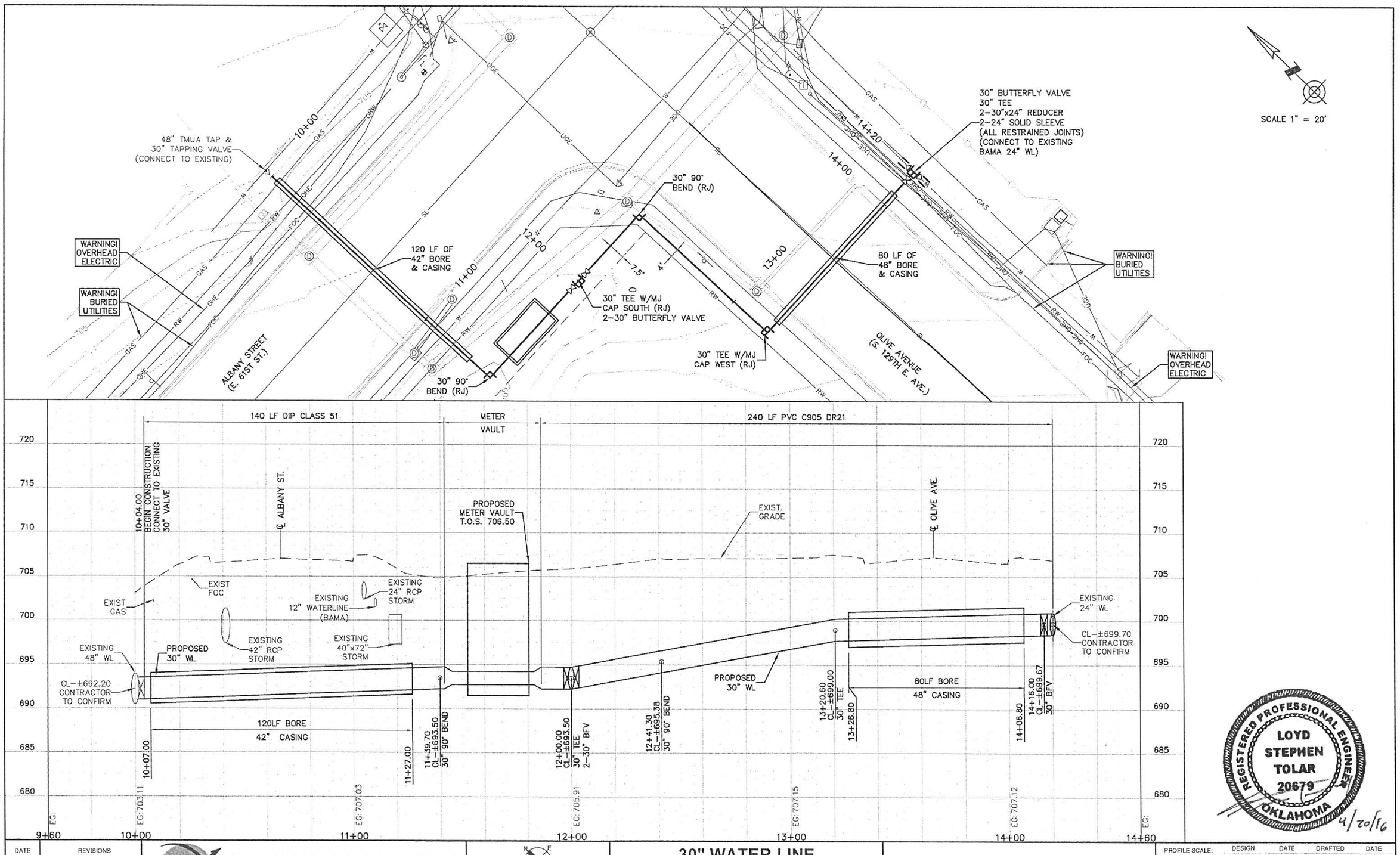
BROKEN ARROW Municipal Authority

0 30' 60' 90'

30" WATER LINE TULSA WATER CONNECTION AT ALBANY ST AND OLIVE AVE

SITE PLAN

PROFILE SCALE:	DESIGN	DATE	DRAFTED	DATE
HORZ.	LST		JME	4/16
VERT.	REVIEWED	DATE	APPROVED	DATE
DRAWING NAME: PLAN	SHEET 4 OF 8		PROJECT NO. WL 1611	



DATE	REVISIONS

BROKEN ARROW
Municipal Authority

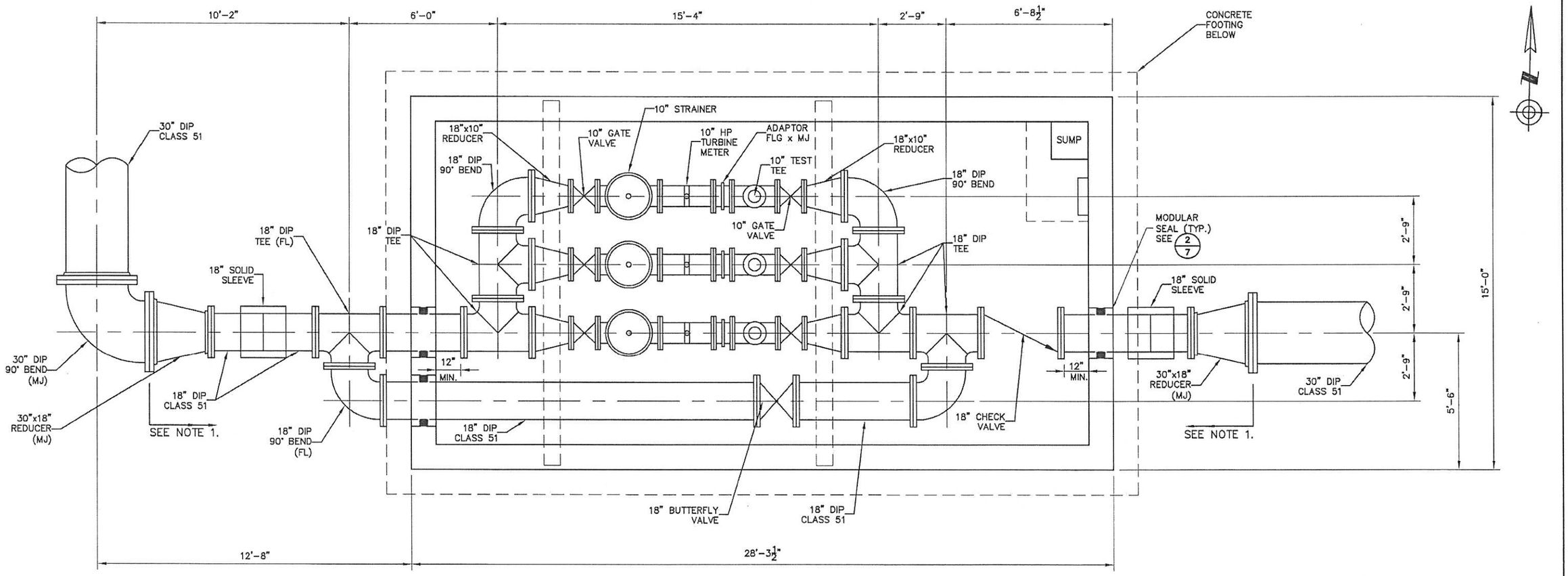
0 20 40 60

30" WATER LINE
TULSA WATER CONNECTION
AT ALBANY ST AND OLIVE AVE

PLAN & PROFILE

REGISTERED PROFESSIONAL ENGINEER
LOYD STEPHEN TOLAR
20679
OKLAHOMA
4/20/16

PROFILE SCALE:	DESIGN	DATE	DRAFTED	DATE
HORZ. 1:20	LST		JME	4/16
VERT. 1:5	REVIEWED	DATE	APPROVED	DATE
DRAWING NAME: PLAN	SHEET 5 OF 8		PROJECT NO. WL 1611	



A/6 METER VAULT PLAN
SCALE: 1/2" = 1'-0"

NOTES:

1. ALL COSTS FOR INSTALLATION OF PIPE AND MATERIALS BETWEEN AND INCLUDING 30"x18" REDUCERS SHALL BE INCLUDED IN LUMP SUM COST FOR METER VAULT.
2. ACCESS LADDERS SHALL BE 316 S.S. CONSTRUCTION WITH 316 S.S. HARDWARE. INSTALL PER MANUFACTURERS RECOMMENDATION. CONTRACTOR SHALL PROVIDE AND INSTALL "MILLER SOLL GLIDELOC 304 S.S." FALL PROTECTION SYSTEM ON ALL LADDERS. A TOTAL OF TWO TROLLEYS AND TWO HARNESSES SHALL BE SUPPLIED BY THE CONTRACTOR FOR THIS PROJECT.

REGISTERED PROFESSIONAL ENGINEER
LOYD STEPHEN TOLAR
20679
OKLAHOMA
4/20/16

DATE	REVISIONS

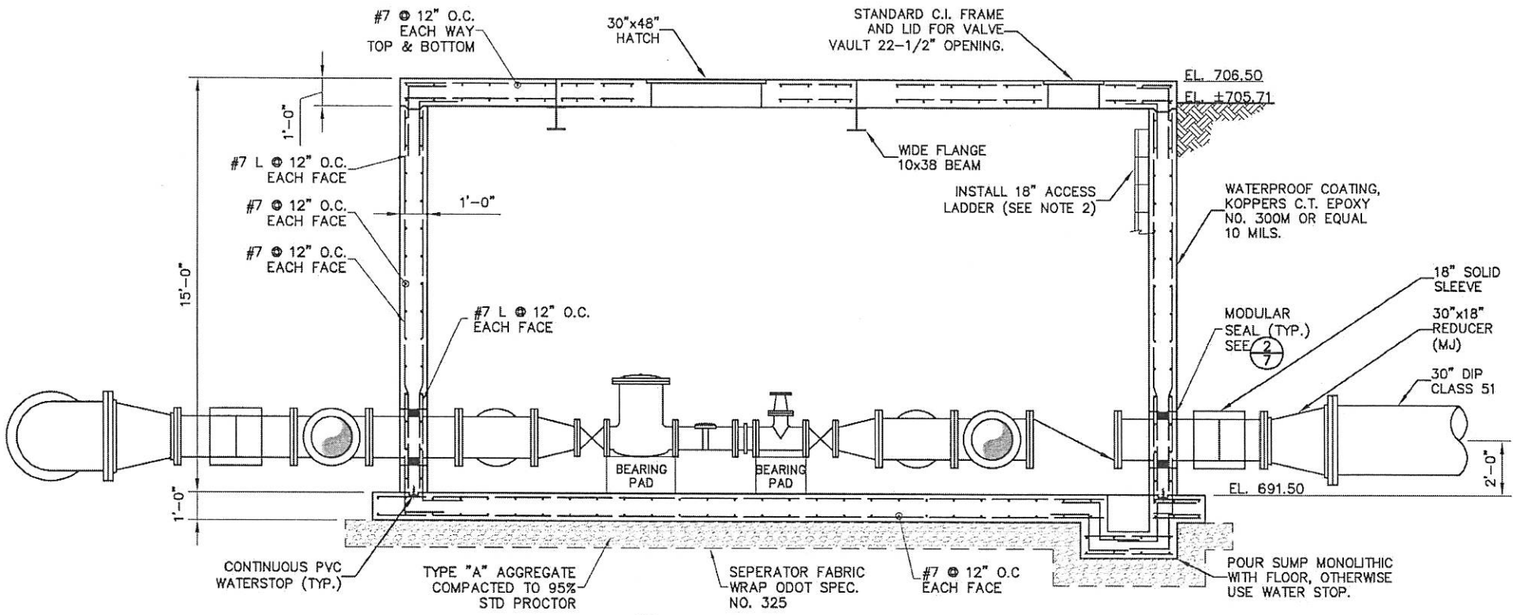
BROKEN ARROW Municipal Authority

N W E S 0 2' 4' 6'

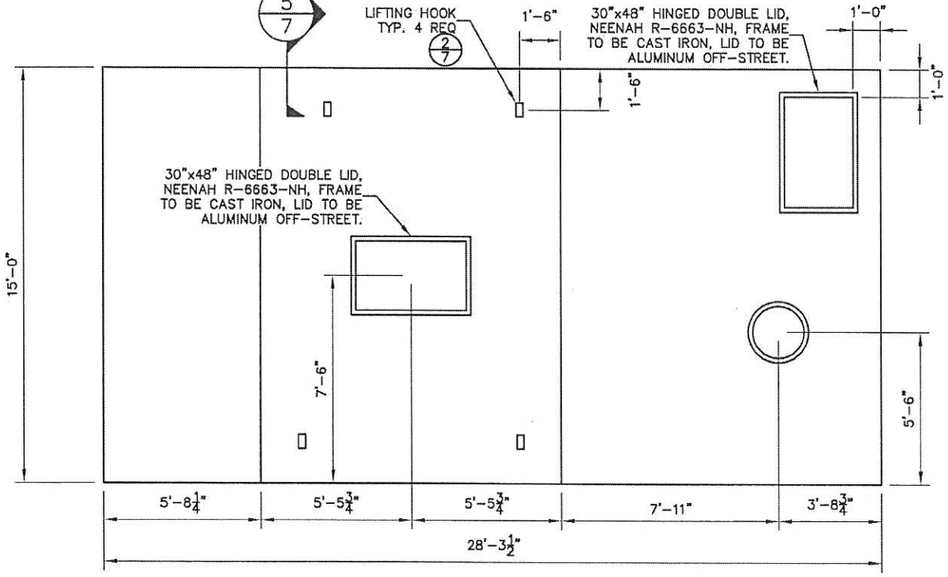
30" WATER LINE TULSA WATER CONNECTION AT ALBANY ST AND OLIVE AVE

VAULT DETAILS

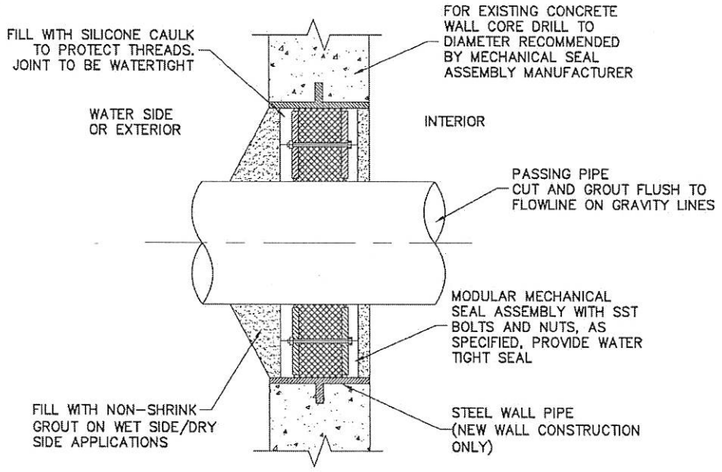
PROFILE SCALE: HORZ: VERT:	DESIGN LST	DATE	DRAFTED JME	DATE 4/16
	REVIEWED	DATE	APPROVED	DATE
DRAWING NAME: PLAN	SHEET 6 OF 8		PROJECT NO. WL. 1611	



1/7 METER VAULT SECTION
SCALE: 3/8" = 1'-0"



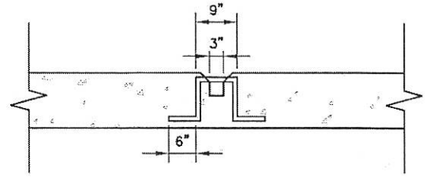
2/7 ROOF SLAB PLAN
SCALE: 3/8" = 1'-0"



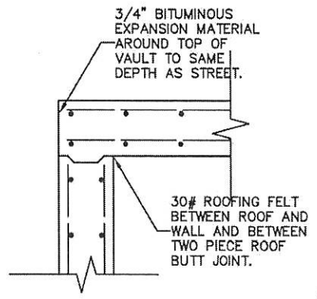
3/7 WALL PENETRATION DETAIL
SCALE: NTS

NOTES:

1. NOTICE SHALL BE GIVE TO CITY OF TULSA ENGINEERING SERVICES DEPARTMENT 48 HOURS IN ADVANCE SO THAT A REPRESENTATIVE OF THE DEPT. MAY WITNESS THE POURING OF THE VAULT AND INSPECT THE MATERIALS. A REPORT SHALL BE FURNISHED ON THE 7 DAY AND 28 DAY STRENGTH OF THE CONCRETE WHICH SHALL BE AT LEAST 4000 PSI. REINFORCING STEEL SHALL BE GR. 60.
2. WHERE RESTRAINED JOINTS ARE REQUIRED, THEY SHALL BE EBBA MEGALUG SERIES 1100 OR EQUAL.
3. METER AND FITTING FROM VALVE TO VALVE SHALL BE ASSEMBLED IN A SHOP ENVIRONMENT APPROVED BY A REPRESENTATIVE OF CITY FO TULSA ENGINEERING SERVICES DEPARTMENT. METER AND FITTING SHALL BE DELIVERED TO THE JOB SITE WITH THE VALVES CLOSED IN ORDER TO PROTECT THE METER AND STRAINER.
4. USE DUCTILE IRON PIPING AND ID/CI FITTINGS FROM THE MAIN LINE TAPPING SLEEVE TO DOWNSTREAM FROM THE METER CHECK VALVE AT THE CONNECTING SLEEVE. PIPE SHALL BE WRAPPED WITH POLYETHYLENE FILM AND TAPED.
5. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO FURNISH FITTING COMPATIBLE WITH THE TYPE OF PIPE FURNISHED.
6. BOLT AND NUTS SHALL CONFORM TO ASTM A-307 GR "B", AND ASTM A-563 GR. "A" RESPECTIVELY. STRUCTURAL STEEL SHALL BE ASTM A-36.
7. BYPASS VALVE SHALL BE SEALED SHUT BY CITY OF TULSA USING A WATER METER SEAL WIRE.
8. TEST TEE SHALL CONSIST OF:
   1 - 10"x10"X6" TEE FLG
   1 - 6"x4" SWEDGE NIPPLE FLG. ON 6" END, 4" END THREADED WITH SCREW CAP.
9. CHAMFER EXPOSED CORNERS. EDGE AROUND OPENINGS IN TOP.
10. BEARING PADS HAVE NO REBAR.
11. VAULT ASSEMBLY SHALL INCLUDE ALL MATERIALS AND LABOR FOR AN INSTALLED AUTOMATED METER READING (AMR) DEVICE PER CONSTRUCTION SPECIFICATIONS DIVISION V. AMR DEVICE SHALL INCLUDE MIU ANTENNA PENETRATING THRU HATCH, MIU POTTED REGISTER, REQUIRED CABLE, AND GEL-CAP 9IF REQUIRED). AMR INSTALLATION SHALL BE APPROVED AND TESTED BY ENGINEER OR ENGINEER'S DESIGNEE.



4/7 LIFTING HOOK DETAIL
SCALE: 3/4" = 1'-0"



5/7 REMOVABLE PANEL DE
SCALE: 3/4" = 1'-0"

REGISTERED PROFESSIONAL ENGINEER
LOYD STEPHEN TOLAR
20679
OKLAHOMA
4/20/16

DATE	REVISIONS

BROKEN ARROW Municipal Authority

N W E S 0 2' 4' 6'

30" WATER LINE TULSA WATER CONNECTION AT ALBANY ST AND OLIVE AVE

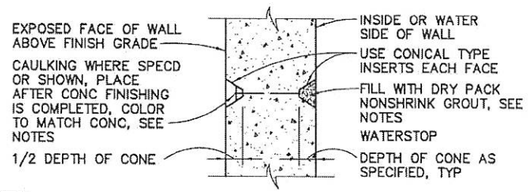
VAULT DETAILS

PROFILE SCALE: HORZ. ____ VERT. ____	DESIGN	DATE	DRAFTED	DATE
	LST		JME	4/16
	REVIEWED	DATE	APPROVED	DATE
DRAWING NAME: PLAN	SHEET 7 OF 8		PROJECT NO. WL 1611	

GENERAL CONSTRUCTION NOTES

CORNER AND INTERSECTION REINFORCING DETAILS

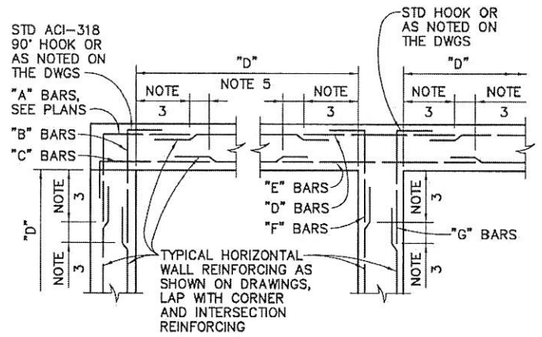
1. TYPICAL HORIZONTAL WALL CORNER AND INTERSECTION REINFORCING LAYOUT IS SHOWN TO AVOID CONGESTION AND PERMIT PROPER PLACEMENT. FOR SIZE AND SPACING SEE PLANS. ALL HORIZONTAL REINFORCING AT CORNERS AND INTERSECTIONS SHALL BE FABRICATED AND INSTALLED WITH SPLICES LOCATED WHERE SHOWN REGARDLESS OF BAR SIZE AND SPACING
2. WHERE THE CORNER OR INTERSECTION REINFORCING SIZE AND SPACING IS NOT SHOWN, NOTED OR TABULATED ON THE PLANS, THE SIZE AND SPACING SHALL BE THE SAME AS THE WALL HORIZONTAL REINFORCING SHOWN ON THE WALL SECTIONS OR AS NOTED FOR THE REINFORCING BETWEEN THE CORNERS OR INTERSECTIONS
3. EXCEPT WHERE OTHERWISE SHOWN ON THE DRAWINGS, THE LENGTH INDICATED AS "NOTE 3" SHALL BE THE LESSER OF D/4, 10 FEET, OR 1.0 TIMES THE HEIGHT OF THE WALL, EXCEPT THAT IN NO CASE SHALL IT BE LESS THAN 2.0 FEET
4. D = LENGTH OF WALL PARALLEL TO THE BAR LENGTH IN QUESTION
5. EXCEPT WHERE OTHERWISE SHOWN ON THE DRAWINGS, THE LENGTH INDICATED AS "NOTE 5" SHALL BE EQUAL TO ONE "LAP LENGTH" AS REQUIRED BY THE GENERAL STRUCTURAL NOTES. USE THE LAP LENGTH AS REQUIRED FOR THE SMALLER OF THE TWO REINFORCING BARS BEING SPLICED
6. UNLESS OTHERWISE NOTED, "B" AND "C" BARS ARE THE SAME SIZE AND SPACING AND "F" AND "G" BARS ARE THE SAME SIZE AND SPACING



NOTES:

1. FOR FORM TIE HOLES ON OUTSIDE FACE OF WALL BELOW GRADE. FILL WITH NONSHRINK GROUT, (DRY PACK)
2. THE SPACING OF FORM TIES ON EXPOSED PORTIONS OF WALLS SHALL BE APPROXIMATELY EQUAL HORIZONTALLY AND VERTICALLY AND SHALL BE UNIFORM IN EACH DIRECTION
3. WHERE CHAULKING IS NOT SPECIFIED OR SHOWN, DRY PACK EXTERIOR TIE HOLES WITH NONSHRINK GROUT WITH COLOR OF GROUT TO MATCH COLOR OF CONCRETE AS CLOSE AS POSSIBLE
4. DRY PACK METHOD SHALL BE AS SPECIFIED USING STEEL TOOLS

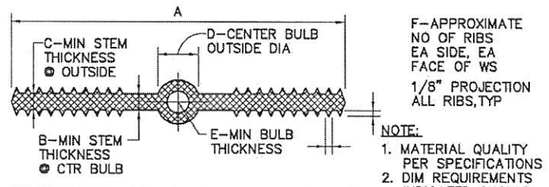
1/21 FORM SNAP TIE–HOLE
NTS



TYPICAL DOUBLE MAT CORNER AND INTERSECTION REINFORCING

2/21 NTS

(SEE PLANS FOR SIZE AND SPACING)

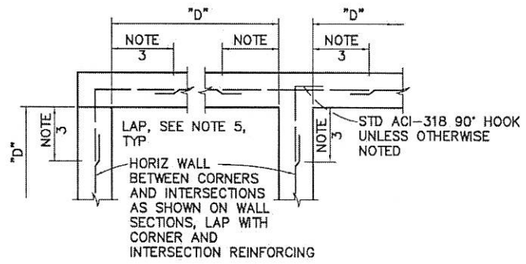


NOTE:

1. MATERIAL QUALITY PER SPECIFICATIONS
2. DIM REQUIREMENTS INDICATED SHOULD BE GIVEN TO SUPPLIERS PRIOR TO PLACING ORDERS
3. NON–ROUND CENTER BULBS SHALL HAVE A MIN OUTSIDE DIM OF "D"

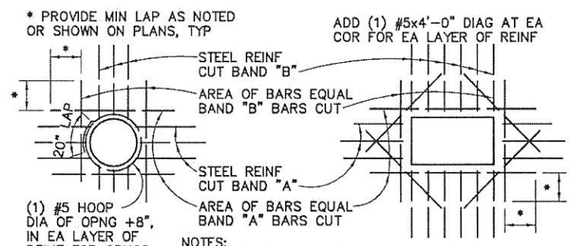
SIZE	A	B	C	D	E	F
4"x1/4	4"	1/4		3/4	1/4	4
6"x3/8	6"	3/8		7/8	1/4	5
9"x7/8	9"	7/8		1"	1/4	8

3/21 PLASTIC WATER STOP
NTS



TYPICAL SINGLE MAT CORNER AND INTERSECTION REINFORCING

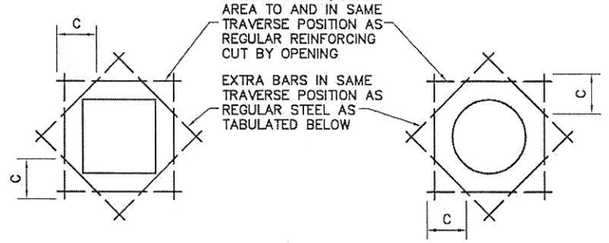
4/21 NTS



NOTES:

1. TYPICAL FOR ALL OPENINGS IN CONCRETE WALLS AND SLABS UNLESS INDICATED OTHERWISE ON PLANS
2. DO NOT WELD REINFORCEMENT TO PIPE SLEEVES AND INSERTS

5/21 OPENING REINFORCING
NTS



FOR RECTANGULAR OPENINGS LARGER THAN 14" DIAGONAL

FOR CIRCULAR OPENINGS LARGER THAN 14" DIAMETER

THICKNESS OF CONCRETE	BAR SIZE	BAR LENGTH "C"
<12"	4	3'–0"
12" TO 18"	5	3'–0"
>18"	6	3'–8"

TYPICAL EXTRA REINFORCING AT OPENINGS AND HATCHES

6/21 NTS

REGISTERED PROFESSIONAL ENGINEER
LOYD STEPHEN TOLAR
20679
OKLAHOMA
4/20/16

DATE	REVISIONS

BROKEN ARROW
Municipal Authority

N W E S 0 0 0 0

30" WATER LINE
TULSA WATER CONNECTION
AT ALBANY ST AND OLIVE AVE

STRUCTURAL DETAILS

PROFILE SCALE:	DESIGN	DATE	DRAFTED	DATE
HORZ.	LST		JME	4/16
VERT	REVIEWED	DATE	APPROVED	DATE
DRAWING NAME: PLAN	SHEET 8 OF 8		PROJECT NO. WL 1611	