

Drainage Advisory Committee

PROJECT REPORT

DATE:	January 16, 2025/April 24, 2025
NAME	Patrick Wilson, City of Broken Arrow
ADDRESS / LOCATION	Covington Creek Tributary, City of Broken Arrow
WATERSHED	Adams Creek
ESTIMATE	\$500,000
CASE NO.	25-005

DESCRIPTION

Deer Creek, an Unnamed Tributary to Covington Creek, and Covington Creek are experiencing increased erosion due to high velocity. The higher velocities create an erosive force that breakdown creek embankments, transports suspended soil particles and deposits sediments along these drainage ways. The sediments build up and trap floating debris, which blocks and impedes flow in the creek. In addition, the increased velocities due to the blockages under cut and erode away embankment material that supports vegetation as well as public and private infrastructure along the creek banks. All 3 creeks are located on private property owned by an HOA or individual homeowners. See attached report dated July 2020.

The Drainage Advisory Committee recommended on 7/27/20 and Council approved on 8/18/20 the expenditure of \$35,000.00 for design and construction plans to mitigate the creeks mentioned above.

The Drainage Advisory Committee recommended on 2/28/22 and Council approved on 3/21/22 the expenditure of \$30,000.00 for applying for an Individual 404 Permit from the United States Army Corps of Engineers and to finalize the construction documents.

The USACE Individual Permit has been processed and was executed by the City of Broken Arrow on April 17, 2025.

A Floodplain Development Permit still needs to be submitted to the City of Broken Arrow.

The conceptual construction cost estimate was approximately \$480.000.00 (2020 dollars). After the design was complete the construction cost estimate increased to about \$1,137,000.00 (2022 dollars). The current construction cost estimate is \$1,200,000.

The HOA has requested a partnership with the City of Broken Arrow to share the construction costs.

BENEFIT

Mitigate the erosion to re-establish banks to protect an exposed City storm sewer headwall and a utility pole at the edge of the bank while reducing the flooding impacts.

RECOMMENDATION

Approve the request for expenditure of \$500,000 to construct erosion control and channel stabilization of Covington Creek Tributary.

COMPLETED BY:

Patrick Wilson

DATE: 1/16/25 & 4/24/25



Drainage Advisory Committee

APPLICATION

DATE:	1-16-2025
OWNER NAME:	Forest Ridge Homeowner's Association
PHONE NUMBER:	
EMAIL ADDRESS:	
OWNER MAILING ADDRESS:	404 N Forest Ridge Blvd, Broken Arrow, OK 74014
ADDRESS OF PROPERTY WITH DRAINAGE PROBLEM:	Numerous properties in Deer Creek, Stanford Landing, Wyckford, Covington Estates (West) and Coving Estates (East) subdivision. See Map
LOCATION OF DRAINAGE ISSUE ON PROPERTY:	In the man-made channel along Covington Creek Tributary

DESCRIPTION OF PROBLEM: (*PHOTOS SHOULD ACCOMPANY APPLICATION)

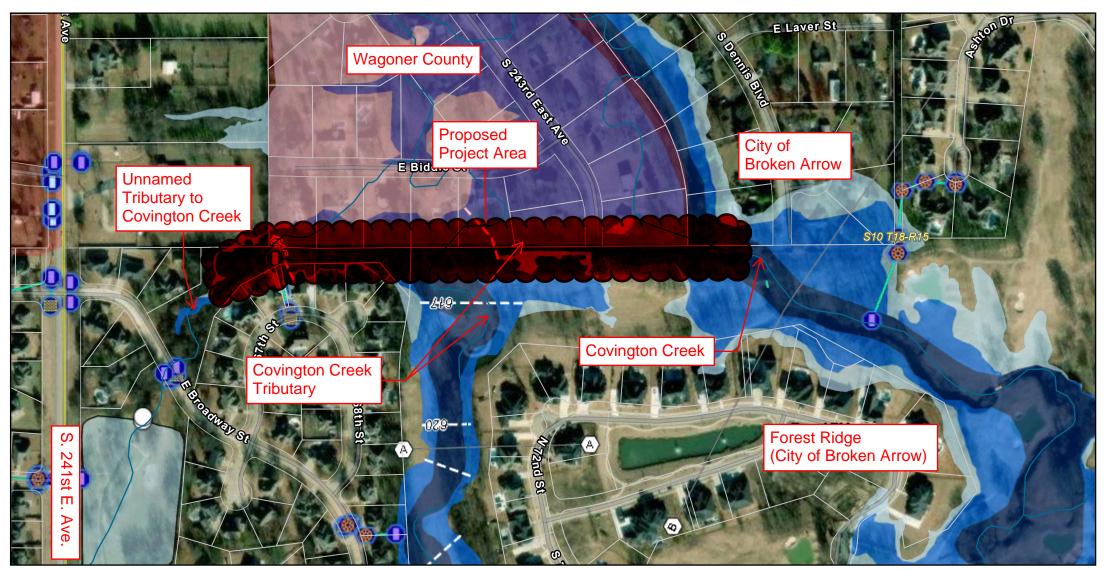
Copied from DAC application presented 7/27/2020.

The man-made channel between the Stanford Landing Subdivision, Wyckford Subdivision and Covington Estates Subdivisions has eroded over time to the point that pedestrian trails, stormwater infrastructure and trees are in danger of falling into the channel and, thereby, creating significant blockages to the flow. This is very concerning because just a small amount of blockage can have a tremendous impact on whether or not properties flood during routine storm events. It is important for the channel to be maintained and kept free of debris and sedimentation deposits as much as practicable. The vast majority to almost the entirety of the channel is located in a drainage easement in the Covington Estates subdivisions. One of the subdivisions is under the jurisdiction of Wagoner County. The Forest Ridge Home Owner's Association and the residents of Covington Estates have agreed, in concept, to work with the City of Broken Arrow in an collaborative effort to mitigate the effects of erosion in this channel in order to better protect all residents in this vicinity. The Forest Ridge Home Owner's Association has agreed, in concept to this point, to help fund the construction of certain improvements. The Forest Ridge Homeowner's Association and the individual residents in Covington Estates (West) are seeking the City of Broken Arrow's assistance under the 2018 General Obligation Bond Program, Proposition 6 funds.

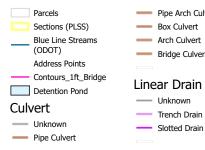
Signature:

RETURN TO STORMWATER DIVISION MANAGER'S OFFICE, PO BOX 610 Broken Arrow, OK 74013

Covington Creek Tributary



1/16/2025 8:25 AM



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Box Culvert	Un
Arch Culvert	- Aq
Bridge Culvert	Spi
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Linear Drain	— Dit
Unknown	- Roa
— Trench Drain	

Open Channel	

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oadside Gutter

BMP Inlet G Unknown

Pipe

— Unknown

— Force Main

Perforated

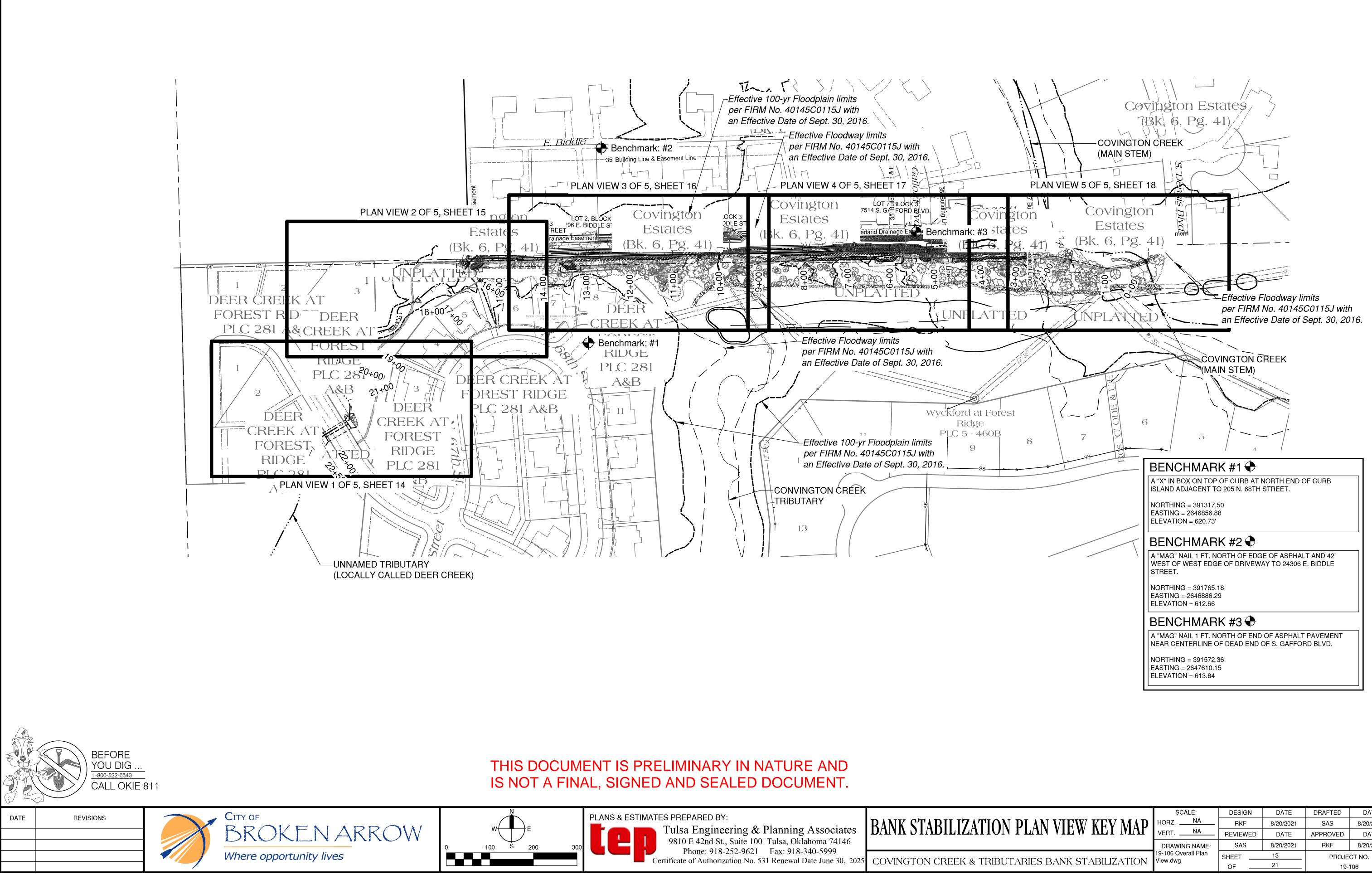
— Gravity

This map's utility information is for general purposes only. The City of Broken Arrow makes no warranties regarding its accuracy, completeness, or reliability. Use of this information is at risk.

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City of Tulsa, US Census Bureau, INCOG, & unknown, Esri Community Maps Contributors, City of Tulsa, Missouri Dept. of Conservation, Missouri DNR, Texas Parks & Wildlife, © OpenStreetMap, Microsoft, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, US Census





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	VERT. <u>NA</u>	REVIEWED	DATE	APPROVED	DATE	torm
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CITY OF BROKEN ARROW

COVINGTON ESTATES CHANNEL DRAINAGE REPORT

JULY 2020

PREPARED FOR THE DRAINAGE ADVISORY COMMITTEE

EXECUTIVE SUMMARY

In 2014, the Forest Ridge Homeowners Association (FRHOA) in connection with the Robson Companies, Inc. commenced with the construction of a segmental retaining structure within a manmade "cut-off" channel in order to prevent and mitigate the effects and impacts from continued erosion along the sides of the channel that is adjacent to the Forest Ridge golf course, which is now Wyckford at Forest Ridge subdivision. Although the initial construction of the retaining structure was located within a platted public drainage easement, it was later deemed improper by the Wagoner County District Attorney's office due to the fact that the FRHOA did not have the legal and proper authority to construct any improvements within the drainage easement. The construction effort has ceased and has not reconvened since late 2014.

Although this matter is considered a private property owner dispute, it has intertwined and involved officials from both Wagoner County and the City of Broken Arrow, as well as private professional engineering consultants. In 2018, after several attempts to resolve the conflict between the two (2) disputing parties, the FRHOA filed a lawsuit against the seven (7) adjacent property owners located in the Covington Estates (West) subdivision immediately north of the Forest Ridge golf course, now Wyckford at Forest Ridge subdivision. The lawsuit essentially claims that these seven (7) individuals have not provided the essential care and maintenance necessary to the man-made "cut-off" channel running across their individual properties, thereby allowing erosion to occur and damaging the adjacent FRHOA property. In turn, the individual property owners in Covington Estates have essentially stated, but not yet filed to the City's knowledge a counter lawsuit that the developers of the Forest Ridge subdivisions have increased stormwater flow onto their property that has adversely impacted and damaged their properties and property values.

During the 2018 General Obligation promotion meetings, representatives of the FRHOA questioned City representatives on whether or not Proposition No. 6 – Drainage funds could be utilized to finance an improvement to this "cut-off" channel. After some internal discussions, the City stated that there was a possibility that these funds might be available for such a project. Obviously, much more detail is required before a definitive answer could be provided. Regardless, any project that might be developed for Council's consideration absolutely must provide a direct and definable benefit to the residents of Broken Arrow.

Recently, after the passage of the 2018 General Obligation Bond and the FRHOA's filing of the lawsuit, both the FRHOA and the Covington Estates residents have reached out to the City of Broken Arrow and requested assistance in efforts to improve the drainage courses such that the public, specifically the residents of Broken Arrow experience a benefit. Staff believes that there may be an opportunity to address the continual and routine flooding as well as erosion related

issues immediately in this specific area. A more global and encompassing solution could produce a better and positive overall impact to all surrounding residents in this vicinity.

It is crucial to note that since some of the property in question lies outside of the city's jurisdiction and could be problematic regarding potential expenditures, the FRHOA has offered to pay some costs specifically associated with those areas located along the stretch of the channel where it abuts city and county jurisdiction.

Lastly, it should be noted that Staff has not developed a project at this time, but instead desires to seek the Council's input in this highly volatile matter before any further engagement commences. The following attached report provides significant details regarding this matter.

DETAILED REPORT

Introduction. Associated with the preparation and then subsequent passage of the 2018 General Obligation Bond Program, a representative of the Forest Ridge Homeowner's Association (FRHOA) asked if the Proposition 6: Drainage funds could be used for a specific project in the Forest Ridge community. The area in question is the man-made creek channelization section that runs from west to east along the northern border of the Deer Creek at Forest Ridge subdivision and a portion of the former Forest Ridge Golf Course area, now Wyckford at Forest Ridge subdivision, coupled with the southern border of the Covington Estates subdivision. The proposed project in question is an embankment stabilization effort and a stormwater conveyance improvement effort along this specific section of the drainage way.

Background. The Covington Creek watershed has a significant history of being a challenging drainage basin with regards to flooding and erosion effects since long before the Robson Companies began to develop the Forest Ridge planned community. In fact, the Oklahoma Department of Transportation (ODOT) indicates that the high water mark prior to the widening of the Kenosha Street (East 71st Street South) in the early 1980s is still above the current-day 100-year (1% chance) base flood elevation (BFE). This fact is evidenced in the Oklahoma Department of Transportation construction plans for Kenosha Street widening dated 1980.

The Covington Creek watershed lies within the larger Adams Creek watershed, which drains to the Verdigris River. The Covington Creek drainage basin consists of 5.92 square miles (3,789 acres). It begins just south of State of Oklahoma Highway 51 and meanders in a northerly manner 6.3 miles to its confluence with Adams Creek approximately one-half mile north of Kenosha Street and one-quarter mile east of East 65th Street South (Oneta Road). Please refer to Exhibit A for further clarity.

As Wagoner County began to develop and new residential, commercial and industrial subdivisions were platted, stormwater runoff increased due to the increased impervious areas in this basin until government regulations required on-site detention to offset this increased runoff. In efforts to address this increase in stormwater runoff in this area, as well as in their respective jurisdictions as a whole, local and county governments enacted subdivision regulations and stormwater management ordinances to counter-act the effects of increased stormwater runoff. The City of Broken Arrow was first to establish an ordinance regarding stormwater management in 1977 and followed up with a much more restrictive stormwater management ordinance adopted on April 25, 2002. Around the late 1980s to the early 1990s, Wagoner County likewise adopted subdivision regulations that required restrictive stormwater management approaches. On April 16, 2012, Wagoner County adopted a Flood Damage Prevention ordinance that provided much more restrictive criteria than prior approaches for development.

Development Area. Wagoner County records indicate that on March 6, 1974, the developers of the original Allison Estates Second subdivision filed a plat with the Wagoner County Clerk. On May 8, 1975, the owners filed a replat of the Allison Estates subdivision in Wagoner County and changed the name to Covington Estates subdivision. Both the original plat and the subsequent replat of this addition show a 30-foot to 40-foot platted drainage easement along the southern border of the subdivision, as well as a double 40-foot for a total of an 80-foot platted drainage easement running diagonally through the center of the subdivision. In April of 1989, the City of Broken Arrow prepared sanitary sewer plans for construction in order to install a new lift station and collection system as a part of an assessment district to incorporate the eastern half of Covington Estates subdivision into the city limits of Broken Arrow. The division line was the diagonal channel that ran through the middle of the Covington Estates subdivision. Please refer to Exhibit B for details of the drainage easement in question.

In 1986, shortly after the Covington Estates subdivision was re-platted, the Robson Companies began to develop the Forest Ridge subdivisions, a master planned, resort style, community in this same watershed. This community includes numerous subdivisions positioned around an athletic club and golf course. Currently, in July 2020, there are 15 individual subdivisions located on nearly 1,100 acres plus one (1) additional subdivision in the early phases of construction. These subdivisions are largely located south of Kenosha Street (East 71st Street South) and extend about one-half mile south of Houston Street (East 81st Street South) and are generally positioned along four (4) individual creeks: Covington Creek, an unnamed Covington Creek tributary, Timber Creek and Deer Creek. The majority of these subdivisions are located east of 65th Street (South 241st East Avenue also known as Oneta Road) and west of 79th Street (South 257th East Avenue also known as Midway Road).

Most crucial to these discussions are those subdivisions that drain directly to Covington Creek on the eastern side of the Forest Ridge community, the unnamed tributary in the center of the development that drains into Covington Creek and, lastly, Deer Creek along the western boundary of the community that drains into the unnamed tributary. Please refer to Exhibit C for clarity of the proposed project area.

Covington Estates Subdivision History. In 1974, when the Sandlane Investment Company platted the original Allison Estates Second subdivision, which later was re-platted as the Covington Estates subdivision, and began construction on the public improvements, the developer constructed man-made channels that essentially redirected the stormwater runoff collected in all three (3) creeks (Covington Creek, the unnamed tributary of Covington Creek and Deer Creek) and rerouted the stormwater through the subdivision. The developer constructed two (2) "cut-off" channels to reroute the runoff to a single main channel that drained through the center of the Covington Estates subdivision.

One "cut-off" channel runs eastward about 1,400 feet from Deer Creek on the far western side of the subdivision due east to the point at which the main channel was constructed. In addition, this particular channel intercepts the unnamed tributary of Covington Creek about midway between Deer Creek and the main channel. The other "cut-off" channel runs westward about 400 feet east of the main channel and collects Covington Creek near the midpoint of the channel. Both channels reroute the upstream stormwater runoff to the main channel.

At this juncture, the developer essentially rerouted all three (3) creeks and combined them in one (1) main man-made channel that divided the subdivision into two (2) halves. One-half (1/2) on the western side of the channel and one-half (1/2) on the eastern side of the channel. This main channel runs generally in a northwest direction through the subdivision.

These three (3) different "cut-off" channel segments consist of varying drainage easement widths along the southern side of the Covington Estates' properties. The western "cut-off" channel was placed within a 40-foot wide drainage easement, except for one section that was placed within a 30-foot wide drainage easement. The eastern "cut-off" channel was placed within a 20-foot wide drainage easement. The main channel was placed within an 80-foot wide drainage easement.

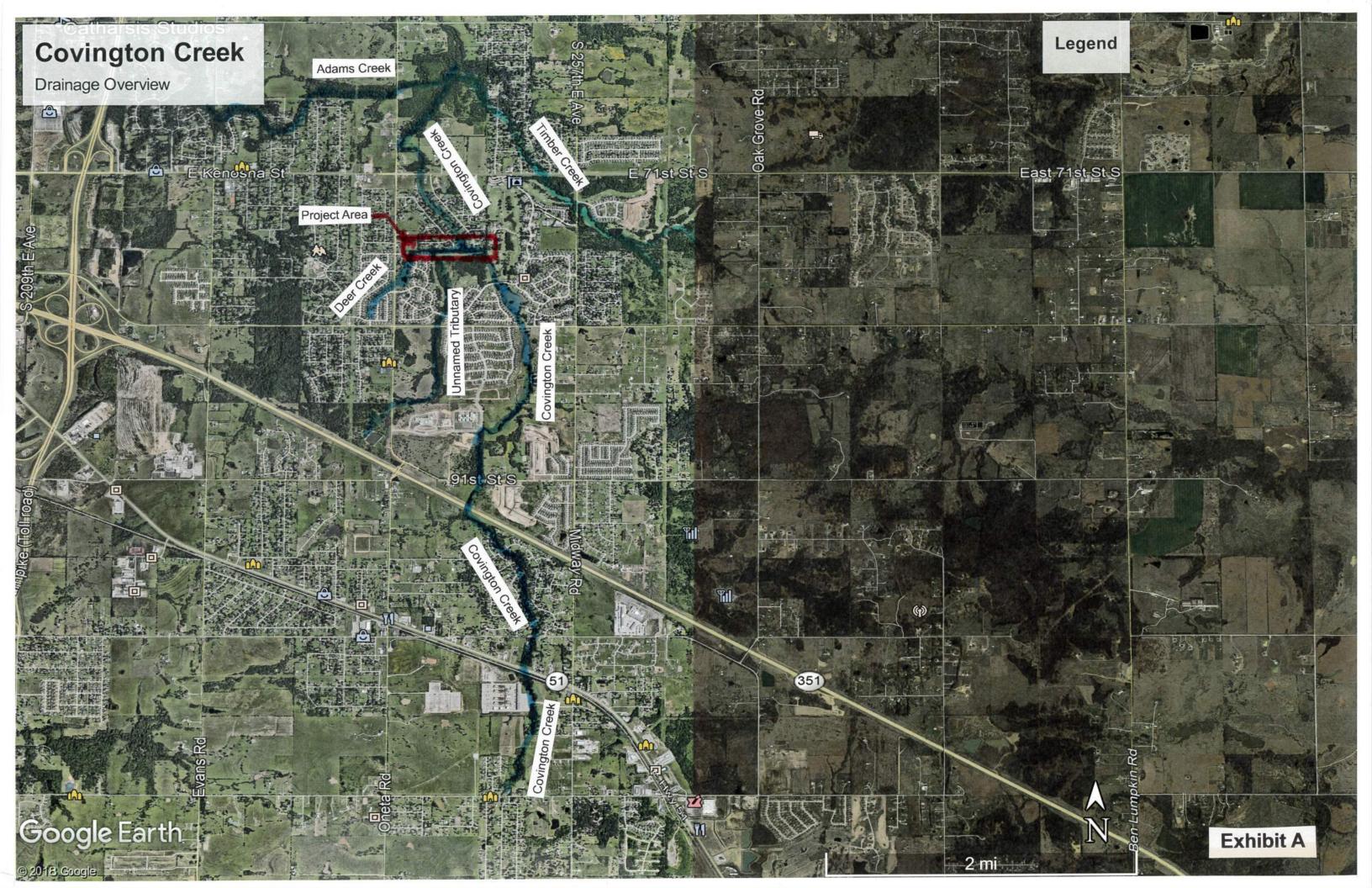
Forest Ridge Subdivision History. In the late 1980s, the Robson Companies, Inc. constructed the Forest Ridge golf course. A portion of the golf course ran alongside the Covington Estates' man-made "cut-off" channels along the southern border of the subdivision. Over time, Forest Ridge developed residential subdivisions around the golf course and the Covington Estates subdivision. Some subdivisions were developed along Covington Creek main stem. Others were developed west of the main stem along an unnamed tributary of Covington Creek and along Deer Creek, while other subdivisions were developed to the north and east of the main stem along Timber Creek. The main focus of this report are those subdivisions developed along Deer Creek and along the unnamed tributary to the west of the confluence of Covington Creek.

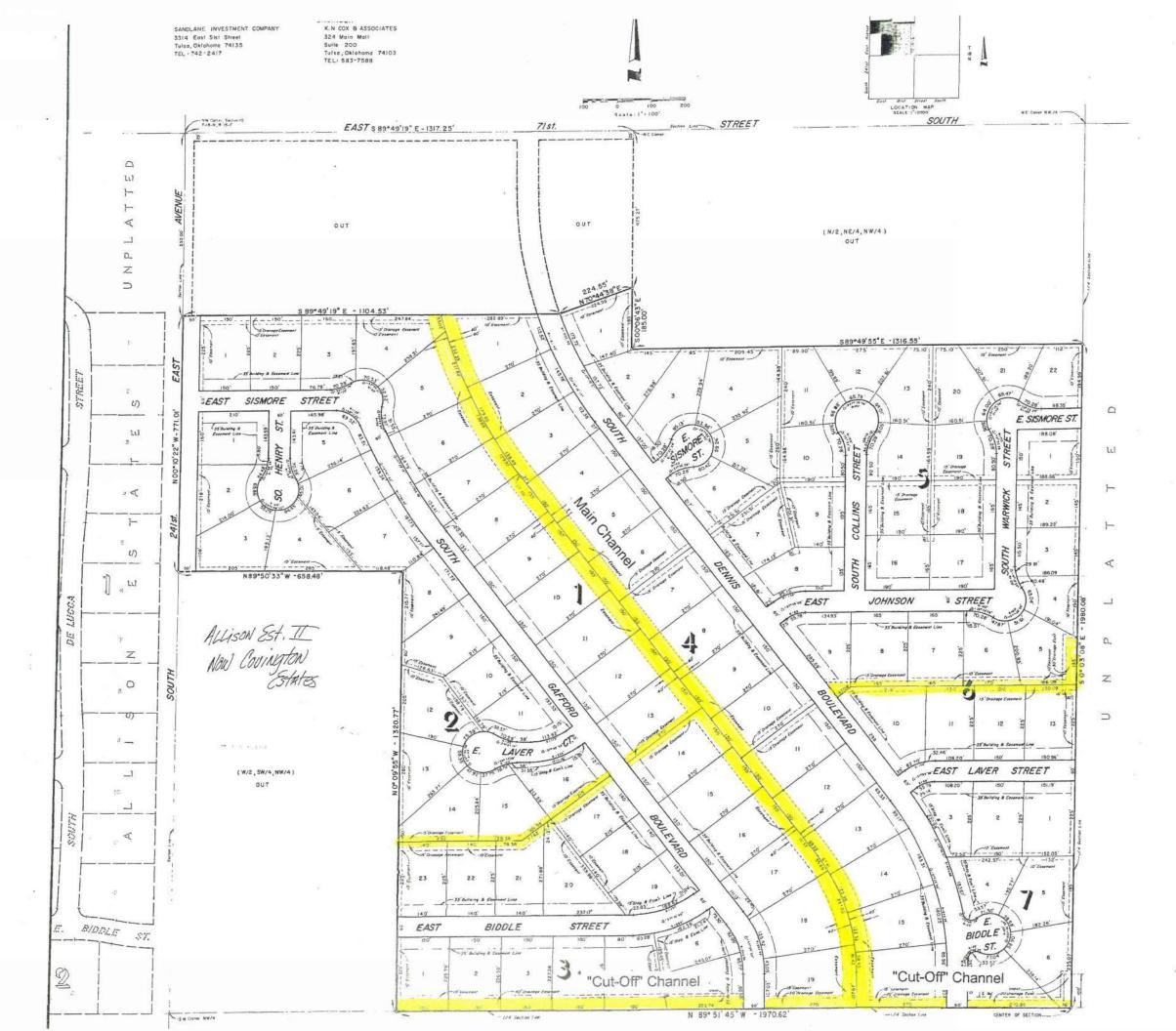
A few of the more pertinent subdivisions regarding this particular issue and that drain directly into this man-made channel include the following: Deer Creek at Forest Ridge, Deer Creek II at Forest Ridge, Deer Creek III at Forest Ridge, Stanford's Landing I at Forest Ridge, Stanford's Landing II at Forest Ridge, Stanford's Landing III at Forest Ridge, The Highlands I at Forest Ridge, The Highlands II at Forest Ridge, The Highlands III at Forest Ridge, The Highlands IV at Forest Ridge, and now Wyckford at Forest Ridge. Essentially, this equates to the southeast quarter of Section 9, the southwest quarter of Section 10, the northwest quarter of Section 15, and the northeast quarter of Section 16 all in Township 18 North and Range 15 East, based upon the Indian Meridian. The drainage area is approximately one square mile. All the subdivisions identified above are located within the city limits of Broken Arrow. Please refer to Table 1 for identification of all pertinent subdivisions that affect these drainage ways.

Drainage Issue. Historically, the Covington Estates subdivision west and to a lesser extent to the east of the main channel has experienced significant flooding. The flooding largely affects property owners that reside outside of the jurisdiction of the city; however, several property owners that reside within the city limits are affected as well.

Not only does this area experience repeat flooding, but the energy within routine stormwater runoff flows create erosive forces that breakdown creek embankments, transports suspended soil particles and deposits sediments along these drainage ways. These sediments build up and trap floating debris, which blocks and impedes flow in the creek. In addition, the increased velocities due to the blockages under cut and erode away embankment material that supports vegetation as well as public and private stormwater infrastructure along the creek banks.

Potential Mitigation Efforts. Both the FRHOA and the Covington Estates' affected property owners have agreed in concept that if the City of Broken Arrow could participate in a more global solution that benefited all parties including FRHOA, the Covington Estates residents and the residents of Broken Arrow in the project vicinity, then the parties in conflict would be willing to work together to resolve the matter.





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AMD, the undersigned OWHS, for the purpose of providing an orderly development of the entire tract, and for the further purpose of insuring adequate restrictions and covenants, and for the matual benefit of the undersigned OWHM, its successors and assigns, and the adjacent owners absting the tract, their suc-ressors and assigns, do hereby inpose the following restrictions. Himitations and reservations which shall be binding upon all subsequent purchasers.

PROFECTIVE COVEHANTS AND RESTRICTIONS

ne supply of electric and telephone service may be located underground in the easement ways reserved for general utility services, shown on the atlached plat. Service predetals and transformers, as more're if supply at secondary voltages may also be located in asid enzement ways. Underground service cables to 11 houses which may be located on all lots in said dad.lion may run from the magrest service predetal or consoferer to the point of using determined by the location and construction of such thouse as may be loca-ated upon said lat: provided that upon the installation of the way is definition to a supplication of shown on the state of the service set of the supplication of electric service shall thereaft to evering a five fort strip extending 2.5 feel on each of seclusive right-of-way connect on said loc.

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- than six feet. unces from streets shall have drain title, size approved by developer or County Commis Wagoner County. 18. All individual sever systems to be constructed according to County and State Health Depa
- ments. 15. There will be no less than 1500 square foot of liveable floor area in the residence, exclusive of garage.
- perch and putto areas. No building shall be arected nearer to the front property line than the building line shown on the plat. Fror to the construction of any residence, a drain tile of the proper size shall be installed in the readway ditch at the drive location.

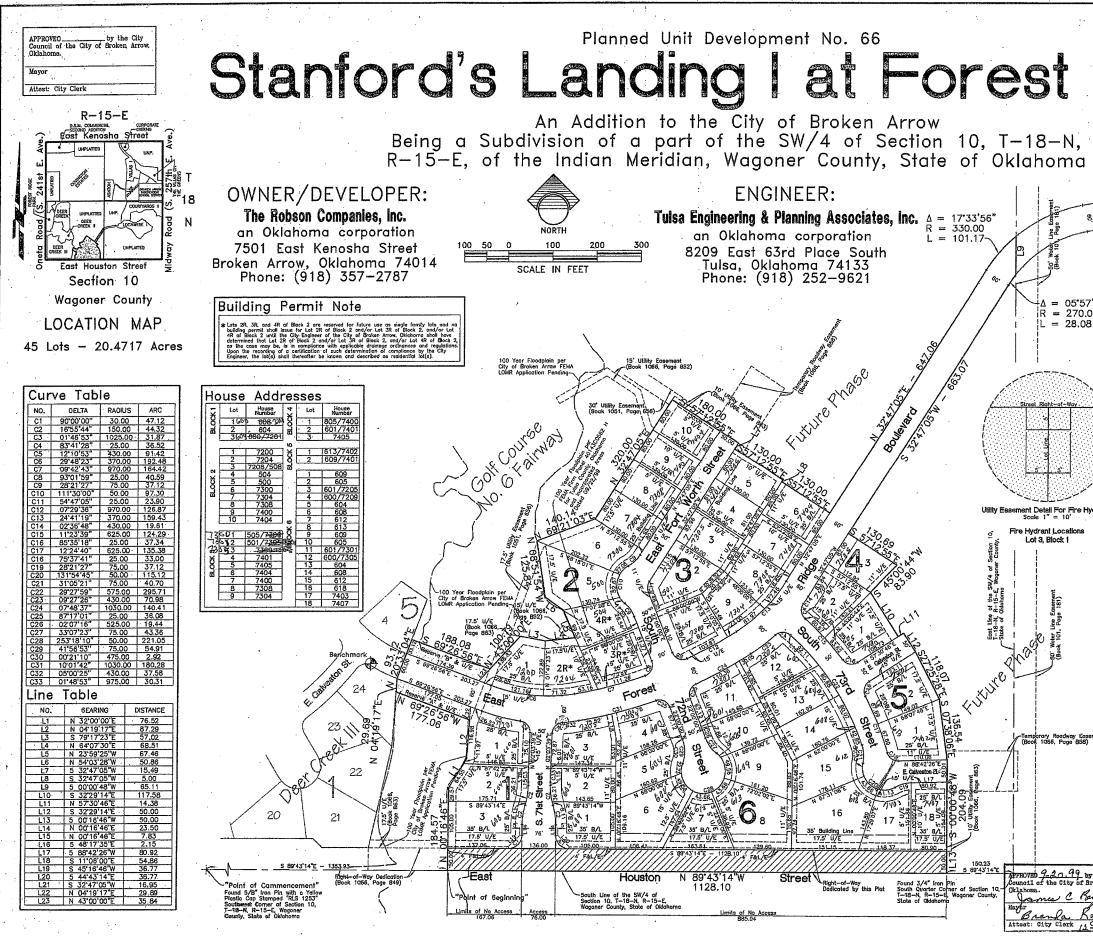
AVHORD G. FELDHAN S Telle STATE OF OKLAHOMA 54. COUNTY OF TULSA Before me, the undersigned, a Notary Public in and for said Gounty and State, on this 7.5 day of identical person who subscribed the name of the maker thereof to the foregoing instrument and as its Pres dent acknowledged to de that he securited the same at his free and voluntary at and deed and as the free and voluntary act and deed of such corporation for the uses and purposes therein set forth. NOTARY PUBLIC My Commission Expires: _ _ _ _ _ _ / / / / / / // CERTIFICATE OF SURVEY We, K, K, COX & ASSOCIATES, ENGINEERS of Tulsa, Oklahoma, hereby certify that we have, at the instance of the QWICK designated abuve, made the above described survey, and that the accompanying plat is a true and correct representation of said survey. Signed and sealed this 3/11 day of ances . 1974. K. W COX & USOONDES. ENTINEERS By JACK C. COX. Registered Land Surveyor STATE OF OKLAHOMA] SS. June Li Alman Hy cumission Expires Sliptantbar 12,1994 Cartify that the tage we want on the setme description - 3.6.194 Exhibit B Wagman Cacarta Swasana



Table 1

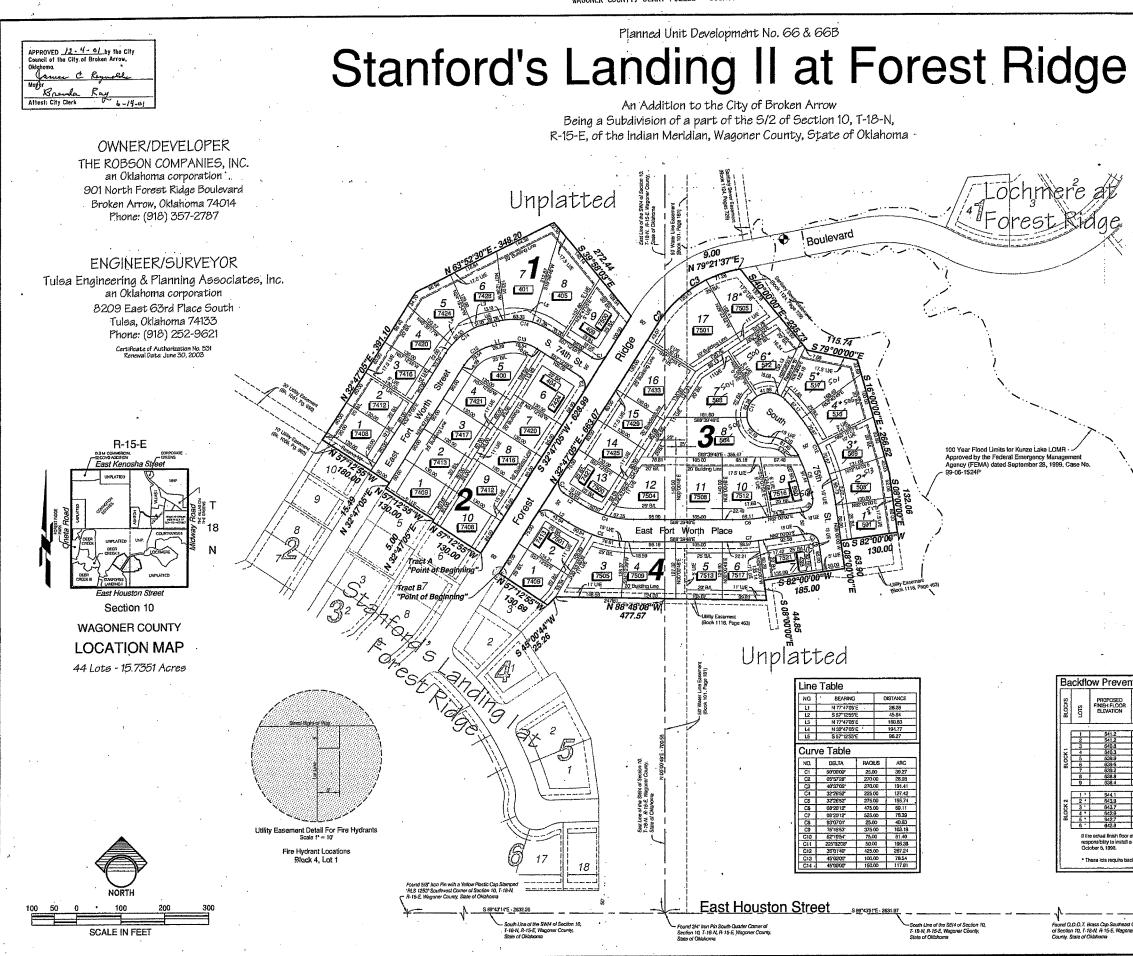
Forest Rdige Developments								
Subdivision Name	S-T-R	PUD No	Date	Recordation No.				
Allison Estates Second	10-18-15	NA	3/6/1974	Bk 6 Pg 29				
Covington Estates replat of Allison Estates Second	10-18-15	NA	5/8/1975	Bk 6 Pg 41				
Deer Creek at Forest Ridge	10-18-15	66	11/7/1990	2				
Deer Creek II at Forest Ridge	10-18-15	66	11/9/1992					
Deer Creek III at Forest Ridge	10-18-15	66	11/9/1992					
Stanford's Landing I at Forest Ridge	10-18-15	66	12/7/1999	199916243				
Stanford's Landing II at Forest Ridge	10-18-15	66 & 66B	6/15/2001	2001 7771				
Stanford's Landing III at Forest Ridge	10-18-15	66 & 66B	4/4/2003	2003 5436				
Highlands I at Forest Ridge	15-18-15		1/13/2003	2003 632				
Highlands II at Forest Ridge	15-18-15		8/16/2004	2004 12676				
Highlands III at Forest Ridge	15-18-15		7/1/2008	2008 9498				
Highlands IV at Forest Ridge	15-18-15		12/6/2011	2011 13532				

FILE DATE: 12/07/1999 FILE TIME: 11:47 WAGONER COUNTY, JERRY FIELDS - COUNTY CLERK RECE#: 199916243



PI	I the undersigned, the duty quolified and acting County Treasurer, of Wagoner County, Wogoner, Oktohormo, hereby certify that according to the <u></u>
	Mary Sue Tedder, County Treasurer
	Jaray Dual Scale
	Lochmere at Forest Ridge
	Backflow Preventer Valve Table
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	Top of Bross Cop set on top af curb approximately 18 feet east of handicop occess romp in the Southeast Quadrant of Forest Ridge Boulevord and East Golveston Street. ELEVATION = 646.53 N.G.V.O. 1929
	Basis of Bearings
	The bearings shown hereon are based on an assumed bearing of N8943714W along the South line of the SW/4 of Section 10, T-18-N, R-15-E, of the Indian 6ase and Meridian, Waganer County, State of Okiahamo.
	U/E = Utility Easement F&L/E = Fence & Landscope Easement 8/L = 8uilding Line Right-of-Way
ment	ZZZ - Oedicated bý this Plat
	Monument Notes A 5/8" x 18" deformed bar with o yellow plostic cop stomped "RLS 1253" to be set of oll plot boundary carner., prior to recordotian, unless noted
	A 3/8" x 18" deformed bor with o yellow plastic cap stomped "RLS 1253" to be set to all lot carners, ofter completion of improvements, unless noted otherwise.
	A 3/8" x 18" deformed bor with a yellaw plastic cap stamped "RLS 1253" to be set at all street centerline intersections, points of curve, points of tangent, pointe of compaund curve, points of reverse curve, center of cu ⁻¹ de-socs and center of eyebrows, ofter completion of improvements, unless noted otherwise.
	Lot Addresses
y the City roken Arrow,	Addresses shown on thie plat provided by the City of Broken Arrow Planning, Deportment are accurate at the time the plat was filed, and the addresses are subject to change and should not be relied on in place of the legol description.
	Stanford's Landing I at Forest Ridge

BOOK: PLC4 PAGE: 378 RECE#: 2001 7771 ** FILE DATE: 06/15/2001 FILE TIME: 12:57 WAGONER COUNTY, JERRY FIELDS - COUNTY CLERK

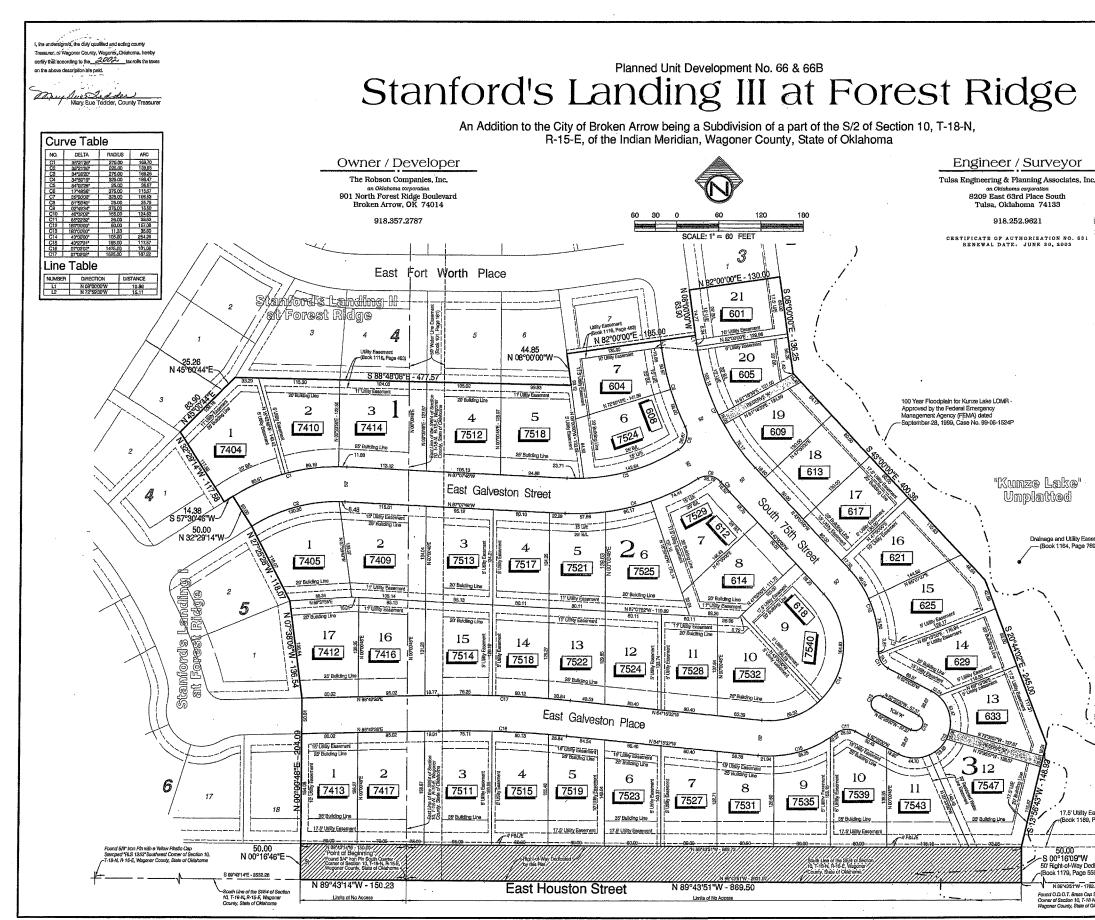


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PROPOSED FINISH FLOOR ELEVATION	UPSTREAM	TOP OF RIM ELEVATION	BLOCKS	rots	PROPOSEO FINISH FLOOR ELEVATION	UPSTREAM	TOP OF RIM ELEVATION	BLOCKS	LOTS	PROPOSEO FINISH FLOOR ELEVATION	UPSTREAM	TOP OF RIM ELEVATION
841.2	32	639.4] ~ [7	646.5	37	643.3		12	631.7	11	630.6
641.2	34	638.9	1×	8	648.8	8	644.3		13	631.6	10	630.5
640.8	34	638.9	BLOCK	9	651.4	6	844.3	2	14	631.7	10	630.5
640.3	34	638.9	긢	10	652.1	Ē	646.4	ð	15	632.0	. 9	628.5
539.9	34	638.9	- · ·					BLOCK 3	16	632.0	9	628.5
639.6	35	638.1	1 1	1.1	657.4	1	656.3	•	17	634.7	8	627.9
639.2	35	638.1		2.	655.1	14	656.8		18	638.1	B	627.9
538.8	36	637.5	1	31	653.7	14	655.8					
536.4	1 1	637.3	1.	4 *	652.4	14	656.6		1	657.4	T J	655.5
			1 2	5 *	651.1	14	656.8		2 .	655.0	20	654.3
\$44.1	0	646.8	BLOCK	6	649.5	13	647.5	BLOCK 4	3 1	653.7	20	654.3
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643.7	1 a	644.3	"	8 .	641.4	13	647.5	12	5	650.5	19	649.4
642.9	37	643.3	1	9	637.1	12	633.0	-	6'	648.7	19	649.4
842.7	37	643.3		10	634.5	12	633.0		7	845.6	18	640.0
642.8	37	643.3	I i	11.	631.6	12	633,0					
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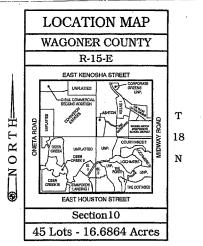
Lol 3, Block 3 Lol 4, Block 3

Stanford's Landing II at Forest Ridge Sheet 1 of 2



CERTIFIED TRUE COPY JERRY FIELDS COUNTY CLERK

Wagoner County, Okla By Sharon K. - Ile



Backflow Preventer Valve Table 23 642.0
 19
 640.4
 a
 640.5

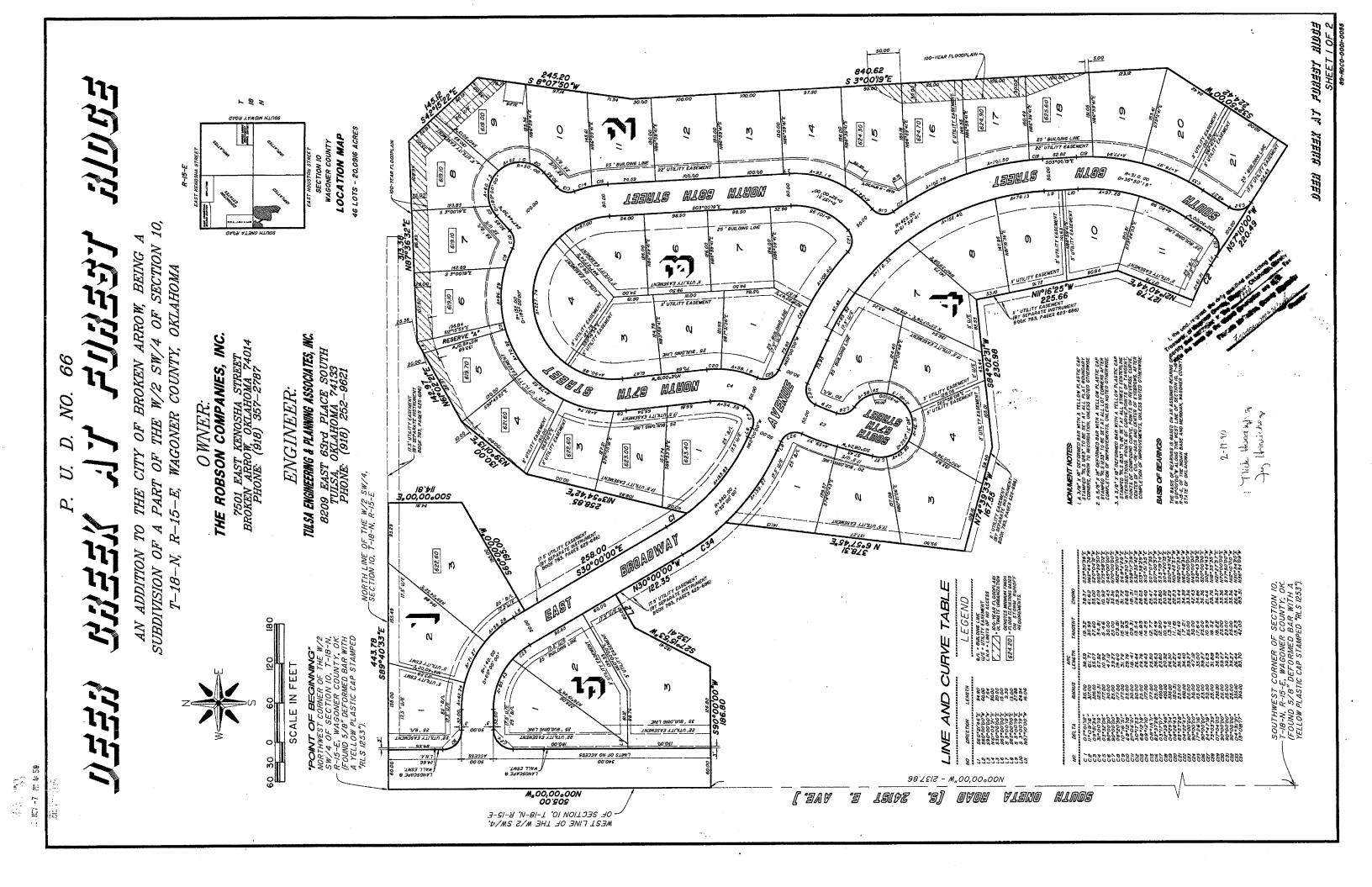
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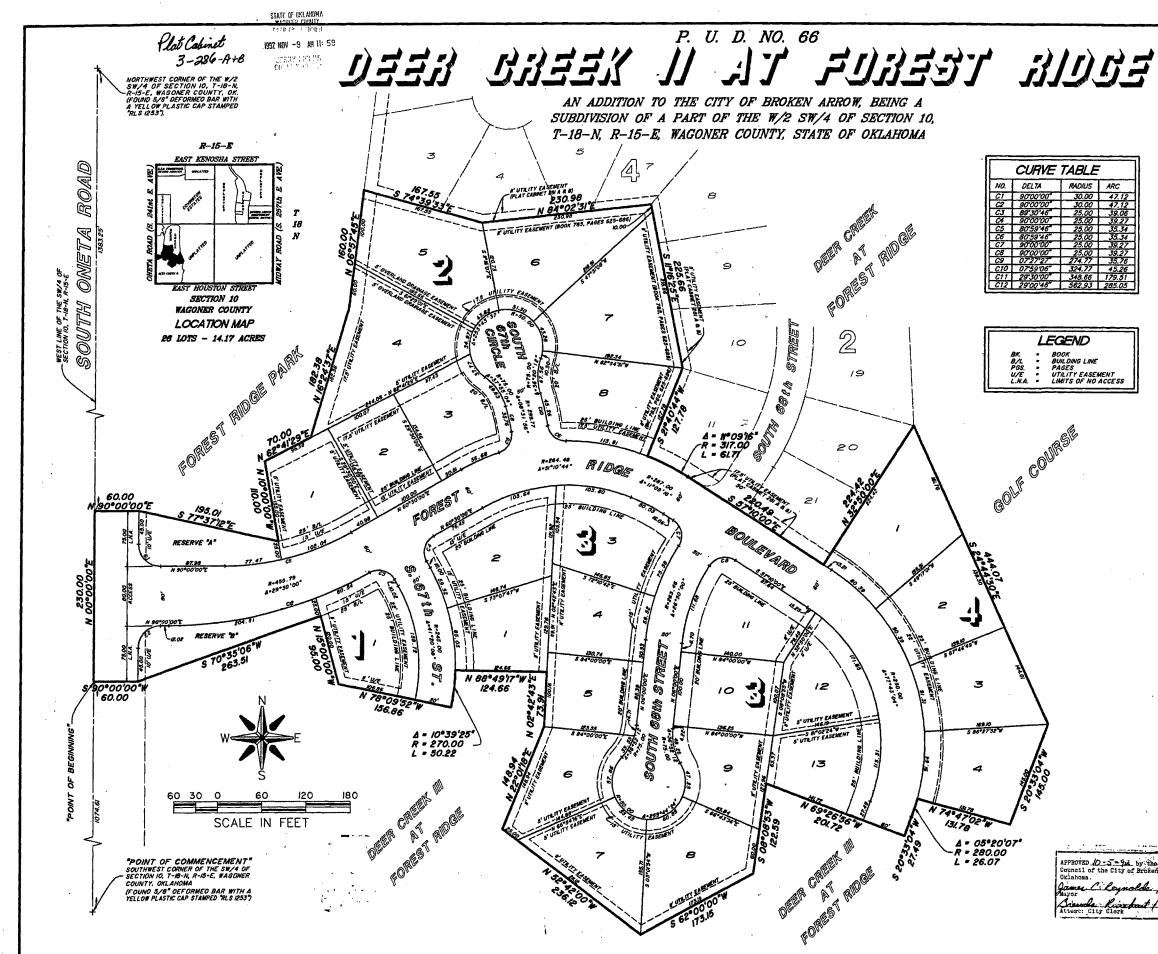
 18
 640.0
 18
 640.0
 manhole, it shall be the uncounter according to Broken Arrow Ordi * These lots require backflow p Benchmark Top of Brass Cap set in concrete aldewalk at the northwest corner of the Kunze Lake Bridge on Fores ELEVATION = 625.33 N.G.V.D. 1 Basis of Bearings The bearings shown hereon are based on an e the SE/4 of Saction 10, T-18-N, R-15-E, ol the I aring of N 89 *43'51'W along the South line Legend F&L/E - Fence & Landscape Right of Way dedicated by Plai - Utility Easemen - Reserve Area A & B B/L - Building Line TCM - Trafile Control Monument Notes A 5/6" x 18" deformed bar with a yellow plastic cap sta A 3/8" x 18" deformed bar with a yellow plastic ca A 3/8" x 18" deformed bar with a yellow plastic ca enter of cul-de-secs and center of e Lot Addresses Addresses shown on this Plet provided by the City of Braken Arrow Planning. Department are accurate at the time the plet was filed, and the addresses are subject to change and should not be relied an in

asement Page 537)
lication
Southeast
Mahama

	APPROVED <u>L. 6. 2. 3 by the City</u> Council of the City of Broken Arrow, Oldahoma. Frences & Reynolds Mayor Branchen Rann
	Attest: City Clerk 4-1-03
Stanford's La	nding III at Forest Ridg

PT02-126 02-207 Sheet 1 of 2





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ARC	
47.12	
39.06	
35.34	
39.27	
35.76	
79.51	
_	

BLOCKS	5107	PROPOSED FINISH FLOOR ELEVATION	TOP OF RIM ELEVATION OF UPSTREAM SANITARY MANHOLE
BLOCKI	1	637.2	<i>638.2</i>
	1	636,0	634.7
	2	636.5	634.7
6 4	J	636.7	634,2
BLOOK 2	4	633.0	632.6
8	5	633.2	630.0
	6	633.2	631,3
	7	634.4	633.7
	8	636.1	633.7
	1 2	638.8	639.1
	3	637.7 639.5	639.1
	4	640.5	639.1 639.1
	5	641.6	639.1
	6	642.4	640.9
×	÷,	642.8	643.9
LOCK J	8	642.9	646.3
	9	643.9	641.8
	10	641.3	641.8
	11	640.3	639.1
- 1	12	643.6	641.8
	13	647.7	641.8
21	1	640.1	641.2
٥l	2	842.0	641.2
31	3	644.3	645.7
9	4	646.7	645.7
lei up re ne Or	ver tha stroam sponsib ar the l dinance	ctual finish flaou n the top of rim e. manhole, it shall . ility to install o bo building occording t No. 1012, Section 2 , 1982.	levation at the be the buildors ckwoter device c Broken Arrow

OWNER: The Robson Companies, Inc. 7501 East Kenosha Street Broken Arrow, Oklahoma 74014 Phone: (918) 357–2787

ENGINEER: Tulsa Engineering & Planning Associates, Inc.

8209 East 63rd Place South Tulsa, Oklahoma 74133 Phone: (918) 252-9621

BASIS OF BEARINGS:

The basis for bearings is based on an assumed bearing of N CO°00'00'W elong the west line of Section 10, T-18-N, R-15-E of the Indian Base and Meridian, Waganer Caunty, Stata of

MONUMENTATION:

- I. A 5/8" x 18" detarmed bar with a yellow plastic cop stamped "RLS 1253" to be set at oil plot boundary corners, prior to recordation, unless noted otherwise.
- A 3/6" x 10" deformed bor with a yellow plastic cap stamped "RLS 12S3" to be set at all for corners offer completion of improvements, unless noted atherwise.

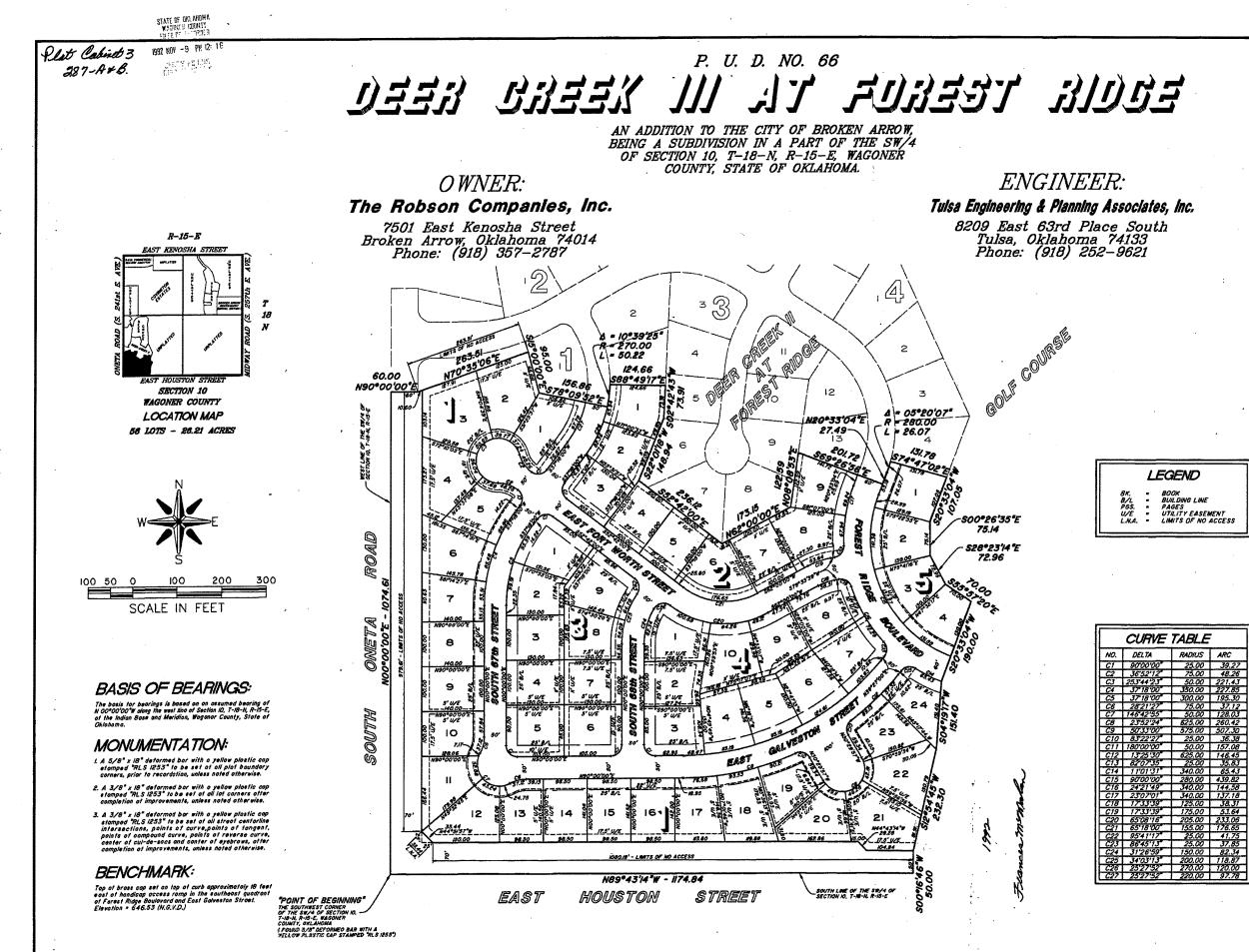
A 3/0² × 18³ detormed bor with a yellow plastic con stamped "RLS [233" to be set of all street contention intersections, points of curve, points of tangent, points of compound curve, points of reverse curve, center of compound curve, points of reverse curve, conter of owniderscos and center of reperces, other completion of improvements, unless noted otherwise.

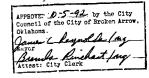
APPROVED 10-5-92 by the City

BENCHMARK: Top of brass cap set on top of curb opproximately 8 feet east of handicap occess ramp of the south end of Seuth 68th Street curberson, Elevation = 640.69 (N.G.V.O.)

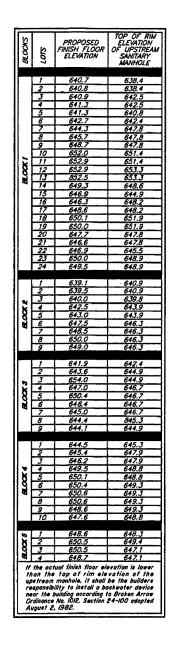
DEEN BREEK II AT FUREST RIDGE

SHEET I OF 2



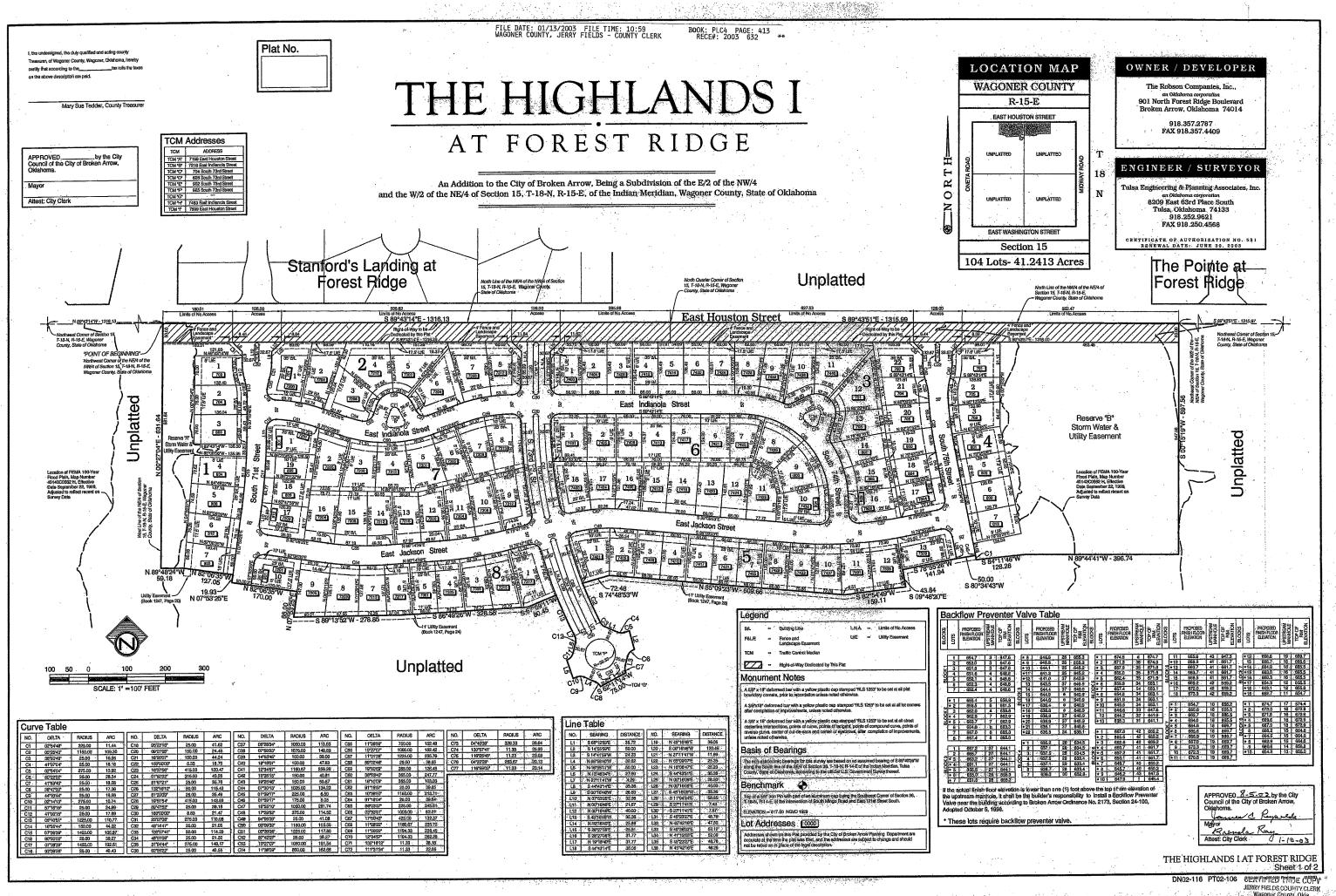


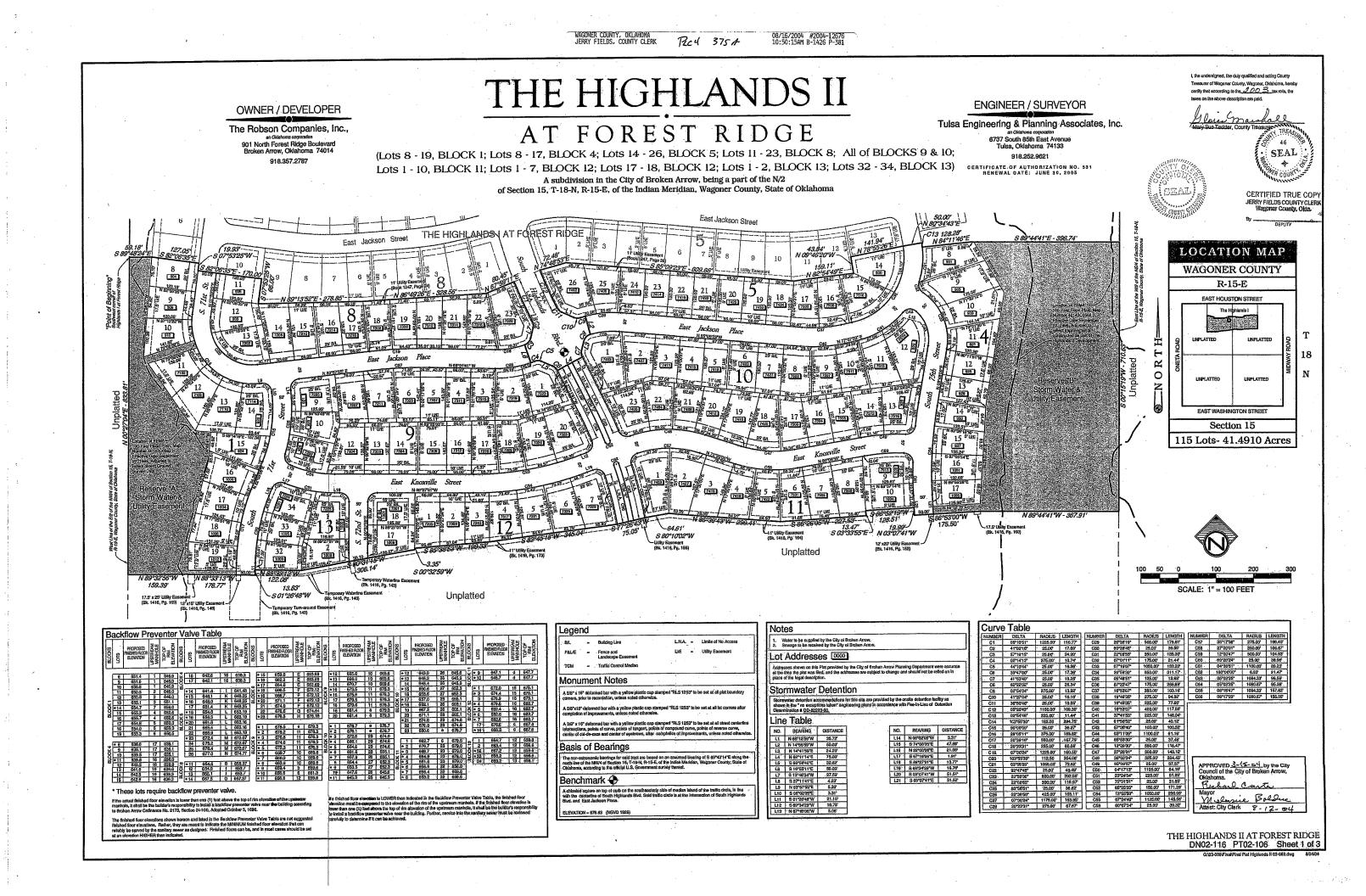
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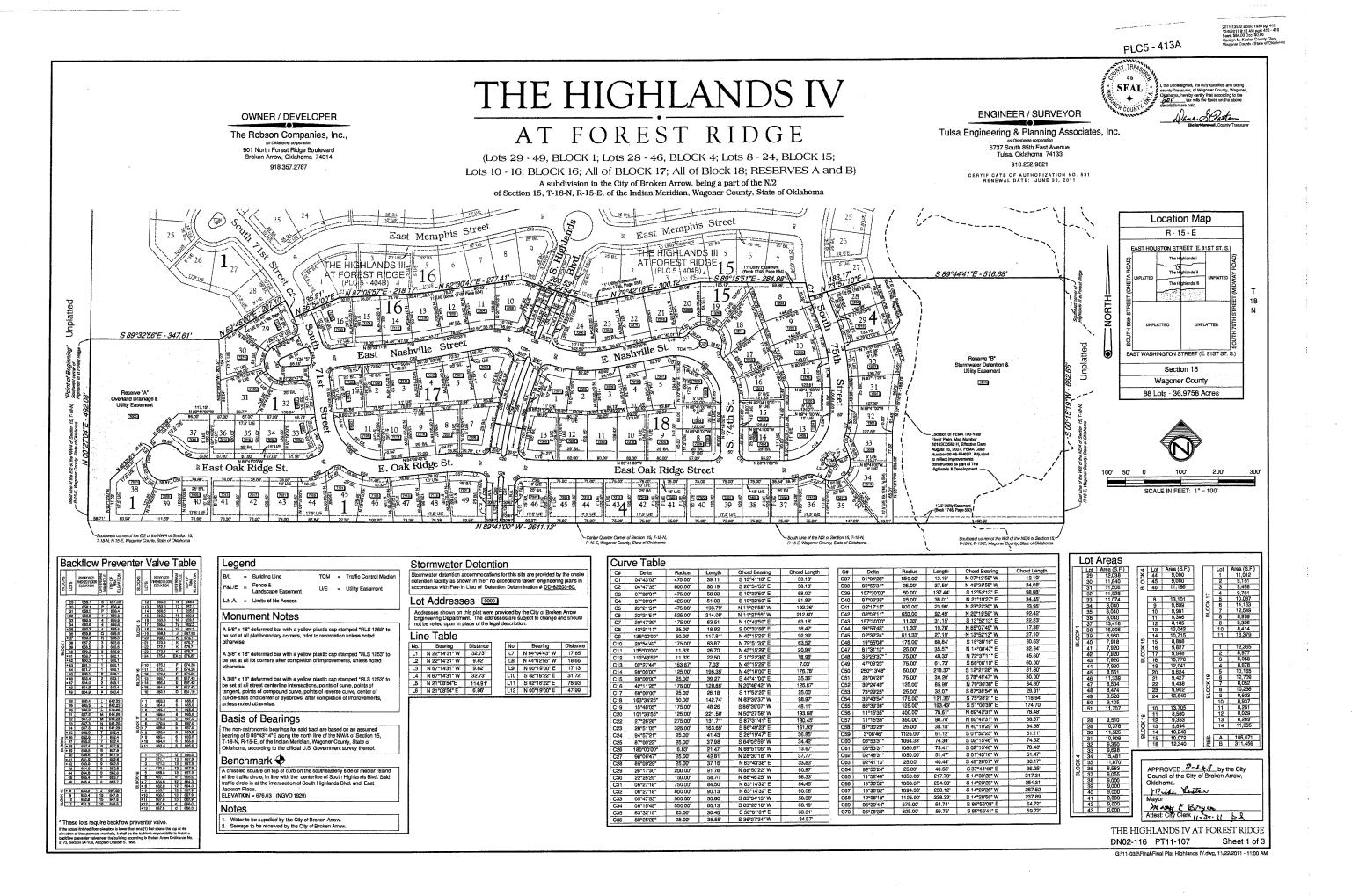
	CURVE TABLE					
2.	DELTA	RADIUS	ARC			
1	90'00'00"	25.00	39.27			
?	36'52'12	75.00	48.26			
3	253'44'23"	50.00	221.43			
1	37"18'00"	350.00	227.85			
5	37 18 00	300.00	195.30			
5	282127	75.00	37.12			
7	146'42'55"	50.00	128.03			
9	23'52'24"	625.00	260.42			
?	50'33'00"	575.00	507.30			
10	83 22'27	25.00	36.38			
11	180'00'00"	50.00	157.08			
12	13 25 30	625.00	146.45			
13	820735	25.00	35.83			
14	11'01'31"	340.00	65.43			
15	90'00'00"	280.00	439.82			
16	24 21 49		144.58			
17	2307'01"	340.00	137.18			
18	17'33'39	125.00	38.31			
19	17'33'39	175.00	53.64			
Š	65'08'16	205.00	233.06			
27	65 18 00	155.00	176.65			
22	95'41'17	25.00	41.75			
23	86'45'13	25.00	37.85			
24	31 26 59	150.00	82.34			
25	34'03'13	200.00	118.87			
?6 ?7	25'27'52	270.00	120.00			
<u>~</u>	25'27'52"	220.00	97.78			

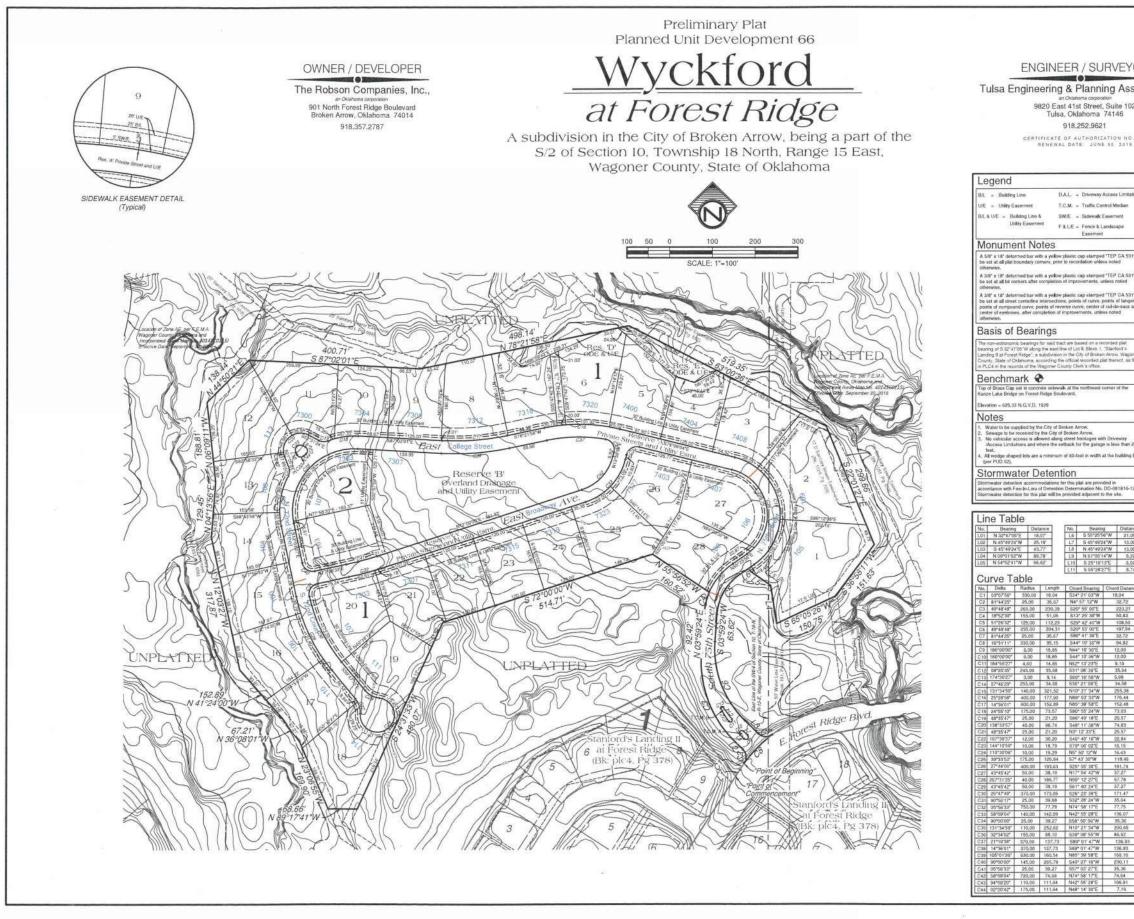
deex dreek III at furest hidde SHEET I OF 2 92-RDC0-0007-004











ENGINEER / SURVEYOR Tulsa Engineering & Planning Associates, Inc. an Oklahoma corporation 9820 East 41st Street, Suite 102 Tulsa, Oklahoma 74146 918.252.9621 CERTIFICATE OF AUTHORIZATION NO. 531 RENEWAL DATE JUNE 30, 2019 D.A.L. - Driveway Access T.C.M. - Traffic Control Median SW/E - Sidewalk Easement WAGONER COUNTY F&LE = Fence & Landscape R - 15 - E EAST KENOSHA STREET (E. 71st Street So.) RTH 18 0 Z EAST HOUSTON STREET (E. 81st Street So.) Section 10 30 Lots - 22.1068 Acres I, the undersigned, the duly qualified and acting county Treasurer, of Wagoner County, Wagoner, Oklahoma, hereby certify that according to the ______ tax rolls the taxes on the above description are Dana Patten, County Treasurer APPROVED ____ by the City Counci of the City of Broken Arrow, Oklahoma Mayor Attest: City Clerk Wyckford at Forest Ridge Date of Preparation: February 18, 2019

G:\18-086\Final\18-086 Preliminary Plat.dwg, 2/18/2019 - 2:53 PM

Erosion Along Deer Creek



Erosion Along Deer Creek – Trail Crossing





Erosion Along Deer Creek – Trail Crossing



Erosion Along Deer Creek & Confluence of Deer Creek & Covington Tributary





Erosion Along Covington Creek Tributary



Erosion Along Covington Creek Tributary



Erosion Along Covington Creek Tributary

