

Exhibit 1

PROCEDURES:

Please see the attached submittal schedule. The Town strictly adheres to this schedule due to legal requirements; **no exceptions will be made.**

1. Submit sketch plat for staff review and Development Review Committee (DRC), if necessary.
2. Submit Land Study for DRC if one of the following circumstances exists:
 - a. Any tract of land over fifty (50) acres in size, or for a smaller tract, where the land is part of a larger parcel over fifty (50) acres in size, which is ultimately to be developed under the Town's Development Ordinance.
 - b. In conjunction with a development plat; or
 - c. In any case where a road is to be established or realigned.
3. Submit Preliminary Plat, including utility plans, tax certificate, and related documents (a final plat may be submitted concurrently, but must include all required information).
 - a. DRC Meeting on Preliminary Plat, if needed.
 - b. P&Z Meeting on Preliminary Plat
 - c. Council Meeting on Preliminary Plat
4. Submit Final Plat, engineering and construction plans and related documents.
 - a. DRC Meeting on Final Plat, if needed.
 - b. P&Z Meeting on Final Plat
 - c. Council Meeting on Final Plat (If Infrastructure is to be constructed)
5. Submit approved Final Plat for filing, along with necessary filing fees.

SUBMITTAL REQUIREMENTS:

Sketch Plat -	If a DRC meeting is required, Copies can be submitted electronically.
Land Study -	Prepared by a qualified civil engineer, land planner, architect, or surveyor; Please submit all copies electronically.
Preliminary Plat, Final Plat, Development Plat, Replat, Amending Plat -	DRC – Please submit Electronically P&Z - Please submit all copies electronically. Council -Please submit all copies electronically.
Filing Requirements -	1 copy measuring 18" X 24" Filing Fees in the form of a business check make payable to the Denton County Clerk’s Office. A call to the Clerk’s office at 940.349.2000, will confirm the fee amount.



July 31, 2024

Mayor Jaclyn Carrington
Town of Bartonville
1941 E. Jeter Road
Bartonville, TX 76226

**Re: High Plains at Furst Ranch Preliminary Plat – PP-2024-002
Waiver Request**

Dear Mayor Carrington,

Please accept this letter as the official request for a waiver from the Bartonville Development Ordinance Section 3.1.k.

3.1.k. Intersecting streets with centerline offsets of less than three hundred feet (300') are prohibited unless a waiver is first obtained from the Town Council in accordance with the requirements of the waiver provisions set forth in Section 1.11 of the Town's Development Ordinance, as amended.

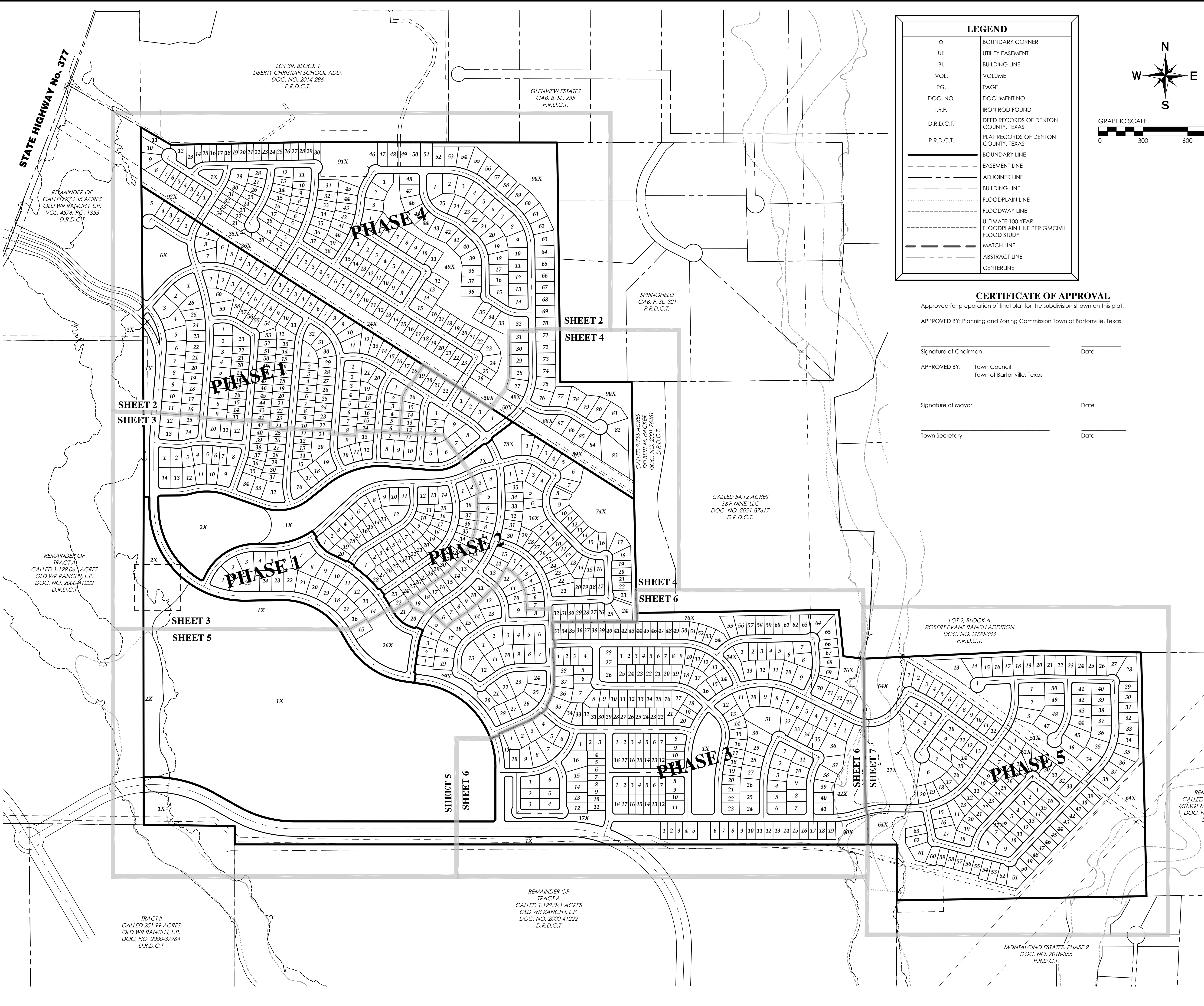
The waiver request is to allow a street centerline offset of approximately 140' between Marigold Trail and Peppervine Lane based on the following criteria:

- 1) The offset intersections are internal streets to the subdivision which will be subject to adjacent neighborhood traffic only.
- 2) Both intersections will be stop controlled Tee-Intersections with the appropriate regulatory signage installed (R1-1 Stop Sign).
- 3) The stopping sight distance for the respective intersections will exceed 300 feet.
- 4) The request does not create a health, safety, or welfare issue in our opinion, as centerline offsets of 125-150 feet are often acceptable in most municipalities. The Town of Argyle standard is 125 feet for offset intersections, the City of Justin standard is 125 feet for local/residential street offset intersections, and the City of Fort Worth is 135 feet for local public/private streets.

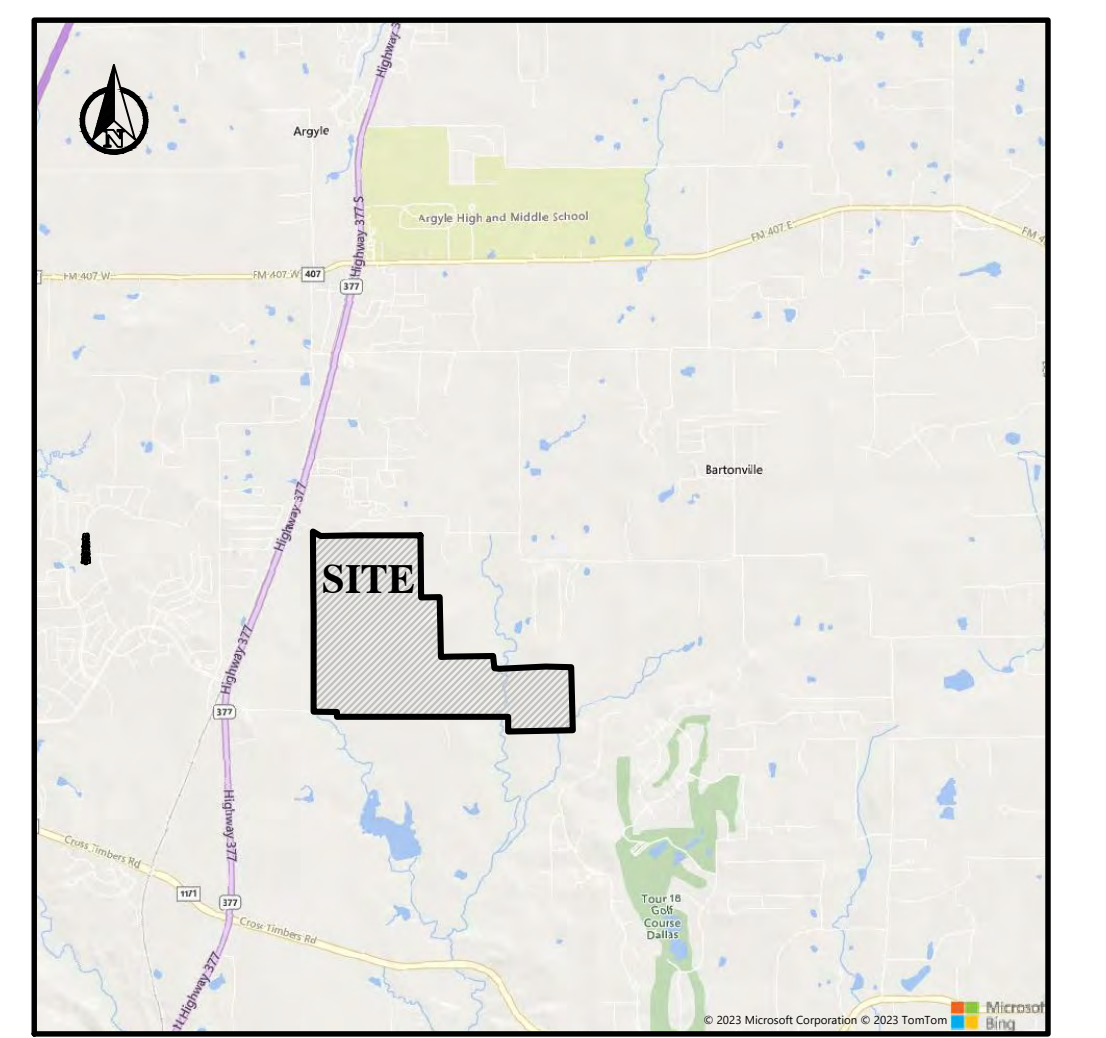
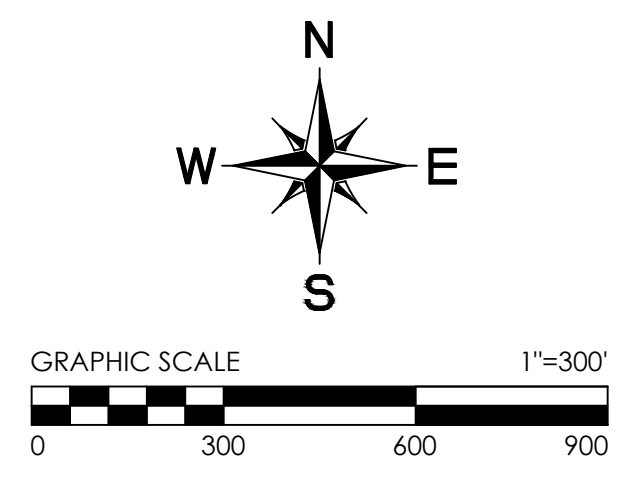
We respectfully request the Town Council approval of this waiver in support of the High Plains at Furst Ranch Preliminary Plat PP-2024-002. We appreciate your time and consideration with this matter.

Sincerely,
GMcivil

Jason S. Weaver, P.E.



LEGEND	
O	BOUNDARY CORNER
UE	UTILITY EASEMENT
BL	BUILDING LINE
VOL.	VOLUME
PG.	PAGE
DOC. NO.	DOCUMENT NO.
I.R.F.	IRON ROD FOUND
D.R.D.C.T.	DEED RECORDS OF DENTON COUNTY, TEXAS
P.R.D.C.T.	PLAT RECORDS OF DENTON COUNTY, TEXAS
---	BOUNDARY LINE
- - - -	EASEMENT LINE
- · - · -	ADJOINER LINE
- · - - -	BUILDING LINE
- · - · - · -	FLOODPLAIN LINE
- · - - - -	FLOODWAY LINE
- · - - - -	ULTIMATE 100 YEAR FLOODPLAIN LINE PER GMCIVIL FLOOD STUDY
- · - - - -	MATCH LINE
- · - - - -	ABSTRACT LINE
- · - - - -	CENTERLINE



VICINITY MAP
N.T.S.

SEE SHEET 8 FOR LINE AND CURVE TABLES

CERTIFICATE OF APPROVAL

Approved for preparation of final plat for the subdivision shown on this plat.
APPROVED BY: Planning and Zoning Commission Town of Bartonville, Texas

Signature of Chairman _____ Date _____

APPROVED BY: Town Council
Town of Bartonville, Texas

Signature of Mayor _____ Date _____

Town Secretary _____ Date _____

OWNER/DEVELOPER:
OLD WR RANCH I HACKER, LP
2591 LAKESIDE PARKWAY, STE 100
FLOWER MOUND, TX 75022
(972) 982-8250

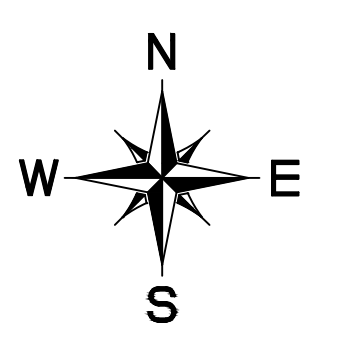
OWNER/DEVELOPER:
Hines
2700 Commerce St., Suite 1600
Dallas, Texas 75226
(972) 716-2900

PREPARED BY:
GMcivil
Engineering & Surveying
2559 SW Grapevine Pkwy., Grapevine, Texas 76051
817-329-4373
TX Eng Firm # F-2944 | TX Surv Firm # 10021700

PRELIMINARY PLAT
OF
HIGH PLAINS AT FURST RANCH
BEING
461.702 ACRES
SITUATED IN THE
PINSON WILES SURVEY, ABSTRACT No. 1339
A. M. FELTUS SURVEY, ABSTRACT No. 1595
DENTON COUNTY, TEXAS
1115 RESIDENTIAL LOTS, 35 NON-RESIDENTIAL LOTS
Date: July 2024



POINT OF BEGINNING
1/2 I.R.F.
SPRINGFIELD
CAB. F. SL. 321
P.R.D.C.T.



SEE SHEET 4

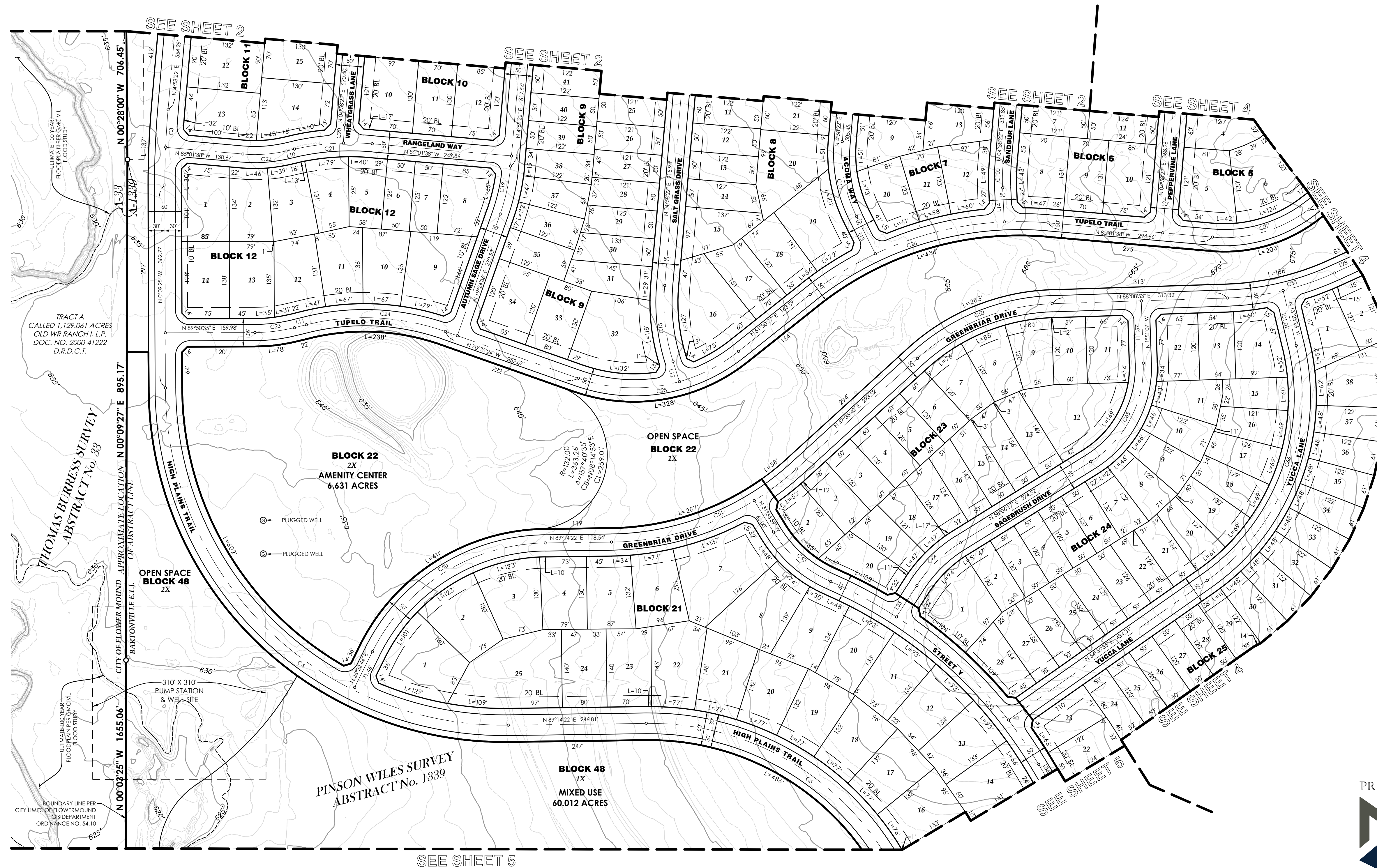
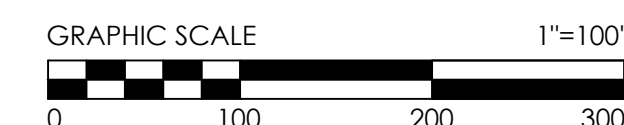
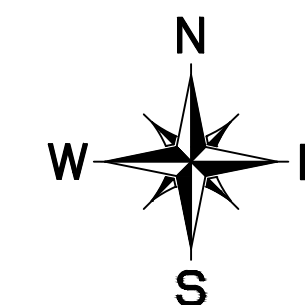
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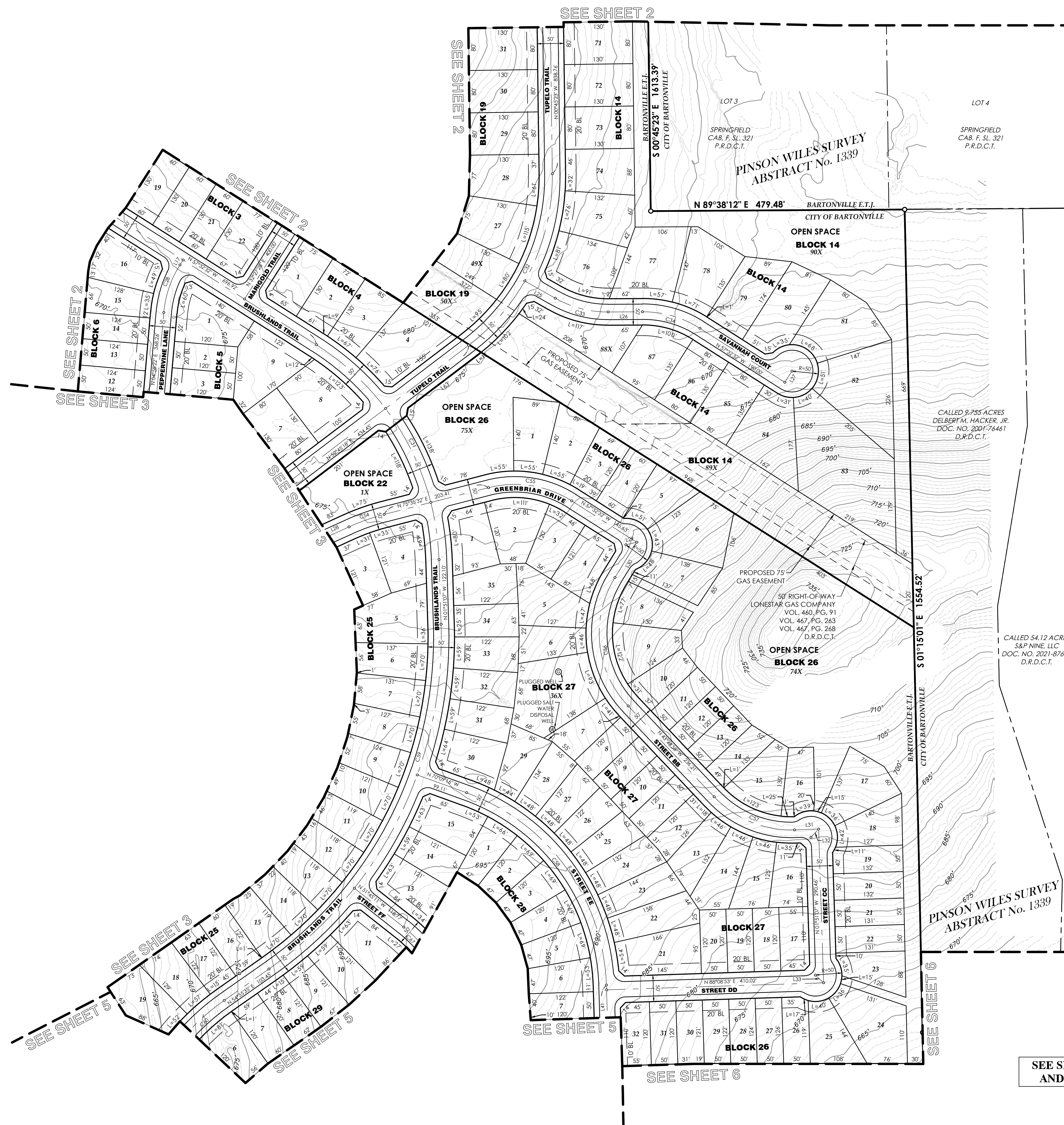
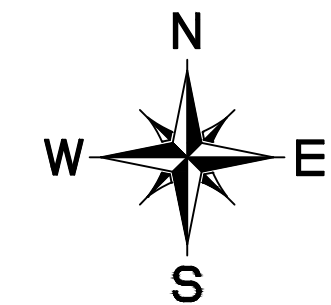
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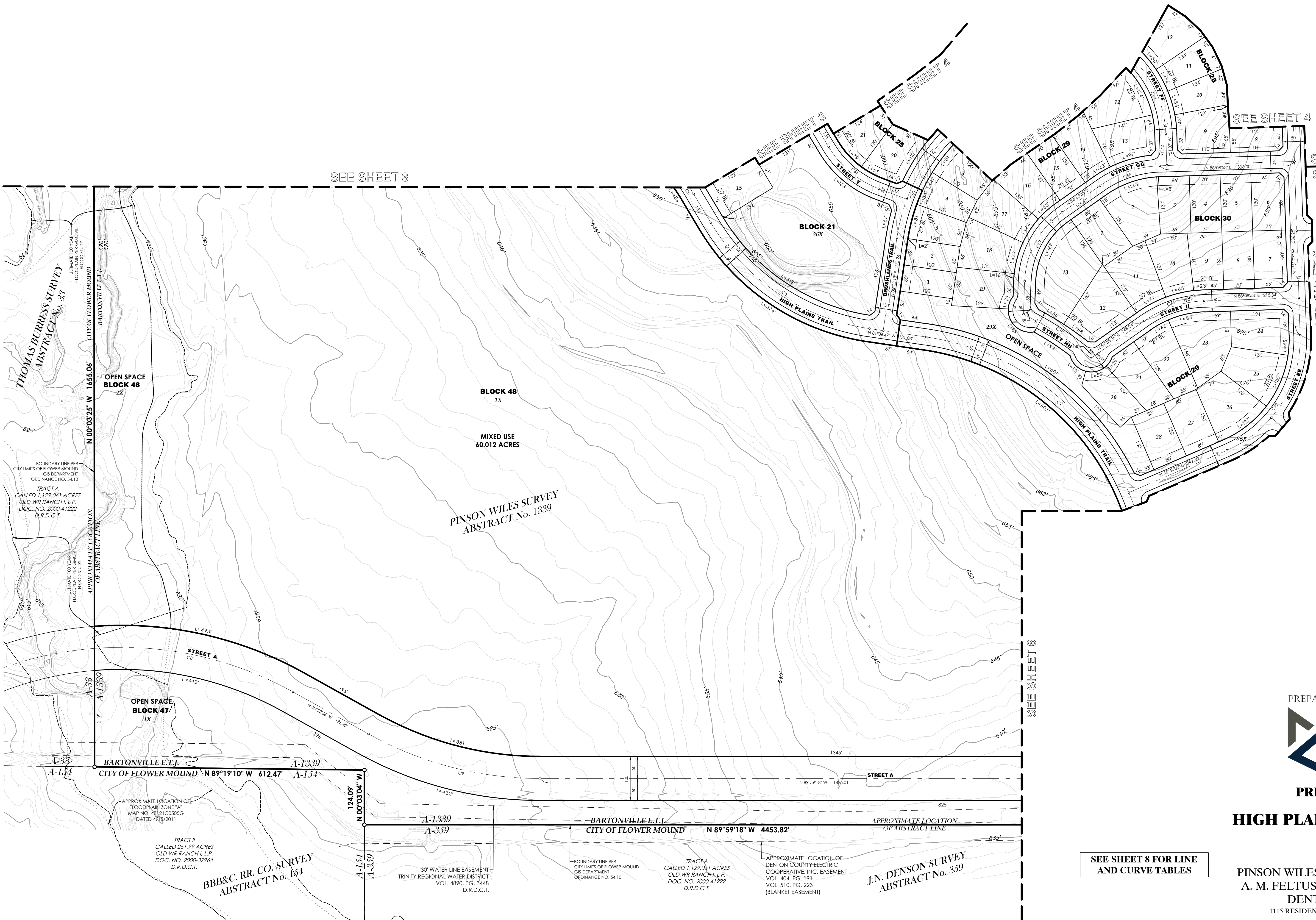
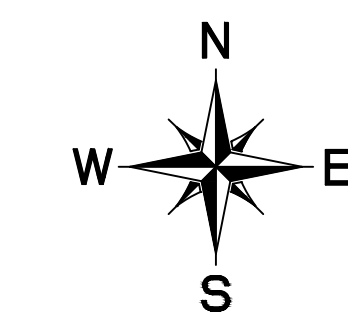
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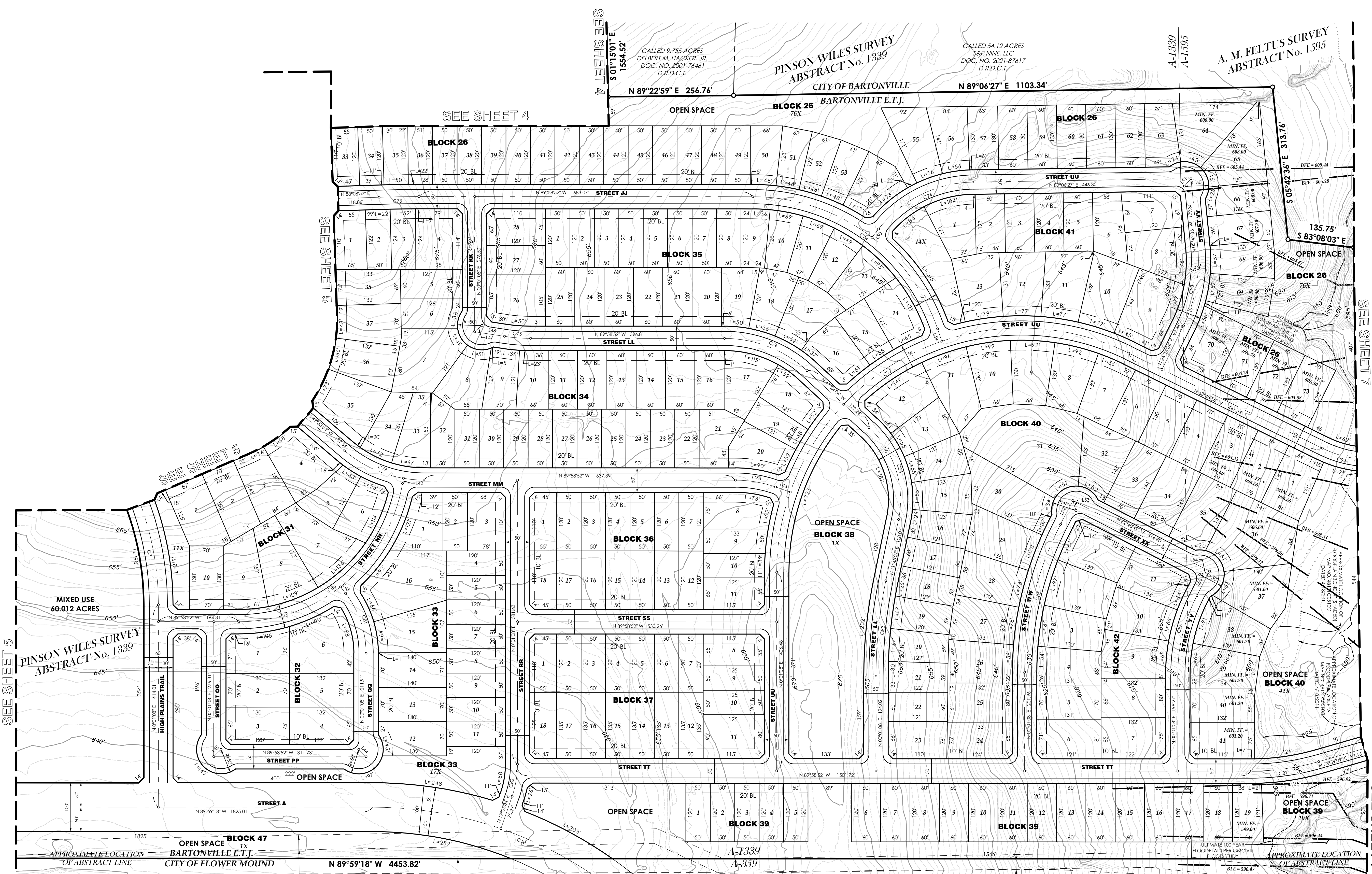
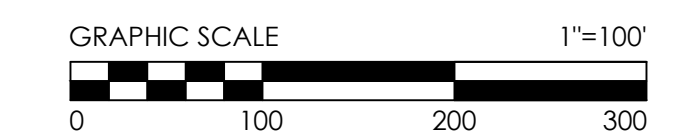
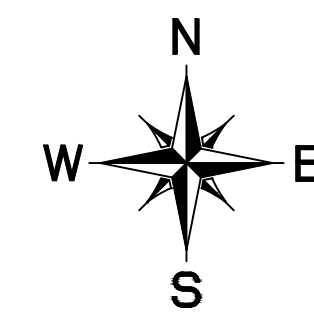
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APPROXIMATE LOCATION OF DENTON COUNTY ELECTRIC COOPERATIVE, INC. EASEMENT VOL. 404, PG. 191 VOL. 510, PG. 223 (BLANKET EASEMENT)

30' WATER LINE EASEMENT TRINITY REGIONAL WATER DISTRICT VOL. 4890, PG. 3448 D.R.D.C.T.

BOUNDARY LINE PER CITY LIMITS OF FLOWER MOUND GIS DEPARTMENT ORDINANCE NO. 54.10

TRACT A CALLED 1,129.061 ACRES OLD WR RANCH I, L.P. DOC. NO. 2000-41222 D.R.D.C.T.

30' WATER LINE EASEMENT TRINITY REGIONAL WATER DISTRICT VOL. 4890, PG. 3448 D.R.D.C.T.

J.N. DENSON SURVEY ABSTRACT No. 359

APPROXIMATE LOCATION OF FLOODPLAIN ZONE "A" MAP NO. 48121C0510G DATED 4/18/2011

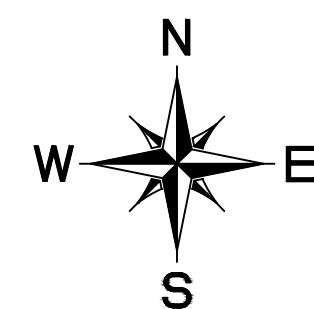
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OWNER'S CERTIFICATION:

WHEREAS, OLD WR RANCH I HACKER, LP, Owner of that certain lot, tract, or parcel of land, situated in a portion of the Pinson Wiles Survey, Abstract No. 1339, the A. M. Feltus Survey, Abstract No. 1595, and the Francis W. Thornton Survey, Abstract No. 1244, Denton County, Texas, being all of that certain called 31.334 acre tract described as Tract 2, all of that certain called 131.318 acre tract described as Tract 3, all of that certain called 244.156 acre tract described as Tract 4, part of that certain called 409.363 acre tract described as Tract 5 in a deed to Old WR Ranch I Hacker, LP recorded in Document No. 2024-23641 of the Deed Records of Denton County, Texas (DRDCT), being all of that certain called 74.176 acre tract described in a deed to some recorded in Document No. 2024-23643 (DRDCT), and being more completely described as follows, to-wit:

BEGINNING at a 1/2" iron rod found for the Northeast corner of said 131.318 acre tract, the Northwest corner of Lot 1 of Springfield a subdivision recorded in Cabinet F, Slide 321 of the Plat Records of Denton County, Texas (PRDCT), and being in the South line of Lot 2, Block 2 of Glenview Estates recorded in Cabinet B, Slide 235 (PRDCT);

THENCE South 00 deg, 45 min, 23 sec., East departing said South line and continue along the East line of said 131.318 acre tract and the West line of said Springfield subdivision, at 783.20 feet pass a 5/8" iron rod found, continue along said East and West lines a total distance of 1,613.39 feet to a 1/2" iron rod found for an ell corner of said 131.318 acre tract and the Southwest corner of said Springfield subdivision;

THENCE North 89 deg, 38 min, 12 sec., East along a North line of said 131.318 acre tract, a North line of said 74.176 acre tract and the South line of said Springfield subdivision, a distance of 479.48 feet to a 1/2" capped iron rod set stamped "GMCVIL", hereinafter referred to as 1/2" capped iron rod set, for the most northerly Northeast corner of said 74.176 acre tract, the Northwest corner of a called 7.771 acre tract described in a deed to Old WR Ranch I Hacker, LP recorded in Document No. 2024-1738 (DRDCT);

THENCE South 01 deg, 15 min, 01 sec., East departing said South line and continue along the East line of said 74.176 acre tract and the West line of said 7.771 acre tract, a distance of 1,554.52 feet to a 1/2" capped iron rod set for the Southwest corner of said 74.176 acre tract, the Southwest corner of said 7.771 acre tract and being in the North line of said 244.156 acre tract;

THENCE North 89 deg, 22 min, 59 sec., East along said North line and the South line of said 7.771 acre tract, a distance of 256.76 feet to a 1/2" iron rod found (bent) for the Southeast corner of said 7.771 acre tract and the most westerly Southwest corner of a called 54.12 are tract described in a deed to S&P NINE, LLC recorded in Document No. 2021-8717 (DRDCT);

THENCE North 89 deg, 06 min, 27 sec., East along said North line and the South line of said 54.12 acre tract, a distance of 1,103.34 feet to a 5/8" capped iron rod found stamped "WALTERS" for an ell corner of said 54.12 acre tract and an ell corner of said 244.156 acre tract;

THENCE South 05 deg, 42 min, 36 sec., East along an East line of said 244.156 acre tract and a West line of said 54.12 acre tract, a distance of 313.76 feet to a 6" wood fence corner for an ell corner of said 244.156 acre tract and the most southerly Southwest corner of said 54.12 acre tract;

THENCE South 83 deg, 08 min, 03 sec., East along the North line of said 244.156 acre tract and the South line of said 54.12 acre tract, a distance of 135.75 feet to a 5/8" capped iron rod found stamped "WALTERS" for the Southeast corner of said 54.12 acre tract and the Southwest corner of Lot 2, Block A of Robert Evans Ranch Addition recorded in Document No. 2020-383 (PRDCT);

THENCE North 87 deg, 24 min, 15 sec., East along the North line of said 244.156 acre tract and the South line of said Lot 2, Block A, a distance of 1,197.72 feet to a 30" Oak Tree;

THENCE South 88 deg, 55 min, 31 sec., East along said North and South lines, a distance of 672.12 feet to a 5" metal fence corner for the most easterly Northeast corner of said 244.156 acre tract and the most northerly Northwest corner of a called 477.2310 acre tract described in a deed to CIMGT Montalcino, LLC recorded in Document No. 2011-121575 (DRDCT);

THENCE South 01 deg, 15 min, 16 sec., East departing said South line and continue along the East line of said 244.156 acre tract and the West line of said 477.2310 acre tract, a distance of 1,640.18 feet to a 5/8" iron rod found for the Southeast corner of said 244.156 acre tract, an ell corner of said 477.2310 acre tract and being in the North line of Montalcino Estates, Phase 2 recorded in Document No. 2018-355 (PRDCT);

THENCE South 89 deg, 01 min, 43 sec., West along the South line of said 244.156 acre tract, the North line of said Montalcino Estates, Phase 2, at 107.91 feet pass a 1/2" capped iron rod found stamped "GA CONSULTANTS", continue along said North and South lines a total distance of 1,680.97 feet to a point for corner for an ell corner of said 244.156 acre tract, the Northwest corner of said Montalcino Estates, Phase 2, being in the East line of said 409.363 acre tract and being in the City Limit Line of Flower Mound per the GIS Department and City Ordinance No. 54-10, from which a 5/8" capped iron rod found stamped "1640" for reference bears South 17 deg, 02 min, 24 sec., West - 0.69 feet, another 5/8" capped iron rod found stamped "1640" for reference bears North 89 deg, 01 min, 43 sec., East - 10.55 feet and another 5/8" capped iron rod found stamped "1640" for reference bears South 00 deg, 01 min, 23 sec., East - 8.13 feet;

THENCE North 00 deg, 01 min, 23 sec., West along said East line, the West line of said 244.156 acre tract and the City of Flower Mound City Limit Line, a distance of 376.01 feet to a 1/2" capped iron rod set;

THENCE North 89 deg, 59 min, 18 sec., West departing said East and West lines and continue along said City Limit Line, a distance of 4,453.82 feet to a 1/2" capped iron rod set;

THENCE North 00 deg, 03 min, 04 sec., West along said City Limit line, a distance of 124.09 feet to a 1/2" capped iron rod set in the North line of said 409.363 acre tract and the South line of said 244.156 acre tract;

THENCE North 89 deg, 19 min, 10 sec., West along said North and South lines and City Limit Line, a distance of 612.47 feet to a 1/2" capped iron rod set for the Southwest corner of said 244.156 acre tract;

THENCE North 00 deg, 03 min, 25 sec., West along the West line of said 244.156 acre tract and said City Limit Line, a distance of 1,655.06 feet to a 6" wood fence corner found for the Northwest corner of said 244.156 acre tract, the Southwest corner of said 74.176 acre tract, and an ell corner of a called 1,129.061 acre tract described in a deed to Old WR Ranch I, LP recorded in Document No. 2000-41222 (DRDCT);

THENCE North 00 deg, 09 min, 27 sec., East along said West line, the East line of said 1,129.061 acre tract and City Limit line, a distance of 895.17 feet to a 1/2" iron rod found for the Northwest corner of said 74.176 acre tract and the Southwest corner of said 131.318 acre tract;

THENCE North 00 deg, 58 min, 00 sec., West along said East line, the West line of said 131.318 acre tract and said City Limit Line, a distance of 706.45 feet to a 1/2" iron rod found for the most northerly Northeast corner of said 1,129.061 acre tract and the Southeast corner of said 31.334 acre tract;

THENCE North 00 deg, 32 min, 54 sec., West departing said City Limit Line and continue along the East line of said 31.334 acre tract and said West line, a distance of 1,314.85 feet to 1/2" iron rod found for an ell corner of said 31.334 acre tract and the Northwest corner of said 131.318 acre tract;

THENCE North 00 deg, 23 min, 00 sec., West, a distance of 121.73 feet to a 1/2" capped iron rod set in the Northeast line of said 31.334 acre tract and the Southwest line of Lot 3R, Block 1 of Liberty Christian School Addition recorded in Document No. 2014-286 (PRDCT);

THENCE

THENCE South 59 deg, 47 min, 05 sec., East along said Northeast and Southwest line, a distance of 223.86 feet to a 1/2" capped iron rod set for the most easterly Northeast corner of said 31.334 acre tract, an ell corner of said Lot 3R, Block 1 and being in the North line of said 131.318 acre tract;

THENCE North 88 deg, 51 min, 05 sec., East along said North line and the South line of said Lot 3R, Block 1, a distance of 908.50 feet to a 1/2" iron rod found;

THENCE South 89 deg, 52 min, 18 sec., East along said North and South lines, a distance of 959.16 feet to a 1/2" capped iron rod set for the Southeast corner of said Lot 3R, Block 1 and the Southwest corner of Lot 3, Block 2 of said Glenview Estates;

THENCE South 89 deg, 58 min, 26 sec., East along said North line and the South line of said Glenview Estates, a distance of 730.98 feet to the **POINT OF BEGINNING**, containing 20,111,758 square feet or 461.702 acres of land, more or less.

OWNER'S CERTIFICATION CONT...

NOW, THEREFORE, KNOW ALL MEN BY THESE PRESENTS:

That OLD WR RANCH I HACKER, LP, acting herein by and through his [its] duly authorized officers, does hereby adopt this plat designating the hereinabove described property as HIGH PLAINS AT FURST RANCH, an addition to the Town of Bartoville, Texas, and does hereby dedicate, in fee simple, to the public use forever, the streets and easements shown thereon. The streets are dedicated for street purposes. The easements and public use areas, as shown, are dedicated, for the public use forever, for the purposes indicated on this plat. No buildings, fences, trees, shrubs or other improvements or growths shall be constructed or placed upon, over or across the easements as shown, except that landscape improvements may be placed in landscape easements, if approved by the Town of Bartoville. In addition, utility easements may also be used for the mutual use and accommodation of all public utilities desiring to use or using the same unless the easement limits the use to particular utilities, said use by public utilities being subordinate to the public's and Town of Bartoville's use thereof. The Town of Bartoville and public utility entities shall have the right to remove and keep removed all or parts of any buildings, fences, trees, shrubs or other improvements or growths which may in any way endanger or interfere with the construction, maintenance, or efficiency of their respective systems in said easements. The Town of Bartoville and public utility entities shall at all times have the full right of ingress and egress to or from their respective easements for the purpose of constructing, reconstructing, inspecting, patrolling, maintaining, reading meters, and adding to or removing all or parts of their respective systems without the necessity of any time procuring permission from anyone. This plat approved subject to all platting ordinances, rules, regulations and resolutions of the Town of Bartoville, Texas

WITNESS, my hand, this the ____ day of _____, 20____.

By: _____
Authorized Signature of Owner

Printed Name and Title

STATE OF TEXAS §
COUNTY OF _____ §

Before me, the undersigned authority, a Notary Public in and for the State of Texas, on this day personally appeared _____, Owner, known to me to be the person whose name is subscribed to the foregoing instrument and acknowledged to me that he executed the same for the purpose and considerations therein expressed.

Given under my hand and seal of office, this ____ day of _____, 20____.

Notary Public in and for the State of Texas

My commission expires on: _____

SURVEYOR'S CERTIFICATE

That I, John N. Rogers, do hereby certify that I prepared this plat from an actual and accurate survey of the land and that the corner monuments shown thereon as set were properly placed under my personal supervision in accordance with the Development Ordinance of the Town of Bartoville.

John N. Rogers
Registered Professional Land Surveyor No. 6372
GMcivil
2559 SW Grapevine Pkwy.
Grapevine, TX 76051
Metro (817) 329-4373

STATE OF TEXAS §
COUNTY OF TARRANT §

Before me, the undersigned authority, a Notary Public in and for the State of Texas, on this day personally appeared John N. Rogers, Land Surveyor, known to me to be the person whose name is subscribed to the foregoing instrument and acknowledged to me that he executed the same for the purpose and considerations therein expressed.

Given under my hand and seal of office, this ____ day of _____, 20____.

Notary Public in and for the State of Texas

My commission expires on: _____

CURVE TABLE

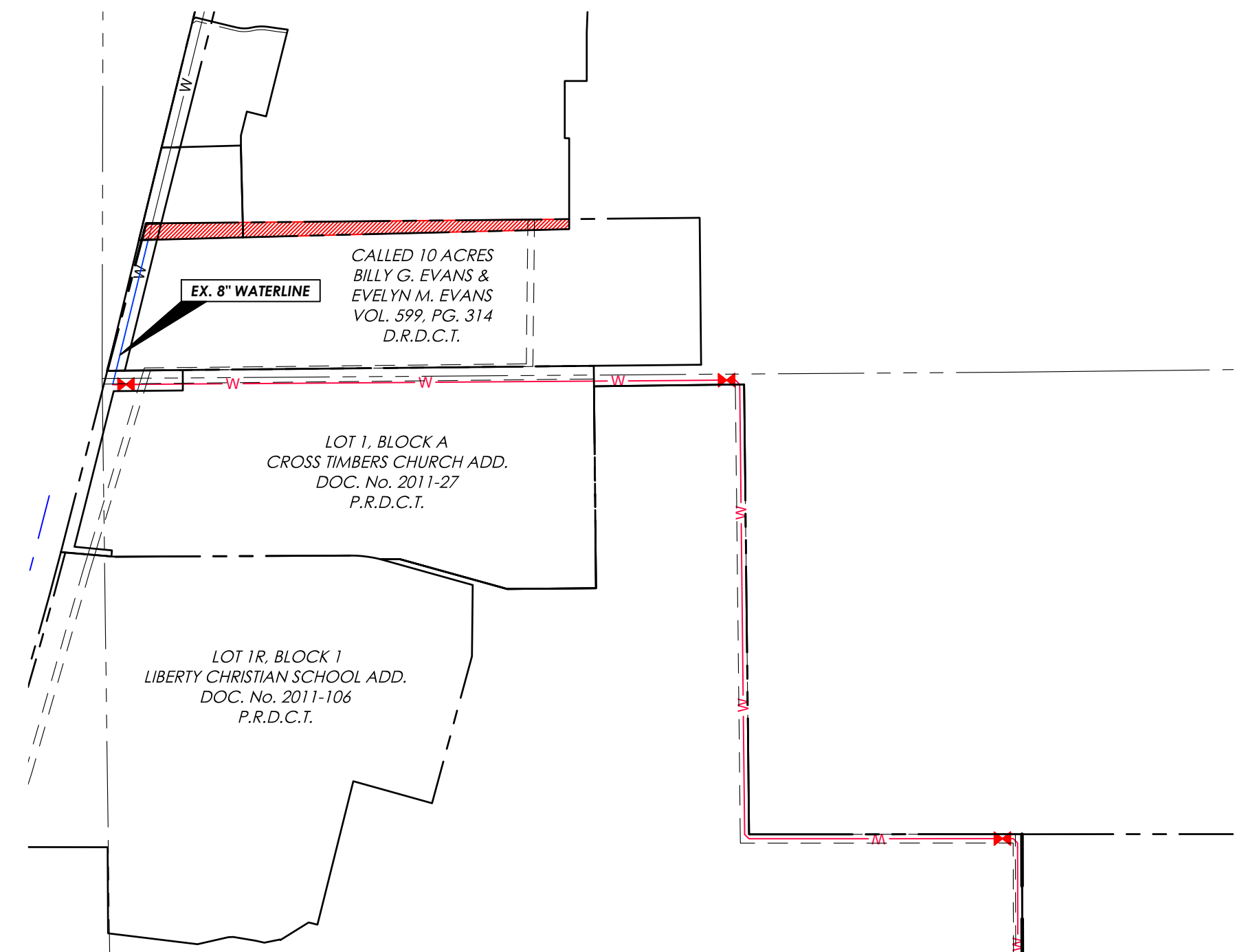
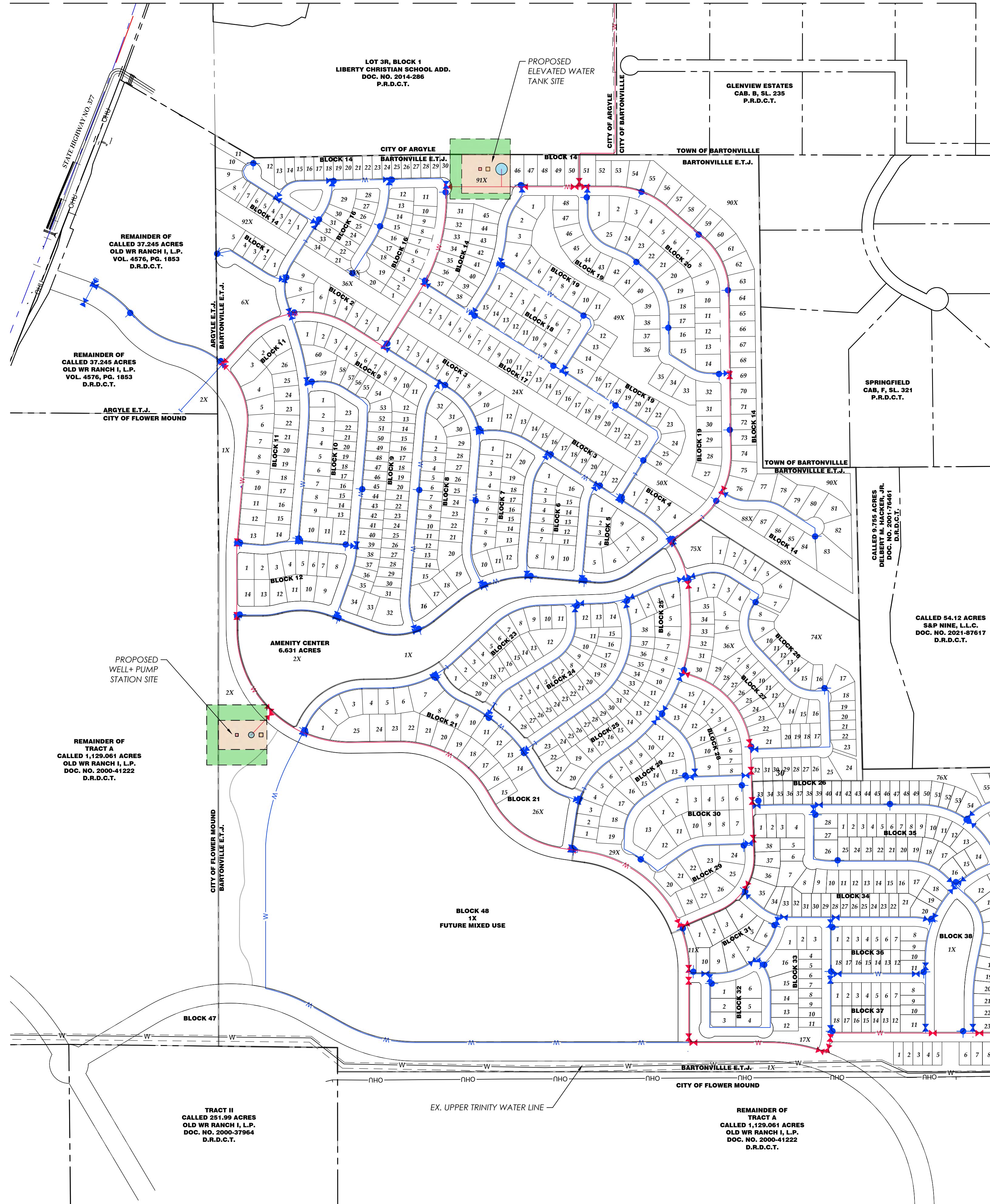
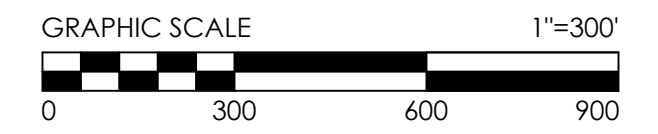
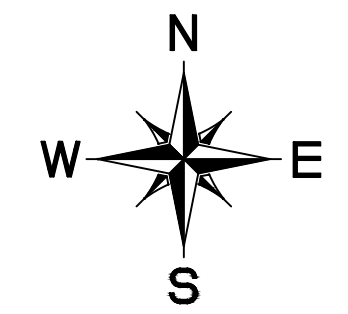
CURVE #	RADIUS	ARC LENGTH	DELTA ANGLE	CHORD BEARING	CHORD LENGTH
C1	450.00'	371.94'	47°21'25"	S18°42'20"E	361.44'
C2	375.00'	354.86'	54°13'09"	S22°08'12"E	341.77'
C3	1505.00'	134.75'	5°07'47"	S02°24'28"W	134.70'
C4	605.00'	956.70'	90°36'12"	S45°27'32"E	860.09'
C5	495.00'	517.41'	59°53'23"	S60°48'56"E	494.18'
C6	505.00'	447.24'	50°44'33"	S56°14'31"E	432.77'
C7	595.00'	847.72'	81°37'55"	S40°47'49"E	777.82'
C8	800.00'	467.88'	33°30'34"	N77°37'53"W	461.24'
C9	800.00'	406.47'	29°06'42"	N75°25'57"W	402.12'
C10	800.00'	414.50'	29°54'11"	N75°08'42"W	409.88'
C11	400.00'	559.70'	80°10'14"	S82°22'21"W	515.14'
C12	300.00'	327.33'	62°30'54"	N26°17'05"W	311.33'
C13	250.00'	138.17'	31°40'01"	N10°51'39"W	136.42'
C14	300.00'	143.91'	27°29'06"	N18°42'55"E	142.54'
C15	350.00'	137.12'	22°26'46"	N06°15'01"W	136.24'
C16	1200.00'	464.77'	22°11'28"	N06°07'22"W	461.87'
C17	200.00'	131.71'	37°43'58"	N76°24'31"W	129.34'
C18	1502.00'	96.99'	3°41'59"	N03°07'22"E	96.97'
C19	350.00'	88.19'	14°26'14"	N12°11'29"E	87.96'
C20	1188.00'	31.85'	1°32'11"	N04°12'17"E	31.85'
C21	450.00'	139.95'	17°49'08"	N86°03'48"E	139.38'
C22	250.00'	77.75'	17°49'08"	N86°03'48"E	77.44'
C23	300.00'	71.65'	13°41'01"	N83°00'04"E	71.48'
C24	435.00'	252.44'	33°15'02"	S87°12'55"E	248.92'
C25	300.00'	303.18'	57°54'09"	N80°27'31"E	290.44'
C26	600.00'	455.17'	43°27'55"	N73°14'24"E	444.33'
C27	250.00'	184.21'	42°13'04"	N73°51'50"E	180.07'
C28	200.00'	95.94'	27°29'06"	N18°42'55"E	95.02'
C29	250.00'	119.93'	27°29'06"	N18°42'55"E	118.78'
C30	325.00'	217.60'	38°21'44"	S76°43'24"E	213.56'
C31	500.00'	485.99'	55°41'25"	S29°41'49"E	467.08'
C32	400.00'	373.58'	53°30'40"	N25°59'57"E	360.15'
C33	200.00'	104.32'	29°53'12"	N75°25'12"W	103.15'
C34	200.00'	114.57'	32°49'16"	N73°57'10"W	113.01'
C35	200.00'	115.94'	33°12'51"	N74°08'57"W	114.32'
C36	250.00'	205.82'	47°10'13"	N24°20'29"W	200.06'
C37	250.00'	81.83'	18°45'13"	N57°18'12"W	81.46'
C38	200.00'	232.85'	66°42'23"	N33°19'37"W	219.92'
C39	350.00'	298.46'	48°51'33"	N25°11'09"W	289.50'
C40	400.00'	281.75'	40°21'30"	N69°47'41"W	275.96'
C41	300.00'	150.94'	28°49'39"	S18°27'39"W	149.35'
C42	650.00'	322.31'	28°24'39"	S18°15'09"W	319.02'
C43	200.00'	42.78'	12°15'19"	S63°40'11"E	42.70'
C44	900.00'	507.83'	32°19'46"	S16°17'35"W	501.12'
C45	543.00'	311.22'	32°50'22"	N16°02'17"E	306.98'
C46	100.00'	98.43'	56°23'37"	S60°39'17"W	94.50'
C47	250.00'	139.38'	31°56'37"	N16°29'10"E	137.58'
C48	250.00'	216.75'	49°40'34"	N07°37'11"E	210.03'
C49	250.00'	95.18'	21°48'46"	S68°26'55"E	94.60'
C50	350.00'	383.99'	62°51'38"	N57°48'33"E	365.02'

PRELIMINARY, this document shall not be recorded for any purpose and shall not be used or viewed or relied upon as a final survey document. Issued for review 7/8/2024 4:19 PM

CURVE TABLE

CURVE #	RADIUS	ARC LENGTH	DELTA ANGLE	CHORD BEARING	CHORD LENGTH
C51	500.00'	363.28'	41°37'42"	N68°25'31"E	355.34'
C52	375.00'	265.31'	40°32'13"	N67°52'47"E	259.81'
C53	500.00'	197.56'	22°38'19"	N76°49'44"E	196.28'
C54	400.00'	70.39'	10°04'58"	N70°33'03"E	70.30'
C55	200.00'	163.59'	46°51'56"	S80°58'30"E	159.07'
C56	200.00'	262.09'	75°04'56"	S05°52'30"E	243.73'
C57	200.00'	169.07'	48°26'09"	S67°38'02"E	164.08'
C58	400.00'	476.84'	68°18'09"	N36°00'11"W	449.10'
C59	765.00'	758.09'	56°46'41"	S26°32'14"W	727.45'
C60	425.00'	345.21'	46°32'22"	S31°39'24"W	335.80'
C61	225.00'	151.38'	38°32'59"	S50°08'44"E	148.55'
C62	810.00'	503.63'	35°37'29"	S48°40'59"E	495.56'
C63	225.00'	137.03'	34°53'44"	S49°02'52"E	134.93'
C64	250.00'	109.67'	25°08'07"	N45°32'13"E	108.80'
C65	200.00'	209.29'	59°57'23"	N28°07'35"E	199.87'
C66	400.00'	477.17'	68°21'00"	N20°45'05"E	449.38'
C67	250.00'	217.73'	49°54'04"	N26°48'09"W	210.92'
C68	250.00'	144.96'	33°13'19"	S71°32'14"W	142.94'
C69	200.00'	184.30'	52°47'58"	S28°31'36"W	177.85'
C70	704.00'	183.64'	14°56'45"	S56°50'27"E	183.12'
C71	250.00'	144.96'	33°13'19"	N71°32'14"E	142.94'
C72	275.00'	329.03'	68°33'09"	N32°25'28"E	309.75'
C73	2500.00'	81.63'	1°52'15"	S89°05'01"W	81.63'
C74	400.00'	496.10'	71°03'42"	N54°27'01"W	464.91'
C75	350.00'	53.47'	8°45'13"	S85°36'15"E	53.42'
C76	250.00'	185.79'	42°34'46"	S68°41'29"E	181.54'
C77	500.00'	1013.74'	116°09'56"	S58°06'06"W	848.81'
C78	250.00'	83.62'	19°09'56"	S80°23'54"E	83.24'
C79	250.00'	176.35'	40°24'58"	S69°46'23"E	172.71'
C80	340.00'	476.72'	80°20'10"	S49°51'03"W	438.62'
C81	200.00'	132.00'	37°48'57"	S18°53'20"E	129.62'
C82	200.00'	66.58'	19°04'26"	N09°33'21"E	66.27'
C83	960.00'	196.59'	11°43'59"	S05°53'07"W	196.24'
C84	200.00'	206.48'	59°09'13"	S17°49'30"E	197.44'
C85	660.00'	314.48'	27°18'02"	S13°40'09"W	311.51'
C86	350.00'	166.77'	27°18'02"	N13°40'09"E	165.20'
C87	500.00'	139.92'	16°02'00"	S82°00'08"W	139.46'
C88	500.00'	143.10'	16°23'51"	S82°11'04"W	142.61'

MATCHLINE - SEE THIS SHEET



LEGEND	
	PROP. FIRE HYDRANT
	PROP. WATER VALVE
	EX. WATER LINE
	PROP. 8\" WATER LINE
	PROP. 12\" WATER LINE

PREPARED FOR:

Hines

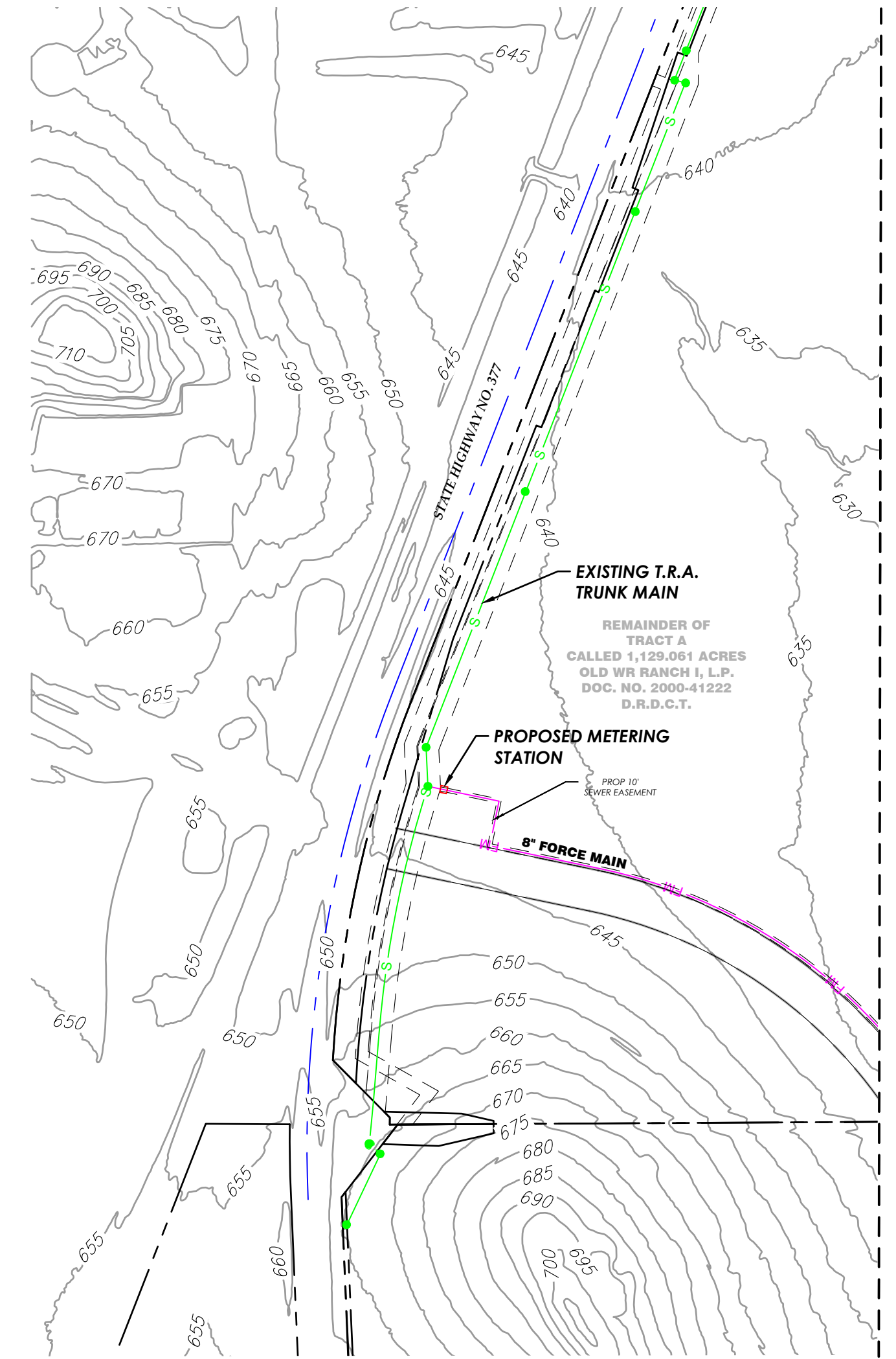
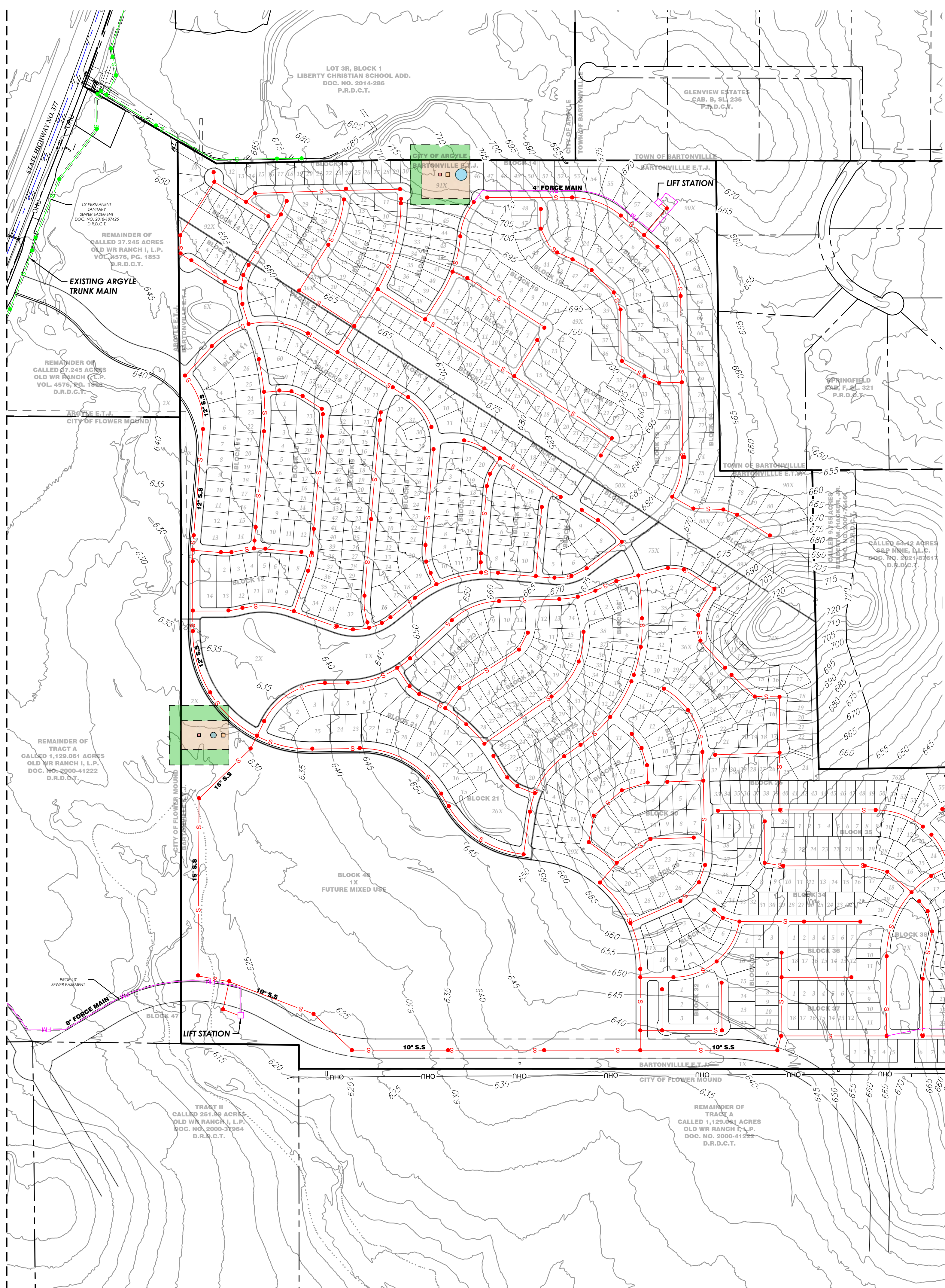
2700 Commerce St., Suite 1600
Dallas, Texas 75226
(972) 716-2900

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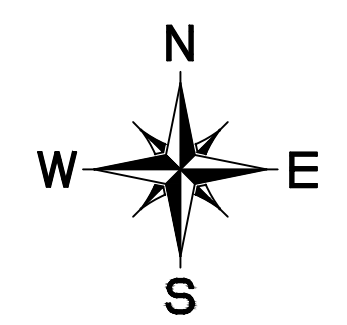


PRELIMINARY WATER LAYOUT
OF
HIGH PLAINS AT FURST RANCH
BEING
461.858 ACRES
SITUATED IN THE
PINSON WILES SURVEY, ABSTRACT No. 1339
PINSON WILES SURVEY, ABSTRACT No. 1339
1115 RESIDENTIAL LOTS, 35 NON-RESIDENTIAL LOTS
Date: JUNE 2024

MATCHLINE - SEE THIS SHEET



MATCHLINE - SEE THIS SHEET



LEGEND	
	EXISTING SEWER
	PROPOSED SEWER
	FORCE MAIN

NOTE: ALL SANITARY SEWER LINES TO BE 8" UNLESS NOTED OTHERWISE.

PREPARED FOR:

Hines

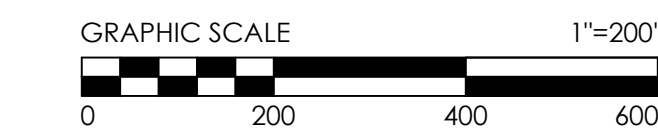
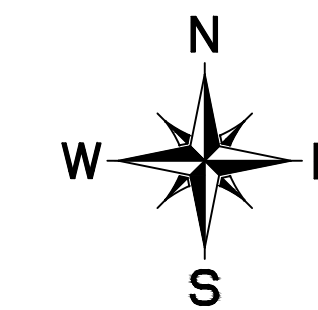
2700 Commerce St., Suite 1600
Dallas, Texas 75226
(972) 716-2900

PREPARED BY:



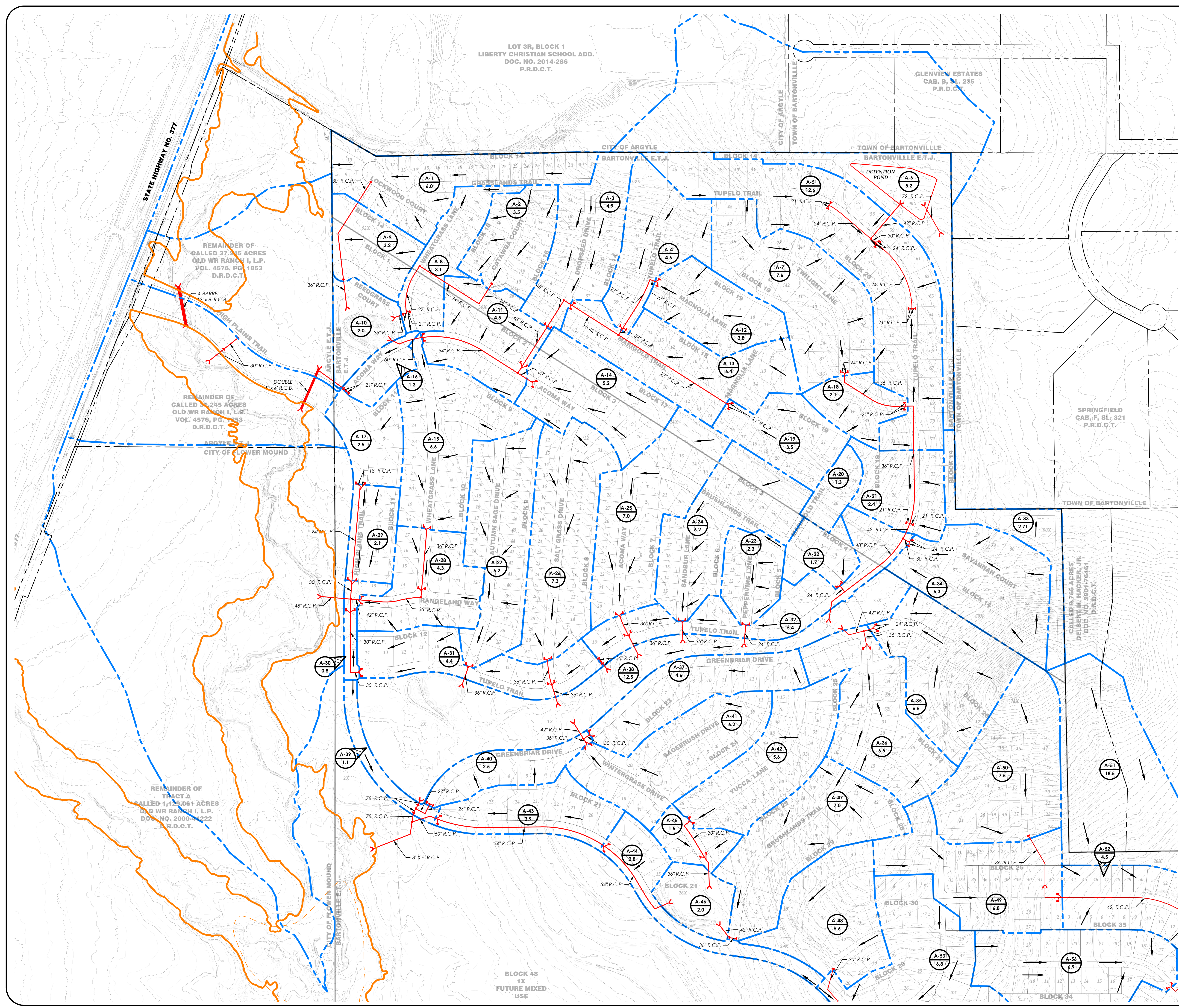
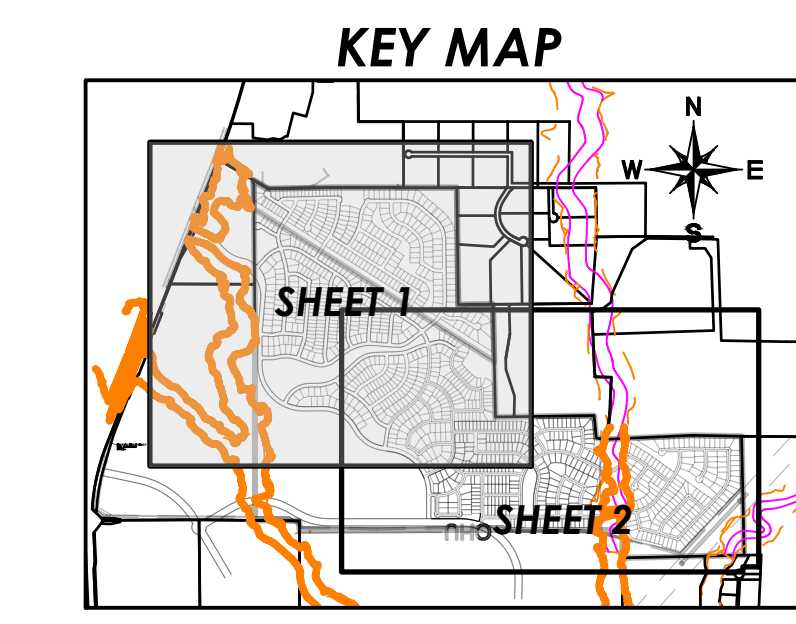
**PRELIMINARY SEWER LAYOUT
OF
HIGH PLAINS AT FURST RANCH
BEING
461,858 ACRES
SITUATED IN THE
PINSON WILES SURVEY, ABSTRACT No. 1339
A.M. FELTUS SURVEY, ABSTRACT No. 1595
DENTON COUNTY, TEXAS
1115 RESIDENTIAL LOTS, 35 NON-RESIDENTIAL LOTS
Date: JUNE 2024**

E:\230002 - Hines - Furst Ranch (Flower Mound) \VIA\SHAETS\PRELIM PLAN\SEWER LAYOUT.GDW



LEGEND

- DRAINAGE AREA /ACREAGE
- DRAINAGE AREA DIVIDE
- FLOW ARROW (RUNOFF DIRECTION)
- STORM DRAIN & INLET



PREPARED FOR:

Hines

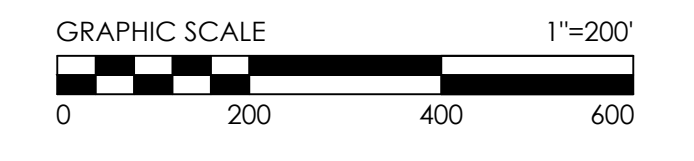
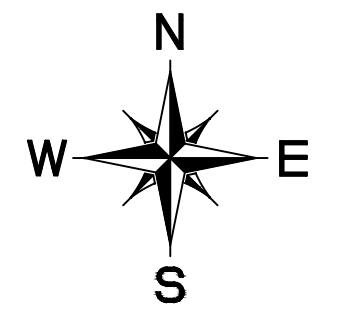
2700 Commerce St., Suite 1600
Dallas, Texas 75226
(972) 716-2900

PREPARED BY:

GMcivil
Engineering & Surveying

2559 SW Grapevine Pkwy, Grapevine, Texas 76051
817-329-4373
TX Reg Firm # F-2944 | TX Surv Firm # 10021700

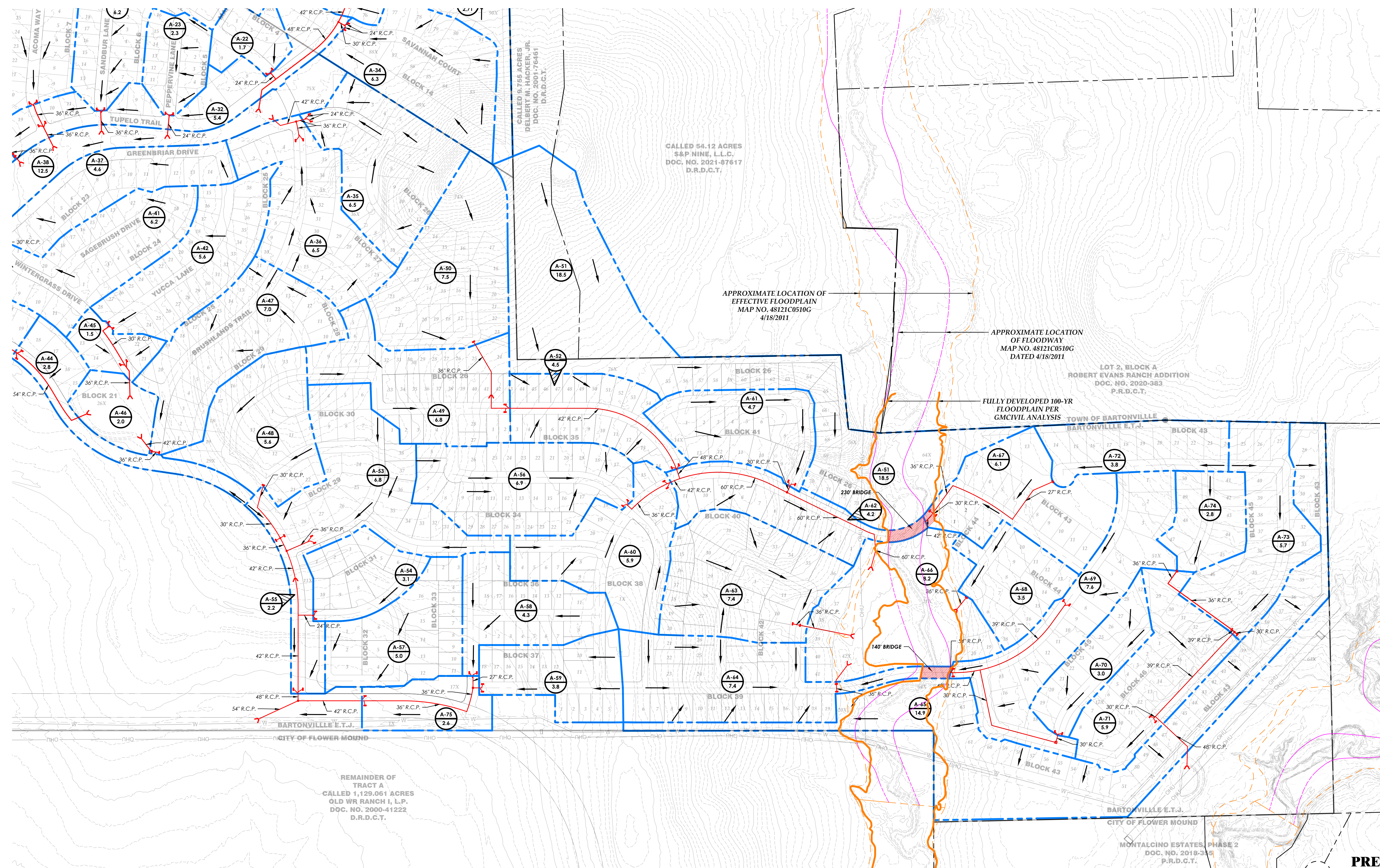
PRELIMINARY DRAINAGE LAYOUT
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HIGH PLAINS AT FURST RANCH
BEING
461.858 ACRES
SITUATED IN THE
PINSON WILES SURVEY, ABSTRACT No. 1339
A.M. FELTUS SURVEY, ABSTRACT No. 1595
DENTON COUNTY, TEXAS
1115 RESIDENTIAL LOTS, 35 NON-RESIDENTIAL LOTS
Date: JUNE 2024



LEGEND

- DRAINAGE AREA /ACREAGE
- DRAINAGE AREA DIVIDE
- FLOW ARROW (RUNOFF DIRECTION)
- STORM DRAIN & INLET

KEY MAP



PREPARED FOR:

Hines

2700 Commerce St., Suite 1600
Dallas, Texas 75226
(972) 716-2900

PREPARED BY:

GMcivil
Engineering & Surveying
2559 SW Grapevine Pkwy, Grapevine, Texas 76051
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PRELIMINARY DRAINAGE LAYOUT
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A.M. FELTUS SURVEY, ABSTRACT No. 1595
DENTON COUNTY, TEXAS
1115 RESIDENTIAL LOTS, 35 NON-RESIDENTIAL LOTS
Date: JUNE 2024

HYDROLOGIC COMPUTATIONS								
Basin	Area	C	CA	TIME	I10	Q10	I100	Q100
A-1	6.00	0.60	3.60	15	5.50	19.80	7.91	28.48
A-2	3.50	0.60	2.10	15	5.50	11.55	7.91	16.61
A-3	4.90	0.60	2.94	15	5.50	16.17	7.91	23.26
A-4	4.60	0.60	2.76	15	5.50	15.18	7.91	21.83
A-5	12.60	0.60	7.56	15	5.50	41.58	7.91	59.80
A-6	5.20	0.60	3.12	15	5.50	17.16	7.91	24.68
A-7	7.60	0.60	4.56	15	5.50	25.08	7.91	36.07
A-8	3.10	0.60	1.86	15	5.50	10.23	7.91	14.71
A-9	3.20	0.60	1.92	15	5.50	10.56	7.91	15.19
A-10	2.00	0.60	1.20	15	5.50	6.60	7.91	9.49
A-11	4.50	0.60	2.70	15	5.50	14.85	7.91	21.36
A-12	3.80	0.60	2.28	15	5.50	12.54	7.91	18.03
A-13	6.40	0.60	3.84	15	5.50	21.12	7.91	30.37
A-14	5.20	0.60	3.12	15	5.50	17.16	7.91	24.68
A-15	6.60	0.60	3.96	15	5.50	21.78	7.91	31.32
A-16	1.30	0.60	0.78	15	5.50	4.29	7.91	6.17
A-17	2.50	0.60	1.50	15	5.50	8.25	7.91	11.87
A-18	2.10	0.60	1.26	15	5.50	6.93	7.91	9.97
A-19	3.50	0.60	2.10	15	5.50	11.55	7.91	16.61
A-20	1.30	0.60	0.78	15	5.50	4.29	7.91	6.17
A-21	2.40	0.60	1.44	15	5.50	7.92	7.91	11.39
A-22	1.70	0.60	1.02	15	5.50	5.61	7.91	8.07
A-23	2.30	0.60	1.38	15	5.50	7.59	7.91	10.92
A-24	6.20	0.60	3.72	15	5.50	20.46	7.91	29.43
A-25	7.00	0.60	4.20	15	5.50	23.10	7.91	33.22
A-26	7.30	0.60	4.38	15	5.50	24.09	7.91	34.65
A-27	6.20	0.60	3.72	15	5.50	20.46	7.91	29.43
A-28	4.30	0.60	2.58	15	5.50	14.19	7.91	20.41
A-29	2.10	0.60	1.26	15	5.50	6.93	7.91	9.97
A-30	0.80	0.60	0.48	15	5.50	2.64	7.91	3.80
A-31	4.40	0.60	2.64	15	5.50	14.52	7.91	20.88
A-32	5.40	0.60	3.24	15	5.50	17.82	7.91	25.63
A-33	2.71	0.60	1.63	15	5.50	8.94	7.91	12.86
A-34	6.30	0.60	3.78	15	5.50	20.79	7.91	29.90
A-35	6.50	0.60	3.90	15	5.50	21.45	7.91	30.85
A-36	6.50	0.60	3.90	15	5.50	21.45	7.91	30.85
A-37	4.60	0.60	2.76	15	5.50	15.18	7.91	21.83
A-38	12.50	0.60	7.50	15	5.50	41.25	7.91	59.33
A-39	1.10	0.60	0.66	15	5.50	3.63	7.91	5.22
A-40	2.50	0.60	1.50	15	5.50	8.25	7.91	11.87
A-41	6.20	0.60	3.72	15	5.50	20.46	7.91	29.43
A-42	5.60	0.60	3.36	15	5.50	18.48	7.91	26.58
A-43	3.90	0.60	2.34	15	5.50	12.87	7.91	18.51
A-44	2.80	0.60	1.68	15	5.50	9.24	7.91	13.29
A-45	1.50	0.60	0.90	15	5.50	4.95	7.91	7.12
A-46	2.00	0.60	1.20	15	5.50	6.60	7.91	9.49
A-47	7.00	0.60	4.20	15	5.50	23.10	7.91	33.22
A-48	5.60	0.60	3.36	15	5.50	18.48	7.91	26.58
A-49	6.80	0.60	4.08	15	5.50	22.44	7.91	32.27
A-50	7.50	0.60	4.50	15	5.50	24.75	7.91	35.60
A-51	18.50	0.60	11.10	15	5.50	61.05	7.91	87.80
A-52	4.50	0.60	2.70	15	5.50	14.85	7.91	21.36
A-53	6.80	0.60	4.08	15	5.50	22.44	7.91	32.27
A-54	3.10	0.60	1.86	15	5.50	10.23	7.91	14.71
A-55	2.20	0.60	1.32	15	5.50	7.26	7.91	10.44
A-56	6.90	0.60	4.14	15	5.50	22.77	7.91	32.75
A-57	5.00	0.60	3.00	15	5.50	16.50	7.91	23.73
A-58	4.30	0.60	2.58	15	5.50	14.19	7.91	20.41
A-59	3.80	0.60	2.28	15	5.50	12.54	7.91	18.03
A-60	5.90	0.60	3.54	15	5.50	19.47	7.91	28.00
A-61	4.70	0.60	2.82	15	5.50	15.51	7.91	22.31
A-62	4.20	0.60	2.52	15	5.50	13.86	7.91	19.93
A-63	7.40	0.60	4.44	15	5.50	24.42	7.91	35.12
A-64	7.40	0.60	4.44	15	5.50	24.42	7.91	35.12
A-65	14.90	0.60	8.94	15	5.50	49.17	7.91	70.72
A-66	8.20	0.60	4.92	15	5.50	27.06	7.91	38.92
A-67	6.10	0.60	3.66	15	5.50	20.13	7.91	28.95
A-68	3.50	0.60	2.10	15	5.50	11.55	7.91	16.61
A-69	7.60	0.60	4.56	15	5.50	25.08	7.91	36.07
A-70	3.00	0.60	1.80	15	5.50	9.90	7.91	14.24
A-71	5.90	0.60	3.54	15	5.50	19.47	7.91	28.00
A-72	3.80	0.60	2.28	15	5.50	12.54	7.91	18.03
A-73	5.70	0.60	3.42	15	5.50	18.81	7.91	27.05
A-74	2.80	0.60	1.68	15	5.50	9.24	7.91	13.29
A-75	2.60	0.60	1.56	15	5.50	8.58	7.91	12.34

PREPARED FOR:

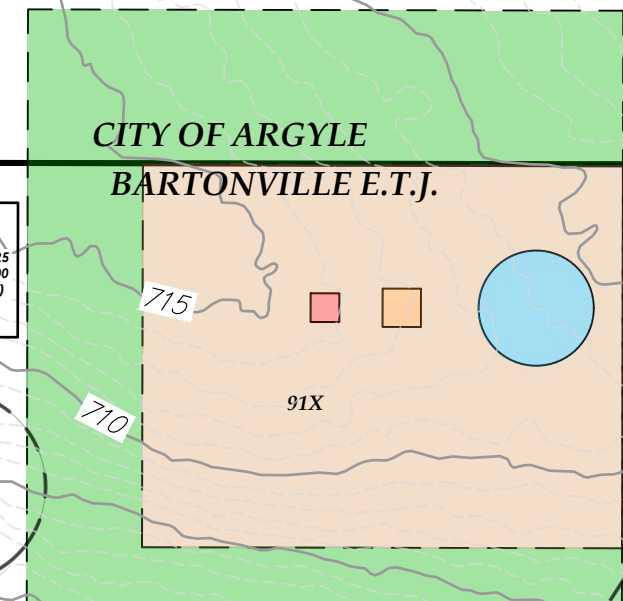
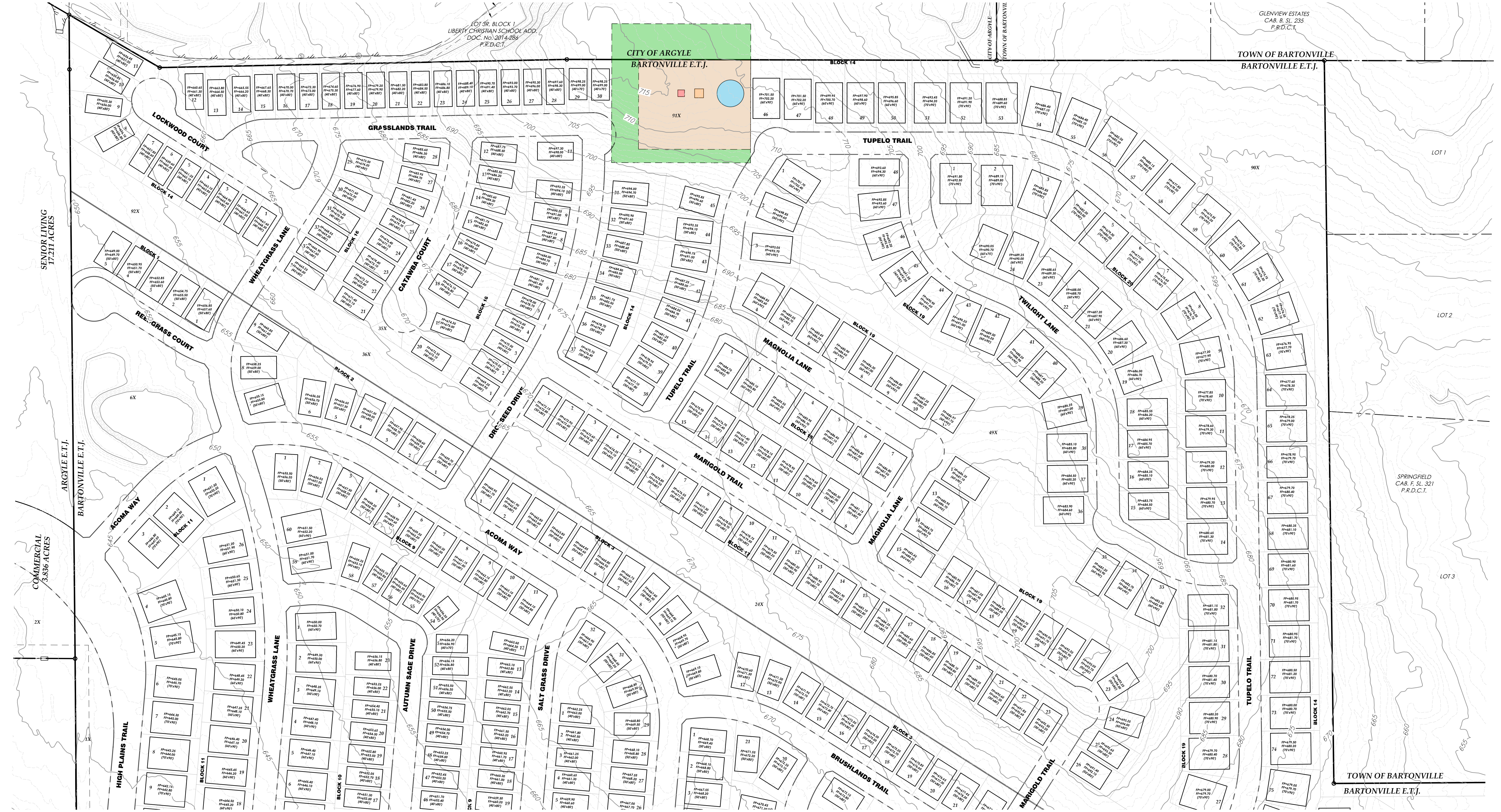
Hines

2700 Commerce St., Suite 1600
Dallas, Texas 75226
(972) 716-2900

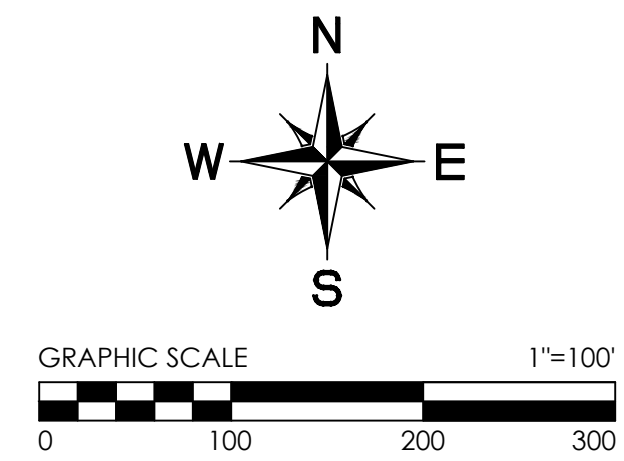
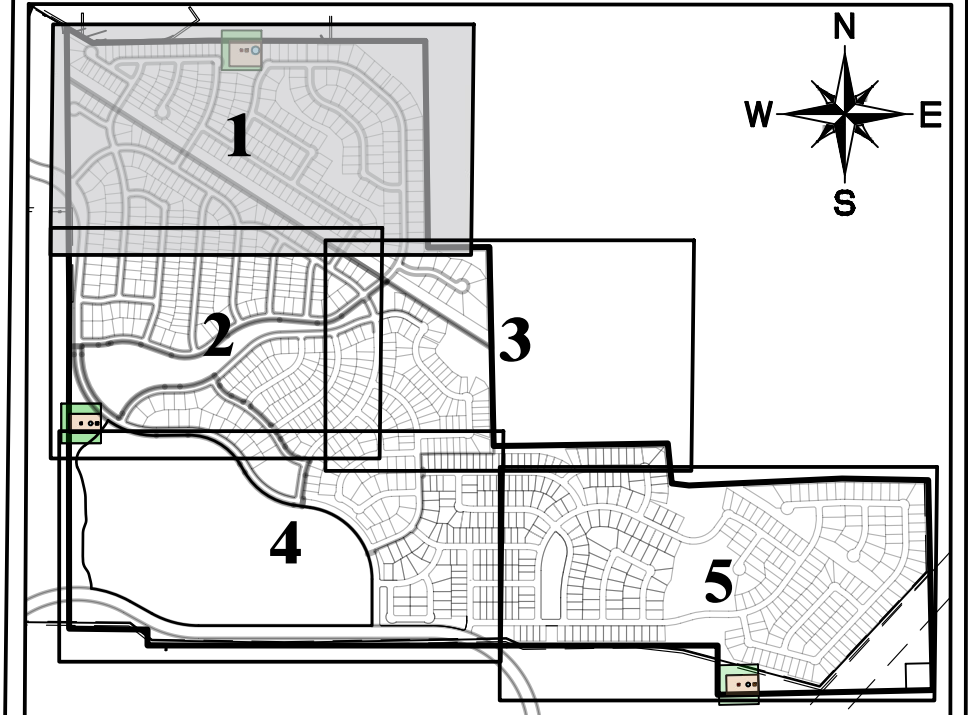
PREPARED BY:



PRELIMINARY DRAINAGE LAYOUT
OF
HIGH PLAINS AT FURST RANCH
BEING
461.858 ACRES
SITUATED IN THE
PINSON WILES SURVEY, ABSTRACT No. 1339
A.M. FELTUS SURVEY, ABSTRACT No. 1595
DENTON COUNTY, TEXAS
1115 RESIDENTIAL LOTS, 35 NON-RESIDENTIAL LOTS
Date: JUNE 2024



Keymap



GRADING LEGEND			
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EXISTING MAJOR CONTOUR	25 FF=700.00 FF=700.70 (40'x80')	40' X 80' TYPICAL PAD	
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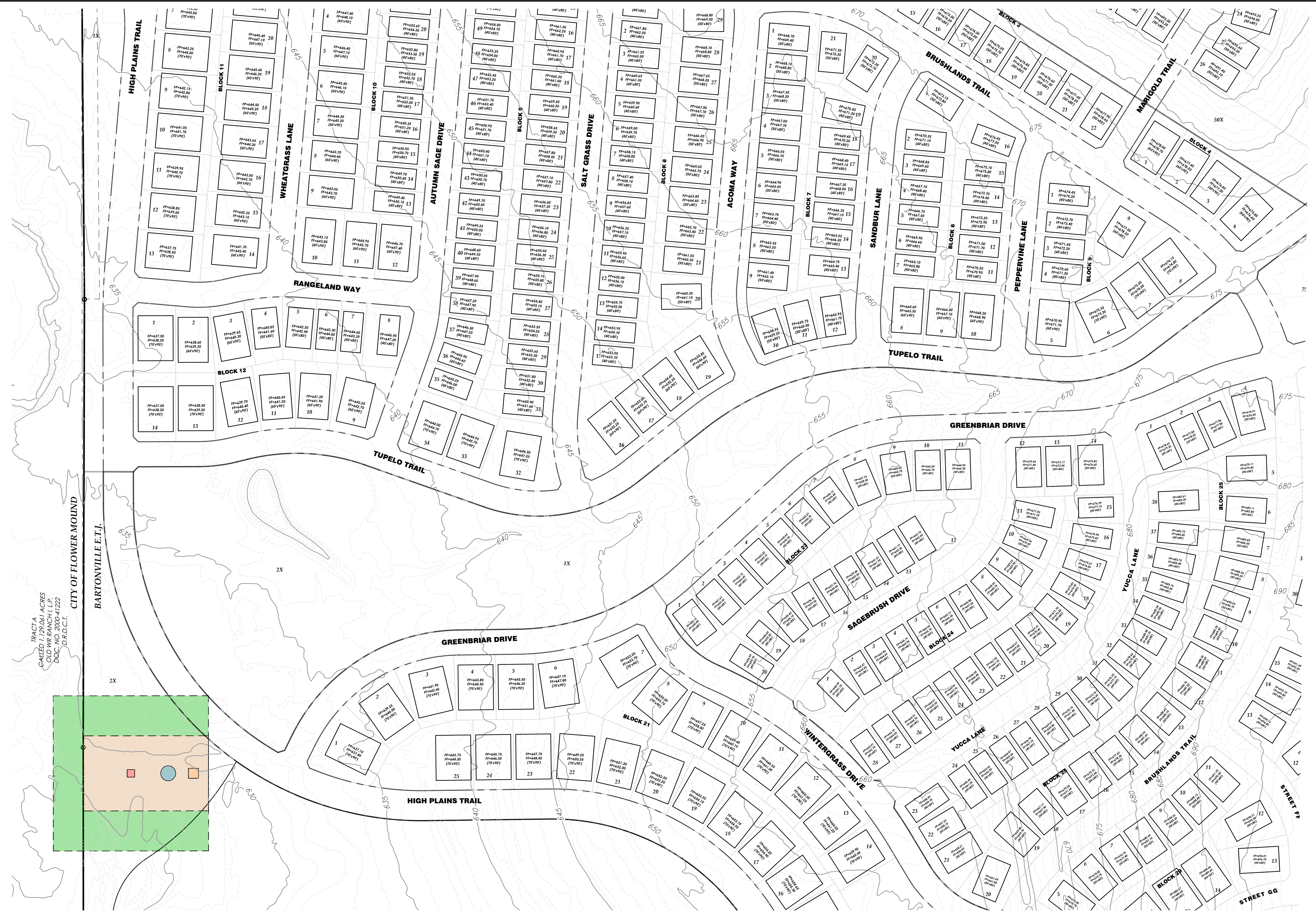
PREPARED FOR:

 2700 Commerce St., Suite 1600
 Dallas, Texas 75226
 (972) 716-2900

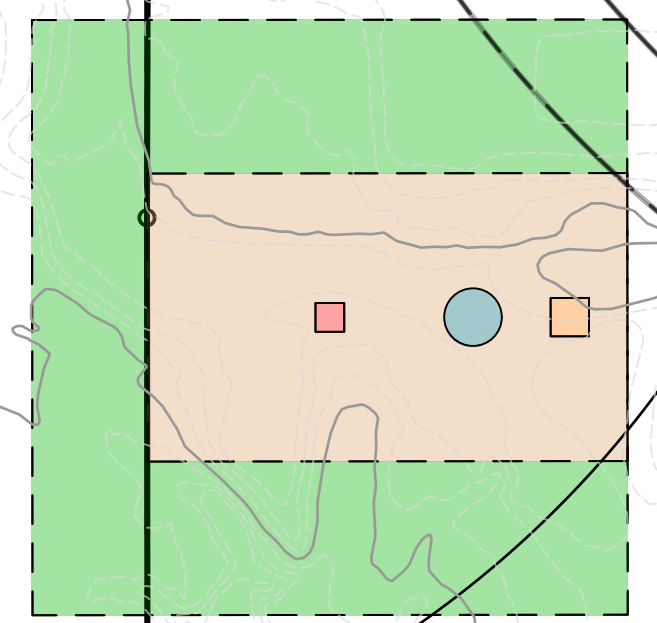
PREPARED BY:

GMcivil
 Engineering & Surveying
 2559 SW Grapevine Pkwy, Grapevine, Texas 76051
 817-329-4373
 TxEng Firm # F-2944 | TxSurv Firm # 10021700

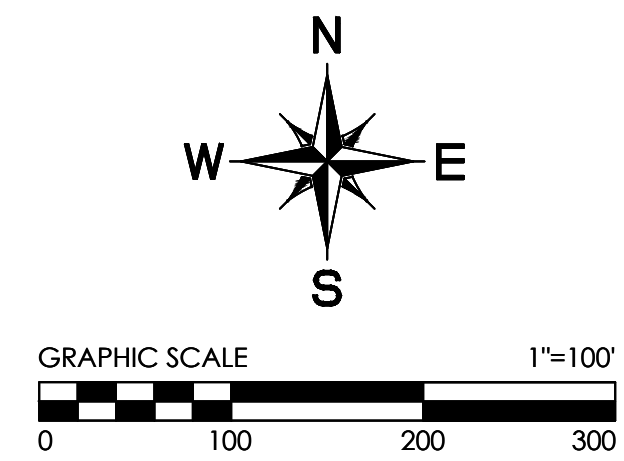
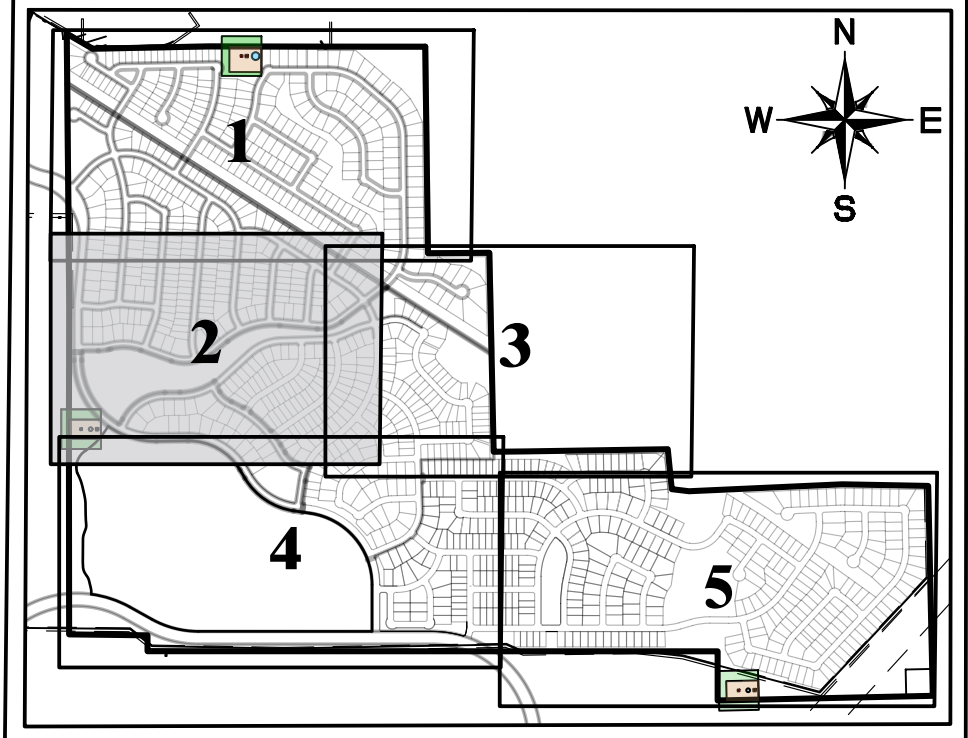
PRELIMINARY PAD GRADING
 OF
HIGH PLAINS AT FURST RANCH
 BEING
 461.858 ACRES
 SITUATED IN THE
PINSON WILES SURVEY, ABSTRACT No. 1339
A.M. FELTUS SURVEY, ABSTRACT No. 1595
DENTON COUNTY, TEXAS
 1115 RESIDENTIAL LOTS, 35 NON-RESIDENTIAL LOTS
 Date: JUNE 2024



TRACT A
 CATED 1/23/04 1 ACRES
 OLD WILSON RANCH L.P.
 DOC. NO. 2000-41222
 D.R.D.C.T.



Keymap



GRADING LEGEND			
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25 FP=700.00 EF=700.70 (50'x80')	50' X 80' TYPICAL PAD	65' X 75' TYPICAL PAD	25 FP=700.00 EF=700.70 (65'x75')

PREPARED FOR:

Hines
 2700 Commerce St., Suite 1600
 Dallas, Texas 75226
 (972) 716-2900

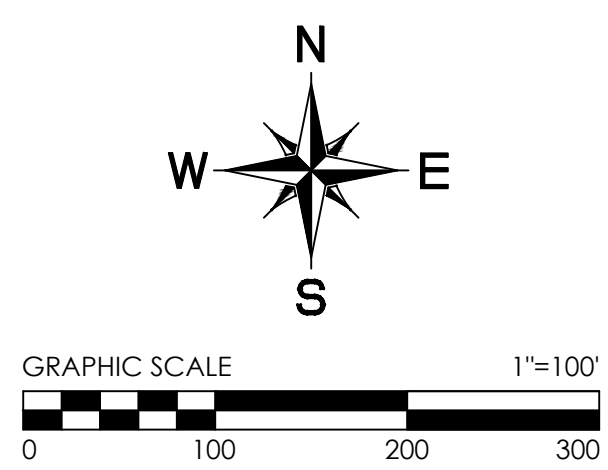
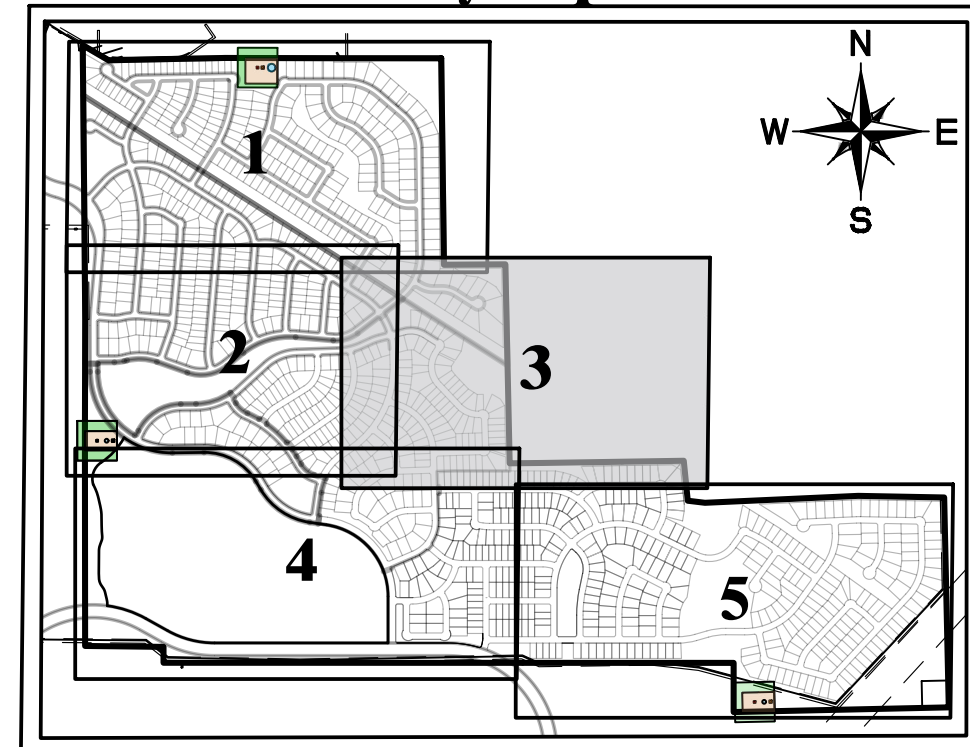
PREPARED BY:

GMcivil
 Engineering & Surveying
 2559 SW Grapevine Pkwy, Grapevine, Texas 76051
 817-329-4373
 TxEng Firm # F-2944 | TxSurv Firm # 10021700

PRELIMINARY PAD GRADING
 OF
HIGH PLAINS AT FURST RANCH
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 461.858 ACRES
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PINSON WILES SURVEY, ABSTRACT No. 1339
A.M. FELTUS SURVEY, ABSTRACT No. 1595
DENTON COUNTY, TEXAS
 1115 RESIDENTIAL LOTS, 35 NON-RESIDENTIAL LOTS
 Date: JUNE 2024



Keymap



GRADING LEGEND			
	EXISTING MINOR CONTOUR		60' X 90' TYPICAL PAD
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	65' X 75' TYPICAL PAD		

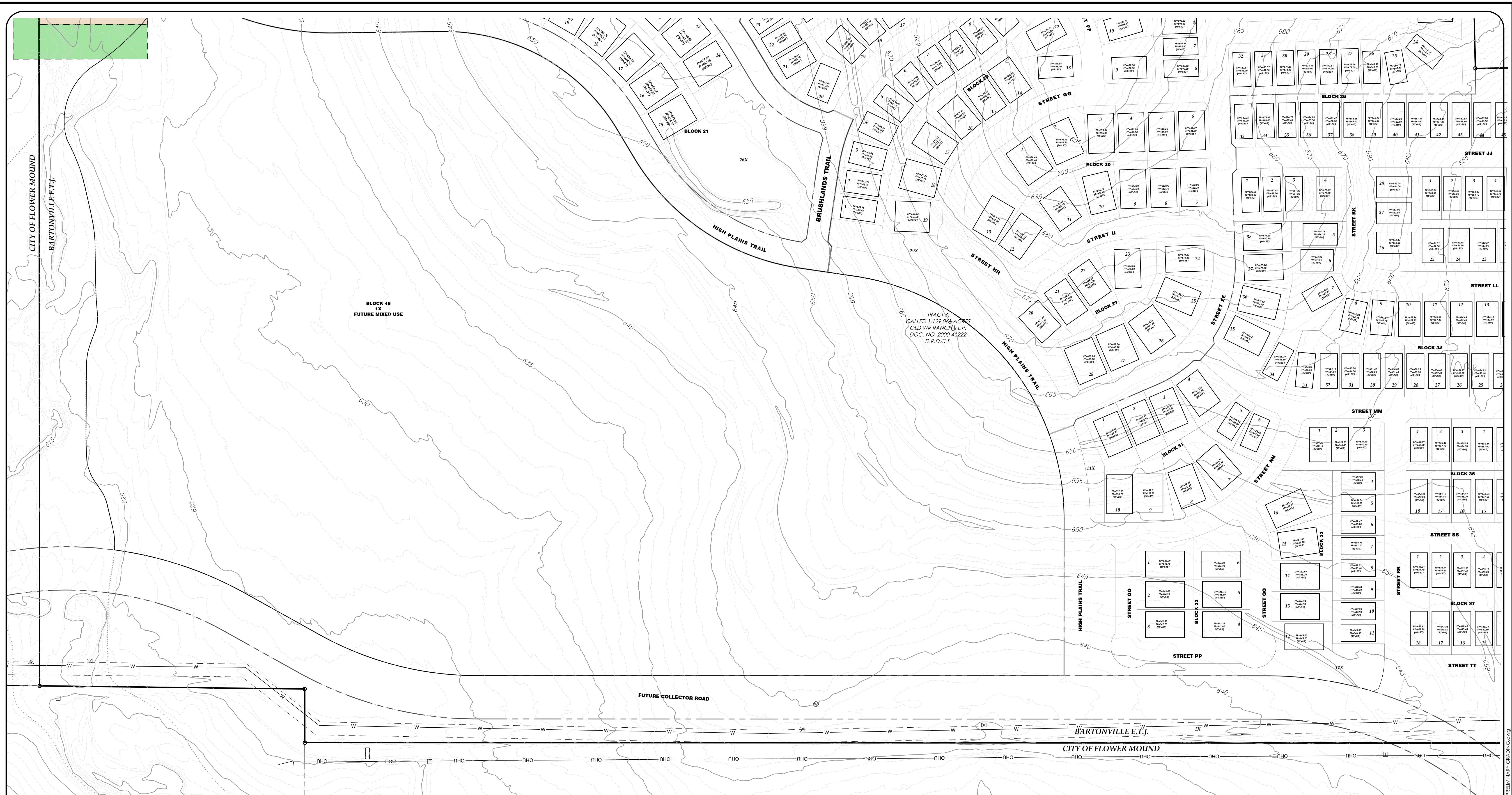
PREPARED FOR:



PREPARED BY:



PRELIMINARY PAD GRADING
 OF
HIGH PLAINS AT FURST RANCH
 BEING
 461.858 ACRES
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PINSON WILES SURVEY, ABSTRACT No. 1339
A.M. FELTUS SURVEY, ABSTRACT No. 1595
DENTON COUNTY, TEXAS
 1115 RESIDENTIAL LOTS, 35 NON-RESIDENTIAL LOTS
 Date: JUNE 2024



TRACTA
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/ OLD WIR RANCH, L.P.
DOC. NO. 2000-41222
D.R.D.C.T.

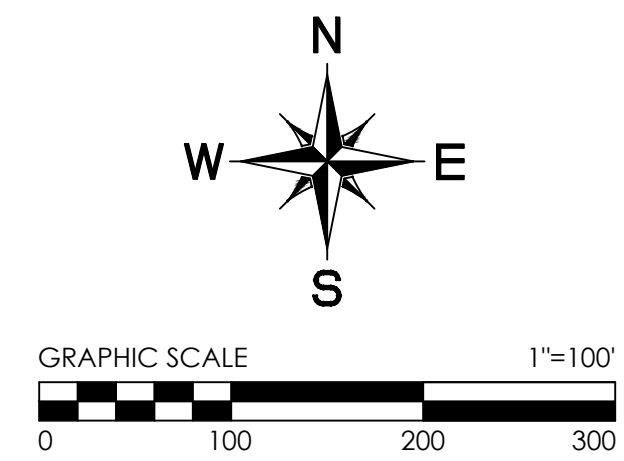
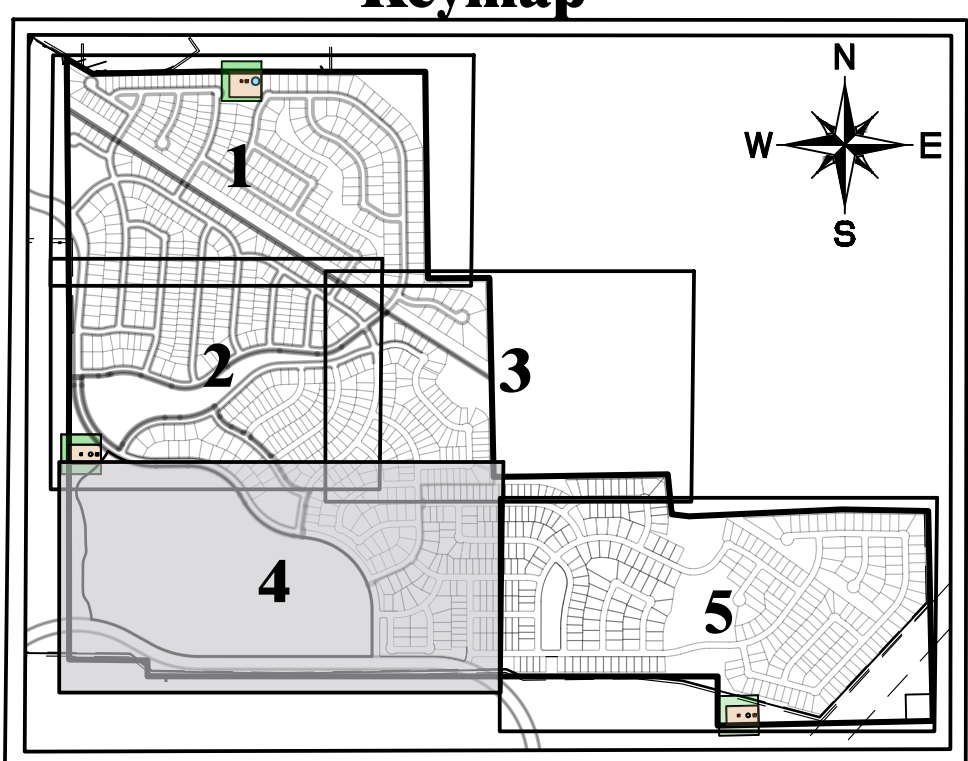
BLOCK 48
1X
FUTURE MIXED USE

FUTURE COLLECTOR ROAD

BARTONVILLE E.T.J.

CITY OF FLOWER MOUND

Keymap



GRADING LEGEND

	EXISTING MINOR CONTOUR	25 FP=700.00 FF=700.70 (60'x90')	60' X 90' TYPICAL PAD
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	50' X 80' TYPICAL PAD	25 FP=700.00 FF=700.70 (65'x75')	65' X 75' TYPICAL PAD

PREPARED FOR:

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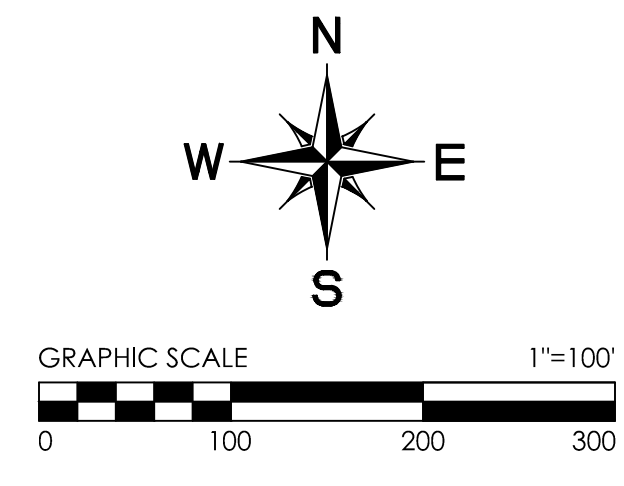
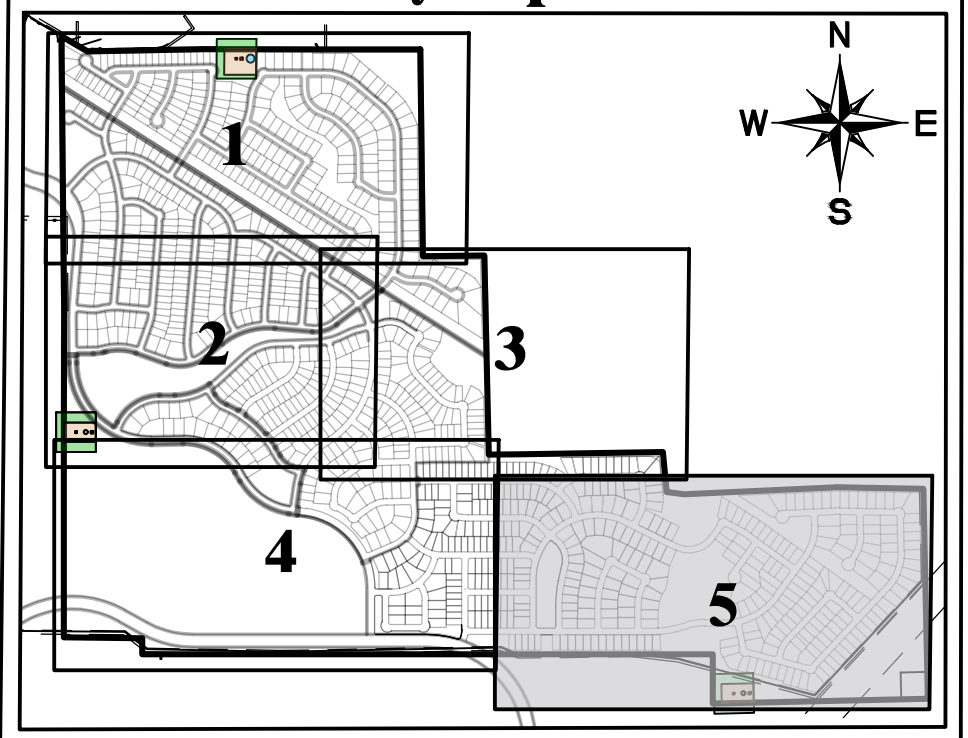


APPROXIMATE LOCATION
 OF FLOODWAY
 MAP NO. 48121C0510G
 DATED 4/18/2011

APPROXIMATE LOCATION OF
 EFFECTIVE FLOODPLAIN
 MAP NO. 48121C0510G
 4/18/2011

TOP SOIL BLOCK G
 MONTALCINO ESTATES, PHASE 2
 DOC. NO. 2018-355
 P.R.D.C.T.

Keymap



GRADING LEGEND

	EXISTING MINOR CONTOUR	25 FP=700.00 FF=700.70 (60'x90')	60' X 90' TYPICAL PAD
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	25 FP=700.00 FF=700.70 (65'x75')		65' X 75' TYPICAL PAD

PREPARED FOR:



PREPARED BY:



PRELIMINARY PAD GRADING
 OF
HIGH PLAINS AT FURST RANCH
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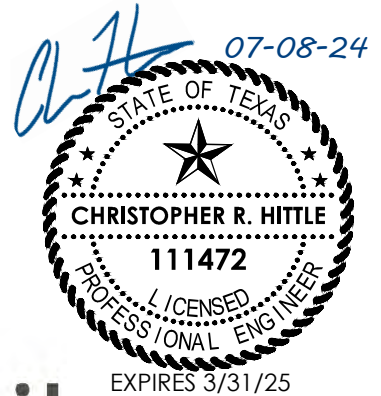
**FLOOD STUDY
FOR A PORTION OF
WHITES BRANCH
BARTONVILLE ETJ, TEXAS**

Prepared by:



GM civil
Engineering & Surveying

JULY 2024



**FLOOD STUDY
FOR A PORTION OF
WHITES BRANCH
BARTONVILLE ETJ, TEXAS**

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APPENDICES

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Appendix B	Post-Project Hydrology
Appendix C	Fully Developed Hydrology
Appendix D	Pre-Project Hydraulics
Appendix E	Post-Project Hydraulics
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**FLOOD STUDY
FOR A PORTION OF
WHITES BRANCH
BARTONVILLE ETJ, TEXAS**

PURPOSE

The report contained herein is in support of the Furst Ranch project in the ETJ of the Town of Bartonville, Texas. The property lies within a moderately developed area with an established development and US 377 to the west, Liberty Christian School to the north, 2-acre residential to the east, and undeveloped land to the south. The property is located on FIRM Panels 48121C0510G and 48121C0505G, which can be seen on Figures 2a and 2b. The purpose of this report is to illustrate the impacts of the proposed Furst Ranch development relative to Whites Branch and show that the results meet Town and FEMA requirements for development.

LOCATION & TOPOGRAPHIC DATA

The property is generally located east of US 377, north of Smoot Lane, and south of Liberty Christian School in the ETJ of the Town of Bartonville, Texas. The project location can be found on Figure 1.

Topographic data was obtained through on-the-ground field survey, 2019 LIDAR data acquired from the Texas Natural Resources Information System (TNRIS) , and as-built drawings. The topographic data is on the NAVD 88 vertical datum.

EFFECTIVE DATA

Effective data for this analysis was obtained from FIS Data Request B2406086. Most of the studied area is within Zone A, so effective data was only used where it existed, namely in the most upstream portion of Whites Branch. In this portion of Whites Branch, the single mapped FEMA cross section within the limits of the study was replicated in the pre-project model as XS 11642. Due to mainly Zone A creeks within the study area, new hydrologic modeling was prepared for the entire watershed.

HYDROLOGIC ANALYSIS

The hydrologic analysis for this study was prepared to determine the impacts of the proposed Furst Ranch development on Whites Branch. The methods utilized to quantify storm run-off for the Whites Branch watershed were performed in conformance with local drainage regulations.

Hydrologic models for pre-project, post-project, and fully developed conditions for this analysis were prepared using the U.S. Army Corps of Engineers (USACE) unit hydrograph program HEC-HMS v4.11. The Soil Conservation Service (SCS) curve number loss method was utilized in conjunction with the SCS unit hydrograph to calculate discharges for the 10-, 50-, 100-, and 500-year storm events. Lag time calculations were prepared using the SCS Unit Hydrograph methodology.

The SCS curve number loss method was utilized in the hydrologic model. Base curve numbers for each drainage basin reflecting general open space with no imperviousness were calculated based on hydrologic soil group using existing soils data. Soils data was downloaded from NRCS for Denton County. The soils data utilized for pre- and post-project conditions can be found on Figures 3 and 5, respectively. Pre-project land uses were determined based on the inspection of aerial photography and matched to an appropriate percent imperviousness. For the post-project condition, the percent imperviousness was updated to reflect the proposed single-family use within the Furst Ranch development. For the fully developed condition, future land use maps from the Towns of Flower Mound, Bartonville, and Argyle were used to develop a fully developed condition land use map. Pre-project, post-project, and fully developed conditions land use maps for this analysis can be found on Figures 4, 6, and 7, respectively. Precipitation data for Denton County was taken from Table 5.3 of the 2014 iSWM Hydrology Manual for the 10-, 50-, 100-, and 500-year storm events.

Pre-Project Condition

The pre-project condition model was designed to analyze all areas upstream of where Whites Branch flows underneath the bridge at FM 1171. Drainage subbasins were delineated using the 2009 Town of Flower Mound Hydrology Study drainage basins as a base. The Town study basins were subdivided and/or re-delineated based on existing topography to calculate discharges are critical locations throughout the watershed. The existing Burger Lake on the Furst property within Flower Mound was modeled as a detention pond. Existing topography was used to generate a stage-storage relationship and the outflow structures methodology in HEC-HMS was utilized to model the outfall structures. A Hydraflow pond report was prepared for the lake to summarize the input data for

the existing lake and can be found in Appendix A. Routing reaches within the HEC-HMS model utilize the Modified Puls methodology where hydraulic modeling was available while Muskingum-Cunge routings were used for reaches that were not hydraulically modeled. The pre-project calculations and model results can be found in Appendix A. The pre-project condition drainage area map can be found on Plate 1.

Post-Project Condition

The post-project condition model was prepared using the pre-project model as a base. Land use parameters for the revised basins were updated to reflect full construction of the portion of Furst Ranch within the Town of Bartonville ETJ.

Subbasin BA3 was subdivided into BA3a and BA3b. Subbasin BA8 was subdivided into six subbasins, BA8a-BA8f. These subdivisions were added to more accurately model flow through the Furst Ranch development.

Three detention ponds are proposed with the Furst Ranch development. Stage-storage curves for the ponds were developed based on preliminary grading. The pond outfalls were modeled in HEC-HMS using the outflow structures methodology. Hydraflow pond reports were prepared to summarize the input data for the proposed detention ponds and can be found in Appendix B. Modified Puls routing calculations were updated where grading is proposed. Updated routing calculations can be found in Appendix B. The post-project calculations and model results can be found in Appendix B. The post-project condition drainage area map can be found on Plate 2.

Fully Developed Condition

The fully developed condition model was prepared using the post-project condition model as a base. Land use parameters were updated throughout the basin to reflect fully developed land uses. Model results can be found in Appendix C. No changes were made to the post-project drainage basins and, therefore, Plate 2 is reflective of the fully developed condition as well.

HYDRAULIC ANALYSIS

All hydraulic modeling performed for this analysis utilizes the Corps of Engineers backwater computation model HEC-RAS v6.4.1. The following represents a summary of the pre-project, post-project, and fully developed conditions models that have been created for this analysis.

Pre-Project Condition

The pre-project condition model was prepared to model the portions of Whites Branch and its tributaries that will be affected by the development. Reach centerlines were drawn with the use of existing topography and aerial photography. Cross sections were drawn and then geometry was extracted from the existing topography. Each cross section had n-values assigned according to land classification based on inspection of aerial photography. Culverts and bridges, with parameters established by as-built plans and survey data, were added to the geometry. As-built plans for the bridge at FM 1171 can be found in the supplemental data folder.

Steady flow data was created with downstream boundary conditions of normal depth. 10-, 50-, 100-, and 500-year flows were added from the results of the hydrologic model. The pre-project condition HEC-RAS model output can be found in Appendix D. Pre-project topographic workmaps can be found on Plates 3 – 6.

Post-Project Condition

The post-project condition model was prepared using the pre-project condition model as a base. The proposed grading improvements for the Furst Ranch project along Whites Branch were added to the geometry of the intersecting cross sections. These improvements are all fill within the overbanks. Culverts that will not remain in the post-project condition were removed from the geometry. One new culvert and one new bridge are proposed along Whites Branch Tributary 2.1 and two new bridges are proposed along Whites Branch. Steady flow data was updated with post-project flows. The post-project condition HEC-RAS model output can be found in Appendix E. Post-project topographic workmaps can be found on Plates 7 – 10.

Fully Developed Condition

The fully developed condition model was prepared using the post-project condition model as a base. Steady flow data was updated with fully developed flows. The 100-year fully developed conditions WSELs will be utilized for design of Furst Ranch, specifically to establish minimum finished floor elevations for residential lots adjacent to the branch. The fully developed condition floodplain delineations can be found on the fully developed topographic workmaps on Plates 11 – 14. The fully developed condition HEC-RAS model output can be found in Appendix H.

RESULTS

The table below provides a comparison of the results of each of the models discussed above for the portion affected by the proposed improvements.

Table 1: Pre-Project Condition Basin Parameters

Drainage Basin	Area (sq. mi.)	Lag Time (min)	Curve Number	% Impervious
BA24	1.195	26.3	69.1	9.6
BA25	1.032	34.6	70.5	10.0
BA26	0.351	19.2	66.7	4.0
BA27	0.345	19.1	73.6	6.9
BA15	0.742	30.8	69.0	23.1
BA16	0.268	18.8	69.2	13.6
BA17	0.702	21.0	68.0	12.9
BA18	0.432	19.8	68.6	11.7
BA19	0.055	12.3	60.2	8.8
BA20	0.044	10.1	73.6	0.0
BA21a	0.069	8.6	60.7	0.8
BA21b	0.197	11.1	67.3	1.9
BA22	0.097	11.1	75.0	0.0
BA23	0.151	19.6	70.7	0.0
BA28	0.137	12.0	72.6	3.8
BA29	0.084	14.8	77.1	0.0
BA30	0.292	17.5	72.1	1.2
BA1	0.511	26.3	67.0	24.2
BA2	0.276	16.4	73.9	44.9
BA3	0.072	17.9	78.4	1.0
BA4	0.152	22.1	76.2	0.1
BA5	0.201	15.8	68.5	38.0

Drainage Basin	Area (sq. mi.)	Lag Time (min)	Curve Number	% Impervious
BA6	0.209	17.7	73.0	21.8
BA7	0.104	19.5	78.9	2.6
BA8	0.138	19.6	76.1	0.0
BA9	0.070	13.6	74.8	0.0
BA10	0.072	16.0	70.6	0.0
BA11	0.064	13.0	69.0	0.0
BA12	0.637	18.4	74.6	5.1
BA14	0.047	21.0	75.7	0.0
BA13	0.113	23.4	75.2	0.0
BA31	0.084	9.5	74.1	7.7

Table 2: Post-Project Condition Basin Parameters

Drainage Basin	Area (sq. mi.)	Lag Time (min)	Curve Number	% Impervious
BA24	1.195	26.3	69.1	9.6
BA25	1.032	34.6	70.5	10.0
BA26	0.341	19.2	66.5	7.6
BA27	0.344	19.1	73.6	7.5
BA15	0.742	30.8	69.0	23.1
BA16	0.268	18.8	69.2	13.6
BA17	0.702	21.0	68.0	12.9
BA18	0.426	19.8	68.8	13.1
BA19	0.049	11.0	63.3	32.7
BA21b	0.196	11.1	67.3	2.7
BA21a	0.081	6.7	62.0	50.8
BA22	0.103	7.9	74.7	47.6
BA23	0.151	19.6	70.7	0.1
BA28	0.137	12.0	72.6	3.8
BA29	0.084	14.8	77.1	0.0
BA30	0.292	17.5	72.1	1.2
BA1	0.511	26.3	67.0	24.2
BA2	0.276	16.4	73.9	45.0
BA3b	0.044	12.2	80.0	13.1
BA3a	0.078	10.3	71.0	56.1
BA4	0.070	19.9	79.5	0.2
BA5	0.201	5.5	68.5	38.0

Drainage Basin	Area (sq. mi.)	Lag Time (min)	Curve Number	% Impervious
BA6	0.209	5.5	73.0	21.8
BA7	0.104	9.7	78.9	2.6
BA8a	0.055	9.9	67.8	49.6
BA8b	0.038	10.0	78.8	55.1
BA8c	0.045	10.1	76.4	52.8
BA8d	0.023	15.8	67.8	56.5
BA8e	0.058	17.7	74.8	64.5
BA8f	0.038	19.5	74.6	0.0
BA9	0.069	12.0	74.9	0.0
BA10	0.044	10.2	74.5	0.0
BA11	0.055	10.2	69.6	38.0
BA12	0.637	18.4	74.6	5.1
BA14	0.047	21.0	75.7	0.0
BA13	0.113	23.4	75.2	0.0
BA31	0.084	9.5	74.1	7.7

Table 3: Fully Developed Condition Basin Parameters

Drainage Basin	Area (sq. mi.)	Lag Time (min)	Curve Number	% Impervious
BA24	1.195	25.5	69.1	9.6
BA25	1.032	29.6	70.5	10.0
BA26	0.341	15.9	66.5	7.6
BA27	0.344	18.1	73.6	7.5
BA15	0.742	25.8	69.0	23.1
BA16	0.268	18.2	69.2	13.6
BA17	0.702	21.0	68.0	12.9
BA18	0.426	19.8	68.8	13.1
BA19	0.049	11.0	63.3	32.7
BA21b	0.196	11.0	67.3	2.7
BA21a	0.081	6.7	62.0	50.8
BA22	0.103	7.9	74.7	47.6
BA23	0.151	19.2	70.7	0.1
BA28	0.137	11.5	72.6	3.8
BA29	0.084	12.6	77.1	0.0
BA30	0.292	16.9	72.1	1.2
BA1	0.511	25.8	67.0	24.2

Drainage Basin	Area (sq. mi.)	Lag Time (min)	Curve Number	% Impervious
BA2	0.276	15.9	73.9	45.0
BA3b	0.044	12.2	80.0	13.1
BA3a	0.078	10.3	71.0	56.1
BA4	0.070	19.9	79.5	0.2
BA5	0.055	15.8	67.8	38.0
BA6	0.038	17.7	78.8	21.8
BA7	0.045	19.1	76.4	2.6
BA8a	0.023	5.5	67.8	49.6
BA8b	0.058	5.5	74.8	55.1
BA8c	0.038	9.7	74.6	52.8
BA8d	0.201	9.9	68.5	56.5
BA8e	0.209	10.0	73.0	64.5
BA8f	0.104	10.1	78.9	0.0
BA9	0.069	12.0	74.9	0.0
BA10	0.044	10.2	74.5	0.0
BA11	0.055	10.2	69.6	38.0
BA12	0.637	17.8	74.6	5.1
BA14	0.047	15.8	75.7	0.0
BA13	0.113	20.2	75.2	0.0
BA31	0.084	7.7	74.1	7.7

Table 4: Pre-Project, Post-Project, and Fully Developed Discharges

HEC-HMS Node	Pre-Project (cfs)				Post-Project (cfs)				Fully Developed (cfs)
	10YR	50YR	100YR	500YR	10YR	50YR	100YR	500YR	100YR
Junction BA2	1,080	1,620	1,860	2,440	1,080	1,620	1,860	2,440	1,980
Junction BA3/BA3a	1,120	1,720	1,970	2,590	1,220	1,800	2,050	2,660	2,180
Junction BA8.1	1,370	2,190	2,520	3,320	1,470	2,210	2,520	3,250	2,670
Junction BA8.2	2,080	3,330	3,860	5,050	2,250	3,420	3,890	5,020	4,150
Junction BA9	2,110	3,390	3,940	5,170	2,290	3,490	3,980	5,140	4,260
Junction BA10	2,170	3,490	4,050	5,330	2,320	3,540	4,040	5,210	4,340
DET BA12	2,300	4,010	4,730	6,470	2,590	4,250	4,940	6,630	5,440
Junction BA13	2,310	4,030	4,800	6,530	2,620	4,320	5,060	6,740	5,540
Junction BA14	2,300	3,990	4,770	6,520	2,590	4,290	5,000	6,700	5,480
Junction BA19/BA20	2,040	3,330	3,920	5,410	2,030	3,290	3,860	5,320	4,270
Junction BA21a	2,090	3,440	4,050	5,620	2,080	3,400	4,000	5,530	4,400
Junction BA21b	2,070	3,400	4,010	5,550	2,060	3,360	3,940	5,450	4,340

HEC-HMS Node	Pre-Project (cfs)				Post-Project (cfs)				Fully Developed (cfs)
	10YR	50YR	100YR	500YR	10YR	50YR	100YR	500YR	100YR
Junction BA22	2,100	3,460	4,080	5,680	2,090	3,400	4,000	5,580	4,420
Junction BA23	2,080	3,460	4,080	5,650	2,060	3,400	4,000	5,550	4,380
Junction BA28	4,310	7,250	8,620	12,100	4,220	7,060	8,390	11,900	8,760
Junction BA30.1	4,340	7,300	8,700	12,300	4,260	7,140	8,490	12,100	8,890
Junction BA30.2	6,650	11,300	13,400	18,900	6,860	11,300	13,300	18,800	14,300
Junction BA31	6,670	11,300	13,500	18,900	6,880	11,300	13,400	18,900	14,300

Table 5: 100-Year HEC-RAS Results Summary

HEC-RAS Station	Pre-Project WSEL	Post-Project WSEL	Delta (ft)	Fully Developed WSEL
Tributary 2.1				
6974	653.16	653.16	0.00	653.24
6820	652.80	652.80	0.00	652.87
6800	Culvert			
6723	651.13	651.13	0.00	651.20
6399	649.48	649.48	0.00	649.56
6350	Culvert			
6317	649.38	649.38	0.00	649.49
6193	649.10	649.10	0.00	649.24
6049	647.64	647.70	0.06	647.81
5893	645.55	645.42	-0.13	645.51
5724	643.84	644.19	0.35	644.33
5570	643.55	644.05	0.50	644.20
5437	642.89	643.70	0.81	644.12
5337	Culvert			
5221	642.43	642.74	0.31	642.86
5000	641.55	641.50	-0.05	641.61
4801	640.94	640.84	-0.10	640.97
4579	640.53	640.34	-0.19	640.46
4398	640.06	639.56	-0.50	639.69
4292	639.88	639.24	-0.64	639.36
4259	Culvert			
4225	638.96	639.04	0.08	639.17
4029	638.33	638.42	0.09	638.57

HEC-RAS Station	Pre-Project WSEL	Post-Project WSEL	Delta (ft)	Fully Developed WSEL
3891	636.46	636.54	0.08	636.64
3720	636.37	636.33	-0.04	636.42
3536	635.76	635.71	-0.05	635.80
3347	633.93	633.91	-0.02	633.96
3160	632.54	632.49	-0.05	632.59
2856	632.27	632.22	-0.05	632.32
2697	631.91	631.86	-0.05	631.97
2508	631.60	631.55	-0.05	631.65
2332	631.14	631.09	-0.05	631.19
2122	630.23	630.19	-0.04	630.28
1943	629.08	629.01	-0.07	629.09
1728	627.84	627.93	0.09	628.00
1513	626.64	626.77	0.13	626.80
1000	623.31	623.25	-0.06	623.38
Tributary 2				
14071	647.05	648.50	1.45	648.53
13960	646.86	648.50	1.64	648.53
13930	Bridge			
13900	643.68	643.68	0.00	643.63
13854	644.27	644.27	0.00	644.30
13812	Culvert			
13768	641.84	641.84	0.00	641.95
13556	638.37	638.37	0.00	638.42
13441	637.40	637.40	0.00	637.45
13284	636.10	636.10	0.00	636.15
13151	635.13	635.13	0.00	635.19
12953	632.86	632.86	0.00	632.91
12754	630.81	630.81	0.00	630.90
12591	630.00	630.00	0.00	630.08
12382	628.89	628.89	0.00	628.99
12039	626.73	626.73	0.00	626.73
11744	623.84	623.63	-0.21	623.77
10999	621.22	621.88	0.66	622.07
10607	620.29	621.07	0.78	621.25
10553	Bridge			

HEC-RAS Station	Pre-Project WSEL	Post-Project WSEL	Delta (ft)	Fully Developed WSEL
10475	620.05	619.91	-0.14	620.05
10361	619.77	619.69	-0.08	619.84
10330	Culvert			
10288	619.69	619.58	-0.11	619.72
10085	618.92	617.91	-1.01	618.07
10060	Culvert			
10032	617.21	617.19	-0.02	617.37
9703	615.95	615.98	0.03	616.17
9494	613.71	613.73	0.02	613.90
8994	610.55	610.57	0.02	610.74
8494	607.82	607.85	0.03	607.97
8152	604.73	604.72	-0.01	604.87
7726	602.40	602.40	0.00	602.57
7264	600.22	600.21	-0.01	600.25
6994	597.34	597.34	0.00	597.58
6494	597.32	597.09	-0.23	597.23
5994	597.19	597.02	-0.17	597.17
5494	597.08	596.96	-0.12	597.10
4994	597.02	596.94	-0.08	597.08
4617	596.99	596.93	-0.06	597.07
4326	595.89	595.88	-0.01	595.98
4025	588.48	588.57	0.09	588.87
3669	580.26	580.45	0.19	580.83
3312	573.55	573.67	0.12	573.91
2941	570.73	570.79	0.06	570.97
2500	567.79	567.92	0.13	568.10
2197	565.75	565.79	0.04	565.94
1800	564.12	564.20	0.08	564.46
1448	563.65	563.71	0.06	564.03
1000	562.99	562.97	-0.02	563.27
Whites Branch				
13185	605.27	605.22	-0.05	605.44
13079	604.95	604.93	-0.02	605.28
12831	603.91	603.97	0.06	604.47
12669	603.67	603.75	0.08	604.24

HEC-RAS Station	Pre-Project WSEL	Post-Project WSEL	Delta (ft)	Fully Developed WSEL
12436	602.79	602.97	0.18	603.58
12330	Bridge			
12210	602.30	602.67	0.37	603.33
12030	598.07	598.38	0.31	598.33
11844	599.00	599.20	0.20	599.56
11691	597.81	598.71	0.90	599.12
11642	Bridge			
11399	596.77	596.67	-0.10	596.92
11285	596.61	596.47	-0.14	596.71
11170	596.33	596.19	-0.14	596.44
11144	Culvert			
11097	596.34	596.22	-0.12	596.47
10857	595.59	595.55	-0.04	595.76
10641	593.93	593.86	-0.07	594.18
10478	593.61	593.56	-0.05	593.82
10300	592.41	592.37	-0.04	592.60
10112	591.41	591.37	-0.04	591.58
9611	589.57	589.53	-0.04	589.72
9096	585.95	585.88	-0.07	586.19
8624	583.83	583.75	-0.08	584.12
8123	581.19	581.13	-0.06	581.46
7612	579.08	578.99	-0.09	578.77
7538	579.04	578.95	-0.09	578.73
7230	577.96	577.87	-0.09	578.31
6869	573.80	573.74	-0.06	573.99
6483	572.90	572.82	-0.08	572.98
6018	572.27	572.08	-0.19	572.38
5919	571.60	571.44	-0.16	571.72
5418	570.59	570.42	-0.17	570.74
4952	566.22	566.16	-0.06	566.28
4511	565.32	565.26	-0.06	565.37
4034	564.07	564.02	-0.05	564.00
3419	561.90	561.86	-0.04	562.23
3005	562.03	562.00	-0.03	562.28
2724	560.85	560.81	-0.04	561.08

HEC-RAS Station	Pre-Project WSEL	Post-Project WSEL	Delta (ft)	Fully Developed WSEL
2324	557.65	557.63	-0.02	557.87
2214	557.45	556.11	-1.34	556.35
2102	Bridge			
1965	555.70	555.69	-0.01	555.85
1773	555.27	555.26	-0.01	555.40
1611	553.93	553.92	-0.01	554.04
1456	553.79	553.76	-0.03	553.91
1209	553.35	553.32	-0.03	553.46
1000	553.02	552.99	-0.03	553.14

Table 6: HEC-HMS Nodes Related to HEC-RAS Cross Sections

HEC-HMS Node	HEC-RAS Cross Section
Junction BA2	6974 – Trib 2.1
Junction BA3b/BA3	5221 – Trib 2.1
Junction BA3a	4398 – Trib 2.1
Junction BA4	3536 – Trib 2.1
Junction BA8.1	1513 – Trib 2.1
Junction BA6	14071 – Trib 2
Junction BA7	12953 – Trib 2
Junction BA8.2	10999 – Trib 2
Junction BA9	10607 – Trib 2
Junction BA10	7264 – Trib 2
DET BA12	4025 – Trib 2
Junction BA14	2500 – Trib 2
Junction BA13	2197 – Trib 2
Junction BA21b	13185
Junction BA22	12030
Junction BA23	9096
Junction BA28	6018
Junction BA30.1	4952
Junction BA30.2	2724
Junction BA31	2324

SUMMARY

A pre-project, post-project, and fully developed hydrologic and hydraulic analysis has been presented herein. The results of the hydrologic analysis show minor increases in 100-year discharge along Whites Branch Tributary 2 through the Furst property within the Town of Flower Mound but that is part of the overall project property and does not negative impact any adjacent property owners. The 100-year discharges along Whites Branch are decreased from the Furst Ranch project in the Bartonville ETJ through the FM1171 bridge at the downstream end of the watershed.

The hydraulic analysis shows that there are no negative impacts to neighboring properties upstream and downstream of the Furst Ranch development. The 100-year fully developed condition WSELs will be utilized for design of Furst Ranch, specifically to establish minimum finished floor elevations for residential lots adjacent to the creeks.