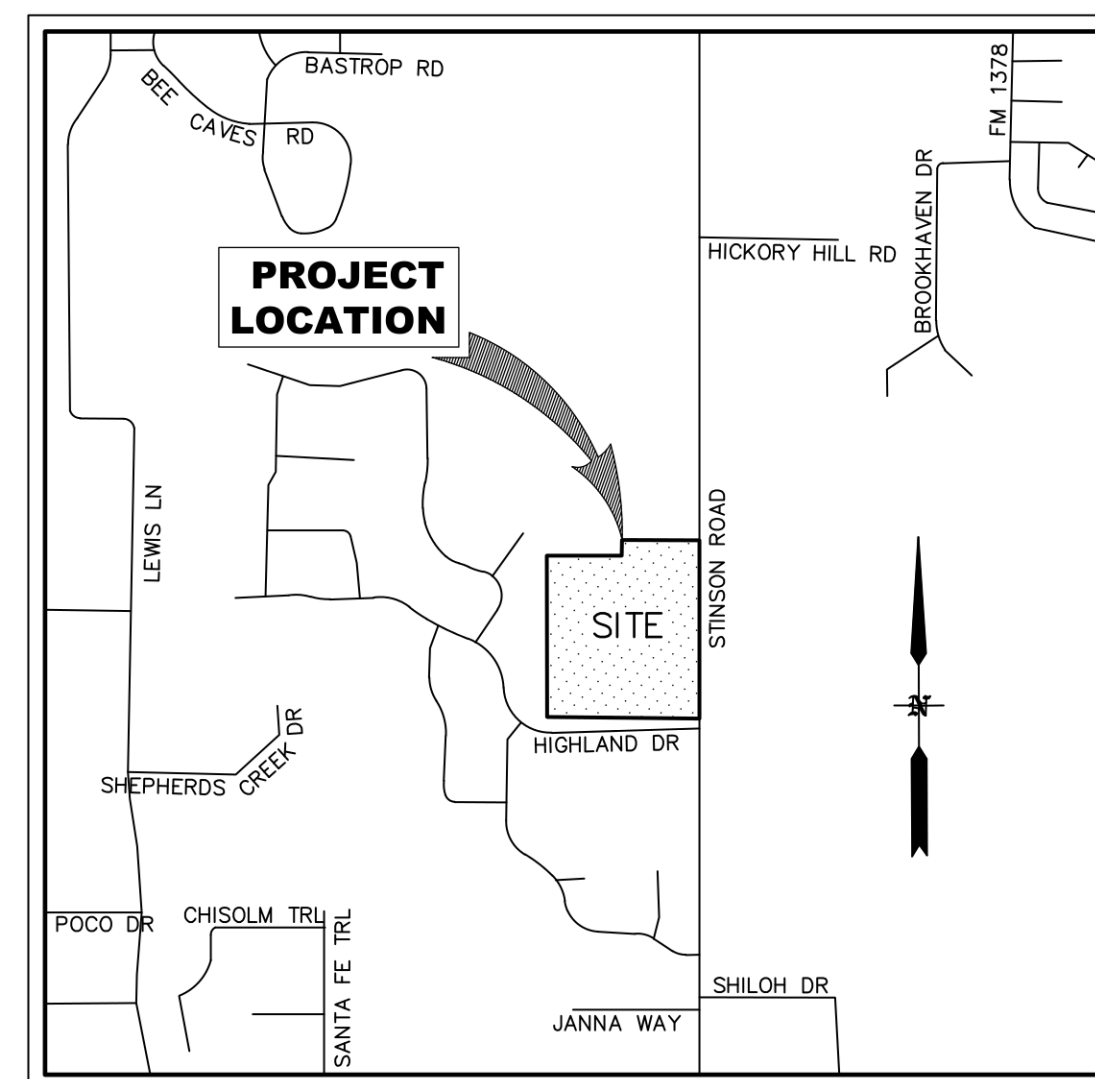


CONSTRUCTION PLANS FOR BRISTOL PARK (PHASE III)

AN ADDITION TO
THE CITY OF LUCAS
COLLIN COUNTY, TEXAS
26 RESIDENTIAL LOTS, 46.14 ACRES



VICINITY MAP
NOT TO SCALE

SHEET INDEX

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7. PAVING PLAN & PROFILE - BELLAGIO COURT (0+00 - 7+50)
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TxDOT STANDARD DETAILS

- PSET-SP
- PSET-RP
- SCC-3 & 4
- SCC-5 & 6
- SETB-PD

RECORD DRAWINGS

THESE RECORD DRAWINGS HAVE BEEN PREPARED
BASED ON INFORMATION PROVIDED BY OTHERS.
THE ENGINEER HAS NOT VERIFIED THE ACCURACY
OF THIS INFORMATION AND SHALL NOT BE
RESPONSIBLE FOR ANY DISCREPANCIES WHICH MAY
BE INCORPORATED HEREIN AS A RESULT.

ENGINEERING CONCEPTS & DESIGNS, L.P.
Todd D. Winters 3-15-16
TODD D. WINTERS, P.E. DATE

CAUTION! EXISTING UTILITIES

CONTRACTOR SHOULD CALL 1-800-DIG-TESS PRIOR TO BEGINNING ANY CONSTRUCTION ACTIVITIES FOR EXISTING UTILITY LOCATIONS. EXISTING UTILITIES AND UNDERGROUND FACILITIES INDICATED ON THESE PLANS HAVE BEEN LOCATED FROM REFERENCE INFORMATION. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY BOTH HORIZONTALLY AND VERTICALLY THE LOCATION OF ALL EXISTING UTILITIES AND UNDERGROUND FACILITIES PRIOR TO CONSTRUCTION AND TO TAKE NECESSARY PRECAUTIONS IN ORDER TO PROTECT ALL FACILITIES ENCOUNTERED. THE CONTRACTOR SHALL PRESERVE AND PROTECT ALL EXISTING UTILITIES FROM DAMAGE DURING CONSTRUCTION.

BENCHMARK:
An "X" cut in south end of a concrete headwall on the east side of Stinson Road at Muddy Creek. Elevation 569.65'

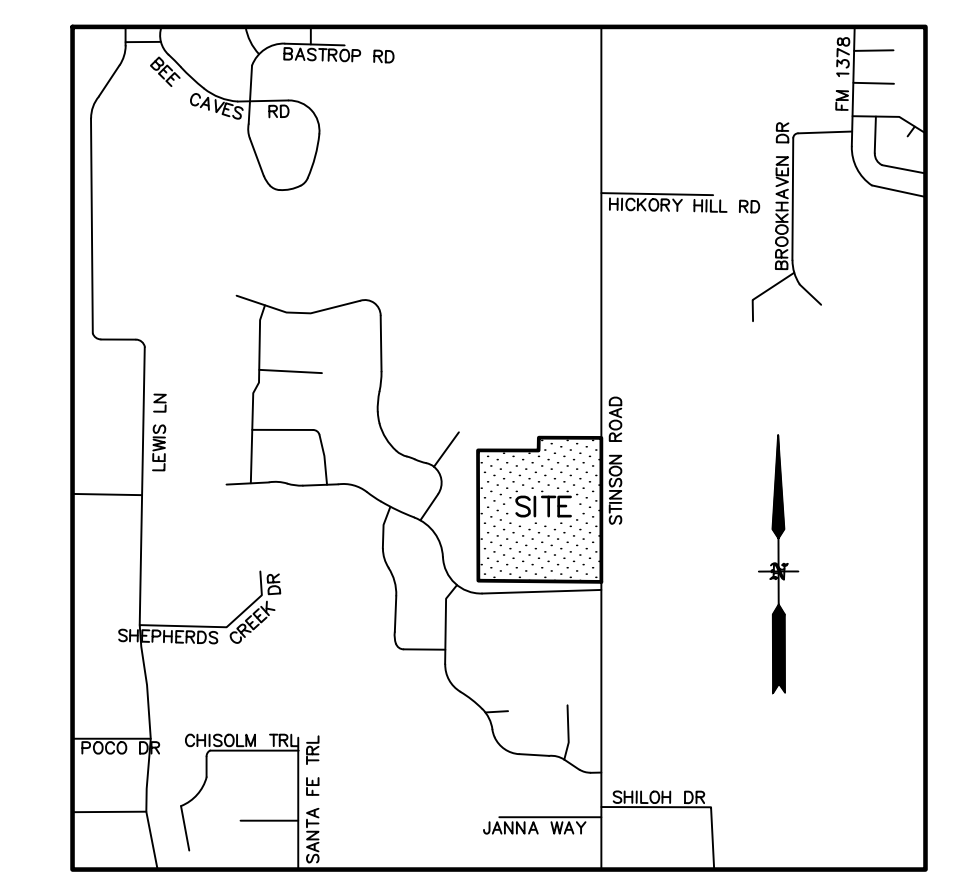
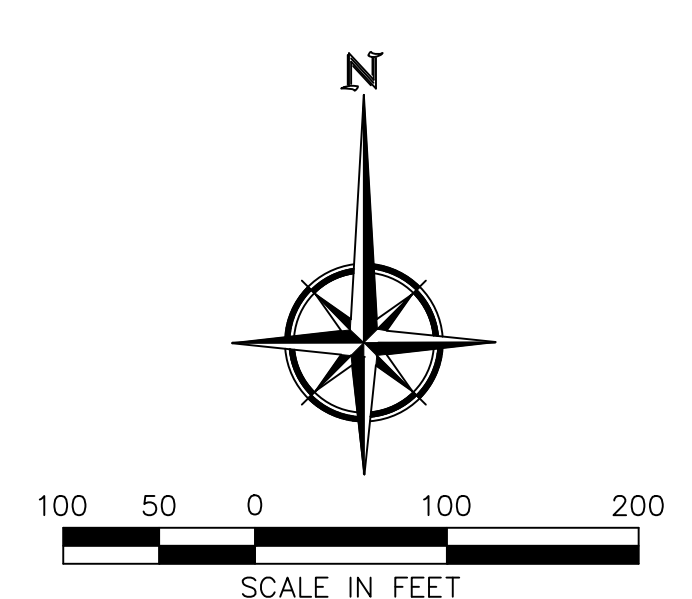
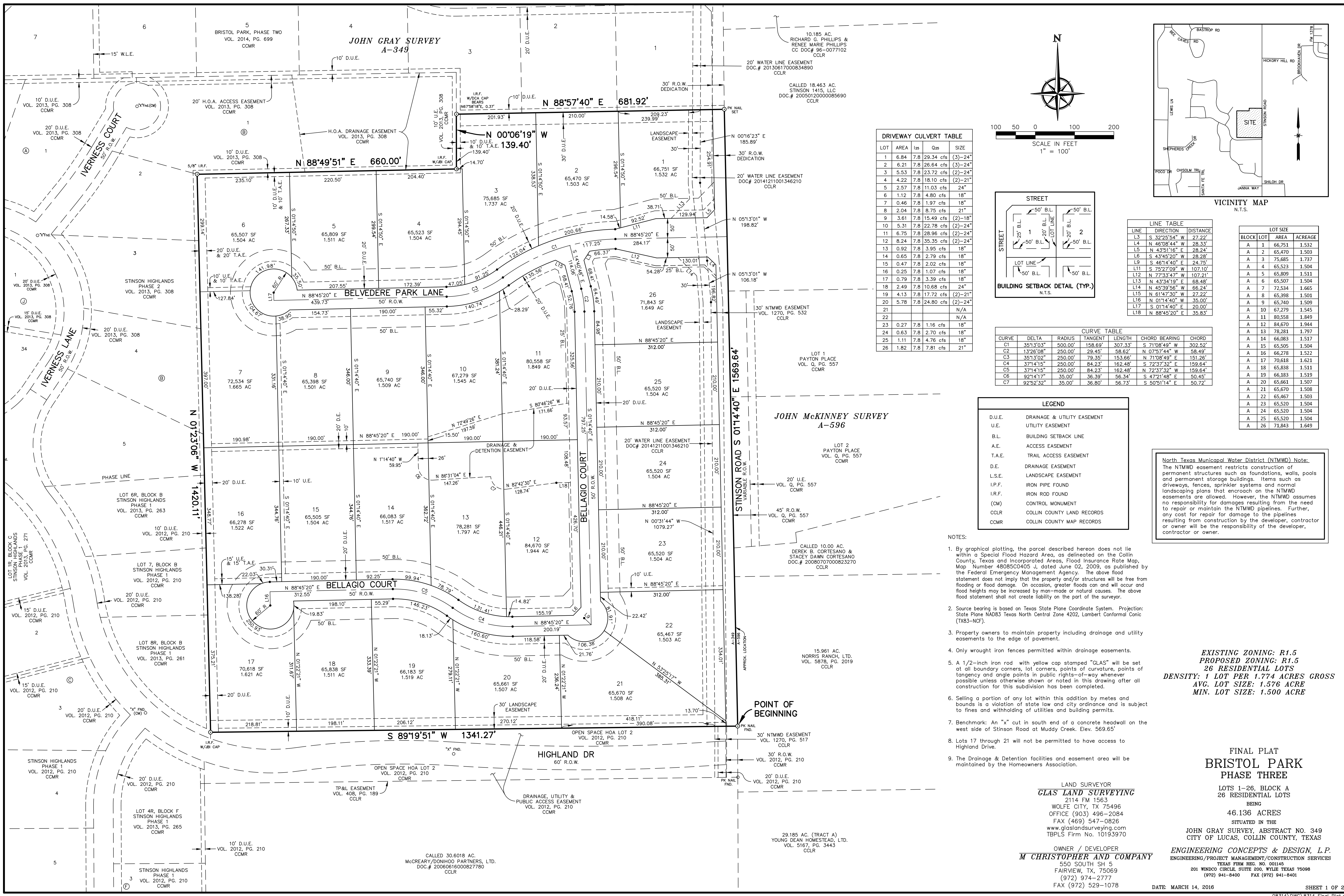
OWNER / DEVELOPER
M. CHRISTOPHER & COMPANY
550 SOUTH STATE HIGHWAY 5
FAIRVIEW, TX 75069
972.974.2777
972.529.1078 FAX

ENGINEERING CONCEPTS & DESIGN, L.P.
ENGINEERING / PROJECT MANAGEMENT /
CONSTRUCTION SERVICES - FIRM REG. #F-001145
201 WINDCO CIR, STE 200, WYLIE, TX 75098
972-941-8400 FAX: 972-941-8401 WWW.ECDLP.COM

REVISIONS:
DATE: MARCH, 2016
PROJECT NO.: 08314
DWG FILE NAME: Z:\PROJECTS\08314\Stinson Meadows\dwg\SHEETS\8314 01 cover sheet.dwg

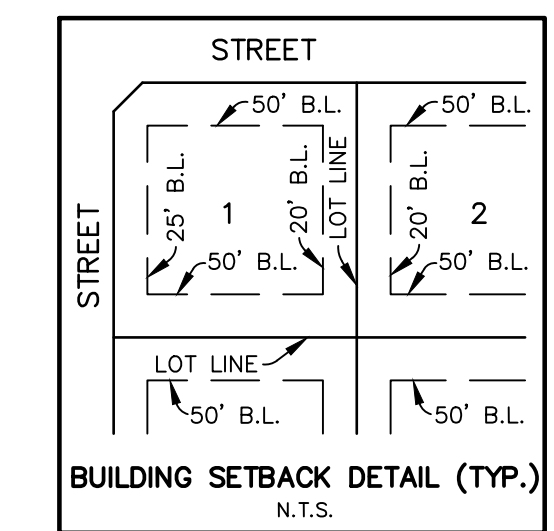
THIS DOCUMENT IS RELEASED FOR
THE PURPOSE OF CONSTRUCTION.
THE SEAL APPEARING ON THIS DOCUMENT WAS
AUTHORIZED BY
TODD D. WINTERS, P.E. 87085





DRIVEWAY CULVERT TABLE

LOT	AREA	Ls	Qs	SIZE
1	6.84	7.8	29.34 cfs	(3)-24"
2	6.21	7.8	26.64 cfs	(3)-24"
3	5.53	7.8	23.72 cfs	(2)-24"
4	4.22	7.8	18.10 cfs	(2)-21"
5	2.57	7.8	11.03 cfs	24"
6	1.12	7.8	4.80 cfs	18"
7	0.46	7.8	1.97 cfs	18"
8	2.04	7.8	8.75 cfs	21"
9	3.61	7.8	15.49 cfs	(2)-18"
10	5.31	7.8	22.78 cfs	(2)-24"
11	6.75	7.8	28.96 cfs	(2)-24"
12	8.24	7.8	35.35 cfs	(2)-24"
13	0.92	7.8	3.95 cfs	18"
14	0.65	7.8	2.79 cfs	18"
15	0.47	7.8	2.02 cfs	18"
16	0.25	7.8	1.07 cfs	18"
17	0.79	7.8	3.39 cfs	18"
18	2.49	7.8	10.68 cfs	24"
19	4.13	7.8	17.72 cfs	(2)-21"
20	5.78	7.8	24.80 cfs	(2)-24"
21	N/A			
22	N/A			
23	0.27	7.8	1.16 cfs	18"
24	0.63	7.8	2.70 cfs	18"
25	1.11	7.8	4.76 cfs	18"
26	1.82	7.8	7.81 cfs	21"



LINE TABLE

LINE	DIRECTION	DISTANCE
L3	S 32°25'54" W	27.22'
L4	N 48°08'44" W	28.33'
L5	N 43°51'16" E	28.24'
L6	S 43°52'20" W	28.28'
L9	S 46°14'40" E	24.75'
L11	S 75°27'09" W	107.10'
L12	N 77°33'47" W	107.21'
L13	N 43°34'19" E	68.48'
L14	N 45°39'56" W	66.24'
L15	N 61°47'30" W	27.22'
L16	N 01°14'40" W	35.00'
L17	S 01°14'40" E	20.00'
L18	N 88°45'20" E	35.83'

LOT SIZE

BLOCK	LOT	AREA	ACREAGE
A	1	66,751	1.532
A	2	65,470	1.503
A	3	75,685	1.737
A	4	65,523	1.504
A	5	65,809	1.511
A	6	65,507	1.504
A	7	72,534	1.665
A	8	65,398	1.501
A	9	65,740	1.509
A	10	67,279	1.545
A	11	80,558	1.849
A	12	84,670	1.944
A	13	78,281	1.797
A	14	66,083	1.517
A	15	65,505	1.504
A	16	66,278	1.522
A	17	70,618	1.621
A	18	65,838	1.511
A	19	66,183	1.519
A	20	65,661	1.507
A	21	65,670	1.508
A	22	65,467	1.503
A	23	65,520	1.504
A	24	65,520	1.504
A	25	65,520	1.504
A	26	71,843	1.649

CURVE TABLE

CURVE	DELTA	RADIUS	TANGENT	LENGTH	CHORD BEARING	CHORD
C1	35°13'03"	500.00'	158.69'	307.33'	S 71°08'49" W	302.52'
C2	13°26'08"	250.00'	29.45'	58.62'	N 07°57'44" E	58.49'
C3	35°13'02"	250.00'	79.35'	153.66'	N 71°08'49" E	151.26'
C4	37°14'15"	250.00'	84.23'	162.48'	S 72°37'32" E	159.64'
C5	37°14'15"	250.00'	84.23'	162.48'	N 72°37'32" E	159.64'
C6	92°14'17"	35.00'	36.39'	56.34'	S 47°21'48" E	50.45'
C7	92°52'32"	35.00'	36.80'	56.73'	S 50°51'14" E	50.72'

LEGEND

- D.U.E. DRAINAGE & UTILITY EASEMENT
- U.E. UTILITY EASEMENT
- B.L. BUILDING SETBACK LINE
- A.E. ACCESS EASEMENT
- T.A.E. TRAIL ACCESS EASEMENT
- D.E. DRAINAGE EASEMENT
- L.S.E. LANDSCAPE EASEMENT
- I.P.F. IRON PIPE FOUND
- I.R.F. IRON ROD FOUND
- (CM) CONTROL MONUMENT
- CCLR COLLIN COUNTY LAND RECORDS
- CCMR COLLIN COUNTY MAP RECORDS

North Texas Municipal Water District (NTMWD) Note:
 The NTMWD easement restricts construction of permanent structures such as foundations, walls, pools and permanent storage buildings. Items such as driveways, fences, sprinkler systems and normal landscaping plans that encroach on the NTMWD easements are allowed. However, the NTMWD assumes no responsibility for damages resulting from the need to repair or maintain the NTMWD pipelines. Further, any cost for repair for damage to the pipelines resulting from construction by the developer, contractor or owner will be the responsibility of the developer, contractor or owner.

- NOTES:**
- By graphical plotting, the parcel described hereon does not lie within a Special Flood Hazard Area, as delineated on the Collin County, Texas and Incorporated Areas, Flood Insurance Rate Map, Map Number 48085C0405 J, dated June 02, 2009, as published by the Federal Emergency Management Agency. The above flood statement does not imply that the property and/or structures will be free from flooding or flood damage. On occasion, greater floods can and will occur and flood heights may be increased by man-made or natural causes. The above flood statement shall not create liability on the part of the surveyor.
 - Source bearing is based on Texas State Plane Coordinate System. Projection: State Plane NAD83 Texas North Central Zone 4202, Lambert Conformal Conic (TX83-NCF).
 - Property owners to maintain property including drainage and utility easements to the edge of pavement.
 - Only wrought iron fences permitted within drainage easements.
 - A 1/2-inch iron rod with yellow cap stamped "GLAS" will be set at all boundary corners, lot corners, points of curvature, points of tangency and angle points in public rights-of-way whenever possible unless otherwise shown or noted in this drawing after all construction for this subdivision has been completed.
 - Selling a portion of any lot within this addition by metes and bounds is a violation of state law and city ordinance and is subject to fines and withholding of utilities and building permits.
 - Benchmark: An "x" cut in south end of a concrete headwall on the west side of Stinson Road at Muddy Creek. Elev. 569.65'
 - Lots 17 through 21 will not be permitted to have access to Highland Drive.
 - The Drainage & Detention facilities and easement area will be maintained by the Homeowners Association.

EXISTING ZONING: R1.5
PROPOSED ZONING: R1.5
26 RESIDENTIAL LOTS
DENSITY: 1 LOT PER 1.774 ACRES GROSS
AVG. LOT SIZE: 1.576 ACRE
MIN. LOT SIZE: 1.500 ACRE

FINAL PLAT
BRISTOL PARK
PHASE THREE

LOTS 1-26, BLOCK A
 26 RESIDENTIAL LOTS
 BEING
 46.136 ACRES
 SITUATED IN THE
 JOHN GRAY SURVEY, ABSTRACT NO. 349
 CITY OF LUCAS, COLLIN COUNTY, TEXAS

LAND SURVEYOR
GLAS LAND SURVEYING
 2114 FM 1563
 WOLFE CITY, TX 75496
 OFFICE (903) 496-2084
 FAX (469) 547-0826
 www.glaslandsurveying.com
 TBPLS Firm No. 10193970
 OWNER / DEVELOPER
M CHRISTOPHER AND COMPANY
 550 SOUTH SH 5
 FAIRVIEW, TX, 75069
 (972) 974-2777
 FAX (972) 529-1078

ENGINEERING CONCEPTS & DESIGN, L.P.
 ENGINEERING/PROJECT MANAGEMENT/CONSTRUCTION SERVICES
 TEXAS FIRM REG. NO. 001145
 201 WINDCO CIRCLE, SUITE 200, WYLE, TEXAS 75098
 (972) 941-8400 FAX (972) 941-8401

OWNER'S CERTIFICATE & DEDICATION

CITY APPROVAL CERTIFICATE

SURVEYOR'S CERTIFICATION

STATE OF TEXAS
COUNTY OF COLLIN

WHEREAS, M. CHRISTOPHER & COMPANY, BEING the owner of a 46.136 acre tract of land situated in the State of Texas, County of Collin, and City of Lucas, being part of the John Gray Survey, Abstract No. 349, and being the resurvey of a called 46.14 acre tract as recorded under Document No. 20120224000211850 of the Collin County Land Records with said premises being more particularly described as follows:

BEGINNING at a PK nail found in the approximate center of Stinson Road marking the southeast corner of said 46.14 acre tract, the southeast corner of said premises, and the most easterly northeast corner of Stinson Highlands, Phase 1, an addition to the City of Lucas as recorded in Volume 2012, Page 210 of the Collin County Map Records;

THENCE with the south line of said 46.14 acre tract, the south line of said premises, a north line of said addition and partway with the north line of Lot 2, Block I of said addition, South 89°19'51" West, 1,341.27 feet to a JBL capped iron rod found marking the southwest corner of said 46.14 acre tract, the southwest corner of said premises, the northwest corner of said Lot 2, and being in the east line of Lot 8R, Block B of Stinson Highlands, Phase 1, an addition to the City of Lucas as recorded in Volume 2013, Page 261 of the Collin County Map Records;

THENCE with the west line of said 46.14 acre tract, the west line of said premises, the east line of said Lot 8R, the east line of Lot 7, Block B of Stinson Highlands, Phase 1, an addition to the City of Lucas as recorded in Volume 2012, Page 210 of the Collin County Map Records, the east line of Lot 6R, Block B of Stinson Highlands, Phase 1, an addition to the City of Lucas as recorded in Volume 2013, Page 263 of the Collin County Map Records, and partway with an east line of Stinson Highlands, Phase 2, an addition to the City of Lucas as recorded in Volume 2013, Page 308 of the Collin County Map Records, North 01°23'06" West, 1,420.11 feet to a 5/8-inch iron rod found marking the most westerly northwest corner of said 46.14 acre tract, the most westerly northwest corner of said premises, and an interior ell-corner of said Stinson Highlands, Phase 2;

THENCE with a north line of said 46.14 acre tract, a north line of said premises, and a south line of said Stinson Highlands, Phase 2, North 88°49'51" East, 660.00 feet to a JBL capped iron rod found marking an interior ell-corner of said 46.14 acre tract, an interior ell-corner of said premises, and a southeast corner of said Stinson Highlands, Phase 2;

THENCE with a west line of said 46.14 acre tract, a west line of said premises, and the east line of said Stinson Highlands, Phase 2, North 00°06'19" West, 139.40 feet to a point for corner marking the most northerly northwest corner of said 46.14 acre tract, the most northerly northwest corner of said premises, and a southwest corner of Bristol Park, Phase Two, an addition to the City of Lucas, as recorded in Volume 2014, Page 699 of the Collin County Map Records, from which a DCA capped iron rod found bears North 67°58'18" East, 0.37 feet;

THENCE with the north line of said 46.14 acre tract, the north line of said premises, and the south line of said Bristol Park, Phase Two, North 88°57'40" East, 681.92 feet to a PK nail set on the east edge of Stinson Road marking the northeast corner of said 46.14 acre tract, the northeast corner of said premises, and the southeast corner of said Bristol Park, Phase Two;

THENCE with the east margin and approximate centerline of Stinson Road, the east line of said 46.14 acre tract, and the east line of said premises, South 01°14'40" East, 1,569.64 feet to the point of beginning and containing 46.136 acres of land.

NOW THEREFORE KNOW ALL MEN BY THESE PRESENTS:

THAT, M. CHRISTOPHER & COMPANY, does hereby adopt this plat designating the herein described property as BRISTOL PARK, PHASE THREE, an addition to the City of Lucas, Texas, and does hereby dedicate to the City of Lucas, the roads, rights-of-way and easements shown thereon. The streets and alleys are dedicated for street purposes. The Easements and public use areas, as shown, are dedicated, to the City of Lucas 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. 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 City of Lucas's use thereof. The City of Lucas 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 systems in said Easements. The City of Lucas 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, and adding to or removing all or parts of their respective systems without the necessity at any time procuring the permission from anyone.

This plat approved subject to all platting ordinances, rules, regulations and resolution of the City of Lucas, Texas.

FOR: M. CHRISTOPHER & COMPANY

BY: Rudy Rivas, Owner

STATE OF TEXAS
COUNTY OF COLLIN

Before me, the undersigned authority, a Notary Public in and for the State of Texas, on this day personally appeared Rudy Rivas, 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 purposes and considerations therein expressed.

Given under my hand and seal of office, this ___ day of _____, 2016.

Notary Public in and for the State of Texas
My Commission Expires: _____

This plat is hereby approved by the Planning and Zoning Commission of the City of Lucas, Texas.

Chairman, Planning and Zoning Commission Date

ATTEST:

Signature Date

Name Date

The The Director of Public Works of the City of Lucas, Texas hereby certifies that to the best of his/her knowledge or belief, this subdivision plat conforms to all requirements of the Code of Ordinances and with engineering construction standards and processes adopted by the City of Lucas, Texas as to which his/her approval is required.

Director of Public Works Date

The Director of Planning and Community Development of the City of Lucas, Texas hereby certifies that to the best of his/her knowledge or belief, this subdivision plat conforms to all requirements of the Code of Ordinances, or as may have been amended or modified, as allowed, by the Planning and Zoning Commission as to which his/her approval is required.

Director of Planning and Community Development Date

ON-SITE SEWAGE FACILITIES (OSSF) NOTES:

- 1. All lots must utilize alternative type On-Site Sewage Facilities.
2. All lots must maintain state-mandated setback of all On-Site Sewage Facility components from any/all easements and drainage areas, water distribution lines, sharp breaks and/or creeks/rivers/ponds, etc. (Per State regulations).
3. Tree removal and/or grading for OSSF may be required on individual lots.
4. Individual site evaluations and OSSF design plans (meeting all State and County requirements) must be submitted to and approved by Collin County for each lot prior to construction of any OSSF system.

HEALTH DEPARTMENT CERTIFICATION:

I hereby certify that the on-site sewage facilities described on this plat conform to the applicable OSSF laws of the State of Texas, that site evaluations have been submitted representing the site conditions in the area in which on-site sewage facilities are planned to be used.

Registered Sanitarian or Designated Representative
Collin County Development Services

KNOW ALL MEN BY THESE PRESENTS:

That I, John Glas, hereby certify, that I prepared this plat was made from an actual on the ground survey of the land as described and that the corner monuments shown thereon were properly placed under my personal supervision in accordance with the Platting Rules and Regulations of the City of Lucas Planning and Zoning Commission

JOHN GLAS
REGISTERED PROFESSIONAL
LAND SURVEYOR NO. 6081

STATE OF TEXAS
COUNTY OF COLLIN

Before me, the undersigned authority, a Notary Public in and for the State of Texas, on this day personally appeared John Glas, 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 29th day of March, 2016.

Notary Public in and for the State of Texas
My Commission Expires: 02/14/2019

FINAL PLAT
BRISTOL PARK
PHASE THREE

LAND SURVEYOR
GLAS LAND SURVEYING
2114 FM 1563
WOLFE CITY, TX 75496
OFFICE (903) 496-2084
FAX (469) 547-0826
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LOTS 1-26, BLOCK A
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ENGINEERING CONCEPTS & DESIGN, L.P.
ENGINEERING/PROJECT MANAGEMENT/CONSTRUCTION SERVICES
TEXAS FIRM REG. NO. 001146
201 WINDCO CIRCLE, SUITE 200, WYLLIE, TEXAS 75099
(972) 941-8400 FAX (972) 941-8401

DATE: MARCH 14, 2016

SHEET 2 OF 2

GENERAL NOTES:

- 1. All work and materials shall conform to the City of LUCAS Engineering Design Manual and the "Standard Specifications for Public Works Construction" published by the North Central Texas Council of Governments (NCTCOG), latest edition. In the event of conflict, duplication, or variance, the City Engineer shall have the final decision on all construction materials, methods, and procedures.
2. Prior to construction, the contractor shall familiarize himself with the contract documents and specifications, the plans including all notes and any other applicable standards or specifications relevant to the proper completion of the work specified. Failure on the part of the contractor to familiarize himself with all standards or specifications pertaining to this work shall in no way relieve the contractor of responsibility for performing the work in accordance with all such applicable standards and specifications.
3. Contractor shall have in his possession, prior to construction, all necessary permits, licenses, etc. Contractor shall have at least one set of approved engineering plans and specifications on site at all time.
4. Any item of work called for by the plans and/or specification and not included, as a bid item shall be subsidiary to the construction of the various bid items.
5. Construction inspection will be performed by representatives of the owner, engineer, city, geotechnical engineer, and reviewing authorities and agencies. Unrestricted access shall be provided to them at all times. Contractor is responsible for scheduling required inspections as required by contract documents.
6. Any item requiring inspection by the City, must be performed between the hours of 8am-5pm Monday thru Friday.
7. The contractor and all subcontractors must confine their activities to the work area. Any damage resulting from construction activities, shall be the contractor's responsibility.
8. It will be the responsibility of each contractor to protect all existing public and private utilities throughout the construction of this project. Contractor shall contact the appropriate utility companies for line locations prior to commencement of construction and shall assume full liability to those companies for any damages caused to their facilities. Location of utilities are taken from the City of LUCAS and Utility Company records. Contractor shall field verify to determine exact location of utilities.
9. Trench safety design will be the responsibility of the contractor. The contractor shall abide by all applicable federal, state, and local laws governing excavation, trench side slopes shall meet OSHA standards. Benching, shoring, and bracing shall be required when side slope standards are not met. A pull box, meeting OSHA standards will be acceptable. The contractor shall submit detailed plans to the City Engineer for review showing how OSHA Standards for excavation shall be met prior to the start of any utility construction. The plans shall be sealed by an Engineer registered by the State of Texas.
10. Contractor shall stockpile salvage materials for inspection. All items not salvaged by the owner shall be removed from the site at the contractor's expense. The owner will transport salvaged materials away from the site at the owner's expense. Salvage, stockpiles, and removal of materials shall be considered subsidiary to the various bid items and shall not be paid for directly unless such items are specifically included in the bid items.
11. The contractor shall be responsible for providing and maintaining all necessary warning and safety work, material, and operations needed to provide for the health and safety of the public until all work has been completed, including maintenance bond periods, and to be accepted by the City of LUCAS in writing.
12. All construction and materials testing unless otherwise indicated, shall be performed by an Engineering Testing Laboratory employed by the Contractor. The testing laboratory shall be approved by the City of LUCAS. The testing laboratory shall make tests necessary to insure that construction is in accordance with the approved plans and specifications. Re-testing required due to construction not being performed in accordance with the plans and specifications shall be at the expense of the contractor. The testing laboratory shall submit testing reports to the City Engineer and Design Engineer.
13. Any additional excavated material shall be placed as directed by the Owner.
14. All fill areas to be density and moisture controlled. Fill should be compacted to 95% of standard proctor density at a minimum of 2% above optimum moisture content.
15. Water and sewer lines crossing the NTMWD easement shall be installed in compliance with the Rules and Regulations for Public Water Systems Paragraph 290.44 (e), Location of Water Lines.
16. "The contractor shall contact NTMWD Engineering at (972) 442-5405 at least 48 hours prior to performing any work in the vicinity of the NTMWD facilities."

CLEARING AND GRADING NOTES:

- 1. All grading shall conform to the City of LUCAS standards.
2. Site Preparation: All surface vegetation and the foreign materials such as roots, grass, etc., shall be stripped to a minimum depth of 4 inches and removed. All cleared and grubbed materials shall be removed off-site in accordance with local, state, and federal regulations.
3. Scarifying Area to be Filled: In areas where fills are desired, the stripped surface shall be scarified to a depth of at least 6 inches for uniform compaction. The scarified surface shall be such that it is free from lumps and uneven surfaces.
4. Compacting Area to be Filled: After clearing and scarifying the area to be filled, the soils shall be brought to a moisture content of -2% to +4% of the optimum moisture value and compacted, in 6 inch maximum lifts, mechanically to at least 95% of Standard Proctor maximum dry density (ASTM D 698). R.O.W. areas to be filled shall be brought to moisture content of 0% to +4% of the optimum moisture value and compacted, in 6 inch maximum lifts, mechanically to at least 95% of Standard Proctor maximum dry density (ASTM D 698)
5. Fill Material: On-site soil and/or rock could be used as random fill provided such material is free from vegetation and other deleterious substances. No fill material shall contain rocks or lumps having a diameter of 6 inches or greater.
6. Depth and Mixing of Fill Layers: The fill materials shall be placed in level, uniform layers. Each layer shall be thoroughly blade mixed during spreading to insure uniform compaction. These materials shall be placed in loose lifts with density and moisture content shall conform to that specified herein.
7. Compaction of Fill Layer: Compaction equipment shall be capable of compacting all fill soils to the specified density. Compaction of all fill shall be accomplished with the material at the specified moisture content. Each fill layer shall be compacted uniformly with sufficient effort to achieve the specified degree of compaction.
8. Amount of Compaction: After each fill layer has been placed, mixed, and spread evenly, it shall be thoroughly compacted to a minimum 95% of the Standard Proctor density (ASTM D 698).
9. Moisture Content: All fill material shall be compacted at the appropriate moisture content as defined for the particular soil type. Each layer shall be brought to a moisture content of -2% to +4% of the optimum moisture value as determined by ASTM D 698. The compaction moisture content of limestone or other rock-like materials is not considered crucial, provided the proper degree of compaction is attained. R.O.W. areas to be filled shall be brought to moisture content of 0% to +4% of the optimum moisture value and compacted, in 6 inch maximum lifts, mechanically to at least 95% of Standard Proctor maximum dry density (ASTM D 698)
10. Slope Control: In areas where cut of fill slopes exceed 3 feet in depth/height, a slope ratio of one (vertical) to 4 (horizontal) shall not be exceeded. Compaction operations of fill slopes shall be continued until the slopes are stable.
11. Field Density: Field density tests of fill and/or backfill shall be controlled by an Engineering Testing Laboratory. Density tests shall be taken in the compacted material below the disturbed surface. When these tests indicate that the density of any layer of fill is below the required density, the particular soil or rock layer shall be reworked until the proper density and/or moisture content is achieved. Re-testing of reworked areas shall be at contractors expense.
12. Tolerance for Rough Grading: Streets shall be rough graded within 0.2' of plan grades prior to utility construction. Utility contractor shall return street to within 0.2' of plan grade prior to street paving.
13. Supervision: Supervision by the Soils Engineer shall be of such continuity during the grading operations that he can adequately describe the work done and evaluate that work in comparison with the specifications. Actual supervision shall be the Contractor's Supervisor.
14. Reports: The Testing Laboratory shall send 1 copy of each test, inspection, or evaluation report to the Public Works Department, Owner, and Design Engineer.
15. All excess earth shall be used on-site or taken to an area designated by the Engineer at the Contractor's expense.

PAVING NOTES

- 1. Concrete street pavement shall be NCTCOG Class "C", 3,600 PSI compressive strength. Air content shall be 3%-5%. Pavement thickness and reinforcing steel shall be as indicated on construction plans and conforming with current City of LUCAS Standards.
2. The subgrade shall be treated 6 inches deep, minimum, with lime slurry. Lime slurry shall be Type B Grade 1 and applied in accordance with the City Standard Specifications. Lime shall be applied at a rate of 6.0% of the dry weight soil and have a P.I. of less than 15. Compaction of the lime stabilized subgrade shall be to 95% Standard Proctor density. Stabilization shall extend 1' ft. beyond edge of pavement (refer to typical paving section).
3. All dimensions are to edge of pavement unless otherwise noted. Elevations are to edge of pavement unless otherwise noted.
4. Water meters and/or services shown to be in conflict with proposed paving or drainage facilities are to be relocated by the Contractor, subject to review by the Public Works Department, prior to commencement of construction of paving and drainage.
5. Power and telephone poles shown to be in conflict with proposed paving to be relocated by appropriate utility prior to paving.
6. It will be the responsibility of the paving contractor to protect all public utilities of this project. All valve boxes, fire hydrants, etc., must be adjusted to proper line and grade by the paving contractor prior to and after the placing of permanent paving.
7. Expansion or contraction joints should be placed at 600 feet maximum spacing or the final pour of the construction day. Transverse contraction joints shall be placed on 20 feet maximum spacing. Refer to City of LUCAS Standard Details.
8. Contraction joints shall be formed by sawing. Joint depth shall be equal to one-fourth (1/4) of slab thickness. Sawing of joints shall begin as soon as the concrete has hardened sufficiently to permit sawing without excessive raveling. All joints should be completed before uncontrolled shrinkage cracking occurs. Joints should be continuous across the slab and extend completely through the curb. All joint openings to be cleaned and sealed with hot poured rubber joint sealing compound prior to opening to traffic.
9. Any excess earth shall be taken to an area, to be designated by the Engineer at the contractors expense.
10. Back fill shall be placed behind all pavement. Back fill material shall be free of earthwork debris such as muck, rock, refuse, stumps, concrete, asphalt, or other unsuitable materials and shall consist of soil suitable for sodding.
11. Topsoil to stripped and placed on parkways and yards on lots.
12. City will water test streets upon completion. Any standing water must be remedied before acceptance.

WATER SYSTEM IMPROVEMENTS NOTES

- 1. All work and materials shall be in accordance with City of LUCAS standard specifications.
2. Fire Hydrants shall be Mueller or approved equal, 3-way breakaway type, no less than 5 1/2 inches in size and shall conform to the provisions of the latest AWWA Standard C502, and shall have a bury depth of five feet. Valves shall be placed on oil fire hydrant leads and shall be F x M.J.. Fire hydrants shall be located so that breakaway point is no less than 2-inches and no greater than 6-inches above the grade surface and a minimum of 2-feet and a maximum of 6-feet behind the edge of pavement. The fire hydrant shall be installed so the steamer connection will face the street, or as directed by the fire department. A Blue Stimsonite, Fire-Lite reflector (or approved equal) shall be placed in the center of the drive lane on the side of the fire hydrant.
3. Fire hydrant Bannets shall be painted according to the capacity of the main to which it is attached. See chart below. The remainder of the hydrant above ground shall be painted aluminum.
8" Waterline - Blue
4. Valves 12" and under to be Gate Valves meeting requirements of AWWA C500 or AWWA C509 (NCTOG Item 2.13.1) with non-rising stems. Contractor shall also mark curb with "V" at location of valve.
5. Water Mains - All water mains, fittings, and valves shall meet AWWA specifications. All water lines to be C900 DR-18 (NCTCOG item 2.12.2). Minimum cover over water mains shall be 6' dia. and under, 3.5-feet, 8" dia., 4-feet, 12" dia. 4.5 feet-5 feet. DR-18 water mains to be tested at 150 psi for a continuous period of four (4) hours. Leakage rate shall not exceed 25 gallons per inch of normal diameter per mile of pipe over test period. Contractor shall flush and sterilize lines and prove lines to be free of conforms organisms by obtaining samples for laboratory tests for contamination. The Contractor shall flush and sterilize until samples for test are free from contamination. Jetting of backfill will not be permitted.
6. All water services shall be 1" copper. Meter boxes shall comply with current City of LUCAS Standards and Specifications.
7. Contractor shall tie a 1" piece of blue plastic flagging to the water service and shall leave a minimum of 36" of flagging exposed after backfill. Contractor shall also mark pavement with "W" at location of water service.
8. Contractor shall furnish a maintenance bond to the City of LUCAS to run for two years from the date of acceptance.
9. The source of water supply for this addition will be from the City of LUCAS.
10. Valve boxes shall be furnished and set on each gate valve. After the final clean-up and alignment has been completed, the Contractor (utility) shall pour a concrete block 6" x 18" x 18" around all valves box tops so the finished grade is level with the finished parkway.
11. Water lines shall be pressure tested and disinfected in accordance with AWWA C601.
12. Water valves deeper than 4' shall have extensions in accordance with City of LUCAS Details.
13. All embedment to be class B+ or better as detailed in the NCTOG Construction Standards.

Texas Commission on Environmental Quality
Chapter 290 - Public Drinking Water
Subchapter D: Rules And Regulations For Public Water Systems
§290.44. Water Distribution.
(e) Location of waterlines
(4) Where the nine-foot separation distance cannot be achieved, the following criteria shall apply.
(A) New waterline installation - parallel lines.
(i) Where a new potable waterline parallels an existing, non-pressure or pressure rated wastewater main or lateral and the licensed professional engineer licensed in the State of Texas is able to determine that the existing wastewater main or lateral is not leaking, the new potable waterline shall be located at least two feet above the existing wastewater main or lateral, measured vertically, and at least four feet away, measured horizontally, from the existing wastewater main or lateral. Every effort shall be exerted not to disturb the bedding and backfill of the existing wastewater main or lateral.
(ii) Where a new potable waterline parallels an existing pressure rated wastewater main or lateral and it cannot be determined by the licensed professional engineer if the existing line is leaking, the existing wastewater main or lateral shall be replaced with at least 150 psi pressure rated pipe. The new potable waterline shall be located at least two feet above the new wastewater line, measured vertically, and at least four feet away, measured horizontally, from the replaced wastewater main or lateral.
(iii) Where a new potable waterline parallels a new wastewater main, the wastewater main or lateral shall be constructed of at least 150 psi pressure rated pipe. The new potable waterline shall be located at least two feet above the wastewater main or lateral, measured vertically, and at least four feet away, measured horizontally, from the wastewater main or lateral.
(B) New waterline installation - crossing lines.
(i) Where a new potable waterline crosses an existing, non-pressure rated wastewater main or lateral, one segment of the waterline pipe shall be centered over the wastewater main or lateral such that the joints of the waterline pipe are equidistant and at least nine feet horizontally from the centerline of the wastewater main or lateral. The potable waterline shall be at least two feet above the wastewater main or lateral. Whenever possible, the crossing shall be centered between the joints of the wastewater main or lateral. If the existing wastewater main or lateral is disturbed or shows signs of leaking, it shall be replaced for at least nine feet in both directions (18 feet total) with at least 150 psi pressure rated pipe.
(ii) Where a new potable waterline crosses an existing, pressure rated wastewater main or lateral, one segment of the waterline pipe shall be centered over the wastewater main or lateral such that the joints of the waterline pipe are equidistant and at least nine feet horizontally from the centerline of the wastewater main or lateral. The potable waterline shall be at least two feet above the wastewater main or lateral. Whenever possible, the crossing shall be centered between the joints of the wastewater main or lateral. If the existing wastewater main or lateral shows signs of leaking, it shall be replaced for at least nine feet in both directions (18 feet total) with at least 150 psi pressure rated pipe.
(iii) Where a new potable waterline crosses a new, non-pressure rated wastewater main or lateral and the standard pipe segment length of the wastewater main or lateral is at least 18 feet, one segment of the waterline pipe shall be centered over the wastewater main or lateral such that the joints of the waterline pipe are equidistant and at least nine feet horizontally from the centerline of the wastewater main or lateral. The potable waterline shall be at least two feet above the wastewater main or lateral. Whenever possible, the crossing shall be centered between the joints of the wastewater main or lateral. The wastewater pipe shall have a minimum pipe stiffness of 115 psi at 5.0% deflection. The wastewater main or lateral shall be embedded in cement stabilized sand (see clause (v) of this subparagraph) for the total length of one pipe segment plus 12 inches beyond the joint on each end.
(iv) Where a new potable waterline crosses a new, non-pressure rated wastewater main or lateral and a standard length of the wastewater pipe is less than 18 feet in length, the potable water pipe segment shall be centered over the wastewater line. The material and method of installation shall conform with one of the following options.
(i) Within nine feet horizontally of either side of the waterline, the wastewater pipe and joints shall be constructed with pipe material having a minimum pressure rating of at least 150 psi. An absolute minimum vertical separation distance of two feet shall be provided. The wastewater main or lateral shall be located below the waterline.
(ii) All sections of wastewater main or lateral within nine feet horizontally of the waterline shall be encased in an 18-foot (or longer) section of pipe. Flexible encasing pipe shall have a minimum pipe stiffness of 115 psi at 5.0% deflection. The encasing pipe shall be centered on the waterline and shall be at least two nominal pipe diameters larger than the wastewater main or lateral. The space around the carrier pipe shall be supported at five-foot (or less) intervals with spacers or be filled to the springline with washed sand. Each end of the casing shall be sealed with watertight non-shrink cement grout or a manufactured watertight seal. An absolute minimum separation distance of six inches between the encasement pipe and the waterline shall be provided. The wastewater line shall be located below the waterline.
(iii) When a new waterline crosses under a wastewater main or lateral, the waterline shall be encased as described for wastewater mains or laterals in subclause (ii) of this clause or constructed of ductile iron or steel pipe with mechanical or welded joints as appropriate. An absolute minimum separation distance of one foot between the waterline and the wastewater main or lateral shall be provided. Both the waterline and wastewater main or lateral must pass a pressure and leakage test as specified in AWWA C600 standards.
(v) Where a new potable waterline crosses a new, pressure rated wastewater main or lateral, one segment of the waterline pipe shall be centered over the wastewater line such that the joints of the waterline pipe are equidistant and at least nine feet horizontally from the center line of the wastewater main or lateral. The potable waterline shall be at least six inches above the wastewater main or lateral. Whenever possible, the crossing shall be centered between the joints of the wastewater main or lateral. The wastewater pipe shall have a minimum pressure rating of at least 150 psi. The wastewater main or lateral shall be embedded in cement stabilized sand (see clause (vi) of this subparagraph) for the total length of one pipe segment plus 12 inches beyond the joint on each end.
(vi) Where cement stabilized sand bedding is required, the cement stabilized sand shall have a minimum of 10% cement per cubic yard of cement stabilized sand mixture, based on loose dry weight volume (at least 2.5 bags of cement per cubic yard of mixture). The cement stabilized sand bedding shall be a minimum of six inches above and four inches below the wastewater main or lateral. The use of brown coloring in cement stabilized sand for wastewater main or lateral bedding is recommended for the identification of pressure rated wastewater mains during future construction.

NOTE:

All backfill for utilities and pavement including lime stabilized subgrade to be +2% or higher of optimum moisture.

STORM WATER DISCHARGE AUTHORIZATION:

- 1. Contractor shall submit a Notice of Intent (NOI) to TCEQ no less than 2 days prior to commencement of construction activities. All grading activities shall conform to the Erosion Control Plan included in the approved construction plans.
2. All contractors and subcontractors providing services related to the SWPPP shall sign a Contractor Certification statement acknowledging their responsibilities as specified in the SWPPP.
3. A copy of the SWPPP, including Contractor Certifications and any Revisions, shall be submitted to the CITY OF LUCAS Engineer and Design Engineer and filed with the construction plans, and shall be retained on-site during construction.
4. A Notice of Termination (NOT) shall be submitted to TCEQ when the site has 100% of the disturbed areas stabilized and the site no longer has storm water discharges associated with industrial activities (construction), or the NOI permittee or co-permittee no longer holds operational control of the construction.

STORM WATER POLLUTION PROTECTION PLAN:

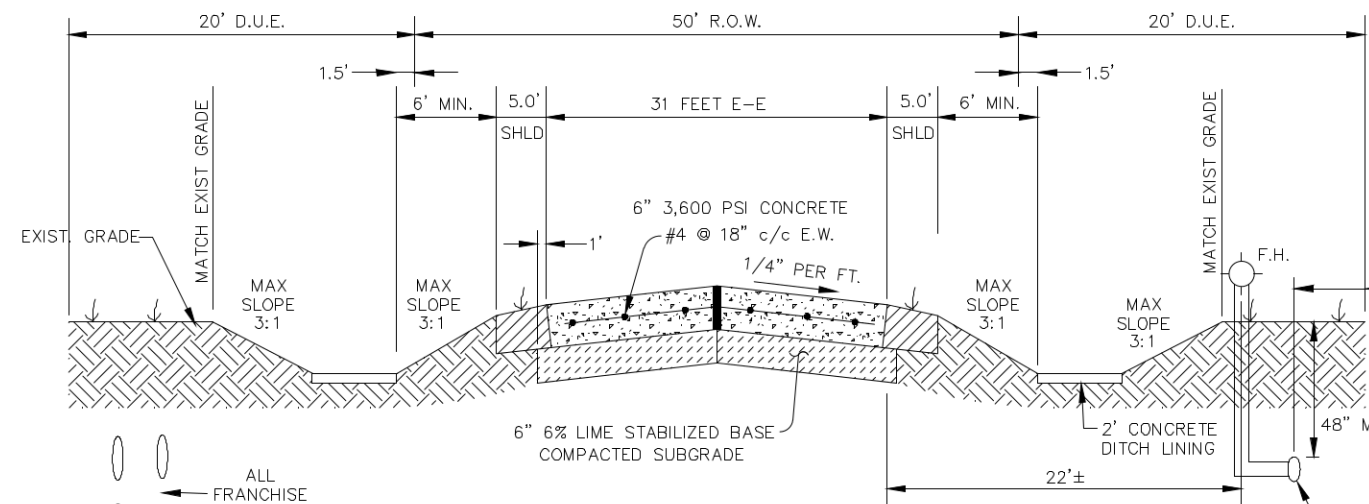
- 1. This site shall be reviewed by owner or his representative weekly and after any major storm. Adjustments/repairs to the erosion control will then be made as needed.

EROSION CONTROL SPECIFICATIONS:

- 1. The Grading Contractor shall provide and maintain all erosion control devices in the areas indicated on the Erosion Control Plan and any other areas as directed by the Engineer.
2. The Utility Contractor shall provide and maintain all erosion control device around all openings into the storm sewer system to protect completion and as directed by the Engineer.
3. The paving Contractor shall provide and maintain all erosion control devices as indicated on the Erosion Control Plan and as directed by the Engineer.
4. Upon completion of fine grading, all street parkways shall be seeded, fertilized, and maintained by the Paving Contractor in accordance with the CITY OF LUCAS specifications.
5. The Electrical Utility, Natural Gas, Telephone, and Cable TV Contractor shall re-establish any previously established erosion control measure or device that is disturbed by their construction, including vegetative cover.
6. Site entry and exit locations shall be maintained in a condition which will prevent tracking or flowing of sediment onto public roadways. All sediment spilled, dropped, washed, or tracked into a public roadway must be removed immediately. When washing is required to remove sediment prior to entrance to a public roadway, it shall be done on an area stabilized with crushed stone which drains into an approved sediment basin. All fines imposed for tracking onto public roads shall be paid by the Contractor.
7. Temporary seeding or other methods of stabilization shall be initiated within 14 days of the last disturbance on any area of the site, unless additional construction on the area is expected within 21 days of the last disturbance.
8. Seeding for permanent vegetative cover shall be initiated upon completion of fine grading by Paving and Grading Contractor, see Final Stabilization.
9. Erosion control devices may be added or reduced in the field as directed by the Engineer.
10. INSPECTION - The Contractor shall conduct inspections of all erosion controls provided in the SWPPP at a minimum of once every 7 calendar days. When field inspection reveals an inadequacy in erosion control measures, the SWPPP shall be revised and erosion control measures shall be upgraded within 7 days.
11. MAINTENANCE - Erosion controls shall be repaired or replaced as inspection deems necessary or as directed by the Engineer. Accumulated silt at any erosion control device shall be removed when it reaches a depth of 6", and shall be distributed on site in a manner not contributing to additional siltation.
12. The Contractor is responsible for re-establishing any erosion control device which he disturbs. Each Contractor shall notify the Engineer of any deficiencies in the established erosion control measures which may lead to unauthorized discharge of storm water pollution, sedimentation, or other surface or ground water pollutants, and excessive dust or other airborne pollutants. Unauthorized pollutants include, but are not limited to, excess concrete dumping or concrete residue, paints and other overspray, solvents, greases, fuel and lube oil, pesticides, and solid waste materials.
13. FINAL STABILIZATION - Upon completion of all soil disturbing construction, all areas not paved or covered by permanent structures or equivalent permanent stabilization measures shall be stabilized with a uniform perennial vegetative cover. For termination of industrial status of the construction site, the vegetative cover must meet a minimum density of 70% as determined by the Engineer. All temporary erosion control measures must be removed.

STORM SEWER NOTES:

- 1. The developer will be held responsible for notifying builders and lot owner of proper driveway culvert sizes (shown on the plot) and ensuring the properly sized culvert is installed with appropriate concrete headwalls.
2. Concrete, wherever mentioned in these regulations, shall be Class A Concrete as defined in TxDOT, Item 421, Concrete materials, placement methods, placement temperatures, curing, etc., shall be in accordance with TxDOT, Items 420 and 421.
3. Pipe culverts must be reinforced concrete pipe.
4. Driveway culverts must have concrete headwalls.
5. All concrete shall have a minimum compressive strength of 3,600 psi at 28 days unless otherwise on the approved plans.
6. All reinforcing steel for concrete shall be ASTM Grade 60
7. Embedment for drainage pipe shall be incidental to pipe installation and will not be a separate pay item.



TYPICAL PAVING SECTION
(31' E-E CONCRETE STREET W/5' GRASS SHOULDER)

RECORD DRAWINGS
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ENGINEERING CONCEPTS & DESIGNS, L.P.
TODD WINTTERS, P.E. 3-15-16 DATE

BENCHMARK: An "X" cut in south end of a concrete headwall on the east side of Stinson Road at Muddy Creek Elevation 569.65'

ENGINEERING CONCEPTS & DESIGN, L.P.
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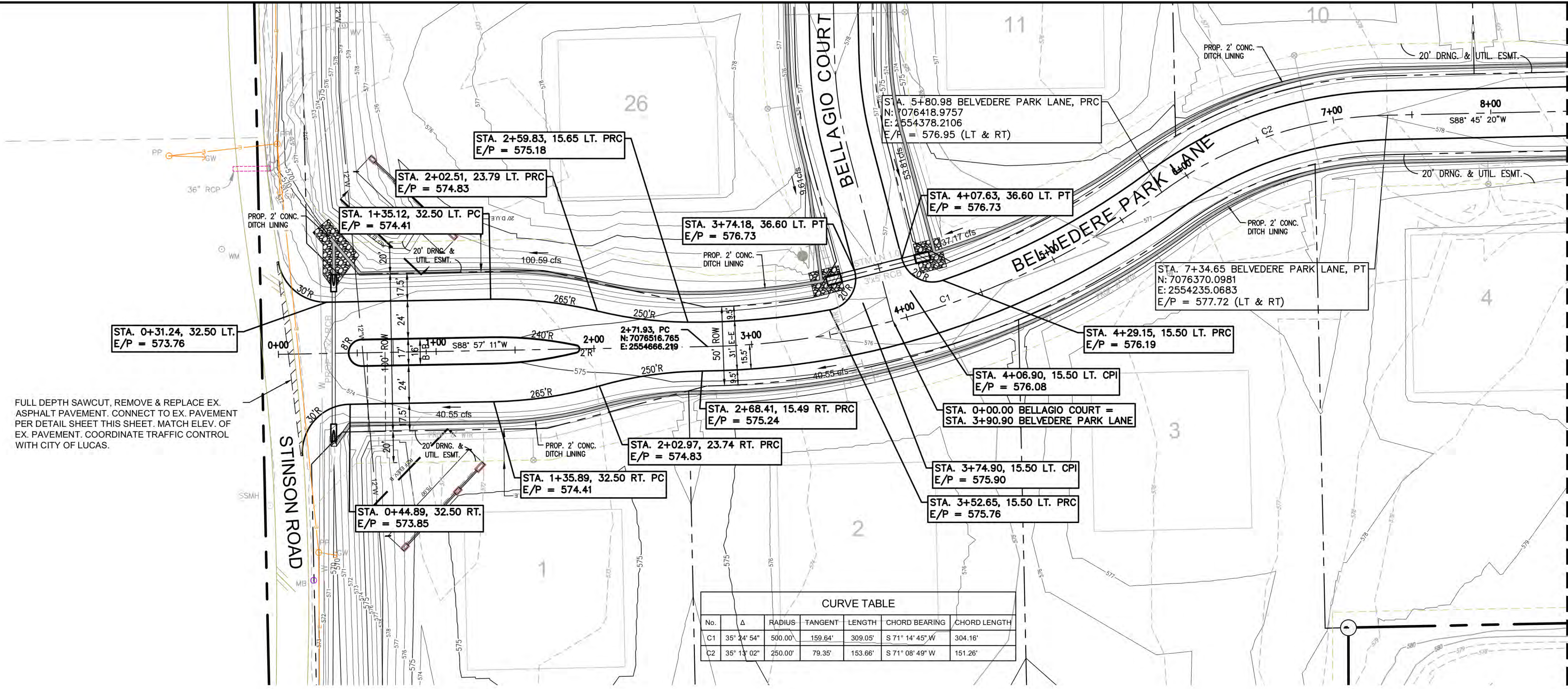
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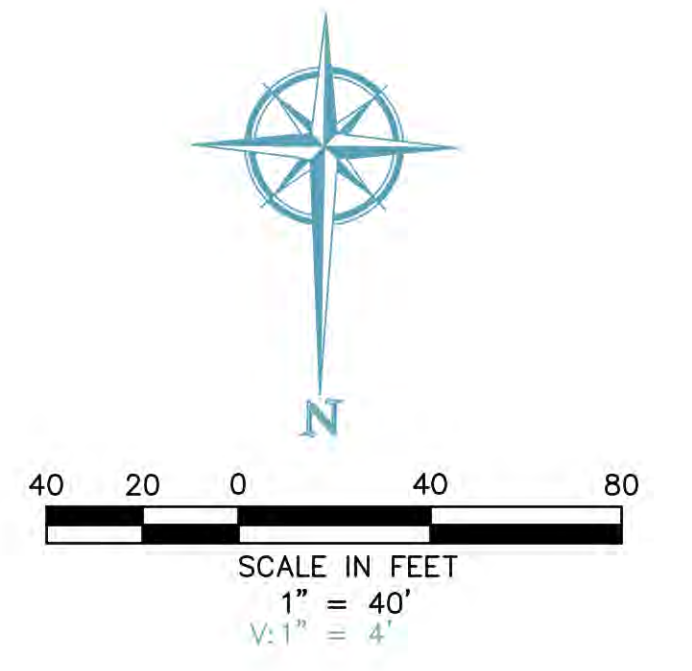
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BRISTOL PARK PHASE III
CITY OF LUCAS, COLLIN COUNTY, TEXAS

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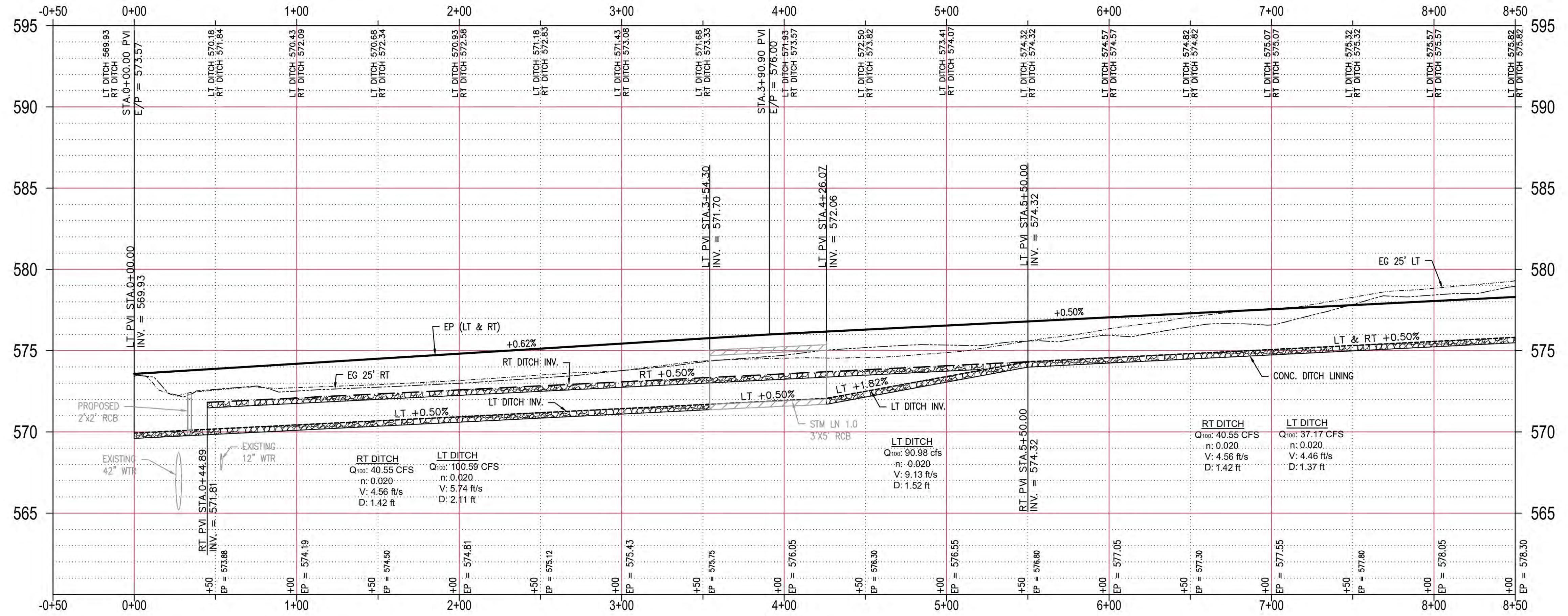
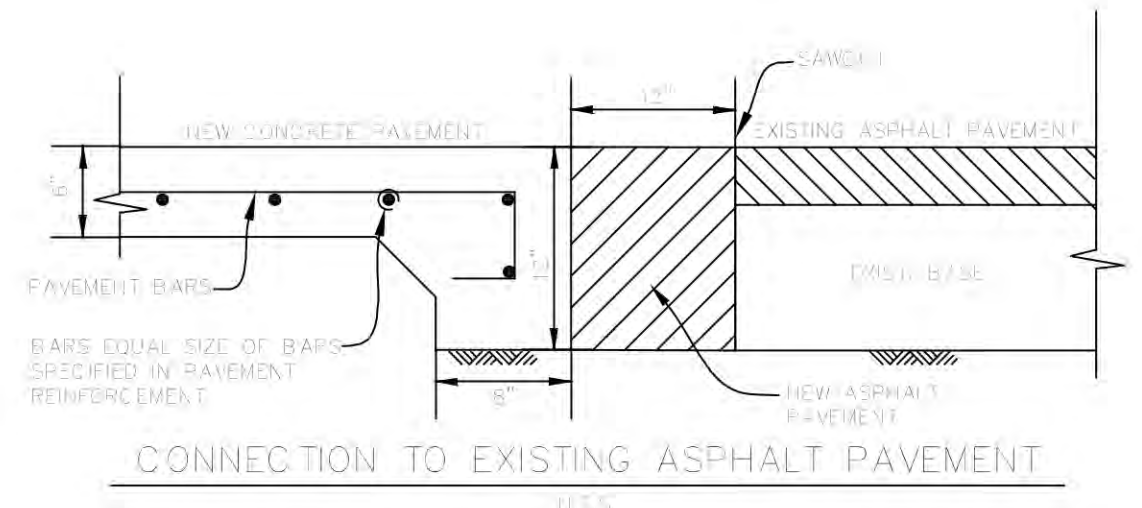
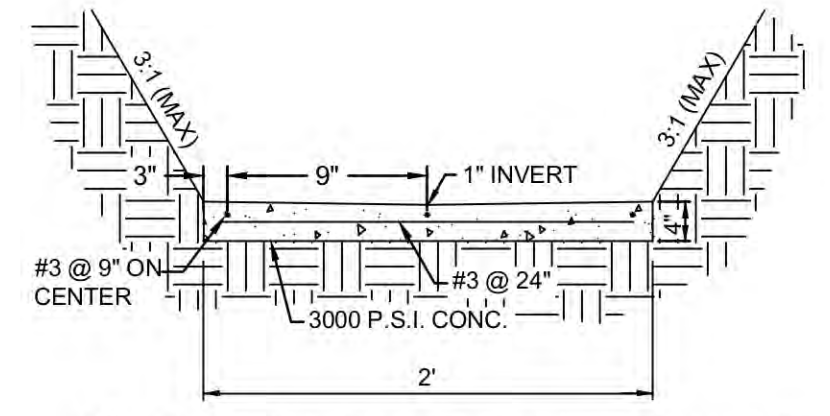


FULL DEPTH SAWCUT, REMOVE & REPLACE EX. ASPHALT PAVEMENT. CONNECT TO EX. PAVEMENT PER DETAIL SHEET THIS SHEET. MATCH ELEV. OF EX. PAVEMENT. COORDINATE TRAFFIC CONTROL WITH CITY OF LUCAS.

CURVE TABLE						
No.	Δ	RADIUS	TANGENT	LENGTH	CHORD BEARING	CHORD LENGTH
C1	35° 24' 54"	500.00'	159.64'	309.05'	S 71° 14' 45" W	304.16'
C2	35° 13' 02"	250.00'	79.35'	153.66'	S 71° 08' 49" W	151.26'



- LEGEND**
- EP EDGE OF PAVEMENT
 - PP POWER POLE
 - EM ELECTRIC METER
 - EL ELECTRIC DISCONNECT
 - LP LIGHT POLE
 - SSMH SAN. SEWER MANHOLE
 - WM WATER METER
 - FH FIRE HYDRANT
 - WV WATER VALVE
 - ROW RIGHT OF WAY
 - FL FENCE LINE
 - N.I.C. NOT IN CONTRACT



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Todd Winters 3-15-16
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REVISIONS:

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CHECKED: TW	DATE: MARCH, 2016
PROJECT NO: 8314	
DWG FILE NAME:	

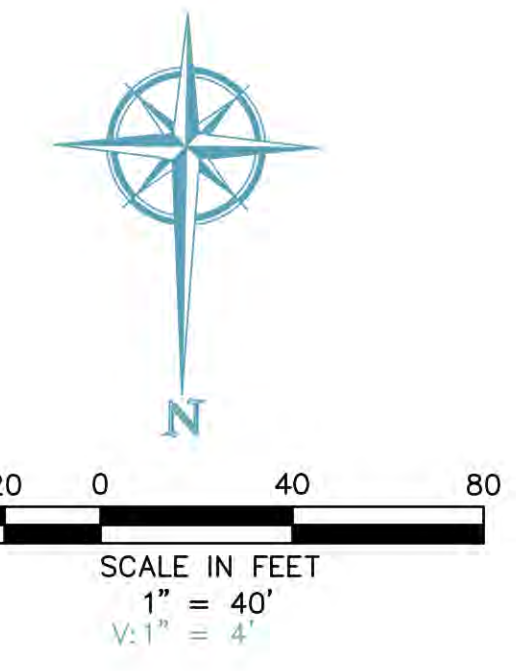
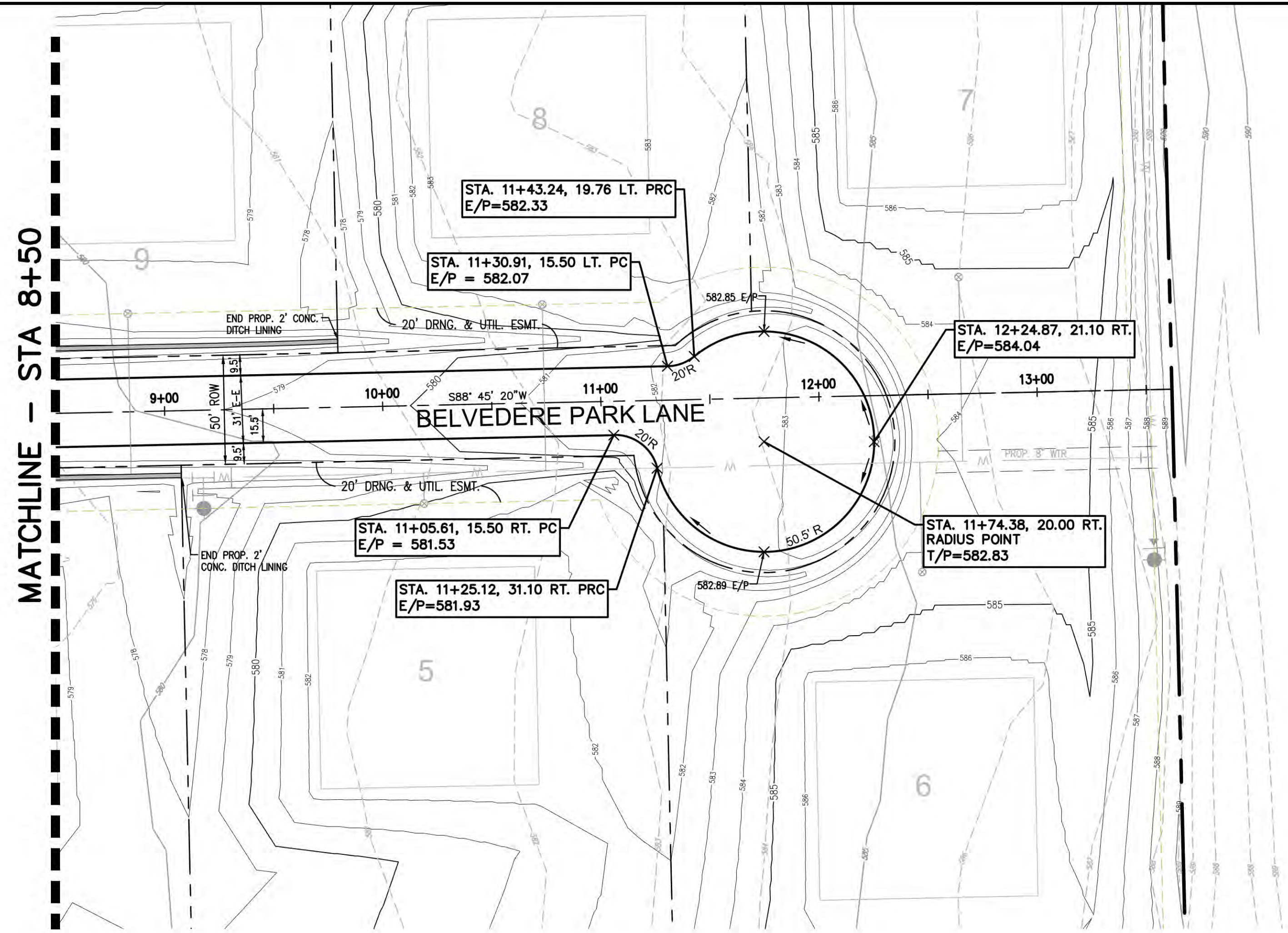
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PAVING PLAN & PROFILE
BELVEDERE PARK LANE
 BRISTOL PARK PHASE III
 CITY OF LUCAS, COLLIN COUNTY, TEXAS

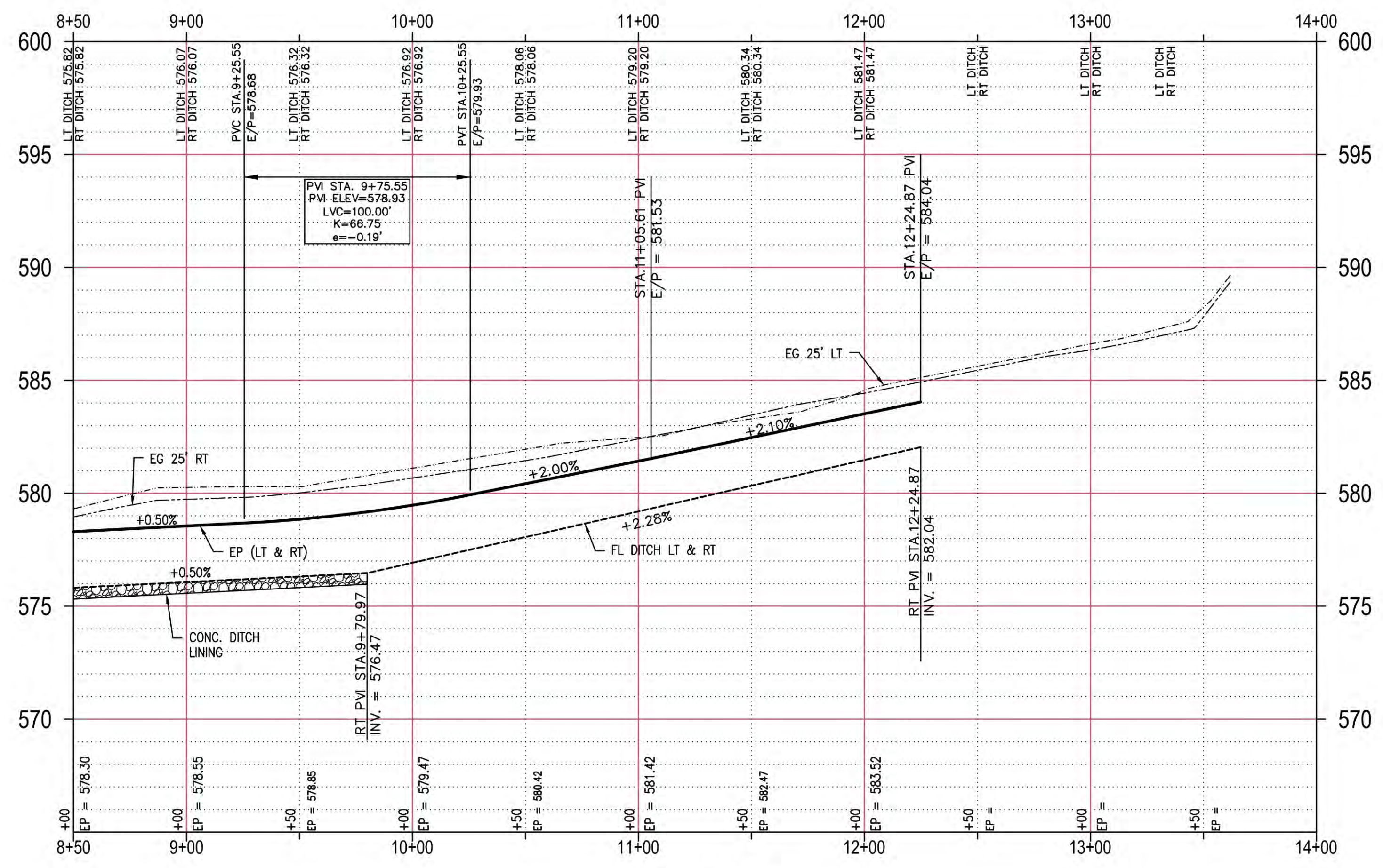
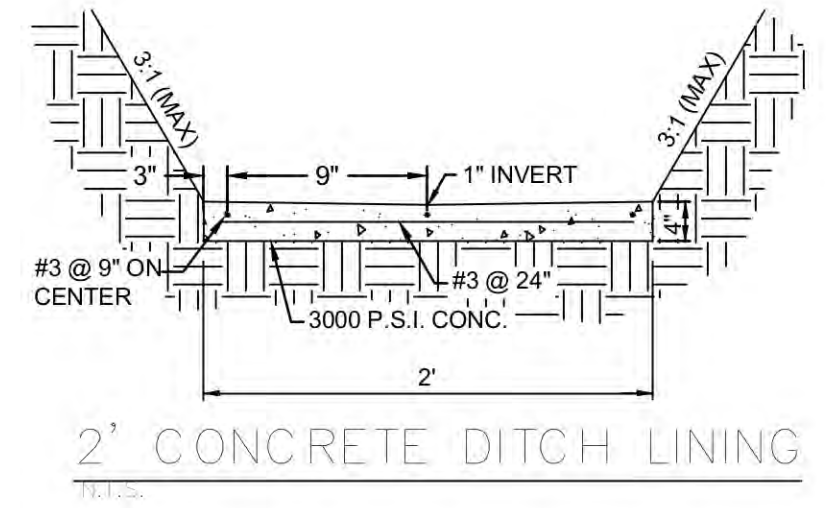
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24

MATCHLINE - STA 8+50



LEGEND

EP	EDGE OF PAVEMENT
PP	POWER POLE
EM	ELECTRIC METER
EL	ELECTRIC DISCONNECT
LP	LIGHT POLE
SSMH	SAN. SEWER MANHOLE
WM	WATER METER
FH	FIRE HYDRANT
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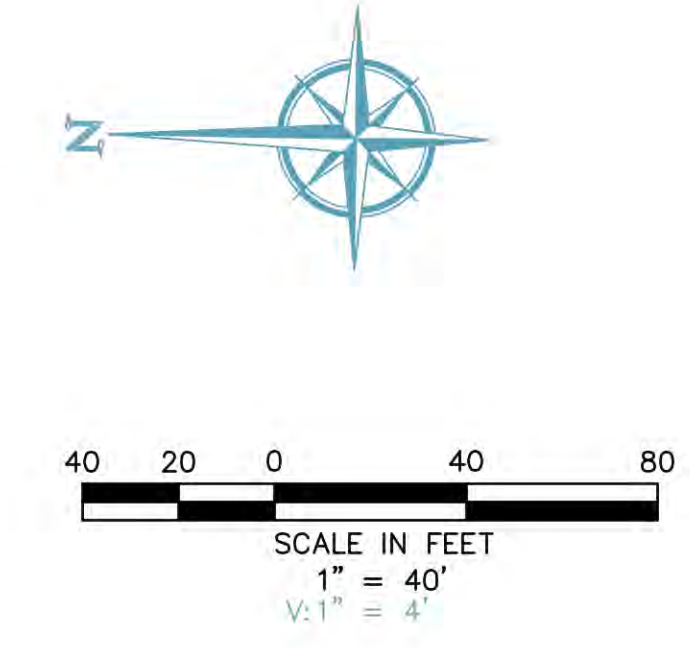
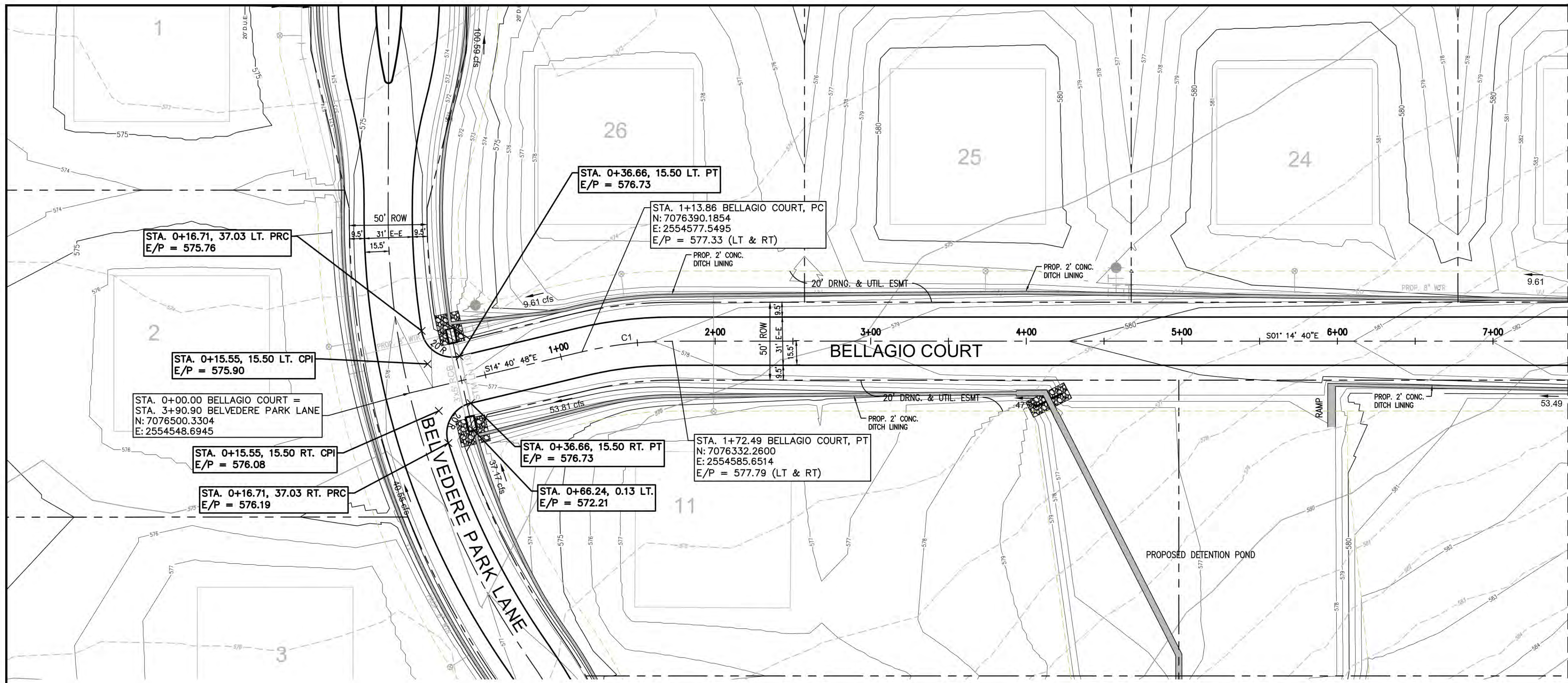
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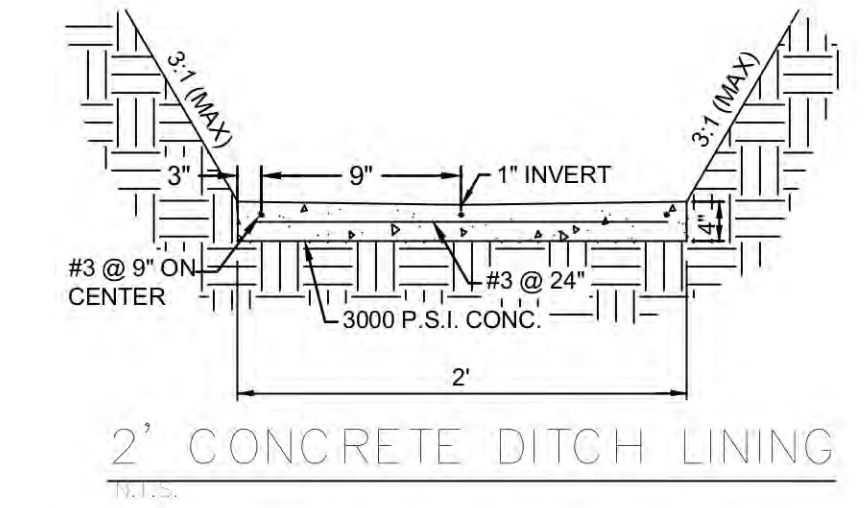
PAVING PLAN & PROFILE
 BELVEDERE PARK LANE
 BRISTOL PARK PHASE III
 CITY OF LUCAS, COLLIN COUNTY, TEXAS

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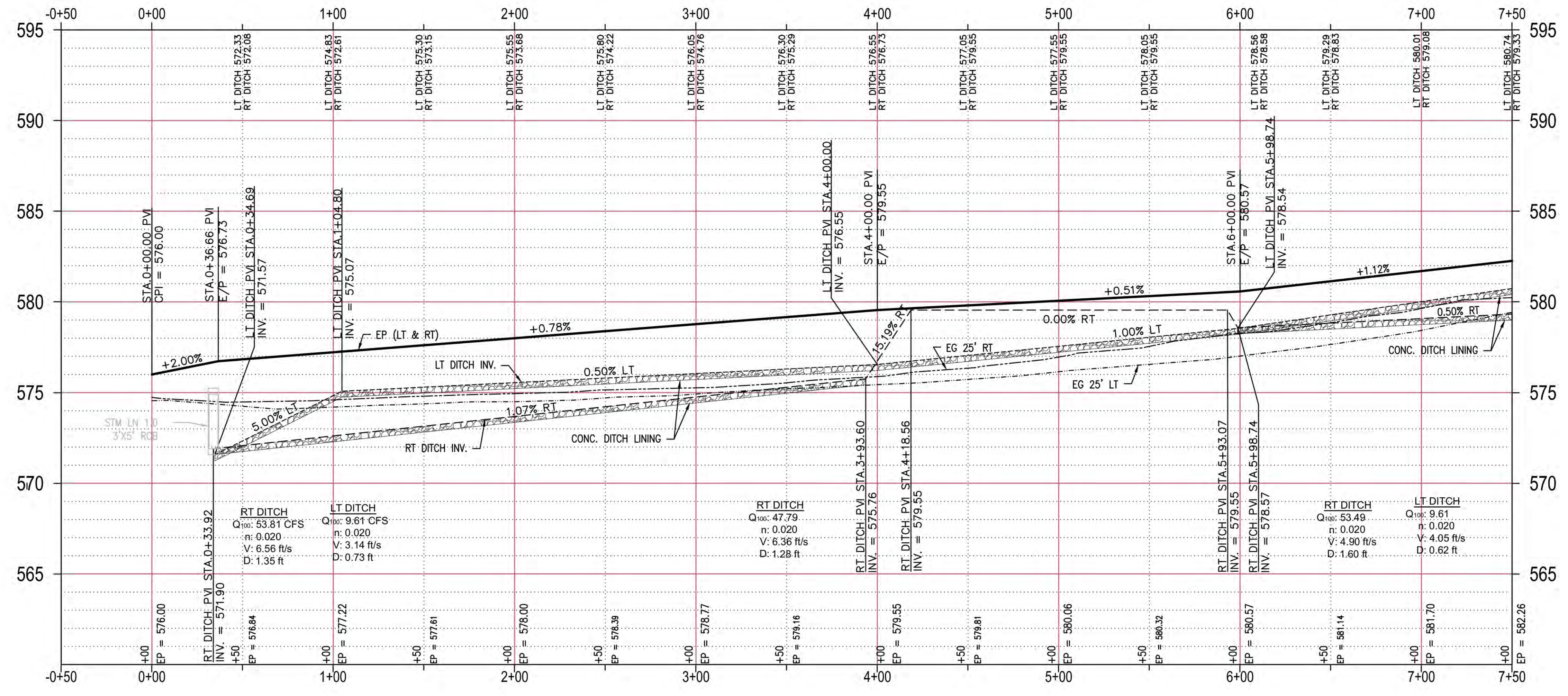
LEGEND

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N.I.C.	NOT IN CONTRACT



CURVE TABLE

No.	Δ	RADIUS	TANGENT	LENGTH	CHORD BEARING	CHORD LENGTH
C1	13° 28' 08"	260.00'	29.45'	58.62'	S 7° 57' 44" E	58.49'



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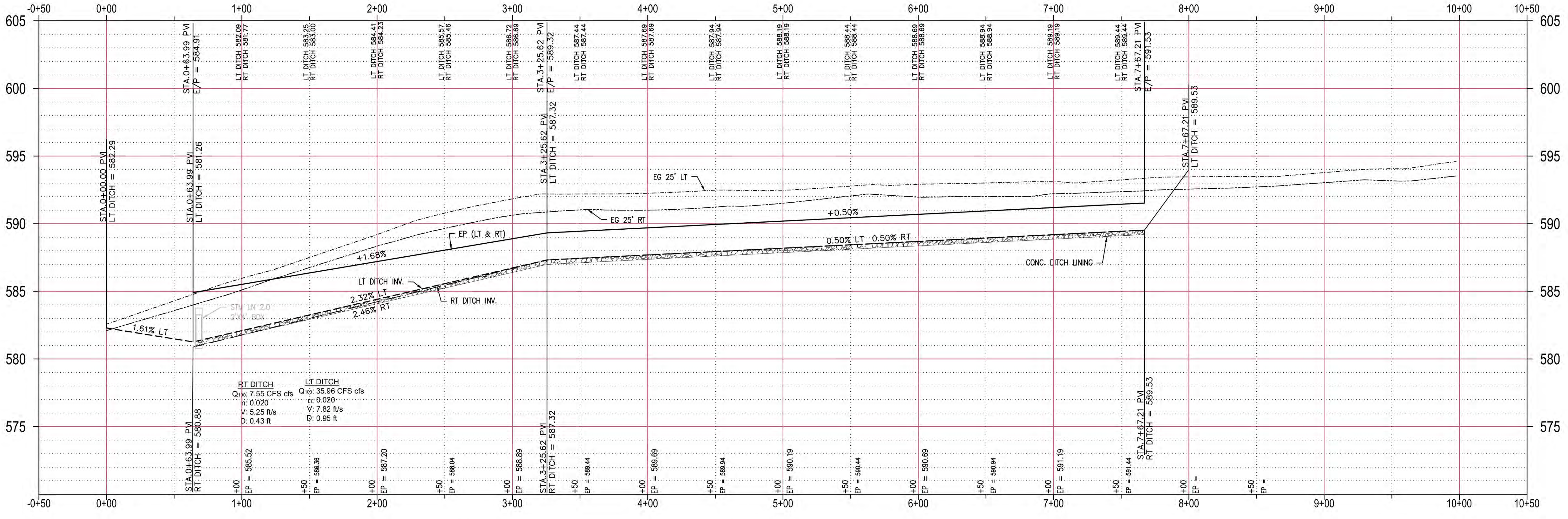
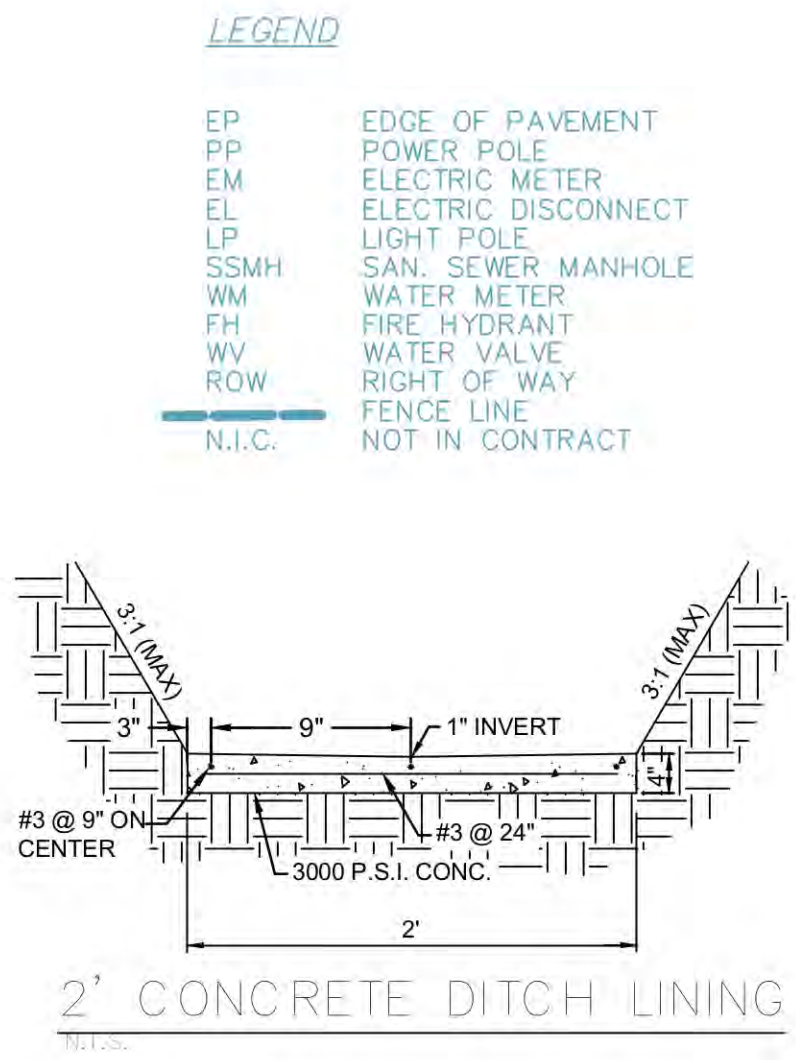
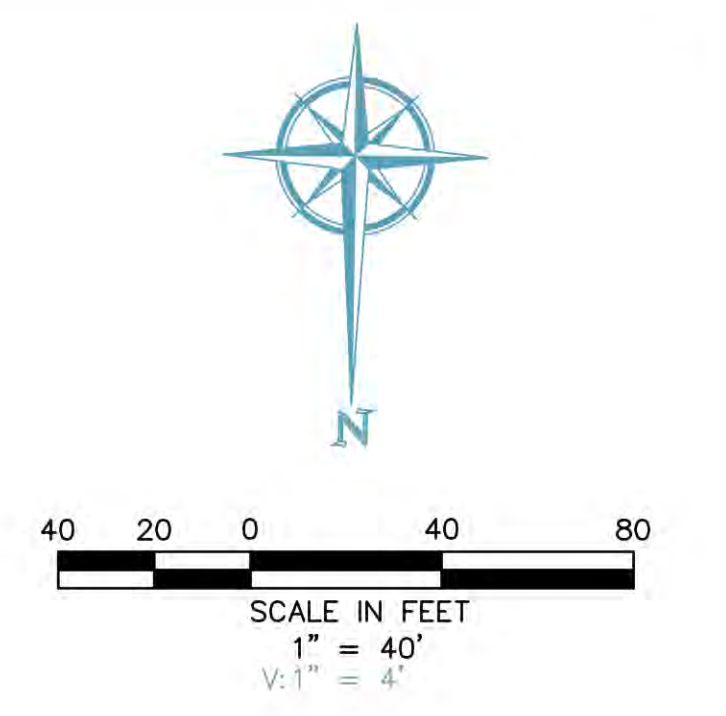
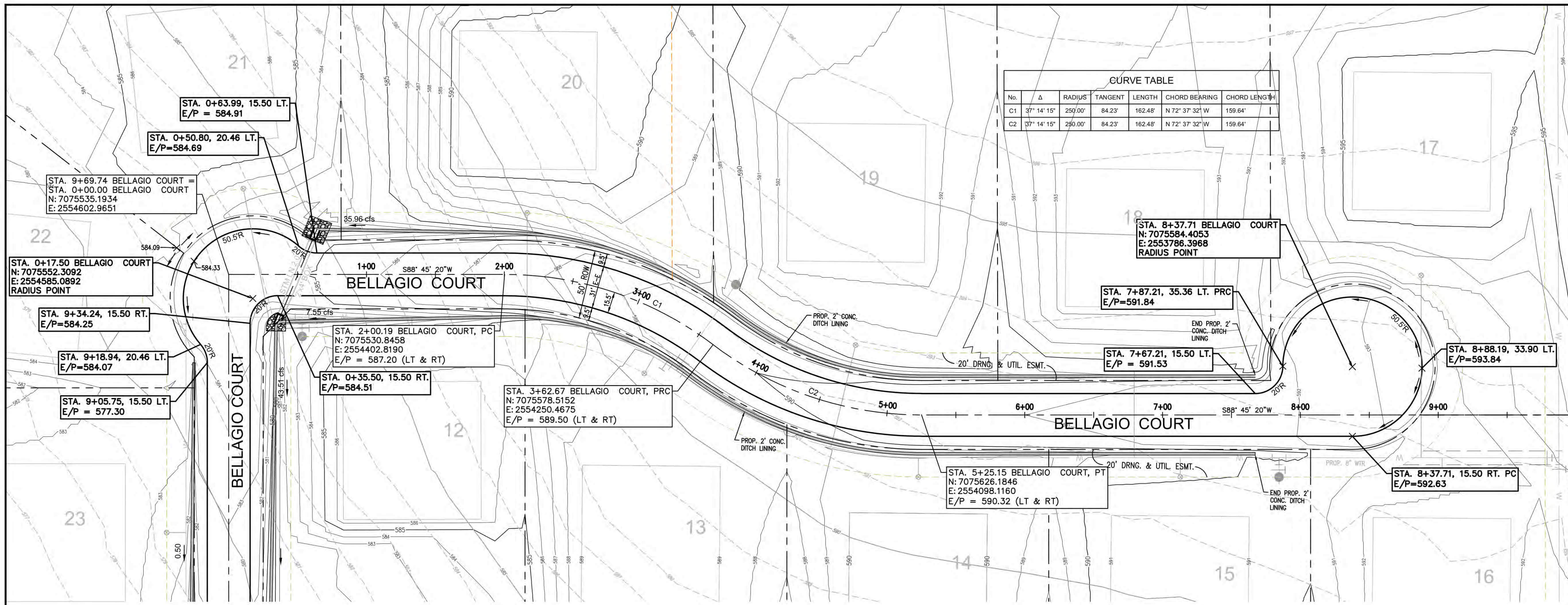
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PAVING PLAN & PROFILE
BELLAGIO COURT
 BRISTOL PARK PHASE III
 CITY OF LUCAS, COLLIN COUNTY, TEXAS

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RECORD DRAWINGS

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ENGINEERING CONCEPTS & DESIGN, L.P.
TODD WINTTERS, P.E. 3-15-16 DATE

BENCHMARK:
An "X" cut in south end of a concrete headwall on the east side of Stinson Road at Muddy Creek
Elevation 569.65'

ENGINEERING CONCEPTS & DESIGN, L.P.

ENGINEERING / PROJECT MANAGEMENT / CONSTRUCTION SERVICES - FIRM REG. #F-00145
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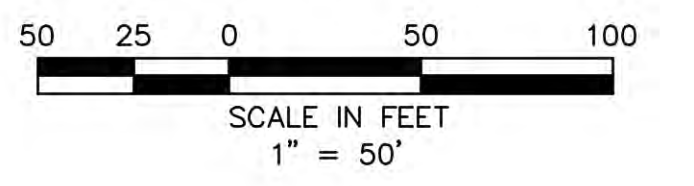
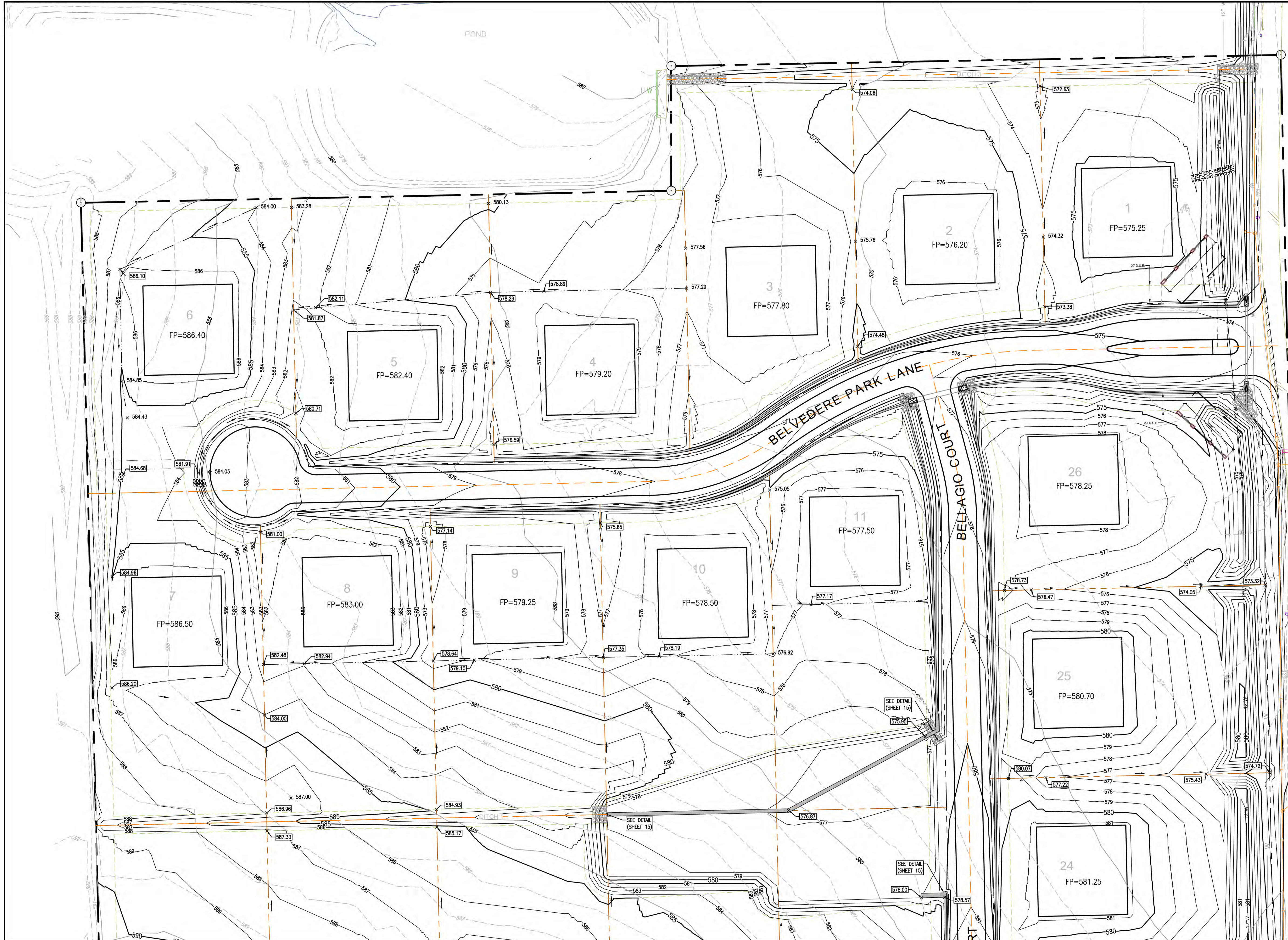
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BRISTOL PARK PHASE III
CITY OF LUCAS, COLLIN COUNTY, TEXAS

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NOTE:
REFER TO LANDSCAPE PLANS FOR DETAILS OF BERMS
ALONG STINSON ROAD.

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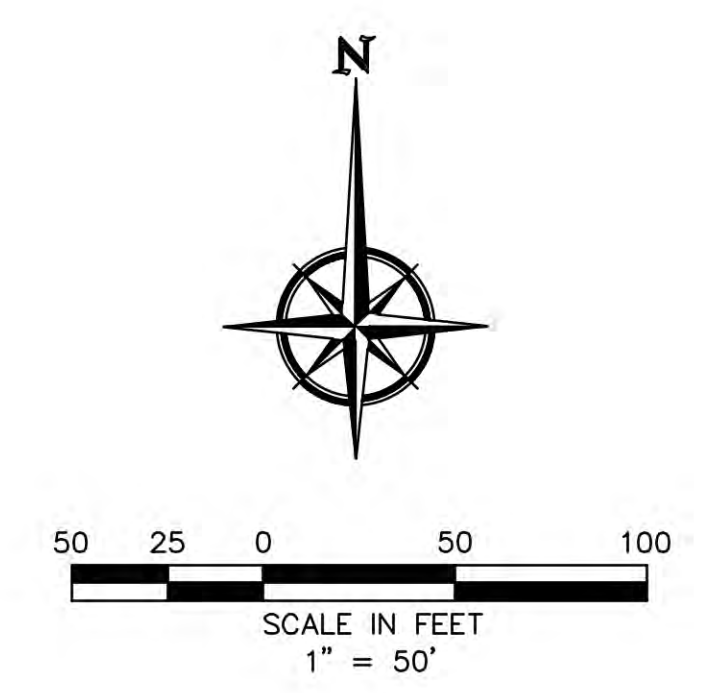
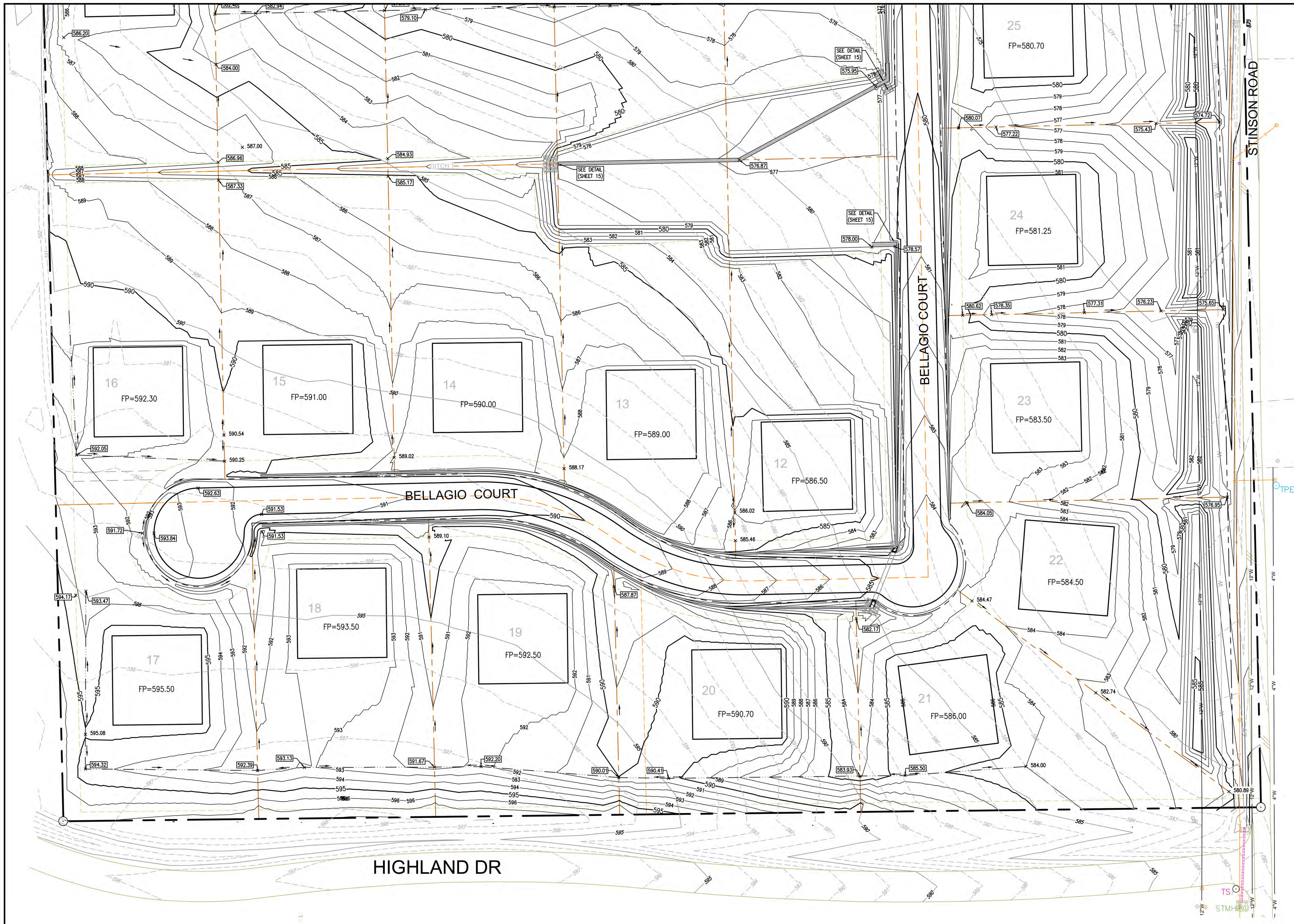
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GRADING PLAN
BRISTOL PARK PHASE III
 CITY OF LUCAS, COLLIN COUNTY, TEXAS

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 Elevation 589.65'

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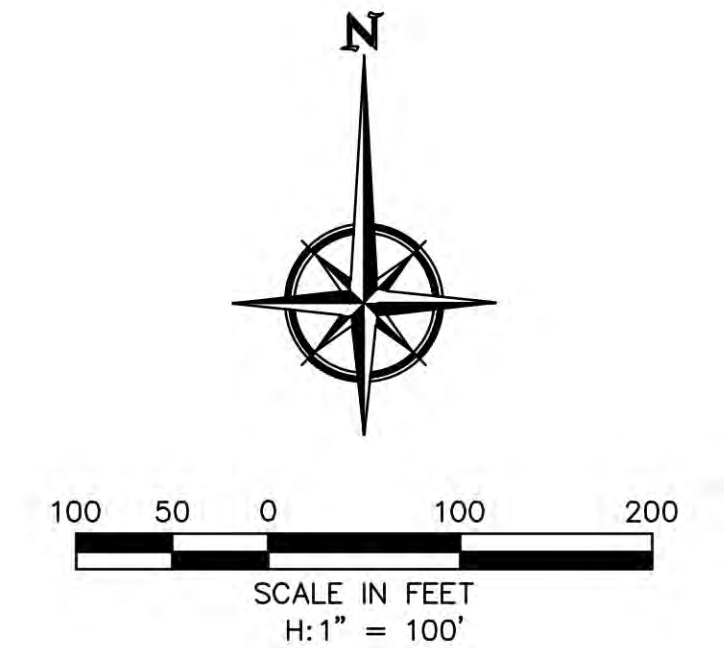
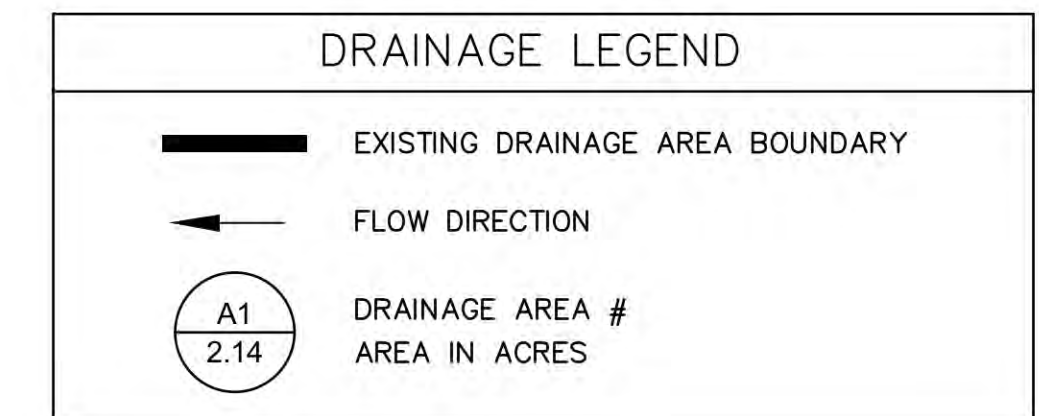
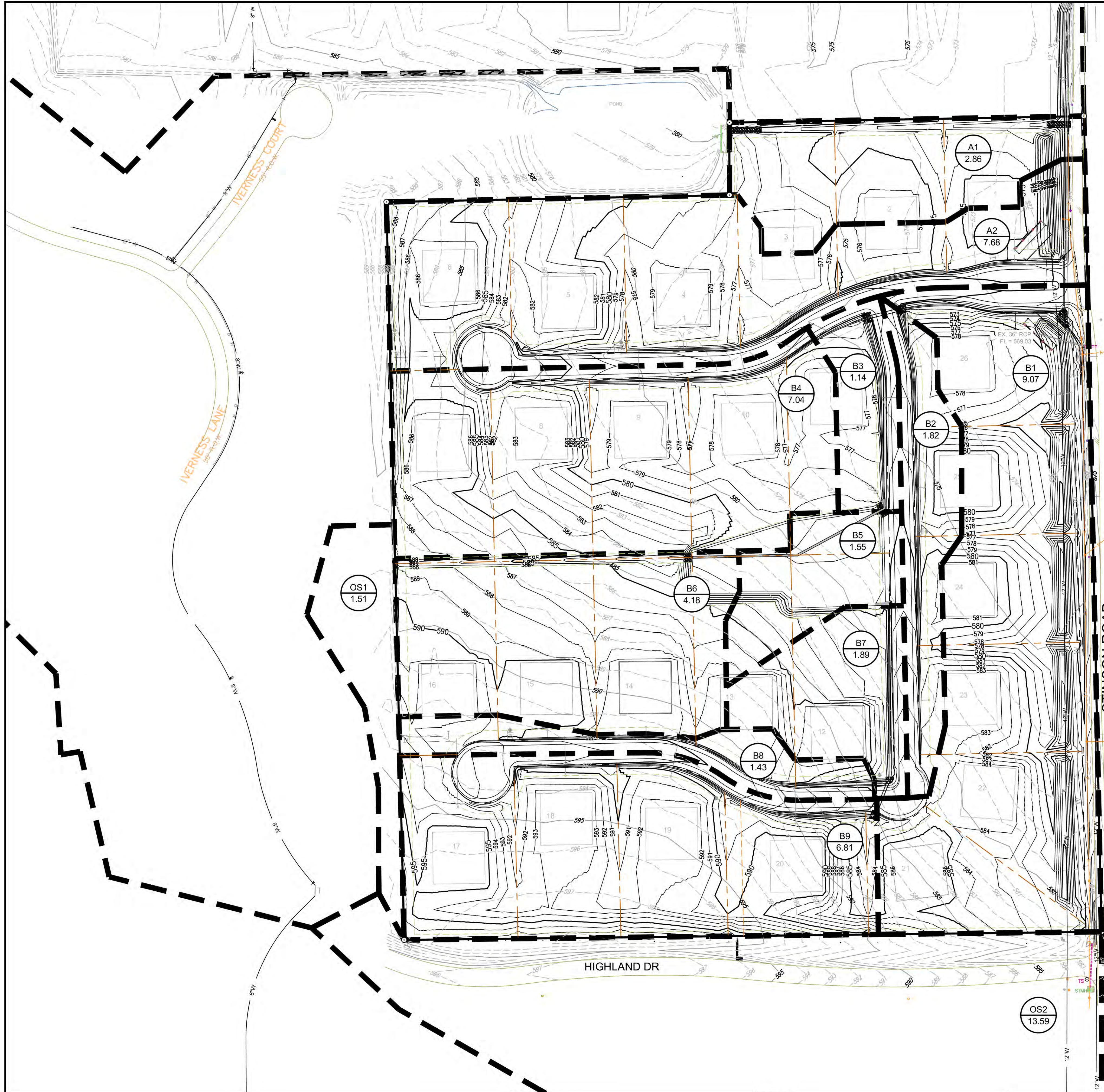
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GRADING PLAN
BRISTOL PARK PHASE III
 CITY OF LUCAS, COLLIN COUNTY, TEXAS

SHEET
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DRAINAGE CALCULATIONS

AREA NO.	AREA (ACRES)	C	T _c (MIN)	I ₂₅ (IN/HR)	I ₁₀₀ (IN/HR)	Q ₂₅ (CFS)	Q ₁₀₀ (CFS)	COMMENTS
A1	2.86	0.55	15	7.80	9.60	12.27	15.10	
A2	7.68	0.55	15	7.80	9.60	32.95	40.55	
B1	9.07	0.55	15	7.80	9.60	38.91	47.89	
B2	1.82	0.55	15	7.80	9.60	7.81	9.61	
B3	1.14	0.55	15	7.80	9.60	4.89	6.02	
B4	7.04	0.55	15	7.80	9.60	30.20	37.17	
B5	1.55	0.55	15	7.80	9.60	6.65	8.18	
B6	4.18	0.55	15	7.80	9.60	17.93	22.07	
B7	1.89	0.55	15	7.80	9.60	8.11	9.98	
B8	1.43	0.55	15	7.80	9.60	6.13	7.55	
B9	6.81	0.55	15	7.80	9.60	29.21	35.96	
OS1	1.51	0.55	15	7.80	9.60	6.48	7.97	
OS2	13.59	0.35	20	6.70	8.30	31.87	39.48	

58.55 ac. EXISTING AREA DRAINING TO EXISTING 36" CULVERT UNDER STINSON ROAD.
 C = 0.35 "C" EXISTING
 T_c = 20
 I₂₅ = 8.30 EXISTING
 Q₁₀₀ = 109.02 EXISTING TO EXISTING 36" CULVERT UNDER STINSON ROAD.

Q₁₀₀ = 103.58 POST DEVELOPMENT TO EXISTING 36" CULVERT UNDER STINSON ROAD.
 - 22.08 2x2' RCB (AUX. OVER FLOW PIPE CAPACITY)
 Q₁₀₀ = 81.50 POST DEVELOPMENT TO EXISTING 36" CULVERT UNDER STINSON ROAD.

NOTE:
 DRIVEWAY CULVERTS MUST MEET CITY OF LUCAS STANDARDS AND MAY REQUIRE CONCRETE HEADWALLS.

DRIVEWAY CULVERT TABLE

LOT	AREA	I ₂₅	Q ₂₅	SIZE
1	6.84	7.8	29.34 cfs	(3)-24"
2	6.21	7.8	26.64 cfs	(3)-24"
3	5.53	7.8	23.72 cfs	(2)-24"
4	4.22	7.8	18.10 cfs	(2)-21"
5	2.57	7.8	11.03 cfs	24"
6	1.12	7.8	4.80 cfs	18"
7	0.46	7.8	1.97 cfs	18"
8	2.04	7.8	8.75 cfs	21"
9	3.61	7.8	15.49 cfs	(2)-18"
10	5.31	7.8	22.78 cfs	(2)-24"
11	6.75	7.8	28.96 cfs	(2)-24"
12	8.24	7.8	35.35 cfs	(2)-24"
13	0.92	7.8	3.95 cfs	18"
14	0.65	7.8	2.79 cfs	18"
15	0.47	7.8	2.02 cfs	18"
16	0.25	7.8	1.07 cfs	18"
17	0.79	7.8	3.39 cfs	18"
18	2.49	7.8	10.68 cfs	24"
19	4.13	7.8	17.72 cfs	(2)-21"
20	5.78	7.8	24.80 cfs	(2)-24"
21				N/A
22				N/A
23	0.27	7.8	1.16 cfs	18"
24	0.63	7.8	2.70 cfs	18"
25	1.11	7.8	4.76 cfs	18"
26	1.82	7.8	7.81 cfs	21"

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DRAINAGE AREA MAP
BRISTOL PARK PHASE III
 CITY OF LUCAS, COLLIN COUNTY, TEXAS

DETENTION POND VOLUME CALCULATOR					
MODIFIED RATIONAL METHOD					
2 YEAR FREQUENCY					
DETENTION REQUIRED					
	24.71	phase 1			
	0	phase 2			
Area, acre	24.71				
Present Conditions		Proposed Conditions			
C	0.35	C	0.55		
Tc	20.00	Tc	15.00		
i(100)	3.86	i(100)	4.50		
Q(100)	33.38	Q(100)	61.16		
Proposed Intensities					
Time	Inflow	Outflow	Storage (cf)	Tc	Intensity
5	28662	20030	8632	5	7.03
10	44441	25037	19404	10	5.45
15	55042	30045	24997	15	4.5
20	62951	35052	27899	20	3.86
30	74367	45067	29300	30	3.04
40	82522	55082	27439	40	2.53
50	88882	65097	23795	50	2.18
60	93938	75112	18825	60	1.92
70	98170	85127	13051	70	1.72
80	102418	95142	7276	80	1.57
90	105680	105157	523	90	1.44

DETENTION POND VOLUME CALCULATOR					
MODIFIED RATIONAL METHOD					
100 YEAR FREQUENCY					
DETENTION REQUIRED					
	24.71	phase 1			
	0	phase 2			
Area, acre	24.71				
Present Conditions		Proposed Conditions			
C	0.35	C	0.55		
Tc	20.00	Tc	15.00		
i(100)	8.30	i(100)	9.60		
Q(100)	71.78	Q(100)	130.47		
Proposed Intensities					
Time	Inflow	Outflow	Storage (cf)	Tc	Intensity
5	60750	43070	17680	5	14.9
10	94590	53837	40753	10	11.6
15	117422	64604	52818	15	9.6
20	135361	75372	59990	20	8.3
30	161455	96906	64549	30	6.6
40	179395	118441	60953	40	5.5
50	195703	139976	55727	50	4.8
60	210381	161511	48870	60	4.3
70	216904	183046	39859	70	3.8
80	228320	204580	23740	80	3.5
90	234844	226115	8729	90	3.2

DETENTION POND

TOTAL DRAINAGE AREA = 24.71 ACRES
 EXISTING C FACTOR, C=0.35
 DEVELOPED C FACTOR, C=0.55
 AREA TO POND = 18.03* ACRES
 BY-PASS AREA = 6.68 ACRES
 * INCLUDES OS1 (1.51 ACRES)

Detention Pond Volume Calculations

Contour Elevation	Surface Area (sf)	Average Area	Cumulative Volume (cf)
576.00	0	7,077	7,077
577.00	14,155	31,442	38,519
578.00	48,730	51,030	66,586
578.55	53,330		

ALLOWABLE RELEASE, 2 YEAR (Q= CIA)
 2 YEAR 20 MINUTE INTENSITY I=3.86
 C=0.35
 Q(2)= 24.36 CFS (ALLOWABLE RELEASE)

ALLOWABLE RELEASE, 5 YEAR (Q= CIA)
 5 YEAR 20 MINUTE INTENSITY I=4.86
 C=0.35
 Q(5)= 30.67 CFS (ALLOWABLE RELEASE)

ALLOWABLE RELEASE, 10 YEAR (Q= CIA)
 10 YEAR 20 MINUTE INTENSITY I=5.7
 C=0.35
 Q(10)= 35.97 CFS (ALLOWABLE RELEASE)

ALLOWABLE RELEASE, 25 YEAR (Q= CIA)
 25 YEAR 20 MINUTE INTENSITY I=6.7
 C=0.35
 Q(25)= 42.28 CFS (ALLOWABLE RELEASE)

ALLOWABLE RELEASE, 100 YEAR (Q= CIA)
 100 YEAR 20 MINUTE INTENSITY I=8.3
 C=0.35
 Q(100)= 52.38 CFS (ALLOWABLE RELEASE)

Outlet Structure Calculations
 2 Year Discharge @ Max Water Surface

Q total = 24.36cfs Allowed
 Storage Elevation = 577.71
 Invert Elevation = 575.95
 Width Weir (1) = 3.50

Q total = 27.24cfs Provided
 Q ALLOW TO Q DESIGN, 10yr DIFFERENCE = 11.82%

WEIR (1)
 $Q = C L H^{3/2}$
 C = 3.333
 H = 1.76 [H = Storage elev. minus FL of weir]
 L = 3.50
 Q = 27.24cfs
 Weir opening 3.50 feet x 1.76 ' @ FL 577.71

Outlet Structure Calculations
 5 Year Discharge @ Max Water Surface

Q total = 30.67cfs Allowed
 Storage Elevation = 577.87
 Invert Elevation = 575.95
 Width Weir (1) = 3.50

Q total = 33.49cfs Provided
 Q ALLOW TO Q DESIGN, 10yr DIFFERENCE = 9.19%

WEIR (1)
 $Q = C L H^{3/2}$
 C = 3.333
 H = 2.02 [H = Storage elev. minus FL of weir]
 L = 3.50
 Q = 33.49cfs
 Weir opening 3.50 feet x 2.02 ' @ FL 577.97

Outlet Structure Calculations
 10 Year Discharge @ Max Water Surface

Q total = 35.97cfs Allowed
 Storage Elevation = 578.10
 Invert Elevation = 575.95
 Width Weir (1) = 3.50

Q total = 36.78cfs Provided
 Q ALLOW TO Q DESIGN, 10yr DIFFERENCE = 2.25%

WEIR (1)
 $Q = C L H^{3/2}$
 C = 3.333
 H = 2.15 [H = Storage elev. minus FL of weir]
 L = 3.50
 Q = 36.78cfs
 Weir opening 3.50 feet x 2.15 ' @ FL 578.10

Outlet Structure Calculations
 25 Year Discharge @ Max Water Surface

Q total = 42.28cfs Allowed
 Storage Elevation = 578.25
 Invert Elevation = 575.95
 Width Weir (1) = 3.50

Q total = 40.69cfs Provided
 Q ALLOW TO Q DESIGN, 10yr DIFFERENCE = -3.76%

WEIR (1)
 $Q = C L H^{3/2}$
 C = 3.333
 H = 2.30 [H = Storage elev. minus FL of weir]
 L = 3.50
 Q = 40.69cfs
 Weir opening 3.50 feet x 2.30 ' @ FL 578.25

Outlet Structure Calculations
 100 Year Discharge @ Max Water Surface

Q total = 52.38cfs Allowed
 Storage Elevation = 578.51
 Invert Elevation = 575.95
 Width Weir (1) = 3.50

Q total = 47.78cfs Provided
 Q ALLOW TO Q DESIGN, 10yr DIFFERENCE = -8.78%

WEIR (1)
 $Q = C L H^{3/2}$
 C = 3.333
 H = 2.56 [H = Storage elev. minus FL of weir]
 L = 3.50
 Q = 47.78cfs
 Weir opening 3.50 feet x 2.56 ' @ FL 578.51

DETENTION POND VOLUME CALCULATOR					
MODIFIED RATIONAL METHOD					
5 YEAR FREQUENCY					
DETENTION REQUIRED					
	24.71	phase 1			
	0	phase 2			
Area, acre	24.71				
Present Conditions		Proposed Conditions			
C	0.35	C	0.55		
Tc	20.00	Tc	15.00		
i(100)	4.86	i(100)	5.63		
Q(100)	42.03	Q(100)	76.51		
Proposed Intensities					
Time	Inflow	Outflow	Storage (cf)	Tc	Intensity
5	35145	25213	9926	5	8.62
10	55205	31524	23681	10	6.77
15	68863	37829	31035	15	5.63
20	79260	44133	35127	20	4.86
30	94182	56743	37439	30	3.85
40	105027	69352	35675	40	3.22
50	113345	81962	31383	50	2.78
60	120357	94571	25786	60	2.46
70	126147	107181	18966	70	2.21
80	131773	119790	11983	80	2.02
90	135769	132400	3369	90	1.85

DETENTION POND VOLUME CALCULATOR					
MODIFIED RATIONAL METHOD					
10 YEAR FREQUENCY					
DETENTION REQUIRED					
	24.71	phase 1			
	0	phase 2			
Area, acre	24.71				
Present Conditions		Proposed Conditions			
C	0.35	C	0.55		
Tc	20.00	Tc	15.00		
i(100)	5.70	i(100)	6.60		
Q(100)	49.30	Q(100)	89.70		
Proposed Intensities					
Time	Inflow	Outflow	Storage (cf)	Tc	Intensity
5	41179	29578	11601	5	10.1
10	63604	36972	26631	10	7.8
15	80720	44367	36361	15	6.6
20	92959	51761	41198	20	5.7
30	110083	66550	43523	30	4.5
40	123945	81339	42606	40	3.8
50	134546	96128	38418	50	3.3
60	136992	110917	26075	60	2.8
70	148408	125706	22702	70	2.6
80	156563	140495	16068	80	2.4
90	161455	155284	6171	90	2.2

DETENTION POND VOLUME CALCULATOR					
MODIFIED RATIONAL METHOD					
25 YEAR FREQUENCY					
DETENTION REQUIRED					
	24.71	phase 1			
	0	phase 2			
Area, acre	24.71				
Present Conditions		Proposed Conditions			
C	0.35	C	0.55		
Tc	20.00	Tc	15.00		
i(100)	6.70	i(100)	7.70		
Q(100)	57.94	Q(100)	104.65		
Proposed Intensities					
Time	Inflow	Outflow	Storage (cf)	Tc	Intensity
5	48926	34767	14159	5	12.0
10	75835	43459	32376	10	9.3
15	94182	52150	42032	15	7.7
20	109268	60842	48425	20	6.7
30	129653	78226	51428	30	5.3
40	143516	95609	47907	40	4.4
50	154932	112993	41939	50	3.8
60	163448	130376	35972	60	3.4
70	176948	147760	29189	70	3.1
80	182656	165143	17513	80	2.8
90	190811	182527	8284	90	2.6

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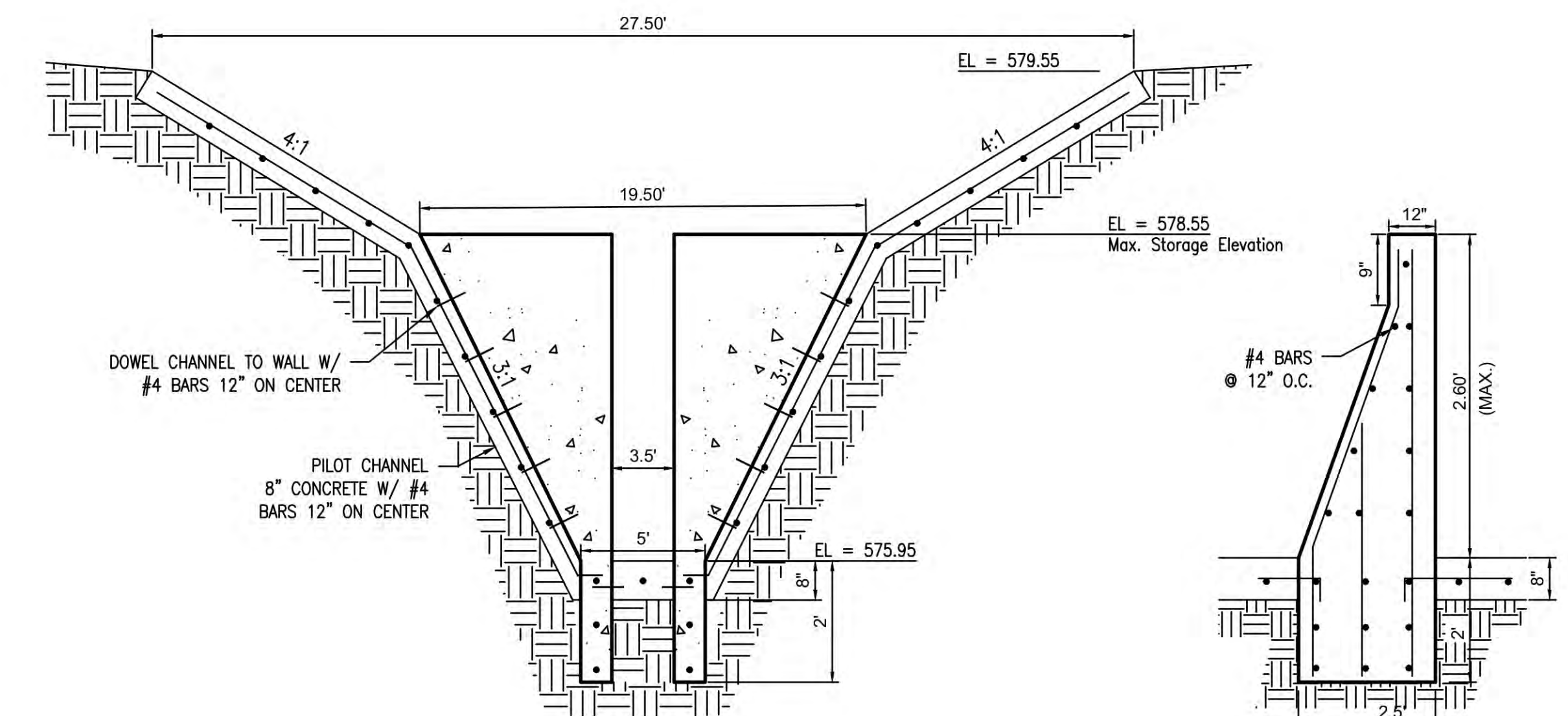
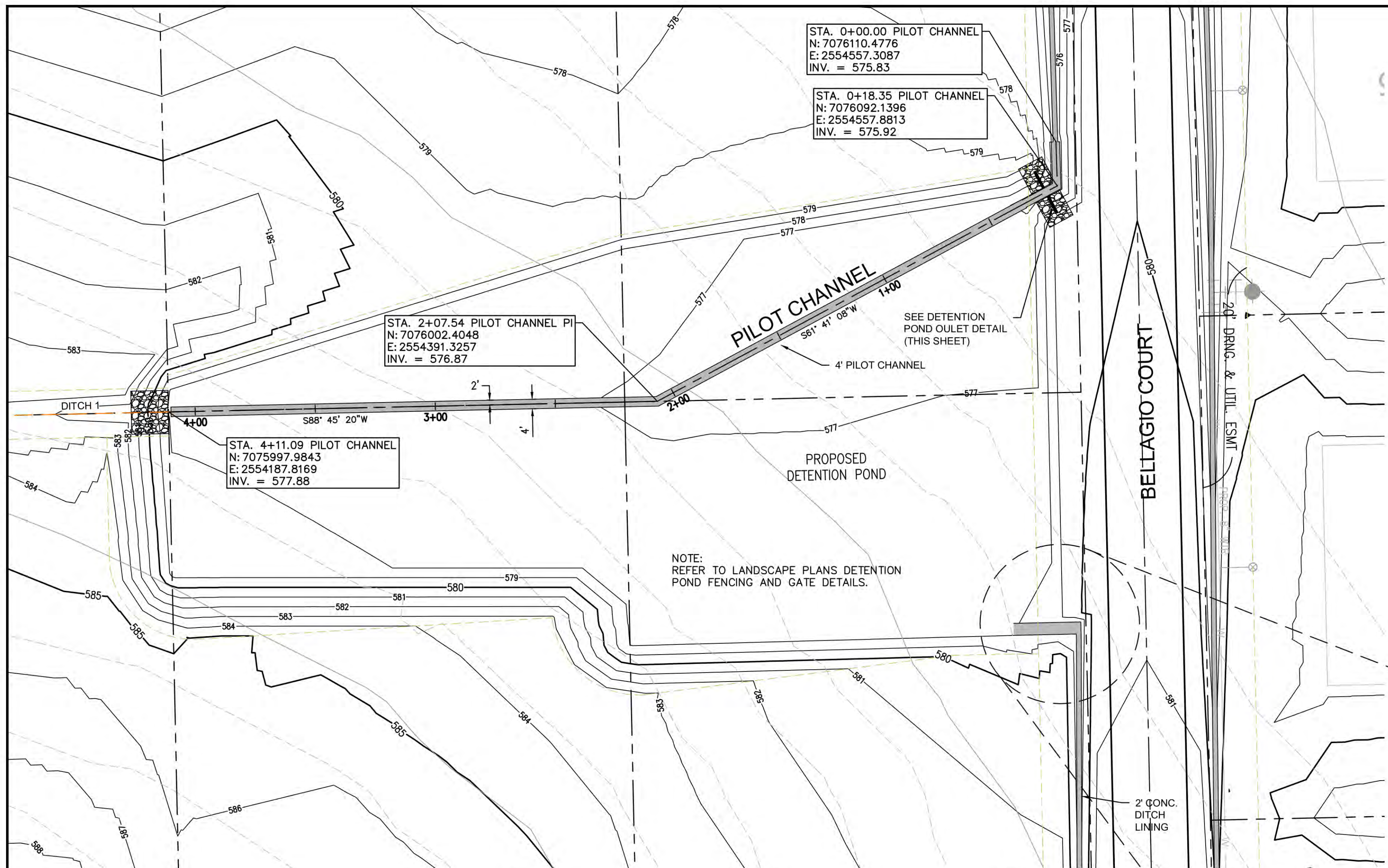
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DETENTION CALCULATIONS

BRISTOL PARK PHASE III

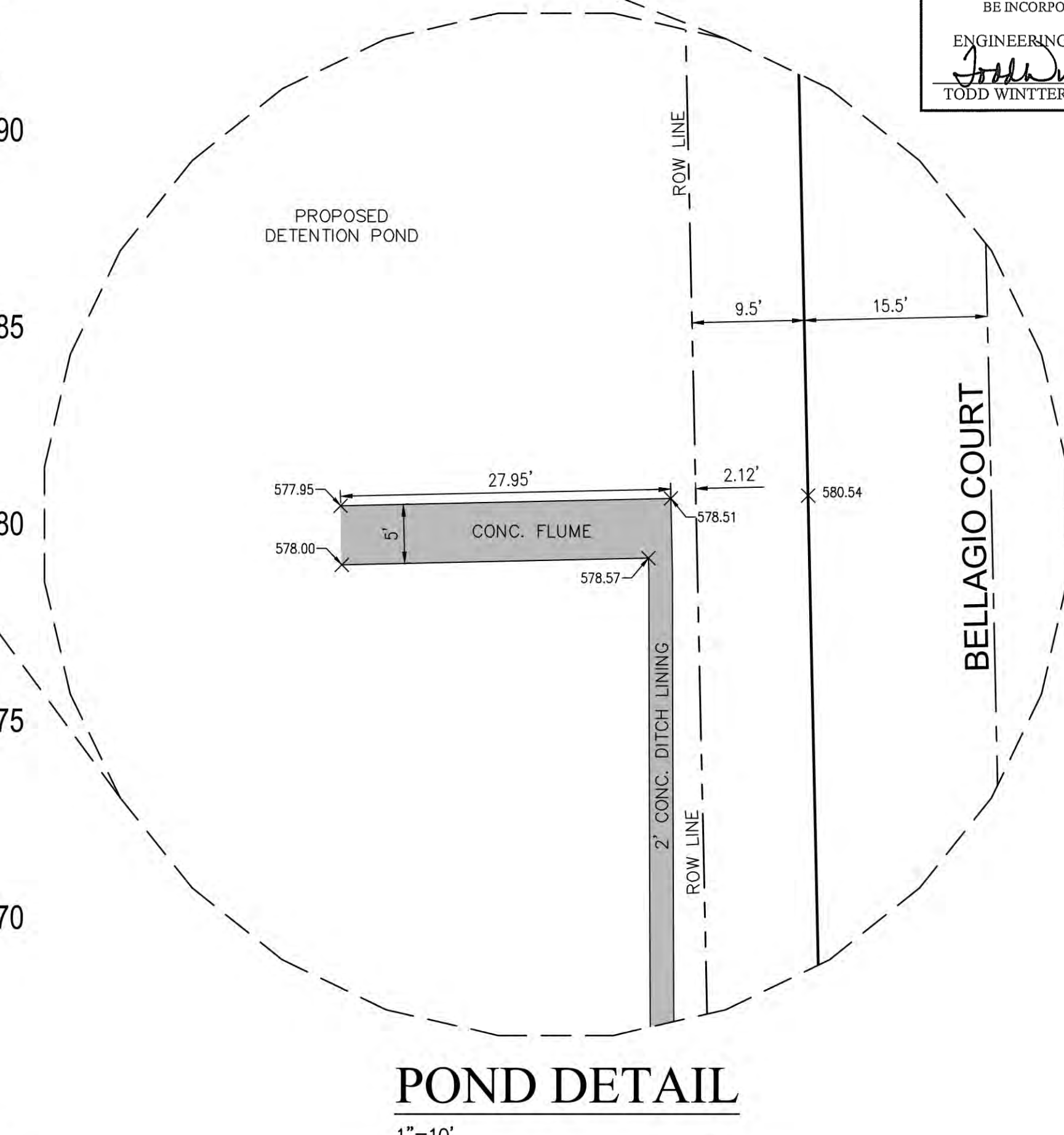
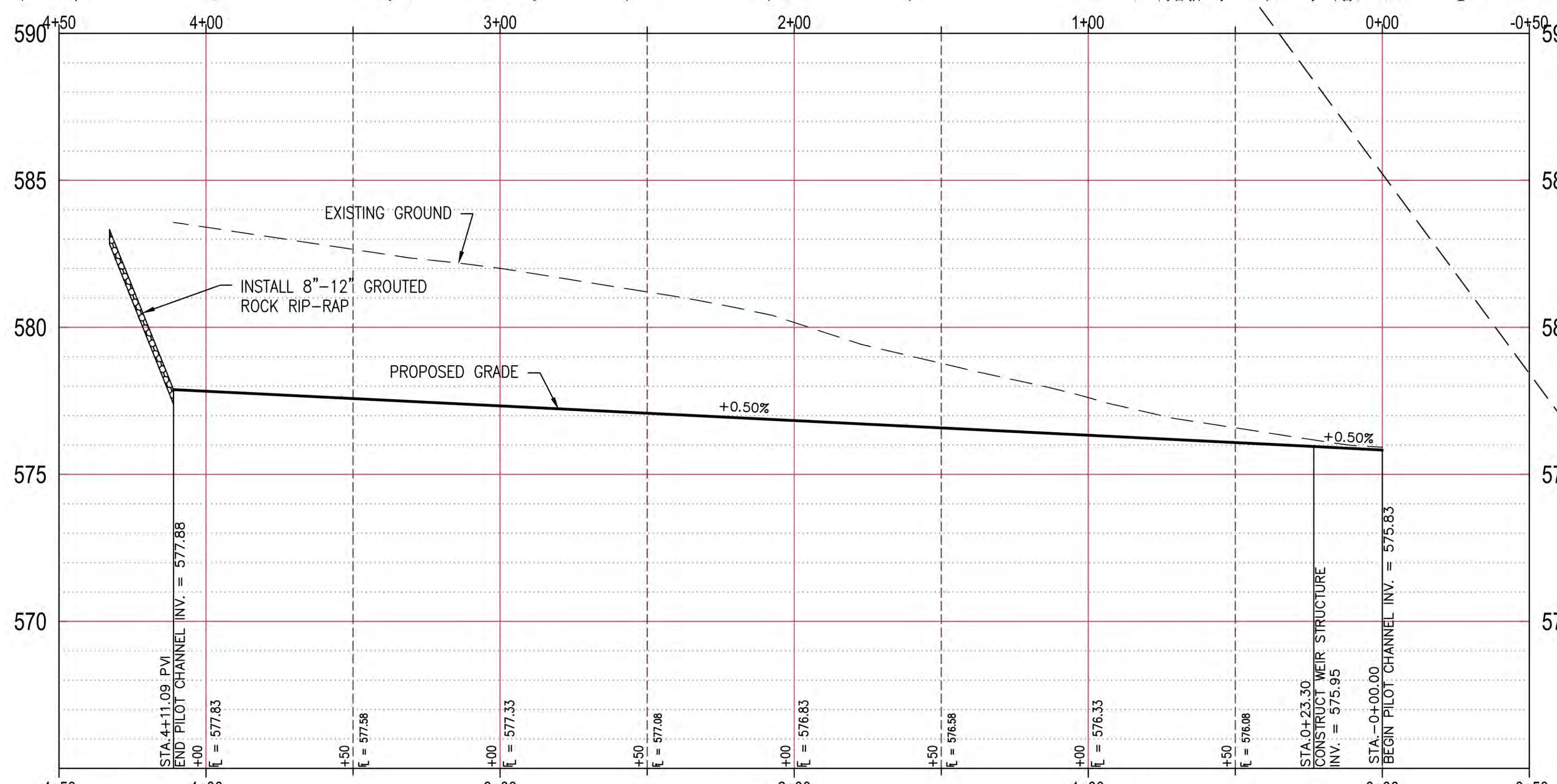
CITY OF LUCAS, COLLIN COUNTY, TEXAS



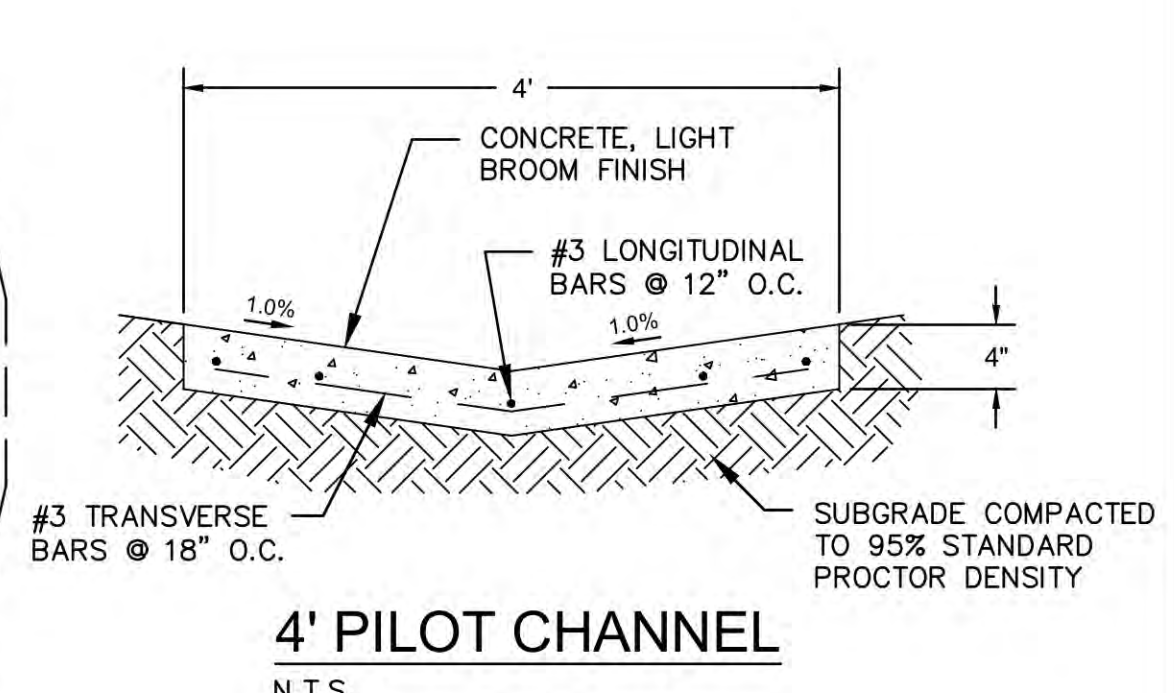
DETENTION POND OUTLET DETAIL
N.T.S.

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 Todd D. Winters
 TODD WINTERS, P.E. 3-15-16 DATE

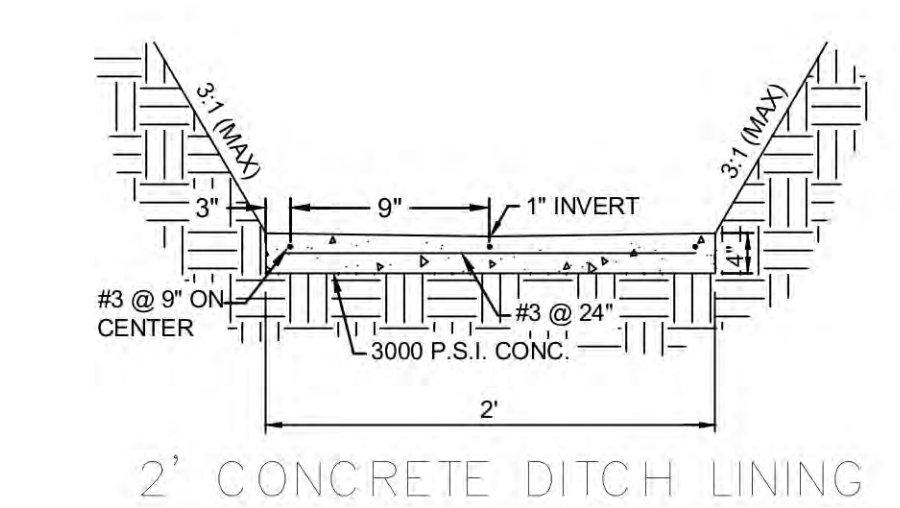
- LEGEND**
- EP EDGE OF PAVEMENT
 - PP POWER POLE
 - EM ELECTRIC METER
 - EL ELECTRIC DISCONNECT
 - LP LIGHT POLE
 - SSMH SAN. SEWER MANHOLE
 - WM WATER METER
 - FH FIRE HYDRANT
 - WV WATER VALVE
 - ROW RIGHT OF WAY
 - FENCE LINE
 - N.I.C. NOT IN CONTRACT



POND DETAIL
1"=10'



4' PILOT CHANNEL
N.T.S.



2' CONCRETE DITCH LINING
N.T.S.

BENCHMARK:
An "X" cut in south end of a concrete headwall on the east side of Stinson Road at Muddy Creek
Elevation 569.65'

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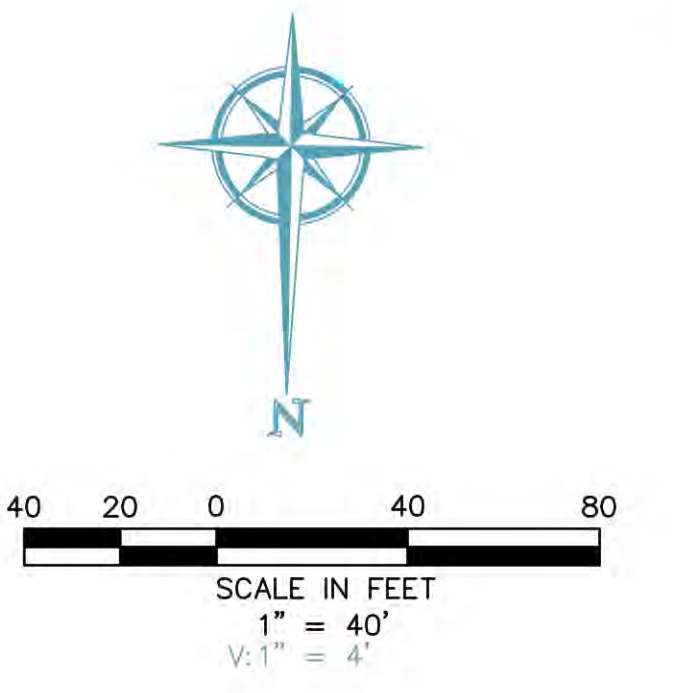
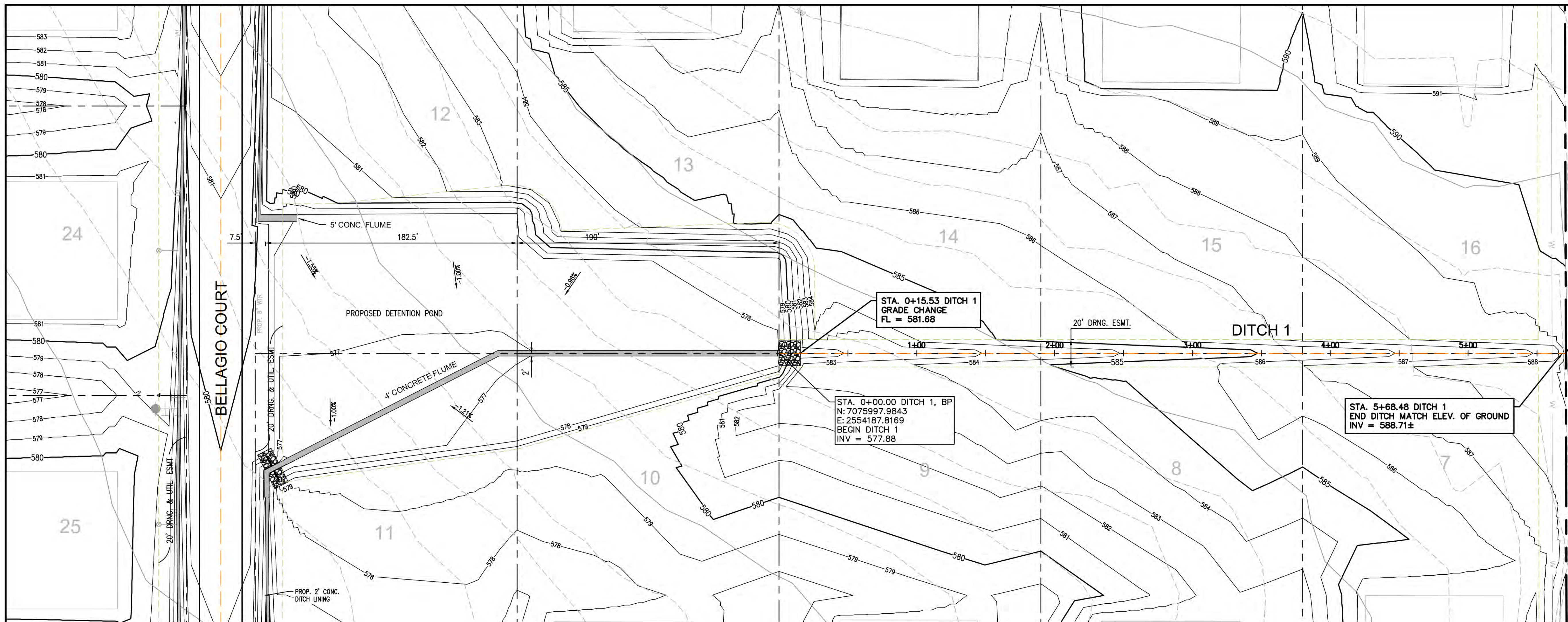
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CHECKED: TW	DATE: MARCH, 2016
PROJECT NO: 8314	
DWG FILE NAME:	

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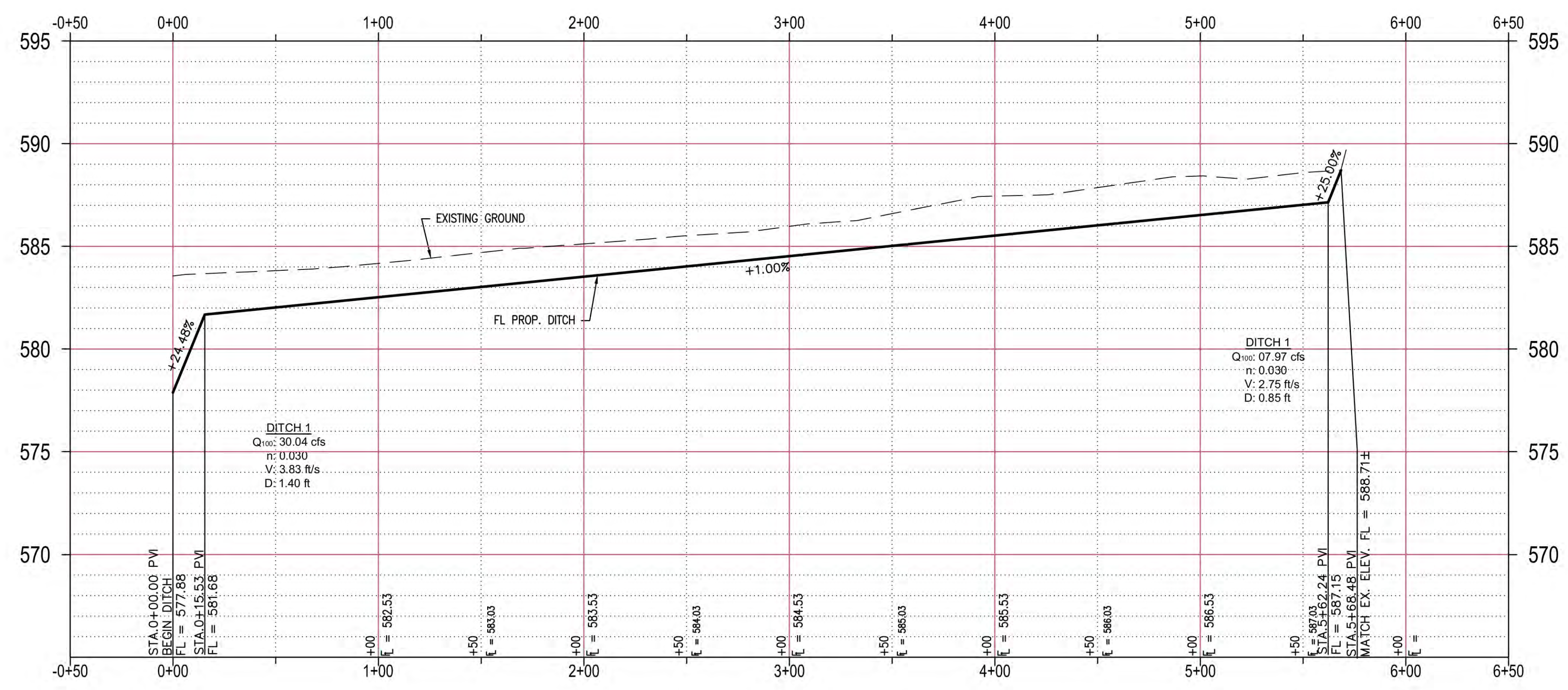
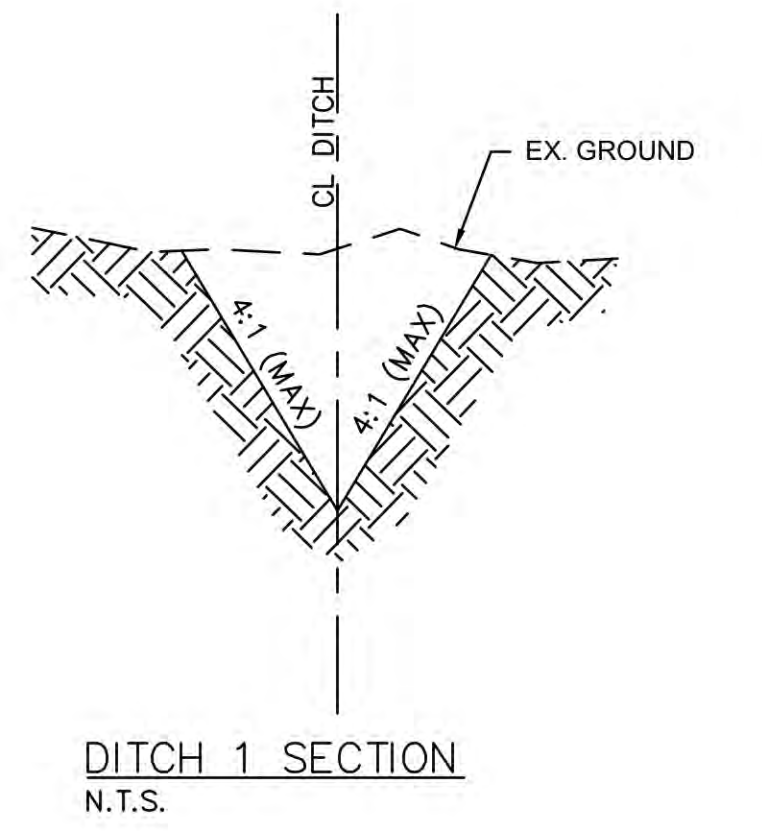


DETENTION POND & WEIR DETAILS
 BRISTOL PARK PHASE III
 CITY OF LUCAS, COLLIN COUNTY, TEXAS

SHEET
15
OF
24



- LEGEND**
- EP EDGE OF PAVEMENT
 - PP POWER POLE
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 - EL ELECTRIC DISCONNECT
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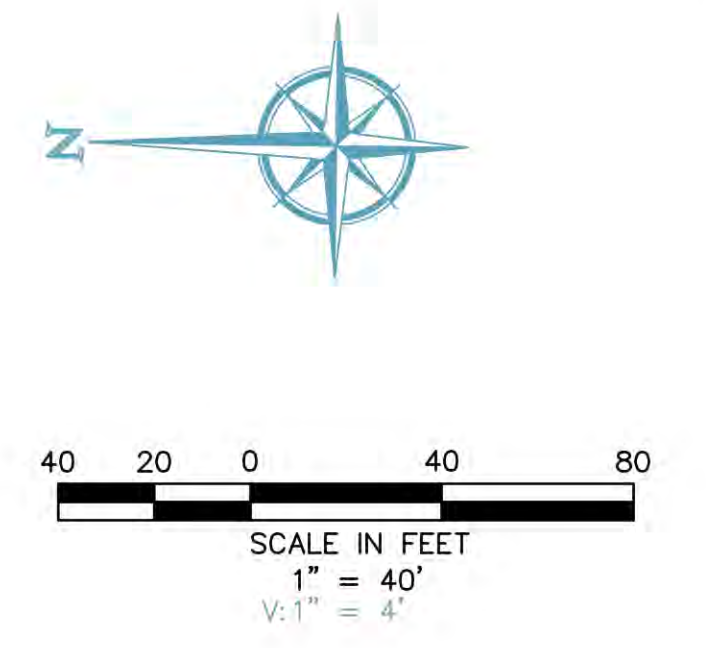
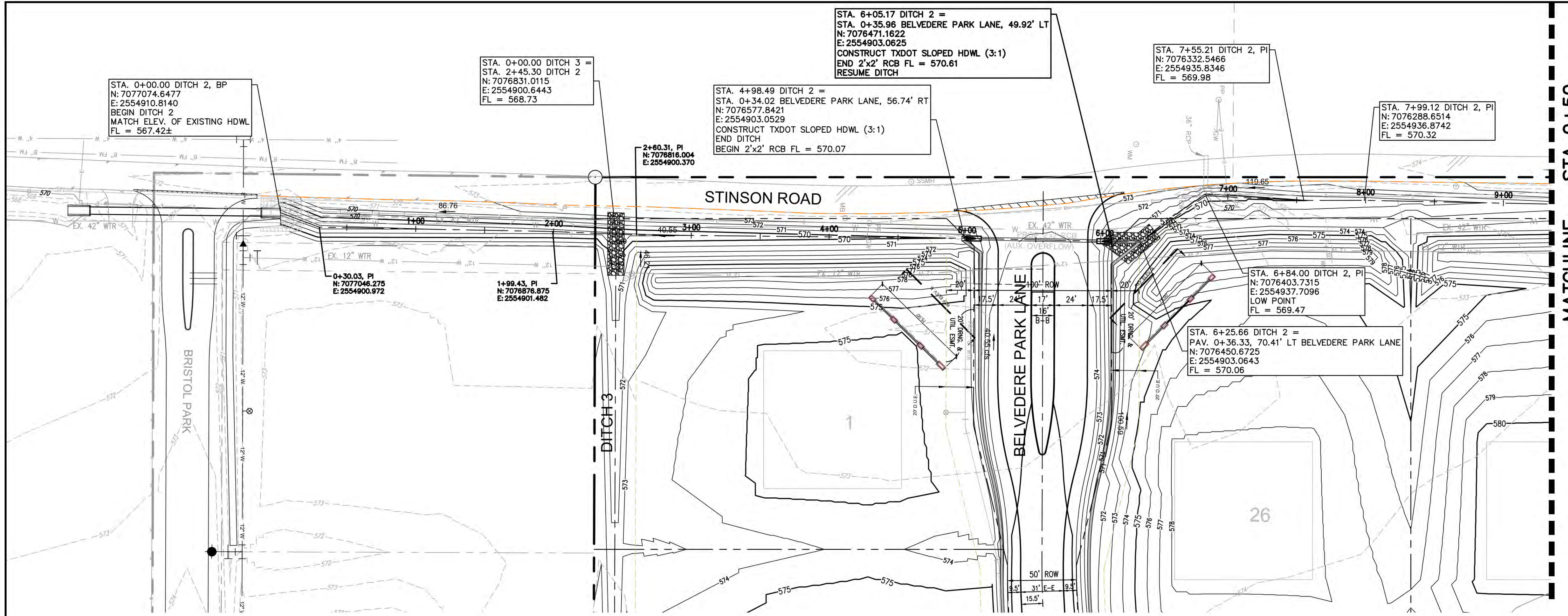
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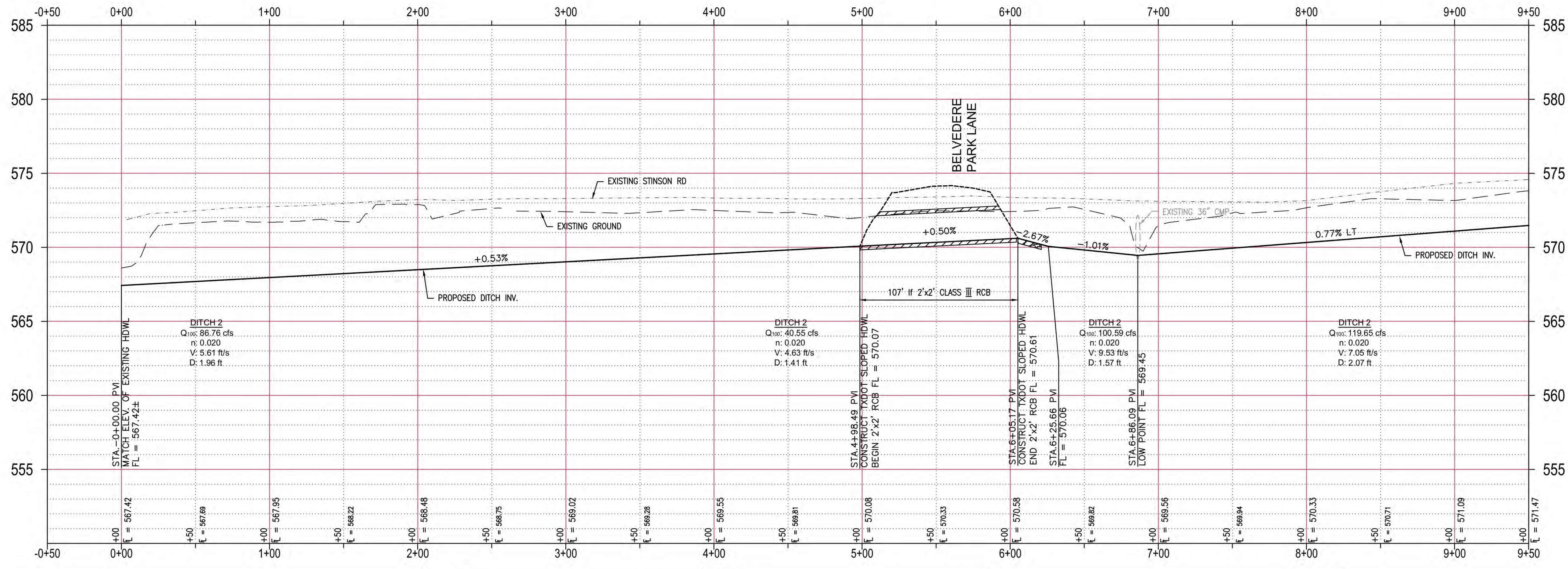
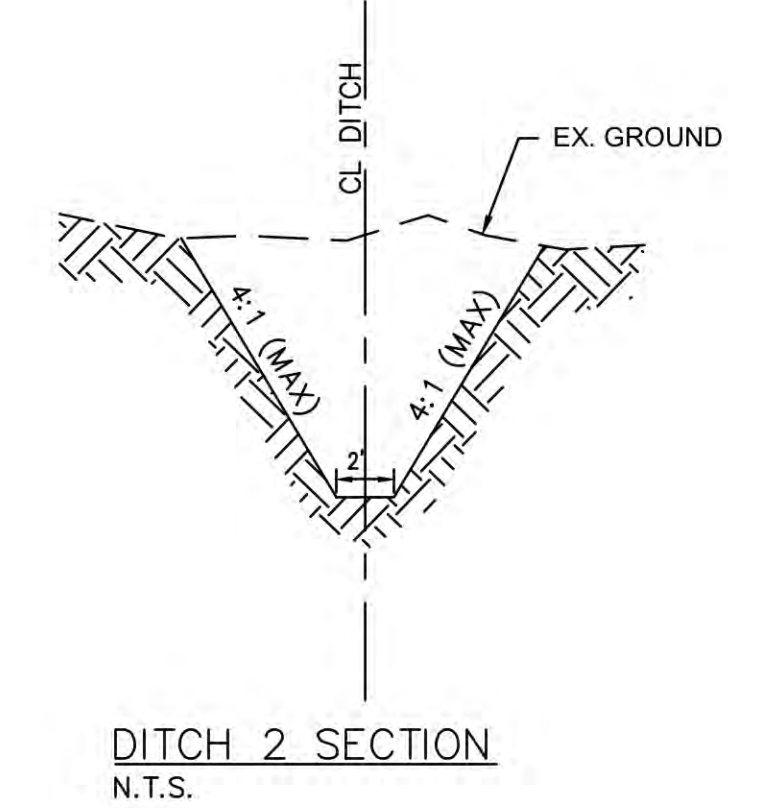


**PLAN & PROFILE
 DITCH 1**
 BRISTOL PARK PHASE III
 CITY OF LUCAS, COLLIN COUNTY, TEXAS

SHEET
16
 OF
24



- LEGEND**
- EP EDGE OF PAVEMENT
 - PP POWER POLE
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 - EL ELECTRIC DISCONNECT
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REVISIONS:

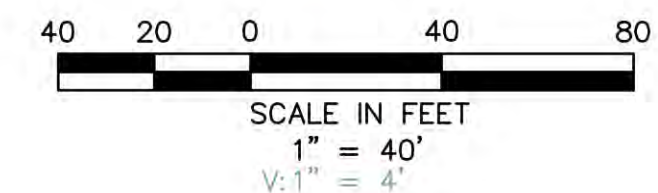
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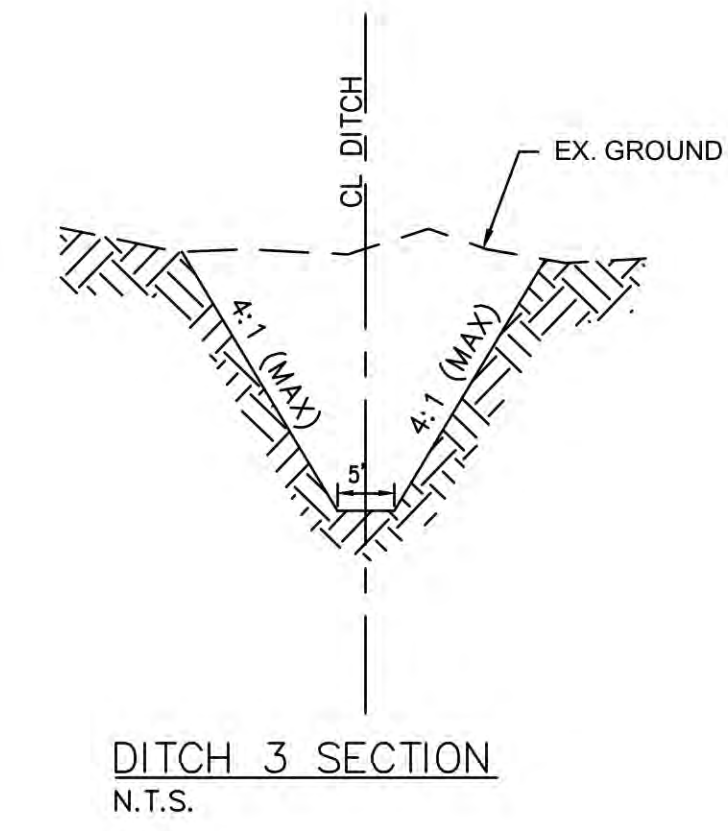
PLAN & PROFILE
DITCH 2
 BRISTOL PARK PHASE III
 CITY OF LUCAS, COLLIN COUNTY, TEXAS

SHEET
 17
 OF
 24



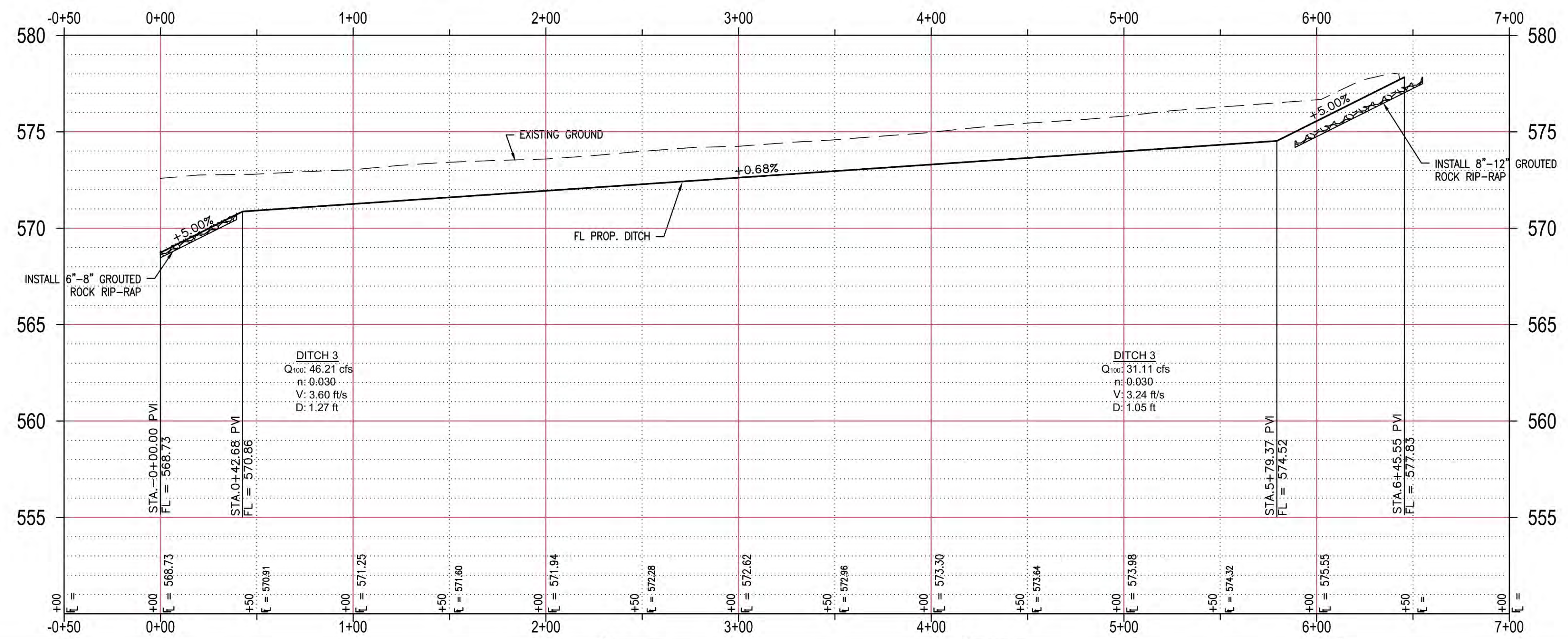
LEGEND

- EP EDGE OF PAVEMENT
- PP POWER POLE
- EM ELECTRIC METER
- EL ELECTRIC DISCONNECT
- LP LIGHT POLE
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- WM WATER METER
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- WV WATER VALVE
- ROW RIGHT OF WAY
- FENCE LINE
- N.I.C. NOT IN CONTRACT



STA. 0+00.00 DITCH 3
 STA. 2+45.30 DITCH 2
 N: 7076831.0115
 E: 2554900.6443
 INSTALL 60 yds 6"-8"
 GROUDED ROCK RIP-RAP
 BEGIN DITCH 3
 FL = 568.73

STA. 6+45.55 DITCH 3
 N: 7076819.3070
 E: 2554255.2043
 END DITCH 3
 INSTALL 88 yds 8"-12"
 GROUDED ROCK RIP-RAP
 MATCH EXISTING ELEVATION
 FL = 577.83±



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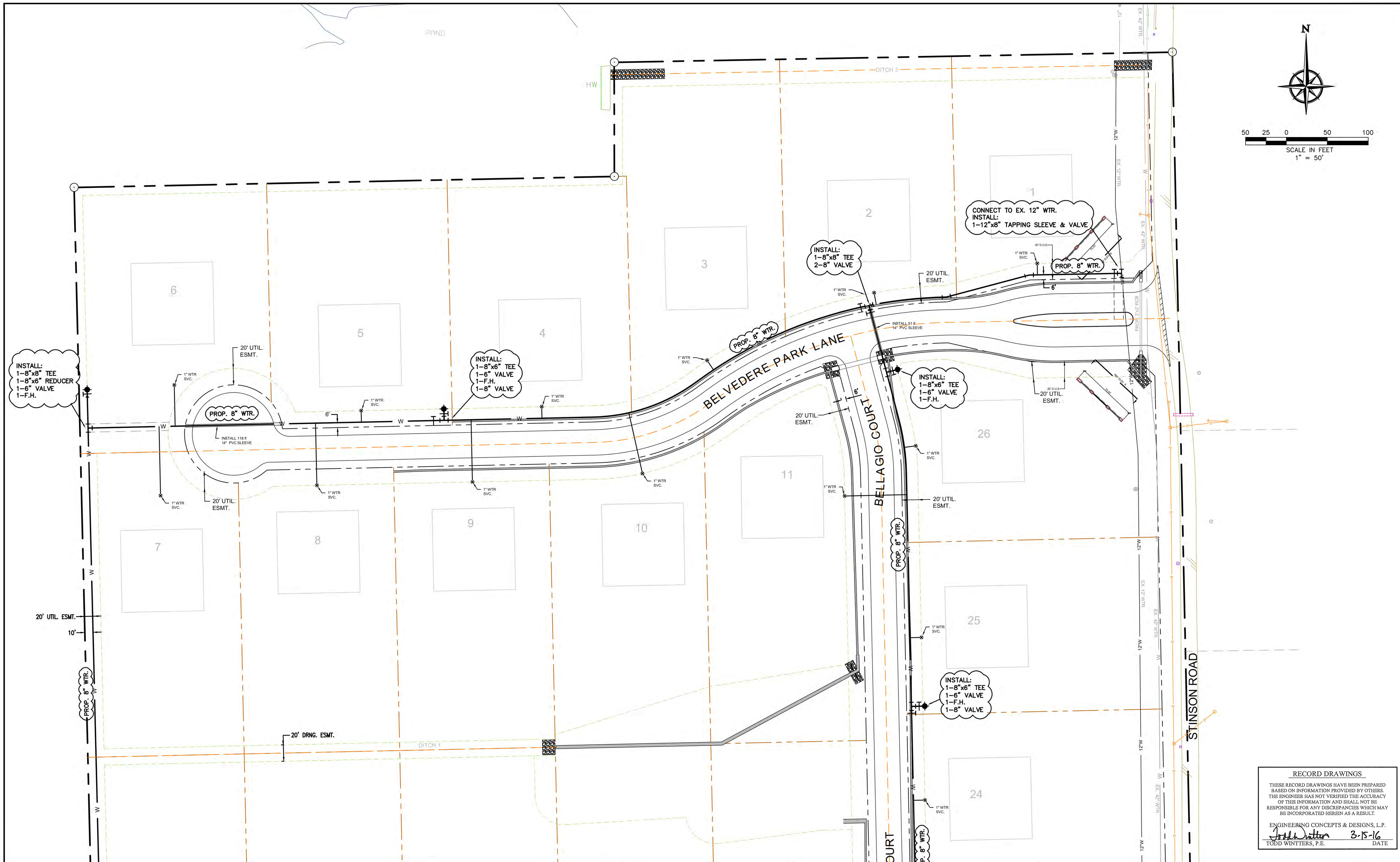
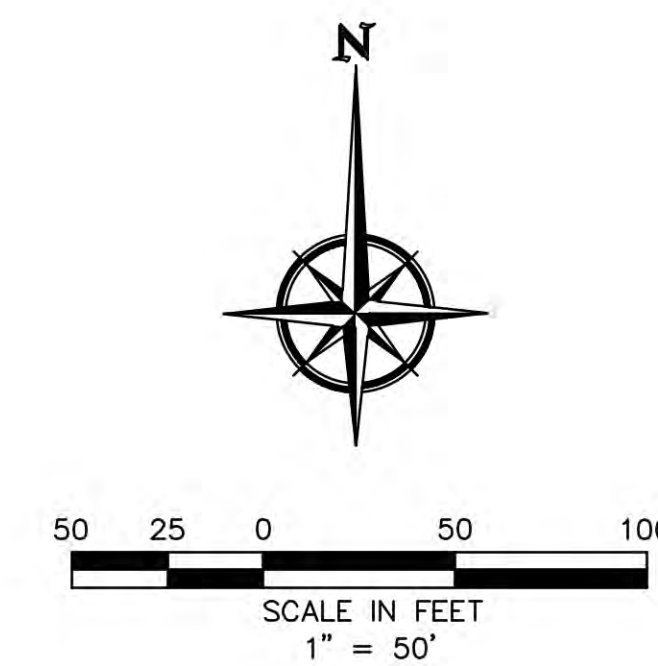
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**PLAN & PROFILE
 DITCH 3
 BRISTOL PARK PHASE III
 CITY OF LUCAS, COLLIN COUNTY, TEXAS**

SHEET
19
 OF
24



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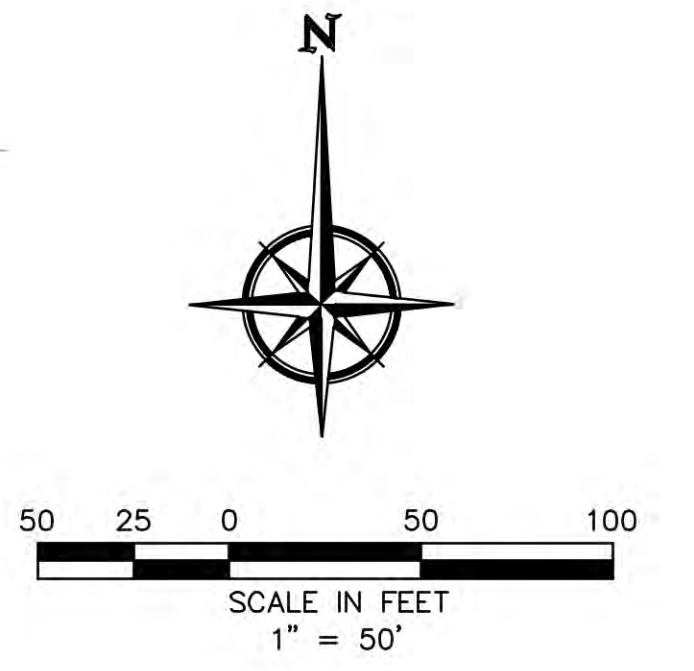
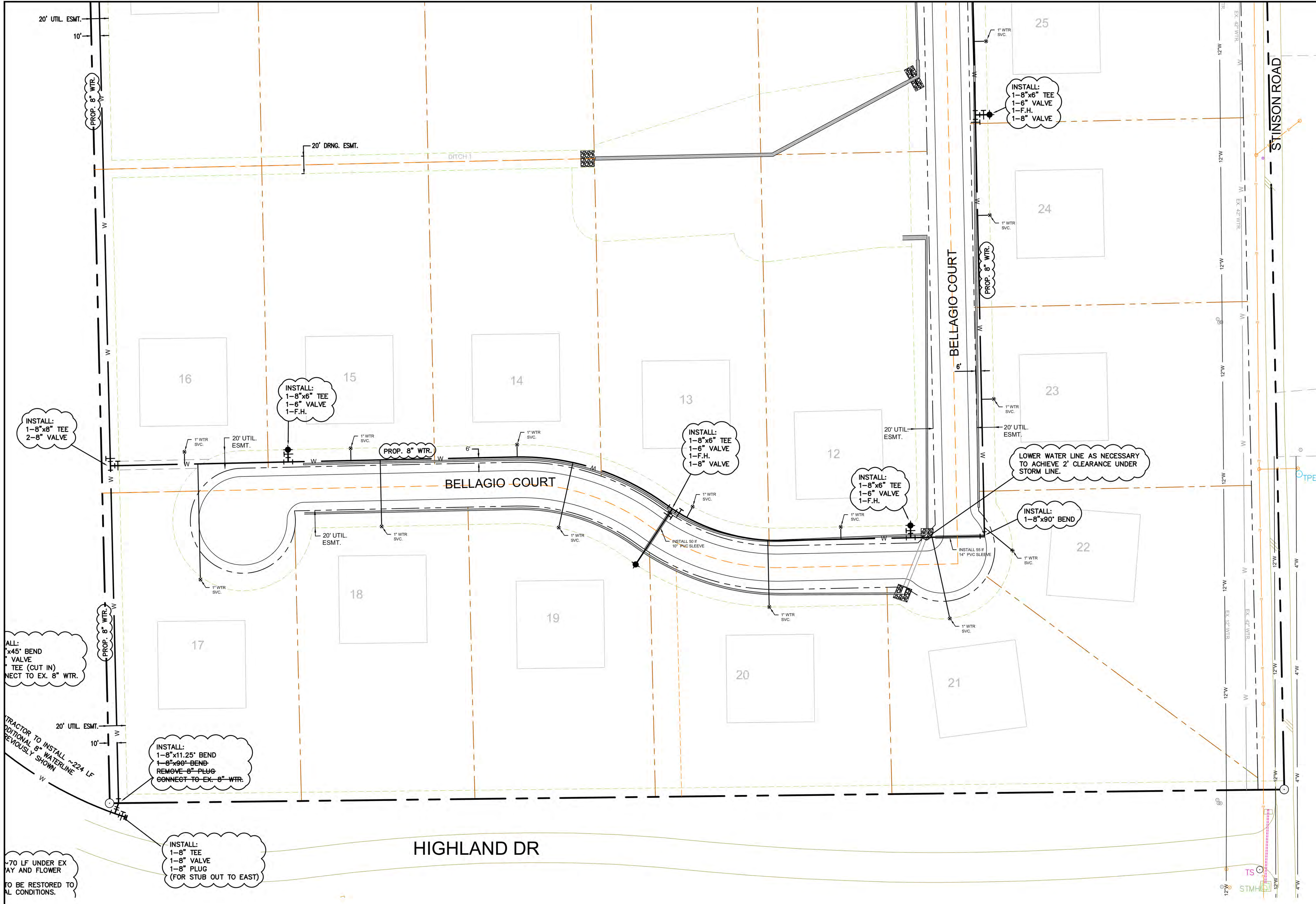
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UTILITY PLAN
BRISTOL PARK PHASE III
 CITY OF LUCAS, COLLIN COUNTY, TEXAS



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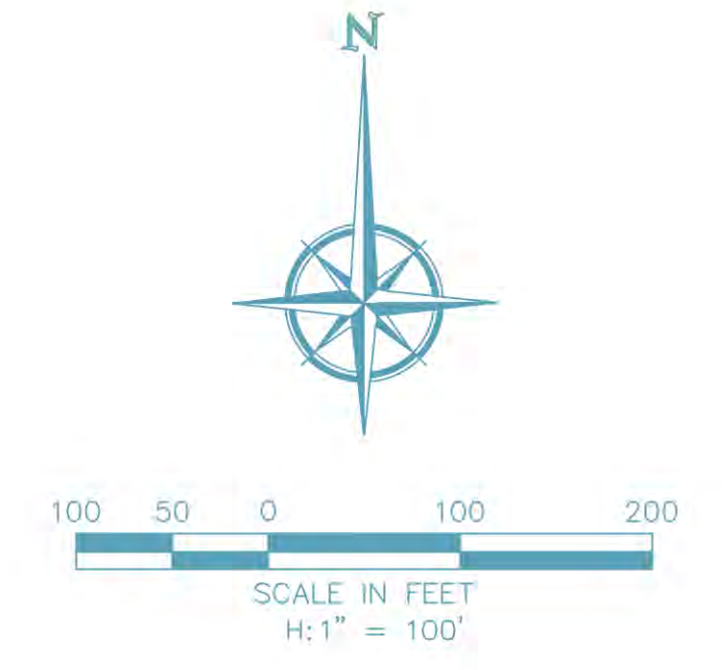
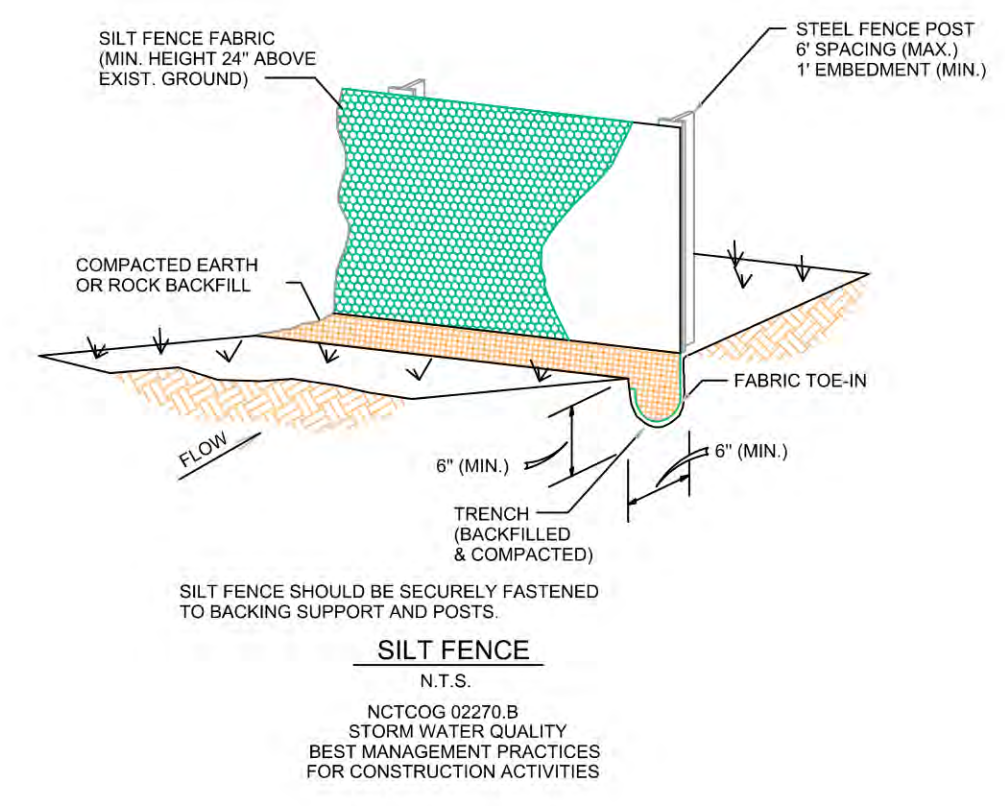
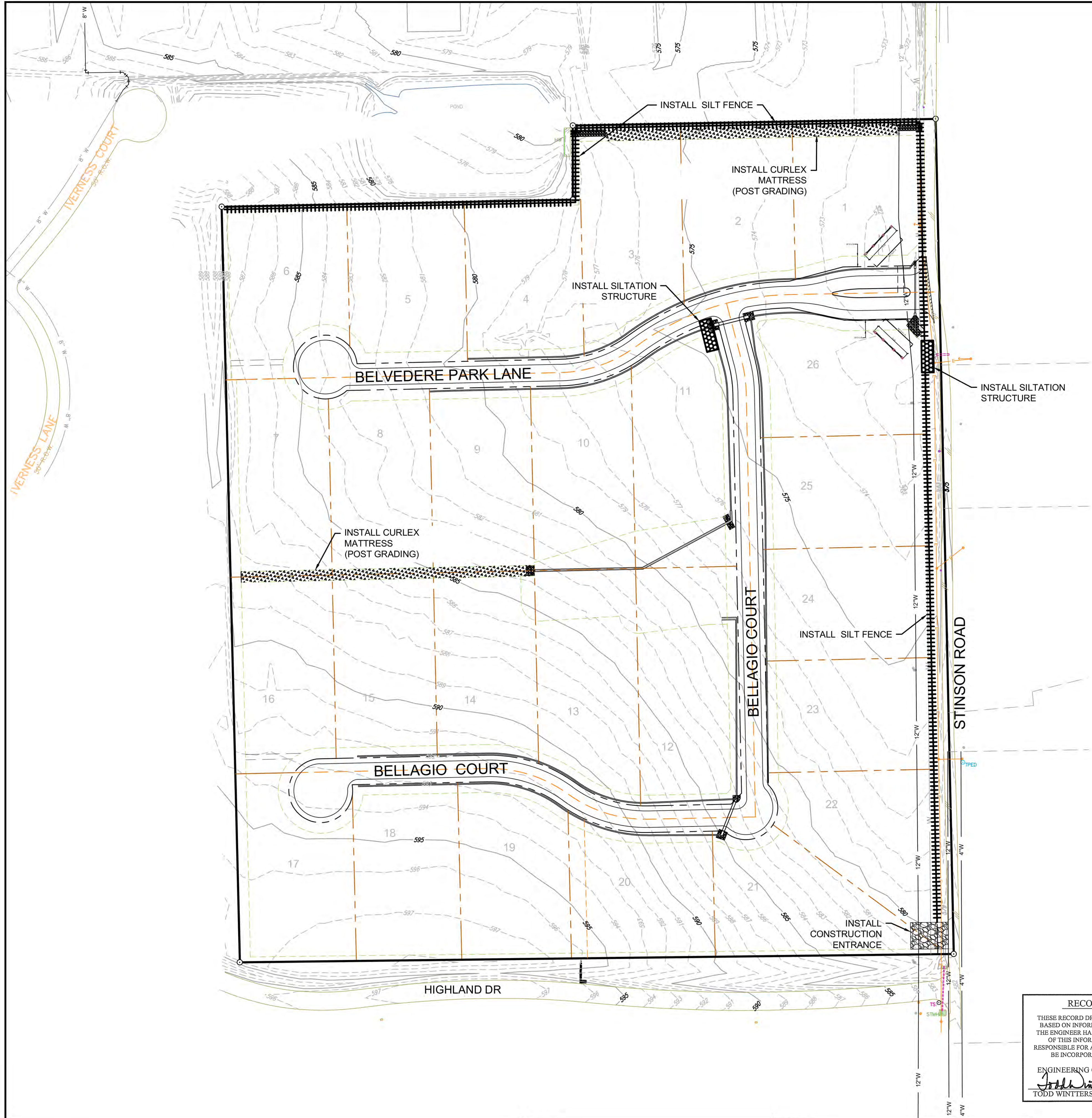
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UTILITY PLAN
BRISTOL PARK PHASE III
 CITY OF LUCAS, COLLIN COUNTY, TEXAS

SHEET
 21
 OF
 24

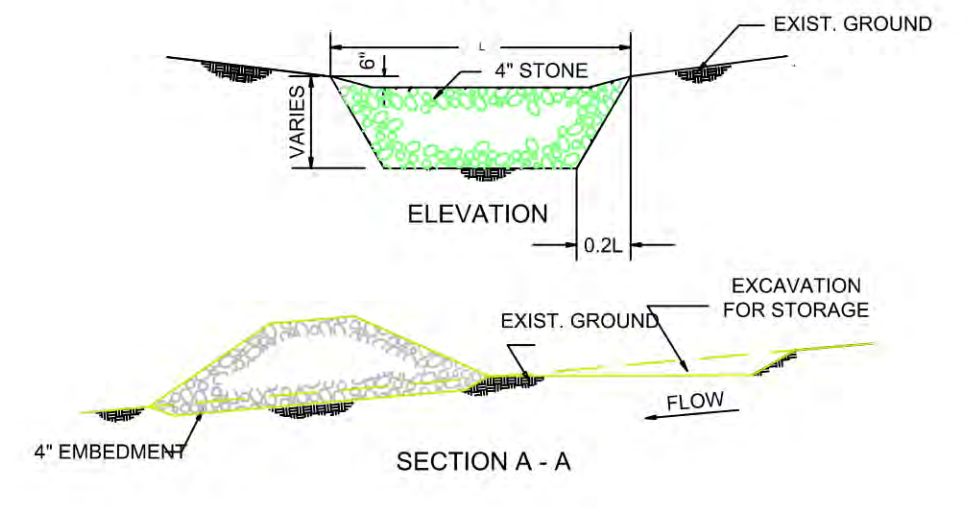
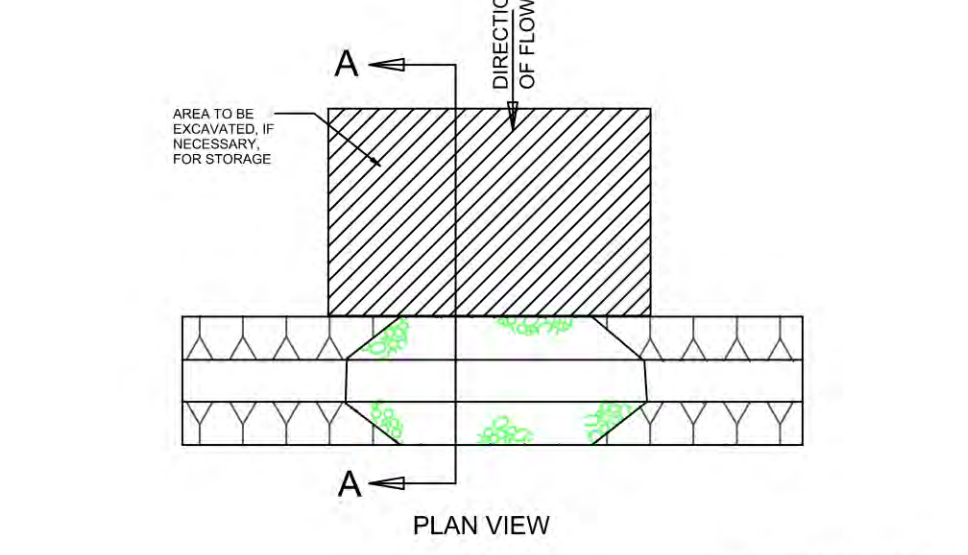


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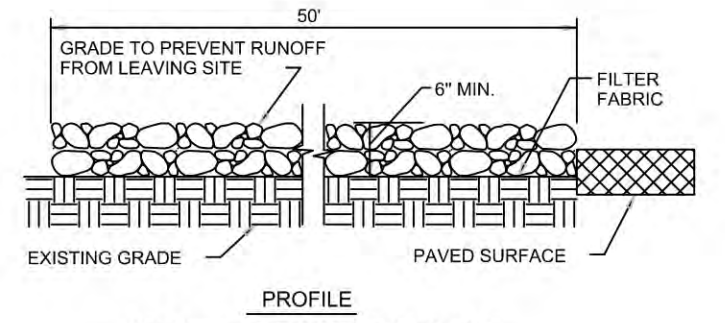
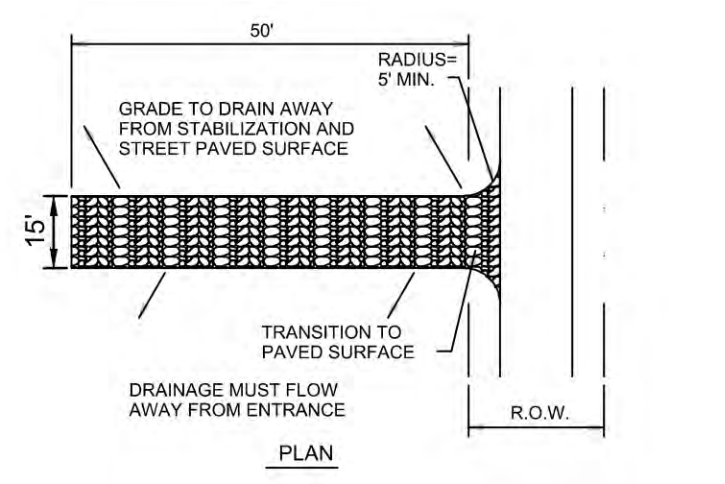
- CURLEX MATTRESS
- SILT FENCE
- STONE SILTATION STRUCTURE
- CONSTRUCTION ENTRANCE

NOTES:

1. A STORM WATER POLLUTION PREVENTION PLAN (S.W.P.P.P.) INCLUDING NOTICE OF INTENT (N.O.I.) WILL BE PREPARED BY THE GENERAL CONTRACTOR FOR THIS PROJECT IN ACCORDANCE WITH THE REQUIREMENTS OF THE N.P.D.E.S. GENERAL PERMIT FOR STORM WATER DISCHARGES ASSOCIATED WITH CONSTRUCTION.
2. ALL CONTRACTORS WILL COMPLY WITH THE REQUIREMENTS AND INTENT OF THE N.P.D.E.S. GENERAL PERMIT FOR STORM WATER DISCHARGES.
3. EACH CONTRACTOR SHALL SUBMIT A NOTICE OF INTENT (N.O.I.) FOR STORM WATER DISCHARGE PERMIT COVERAGE. THIS SUBMITTAL SHALL BE COORDINATED WITH THE OWNER AND SHALL OCCUR NO LESS THAN 48 HOURS PRIOR TO THE COMMENCEMENT OF ANY CONSTRUCTION ACTIVITY.
4. EACH CONTRACTOR SHALL OBTAIN AND SUBMIT TO THE OWNER A POLLUTION PREVENTION CERTIFICATION FROM EACH SUBCONTRACTOR WHOSE WORK IMPACTS THE STORM WATER POLLUTION PREVENTION PLAN (S.W.P.P.P.) PRIOR TO THE PERFORMANCE OF ANY WORK BY SAID SUBCONTRACTOR. THESE CERTIFICATIONS SHALL BECOME A PART OF THE STORM WATER POLLUTION PREVENTION PLAN.
5. CONTRACTOR SHALL INSTALL EROSION CONTROL MEASURES, AS INDICATED ON THE PLANS AND AS FIELD CONDITIONS WARRANT, PRIOR TO COMMENCING ANY CONSTRUCTION ACTIVITY. REPAIRS OR MODIFICATIONS TO THE MEASURES WILL BE MADE BY THE CONTRACTOR IF THE CONTROL MEASURES PROVE INEFFECTIVE OR IF ADDITIONAL CONTROL MEASURES ARE NECESSARY.
6. CONTRACTOR SHALL TAKE APPROPRIATE MEASURES TO PREVENT TRACKING OF MUD AND/OR SOILS ONTO EXISTING AND/OR NEW PAVEMENT. ANY TRACKING THAT OCCURS SHALL BE REMOVED IMMEDIATELY BY THE CONTRACTOR.
7. AT A MINIMUM, PERIMETER CONTROLS SUCH AS SILT FENCE OR STRAW BALES SHALL BE INSTALLED AT ALL DOWN SLOPE BOUNDARIES AND AS WARRANTED WHERE PAVEMENT REMOVAL, UTILITY CONSTRUCTION, GRADING, OR OTHER CONSTRUCTION ACTIVITIES ARE TO BE PERFORMED. THE CONTRACTOR SHALL AT ALL TIMES TAKE SUCH MEASURES AS NECESSARY TO MINIMIZE OFFSITE TRACKING OR TRANSPORT OF SEDIMENT AND DEBRIS.
8. DAMAGE TO ADJACENT PROPERTY AND/OR TO RECEIVING WATERS CAUSED BY IMPROPERLY INSTALLED OR POORLY MAINTAINED EROSION CONTROL MEASURES WILL BE THE RESPONSIBILITY OF THE CONTRACTOR.
9. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REMOVAL AND DISPOSAL OF ANY SILTATION CAUSED BY HIS OPERATIONS AND/OR FAILURE OF THE EROSION CONTROL MEASURES.
10. CONTRACTOR SHALL REMOVE AND PROPERLY DISPOSE OF ACCUMULATED SILT AND SEDIMENT FROM EROSION CONTROL MEASURES WHEN IT REACHES A DEPTH OF SIX (6) INCHES OR IMPAIRS THE EFFECTIVENESS OF THE MEASURES.
11. THE CONTRACTOR REPRESENTATIVE WILL INSPECT THE PROJECT EVERY SEVEN DAYS, AT A MINIMUM, AND AFTER EVERY RAINFALL OF ONE-HALF INCHES OR GREATER TO DETERMINE THE INTEGRITY AND EFFECTIVENESS OF THE EROSION CONTROL MEASURES. A WRITTEN INSPECTION REPORT WILL BE FILED WITH THE POLLUTION PREVENTION PLAN. THIS INSPECTION DOES NOT RELIEVE THE CONTRACTOR'S RESPONSIBILITY FOR INSPECTION AND MAINTENANCE OF THE EROSION CONTROL MEASURES OR HIS DUTY TO COMPLY WITH THE INTENT AND CONDITIONS OF THE N.P.D.E.S. GENERAL PERMIT.
12. ALL STOCKPILED SOILS WILL BE SURROUNDED BY A SILT FENCE, SEDIMENT CONTROL SWALE, OR EQUIVALENT MEASURE TO PROPERLY CONTROL SEDIMENT RUNOFF, AS APPROVED BY THE OWNER.
13. CONTRACTOR SHALL STABILIZE ANY AREA WHERE CONSTRUCTION ACTIVITY IS TO BE TEMPORARILY OR PERMANENTLY CEASED FOR MORE THAN 14 DAYS.
13. ALL DISTURBED AREAS TO BE SEEDED AND STABILIZED UNTIL GRASS IS ESTABLISHED.



STONE SILTATION STRUCTURE
N.T.S.
Stone Siltation Structure To be Installed Prior To Beginning Work On Site.



STABILIZED CONSTRUCTION ENTRANCE / EXIT
N.T.S.
NCTCOG 02270.G STORM WATER QUALITY BEST MANAGEMENT PRACTICES FOR CONSTRUCTION ACTIVITIES

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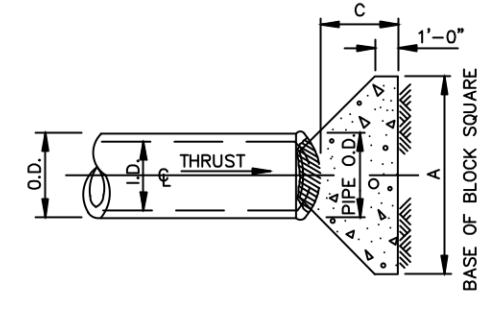
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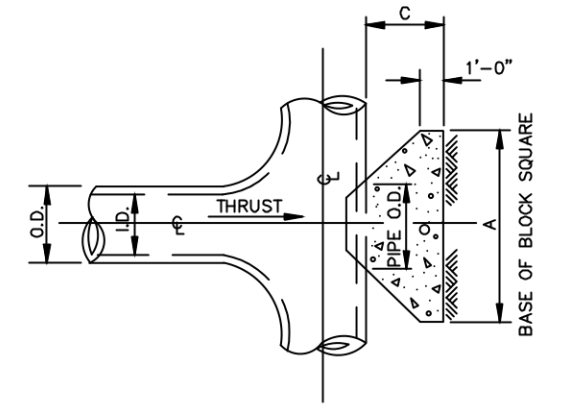
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EROSION CONTROL PLAN
BRISTOL PARK PHASE III
CITY OF LUCAS, COLLIN COUNTY, TEXAS



PLAN OF PLUG THRUST BLOCK



PLAN OF TEE THRUST BLOCK

REFER TO STD. DWG. No. 4040 FOR GENERAL NOTES.

I.D. (IN.)	T (IN.)	Δ = 11.25°		Δ = 22.50°		E (FT.)	
		A (FT.)	B (FT.)	A (FT.)	B (FT.)	A (FT.)	B (FT.)
4.6,8	0.4	1.0	1.5	1.5	0.9		
10.12	0.5	1.5	1.5	1.2			
16.18	0.6	1.5	1.5	1.6			
20	0.7	1.5	1.5	1.8			
24	0.9	1.5	1.5	2.1			
30	2.9	1.5	1.9	2.6			
36	4.5	1.5	2.3	3.3			
42	5.0	1.8	2.6	3.8			
48	5.5	2.0	3.0	4.3			
54	6.0	2.3	3.4	4.8			
60	6.5	2.5	3.8	5.3			
66	6.8	2.8	4.1	5.7			
72	7.5	3.0	4.5	6.3			
78	7.5	3.3	4.9	6.7			
84	8.0	3.5	5.3	7.2			
90	8.5	3.8	5.6	7.7			
96	9.0	4.0	6.0	8.2			

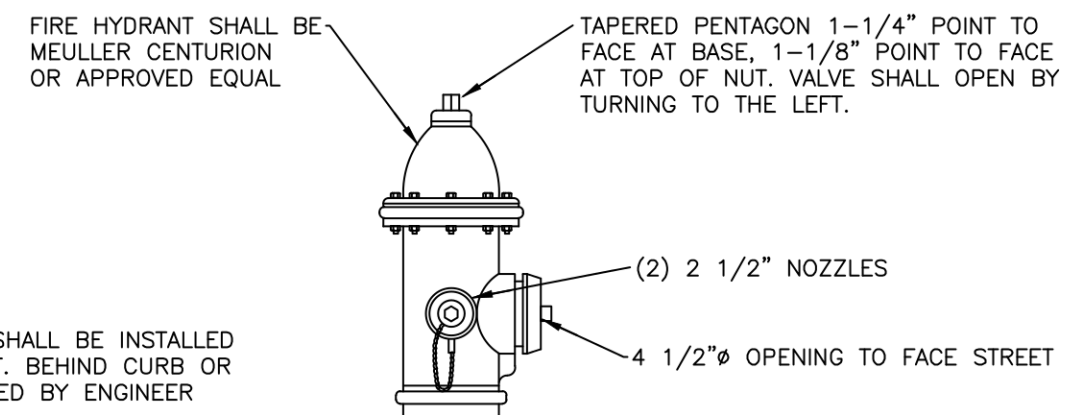
I.D. (IN.)	G (FT.)	THRUST (TONS)	EARTH		ROCK		I.D. (IN.)	G (FT.)	THRUST (TONS)	EARTH		ROCK	
			A (FT.)	B (FT.)	A (FT.)	B (FT.)				A (FT.)	B (FT.)	A (FT.)	B (FT.)
4.6,8	0.4	1.0	1.5	0.1	0.1	4.6,8	0.8	2.0	1.5	0.1	1.0	1.0	0.1
10.12	0.6	2.2	1.5	0.1	0.1	10.12	1.1	4.4	2.0	2.5	0.3	1.5	0.1
16.18	0.8	5.0	2.0	2.5	0.3	16.18	1.6	9.9	3.0	3.5	0.6	2.0	0.3
20	0.9	6.2	2.0	3.5	0.4	20	1.8	12.3	3.5	3.5	0.7	2.0	0.4
24	1.1	8.9	3.0	3.5	0.5	24	2.2	17.7	4.0	4.5	1.0	3.0	0.5
30	1.4	10.4	3.0	3.5	0.6	30	2.7	20.7	5.0	4.5	1.5	3.0	0.8
36	1.7	15.0	3.5	4.5	0.9	36	3.3	28.8	5.5	5.5	2.3	4.0	1.3
42	1.9	20.4	4.5	5.0	1.5	42	3.8	40.5	7.0	6.0	3.9	4.5	2.1
48	2.2	26.6	4.5	6.0	2.0	48	4.4	52.9	8.0	7.0	5.7	4.5	2.8
54	2.5	33.7	6.0	6.0	3.0	54	4.9	67.0	9.0	8.0	6.0	6.0	4.1
60	2.7	41.6	6.0	7.0	3.8	60	5.5	82.7	9.5	9.0	10.8	6.0	5.3
66	3.0	50.3	6.5	8.0	5.1	66	6.0	100.1	10.5	10.0	14.1	6.5	6.0
72	3.3	59.9	7.5	8.0	6.3	72	6.6	119.1	11.0	11.0	17.6	7.5	6.0
78	3.6	70.2	8.0	9.0	8.1	78	7.1	139.8	12.0	12.0	22.5	8.0	9.1
84	3.8	81.6	8.5	10.0	10.3	84	7.6	162.1	13.0	12.5	27.2	8.5	10.0
90	4.1	93.5	9.5	10.0	12.2	90	8.2	186.1	14.0	13.5	33.7	9.5	10.0
96	4.4	106.4	10.0	11.0	15.0	96	8.7	211.7	15.0	14.5	41.2	10.0	11.0

TABLES OF DIMENSIONS AND QUANTITIES

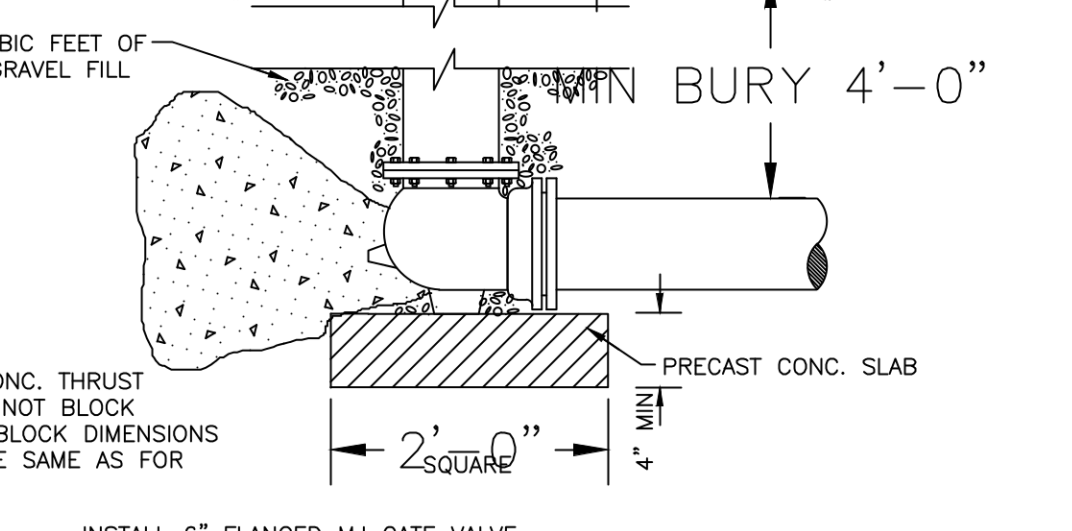
I.D. (IN.)	G (FT.)	THRUST (TONS)	EARTH		ROCK		I.D. (IN.)	G (FT.)	THRUST (TONS)	EARTH		ROCK	
			A (FT.)	B (FT.)	A (FT.)	B (FT.)				A (FT.)	B (FT.)	A (FT.)	B (FT.)
4.6,8	0.4	1.0	1.5	0.1	0.1	4.6,8	0.8	2.0	1.5	0.1	1.0	1.0	0.1
10.12	0.6	2.2	1.5	0.1	0.1	10.12	1.1	4.4	2.0	2.5	0.3	1.5	0.1
16.18	0.8	5.0	2.0	2.5	0.3	16.18	1.6	9.9	3.0	3.5	0.6	2.0	0.3
20	0.9	6.2	2.0	3.5	0.4	20	1.8	12.3	3.5	3.5	0.7	2.0	0.4
24	1.1	8.9	3.0	3.5	0.5	24	2.2	17.7	4.0	4.5	1.0	3.0	0.5
30	1.4	10.4	3.0	3.5	0.6	30	2.7	20.7	5.0	4.5	1.5	3.0	0.8
36	1.7	15.0	3.5	4.5	0.9	36	3.3	28.8	5.5	5.5	2.3	4.0	1.3
42	1.9	20.4	4.5	5.0	1.5	42	3.8	40.5	7.0	6.0	3.9	4.5	2.1
48	2.2	26.6	4.5	6.0	2.0	48	4.4	52.9	8.0	7.0	5.7	4.5	2.8
54	2.5	33.7	6.0	6.0	3.0	54	4.9	67.0	9.0	8.0	6.0	6.0	4.1
60	2.7	41.6	6.0	7.0	3.8	60	5.5	82.7	9.5	9.0	10.8	6.0	5.3
66	3.0	50.3	6.5	8.0	5.1	66	6.0	100.1	10.5	10.0	14.1	6.5	6.0
72	3.3	59.9	7.5	8.0	6.3	72	6.6	119.1	11.0	11.0	17.6	7.5	6.0
78	3.6	70.2	8.0	9.0	8.1	78	7.1	139.8	12.0	12.0	22.5	8.0	9.1
84	3.8	81.6	8.5	10.0	10.3	84	7.6	162.1	13.0	12.5	27.2	8.5	10.0
90	4.1	93.5	9.5	10.0	12.2	90	8.2	186.1	14.0	13.5	33.7	9.5	10.0
96	4.4	106.4	10.0	11.0	15.0	96	8.7	211.7	15.0	14.5	41.2	10.0	11.0

I.D. (IN.)	G (FT.)	THRUST (TONS)	EARTH		ROCK		I.D. (IN.)	G (FT.)	THRUST (TONS)	EARTH		ROCK	
			A (FT.)	B (FT.)	A (FT.)	B (FT.)				A (FT.)	B (FT.)	A (FT.)	B (FT.)
4.6,8	0.4	1.0	1.5	0.1	0.1	4.6,8	0.8	2.0	1.5	0.1	1.0	1.0	0.1
10.12	0.6	2.2	1.5	0.1	0.1	10.12	1.1	4.4	2.0	2.5	0.3	1.5	0.1
16.18	0.8	5.0	2.0	2.5	0.3	16.18	1.6	9.9	3.0	3.5	0.6	2.0	0.3
20	0.9	6.2	2.0	3.5	0.4	20	1.8	12.3	3.5	3.5	0.7	2.0	0.4
24	1.1	8.9	3.0	3.5	0.5	24	2.2	17.7	4.0	4.5	1.0	3.0	0.5
30	1.4	10.4	3.0	3.5	0.6	30	2.7	20.7	5.0	4.5	1.5	3.0	0.8
36	1.7	15.0	3.5	4.5	0.9	36	3.3	28.8	5.5	5.5	2.3	4.0	1.3
42	1.9	20.4	4.5	5.0	1.5	42	3.8	40.5	7.0	6.0	3.9	4.5	2.1
48	2.2	26.6	4.5	6.0	2.0	48	4.4	52.9	8.0	7.0	5.7	4.5	2.8
54	2.5	33.7	6.0	6.0	3.0	54	4.9	67.0	9.0	8.0	6.0	6.0	4.1
60	2.7	41.6	6.0	7.0	3.8	60	5.5	82.7	9.5	9.0	10.8	6.0	5.3
66	3.0	50.3	6.5	8.0	5.1	66	6.0	100.1	10.5	10.0	14.1	6.5	6.0
72	3.3	59.9	7.5	8.0	6.3	72	6.6	119.1	11.0	11.0	17.6	7.5	6.0
78	3.6	70.2	8.0	9.0	8.1	78	7.1	139.8	12.0	12.0	22.5	8.0	9.1
84	3.8	81.6	8.5	10.0	10.3	84	7.6	162.1	13.0	12.5	27.2	8.5	10.0
90	4.1	93.5	9.5	10.0	12.2	90	8.2	186.1	14.0	13.5	33.7	9.5	10.0
96	4.4	106.4	10.0	11.0	15.0	96	8.7	211.7	15.0	14.5	41.2	10.0	11.0

TABLES OF DIMENSIONS AND QUANTITIES

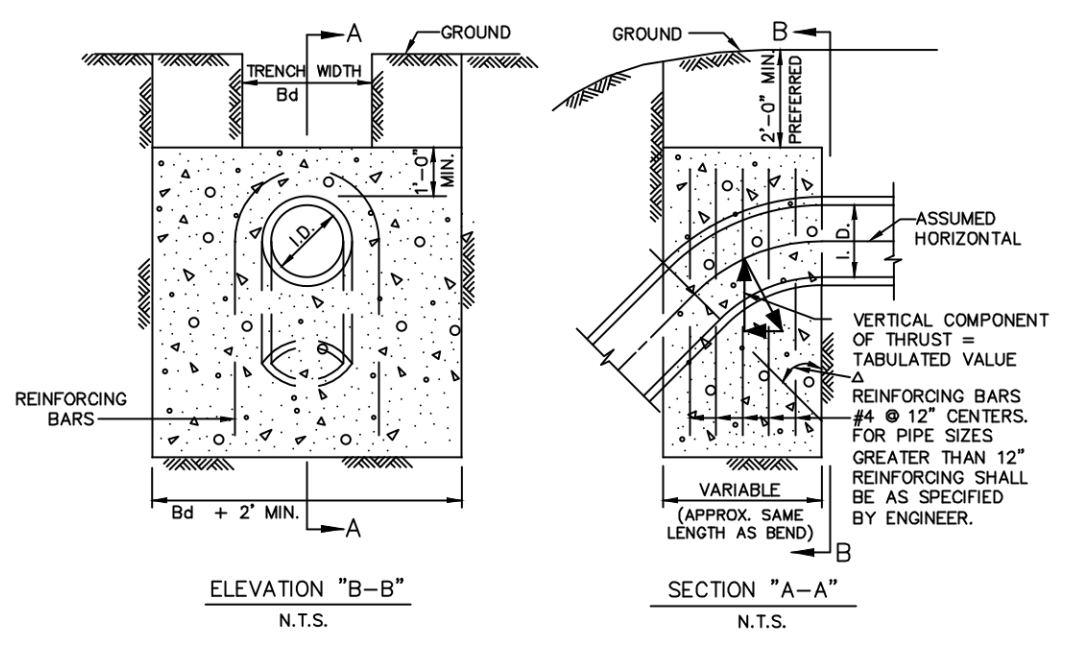


FIRE HYDRANT ASSEMBLY DETAIL



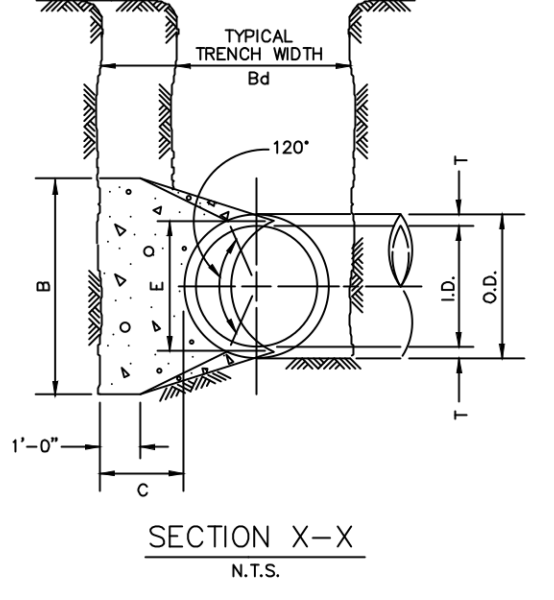
BLOCKED INSTALLATION

NOTE: ALL MATERIALS SHOWN ON THIS DETAIL SHALL BE INCLUDED IN THE UNIT PRICE FOR A FIRE HYDRANT ASSEMBLY. NO SEPARATE PAYMENT WILL BE MADE FOR VALVES, PIPE, FITTINGS ETC.

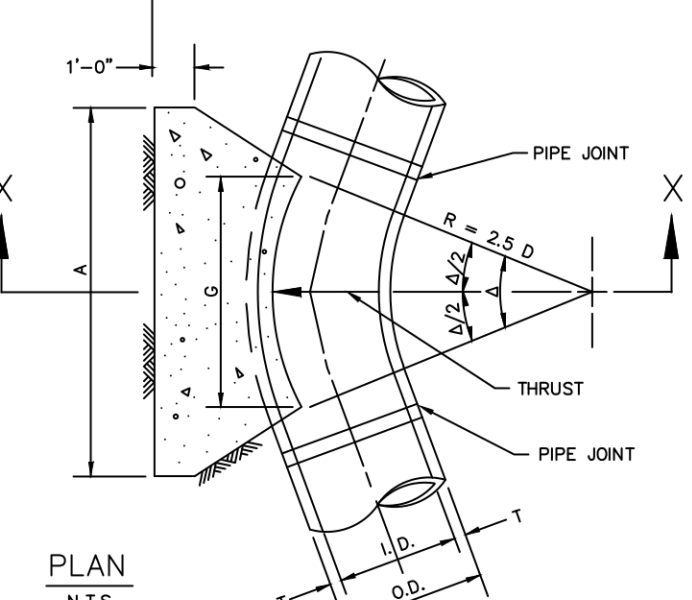


Δ	11.25°		22.50°		30°		45°		67.50°		90°	
	I.D. (IN.)	THRUST (TONS)	A (FT.)	B (FT.)	I.D. (IN.)	THRUST (TONS)	A (FT.)	B (FT.)	I.D. (IN.)	THRUST (TONS)	A (FT.)	B (FT.)
4.6,8	1.0	0.5	2.0	1.0	2.5	1.3	3.6	1.8	4.6	2.3	5.0	2.5
10.12	2.2	1.1	4.3	2.2	5.7	2.8	8.0	4.0	10.5	5.2	11.3	5.7
16.18	5.0	2.5	9.7	4.9	12.7	6.4	18.0	9.0	23.5	11.8	25.5	12.7
20	6.1	3.1	12.0	6.0	15.7	7.9	22.2	11.1	29.2	14.5	31.4	15.7
24	8.2	4.4	17.3	8.7	22.6	11.3	32.0	16.0	41.8	20.9	45.2	22.6
30	10.5	5.2	20.3	10.1	28.5	13.3	37.5	18.8	49.0	24.5	53.1	26.5
36	14.9	7.5	29.2	14.6	38.2	19.1	54.0	27.0	70.5	35.3	76.4	38.2
42	20.3	10.1	39.8	19.9	52.0	26.0	73.5	36.7	96.0	48.0	104.0	52.0
48	26.5	13.2	51.9	26.0	67.9	33.9	96.0	48.0	126.0	62.7	136.0	67.9
54	33.5	16.8	65.7	32.9	85.9	42.9	122.0	60.7	159.0	79.4	172.0	85.9
60	41.4	20.7	81.2	40.6	108.0	53.0	152.0	75.0	196.0	98.0	212.0	108.0
66	50.1	25.0	98.2	49.1	128.0	64.2	182.0	90.7	237.0	119.0	257.0	128.0
72	59.6	29.8	117.0	58.4	153.0	76.3	216.0	108.0	282.0	141.0	305.0	153.0
78	69.9	35.0	137.0	68.6	179.0	90.0	254.0	127.0	331.0	166.0	358.0	179.0
84	81.1	40.5	159.0	79.5	208.0	104.0	294.0	147.0	384.0	192.0	416.0	208.0
90	93.1	46.5	183.0	91.3	239.0	119.0	337.0	169.0	441.0	221.0	477.0	239.0
96	106.0	53.0	208.0	104.0	272.0	136.0	384.0	192.0	502.0	251.0	543.0	272.0

VERTICAL THRUST BLOCK AT PIPE BEND



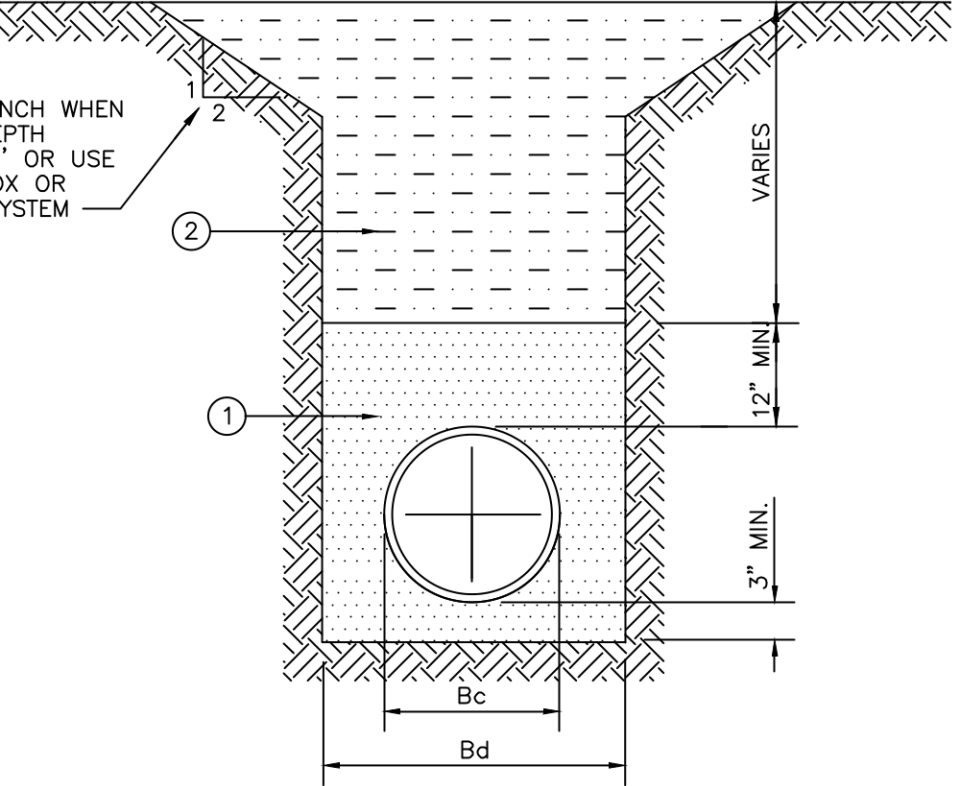
SECTION X-X



PLAN

GENERAL NOTES FOR ALL THRUST BLOCKS:

- CONCRETE FOR BLOCKING SHALL BE CLASS "B".
- ALL CALCULATIONS ARE BASED ON INTERNAL PRESSURE OF 200 PSI FOR DUCTILE IRON, P.V.C., AND 150 PSI FOR CONCRETE PIPE.
- VOLUMES OF THRUST BLOCKS ARE NET VOLUMES OF CONCRETE TO BE FURNISHED. THE CORRESPONDING WEIGHT OF THE CONCRETE (CLASS "B") IS EQUAL TO OR GREATER THAN THE VERTICAL COMPONENT OF THE THRUST ON THE VERTICAL BEND.
- WALL THICKNESS (T) ASSUMED HERE FOR ESTIMATING PURPOSES ONLY.
- POUR CONCRETE FOR BLOCK AGAINST UNDISTURBED EARTH.
- DIMENSIONS MAY BE VARIED AS REQUIRED BY FIELD CONDITIONS WHERE AND AS DIRECTED BY THE ENGINEER. THE VOLUME OF CONCRETE BLOCKING SHALL NOT BE LESS THAN SHOWN HERE.
- THE SOIL BEARING PRESSURES ARE BASED ON 1000 LBS./S.F. IN SOIL AND 2000 LBS./S.F. IN ROCK.
- USE POLYETHYLENE WRAP OR EQUAL BETWEEN CONCRETE AND BEND, TEE, OR PLUG TO PREVENT THE CONCRETE FROM STICKING TO IT.
- CONCRETE SHALL NOT EXTEND BEYOND JOINTS.

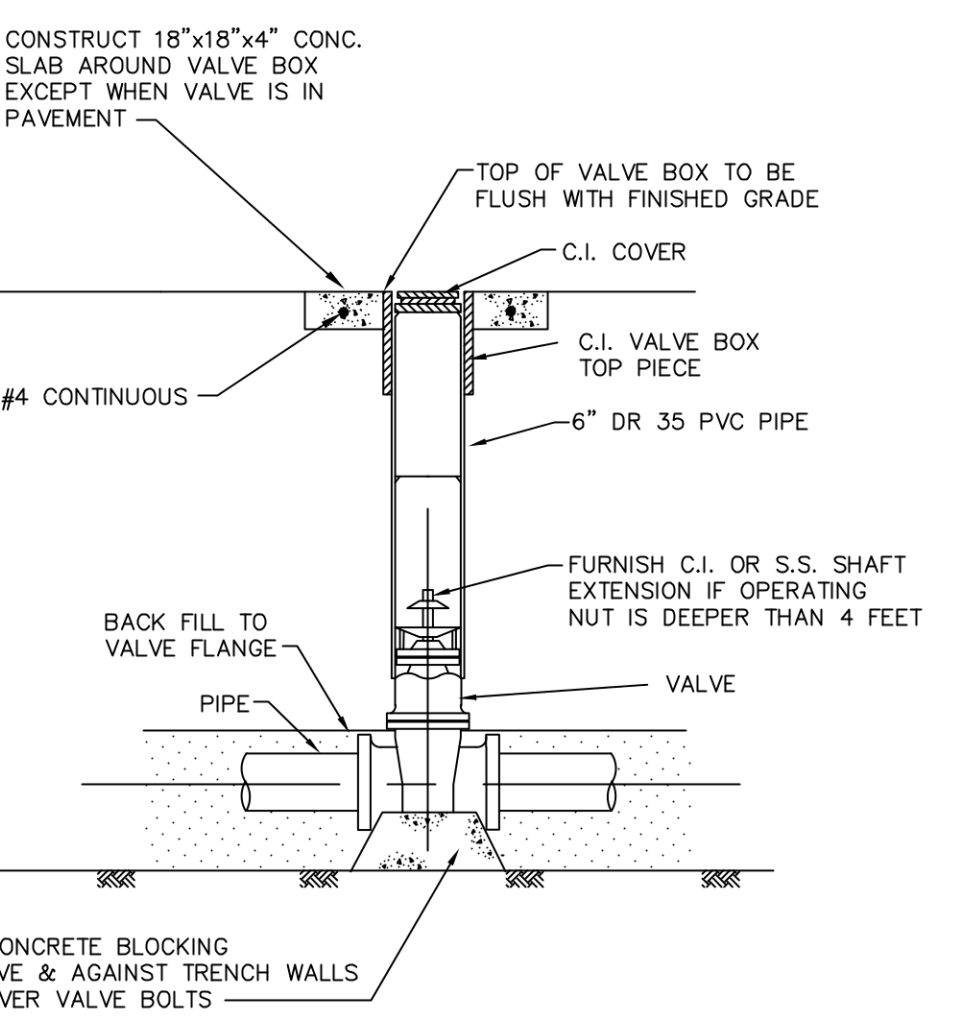


WATER EMBEDMENT

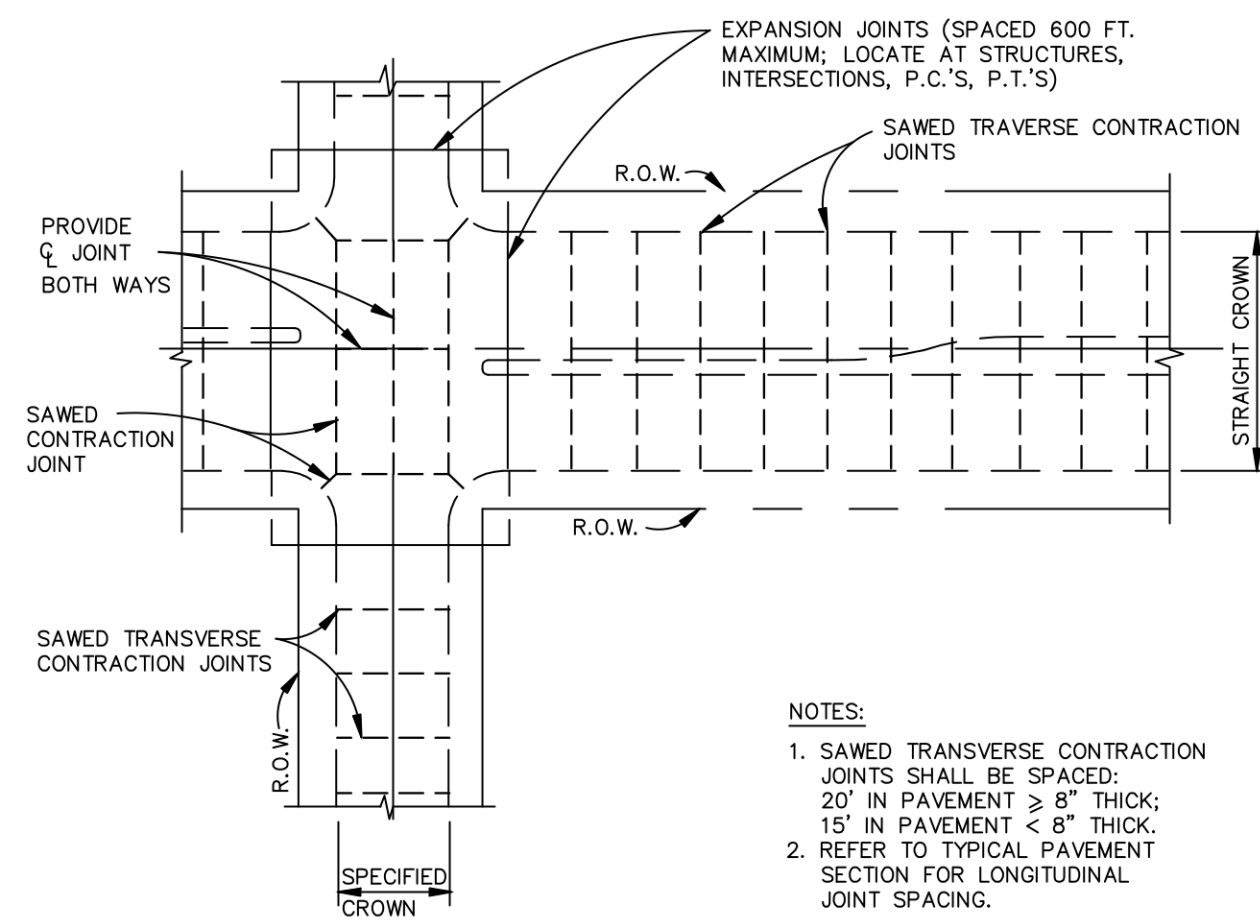
- GRANULAR MATERIAL (SAND) COMPACTED TO 95% STANDARD PROCTOR DENSITY.
- SELECT MATERIAL FREE OF ROCKS, CLUMPS OR DEBRIS LARGER THAN 6" IN GREATEST DIMENSION, COMPACT TO 90% STANDARD PROCTOR DENSITY. UNDER STRUCTURES, ROADWAYS AND PAVEMENT, EXCLUDE MATERIAL WITH LL >50 COMPACT TO 95% STANDARD PROCTOR DENSITY. GRANULAR MATERIAL MUST BE WELL GRADED.

SIZE OF PIPE IN INCHES DIA.	KIND OF PIPE	EXTERNAL DIA. (Bc) IN INCHES	TRENCH WIDTH (Bd) IN INCHES
6"	PVC PIPE	6.28	24
8"	PVC PIPE	8.16	24
10"	PVC PIPE	10.2	26

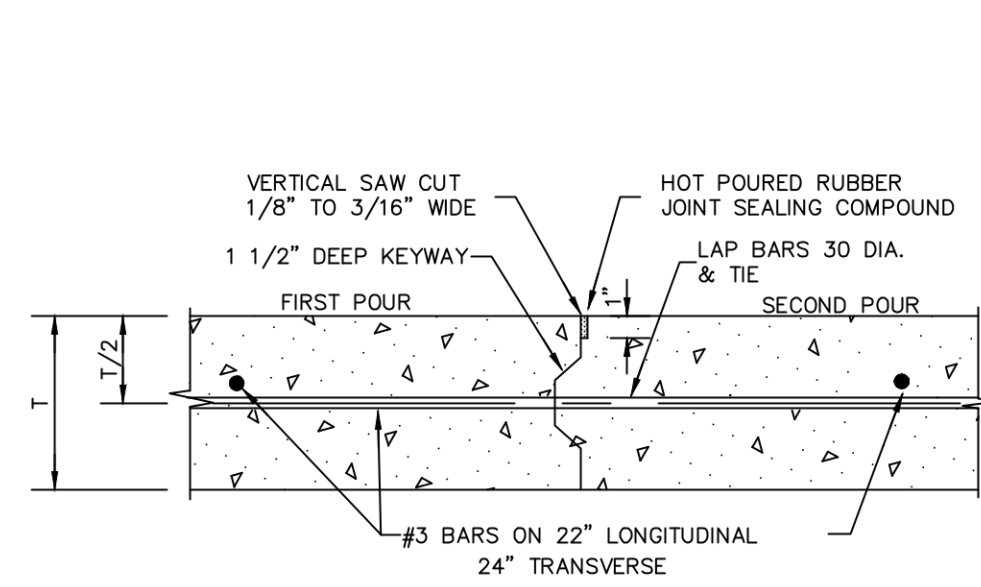
CLASS "B-3"



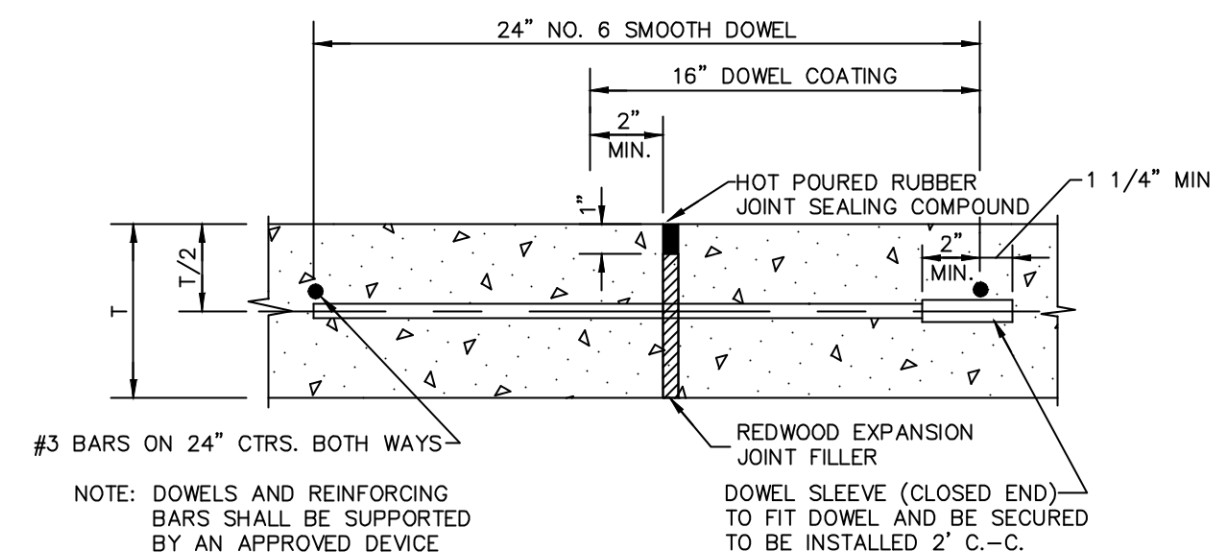
VALVE INSTALLATION DETAIL



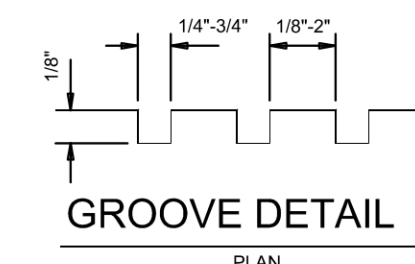
SPACING DIAGRAM FOR TRANSVERSE JOINTS
N.T.S.



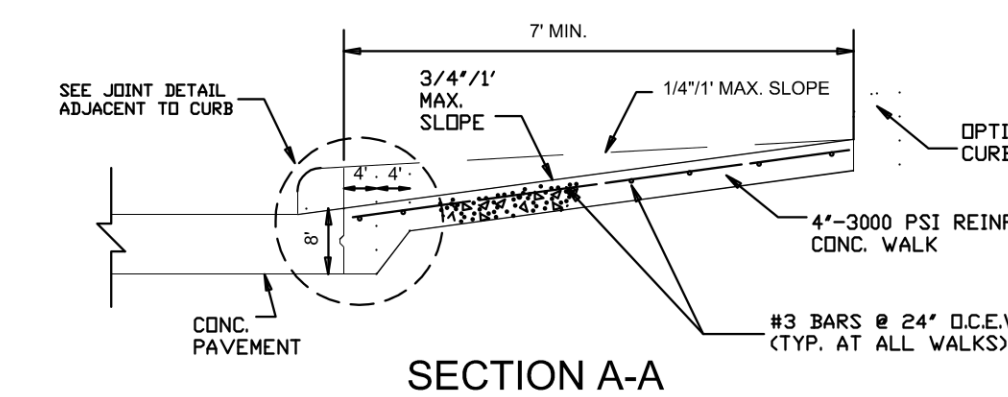
CONSTRUCTION JOINT DETAIL



TRANSVERSE EXPANSION JOINT DETAIL

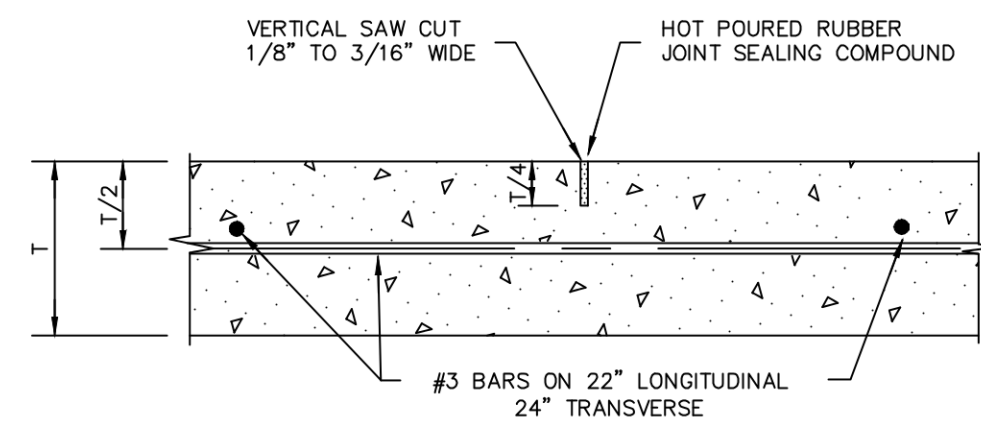


GROOVE DETAIL

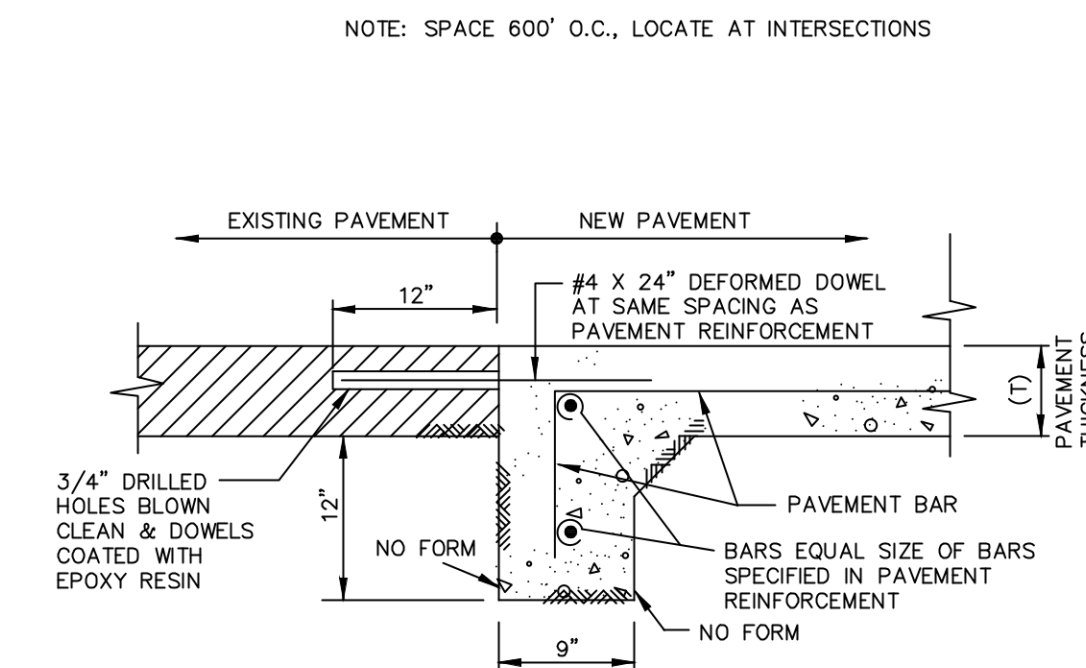


SECTION A-A

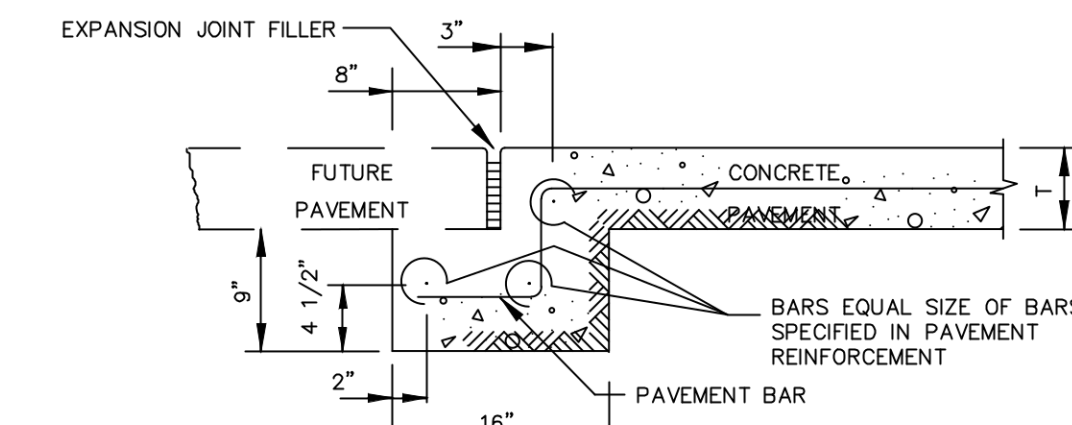
- NOTES:
1. ALL HONEYCOMB IN BACK OF CURB TO BE TRIGVEL-PLASTERED BEFORE POURING SIDEWALK.
 2. LUG MAY BE FORMED BY SHAPING SUBGRADE TO APPROXIMATE DIMENSIONS SHOWN.



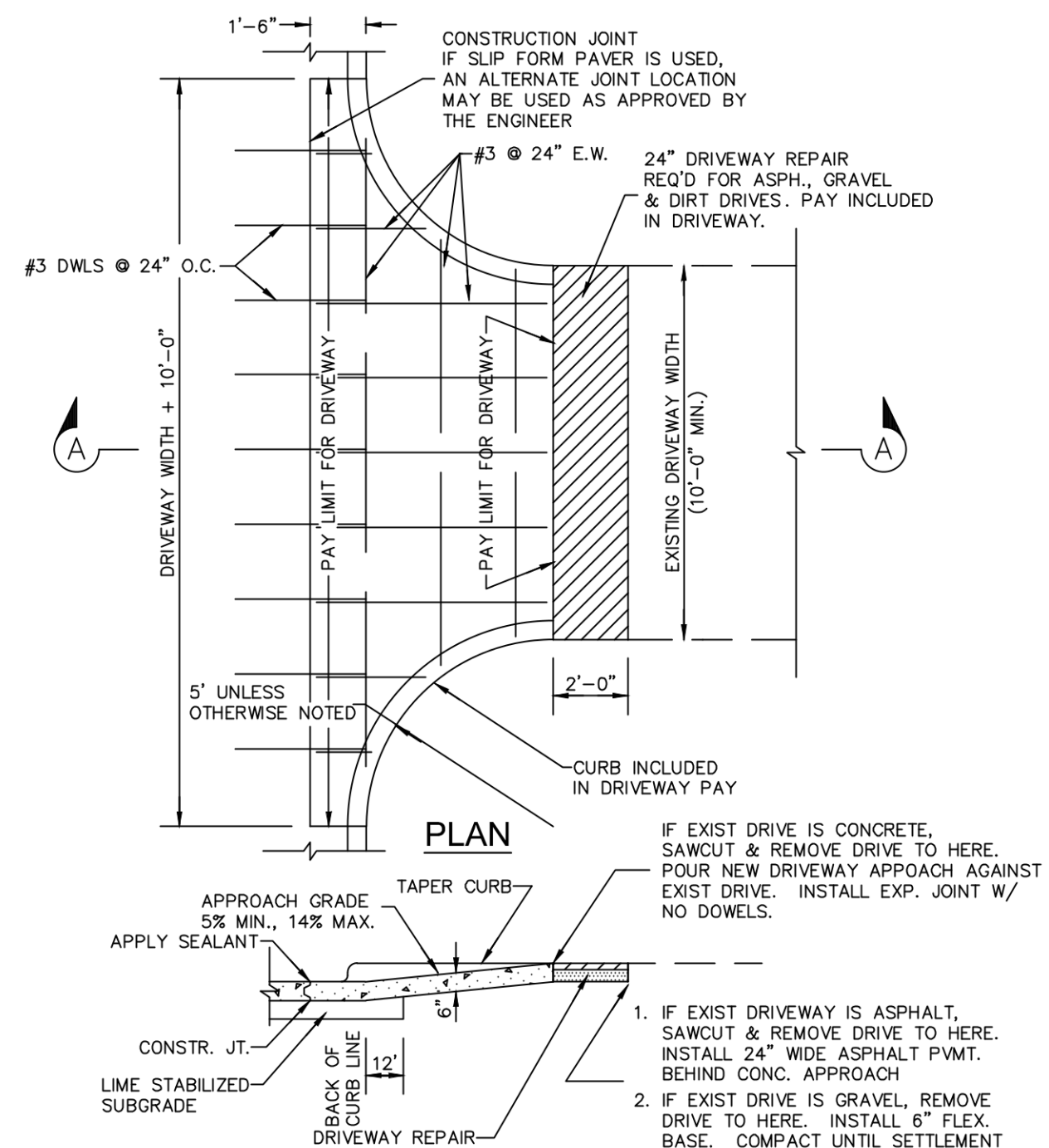
SAWED DUMMY JOINT DETAIL



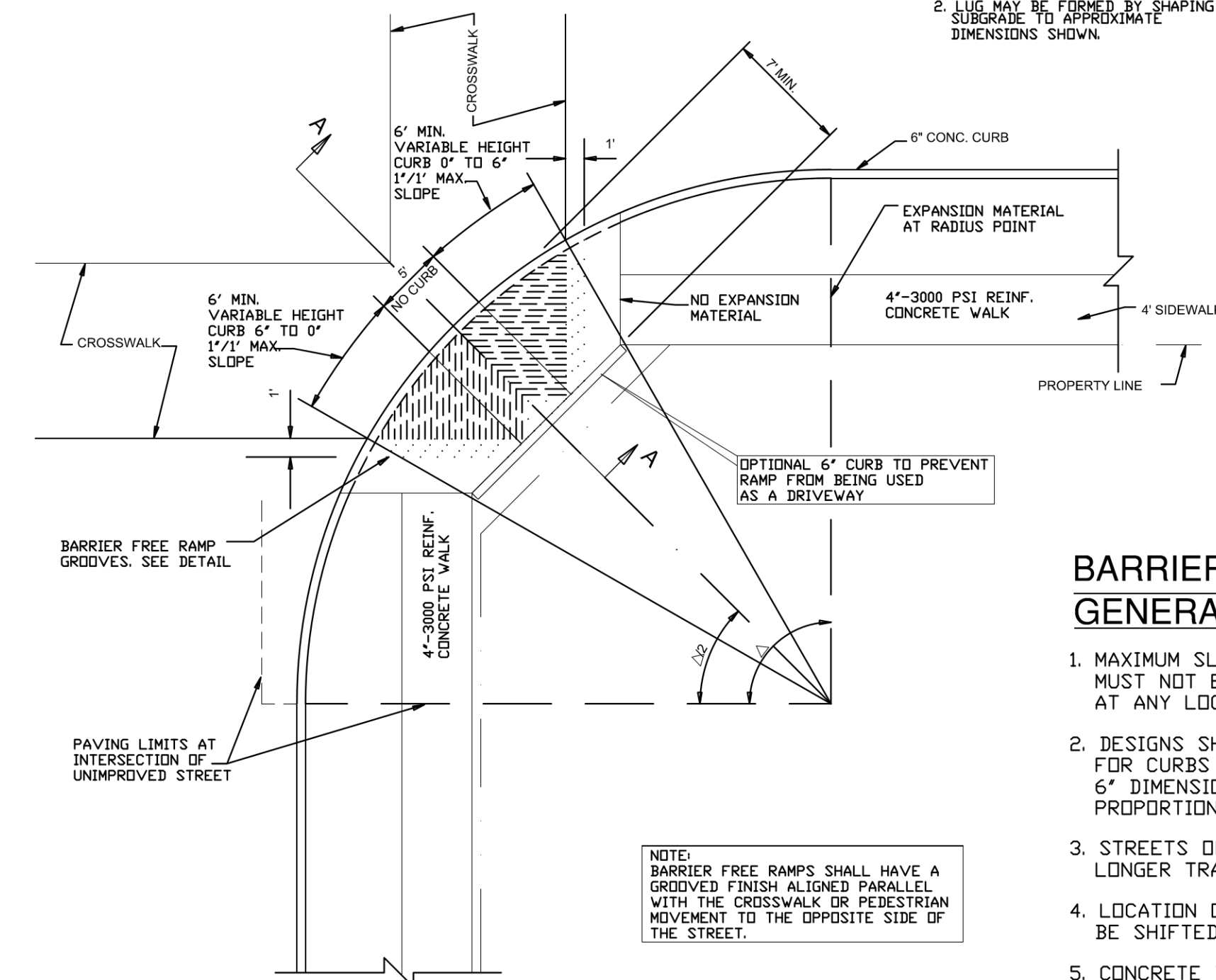
STREET HEADER AT EXISTING PAVEMENT



STREET HEADER FOR FUTURE PAVEMENT



DRIVEWAY APPROACH DETAIL



BARRIER FREE RAMP DETAIL AT INTERSECTING STREET

BARRIER FREE RAMP GENERAL NOTES

1. MAXIMUM SLOPE ON BARRIER FREE RAMPS MUST NOT EXCEED ONE INCH PER FOOT AT ANY LOCATION.
2. DESIGNS SHOWN ARE FOR 6\"/>

CAUTION! EXISTING UTILITIES
CONTRACTOR SHOULD CALL 1-800-DIG-TESS PRIOR TO BEGINNING ANY CONSTRUCTION ACTIVITIES FOR EXISTING UTILITY LOCATIONS. EXISTING UTILITIES AND UNDERGROUND FACILITIES INDICATED ON THESE PLANS HAVE BEEN LOCATED FROM REFERENCE INFORMATION. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY BOTH HORIZONTALLY AND VERTICALLY THE LOCATION OF ALL EXISTING UTILITIES AND UNDERGROUND FACILITIES PRIOR TO CONSTRUCTION AND TO TAKE NECESSARY PRECAUTIONS IN ORDER TO PROTECT ALL FACILITIES ENCOUNTERED. THE CONTRACTOR SHALL PRESERVE AND PROTECT ALL EXISTING UTILITIES FROM DAMAGE DURING CONSTRUCTION.

OWNER / DEVELOPER
M. CHRISTOPHER & COMPANY
550 SOUTH STATE HIGHWAY 5
FAIRVIEW, TX 75069
972.941.2777

C:\Users\denny.ECD\Desktop\ECDLP Logo for Plans.jpg

REVISIONS:	
DRAWN: DJW	DATE: JANUARY 2015
CHECKED: TW	DATE: JANUARY 2015
PROJECT NO.: 08314	
DWG FILE NAME: 08314 Detail Sheets.DWG	

THIS DOCUMENT IS RELEASED FOR THE PURPOSE OF CONSTRUCTION. THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY TODD D. WINTTERS, P.E. 87085

PAVING DETAILS
BRISTOL PARK PHASE III
CITY OF LUCAS, COLLIN COUNTY, TX

RECORD DRAWINGS
THESE RECORD DRAWINGS HAVE BEEN PREPARED BASED ON INFORMATION PROVIDED BY OTHERS. THE ENGINEER HAS NOT VERIFIED THE ACCURACY OF THIS INFORMATION AND SHALL NOT BE RESPONSIBLE FOR ANY DISCREPANCIES WHICH MAY BE INCORPORATED HEREIN AS A RESULT.
ENGINEERING CONCEPTS & DESIGNS, L.P.
Todd Winters 3-15-16
TODD WINTTERS, P.E. DATE