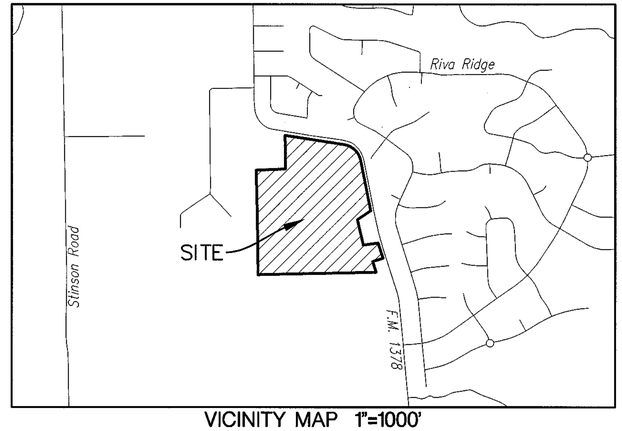
CONSTRUCTION PLANS
for
LEWIS PARK ESTATES

LOT 1-16, 1-20, BLOCK A, B
LEWIS PARK ESTATES
60.858 Acres

in the

JAMES ANDERSON SURVEY, ABSTRACT NO. 17
CITY OF LUCAS
COLLIN COUNTY, TEXAS
NOVEMBER, 2014



VICINITY MAP 1"=1000'

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AS-BUILT RECORD DRAWING

THE INFORMATION ON THESE PLANS HAS BEEN REVISED TO REFLECT CHANGES TO PUBLIC IMPROVEMENTS MADE DURING CONSTRUCTION PROVIDED TO ENGINEER BY THE CONTRACTOR. UNLESS OTHERWISE NOTED, THE CONSTRUCTION OF THE PUBLIC IMPROVEMENTS IS IN GENERAL CONFORMANCE WITH THESE PLANS BASED UPON INFORMATION PROVIDED BY THE CONTRACTOR AND THE RESPONSIBILITY FOR ACCURACY AND COMPLETENESS BELONGS TO THE CONTRACTOR.

Douglas W. Weaver
G & A Consultants, LLC.
Date: 11/23/2015

STATE OF TEXAS
DOUGLAS W. WEAVER
117386
LICENSED
PROFESSIONAL ENGINEER

OWNER/DEVELOPER
CADG LEWIS PARK LLC
C/O LENART DEVELOPMENT COMPANY, LLC
520 CENTRAL PARKWAY E. SUITE 104 PLANO,
TX 75074
Ph. (972) 422-9880
Contact: Steve Lenart

SITE PLANNING CIVIL ENGINEERING PLATTING
CONSULTANTS, LLC
LAND SURVEYING LANDSCAPE ARCHITECTURE
111 Hillside Drive • Lewisville, TX 75057 • P: 972.436.9712 • F: 972.436.9715
610 Byron Nelson Blvd, Suite 114 • Roanoke, TX 76262 • P: 682.831.9712 • F: 817.890.4043
TBPLS Firm No. 10047700
TBPE Firm No. 1798
Contact: R. Von Beougher, P.E.

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CONSULTANTS, LLC
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TBPE F-1798

Drawn By: TJF
Date: 11/07/2014
Scale: N/A
Revisions:

14026

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CONSTRUCTION PLANS

LEWIS PARK ESTATES

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GENERAL NOTES

1. THE TERM MUNICIPALITY REFERS TO THE CITY OF LUCAS.

2. ALL WORK SHALL CONFORM TO THE REQUIREMENTS OF THE MUNICIPALITY AND SHALL BE IN ACCORDANCE WITH THE MUNICIPAL STANDARD DETAILS AND SPECIFICATIONS FOR CONSTRUCTION. ALL WORK NOT COVERED IN THE CONTRACT DOCUMENTS AND MUNICIPAL STANDARD DETAILS AND SPECIFICATIONS FOR CONSTRUCTION SHALL BE GOVERNED BY THE NORTH CENTRAL TEXAS COUNCIL OF GOVERNMENT STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION.

3. EXISTING UTILITY LOCATIONS SHOWN ARE GENERALLY SCHEMATIC IN NATURE AND MAY NOT ACCURATELY REFLECT THE SIZE AND LOCATION OF EACH PARTICULAR UTILITY. EXISTING UTILITIES SHOWN HAVE BEEN BASED ON AVAILABLE RECORD DRAWINGS AND SURFACE APPURTENANCE FIELD TIES ONLY. SOME UTILITY LINES AND SURFACE LOCATIONS MAY NOT BE SHOWN. THE CONTRACTOR SHALL ASSUME RESPONSIBILITY FOR ACTUAL FIELD LOCATIONS AND PROTECTION OF EXISTING UTILITIES WHETHER SHOWN OR NOT. THE CONTRACTOR SHALL ALSO ASSUME RESPONSIBILITY FOR REPAIRS TO EXISTING UTILITIES WHETHER SHOWN OR NOT, DAMAGED BY THE CONTRACTOR'S ACTIVITIES. DIFFERENCES IN HORIZONTAL OR VERTICAL LOCATIONS OF EXISTING UTILITIES SHALL NOT BE BASIS FOR ADDITIONAL COMPENSATIONS TO THE CONTRACTOR.

4. THE CONTRACTOR SHALL PROTECT EXISTING PROPERTY MONUMENTATION AND PRIMARY CONTROL. ANY SUCH POINTS WHICH THE CONTRACTOR BELIEVES WILL BE DESTROYED SHALL HAVE OFFSET POINTS ESTABLISHED BY THE CONTRACTOR PRIOR TO CONSTRUCTION. ANY MONUMENTATION DESTROYED BY THE CONTRACTOR SHALL BE REESTABLISHED AT CONTRACTORS EXPENSE BY A REGISTERED PROFESSIONAL LAND SURVEYOR.

5. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO: A.) PREVENT ANY DAMAGES TO PRIVATE PROPERTY AND PROPERTY OWNER'S POLES, FENCES, SHRUBS, ETC. B.) PROTECT ALL UNDERGROUND UTILITIES. C.) NOTIFY ALL UTILITY COMPANIES AT LEAST 48 HOURS PRIOR TO EXCAVATION IN ACCORDANCE WITH TEXAS LAW. D.) FIELD VERIFY HORIZONTAL AND VERTICAL LOCATION OF ALL UTILITIES IN THE VICINITY OF CONSTRUCTION ACTIVITIES PRIOR TO START OF CONSTRUCTION. THE CONTRACTOR SHALL NOTIFY ENGINEER OF ANY UNIDENTIFIED POTENTIAL CONFLICTS THAT MAY EXIST BETWEEN THE EXISTING UTILITIES AND CONSTRUCTION PLANS.

6. ANY DAMAGES THAT MAY OCCUR TO REAL PROPERTY OR EXISTING IMPROVEMENTS, INCLUDING EXISTING PRIVATE AND PUBLIC LANDSCAPE IRRIGATION SYSTEMS, SHALL BE RESTORED BY THE CONTRACTOR TO AT LEAST THE SAME CONDITION THAT THE REAL PROPERTY OR EXISTING IMPROVEMENT WERE IN PRIOR TO THE DAMAGES. THE CONTRACTOR WILL ALSO BE RESPONSIBLE FOR THE ADJUSTMENT OF SPRINKLER HEADS TO FINAL GRADE AND RELOCATION IF NECESSARY.

7. THE CONTRACTOR SHALL MAINTAIN DRAINAGE AT ALL TIMES DURING CONSTRUCTION. THE PONDING OF WATER IN STREETS, DRIVES, TRENCHES, ETC, WILL NOT BE ALLOWED. THE CONTRACTOR SHALL MAINTAIN EXISTING DRIVEWAYS ACCESS AT ALL TIME.

8. THE CONTRACTOR SHALL MAINTAIN EXISTING WATER SERVICES AT ALL TIMES DURING CONSTRUCTION.

9. AREAS OF THE SITE THAT WILL UNDERLIE FILL SHALL BE SCARIFIED TO A DEPTH OF 8 INCHES, FILL SHALL BE PLACED IN LOOSE LIFTS NOT EXCEEDING 8 INCHES IN UNCOMPACTED THICKNESS. ALL FILL MATERIAL SHALL BE COMPACTED TO 95% STANDARD PROCTOR DENSITY WITH A MOISTURE CONTENT FROM −3% TO +1% OF OPTIMUM OR PER GEOTECH RECOMMENDATION. FIELD DENSITY TESTS PER MUNICIPAL REQUIREMENTS.

10. THE CONTRACTOR SHALL ABIDE BY ALL APPLICABLE FEDERAL, STATE, AND LOCAL LAWS GOVERNING EXCAVATION. THE CONTRACTOR SHALL PROVIDE DETAILED PLANS AND SPECIFICATION FOR TRENCH SAFETY SYSTEMS THAT COMPLY WITH APPLICABLE LAWS GOVERNING EXCAVATION. THESE PLANS SHALL BE SEALED BY AN ENGINEER EXPERIENCED IN THE DESIGN OF TRENCH SAFETY SYSTEM, REGISTERED IN THE STATE OF TEXAS. THE CONTRACTOR SHALL SUBMIT COMPLETED TRENCH SAFETY PLANS TO THE MUNICIPALITY PRIOR TO COMMENCING WORK. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR ALL ASPECTS OF WORK RELATED TO EXCAVATION. ALL EXCAVATIONS, TRENCHING AND SHORING OPERATIONS SHALL COMPLY WITH THE REQUIREMENTS OF THE U.S. DEPARTMENT OF LABOR, OSHA, "CONSTRUCTION SAFETY AND HEALTH REGULATIONS".

11. WORK MAY NOT BE BACKFILLED OR COVERED UNTIL IT HAS BEEN INSPECTED BY THE MUNICIPALITY.

12. ALL EXCAVATION ON THE PROJECT IS UNCLASSIFIED.

13. CONTRACTOR SHALL COORDINATE THE PROTECTION OF EXISTING FRANCHISE UTILITIES AND APPURTENANCES INCLUDING EXISTING UTILITY POLES IN THE VICINITY OF CONSTRUCTION OPERATIONS WHETHER UTILITIES ARE SHOWN ON PLANS OR NOT. ANY DAMAGE INCURRED TO EXISTING FRANCHISE UTILITIES, APPURTENANCES, UTILITY POLES, LIGHT STANDARDS, ETC., BY CONSTRUCTION RELATED ACTIVITIES SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.

14. THE CONTRACTOR SHALL LOCATE AND RECORD EXISTING IRRIGATION SYSTEMS PRIOR TO CONSTRUCTION. CONTRACTOR SHALL TEMPORARILY REMOVE AND CAP IRRIGATION SYSTEM AS NECESSARY FOR CONSTRUCTION AND SHALL REPLACE THE PORTION REMOVED WITH EQUIVALENT SYSTEMS. CONTRACTOR SHALL COORDINATE ANY IRRIGATION WORK WITH THE MUNICIPALITY AND PROPERTY OWNER'S REPRESENTATIVES.

15. THE CONTRACTOR MUST CEASE ALL CONSTRUCTION OPERATIONS IMMEDIATELY IF A SUSPECTED ARCHEOLOGICAL OBJECT/ARTIFACT IS UNCOVERED DURING CONSTRUCTION. THE CONTRACTOR MUST IMMEDIATELY CONTACT THE TEXAS HISTORICAL COMMISSION AND THE MUNICIPALITY. PROJECT WORK WILL NOT COMMENCE UNTIL PROPER PERMITS ARE IN PLACE AND PROVIDED TO THE MUNICIPALITY.

16. ALL PAVING DIMENSIONS ARE TO EDGE OF PAVEMENT UNLESS OTHERWISE NOTED.

17. IT IS THE CONTRACTOR'S RESPONSIBILITY TO ENSURE COMPLIANCE WITH ALL HANDICAPPED ACCESSIBILITY REQUIREMENTS INCLUDING SIGNAGE, TEXTURES, COLORING, MARKINGS, AND SLOPES OF ADA/TAS 2012 ACCESSIBLE ROUTES & RAMPS, AND PARKING SPACES.

18. ALL PIPE LENGTHS MEASURED FROM STATION TO STATION BASED ON THE CENTER OF STRUCTURE UNLESS OTHERWISE NOTED.

19. CONTRACTOR SHALL NOTIFY ENGINEER IF ANY DISCREPANCIES ARISE.

GENERAL NOTES FOR WATER IMPROVEMENTS

1. ALL WATER LINES SHALL BE PVC PIPE CONFORMING TO A.W.W.A. STANDARD C−900 SDR−18 MINIMUM, WITH NSF SEAL, PRESSURE TESTED AND DISINFECTED IN ACCORDANCE WITH MUNICIPAL AND/OR NCTCOG STD. SPECS., UNLESS OTHERWISE NOTED WITHIN THE CONSTRUCTION PLANS.
2. CONTRACTOR SHALL NOT DIG WITHIN 20 FEET OF ANY WATERLINES ON FRIDAY, SATURDAY OR SUNDAY WITHOUT WRITTEN PERMISSION OF THE CITY ENGINEER.

GENERAL NOTES FOR PAVING IMPROVEMENTS

1. THE SUB GRADE SHALL BE PROOF ROLLED AND OBSERVED BY THE CONSTRUCTION INSPECTOR PRIOR TO AND AFTER SUB−GRADE STABILIZATION.
2. INDIVIDUAL WATER AND SEWER SERVICES AND WATER VALVES SHALL BE MARKED IN ACCORDANCE WITH MUNICIPAL REQUIREMENTS.
3. THE CONTRACTOR SHALL PROCEED WITH PAVING NO MORE THAN SEVENTY−TWO (72) HOURS AFTER DENSITY/MOISTURE TESTS HAVE BEEN TAKEN AND PASSED BY A REGISTERED TESTING FIRM. COPIES OF THE TEST RESULTS SHALL BE FURNISHED TO THE MUNICIPALITY. IN THE EVENT PAVING OPERATIONS HAVE NOT COMMENCED WITHIN THE SEVENTY−TWO (72) HOUR LIMIT, A RETEST SHALL BE REQUIRED AT THE CONTRACTOR'S EXPENSE.
4. MANHOLE RIM ELEVATIONS, CLEAN−OUTS, VALVE BOXES, FIRE HYDRANTS, ETC. SHALL BE ADJUSTED TO FINISHED GRADE BY THE PAVING CONTRACTOR AT THE TIME OF PAVING.
5. THE PAVING CONTRACTOR SHALL INSTALL A BLUE REFLECTOR IN THE STREET OR FIRE LANE CENTERLINE AT THE LOCATION OF EACH FIRE HYDRANT.
6. THE CONTRACTOR SHALL PREPARE ALL TRAFFIC CONTROL PLANS AND SUBMIT TO THE MUNICIPALITY PRIOR TO THE ISSUANCE OF ANY CONSTRUCTION PERMITS FOR WORK WITHIN THE MUNICIPALITY. THE PLAN SHALL BE PREPARED IN ACCORDANCE WITH THE CURRENT EDITION OF THE M.U.T.C.D AND AS MODIFIED BY THE TXDOT SUPPLEMENT TO THE M.U.T.C.D. THE PLAN SHALL ADDRESS THE REQUIREMENTS FOR ALL SIGNS, BARRICADES, FLAGMEN, LIGHTS, HOURS OF CONSTRUCTION, AND OTHER DEVICES AS NECESSARY FOR SAFE TRAFFIC CONTROL.

PROJECT GENERAL NOTES

1. THE TEXAS DEPARTMENT OF TRANSPORTATION (TXDOT) MUST APPROVE ANY WORK TO BE DONE IN THE STATE HIGHWAY RIGHT−OF−WAY. AN APPLICATION AND APPROPRIATE PLANS MUST BE SUBMITTED TO THE CITY OF LUCAS FOR REVIEW AND APPROVED BY THE MUNICIPALITY WHERE THE WORK WILL BE PERFORMED.

2. THE LOCATION OF UNDERGROUND FACILITIES INDICATED ON THE PLANS IS TAKEN FROM PUBLIC RECORDS. IT IS THE CONTRACTOR'S SOLE RESPONSIBILITY TO MAKE ARRANGEMENTS WITH THE OWNERS OF SUCH UNDERGROUND FACILITIES PRIOR TO WORKING IN THE AREA TO CONFIRM THEIR EXACT LOCATION AND TO DETERMINE WHETHER ANY ADDITIONAL FACILITIES OTHER THAN THOSE SHOWN ON THE PLANS MAY BE PRESENT. THE CONTRACTOR SHALL PRESERVE AND PROTECT ALL UNDERGROUND FACILITIES. IF THE EXISTING UNDERGROUND UTILITIES ARE DAMAGED, THE CONTRACTOR WILL BE RESPONSIBLE FOR THE COST OF REPAIRING THE UTILITY.

3. WHERE EXISTING UTILITIES, SERVICE LINES OR IRRIGATION LINES ARE CUT, BROKEN OR DAMAGED, THE CONTRACTOR SHALL REPLACE OR REPAIR THE UTILITIES, SERVICE LINES OR IRRIGATION LINES WITH THE SAME TYPE OF ORIGINAL MATERIAL AND CONSTRUCTION, OR BETTER, UNLESS OTHERWISE SHOWN OR NOTED ON THE PLANS, AT HIS OWN COST AND EXPENSE. THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER AT ONCE OF ANY CONFLICTS IN GRADES AND ALIGNMENTS.

4. CONTRACTOR SHALL NOT DIG WITHIN 20 FEET OF ANY WATERLINES ON FRIDAY, SATURDAY OR SUNDAY WITHOUT WRITTEN PERMISSION OF THE CITY ENGINEER.

5. ALL EXCAVATIONS, TRENCHING AND SHORING OPERATIONS SHALL COMPLY WITH THE REQUIREMENTS OF THE U.S. DEPARTMENT OF LABOR, OSHA, "CONST. SAFETY AND HEALTH REGULATIONS." VOL. 29, SUBPART P. PG. 128−137, AND ANY AMENDMENTS THERETO. THE CONTRACTOR SHALL PREPARE AND IMPLEMENT A TRENCH SAFETY PLAN FOR THIS PROJECT.

6. THE CONTRACTOR SHALL RESTORE ALL AREAS, ONSITE AND OFFSITE, DISTURBED BY CONSTRUCTION TO ORIGINAL CONDITION OR BETTER. RESTORED AREAS INCLUDE, BUT ARE NOT LIMITED TO: TRENCH BACKFILL, SIDE SLOPES, FENCES, CULVERT PIPES, DRAINAGE SWALES, STAGING AREAS, DRIVEWAYS, PRIVATE YARDS AND ROADWAYS. UNLESS OTHERWISE DIRECTED BY THE LANDSCAPE DRAWINGS, RESTORATION SHALL INCLUDE SODDING ALL DISTURBED AREAS. ESTABLISHMENT OF GRASS THROUGH PROPER WATERING IS LEFT UP TO THE CONTRACT'S MEANS AND METHODS, UNLESS OTHERWISE DIRECTED BY THE LANDSCAPE/IRRIGATION DRAWINGS.

7. THE CONTRACTOR SHALL KEEP RECORDS FOR AS−BUILTS DRAWINGS AND SHALL SUBMIT MARK−UPS TO THE MUNICIPALITY INSPECTOR PRIOR TO SCHEDULING A FINAL WALK THROUGH INSPECTION.

8. PRIOR TO CONSTRUCTION, A PRE−CONSTRUCTION MEETING SHALL BE HELD WITH REPRESENTATIVES FROM ALL CONTRACTORS, THE ENGINEER, AND THE MUNICIPALITY.

9. ALL CONSTRUCTION MUST ADHERE TO THE TREE PRESERVATION REQUIREMENTS OF THE MUNICIPALITY.

10. THE CONTRACTOR, AND HIS AGENTS, AND SUB−CONTRACTOR, ARE COMPLETELY RESPONSIBLE FOR THE VERIFICATION OF THE ACCURACY OF THE DIMENSION CONTROL FURNISHED HEREIN. THE OWNER, ENGINEER AND THEIR AGENTS, ARE NOT RESPONSIBLE FOR THE ACCURACY OF THE COORDINATES FURNISHED. THE CONTRACTOR IS REQUIRED TO VERIFY ALL COORDINATES FOR ACCURACY AND CONFIRM THE LOCATIONS OF ALL UTILITIES TO BE CONSTRUCTED, BOTH HORIZONTAL AND VERTICALLY. DISCREPANCIES FOUND BY THE CONTRACTOR SHALL BE REPORTED, IN WRITING, TO THE OWNER IMMEDIATELY FOR RECONCILIATION.

11. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE IMPLEMENTATION OF STORM WATER POLLUTION PREVENTION PLAN (SWPPP) REQUIRED FOR THIS PROJECT IN ACCORDANCE WITH THE CONTRACT DOCUMENTS. THE CONTRACTOR SHALL PREPARE, IMPLEMENT AND MAINTAIN THE SWPPP IN ACCORDANCE WITH THE REQUIREMENTS OF THE CURRENT TCEQ AND NPDES GENERAL PERMIT AS DESCRIBED IN THE FEDERAL REGISTER, PAGES 36489 THROUGH 36519.

GENERAL NOTES FOR STORM DRAIN IMPROVEMENTS

1. ALL STORM SEWER AND CULVERT PIPE AND FITTINGS SHALL BE ASTM C76, CLASS III REINFORCED CONCRETE PIPE (RCP), INSTALLED WITH COMPRESSIVE TYPE JOINTS UNLESS NOTED OTHERWISE.

2. AFTER COMPLETION OF ALL STORM SEWER INSTALLATION, THE CONTRACTOR SHALL ENSURE THAT ALL DEBRIS AND SILTATION HAS BEEN REMOVED.

MISCELLANEOUS NOTES AND CONSTRUCTION ITEMS

1. ALL EXISTING MAILBOXES IN CONFLICT WITH THE PROPOSED IMPROVEMENTS SHALL BE RELOCATED AND REPLACED WITH AN EQUIVALENT MAILBOX AT NO COST UNLESS SPECIFIED AS A BID ITEM.

LEGEND

C.R.F.	Capped Rebar Found
C.R.S.	Capped Rebar Set
C.M.	Control Monument
CP	Control Point
Mon.	Monument
BM	Benchmark
FH−	Fire Hydrant
WM−	Water Meter
WV−	Water Valve
W/L	Water Line
ICV−	Irrigation Control Valve
SSMH−	Sanitary Sewer Manhole
CO−	Sanitary Sewer Cleanout
UP−	Utility Pole
LP−	Light Pole
PP	Power Pole
Ex TC	Existing Top of Curb
Ex TP	Existing Top of Pavement
TC	Top of Curb
G	Gutter
PG	Proposed Grade
TP	Grade at Top of Pavement
TA	Grade at Top of Asphalt
TW	Grade at Top of Wall
BW	Grade at Bottom of Wall
RW	Grade at Retaining Wall
TG	Grade at Top of Grate
RR	Rail road
FG	Finished Grade
FF	Finished Floor
FP	Finished Pad
FL	Flowline
U.E.	Utility Easement
D.E.	Drainage Easement
B.L.	Building Line
R.O.W.	Right−of−Way
D.R.	Deed Records
P.R.	Plat Records
P.A.E.	Pedestrian Access Easement
S.B.	Setback line
W.E	Waterline Easement
MAE	Mutual Access Easement
	Overhead Power Lines
	Down Guy Wire
443	Existing Contours
445	Proposed Contours
	Concrete Pavement
	Asphalt Pavement
	Wood Fence
	Chain Link Fence
	Wire Fence
	Masonry Wall
	Existing Tree
	(FL) Flowline
	Centerline of Creek, Swale, or Waterway

AS-BUILT RECORD DRAWING

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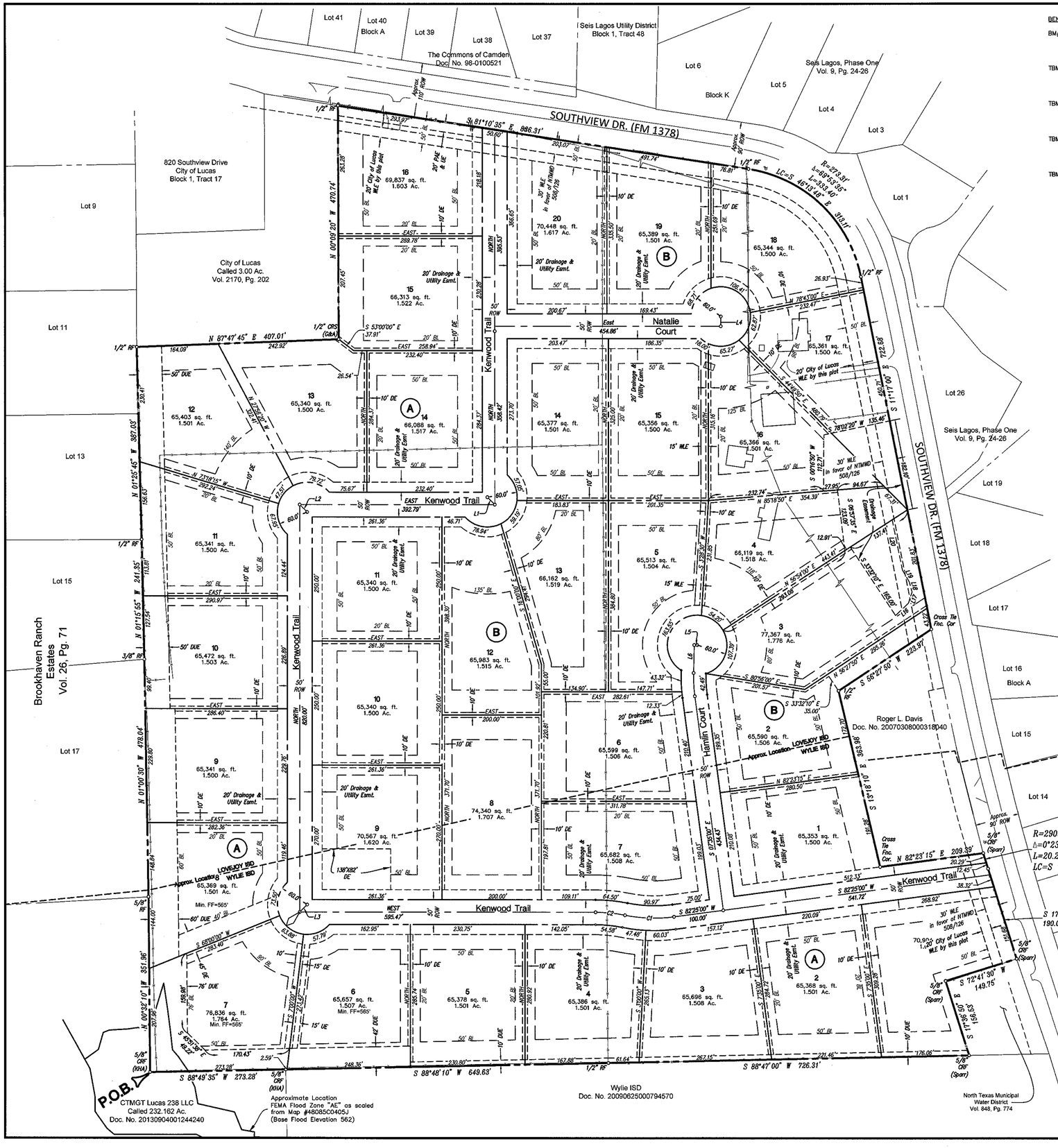


BENCHMARKS:

BM#1 – RM133 – 590.08'
Square cut on east headwall of west of bridge at White Rock Creek (East) and FM 1378. Map# 48085C0455G, Dated January 19th, 1996.

TBM#2 – Square Cut – 569.45'
~981' Southwest from the Northwest corner of subject property on south edge of Brookhaven Dr.
N=7,079,521.1' E=2,557,109.8'

TBM#3 – "X" – 579.96'
~760' Northeast from the Northwest corner of subject property near the intersection of Conner Ln. & Chapel Ct.
N=7,080,175.7' E=2,558,146.1

TBM#4 – PK Nail – 554.84'
~900' Northeast from the Northeast corner of subject property at the south edge of a cul-de-sac on Alameda Cir.
N=7,079,803.4' E=2,559,558.0'

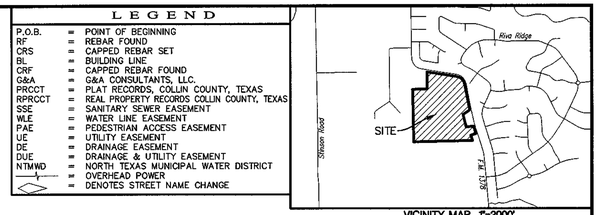
TBM#5 – "X" – 584.19'
~1040' Southeast from the southeast corner of subject property on a headwall on the north side of the intersection of FM 1378 & Seis Lagos Trail.
N=7,076,568.5' E=2,559,653.8'

DENSITY TABLE

	Acres	Density
Gross Land Area	60.858	0.58 du/ac
Net Land Area		
ROW Internal	5.913	
Total Net Acres	54.945	0.60 du/ac

LEGEND

P.O.B.	=	POINT OF BEGINNING
RF	=	REBAR FOUND
CRS	=	CAPPED REBAR SET
BL	=	BUILDING LINE
CRF	=	CAPPED REBAR FOUND
G&A	=	G&A CONSULTANTS, LLC.
PRCCT	=	PLAT RECORDS, COLLIN COUNTY, TEXAS
RPRCCT	=	REAL PROPERTY RECORDS COLLIN COUNTY, TEXAS
SSE	=	SANITARY SEWER EASEMENT
WLE	=	WATER LINE EASEMENT
PAE	=	PEDESTRIAN ACCESS EASEMENT
UE	=	UTILITY EASEMENT
DE	=	DRAINAGE EASEMENT
DUE	=	DRAINAGE & UTILITY EASEMENT
NTMWD	=	NORTH TEXAS MUNICIPAL WATER DISTRICT
—/—/—	=	OVERHEAD POWER
◇	=	DENOTES STREET NAME CHANGE



VICINITY MAP T=2000'

NOTES:

1. Bearings based on the Texas Coordinate System, North Central Zone (4202), NAD '83.

2. Surveyor has made no investigation or independent search for easement of record, encumbrances, restrictive covenants, ownership title evidence, or any other facts that an accurate abstract of title may disclose.

3. No flood zone area analysis has been performed on the subject property by G&A Consultants.

4. According to Community/Panel No. 48085C0405J, effective May 6, 2009, of the FLOOD INSURANCE RATE MAP for Collin County, Texas & Incorporated Areas, by graphic plotting only, a portion of this property appears to be within Flood Zone "AE" (area within the 1% annual chance flood plain, with base flood elevations established). This flood statement does not imply that the property and/or the structures thereon will be free from flooding or flood damage. On rare occasions, greater floods can and will occur and flood heights may be increased by man-made or natural causes.

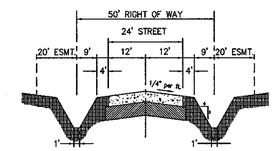
This flood statement shall not create liability on the part of the surveyor.

5. Lots or portions of lots within the floodplain or areas of special flood hazard require a development permit prior to issuance of a building permit or commencement of construction including site grading, on all or part of those lots.

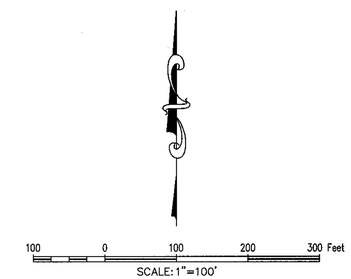
6. No access to F.M. 1378 from any part of a lot shall be allowed.

7. Easement in favor of North Texas Municipal Water District, recorded in Volume 508, Page 126 is not for public use.

8. Drainage easements shall be maintained by the HOA



PROPOSED STREET SECTION



SCALE: 1"=100'

"PRELIMINARY PLAT- For Inspection Purposes Only"

LEWIS PARK ESTATES

PRELIMINARY PLAT
Lots 1-16, Block A
Lots 1-20, Block B
60.858 Acres
Zoned R1.5
In the
JAMES ANDERSON SURVEY, ABSTRACT NO. 17
CITY OF LUCAS
COLLIN COUNTY, TEXAS

THIS DOCUMENT IS PRELIMINARY. IT IS INTENDED FOR REVIEW BY PLANNING AND ZONING ONLY AND SHALL NOT BE RECORDED OR FILED FOR PUBLIC RECORD.

SITE PLANNING CIVIL ENGINEERING PLATTING
CONSULTANTS, LLC
LAND SURVEYING LANDSCAPE ARCHITECTURE
111 Hillside Drive • Lewisville, TX 75057 • P: 972.436.9712 • F: 972.436.9715
610 Byron Nelson Blvd. Ste 114 • Roanoke, TX 76262 • P: 682.831.9712 • F: 817.890.4043
TBPE Firm No. 1798
TBPLS Firm No. 10047700

1/2

DRAWN BY: DATE: 09/03/14 SCALE: 1"=100' JOB. No. 14026

OWNER
CADG Lewis Park LLC
c/o Lenart Development Company, LLC
520 Central Parkway E.
Suite 104
Plano, Tx 75074
Contact: Steve Lenart
(972) 422-9880

File: J:\2014\14026\Drawings\Plats\14026.PP
Plotted: 11/20/2015 2:41 PM, by jsch
Saved: 11/20/2015 2:41 PM, by jsch

OWNER'S CERTIFICATE AND DEDICATION

STATE OF TEXAS :
COUNTY OF COLLIN : WHEREAS WE, CADG LEWIS PARK LLC, are the owners of property situated in the City of Lucas described as follows:

BEING all that certain lot, tract or parcel of land situated in the J. Anderson Survey, Abstract Number 17, in the City of Lucas, Collin County, Texas and part of those certain tracts of land described as Tracts I and II, in deed to Guardian Mortgage Company, Inc., as recorded in Document Number 20140131000092420 of the Deed Records of Collin County, Texas, and being all of that certain called 24.45 acre tract of land described in deed to Lewis-McWhirter, Ltd, recorded in Document Number 2005-160899 of the Deed Records of Collin County, Texas, and being more particularly described as follows:

BEGINNING at a 5/8" capped rebar found (Kimley Horn and Associates) at the southwest corner of said Tract I, and being an inner ells corner of that certain called 232.162 acre tract of land described in deed to CTMGT Lucas 238, LLC, recorded in Document Number 20130904001244240 of the Deed Records of Collin County, Texas;

THENCE N 00°32'10" W, 351.96 feet with the west line of said Tract I, and the east line of said 232.162 acre tract, to a 5/8" rebar found at the northeast corner thereof, and being the southeast corner of Brookhaven Ranch Estates, an addition to the City of Lucas, according to the plat thereof, recorded in Volume 26, Page 71 of the Plat Records of Collin County, Texas;

THENCE N 01°00'30" W, 478.04 feet with the west line of said Tract 1, and the east line of said Brookhaven Ranch Estates to a 3/8" rebar found at the northwest corner of said Tract 1, and being the southwest corner of said Tract 2;

THENCE N 01°15'55" W, 241.35 feet with the west line of said Tract 2, and the east line of said Brookhaven Ranch Estates, to a 1/2" rebar found;

THENCE N 01°25'45" W, 387.03 feet with the west line of said Tract 2, and the east line of said Brookhaven Ranch Estates, to a 1/2" rebar found at the westerly northwest corner of said Tract 2, and being the southwest corner of that certain called 3.00 acre tract of land described in deed to the City of Lucas, recorded in Volume 2170, Page 202 of the Deed Records of Collin County, Texas;

THENCE N 87°47'45" E, 407.01 feet, with the north line of said Tract 2, and the south line of said 3.00 acre tract, to the southeast corner thereof;

THENCE N 00°09'20" W, 470.74 feet, with the north line of said Tract 2, and the east line of said 3.00 acre tract, to a 1/2" rebar found at the most northerly northwest corner of said Tract 2, the northeast corner of said 3.00 acre tract, and being on the south line of F.M. Highway 1378;

THENCE S 81°10'35" E, with the north line of said Tract 2, and the south line of said F.M. Highway 1378, passing at 581.11 feet a 1/2" rebar found at the northeast corner of said Tract 2, and being the northwest corner of said 24.45 acre tract, continuing with the north line thereof, 836.31 feet to a 1/2" rebar found;

THENCE Southeasterly with east line of said 24.45 acre tract, and the west line of said F.M. Highway 1378, with the arc of a curve to the right, having a radius of 273.31 feet, a central angle of 69°53'35", an arc length of 333.40 feet, and whose chord bears S 46°13'48" E, 313.11 feet;

THENCE S 11°17'10" E, 722.68 feet, with the east line of said 24.45 acre tract, and the west line of F.M. Highway 1378, to the northeast corner of that certain tract of land described in deed to Roger L. Davis, recorded in Document Number 20070308000318040 of the Deed Records of Collin County, Texas;

THENCE S 56°27'50" W, 223.97 feet with the east line of said 24.45 acre tract, and the north line of said Davis tract, to the northwest corner thereof;

THENCE S 13°18'10" E, 363.98 feet with the east line of said 24.45 acre tract, and the west line of said Davis tract, to the southwest corner thereof;

THENCE N 82°23'15" E, 209.39 feet with the east line of said 24.45 acre tract, and the south line of said Davis tract, to the southeast corner thereof, being on the west line of F.M. Highway 1378;

THENCE Southeasterly with the east line of said 24.45 acre tract, and the west line of said F.M. Highway 1378, with the arc of a non-tangent curve to the left, having a radius of 2909.79 feet, a central angle of 00°38'41", an arc length of 32.74 feet, and whose chord bears S 17°17'56" E, 32.74 feet;

THENCE S 17°36'00" E, 190.00 feet with the east line of said 24.45 acre tract, and the west line of said F.M. Highway 1378, to the northeast corner of that certain tract of land described in deed to North Texas Municipal Water District, recorded in Volume 848, Page 774 of the Deed Records of Collin County, Texas;

THENCE S 72°41'30" W, 149.75 feet with the east line of said 24.45 acre tract, and the north line of said North Texas Municipal Water District tract, to the northwest corner thereof;

THENCE S 17°36'50" E, 156.53 feet with the east line of said 24.45 acre tract, and the west line of said North Texas Municipal Water District tract, to a 5/8" capped rebar found (Sparr Surveys) at the southwest corner thereof, and being the southeast corner of said 24.45 acre tract, and being on the north line of that certain called 60.000 acre tract of land described in deed to Wylie Independent School District, recorded in Document Number 20090625000794570 of the Deed Records of Collin County, Texas;

THENCE S 88°47'00" W, 726.31 feet with the south line of said 24.45 acre tract, and the north line of said 60.000 acre tract, to a 1/2" rebar found at the southwest corner of said 24.45 acre tract, and being the southeast corner of said Tract I;

THENCE S 88°48'10" W, 649.63 feet, with the south line of said Tract I, and the north line of said 60.00 acre tract, to a 5/8" capped rebar found (Kimley Horn and Associates) at the northwest corner thereof, and being the easterly northeast corner of said 232.162 acre tract;

THENCE S 88°49'35" W, 273.28 feet with the south line of said Tract I, and a north line of said 232.162 acre tract, to the POINT OF BEGINNING and containing approximately 60.858 acres of land.

NOW, THEREFORE, KNOW ALL MEN BY THESE PRESENTS: THAT WE, CADG LEWIS PARK LLC, acting herein by and through its duly authorized representatives, do hereby adopt this preliminary plat designating the hereinabove described tract as LEWIS PARK ESTATES, an addition to the City of Lucas, Collin County, Texas, and do hereby dedicate to the public use forever the streets, alleys, and right-of-ways as shown thereon, and do hereby reserve the easement strips shown on this plat for the mutual use and accommodation of garbage collection agencies and all public utilities desiring to use or using same. Any public utility shall have the right to remove and keep removed all or part of any buildings, fences, trees, shrubs, or other improvements or growths that in any way endanger or interfere with the construction, maintenance or efficiency of its respective systems on any of these easement strips, and any public utility shall at all times have the right of ingress and egress to and from and upon the said easement strips for the purpose of constructing, reconstructing, inspecting, patrolling, without the necessity at any time of procuring the permission of anyone. Additionally, we, CADG LEWIS PARK LLC, are the sole owners of the dedicated property and that no other's interest are attached to this property unless otherwise indicated on the required Mortgage Holder Certification that is included on this plat. This plat approved subject to all platting ordinances, rules, regulations, and resolution of the City of Lucas, Texas.

WITNESS MY HAND this_____day of_____, 2014.

_____
Authorized Representative
CADG LEWIS PARK LLC

STATE OF TEXAS :
COUNTY OF _____ : BEFORE ME, THE UNDERSIGNED AUTHORITY, personally appeared_____, known to me to be the person whose name is subscribed to the foregoing instrument and acknowledged that he executed the same for the purpose and consideration therein expressed and in the capacity therein stated.

GIVEN UNDER MY HAND AND SEAL OF OFFICE this _____day of _____, 2012.

_____
Notary Public State of Texas

My commission expires the_____day of_____, _____.

MORTGAGE HOLDER CERTIFICATION

THAT I,_____, hold a mortgage or represent holders of a mortgage on the described property herein, do hereby consent to the submission and filing of this plat designating the hereinabove described property as LEWIS PARK ESTATES, an addition to the City of Lucas, Texas,do hereby dedicate to the public use forever the streets, alleys, and right-of-ways as shown thereon, and do hereby reserve the easement strips shown on this plat for the mutual use and accommodation of garbage collection agencies and all public utilities desiring to use or using same. Any public utility shall have the right to remove and keep removed all or part of any buildings, fences, trees, shrubs, or other improvements or growths that in any way endanger or interfere with the construction, maintenance or efficiency of its respective systems on any of these easement strips, and any public utility shall at all times have the right of ingress and egress to and from and upon the said easement strips for the purpose of constructing, reconstructing, inspecting, patrolling, without the necessity at any time of procuring the permission of anyone. This plat approved subject to all platting ordinances, rules, regulations, and resolution of the City of Lucas, Texas.

WITNESS OUR HAND this_____day of_____, 2014.

_____ _____
Authorized Representative Title

CITY APPROVAL CERTIFICATE

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 & Title

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.

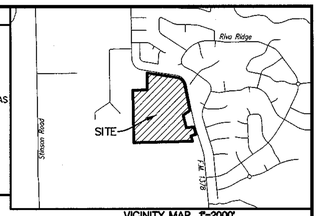
_____ _____
Director of Public Works Date

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 modifies, as allowed, by the Planning and Zoning Commission as to which his/her approval is required.

_____ _____
Director of Planning and Community Development Date

LEGEND

P.O.B.	=	POINT OF BEGINNING
RF	=	REBAR FOUND
CRS	=	CAPPED REBAR SET
BL	=	BUILDING LINE
CRF	=	CAPPED REBAR FOUND
G&A	=	G&A CONSULTANTS, LLC.
PRCCT	=	PLAT RECORDS, COLLIN COUNTY, TEXAS
RPRCCT	=	REAL PROPERTY RECORDS COLLIN COUNTY, TEXAS
SSE	=	SANITARY SEWER EASEMENT
WLE	=	WATER LINE EASEMENT
PAE	=	PEDESTRIAN ACCESS EASEMENT
UE	=	UTILITY EASEMENT
DE	=	DRAINAGE EASEMENT
DUE	=	DRAINAGE & UTILITY EASEMENT
NTMWD	=	NORTH TEXAS MUNICIPAL WATER DISTRICT
	=	OVERHEAD POWER
	=	DENOTES STREET NAME CHANGE



VICINITY MAP 1"=2000'

LOT / BLOCK ANALYSIS			
LOT	BLOCK	SQUARE FEET	ACRES
1	BLOCK A	70,904	1.628
2	BLOCK A	65,368	1.501
3	BLOCK A	65,696	1.508
4	BLOCK A	65,386	1.501
5	BLOCK A	65,378	1.501
6	BLOCK A	65,657	1.507
7	BLOCK A	76,836	1.764
8	BLOCK A	65,369	1.501
9	BLOCK A	65,341	1.500
10	BLOCK A	65,472	1.503
11	BLOCK A	65,341	1.500
12	BLOCK A	65,403	1.501
13	BLOCK A	65,340	1.500
14	BLOCK A	66,088	1.517
15	BLOCK A	66,313	1.522
16	BLOCK A	69,837	1.603

LOT / BLOCK ANALYSIS			
LOT	BLOCK	SQUARE FEET	ACRES
1	BLOCK B	65,353	1.500
2	BLOCK B	65,590	1.506
3	BLOCK B	77,367	1.776
4	BLOCK B	66,119	1.518
5	BLOCK B	65,513	1.504
6	BLOCK B	65,599	1.506
7	BLOCK B	65,682	1.508
8	BLOCK B	74,340	1.707
9	BLOCK B	70,567	1.620
10	BLOCK B	65,340	1.500
11	BLOCK B	65,340	1.500
12	BLOCK B	65,983	1.515
13	BLOCK B	66,162	1.519
14	BLOCK B	65,377	1.501
15	BLOCK B	65,356	1.500
16	BLOCK B	65,366	1.501
17	BLOCK B	65,361	1.500
18	BLOCK B	65,344	1.500
19	BLOCK B	65,389	1.501
20	BLOCK B	70,448	1.617

CURVE TABLE				
CURVE	RADIUS	DELTA ANGLE	ARC LENGTH	LONG CHORD
C1	300.00'	18°57'16"	99.24'	S 88°06'22" E, 98.79'
C2	300.00'	11°22'16"	59.54'	N 84°18'52" W, 59.44'

LINE TABLE		
LINE	BEARING	DISTANCE
L1	N 45°00'00" W	21.21'
L2	S 45°00'00" E	21.21'
L3	N 45°00'00" E	21.21'
L4	N 00°00'00" E	19.69'
L5	N 88°37'30" W	5.81'
L6	N 01°22'30" E	56.34'
L16	N 46°14'55" E	35.73'
L17	N 18°03'20" E	23.69'
L18	N 15°05'30" W	20.92'
L19	N 30°12'35" W	27.28'
L20	N 11°31'30" W	103.64'

SURVEYOR'S STATEMENT

I, Mark Paine, a Registered Professional Land Surveyor in the State of Texas, have prepared this plat of the above property from an actual survey on the ground, and this plat represents that survey made by me or under my supervision.

_____
Mark Paine, RPLS #____
Texas Registration No. 5068

STATE OF TEXAS :
COUNTY OF DENTON : BEFORE ME, THE UNDERSIGNED AUTHORITY, personally appeared Mark Paine, known to me to be the person whose name is subscribed to the foregoing instrument and acknowledged that he executed the same for the purpose and consideration therein expressed and in the capacity therein stated.

GIVEN UNDER MY HAND AND SEAL OF OFFICE this _____day of ___ _____, 2014.

_____
Notary Public
State of Texas

My commission expires the _____day of _____,___ _____.

THIS DOCUMENT IS PRELIMINARY. IT IS INTENDED FOR PLANNING PURPOSES ONLY AND SHALL NOT BE RECORDED OR FILED FOR PUBLIC RECORD.

"PRELIMINARY PLAT- For Inspection Purposes Only"

LEWIS PARK ESTATES

PRELIMINARY PLAT
Lots 1-16, Block A
Lots 1-20, Block B
60.858 Acres
Zoned R15
in the
JAMES ANDERSON SURVEY, ABSTRACT NO. 17
CITY OF LUCAS
COLLIN COUNTY, TEXAS

SITE PLANNING CIVIL ENGINEERING PLATTING
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TBPE Firm No. 1798
TBPLS Firm No. 10047700

2/2

DRAWN BY: DATE: 8/16/14 SCALE: 1"=100' JOB. No. **14026**

OWNER
CADG Lewis Park LLC
c/o Lenart Development Company, LLC
520 Central Parkway E.
Suite 104
Plano, Tx 75074
Contact: Steve Lenart
(972) 422-9880

File: J:\2014\14026\Drawings\Plats\14026.dwg
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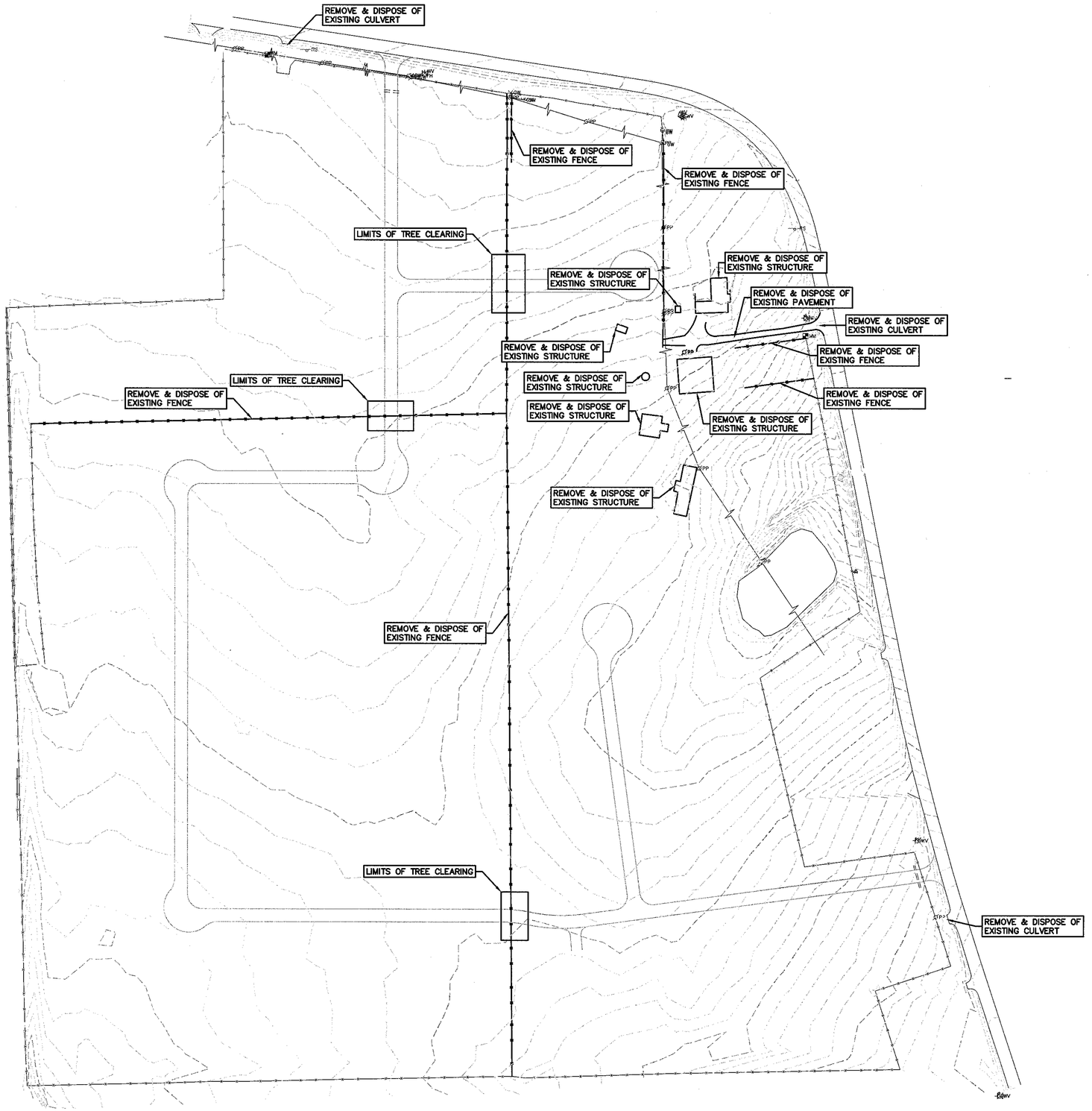

100 0 100 200 300 Feet

SCALE: 1"=100'

BENCHMARKS:

BM#1 – RM133 – 590.08'
Square cut on east headwall of west of bridge at White Rock Creek (East) and FM 1378. Map# 48085C0455G, Dated January 19th, 1996.

TBM#2 – Square Cut – 569.45'
~981' Southwest from the Northwest corner of subject property on south edge of Brookhaven Dr.
N=7,079,521.1' E=2,557,109.8'

TBM#3 – "X" – 579.96'
~760' Northeast from the Northwest corner of subject property near the intersection of Conner Ln. & Chapel Ct.
N=7,080,175.7' E=2,558,146.1

TBM#4 – PK Nail – 554.84'
~900' Northeast from the Northeast corner of subject property at the south edge of a cul-de-sac on Alameda Cir.
N=7,079,803.4' E=2,559,558.0'

TBM#5 – "X" – 584.19'
~1040' Southeast from the southeast corner of subject property on a headwall on the north side of the intersection of FM 1378 & Seis Lagos Trail.
N=7,076,568.5' E=2,559,653.8'

LEGEND

C.R.F.	Capped Rebar Found		Overhead Power Lines
C.R.S.	Capped Rebar Set		Down Guy Wire
C.M.	Control Monument	443	Existing Contours
Mon.	Monument	445	Proposed Contours
BM	Benchmark		Concrete Pavement
FH–	Fire Hydrant		Asphalt Pavement
WM–	Water Meter		Wood Fence
WV–	Water Valve		Chain Link Fence
W/L	Water Line		Wire Fence
ICV–	Irrigation Control Valve		Masonry Wall
SSMH–	Sanitary Sewer Manhole		Existing Tree
CO–	Sanitary Sewer Cleanout		(FL) Flowline
UP–	Utility Pole		Centerline of Creek, Swale, or Waterway
LP–	Light Pole		Creek, Swale, or Waterway Embankment
TC	Top of Curb		
TP	Top of Pavement		
TW	Top of Wall		
FG	Finished Grade		
U.E.	Utility Easement		
D.E.	Drainage Easement		
B.L.	Building Line		
R.O.W.	Right-of-Way		
D.R.	Deed Records		
P.R.	Plat Records		

GENERAL NOTES

1. THE CITY OF LUCAS CONSTRUCTION STANDARDS APPLY WHETHER INDICATED ON THESE PLANS OR NOT.

AS-BUILT RECORD DRAWING

THE INFORMATION ON THESE PLANS HAS BEEN REVISED TO REFLECT CHANGES TO PUBLIC IMPROVEMENTS MADE DURING CONSTRUCTION PROVIDED TO ENGINEER BY THE CONTRACTOR. UNLESS OTHERWISE NOTED, THE CONSTRUCTION OF THE PUBLIC IMPROVEMENTS IS IN GENERAL CONFORMANCE WITH THESE PLANS BASED UPON INFORMATION PROVIDED BY THE CONTRACTOR, AND THE RESPONSIBILITY FOR ACCURACY AND COMPLETENESS BELONGS TO THE CONTRACTOR.

Douglas W. Weaver
G & A Consultants, LLC.

Date: 11/23/2015

STATE OF TEXAS
DOUGLAS W. WEAVER
117386
LICENSED PROFESSIONAL ENGINEER

G&A CONSULTANTS, LLC.
TBPE F-1798

OWNER/DEVELOPER
CADG LEWIS PARK LLC
C/O LENART DEVELOPMENT COMPANY, LLC
520 CENTRAL PARKWAY E. SUITE 104
PLANO, TX 75074
Ph. (972) 422-9880
Contact: Steve Lenart

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LEWIS PARK ESTATES

LEWIS PARK ESTATES
Lot 1-16, 1-20, Block A, B
LEWIS PARK ESTATES
60.858 Acres
in the
JAMES ANDERSON SURVEY, ABSTRACT NO. 17
CITY OF LUCAS
COLLIN COUNTY, TEXAS

DEMOLITION PLAN

Drawn By: TJF
Date: 11/07/2014
Scale: 1" = 100'
Revisions:

14026

C4

File: S:\2014\14026\Drawings\DP & Const Plan\SHEET SET\14026.DWG
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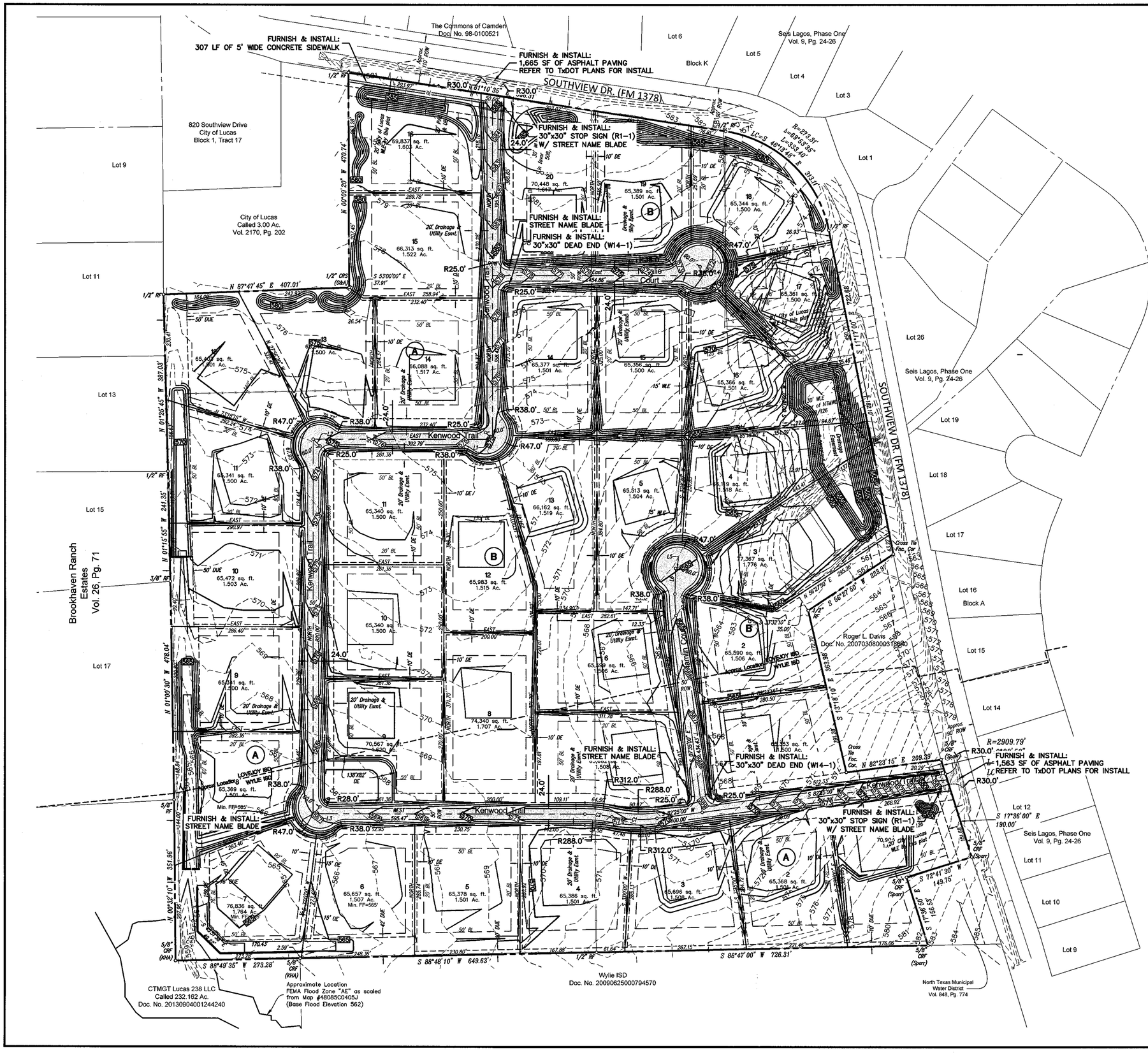

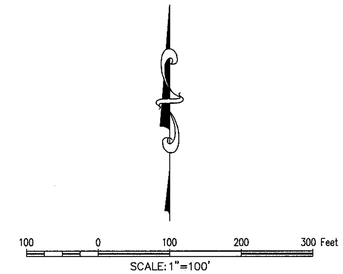

BENCHMARKS:

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~1040' Southeast from the southeast corner of subject property on a headwall on the north side of the intersection of FM 1378 & Seis Lagos Trail.
N=7,076,568.5' E=2,559,653.8'

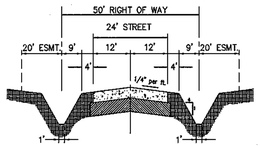
GENERAL NOTES

1. THE CITY OF LUCAS CONSTRUCTION STANDARDS APPLY WHETHER INDICATED ON THESE PLANS OR NOT.
2. ALL SIGNAGE WITHIN TXDOT ROW SHALL MEET TXDOT STANDARDS.

PAVING SPECIFICATIONS:

CONCRETE ROAD:
6" 3,600 PSI CONC. PAVEMENT W/ #3 BARS @ 18" O.C.E.W. ON 6" STABILIZED SUBGRADE OR APPROVED EQUAL

ASPHALT PAVEMENT AREA:
REFER TO TxDOT PLANS.



TYPICAL STREET SECTION

AS-BUILT RECORD DRAWING

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Douglas W. Weaver
G & A Consultants, LLC.

Date: 11/23/2015

DOUGLAS W. WEAVER
117386
LICENSED
PROFESSIONAL ENGINEER
STATE OF TEXAS

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610 Byron Nelson Blvd. • Roanoke, TX 76262 - P: 817.491.5170 - F: 817.268.0043
TBPE Firm No. 1796 TBPLS Firm No. 10047700

LEWIS PARK ESTATES

LEWIS PARK ESTATES
Lot 1-16, 1-20, Block A, B
LEWIS PARK ESTATES
60.858 Acres
in the
JAMES ANDERSON SURVEY, ABSTRACT NO. 17
CITY OF LUCAS
COLLIN COUNTY, TEXAS

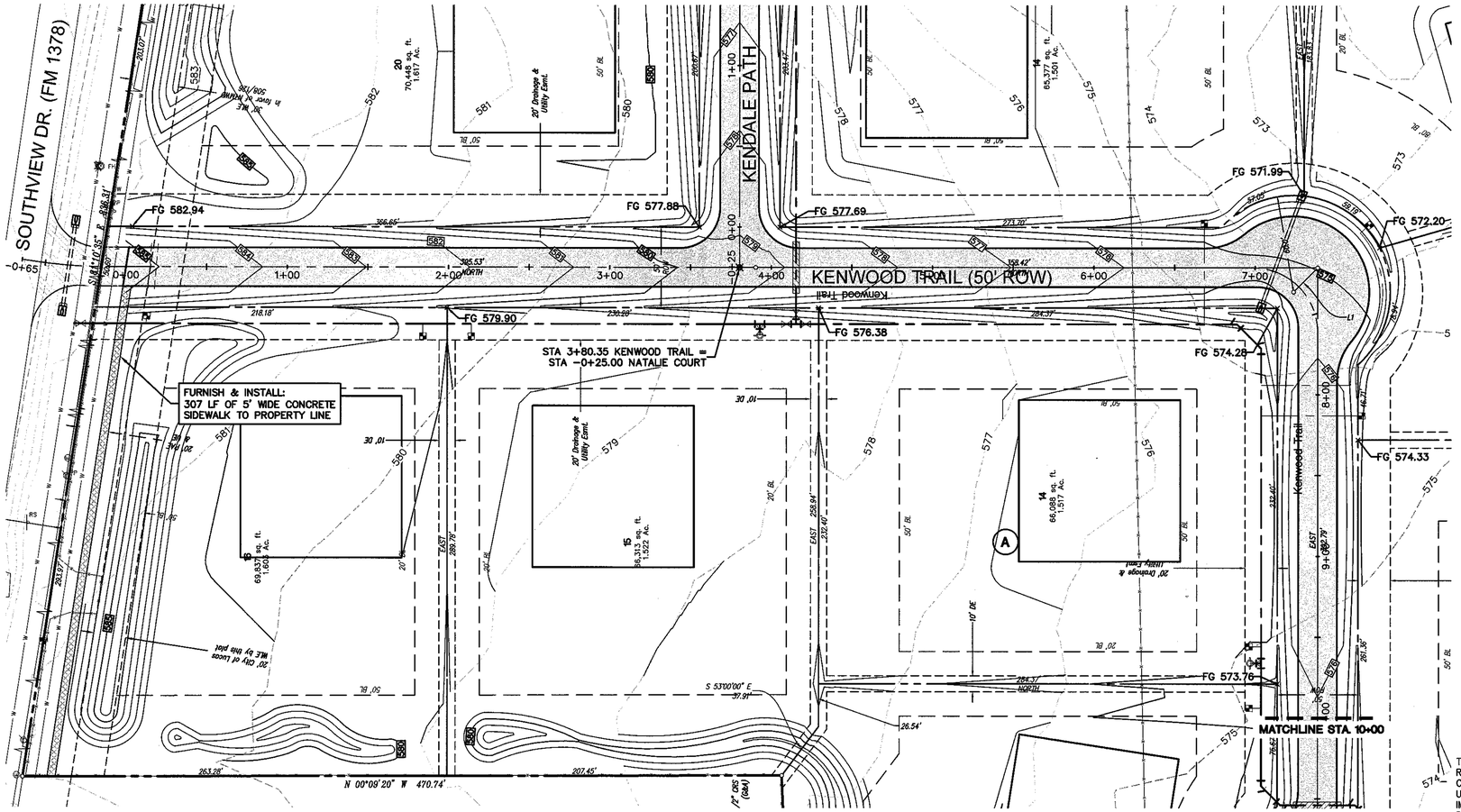
PAVING, LIGHTING & SIGNAGE PLAN

G&A CONSULTANTS, LLC.
TBPE F-1796

Drawn By: TJF
Date: 11/07/2014
Scale: 1" = 100'
Revisions:

14026

C5



GENERAL NOTES

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40 0 40 80 120 Feet

SCALE: 1"=40'

BENCHMARKS:

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Square cut on east headwall of west of bridge at White Rock Creek (East) and FM 1378. Map# 48085C0455G, Dated January 19th, 1996.

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LEGEND

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C.R.S.	Capped Rebar Set		Down Guy Wire
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AS-BUILT RECORD DRAWING

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Douglas W. Weaver
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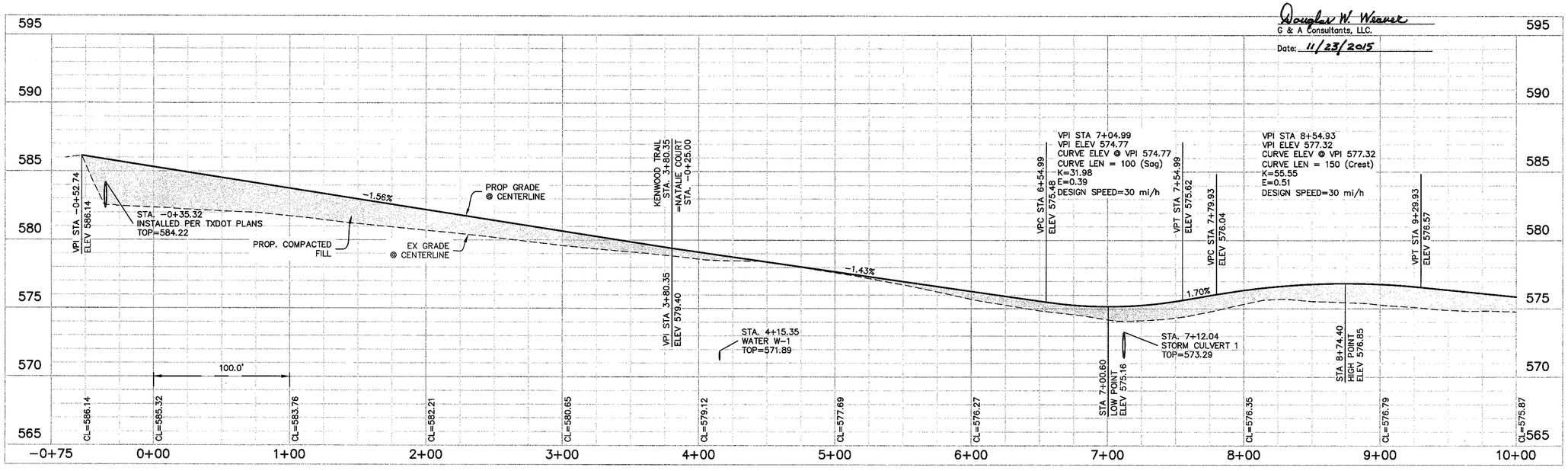
Date: 11/23/2015



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Ph. (972) 422-9880
Contact: Steve Lenart

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KENWOOD TRAIL PLAN & PROFILE STA 0+00 TO STA 10+00

STATE OF TEXAS
DOUGLAS W. WEAVER
117386
LICENSED PROFESSIONAL ENGINEER

G&A CONSULTANTS, LLC.
TBPE F-1798

Drawn By: TJF
Date: 11/07/2014
Scale: H 1"=40; V 1"=4'
Revisions:

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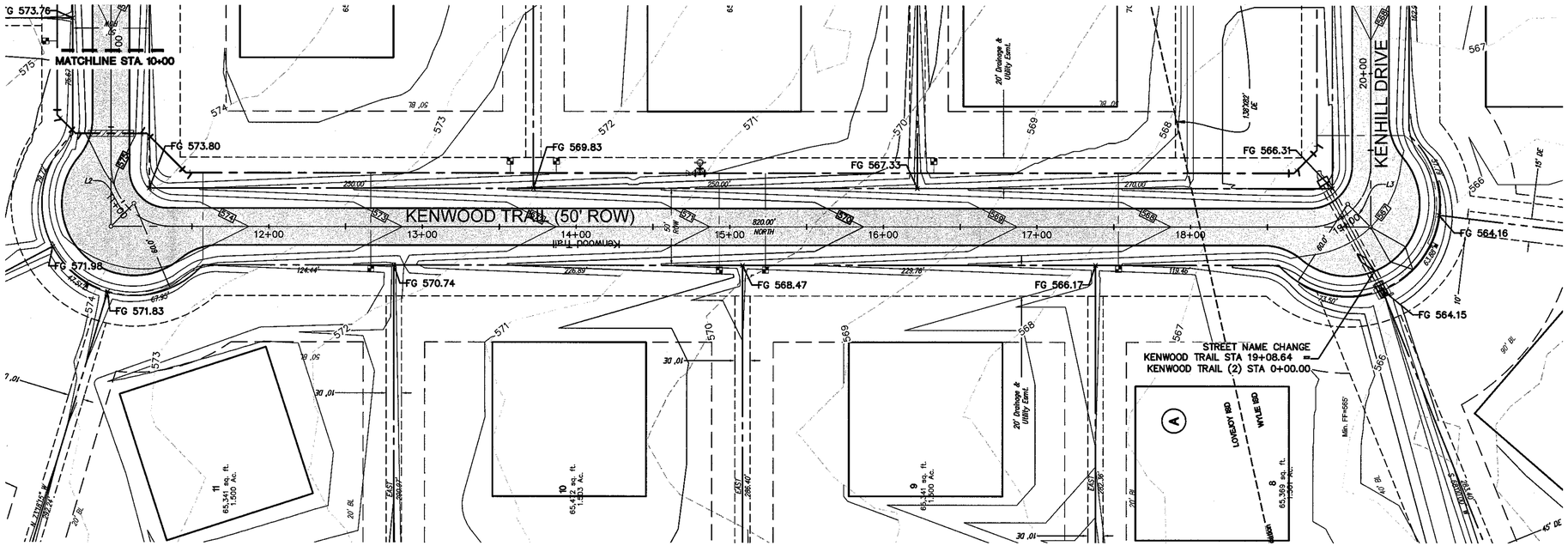

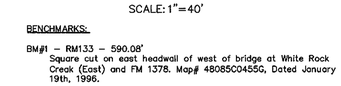

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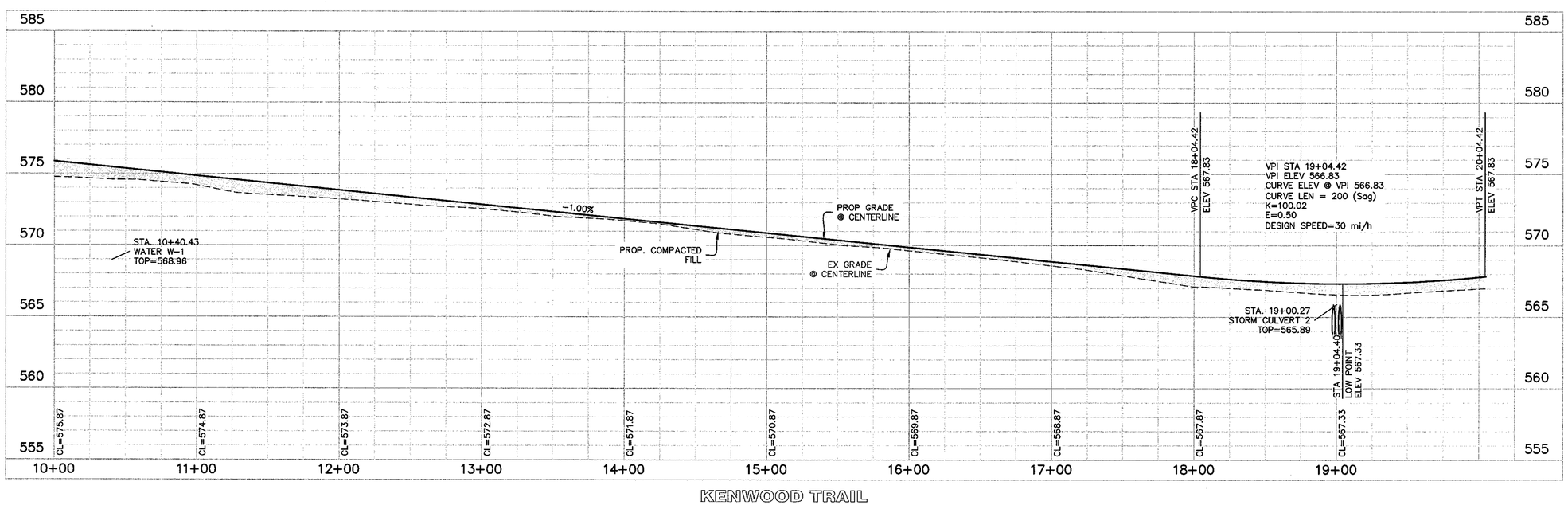

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TBPE Firm No. 1798 – TBPLS Firm No. 10194693

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G&A CONSULTANTS, LLC.
TBPE F-1798

Drawn By: TJF
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Scale: H 1"=40; V 1"=4'
Revisions:

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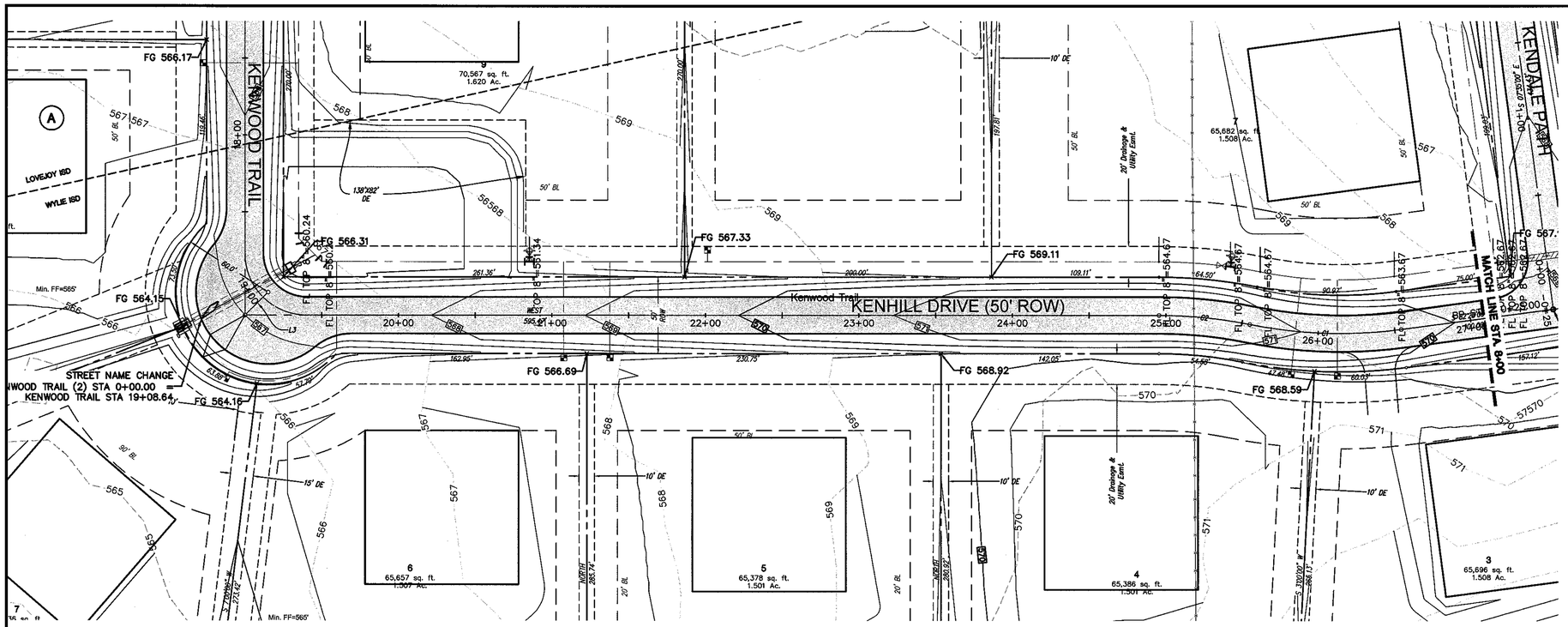

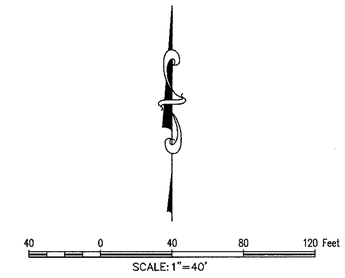

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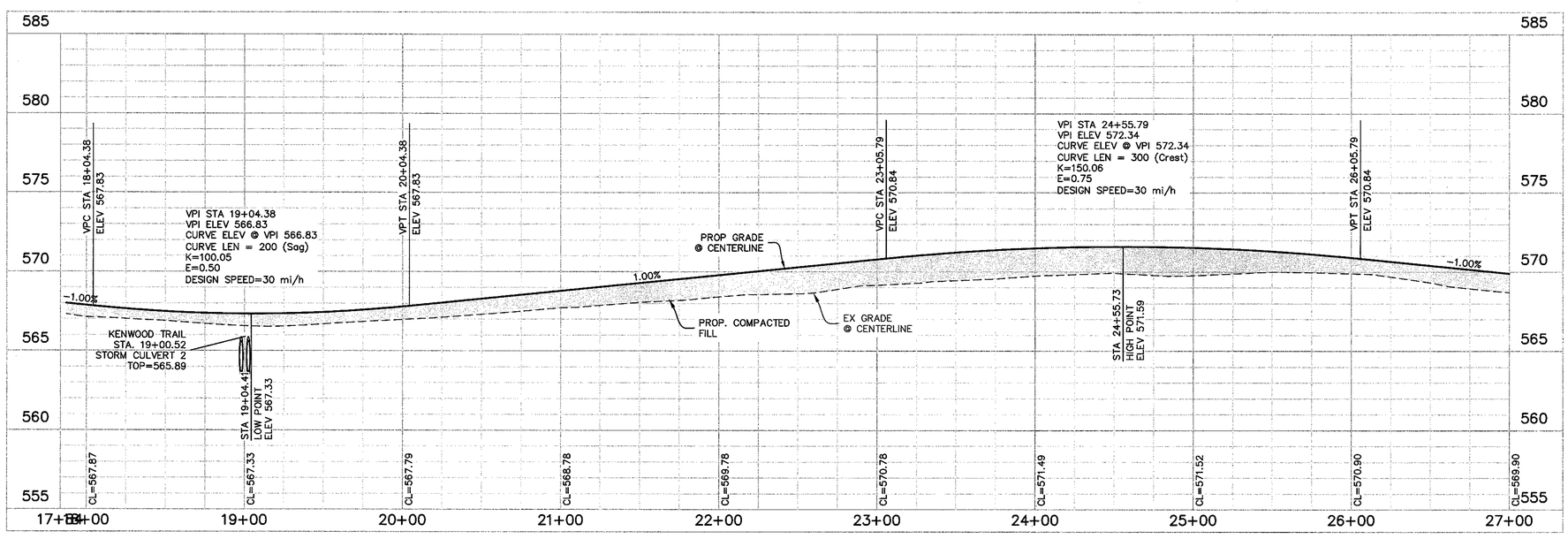

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TBPE F-1798

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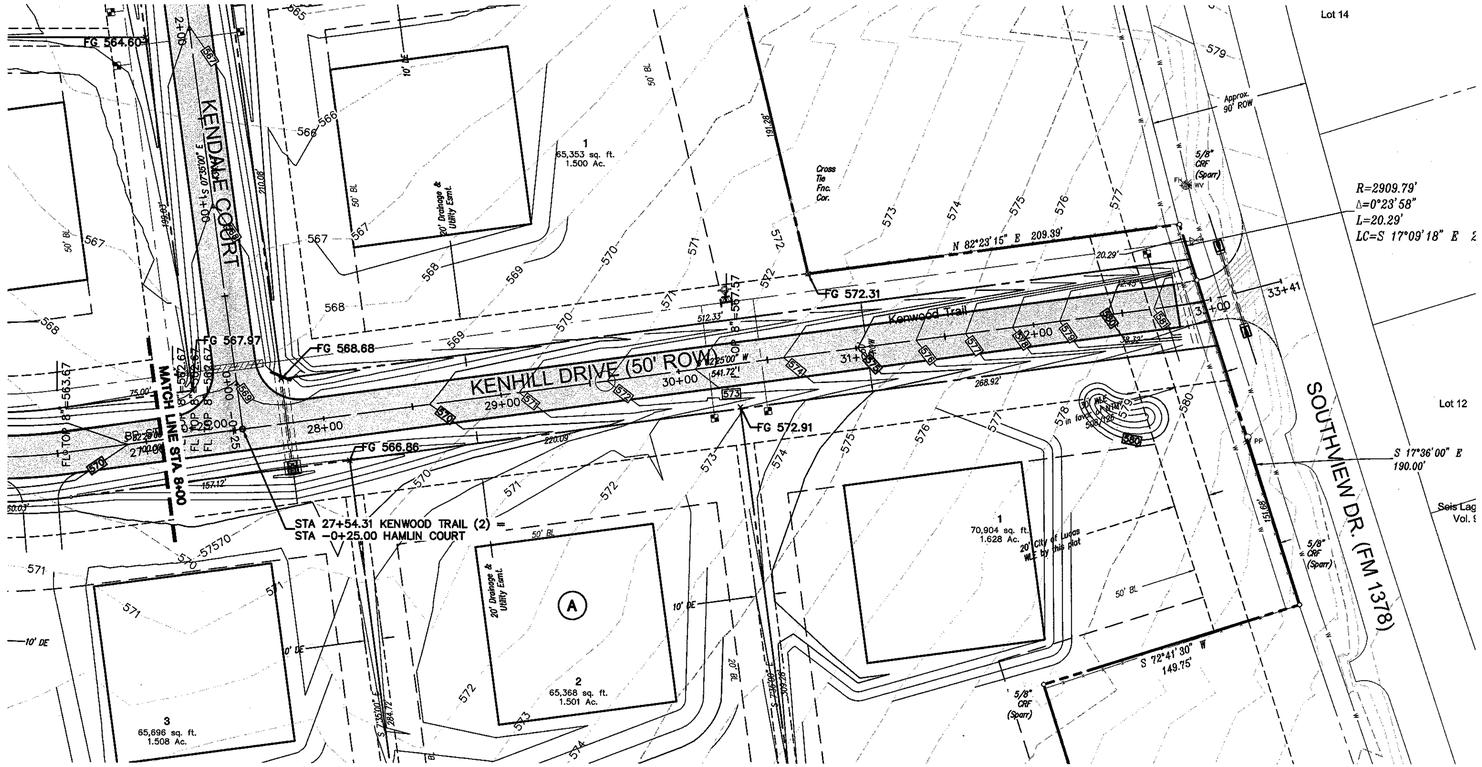
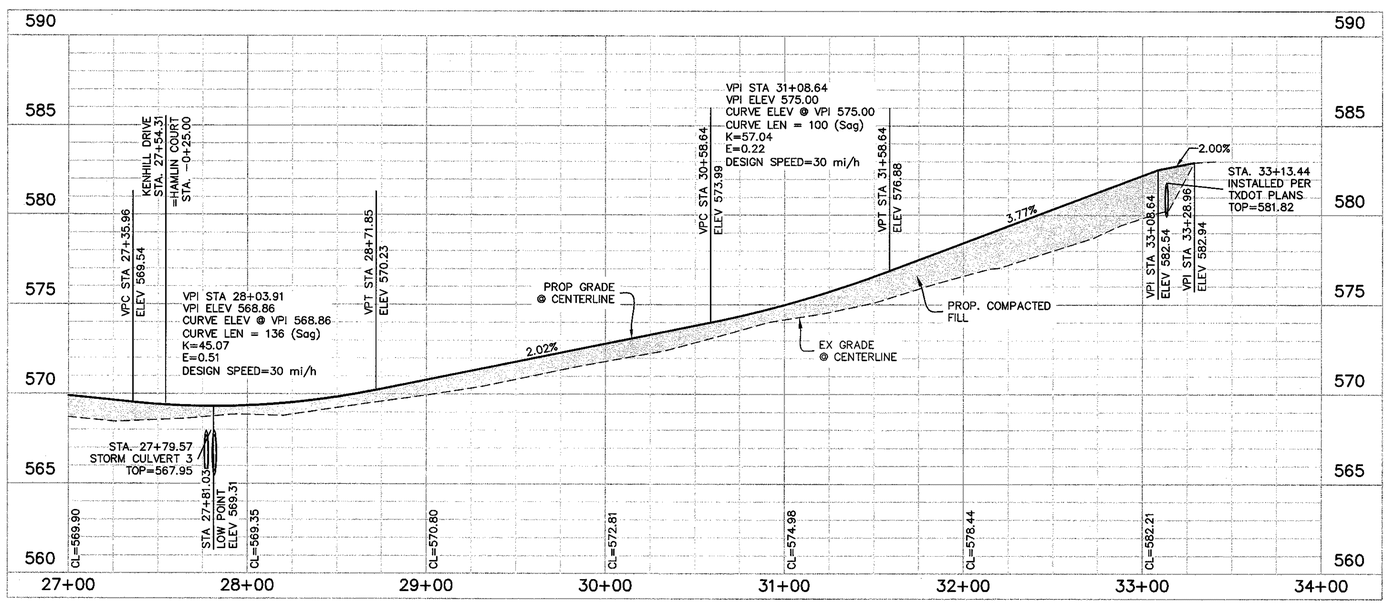
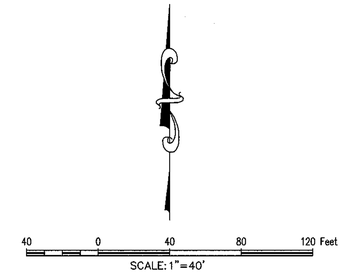




KENWOOD TRAIL



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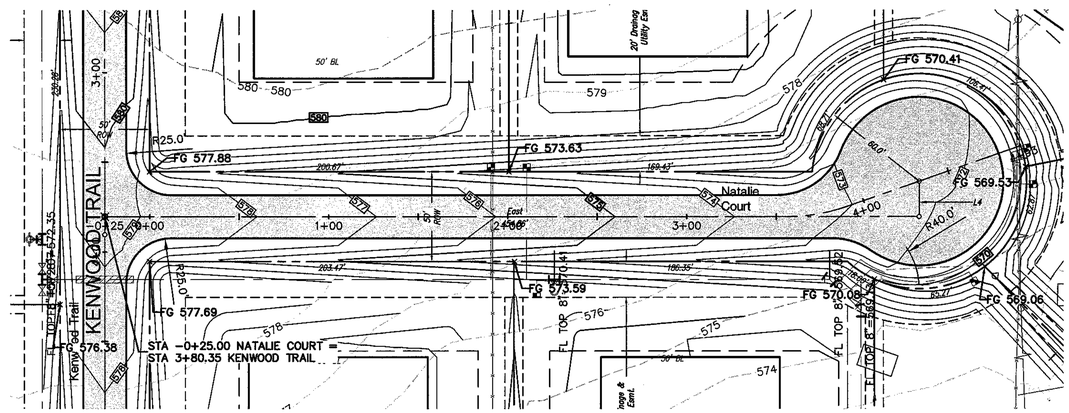

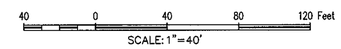

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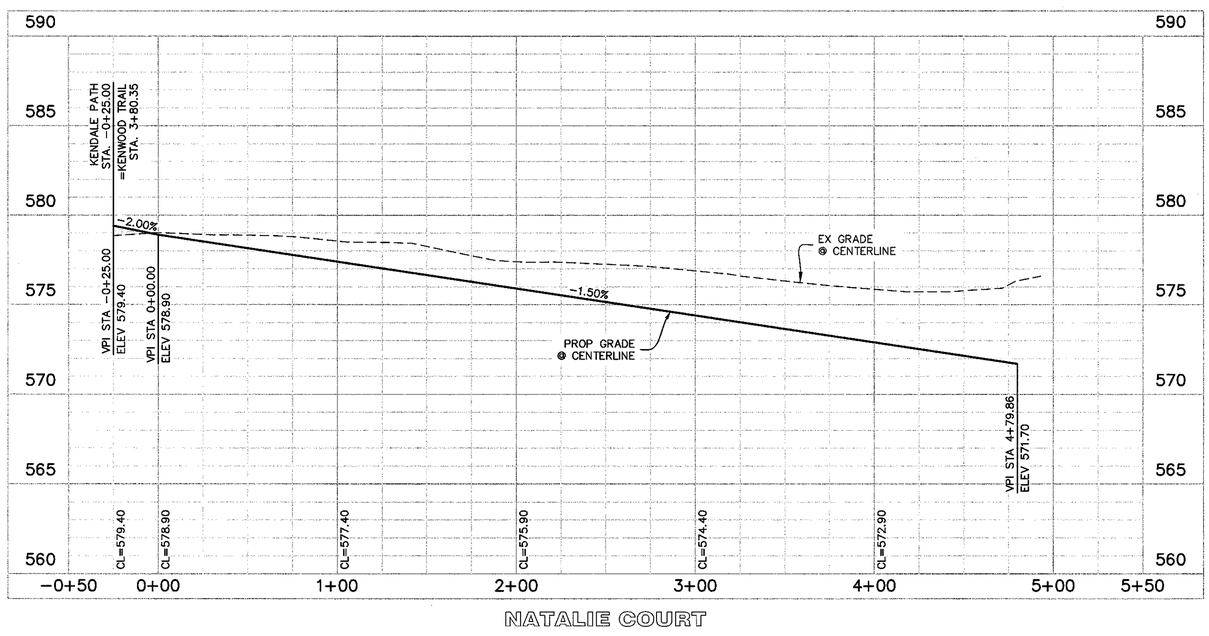

NATALIE COURT

GENERAL NOTES

1. THE CITY OF LUCAS CONSTRUCTION STANDARDS APPLY WHETHER INDICATED ON THESE PLANS OR NOT.

AS-BUILT RECORD DRAWING

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Douglas W. Weaver
G & A Consultants, LLC.

Date: 11/23/2015

STATE OF TEXAS
DOUGLAS W. WEAVER
117386
LICENSED PROFESSIONAL ENGINEER

OWNER/DEVELOPER
CADG LEWIS PARK LLC
C/O LENART DEVELOPMENT COMPANY, LLC
520 CENTRAL PARKWAY E. SUITE 104
PLANO, TX 75074
Ph. (972) 422-9880
Contact: Steve Lenart

SITE PLANNING CIVIL ENGINEERING PLATTING
G&A CONSULTANTS, LLC
LAND SURVEYING LANDSCAPE ARCHITECTURE
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611 Dallas Drive, Suite 114 • Rowlett, TX 75088 • P: 682.831.9712 • F: 817.890.4043
TBPE Firm No. 1798

LEWIS PARK ESTATES

LEWIS PARK ESTATES
Lot 1-16, 1-20, Block A, B
LEWIS PARK ESTATES
60.858 Acres
in the
JAMES ANDERSON SURVEY, ABSTRACT NO. 17
CITY OF LUCAS
COLLIN COUNTY, TEXAS

NATALIE COURT PLAN & PROFILE STA 0+00 TO STA 9+50

G&A CONSULTANTS, LLC.
TBPE F-1798

Drawn By: TJF
Date: 11/07/2014
Scale: H 1"=40; V 1"=4'
Revisions:

14026

C10

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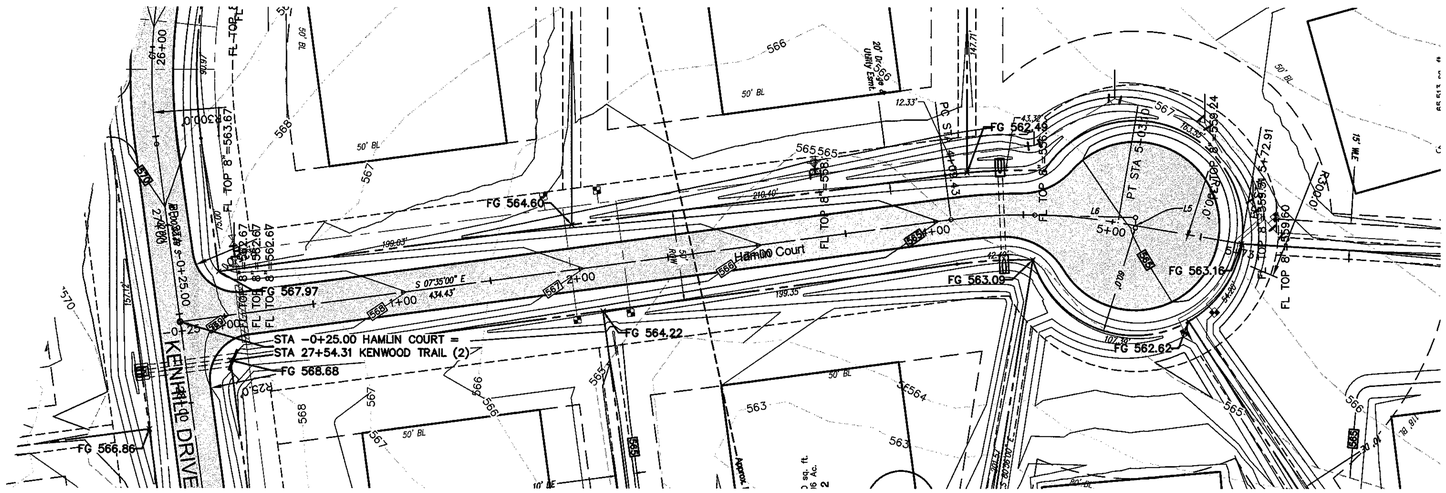

40 0 40 80 120 Feet

SCALE: 1"=40'

BENCHMARKS:

BM#1 – RM133 – 590.08'
Square cut on east headwall of west of bridge at White Rock Creek (East) and FM 1378. Map# 48085C0455G, Dated January 19th, 1996.

TBM#2 – Square Cut – 569.45'
~981' Southwest from the Northwest corner of subject property on south edge of Brookhaven Dr.
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TBM#3 – "X" – 579.96'
~760' Northeast from the Northwest corner of subject property near the intersection of Conner Ln. & Chapel Ct.
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TBM#4 – PK Nail – 554.84'
~900' Northeast from the Northeast corner of subject property at the south edge of a cul-de-sac on Alameda Cir.
N=7,079,803.4' E=2,559,558.0'

TBM#5 – "X" – 584.19'
~1040' Southeast from the southeast corner of subject property on a headwall on the north side of the intersection of FM 1378 & Seis Lagos Trail.
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LEGEND

C.R.F.	Capped Rebar Found		Overhead Power Lines
C.R.S.	Capped Rebar Set		Down Guy Wire
C.M.	Control Monument		
Mon.	Monument	443	Existing Contours
BM	Benchmark	445	Proposed Contours
FH–	Fire Hydrant		Concrete Pavement
WM–	Water Meter		Asphalt Pavement
WV–	Water Valve		Wood Fence
W/L	Water Line		Chain Link Fence
ICV–	Irrigation Control Valve		Wire Fence
SSMH–	Sanitary Sewer Manhole		Masonry Wall
CO–	Sanitary Sewer Cleanout		Existing Tree
UP–	Utility Pole		(FL) Flowline
LP–	Light Pole		Centerline of Creek, Swale, or Waterway
TC	Top of Curb		Creek, Swale, or Waterway Embankment
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TW	Top of Wall		
FG	Finished Grade		
U.E.	Utility Easement		
D.E.	Drainage Easement		
B.L.	Building Line		
R.O.W.	Right-of-Way		
D.R.	Deed Records		
P.R.	Plat Records		

GENERAL NOTES

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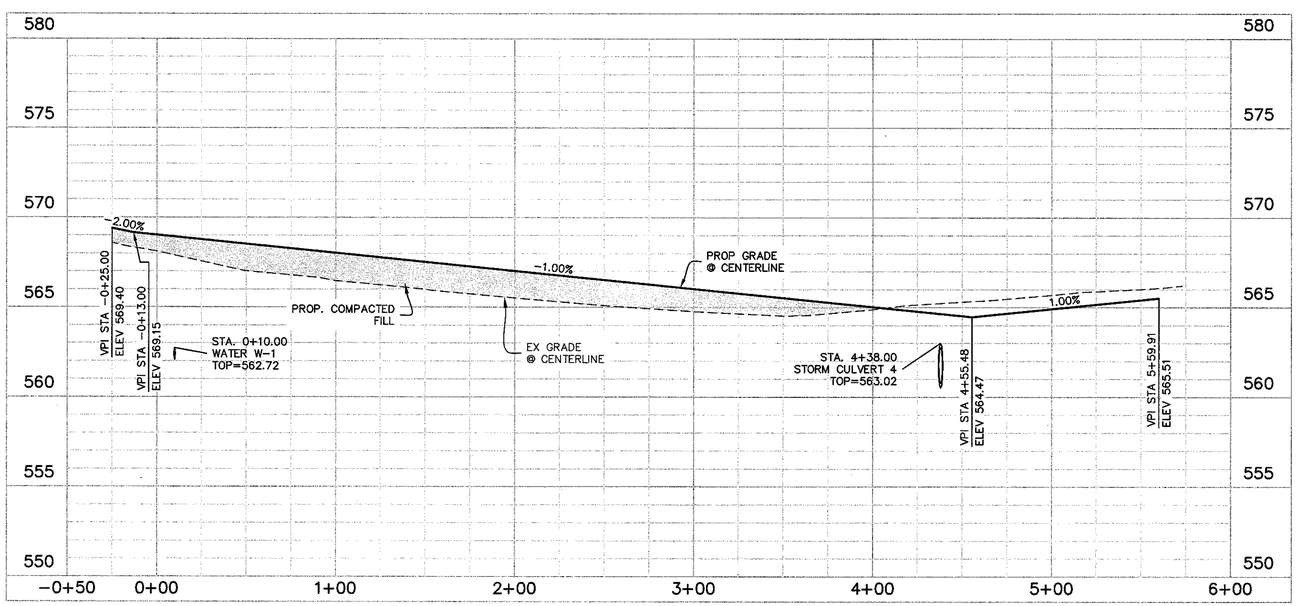

HAMLIN COURT

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HAMLIN COURT PLAN & PROFILE STA 0+00 TO STA 5+60

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Drawn By: TJF
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Scale: H 1"=40'; V 1"=4'
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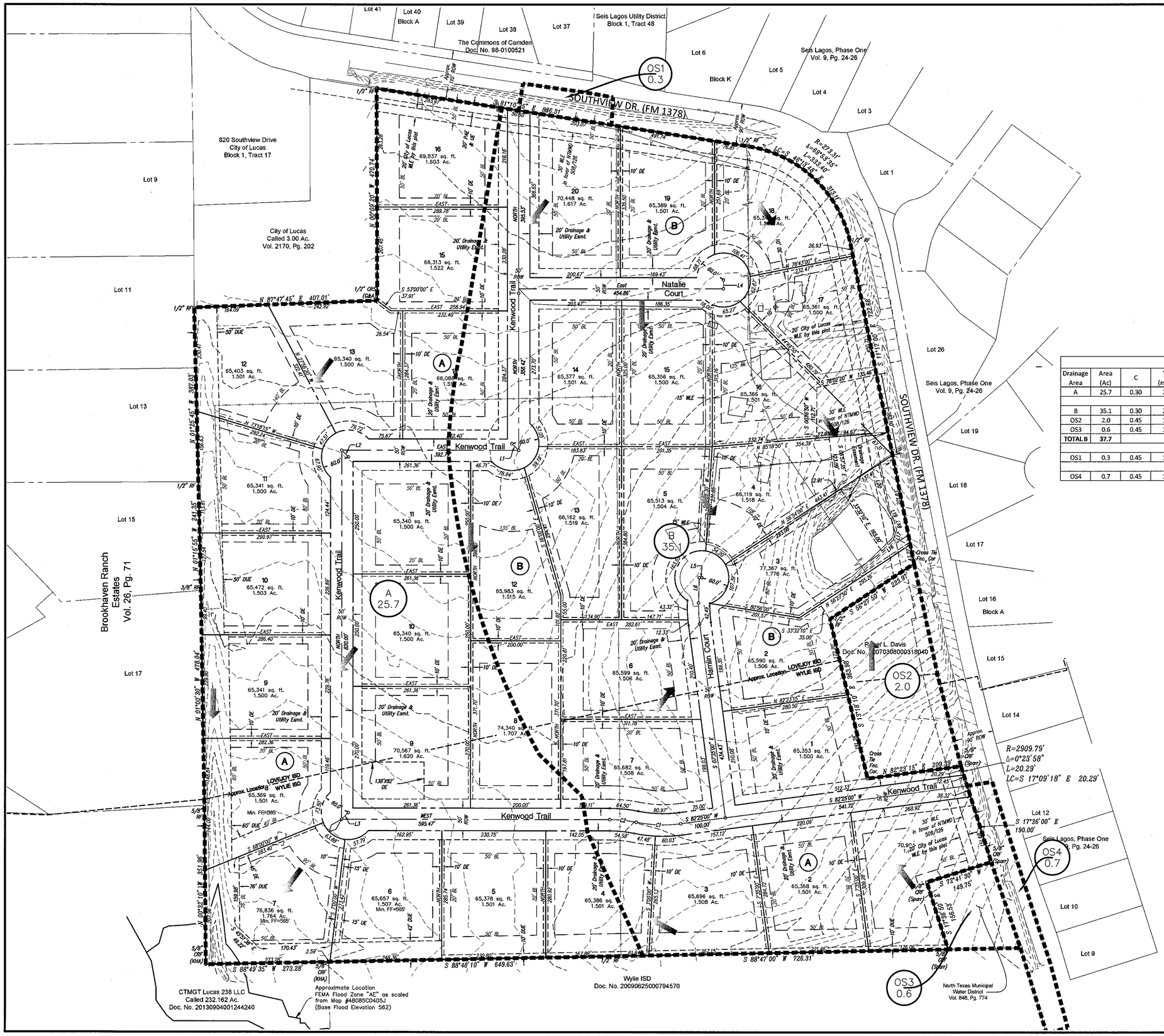

100 0 100 200 300 Feet

SCALE: 1"=100'

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EXISTING DRAINAGE CALCULATIONS

Drainage Area	Area (Ac)	C	Tc (min)	I (in/hr)	Q100 (cfs)	Comments
A	25.7	0.30	20	6.9	53.2	SHEET FLOW TO FLOOD PLAIN
B	35.1	0.30	20	6.9	72.7	SHEET FLOW TO DETENTION POND
OS2	2.0	0.45	10	9.2	8.1	SHEET FLOW TO DETENTION POND
OS3	0.6	0.45	10	9.2	2.6	SHEET FLOW TO LOT 1
TOTAL B	**37.7**				**83.3**	
OS1	0.3	0.45	10	9.2	1.2	SHEET FLOW TO SOUTHVIEW DRIVE
OS4	0.7	0.45	10	9.2	2.9	SHEET FLOW TO SOUTHVIEW DRIVE

LEGEND

C.R.F.	Capped Rebar Found		Overhead Power Lines
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Mon.	Monument	443	Existing Contours
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LP	Light Pole		Centerline of Creek, Swale, or Waterway
TC	Top of Curb		Creek, Swale, or Waterway Embankment
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EXISTING DRAINAGE AREA MAP

G&A CONSULTANTS, LLC.
TBPE F-1798

Drawn By: TAC
Date: 11/07/2014
Scale: 1" = 100'
Revisions:

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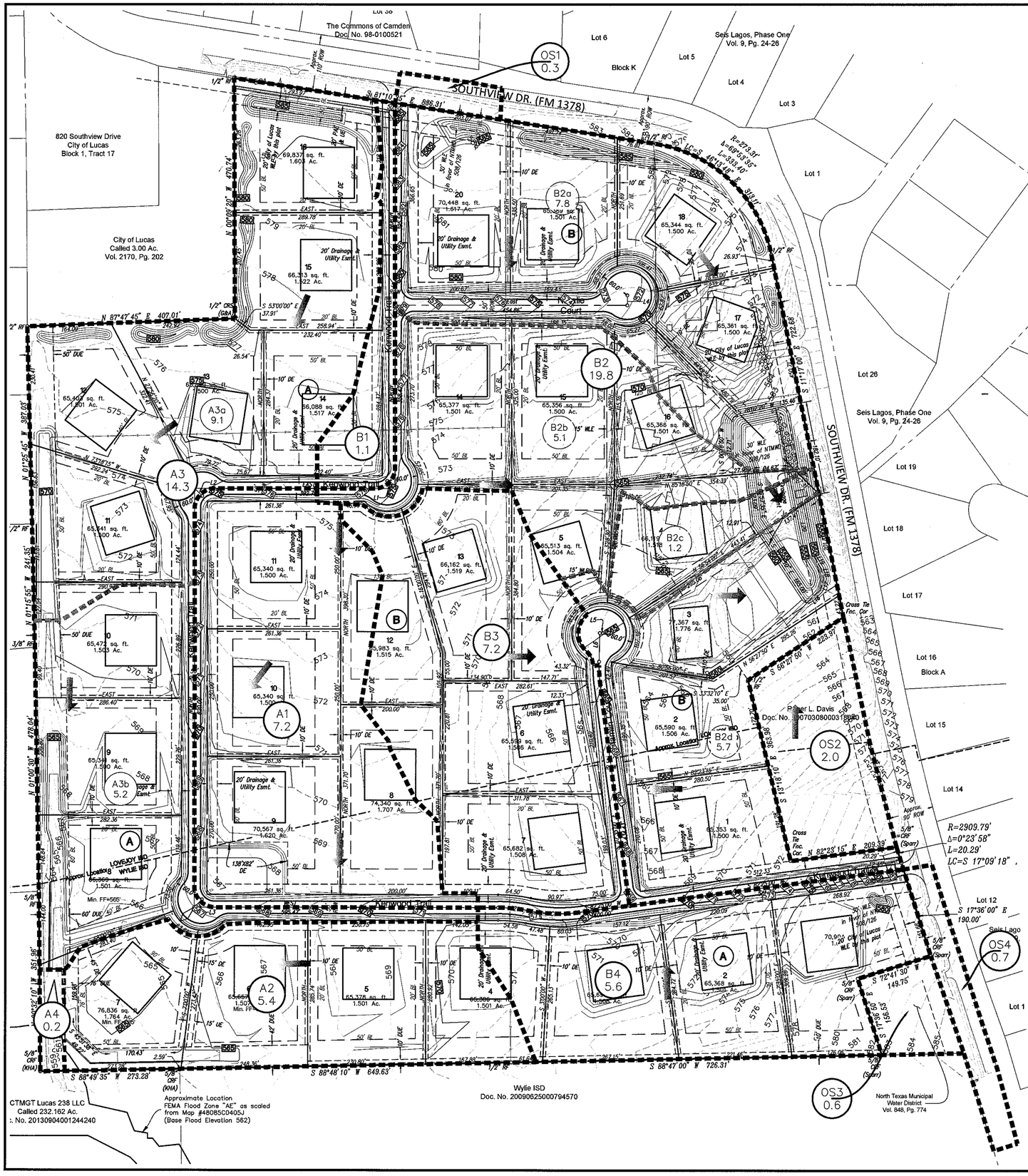

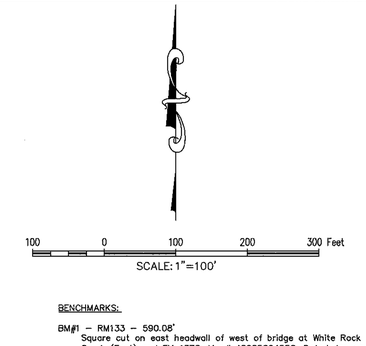

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Drainage Area	Area (Ac)	C	Tc (min)	I (in/hr)	Q100 (cfs)	Comments
OS1	0.3	0.45	10	9.2	1.2	SHEET FLOW TO SOUTHVIEW DRIVE
OS4	0.7	0.45	10	9.2	2.9	SHEET FLOW TO SOUTHVIEW DRIVE
A1	7.2	0.45	10	9.2	29.8	SHEET FLOW TO BAR DITCH THEN TO FLOOD ZONE
A2	5.4	0.45	10	9.2	22.4	SHEET FLOW TO STREET STORM CULVERT
A3	14.3	0.45	10	9.2	59.2	SHEET FLOW TO DRAINAGE BAR DITCH
A4	0.2	0.45	10	9.2	0.8	SHEET FLOW TO DRAINAGE SWALE THEN TO FLOOD ZONE
TOTAL A	**27.1**				**112.2**	
B1	1.1	0.45	10	9.2	4.6	SHEET FLOW TO KENDALE PATH BAR DITCH
B2	19.8	0.45	10	9.2	82.0	SHEET FLOW TO SWALE
B3	7.2	0.45	10	9.2	29.8	SHEET FLOW TO STREET STORM CULVERT
B4	5.6	0.45	10	9.2	23.2	SHEET FLOW TO DETENTION POND
	33.7				**139.5**	
OS2	2.0	0.45	10	9.2	8.1	SHEET FLOW TO DRAINAGE SWALE
OS3	0.6	0.45	10	9.2	2.6	SHEET FLOW TO DRAINAGE SWALE
	2.6				**10.7**	
TOTAL B	**36.3**				**150.2**	

A1	7.2	0.45	10	9.2	29.8	SHEET FLOW TO BAR DITCH ON KENWOOD TRAIL THEN TO FLOOD ZONE
A2	5.4	0.45	10	9.2	22.4	SHEET FLOW TO DETENTION A2 THEN TO FLOOD ZONE
A3a	9.1	0.45	10	9.2	37.7	SHEET FLOW TO DRAINAGE SWALE THEN TO DETENTION A3a
A3b	5.2	0.45	10	9.2	21.5	SHEET FLOW TO DRAINAGE SWALE THEN TO DETENTION A3b THEN TO FLOOD ZONE
A4	0.2	0.45	10	9.2	0.8	SHEET FLOW TO FLOOD ZONE
TOTAL A	**27.1**				**112.2**	

LEGEND

C.R.F.	Capped Rebar Found		Overhead Power Lines
C.R.S.	Capped Rebar Set		Down Guy Wire
C.M.	Control Monument	443	Existing Contours
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ICV–	Irrigation Control Valve		Masonry Wall
SSMH–	Sanitary Sewer Manhole		Existing Tree
CO–	Sanitary Sewer Cleanout		(FL) Flowline
UP–	Utility Pole		Centerline of Creek, Swale, or Waterway
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PROPOSED DRAINAGE AREA MAP

G&A CONSULTANTS, LLC.
TBPE F-1798

Drawn By: TAC
Date: 11/07/2014
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Revisions:

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Plot: S:\2014\2026 Drainage\01 P & Grad Plans\SHEET SET\2026.dwg
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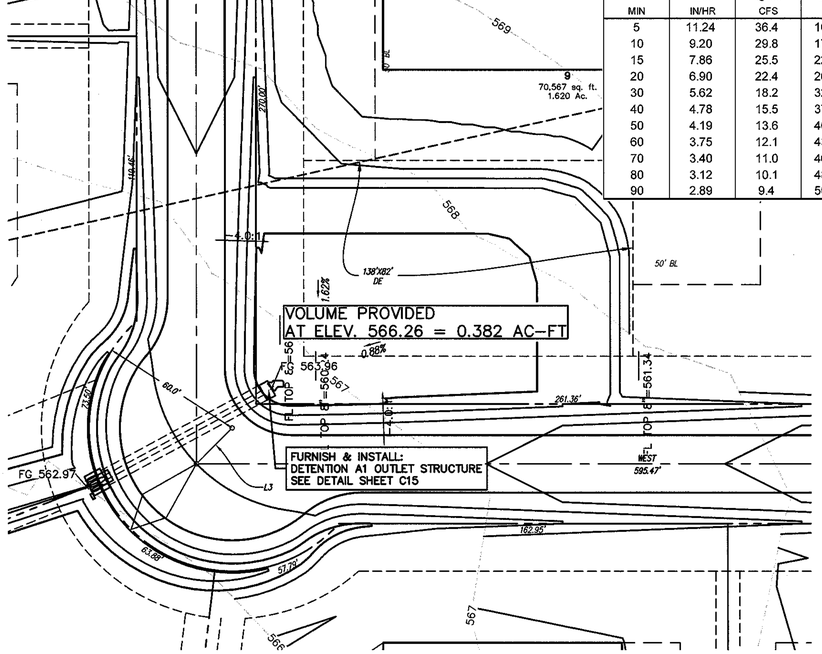
DETENTION "A1"

Detention Computations for Proposed Development
City of Lucas

		Undeveloped		Developed		Bypass
Area	A=	7.200	AC	7.200	AC	0.000
Runoff Coeficient	C=	0.30		0.45		0.45
Time of Concentration	Tc=	20.0	MIN	10.0	MIN	10.0
Rainfall Intensity	I100=	*6.90*	IN/HR	*9.20*	IN/HR	9.20
Peak Rate of Runoff	Q100=	*14.9*	CFS	*29.8*	CFS	0.0
Allowable Outflow	Q100=			*14.9*	CFS	

Tc	I100	Q100	Inflow	Outflow	Storage		Required
MIN	IN/HR	CFS	CF	CF	CF	AC-FT	AC-FT
5	11.24	36.4	10,921	6,707	4,214	0.097	
10	9.20	29.8	17,876	8,942	8,933	0.205	
15	7.86	25.5	22,908	11,178	11,730	0.269	
20	6.90	22.4	26,830	13,414	13,417	0.308	
30	5.62	18.2	32,751	17,885	14,866	0.341	**0.341**
40	4.78	15.5	37,180	22,356	14,824	0.340	
50	4.19	13.6	40,729	26,827	13,902	0.319	
60	3.75	12.1	43,702	31,298	12,403	0.285	
70	3.40	11.0	46,267	35,770	10,497	0.241	
80	3.12	10.1	48,529	40,241	8,288	0.190	
90	2.89	9.4	50,557	44,712	5,845	0.134	

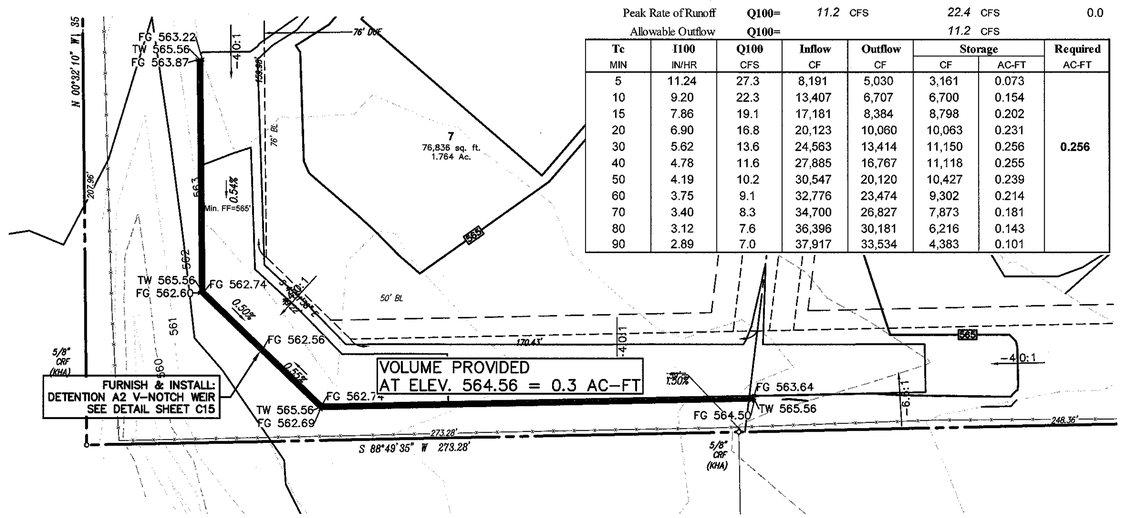


DETENTION "A2"

Detention Computations for Proposed Development
City of Lucas

		Undeveloped		Developed		Bypass
Area	A=	5.400	AC	5.400	AC	0.000
Runoff Coeficient	C=	0.30		0.45		0.45
Time of Concentration	Tc=	20.0	MIN	10.0	MIN	10.0
Rainfall Intensity	I100=	*6.90*	IN/HR	*9.20*	IN/HR	9.20
Peak Rate of Runoff	Q100=	*11.2*	CFS	*22.4*	CFS	0.0
Allowable Outflow	Q100=			*11.2*	CFS	

Tc	I100	Q100	Inflow	Outflow	Storage		Required
MIN	IN/HR	CFS	CF	CF	CF	AC-FT	AC-FT
5	11.24	27.3	8,191	5,030	3,161	0.073	
10	9.20	22.3	13,407	6,707	6,700	0.154	
15	7.86	19.1	17,181	8,384	8,798	0.202	
20	6.90	16.8	20,123	10,060	10,063	0.231	
30	5.62	13.6	24,563	13,414	11,150	0.256	**0.256**
40	4.78	11.6	27,885	16,767	11,118	0.255	
50	4.19	10.2	30,547	20,120	10,427	0.239	
60	3.75	9.1	32,776	23,474	9,302	0.214	
70	3.40	8.3	34,700	26,827	7,873	0.181	
80	3.12	7.6	36,396	30,181	6,216	0.143	
90	2.89	7.0	37,917	33,534	4,383	0.101	

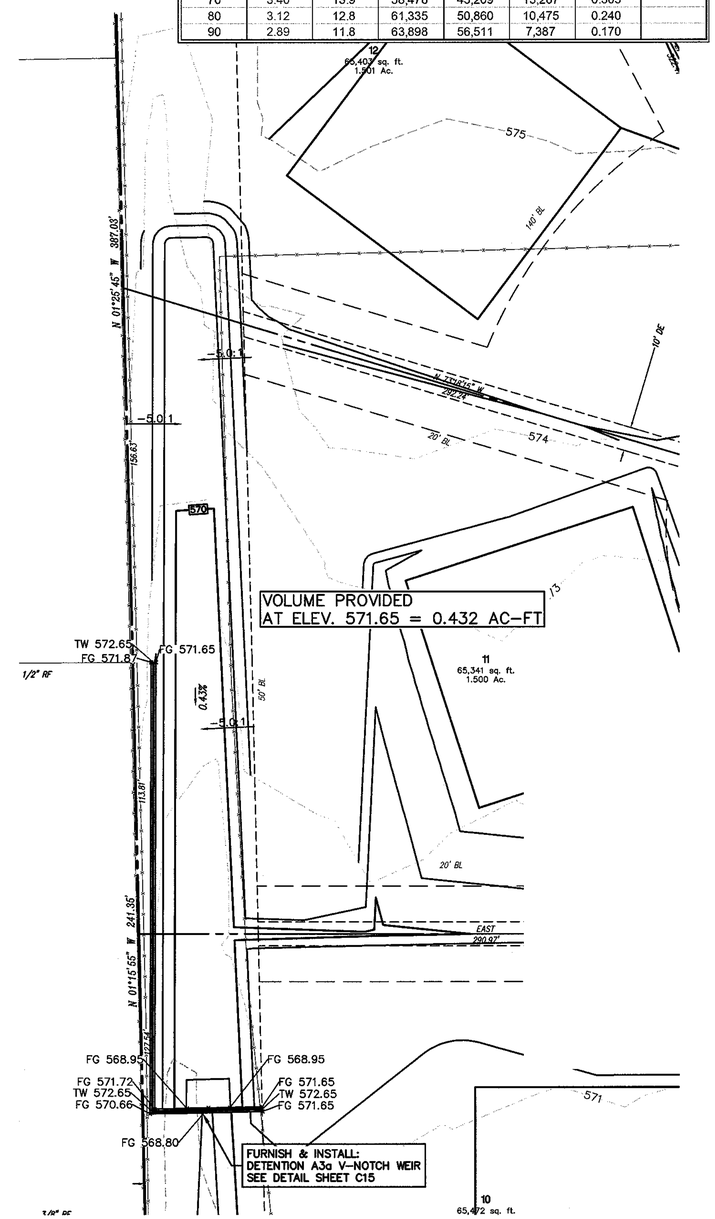


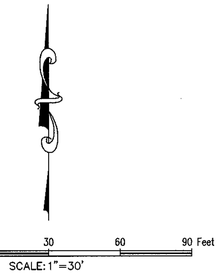
DETENTION "A3a"

Detention Computations for Proposed Development
City of Lucas

		Undeveloped		Developed		Bypass
Area	A=	9.100	AC	9.100	AC	0.000
Runoff Coeficient	C=	0.30		0.45		0.45
Time of Concentration	Tc=	20.0	MIN	10.0	MIN	10.0
Rainfall Intensity	I100=	*6.90*	IN/HR	*9.20*	IN/HR	9.20
Peak Rate of Runoff	Q100=	*18.8*	CFS	*37.7*	CFS	0.0
Allowable Outflow	Q100=			*18.8*	CFS	

Tc	I100	Q100	Inflow	Outflow	Storage		Required
MIN	IN/HR	CFS	CF	CF	CF	AC-FT	AC-FT
5	11.24	46.0	13,803	8,477	5,327	0.122	
10	9.20	37.7	22,593	11,302	11,290	0.259	
15	7.86	32.2	28,953	14,128	14,825	0.340	
20	6.90	28.3	33,911	16,953	16,957	0.389	
30	5.62	23.0	41,394	22,604	18,790	0.431	**0.431**
40	4.78	19.6	46,991	28,256	18,736	0.430	
50	4.19	17.2	51,477	33,907	17,571	0.403	
60	3.75	15.3	55,234	39,558	15,676	0.360	
70	3.40	13.9	58,476	45,209	13,267	0.305	
80	3.12	12.8	61,335	50,860	10,475	0.240	
90	2.89	11.8	63,898	56,511	7,387	0.170	





BENCHMARKS:

BM#1 – RM133 – 590.08'
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TBM#5 – "X" – 584.19'
~1040' Southeast from the southeast corner of subject property on a headwall on the north side of the intersection of FM 1378 & Sels Logos Trail.
N=7,076,568.5' E=2,559,653.8'

LEGEND

C.R.F.	Capped Rebar Found		Overhead Power Lines
C.R.S.	Capped Rebar Set		Down Guy Wire
C.M.	Control Monument		
Mon.	Monument	443	Existing Contours
BM	Benchmark	445	Proposed Contours
FH–	Fire Hydrant		Concrete Pavement
WM–	Water Meter		
WV–	Water Valve		
W/L	Water Line		Asphalt Pavement
ICV–	Irrigation Control Valve		Wood Fence
SSMH–	Sanitary Sewer Manhole		
CO–	Sanitary Sewer Cleanout		Chain Link Fence
UP–	Utility Pole		
LP–	Light Pole		Wire Fence
TC	Top of Curb		
TP	Top of Pavement		Masonry Wall
TW	Top of Wall		Existing Tree
FG	Finished Grade		
U.E.	Utility Easement		(FL) Flowline
D.E.	Drainage Easement		
B.L.	Building Line		Centerline of Creek, Swale, or Waterway
R.O.W.	Right-of-Way		
D.R.	Deed Records		Creek, Swale, or Waterway Embankment
P.R.	Plat Records		

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AS-BUILT RECORD DRAWING

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G & A Consultants, LLC.

Date: 11/23/2015

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C/O LENART DEVELOPMENT COMPANY, LLC
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PLANO, TX 75074
Ph. (972) 422-9880
Contact: Steve Lenart

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TBPE-Firm No. 1798 TBPLS Firm No. 10097700

LEWIS PARK ESTATES

LEWIS PARK ESTATES
Lot 1-16, 1-20, Block A, B
LEWIS PARK ESTATES
60.858 Acres
in the
JAMES ANDERSON SURVEY, ABSTRACT NO. 17
CITY OF LUCAS
COLLIN COUNTY, TEXAS

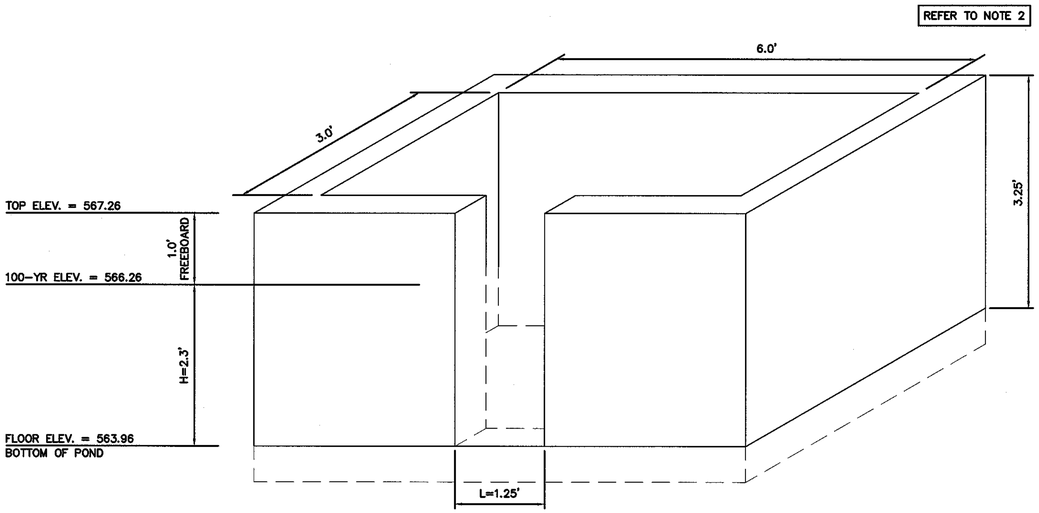
DETENTION POND DETAILS & CALCULATIONS

G&A CONSULTANTS, LLC.
TBPE F-1798

Drawn By: TAC
Date: 11/07/2014
Scale: 1" = 30'
Revisions:

14026

C14



DETENTION A1 OUTLET STRUCTURE
NTS

DETENTION A1 OUTLET STRUCTURE			
Q (cfs)	Cw	L (ft.)	H (ft.)
13.50	3.33	1.25	2.25
Q=CwLH^1.5			

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C.M.	Control Monument	
Mon.	Monument	Existing Contours (443)
BM	Benchmark	
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WV–	Water Valve	Concrete Pavement
W/L	Water Line	Asphalt Pavement
ICV–	Irrigation Control Valve	
SSMH–	Sanitary Sewer Manhole	Wood Fence
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UP–	Utility Pole	
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TC	Top of Curb	
TP	Top of Pavement	Masonry Wall
TW	Top of Wall	
FG	Finished Grade	Existing Tree
U.E.	Utility Easement	(FL) Flowline
D.E.	Drainage Easement	
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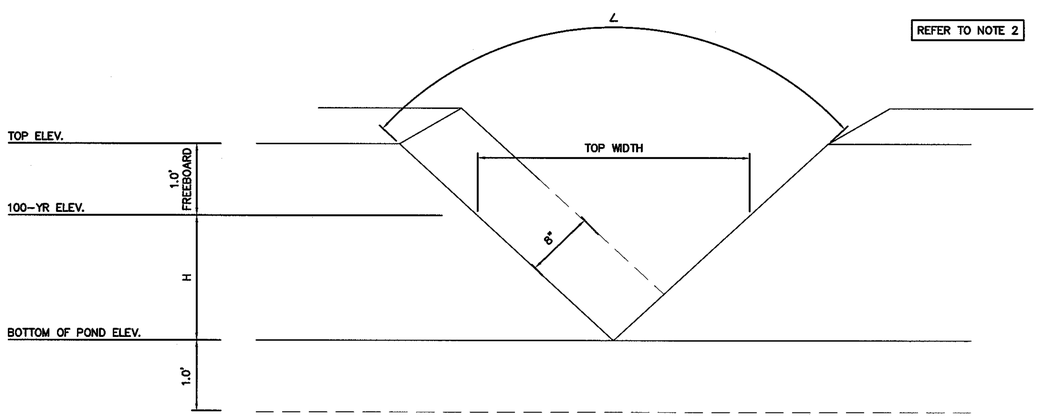

V-NOTCH WEIR
NTS

V-NOTCH WEIR					
DETENTION AREA	Q (cfs)	Cw	∠ (°)	H (ft.)	TOP WIDTH (ft.)
A2	11.00	2.77	95.00	1.75	3.75
A3a	18.80	1.78	60.00	2.85	3.20
Q=CwH^2.5 Cw=2.54Tan(∠/2)					

V-NOTCH WEIR ELEVATIONS			
DETENTION AREA	TOP ELEV.	100-YR ELEV.	BOTTOM OF POND ELEV.
A2	565.56	564.56	562.56
A3a	572.65	571.65	569.40

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DETENTION POND DETAILS & CALCULATIONS

G&A CONSULTANTS, LLC.
TBPE F-1798

Drawn By: TJF
Date: 11/07/2014
Scale: NTS
Revisions:

14026

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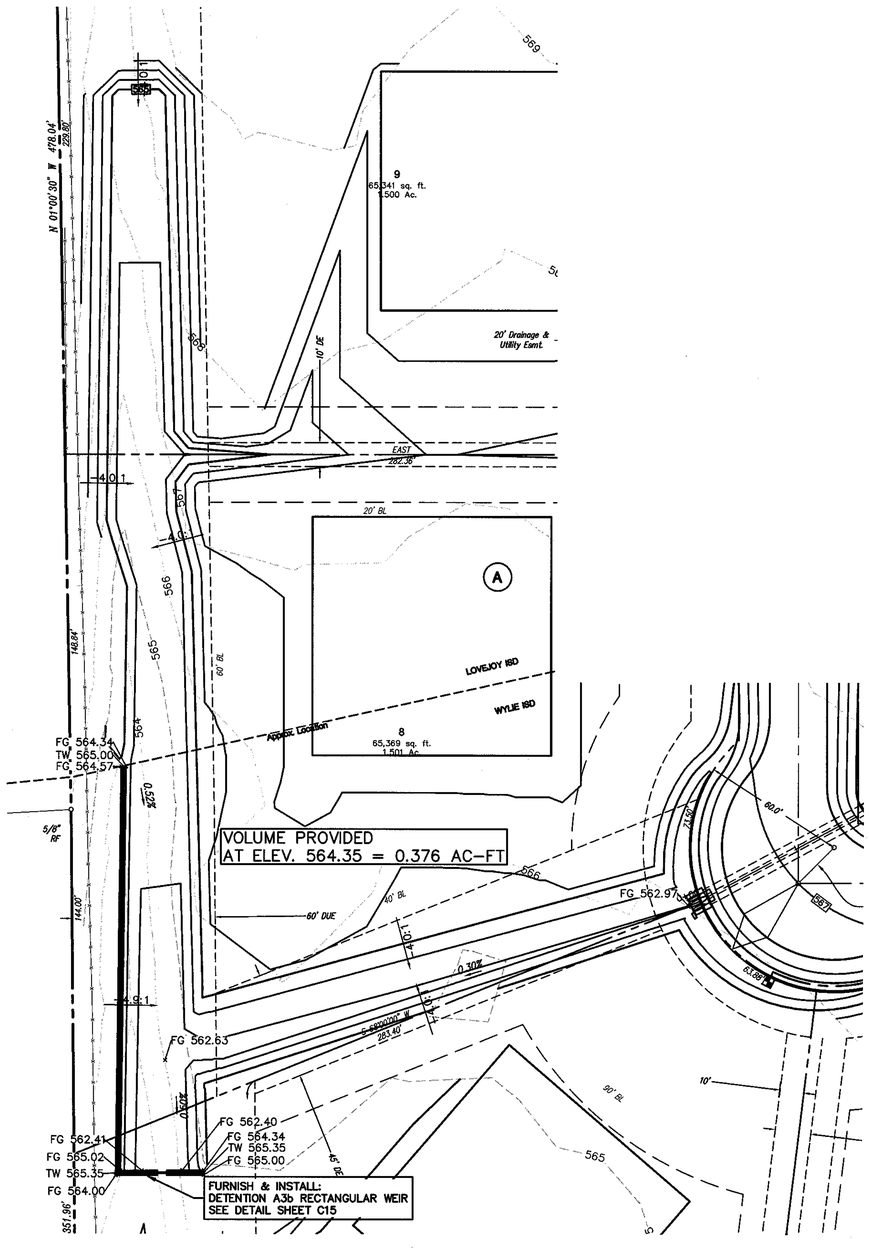


DETENTION "A3b"

Detention Computations for Proposed Development
City of Lucas

		Undeveloped		Developed		Bypass
Area	A=	5.200	AC	5.200	AC	0.000
Runoff Coeficient	C=	0.30		0.45		0.45
Time of Concentration	Tc=	20.0	MIN	10.0	MIN	10.0
Rainfall Intensity	I100=	*6.90*	IN/HR	*9.20*	IN/HR	9.20
Peak Rate of Runoff	Q100=	*10.8*	CFS	*21.5*	CFS	0.0
Allowable Outflow	Q100=			*10.8*	CFS	

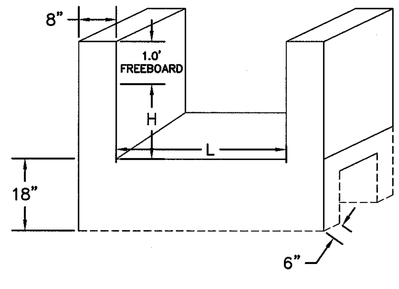
Tc	I100	Q100	Inflow	Outflow	Storage		Required
MIN	IN/HR	CFS	CF	CF	CF	AC-FT	AC-FT
5	11.24	26.3	7,888	4,844	3,044	0.070	
10	9.20	21.5	12,910	6,458	6,452	0.148	
15	7.86	18.4	16,545	8,073	8,472	0.194	
20	6.90	16.1	19,378	9,688	9,690	0.222	
30	5.62	13.1	23,654	12,917	10,737	0.246	**0.246**
40	4.78	11.2	26,852	16,146	10,706	0.246	
50	4.19	9.8	29,416	19,375	10,040	0.230	
60	3.75	8.8	31,562	22,604	8,958	0.206	
70	3.40	8.0	33,415	25,834	7,581	0.174	
80	3.12	7.3	35,048	29,063	5,986	0.137	
90	2.89	6.8	36,513	32,292	4,221	0.097	
100	2.70	6.3	37,843	35,521	2,322	0.053	
110	2.53	5.9	39,063	38,750	313	0.007	
120	2.39	5.6	40,192	41,980	(1,787)	-0.041	

RECTANGULAR WEIR

DETENTION AREA	Q (cfs)	Cw	L (ft)	H (ft)
A3b	41.10	3.33	3.75	2.25
Q=CwLH^1.5				

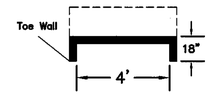
RECTANGULAR WEIR ELEVATIONS

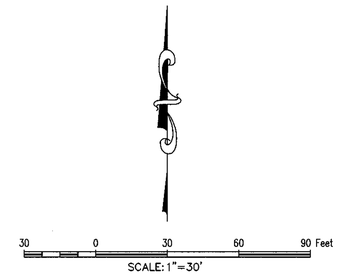
DETENTION AREA	TOP ELEV.	100-YR ELEV.	BOTTOM OF POND ELEV.
A3b	565.35	564.35	562.10



RECTANGULAR WEIR
NTS

REFER TO NOTE 2





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LEGEND

C.R.F.	Capped Rebar Found		Overhead Power Lines
C.R.S.	Capped Rebar Set		Down Guy Wire
C.M.	Control Monument	443	Existing Contours
Mon.	Monument	445	Proposed Contours
BM	Benchmark		Concrete Pavement
FH–	Fire Hydrant		Asphalt Pavement
WM–	Water Meter		Wood Fence
WV–	Water Valve		Chain Link Fence
W/L	Water Line		Wire Fence
ICV–	Irrigation Control Valve		Masonry Wall
SSMH–	Sanitary Sewer Manhole		Existing Tree
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UP–	Utility Pole		Centerline of Creek, Swale, or Waterway
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TC	Top of Curb		
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TBPE F-1798

Drawn By: TAC
Date: 11/07/2014
Scale: 1"=30'
Revisions:

14026

C16

DETENTION "B"

Detention Computations for Proposed Development
City of Lucas

		Undeveloped		Developed		Bypass
Area	A=	37.700	AC	37.700	AC	0.000
Runoff Coeficient	C=	0.32		0.45		0.00
Time of Concentration	Tc=	20.0	MIN	10.0	MIN	0.0
Rainfall Intensity	I100=	*6.90*	IN/HR	*9.20*	IN/HR	0.00
Peak Rate of Runoff	Q100=	*83.3*	CFS	*156.1*	CFS	0.0
Allowable Outflow	Q100=			*83.3*	CFS	

Tc	I100	Q100	Inflow	Outflow	Storage		Required
MIN	IN/HR	CFS	CF	CF	CF	AC-FT	AC-FT
5	11.24	190.6	57,185	37,506	19,679	0.452	
10	9.20	156.0	93,598	50,007	43,591	1.001	
15	7.86	133.3	119,949	62,509	57,440	1.319	
20	6.90	117.1	140,487	75,011	65,476	1.503	
30	5.62	95.3	171,489	100,015	71,474	1.641	**1.641**
40	4.78	81.1	194,678	125,018	69,659	1.599	
50	4.19	71.1	213,263	150,022	63,241	1.452	
60	3.75	63.6	228,826	175,026	53,801	1.235	
70	3.40	57.7	242,257	200,030	42,227	0.969	
80	3.12	52.9	254,101	225,033	29,068	0.667	
90	2.89	49.0	264,720	250,037	14,683	0.337	

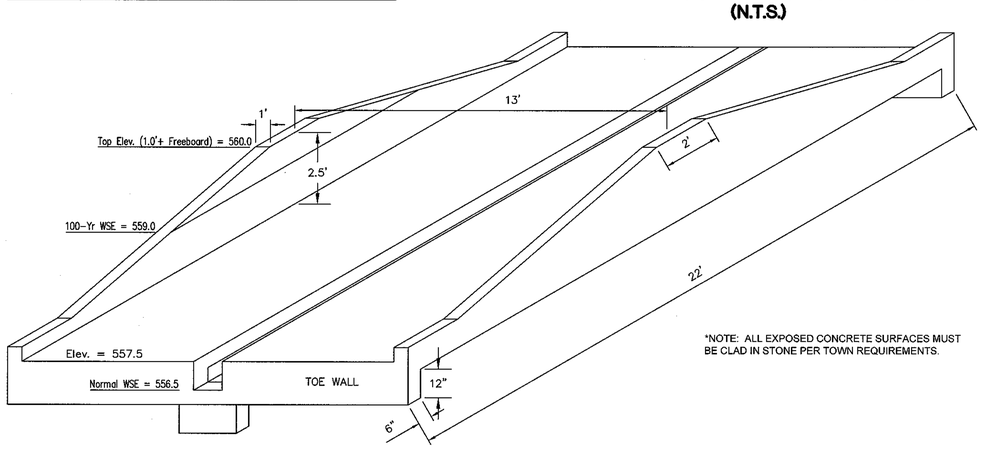
COMPOUND WEIR

DETENTION AREA	Q (cfs)	Cw	L (ft)	H (ft)	X (ft)	A (ft)
B	83.30	3.33	13.00	1.50	1.00	1.00
Q=CwLH^1.5 + CwA^1.5						

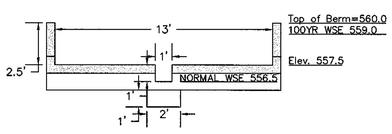
COMPOUND WEIR ELEVATIONS

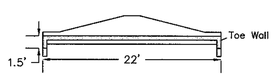
DETENTION AREA	TOP ELEV.	100-YR ELEV.	BOTTOM OF POND ELEV.
B	560.00	559.00	556.50 NORMAL WSE

Retention/Detention Pond Outlet Structure (N.T.S.)



*NOTE: ALL EXPOSED CONCRETE SURFACES MUST BE CLAD IN STONE PER TOWN REQUIREMENTS.

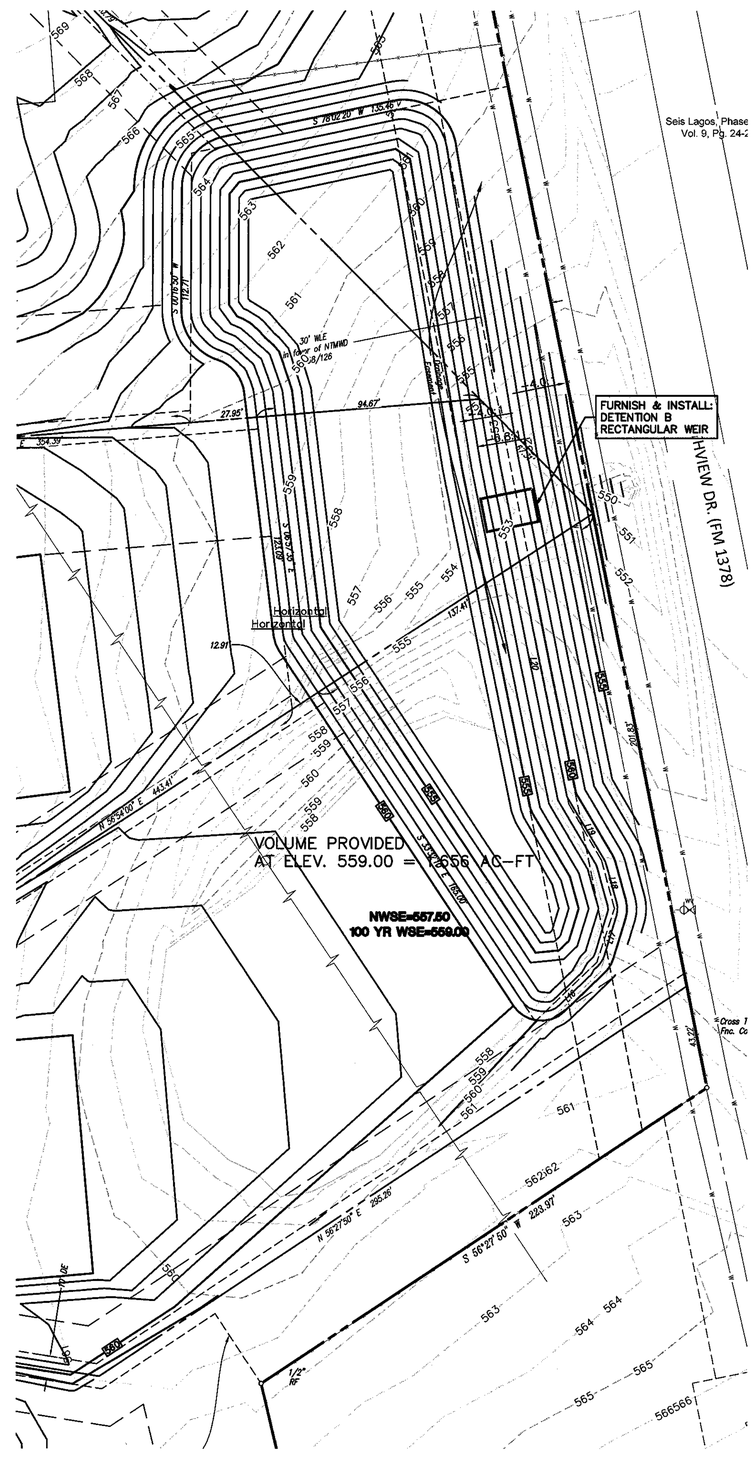


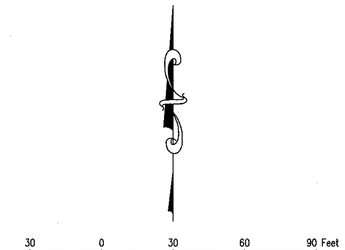


WEIR CROSS SECTIONS (N.T.S)

LENGTH = 22 FT
WIDTH = 13 FT
HEIGHT = 2.5 FT

6" 3000 PSI CONCRETE
W/ #3 REBAR 12" O.C.E.W.
& 12" TOE WALLS (INFLOW AND OUTFLOW)





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TBM#5 – "X" – 584.19'
~1040' Southeast from the southeast corner of subject property on a headwall on the north side of the intersection of FM 1378 & Seis Lagos Trail.
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LEGEND

C.R.F.	Capped Rebar Found		Overhead Power Lines
C.R.S.	Capped Rebar Set		Down Guy Wire
C.M.	Control Monument	443	Existing Contours
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WV–	Water Valve		Chain Link Fence
W/L	Water Line		Masonry Wall
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B.L.	Building Line		
R.O.W.	Right-of-Way		
D.R.	Deed Records		
P.R.	Plat Records		

GENERAL NOTES

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3. NOT TO SCALE (NTS).

AS-BUILT RECORD DRAWING

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Douglas W. Weaver
G & A Consultants, LLC.

Date: 11/23/2015

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117386
LICENSED
PROFESSIONAL ENGINEER

OWNER/DEVELOPER
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TBPLS Firm No. 10047100 TBPE Firm No. 1798

LEWIS PARK ESTATES

LEWIS PARK ESTATES
Lot 1-16, 1-20, Block A, B
LEWIS PARK ESTATES
60.858 Acres
The
JAMES ANDERSON SURVEY, ABSTRACT NO. 17
CITY OF LUCAS
COLLIN COUNTY, TEXAS

DETENTION POND DETAILS AND CALCULATIONS

G&A CONSULTANTS, LLC.
TBPE F-1798

Drawn By: TJF
Date: 11/07/2014
Scale: NTS
Revisions:

14026

C17

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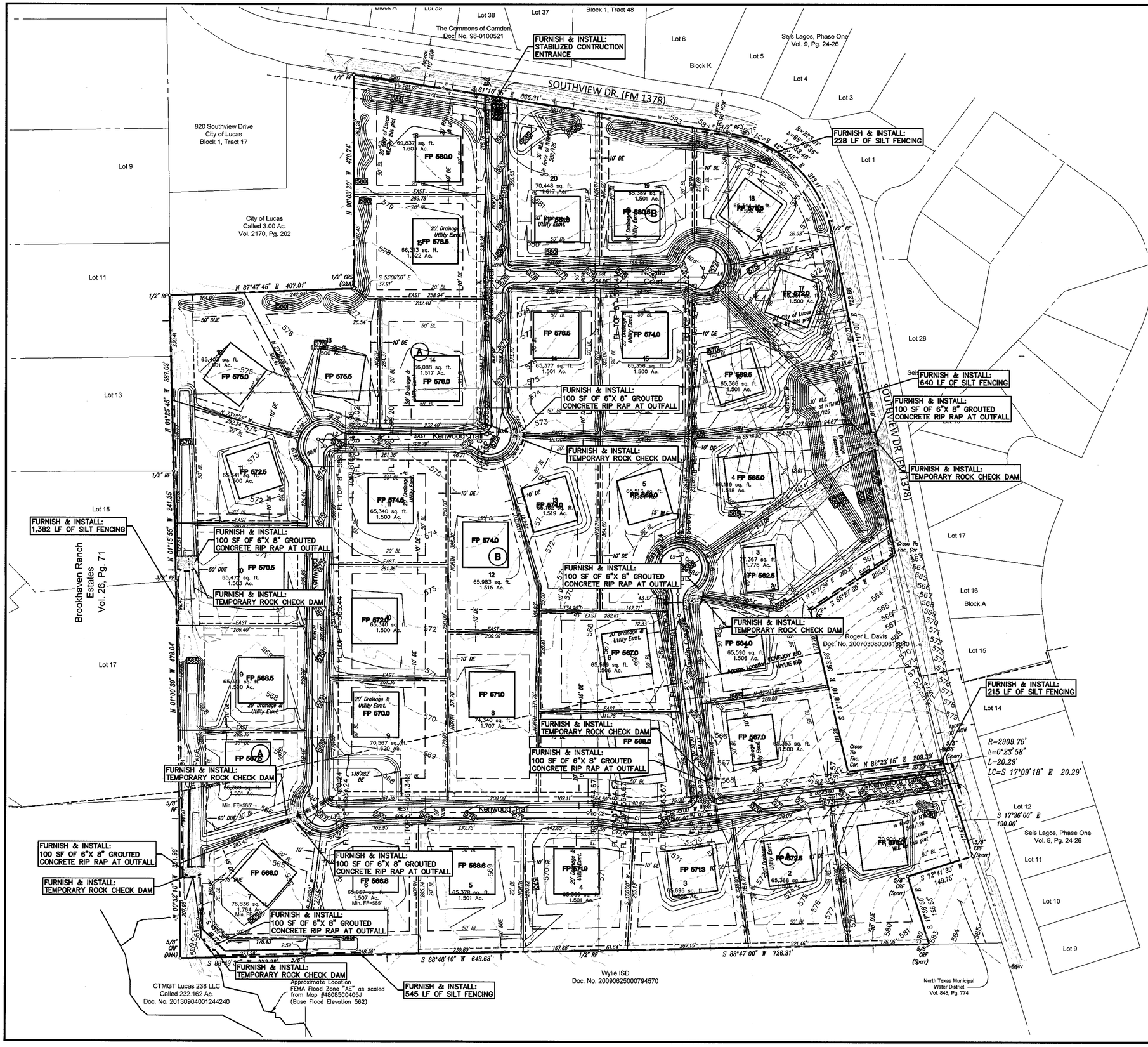

100 0 100 200 300 Feet

SCALE: 1"=100'

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TBPE Firm No. 1798 TBPLS Firm No. 10047700

LEWIS PARK ESTATES

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CITY OF LUCAS
COLLIN COUNTY, TEXAS

GRADING & EROSION CONTROL PLAN

G&A CONSULTANTS, LLC.
TBPE F-1798

Drawn By: TJF
Date: 11/07/2014
Scale: 1" = 100'
Revisions:
06/25/15

14026

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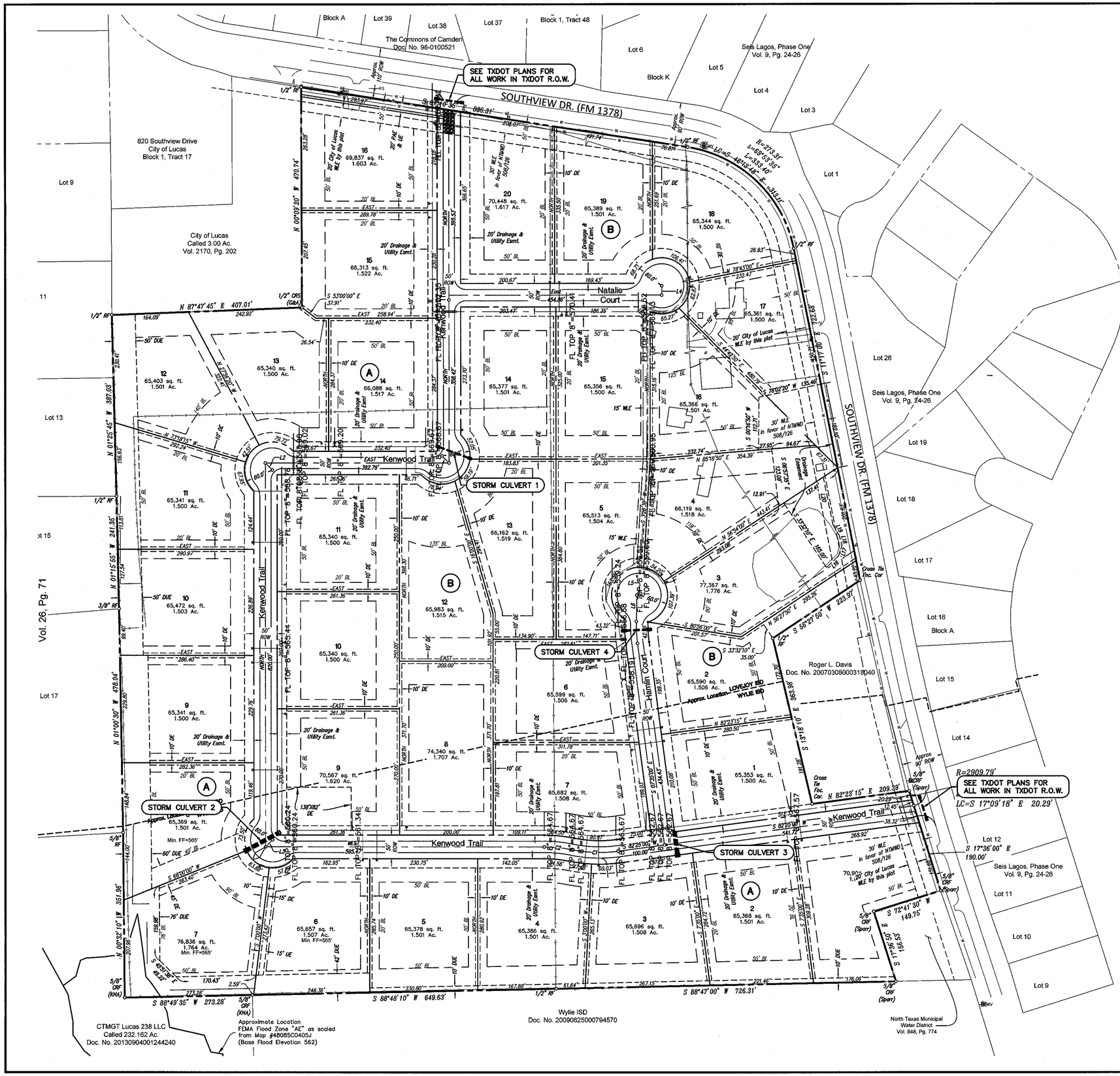

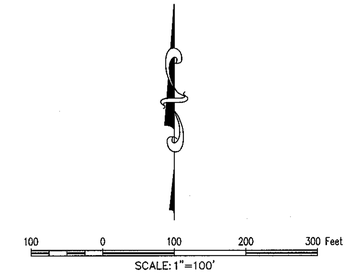

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60.858 Acres
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COLLIN COUNTY, TEXAS

STORM SEWER PLAN

G&A CONSULTANTS, LLC.
TBPE F-1798

Drawn By: TJF
Date: 11/07/2014
Scale: 1" = 100'
Revisions:

14026

C19

LEWIS PARK ESTATES

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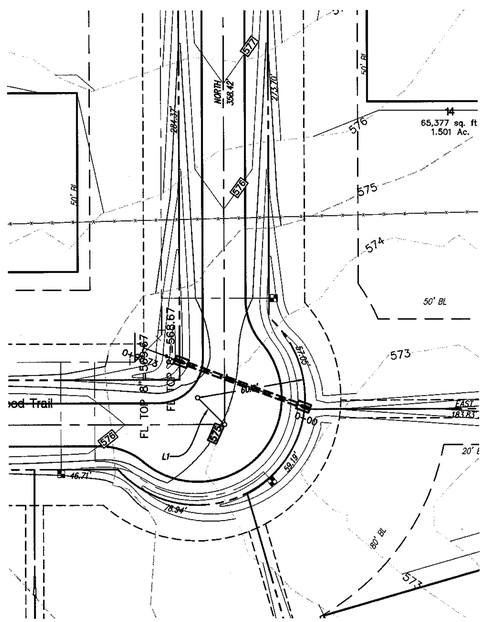

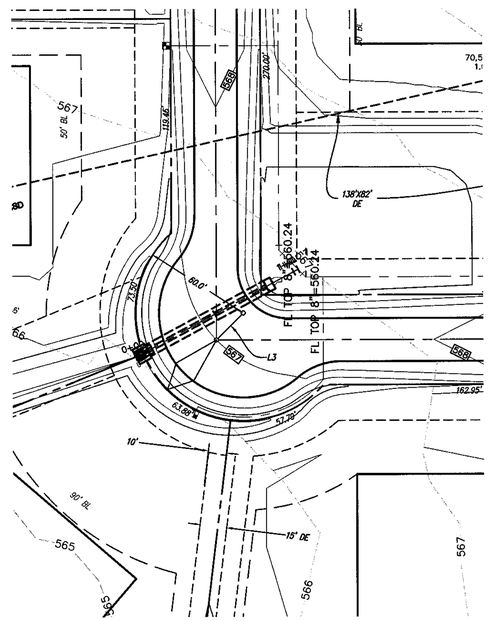

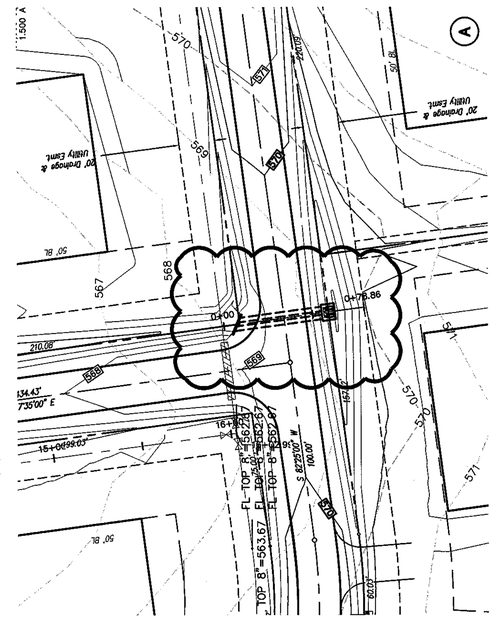

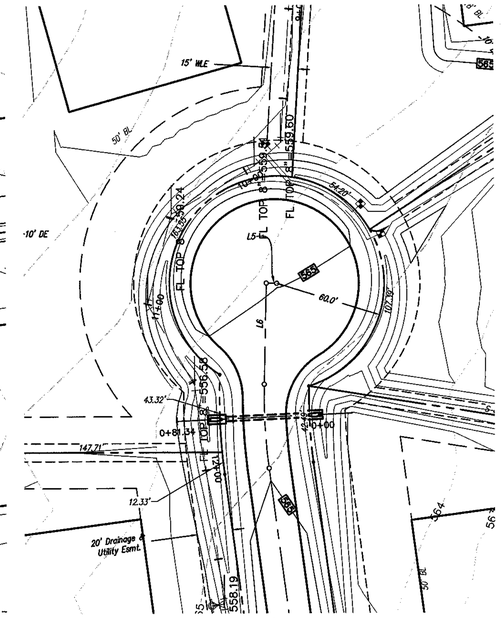

40 0 40 80 120 Feet

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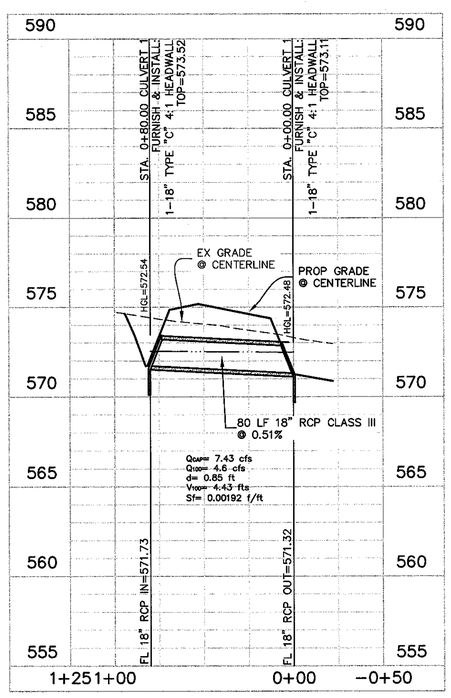
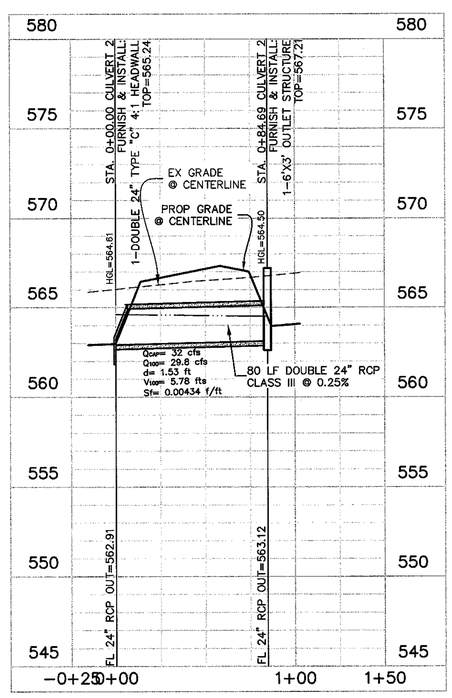
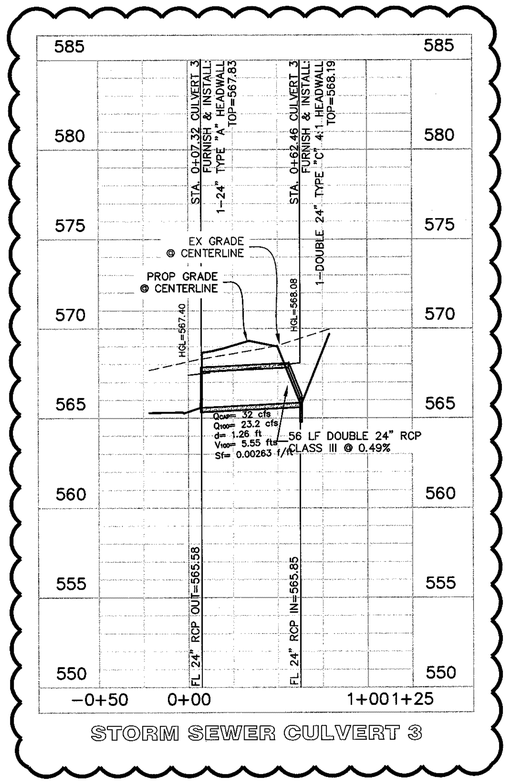


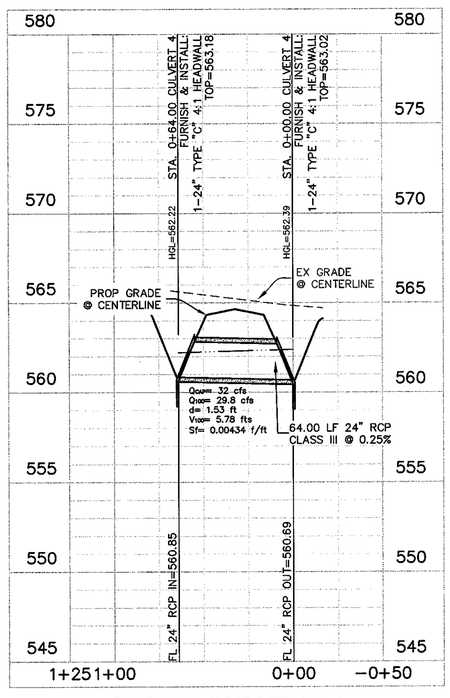
STORM CULVERT 1



STORM SEWER CULVERT 2



STORM SEWER CULVERT 3



STORM CULVERT 4

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STORM SEWER PROFILE

G&A CONSULTANTS, LLC.
TBPE F-1798

Drawn By: TJF
Date: 11/07/2014
Scale: H 1"=40; V 1"=4'
Revisions:
1 06/08/15

14026

C20

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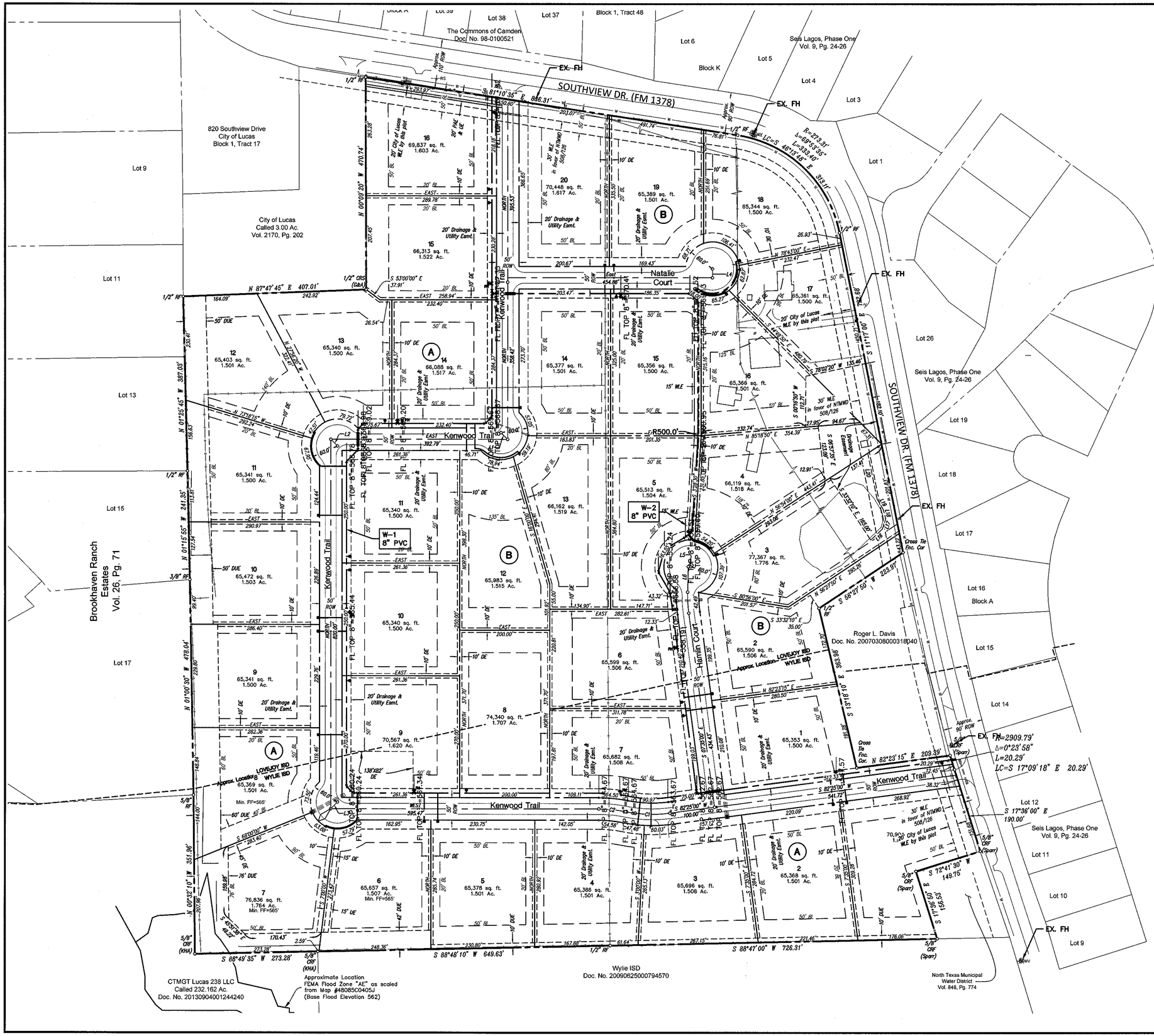

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UTILITY NOTES

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3. ALL FITTINGS TO BE FORD BRASS OR EQUAL, APPROVED BY CITY OF LUCAS PUBLIC WORKS DIRECTOR.
4. ALL METERS AND SERVICE TAPS SHALL BE 1" POLY OR LARGER.
5. ALL UTILITY WORK WITHIN TXDOT ROW REQUIRES SEPARATE PERMIT FROM TXDOT.

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OVERALL WATER PLAN

G&A CONSULTANTS, LLC.
TBPE F-1798

Drawn By: TJF
Date: 11/07/2014
Scale: 1" = 100'
Revisions:

14026

C21

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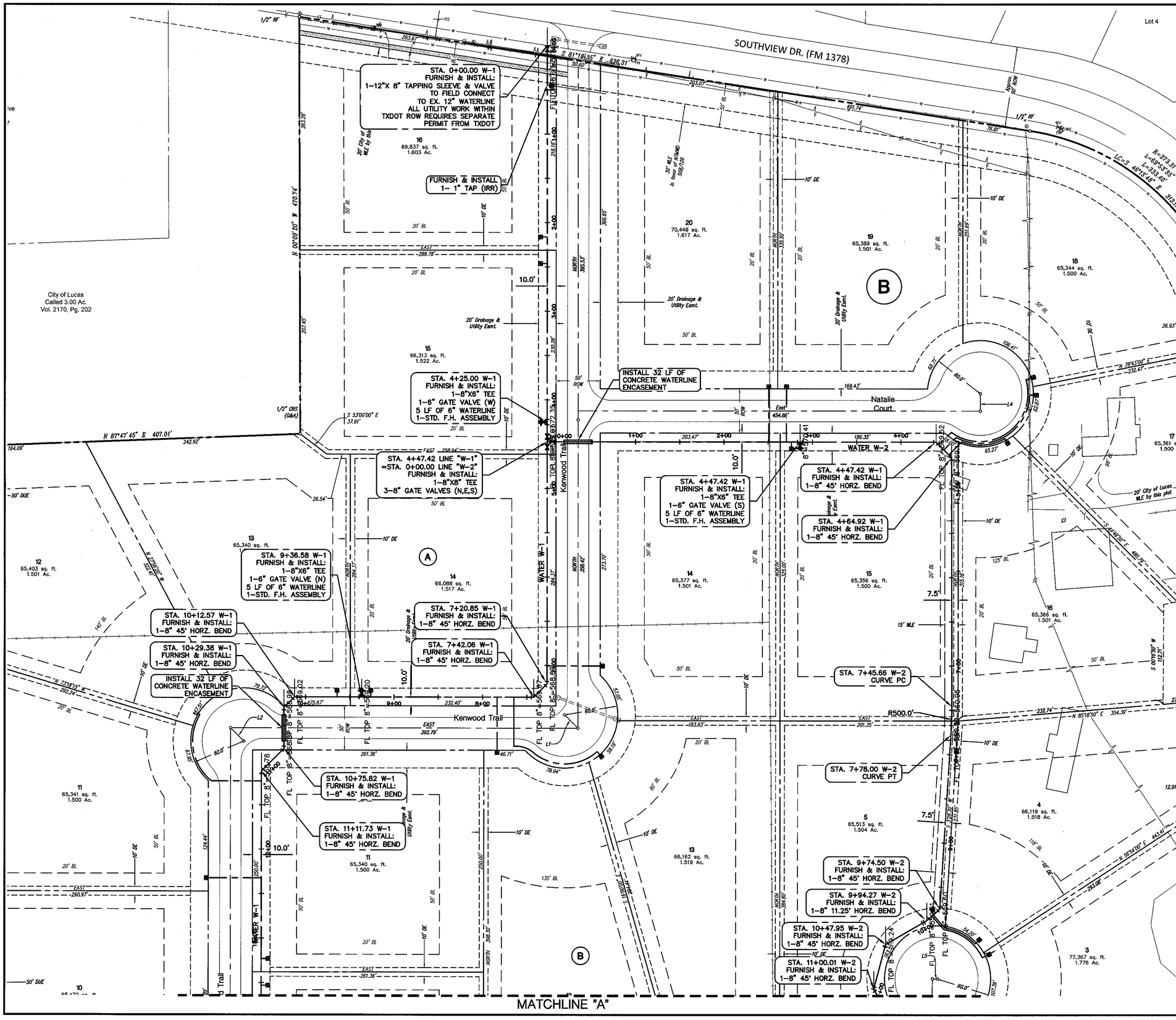

50 0 50 100 150 Feet

SCALE: 1"=50'

BENCHMARKS:

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LEGEND

C.R.F.	Capped Rebar Found		Overhead Power Lines
C.R.S.	Capped Rebar Set		Down Guy Wire
C.M.	Control Monument	443	Existing Contours
Mon.	Monument	445	Proposed Contours
BM	Benchmark		Concrete Pavement
FH–	Fire Hydrant		Asphalt Pavement
WM–	Water Meter		Wood Fence
WV–	Water Valve		Chain Link Fence
W/L	Water Line		Wire Fence
ICV–	Irrigation Control Valve		Masonry Wall
SSMH–	Sanitary Sewer Manhole		Existing Tree
CO–	Sanitary Sewer Cleanout		(FL) Flowline
UP–	Utility Pole		Centerline of Creek, Swale, or Waterway
LP–	Light Pole		Creek, Swale, or Waterway Embankment
TC	Top of Curb		
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D.R.	Deed Records		
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AS-BUILT RECORD DRAWING

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Douglas W. Weaver
G & A Consultants, LLC.

Date: 11/23/2015

DOUGLAS W. WEAVER
117386
LICENSED
PROFESSIONAL ENGINEER
STATE OF TEXAS

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Ph. (972) 422-9880
Contact: Steve Lenart

G&A
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Plano • Lewisville • Tyler • Roanoke • Fort Worth • Austin • Houston • P: 817.336.5773 • F: 817.336.5043
610 Byron Nelson Blvd. • Roanoke, TX 76262
TBPE Firm No. 1798 TBPLS Firm No. 10047700

LEWIS PARK ESTATES

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Lot 1-16, 1-20, Block A, B
LEWIS PARK ESTATES
60.858 Acres
in the
JAMES ANDERSON SURVEY, ABSTRACT NO. 17
CITY OF LUCAS
COLLIN COUNTY, TEXAS

WATER PLAN NORTH

G&A CONSULTANTS, LLC.
TBPE F-1798

Drawn By: AC
Date: 11/07/2014
Scale: 1" = 50'
Revisions:

14026

C22

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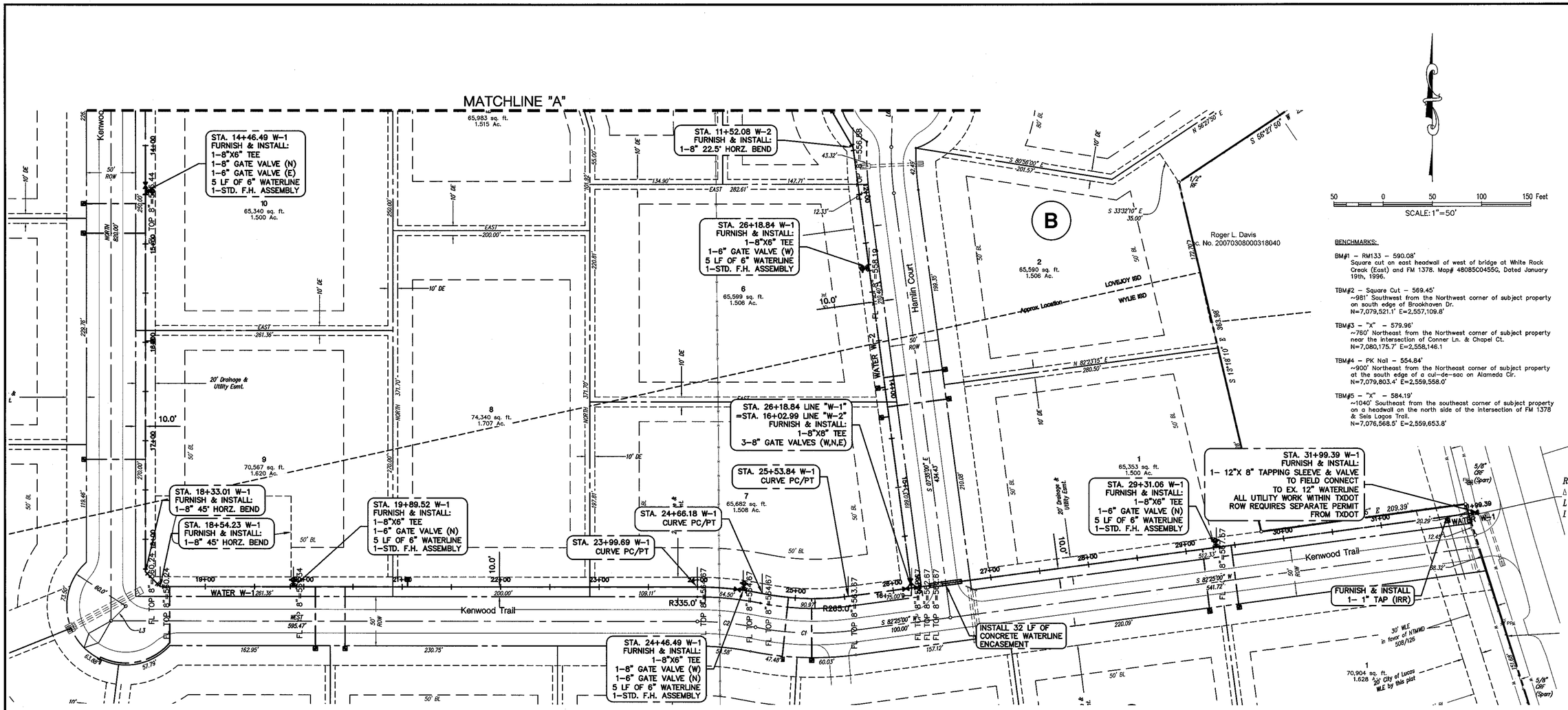

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Date: 11/23/2015

STATE OF TEXAS
DOUGLAS W. WEAVER
117386
LICENSED
PROFESSIONAL ENGINEER

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WATER PLAN SOUTH

G&A CONSULTANTS, LLC.
TBPE F-17798

Drawn By: AC
Date: 11/07/2014
Scale: 1" = 50'
Revisions:

14026

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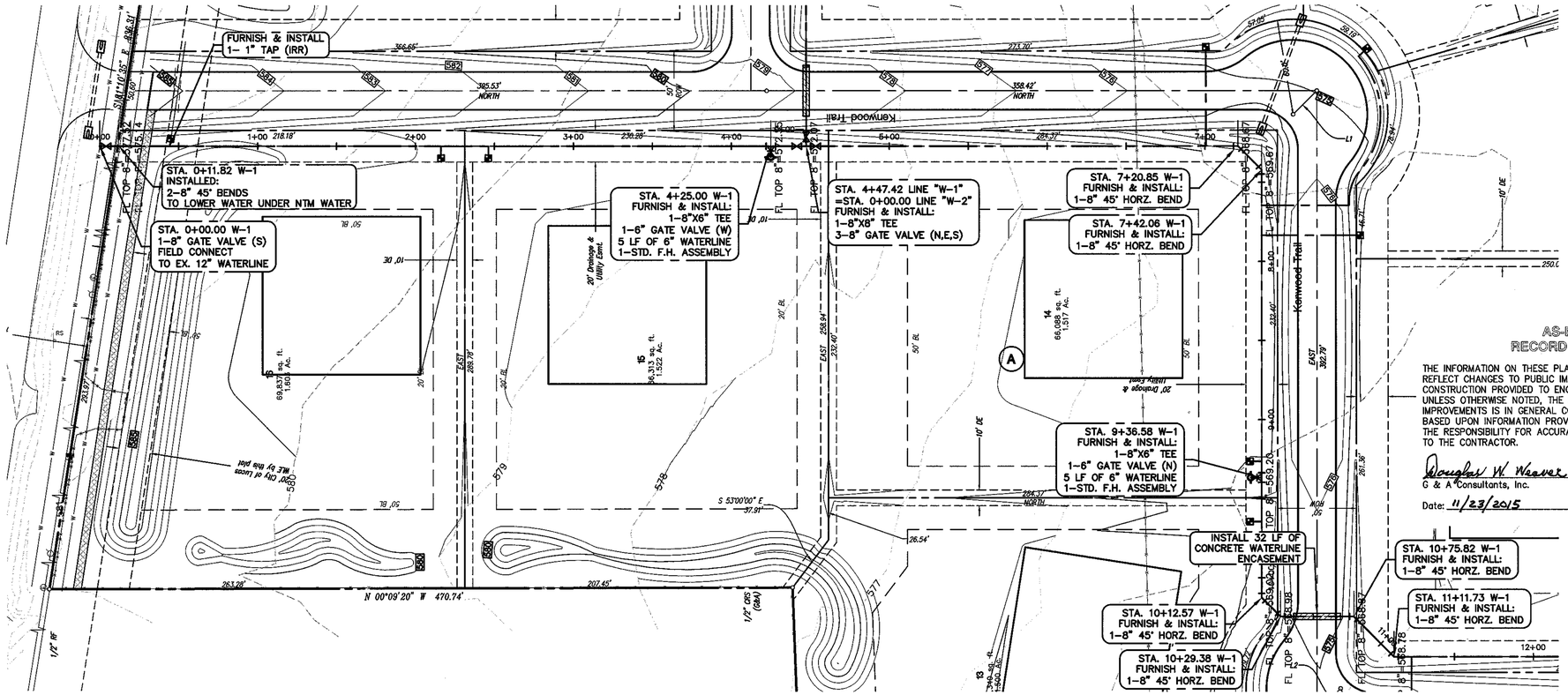

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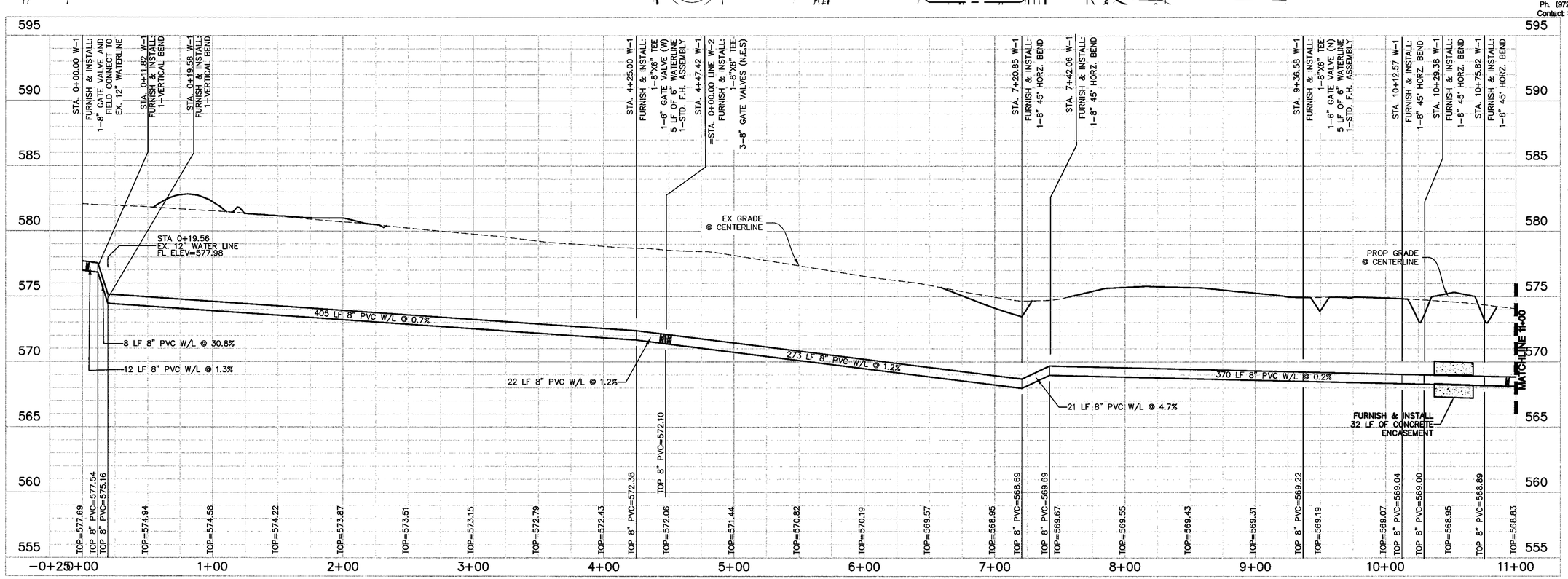

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WATER PLAN & PROFILE LINE W-1 STA 0+00 TO STA 11+00

STATE OF TEXAS
DOUGLAS W. WEAVER
117386
REGISTERED PROFESSIONAL ENGINEER

G&A CONSULTANTS, LLC.
TBPE F-1798

Drawn By: AC
Date: 11/07/2014
Scale: H 1"=40'; V 1"=4'
Revisions:

14026

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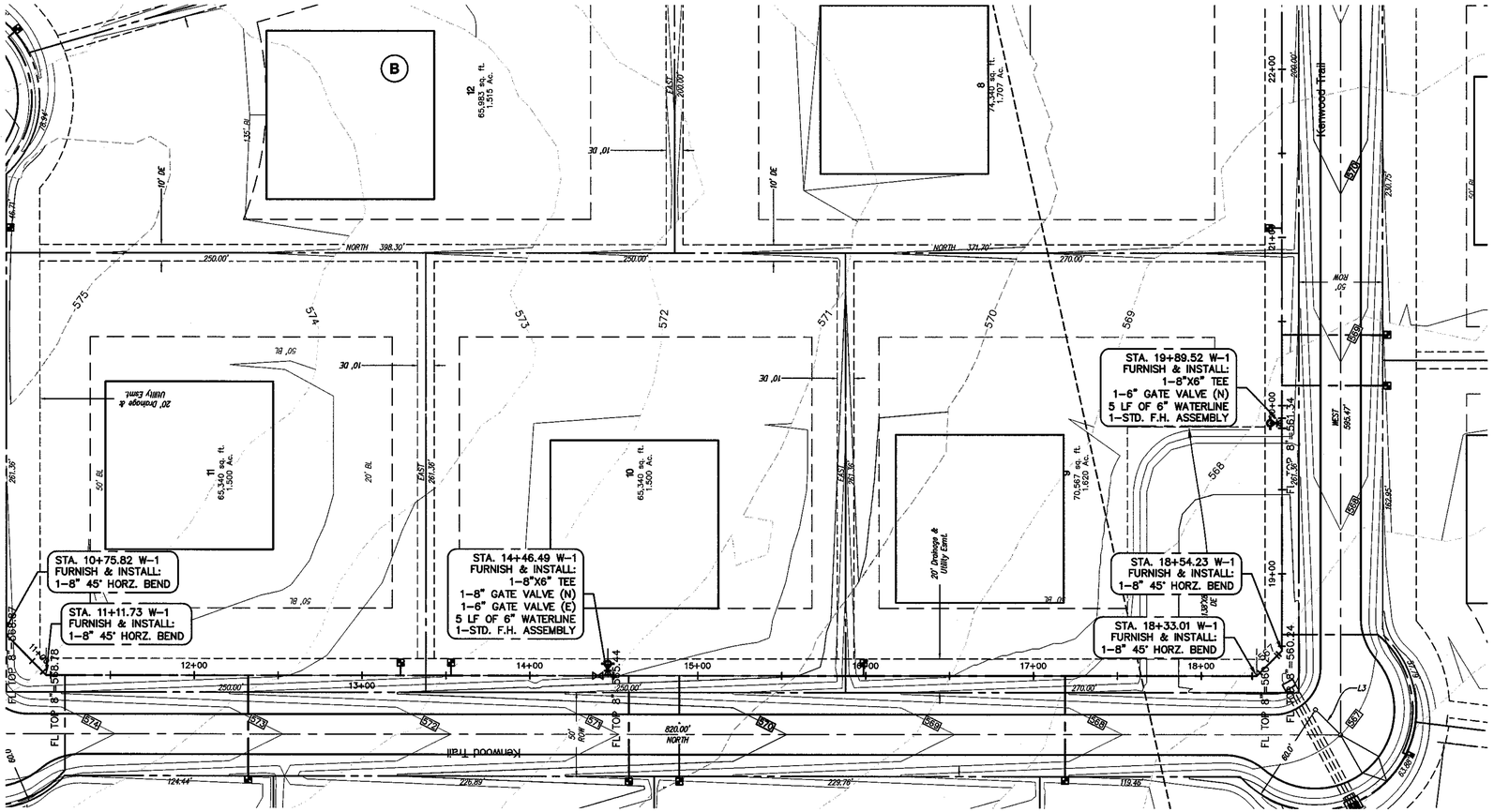

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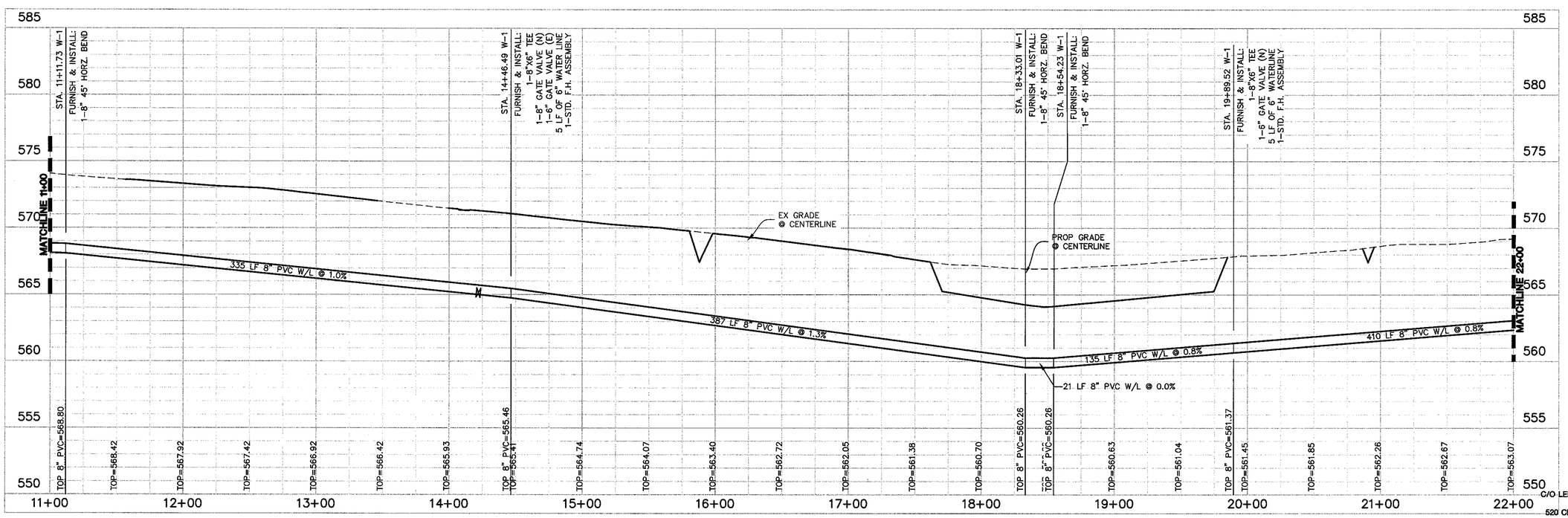

WATER W-1

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Revisions:

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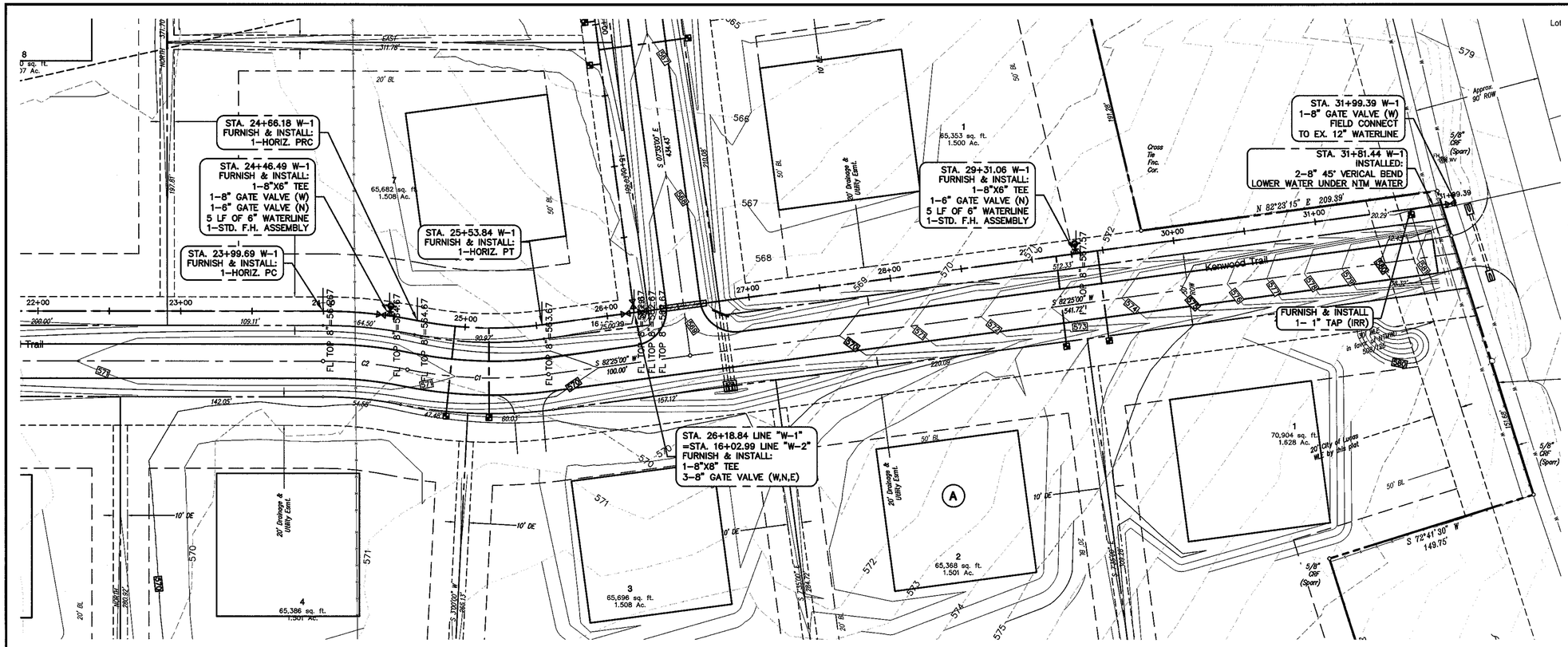

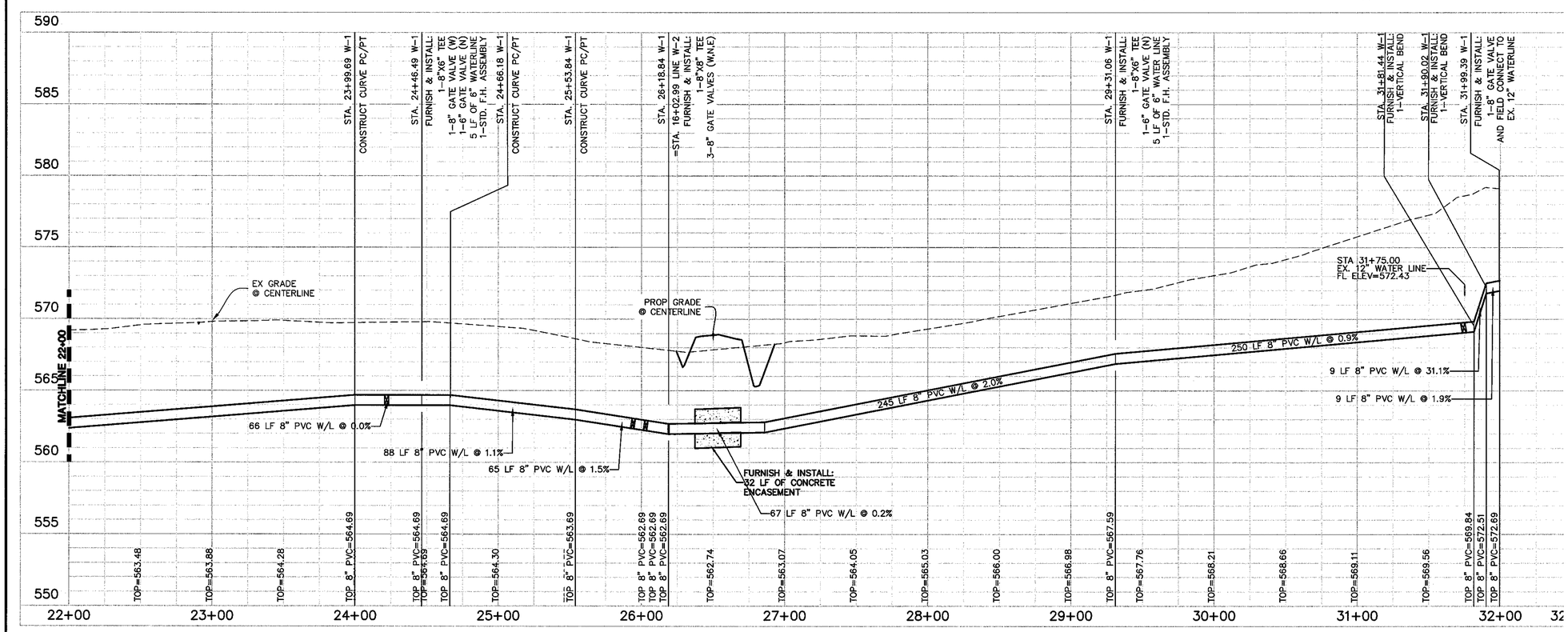

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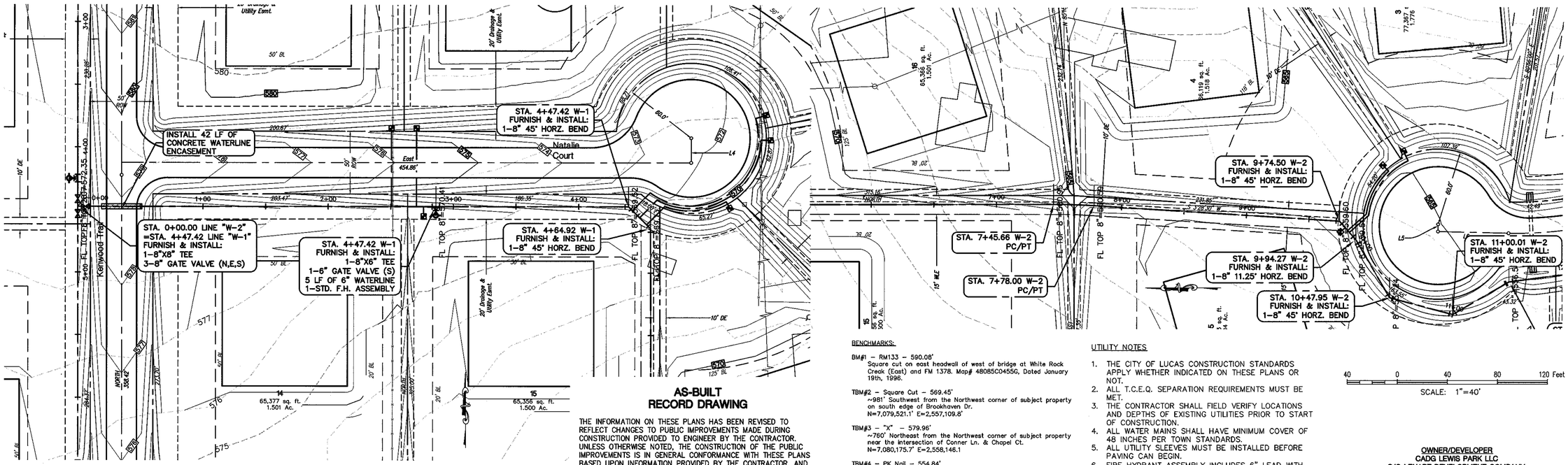
Revisions:

14026

C26



AS-BUILT RECORD DRAWING

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Douglas W. Weaver
G & A Consultants, LLC.

Date: 11/23/2015

BENCHMARKS:

BM#1 – RM133 – 590.08'
Square cut on east headwall of west of bridge at White Rock Creek (East) and FM 1378. Map# 48085C0455G, Dated January 19th, 1996.

TBM#2 – Square Cut – 569.45'
~981' Southwest from the Northwest corner of subject property on south edge of Brookhaven Dr.
N=7,079,521.1' E=2,557,109.8'

TBM#3 – "X" – 579.96'
~760' Northeast from the Northwest corner of subject property near the intersection of Conner Ln. & Chapel Ct.
N=7,080,175.7' E=2,558,146.1

TBM#4 – PK Nail – 554.84'
~900' Northeast from the Northeast corner of subject property at the south edge of a cul-de-sac on Alameda Cir.
N=7,079,803.4' E=2,559,558.0'

TBM#5 – "X" – 584.19'
~1040' Southeast from the southeast corner of subject property on a headwall on the north side of the intersection of FM 1378 & Seis Lagos Trail.
N=7,076,568.5' E=2,559,653.8'

UTILITY NOTES

1. THE CITY OF LUCAS CONSTRUCTION STANDARDS APPLY WHETHER INDICATED ON THESE PLANS OR NOT.
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3. THE CONTRACTOR SHALL FIELD VERIFY LOCATIONS AND DEPTHS OF EXISTING UTILITIES PRIOR TO START OF CONSTRUCTION.
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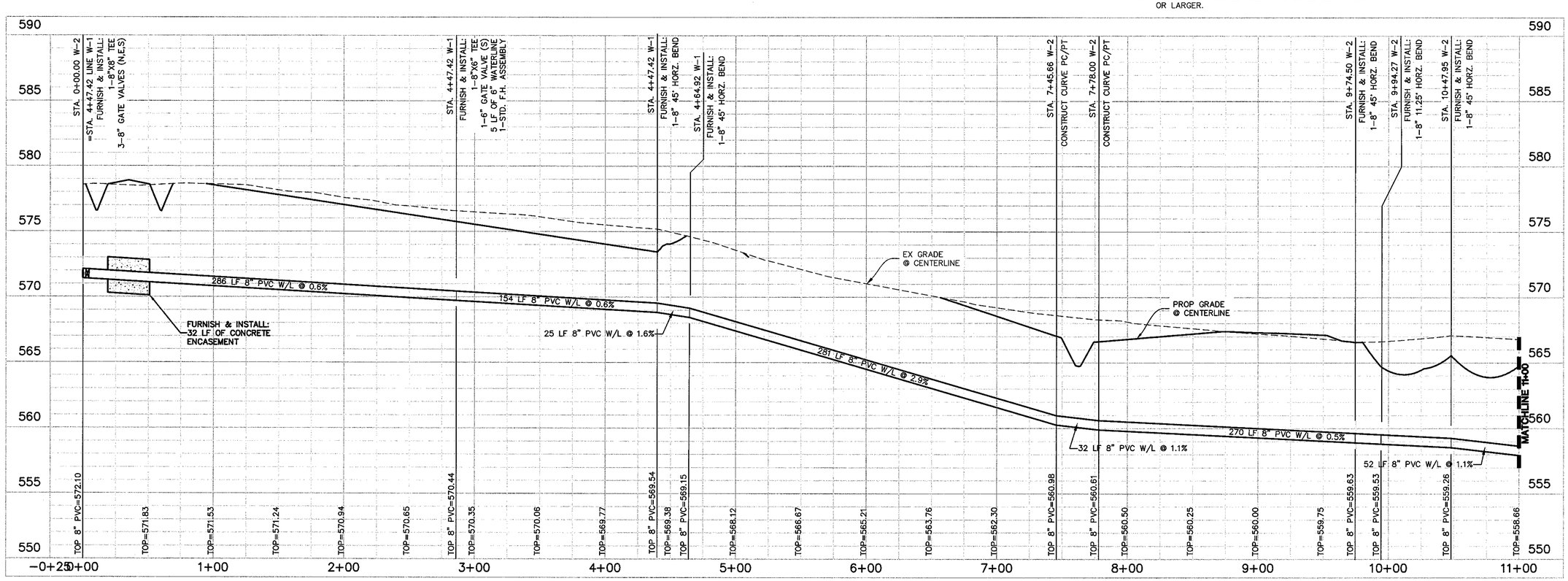
6. FIRE HYDRANT ASSEMBLY INCLUDES 6" LEAD WITH 90° BEND PER TOWN STANDARD CONSTRUCTION DETAILS.
7. ALL FIRE HYDRANTS TO BE WATEROUS FIRE HYDRANTS OR EQUAL, APPROVED BY CITY OF LUCAS PUBLIC WORKS DIRECTOR.
8. ALL FITTINGS TO BE FORD BRASS OR EQUAL, APPROVED BY CITY OF LUCAS PUBLIC WORKS DIRECTOR.
9. ALL METERS AND SERVICE TAPS SHALL BE 1" POLY OR LARGER.

40 0 40 80 120 Feet
SCALE: 1"=40'

OWNER/DEVELOPER
CADG LEWIS PARK LLC
C/O LENART DEVELOPMENT COMPANY, LLC
520 CENTRAL PARKWAY E. SUITE 104
PLANO, TX 75074
Ph. (972) 422-9880
Contact: Steve Lenart



WATER W-2

SITE PLANNING CIVIL ENGINEERING PLATTING
G&A CONSULTANTS, LLC
LAND SURVEYING LANDSCAPE ARCHITECTURE
111 Hillside Drive • Lewisville, TX 75067 • P: 972.436.9712 • F: 972.436.9715
610 Byron Nelson Blvd. Ste 114 • Roanoke, TX 76262 • P: 682.831.9712 • F: 817.890.4043
TBPLS Firm No. 10047100 TBPE Firm No. 1798

LEWIS PARK ESTATES

LEWIS PARK ESTATES
Lot 1-16, 1-20, Block A, B
LEWIS PARK ESTATES
60.858 Acres
In the
JAMES ANDERSON SURVEY, ABSTRACT NO. 17
CITY OF LUCAS
COLLIN COUNTY, TEXAS

WATER PLAN & PROFILE LINE W-2 STA 0+00 TO STA 11+00

STATE OF TEXAS
DOUGLAS W. WEAVER
117386
LICENSED
PROFESSIONAL ENGINEER

G&A CONSULTANTS, LLC.
TBPE F-1798

Drawn By: AC
Date: 11/07/2014
Scale: H 1"=40'; V 1"=4'
Revisions:

14026

C27

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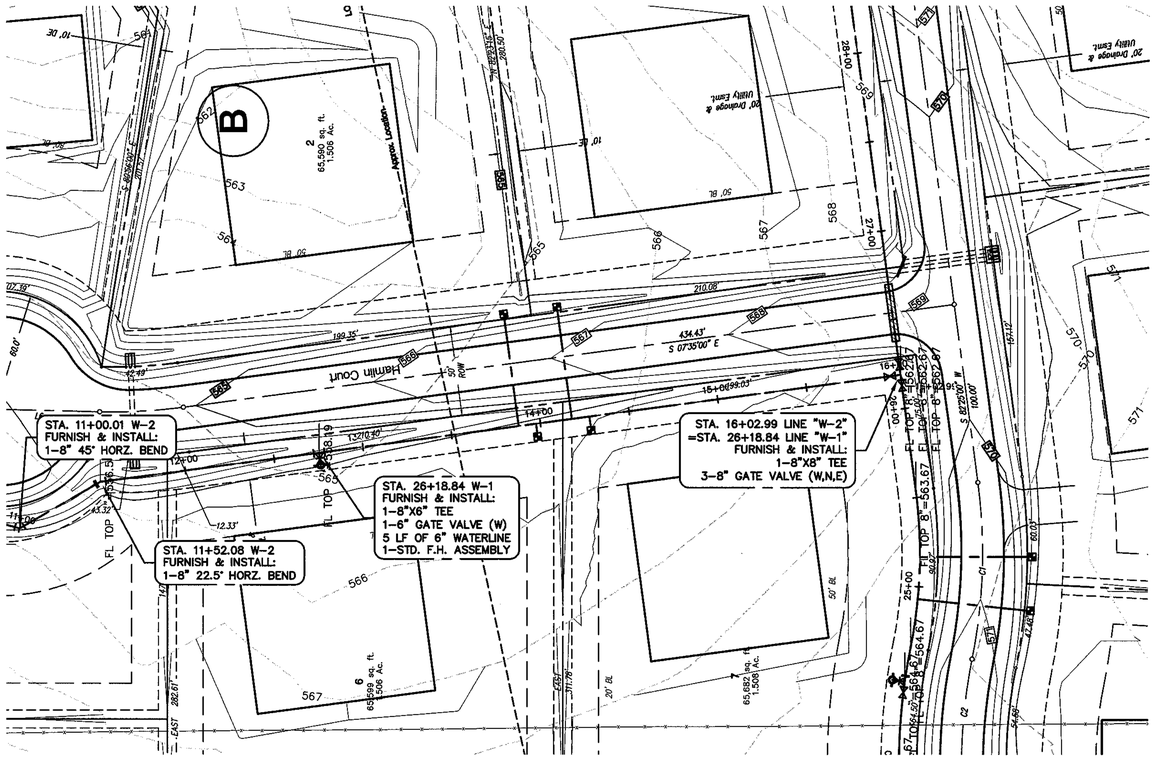

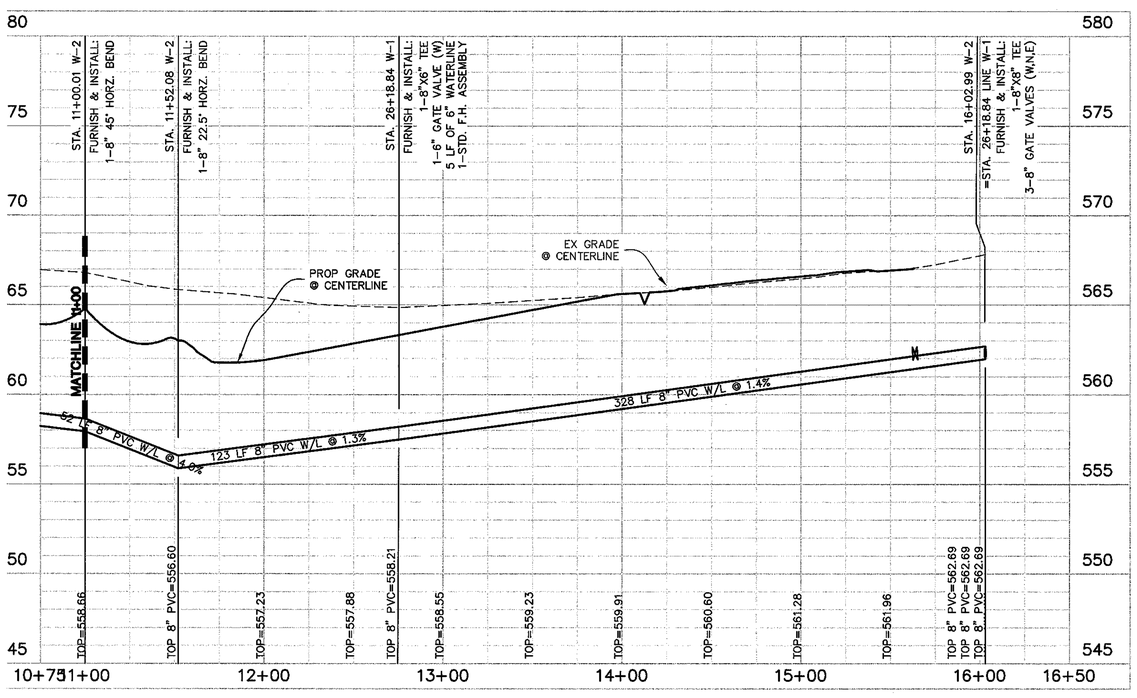

WATER W-2

40 0 40 80 120 Feet

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Douglas W. Weaver
G & A Consultants, LLC.

Date: 11/23/2015

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Lot 1-16, 1-20, Block A, B
LEWIS PARK ESTATES
60.858 Acres
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CITY OF LUCAS
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WATER PLAN & PROFILE LINE W-2 STA 11+00 TO STA 15+69.48

G&A CONSULTANTS, LLC.
TBPE F-1798

Drawn By: AC
Date: 11/07/2014
Scale: H 1"=40'; V 1"=4'
Revisions:

14026

C28

File: S:\2014\14026\Drawings\W & Sewer Plan\GRET SITWORK W-WTRW
Plotted: 11/20/2015 10:11 AM, by Jason Morris, Gerald 11/11/2015 8:50 AM, by Roland

TABLE OF VARIABLE DIMENSIONS AND QUANTITIES FOR ONE HEADWALL (4)						
SLOPE (Vertical to Horizontal)	Values for one Pipe for each adjt Pipe			Values to be added for each adjt Pipe		
	W	Reinf (Lbs)	Conc (C.Y.) (1)	W	Reinf (Lbs)	Conc (C.Y.) (1)
12:1	12'- 0"	122	1.1	1'- 9"	15	0.2
15:1	10'- 3"	136	1.3	2'- 2"	16	0.2
18:1	11'- 6"	163	1.5	2'- 8"	19	0.3
21:1	12'- 9"	200	1.8	3'- 1"	31	0.4
24:1	14'- 0"	217	2.1	3'- 7"	34	0.4
27:1	15'- 3"	254	2.4	3'-11"	37	0.5
30:1	16'- 6"	272	2.7	4'- 4"	40	0.6
33:1	17'- 9"	314	3.1	4'- 8"	43	0.6
36:1	19'- 0"	371	3.9	5'- 1"	46	0.8
42:1	21'- 6"	442	4.9	5'-10"	52	1.0
48:1	25'- 0"	569	6.4	6'- 7"	59	1.3
54:1	27'- 6"	701	7.5	7'- 6"	82	1.6
60:1	30'- 0"	794	8.8	8'- 3"	90	1.8
66:1	32'- 6"	894	10.2	8'- 9"	98	2.0
72:1	35'- 0"	1055	11.7	9'- 4"	103	2.3
12:1	13'- 0"	175	1.6	1'- 9"	14	0.2
15:1	14'- 9"	193	1.9	2'- 2"	17	0.2
18:1	16'- 6"	228	2.2	2'- 8"	19	0.3
21:1	18'- 3"	298	2.6	3'- 1"	31	0.4
24:1	20'- 0"	323	3.0	3'- 7"	33	0.4
27:1	21'- 9"	371	3.5	3'-11"	37	0.5
30:1	23'- 6"	415	4.0	4'- 4"	40	0.5
33:1	25'- 3"	469	4.6	4'- 8"	43	0.6
36:1	27'- 0"	556	5.7	5'- 1"	46	0.8
42:1	30'- 6"	675	7.1	5'-10"	52	1.0
48:1	35'- 6"	837	9.2	6'- 7"	59	1.3
54:1	39'- 0"	1015	11.0	7'- 6"	84	1.6
60:1	42'- 6"	1171	12.8	8'- 3"	91	1.8
66:1	46'- 0"	1298	14.9	8'- 9"	98	2.0
72:1	49'- 6"	1561	17.1	9'- 4"	103	2.3
12:1	17'- 0"	229	2.0	1'- 9"	15	0.2
15:1	19'- 3"	266	2.4	2'- 2"	17	0.2
18:1	21'- 6"	306	2.9	2'- 8"	19	0.3
21:1	23'- 9"	382	3.5	3'- 1"	31	0.3
24:1	26'- 0"	430	3.9	3'- 7"	34	0.4
27:1	28'- 3"	486	4.7	3'-11"	37	0.5
30:1	30'- 6"	539	5.2	4'- 4"	40	0.6
33:1	32'- 9"	603	6.0	4'- 8"	43	0.6
36:1	35'- 0"	738	7.5	5'- 1"	47	0.8
42:1	39'- 6"	881	9.3	5'-10"	52	1.0
48:1	46'- 0"	1102	12.1	6'- 7"	59	1.3
54:1	50'- 6"	1364	14.4	7'- 6"	84	1.6
60:1	55'- 0"	1547	16.9	8'- 3"	91	1.8
66:1	59'- 6"	1741	19.5	8'- 9"	98	2.0
72:1	64'- 0"	2069	22.4	9'- 4"	103	2.3
12:1	25'- 0"	336	3.0	1'- 9"	14	0.2
15:1	28'- 3"	384	3.6	2'- 2"	17	0.2
18:1	31'- 6"	452	4.2	2'- 8"	19	0.3
21:1	34'- 9"	581	5.1	3'- 1"	31	0.4
24:1	38'- 0"	644	5.8	3'- 7"	34	0.4
27:1	41'- 3"	737	6.9	3'-11"	37	0.5
30:1	44'- 6"	807	7.7	4'- 4"	39	0.6
33:1	47'- 9"	912	8.9	4'- 8"	44	0.6
36:1	51'- 0"	1108	11.0	5'- 1"	48	0.8
42:1	57'- 6"	1318	13.7	5'-10"	54	1.0
48:1	67'- 0"	1674	17.9	6'- 7"	59	1.3
54:1	73'- 6"	2064	21.3	7'- 6"	83	1.6
60:1	80'- 0"	2343	24.9	8'- 3"	89	1.8
66:1	86'- 6"	2635	28.9	8'- 9"	96	2.0
72:1	93'- 0"	3123	33.1	9'- 4"	101	2.3

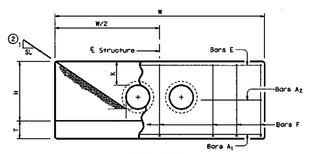
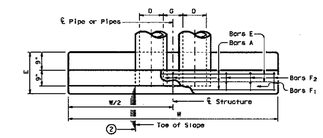
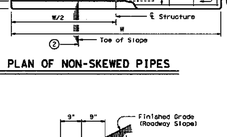
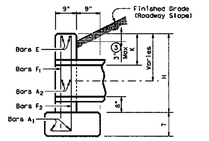


TABLE OF CONSTANT DIMENSIONS					
SLOPE (Vertical to Horizontal)	G	K	H	T	E
12:1	9"	1'- 0"	2'- 8"	9"	1'- 9"
15:1	11"	1'- 0"	2'-11"	9"	1'- 9"
18:1	1'- 2"	1'- 0"	3'- 2"	9"	1'- 9"
21:1	1'- 4"	1'- 0"	3'- 5"	9"	2'- 0"
24:1	1'- 7"	1'- 0"	3'- 8"	9"	2'- 0"
27:1	1'- 8"	1'- 0"	3'-11"	9"	2'- 3"
30:1	1'-10"	1'- 0"	4'- 2"	9"	2'- 3"
33:1	1'-11"	1'- 0"	4'- 5"	9"	2'- 6"
36:1	2'- 1"	1'- 0"	4'- 8"	1'- 0"	2'- 6"
42:1	2'- 4"	1'- 0"	5'- 2"	1'- 0"	2'- 9"
48:1	2'- 7"	1'- 3"	5'-11"	1'- 0"	3'- 0"
54:1	3'- 0"	1'- 3"	6'- 5"	1'- 0"	3'- 3"
60:1	3'- 3"	1'- 3"	6'-11"	1'- 0"	3'- 6"
66:1	3'- 3"	1'- 3"	7'- 5"	1'- 0"	3'- 9"
72:1	3'- 4"	1'- 3"	7'-11"	1'- 0"	4'- 0"

TABLE OF REINFORCING STEEL (4)			
Bar	Size	Spa	No.
A1	# 5	1'-6"	2
A2	# 5	1'-6"	~
E	# 5	~	2
F	# 5	1'-0"	~







GENERAL NOTES:
Designed according to current AASHTO Standard and Interim Specifications.
Reinforcing steel shall be placed with the center of the outer layer of bars 2" from the surface of the concrete.
All reinforcing steel shall be Grade 60.
All concrete shall be Class "C" and shall have a minimum compressive strength of 3600 psi.
No bridge rails of any type may be mounted directly to these culvert headwalls.

(1) Quantities shown are for concrete pipe and will increase slightly for metal pipe installations.
(2) Indicated slope is perpendicular to centerline Pipe or Pipes.
(3) For vehicle safety, curbs shall project no more than 3" above finished grade. Curb heights shall be reduced, if necessary, to meet these requirements. No changes will be made in quantities and no additional compensation will be allowed for this work.
(4) Quantities shown are for one structure and only one headwall.

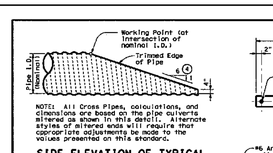
Texas Department of Transportation
Bridge Division

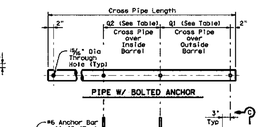
CONCRETE HEADWALLS
WITH PARALLEL WINGS FOR
NON-SKEWED PIPE CULVERTS

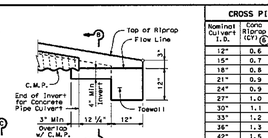
CH-PW-0

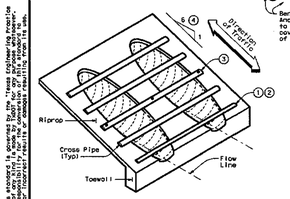
FILE: chw0ste.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK:	CAP
©TxDOT May 2005	REVISIONS	FEDERAL AID PROJECT			SHEET
		STATE	DISTRICT	COUNTY	

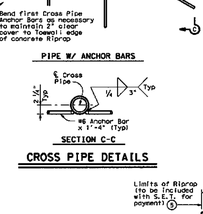
TYPE 'A' HEADWALL
NOT TO SCALE

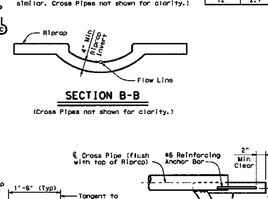






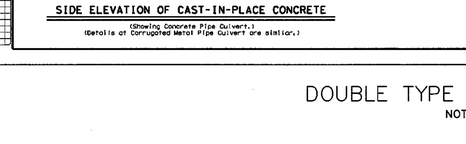


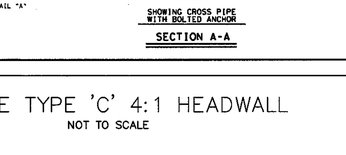




CROSS PIPE LENGTHS, REQUIRED PIPE SIZES, & RIPRAP QUANTITIES (2)						
Nominal Culvert I.D.	Conc Riprap (CY) (6)	Pipe Culvert Spa ~ G	Single Barrel ~ Q1	Multi-Barrel ~ Q1	Q2	Conditions for use of Cross Pipes	Cross Pipe Size
12"	0.6	9"	N/A	2'- 1"	1'- 9"		
15"	0.7	11"	N/A	2'- 5"	2'- 2"		
18"	0.8	1'- 0"	N/A	2'-10"	2'- 8"	3 or more Pipe Culverts	3" Std (3.500" O.D.)
21"	0.9	1'- 4"	N/A	3'- 2"	3'- 1"		
24"	0.9	1'- 7"	N/A	3'- 6"	3'- 7"		
27"	1.0	1'- 8"	N/A	3'-10"	3'-11"	3 or more Pipe Culverts	
30"	1.1	1'-10"	N/A	4'- 2"	4'- 4"	2 or more Pipe Culverts	3 1/2" Std (4.000" O.D.)
33"	1.2	1'-11"	4'- 2"	4'- 5"	4'- 8"	All Pipe Culverts	
36"	1.3	2'- 1"	4'- 5"	4'- 9"	5'- 1"	All Pipe Culverts	4" Std (4.500" O.D.)
42"	1.5	2'- 4"	4'-11"	5'- 5"	5'-10"		
48"	1.7	2'- 7"	5'- 5"	6'- 0"	6'- 7"		
54"	2.0	3'- 0"	5'-11"	6'- 9"	7'- 6"	All Pipe Culverts	5" Std (5.563" O.D.)
60"	2.2	3'- 3"	6'- 5"	7'- 4"	8'- 3"		
66"	2.4	3'- 3"	6'-11"	7'-10"	8'- 9"		
72"	2.7	3'- 4"	7'- 5"	8'- 5"	9'- 4"		

(1) The proper installation of the first Cross Pipe is critical for vehicle safety. The top of the first Cross Pipe must be placed at no more than 6" above the flow line.
(2) Size of Cross Pipes, except the first bottom pipe, shall be as shown in the PIPE SIZE table. The first bottom pipe shall be 3 1/2" Standard Pipe (4" O.D.).
(3) The third Cross Pipe from the bottom of the Culvert shall always be installed using a bolted connection. Care shall be taken to ensure that Riprap concrete does not flow into the Cross Pipe so as to permit disassembly of the bolted connection to allow cleanout access. At the Contractor's option, the first Cross Pipe may also be installed using the bolted connection details.
(4) Match Cross Slope as shown elsewhere in the plans. Cross Slope of 6:1 or flatter is required for vehicle safety.
(5) Riprap placed beyond the limits shown will be paid as Concrete Riprap in accordance with Item 432, "Riprap".
(6) Quantities shown are for one end of one reinforced Concrete Pipe Culvert. For multiple pipe culverts or for Corrugated Metal Pipe Culverts, quantities will need to be adjusted. Riprap quantities are for Contractor's information only.





GENERAL NOTES:
Cross Pipes are designed for a traversing load of 10,000 pounds or yield as recommended by Research Report 280-2F, "Safety Treatment of or Roadside Parallel-Drainage Structures", Texas Transportation Institute, March 1981.
Safety End Treatments shown herein are intended for use in those installations where out of control vehicles may be expected to cross the drainage opportunity presented by the Cross Pipes.
Riprap and all necessary inverts shall be Concrete Riprap conforming to the requirements of Item 432, "Riprap".
Payment for riprap and toewall is included in the Price Bid for each Safety End Treatment.
Cross Pipes shall conform to the requirements of ASTM A53 (type E or S, Grade B), ASTM A500 (Grade B), or API 5L(X42).
Bolts and nuts shall conform to ASTM A307. All steel components except concrete reinforcing, shall be galvanized after fabrication. Galvanizing damaged during transport or construction shall be repaired in accordance with the specifications.

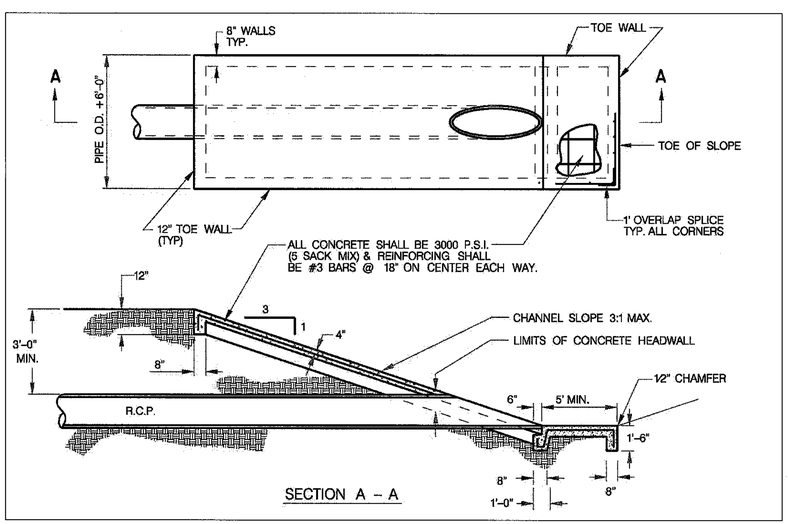
Texas Department of Transportation
Bridge Division

SAFETY END TREATMENT
FOR 12" DIA TO 72" DIA
PIPE CULVERTS
TYPE II ~ PARALLEL DRAINAGE

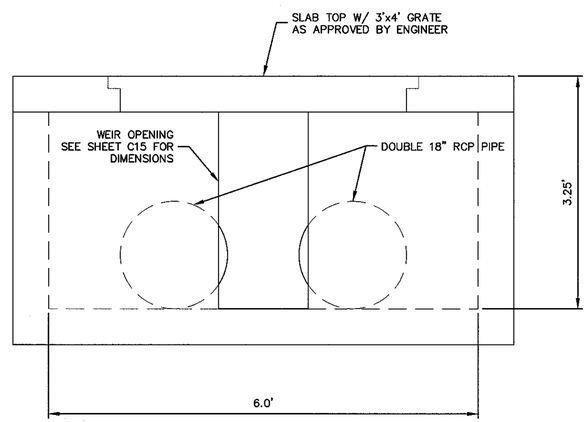
SETP-PD

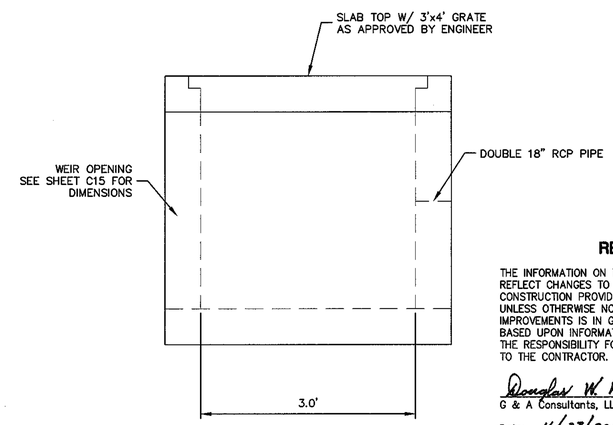
FILE: setpd06.dgn	DN: DAF	CK: GLT	DW: JRP	CK:	CAP
©TxDOT May 2005	REVISIONS	FEDERAL AID PROJECT			SHEET
		STATE	DISTRICT	COUNTY	

TYPE 'C' 4:1 HEADWALL
NOT TO SCALE



TYPE 'C' 4:1 HEADWALL
NOT TO SCALE





DETENTION 'A1' OUTLET STRUCTURE
NOT TO SCALE

AS-BUILT RECORD DRAWING

THE INFORMATION ON THESE PLANS HAS BEEN REVISED TO REFLECT CHANGES TO PUBLIC IMPROVEMENTS MADE DURING CONSTRUCTION PROVIDED TO ENGINEER BY THE CONTRACTOR. UNLESS OTHERWISE NOTED, THE CONSTRUCTION OF THE PUBLIC IMPROVEMENTS IS IN GENERAL CONFORMANCE WITH THESE PLANS BASED UPON INFORMATION PROVIDED BY THE CONTRACTOR AND THE RESPONSIBILITY FOR ACCURACY AND COMPLETENESS BELONGS TO THE CONTRACTOR.

Douglas W. Weaver
G & A Consultants, LLC.
Date: 11/23/2015

STATE OF TEXAS
DOUGLAS W. WEAVER
117386
LICENSED PROFESSIONAL ENGINEER

OWNER/DEVELOPER
CADG LEWIS PARK LLC
C/O LENART DEVELOPMENT COMPANY, LLC
520 CENTRAL PARKWAY E. SUITE 104
PLANO, TX 75074
Ph. (972) 422-9880
Contact: Steve Lenart

G&A CONSULTANTS, LLC
SITE PLANNING CIVIL ENGINEERING PLATTING
LAND SURVEYING LANDSCAPE ARCHITECTURE
111 Rillado Drive - Lewisville, TX 75067 - P: 972.436.9715 - F: 972.436.9716
611 Dallas Drive, Suite 114 - Roanoke, TX 76262 - P: 682.831.9712 - F: 817.890.4043
TBPE Firm No. 1798

LEWIS PARK ESTATES

LEWIS PARK ESTATES
Lot 1-16, 1-20, Block A, B
LEWIS PARK ESTATES
60.858 Acres
in the
JAMES ANDERSON SURVEY, ABSTRACT NO. 17
CITY OF LUCAS
COLLIN COUNTY, TEXAS

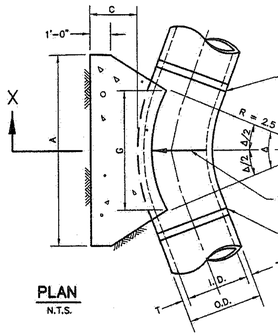
STORM DRAINAGE DETAILS

G&A CONSULTANTS, LLC.
TBPE F-1798

Drawn By: TJF
Date: 11/07/2014
Scale: ######
Revisions:

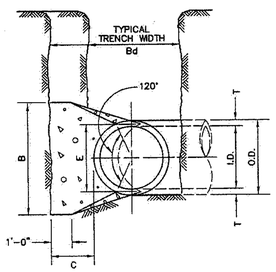
14026

C29



PLAN
N.T.S.

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



SECTION X–X
N.T.S.

HORIZONTAL THRUST BLOCK
AT PIPE BEND

North Central Texas Council of Governments

STANDARD SPECIFICATION REFERENCE 6.7.
DATE NOV. '96 | STANDARD DRAWING NO. 4010A

I.D. (IN.)	T (IN.)	Δ = 11.25° (FT.)	Δ = 22.50° (FT.)	E (FT.)
4,6,8	0.4	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.)	Δ = 11.25° G (FT.)	THRUST (TONS)	EARTH A (FT.)	EARTH B (FT.)	EARTH VOL. (C.Y.)	ROCK A (FT.)	ROCK B (FT.)	ROCK VOL. (C.Y.)	I.D. (IN.)	Δ= 22.50° G (FT.)	THRUST (TONS)	EARTH A (FT.)	EARTH B (FT.)	EARTH VOL. (C.Y.)	ROCK A (FT.)	ROCK B (FT.)	ROCK VOL. (C.Y.)
4,6,8	0.4	1.0	1.0	1.5	0.1	1.0	1.0	0.1	4,6,8	0.8	2.0	1.5	1.5	0.1	1.0	1.0	0.1
10,12	0.6	2.2	1.5	1.5	0.1	1.0	1.5	0.1	10,12	1.1	4.4	2.0	2.5	0.3	1.5	1.5	0.1
16,18	0.8	5.0	2.0	2.5	0.3	1.5	2.0	0.2	16,18	1.6	9.9	3.0	3.5	0.6	2.0	2.5	0.3
20	0.9	6.2	2.0	3.5	0.4	1.5	3.0	0.3	20	1.8	12.3	3.5	3.5	0.7	2.0	3.0	0.4
24	1.1	8.9	3.0	3.5	0.5	1.5	3.0	0.3	24	2.2	17.7	4.0	4.5	1.0	3.0	3.5	0.5
30	1.4	10.4	3.0	3.5	0.6	2.0	3.5	0.4	30	2.7	20.7	5.0	4.5	1.5	3.0	4.0	0.8
36	1.7	15.0	3.5	4.5	0.9	2.0	4.0	0.5	36	3.3	29.8	5.5	5.5	2.3	4.0	4.0	1.3
42	1.9	20.4	4.5	5.0	1.5	2.5	5.0	0.8	42	3.8	40.5	7.0	6.0	3.9	4.5	5.0	2.1
48	2.2	26.6	4.5	6.0	2.0	2.5	6.0	1.1	48	4.4	52.9	8.0	7.0	5.7	4.5	6.0	2.8
54	2.5	33.7	6.0	6.0	3.0	3.0	6.0	1.4	54	4.9	67.0	9.0	8.0	8.0	6.0	6.0	4.1
60	2.7	41.6	6.0	7.0	3.8	3.0	7.0	1.8	60	5.5	82.7	9.5	9.0	10.6	6.0	7.0	5.3
66	3.0	50.3	6.5	8.0	5.1	3.5	8.0	2.7	66	6.0	100.1	10.5	10.0	14.1	6.5	8.0	7.2
72	3.3	59.9	7.5	8.0	6.3	4.0	8.0	3.3	72	6.6	119.1	11.0	11.0	17.6	7.5	8.0	9.1
78	3.6	70.2	8.0	9.0	8.1	4.0	9.0	3.9	78	7.1	139.8	12.0	12.0	22.5	8.0	9.0	11.7
84	3.8	81.5	8.5	10.0	10.3	4.5	10.0	5.3	84	7.6	162.1	13.0	12.5	27.2	8.5	10.0	14.8
90	4.1	93.5	9.5	10.0	12.2	5.0	10.0	6.3	90	8.2	186.1	14.0	13.5	33.7	9.5	10.0	17.7
96	4.4	106.4	10.0	11.0	15.0	5.0	11.0	7.4	96	8.7	211.7	15.0	14.5	41.2	10.0	11.0	21.8

TABLES OF DIMENSIONS AND QUANTITIES

HORIZONTAL THRUST BLOCK
AT PIPE BEND

North Central Texas Council of Governments

STANDARD SPECIFICATION REFERENCE
DATE NOV. '96 | STANDARD DRAWING NO. 4010B

I.D. (IN.)	Δ = 30° G (FT.)	THRUST (TONS)	EARTH A (FT.)	EARTH B (FT.)	EARTH VOL. (C.Y.)	ROCK A (FT.)	ROCK B (FT.)	ROCK VOL. (C.Y.)	I.D. (IN.)	Δ = 45° G (FT.)	THRUST (TONS)	EARTH A (FT.)	EARTH B (FT.)	EARTH VOL. (C.Y.)	ROCK A (FT.)	ROCK B (FT.)	ROCK VOL. (C.Y.)
4,6,8	1.0	2.6	2.0	1.5	0.2	1.0	1.5	0.1	4,6,8	1.5	3.9	2.0	2.0	0.2	1.5	1.5	0.1
10,12	1.5	5.9	2.5	2.5	0.3	2.0	1.5	0.2	10,12	2.2	8.7	3.5	2.5	0.5	2.0	2.5	0.3
16,18	2.2	13.2	3.5	4.0	0.8	2.5	3.0	0.4	16,18	3.2	19.5	4.5	4.5	1.2	3.0	3.5	0.6
20	2.4	16.3	4.5	4.0	1.0	3.0	3.0	0.5	20	3.6	24.1	5.5	4.5	1.5	3.5	3.5	0.7
24	2.9	23.4	6.0	4.0	1.4	3.5	3.5	0.7	24	4.3	34.6	8.0	4.5	2.3	4.5	4.0	1.1
30	3.6	27.5	6.5	5.0	1.9	3.5	4.0	0.9	30	5.4	40.6	8.5	5.0	3.2	5.5	4.0	1.6
36	4.4	39.5	7.0	6.0	3.4	4.5	4.5	1.6	36	6.5	58.5	10.0	6.0	5.3	6.5	4.5	2.6
42	5.1	53.8	8.0	7.0	5.1	5.5	5.0	2.5	42	7.5	79.6	11.5	7.0	8.1	8.0	5.0	4.2
48	5.8	70.3	9.0	8.0	7.4	6.0	6.0	3.7	48	8.6	104.0	13.0	8.0	11.9	9.0	6.0	6.3
54	6.5	89.0	10.0	9.0	10.3	7.0	6.5	5.3	54	9.7	131.5	15.0	9.0	17.1	10.5	6.5	8.9
60	7.3	110.0	11.0	10.0	13.9	7.5	7.5	7.3	60	10.7	162.4	16.5	10.0	23.1	11.0	7.5	12.0
66	8.0	132.9	12.5	11.0	18.9	8.5	8.0	9.6	66	11.8	196.5	18.0	11.0	30.1	12.0	8.5	16.2
72	8.7	158.2	13.5	12.0	24.0	9.0	9.0	12.3	72	12.9	233.9	19.5	12.0	38.6	14.0	8.5	20.7
78	9.4	185.6	14.5	13.0	30.0	10.0	9.5	15.6	78	13.9	274.5	21.5	13.0	49.8	14.5	9.5	25.9
84	10.1	215.3	15.5	14.0	37.1	10.5	10.5	19.5	84	15.0	318.4	23.0	14.0	61.2	15.5	10.5	32.6
90	10.9	247.1	16.5	15.0	45.0	11.5	11.0	23.9	90	16.1	365.5	24.5	15.0	74.5	17.5	10.5	39.6
96	11.6	281.2	18.0	16.0	55.5	12.5	11.5	28.9	96	17.1	415.6	26.0	16.0	89.5	18.5	11.5	48.5

I.D. (IN.)	Δ = 67.50° G (FT.)	THRUST (TONS)	EARTH A (FT.)	EARTH B (FT.)	EARTH VOL. (C.Y.)	ROCK A (FT.)	ROCK B (FT.)	ROCK VOL. (C.Y.)	I.D. (IN.)	Δ = 90° G (FT.)	THRUST (TONS)	EARTH A (FT.)	EARTH B (FT.)	EARTH VOL. (C.Y.)	ROCK A (FT.)	ROCK B (FT.)	ROCK VOL. (C.Y.)
4,6,8	2.1	5.6	3.0	2.0	0.3	2.0	1.5	0.2	4,6,8	2.7	7.1	5.0	1.5	0.4	2.0	2.0	0.2
10,12	3.1	12.6	5.5	2.5	0.8	3.5	2.0	0.4	10,12	4.0	16.0	6.5	2.5	1.0	3.5	2.5	0.5
16,18	4.7	28.3	7.5	4.0	1.9	5.5	3.0	0.9	16,18	6.0	36.0	9.0	4.0	2.4	4.5	4.0	1.0
20	5.2	34.9	9.0	4.0	2.3	5.5	3.5	1.2	20	6.6	44.4	10.0	4.5	3.1	6.0	4.0	1.5
24	6.2	50.3	11.5	4.5	3.5	6.5	4.0	1.6	24	7.9	64.0	14.5	4.5	5.0	8.0	4.0	2.1
30	7.8	58.9	12.0	5.0	4.8	7.5	4.0	2.2	30	9.9	75.0	15.0	5.0	6.7	10.0	4.0	3.3
36	9.4	84.9	14.5	6.0	8.2	9.5	4.5	3.8	36	11.9	108.0	18.0	6.0	11.4	12.0	4.5	5.3
42	10.9	115.5	17.0	7.0	12.8	11.0	5.5	6.3	42	13.9	147.0	21.0	7.0	17.8	14.0	5.5	8.7
48	12.5	150.9	19.0	8.0	18.4	13.0	6.0	9.2	48	15.9	192.0	24.0	8.0	26.2	16.0	6.0	12.4
54	14.0	191.0	21.5	9.0	26.0	15.0	6.5	12.9	54	17.9	243.0	27.0	9.0	36.9	18.0	7.0	18.1
60	15.6	235.8	24.0	10.0	35.6	16.0	7.5	17.6	60	19.9	299.8	30.0	10.0	50.3	20.0	7.5	24.0
66	17.1	285.3	26.0	11.0	46.0	18.0	8.0	23.0	66	21.8	362.8	33.0	11.0	66.2	22.0	8.5	32.5
72	18.7	339.5	28.5	12.0	57.8	19.0	9.0	28.4	72	23.8	431.8	36.0	12.0	85.6	24.0	9.0	41.0
78	20.2	398.5	31.0	13.0	75.7	21.0	9.5	37.4	78	25.7	506.7	39.0	13.0	108.2	26.0	10.0	53.2
84	21.8	462.1	33.5	14.0	94.7	22.0	10.5	46.5	84	27.7	587.7	42.0	14.0	134.4	28.0	10.5	64.8
90	23.3	530.5	35.5	15.0	114.4	24.5	11.0	58.2	90	29.0	674.6	45.0	15.0	164.9	30.0	11.5	81.2
96	24.9	603.6	38.0	16.0	138.9	25.5	12.0	70.0	96	31.6	767.5	48.0	16.0	199.0	32.0	12.0	95.1

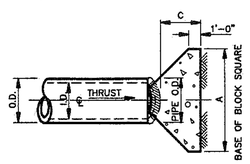
TABLES OF DIMENSIONS AND QUANTITIES

HORIZONTAL THRUST BLOCK
AT PIPE BEND

North Central Texas Council of Governments

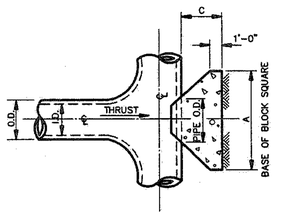
STANDARD SPECIFICATION REFERENCE
DATE NOV. '96 | STANDARD DRAWING NO. 4010C

GENERAL NOTES:
1. ALL FIRE HYDRANTS TO BE WATEROUS FIRE HYDRANTS OR EQUAL, APPROVED BY CITY OF LUCAS PUBLIC WORKS DIRECTOR.
2. ALL FITTINGS TO BE FORD BRASS OR EQUAL, APPROVED BY CITY OF LUCAS PUBLIC WORKS DIRECTOR.
3. ALL METERS AND SERVICE TAPS SHALL BE 1" POLY OR LARGER.



PLAN OF PLUG THRUST BLOCK
N.T.S.

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



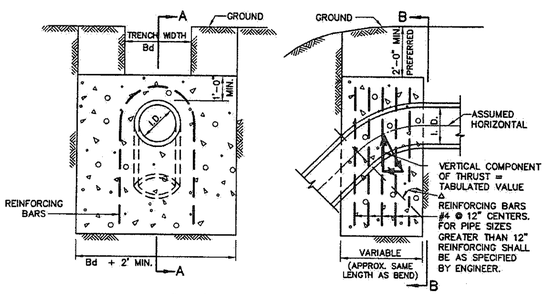
PLAN OF TEE THRUST BLOCK
N.T.S.

I.D. (IN.)	THRUST (TONS)	C (FT.)	EARTH A (FT.)	EARTH VOL. (C.Y.)	ROCK A (FT.)	ROCK VOL. (C.Y.)
4,6,8	5.1	1.5	2.5	0.3	2.0	0.2
10,12	11.3	1.5	3.5	0.6	2.5	0.3
16,18	25.5	2.0	5.5	1.6	4.0	0.9
20	31.5	2.0	6.0	1.9	4.0	0.9
24	45.2	2.5	7.0	3.1	5.0	1.7
30	53.0	3.0	7.5	4.1	5.5	2.4
36	76.3	4.0	9.0	7.3	6.5	4.2
42	104.0	4.5	10.5	11.0	7.5	6.2
48	136.0	5.0	12.0	15.6	8.5	8.7
54	172.0	5.5	13.5	21.4	9.5	11.9
60	212.0	6.0	15.0	28.4	10.5	15.7
66	257.0	6.5	16.5	36.8	11.5	20.5
72	305.0	7.5	17.5	47.2	12.5	27.2
78	358.0	8.0	19.0	58.9	13.5	33.7
84	416.0	8.5	20.5	72.3	14.5	41.2
90	477.0	9.0	22.0	87.7	15.5	49.7
96	543.0	9.5	23.5	104.8	16.5	61.0

HORIZONTAL THRUST BLOCK
AT TEES AND PLUGS

North Central Texas Council of Governments

STANDARD SPECIFICATION REFERENCE 6.7.
DATE NOV. '96 | STANDARD DRAWING NO. 4020



ELEVATION "B–B"
N.T.S.

SECTION "A–A"
N.T.S.

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

Δ	11.25° THRUST (TONS)	11.25° VOL. (C.Y.)	22.50° THRUST (TONS)	22.50° VOL. (C.Y.)	30° THRUST (TONS)	30° VOL. (C.Y.)	45° THRUST (TONS)	45° VOL. (C.Y.)	67.50° THRUST (TONS)	67.50° VOL. (C.Y.)	90° THRUST (TONS)	90° VOL. (C.Y.)	Δ I.D. (IN.)
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	4,6,8
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	10,12
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	16,18
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	20
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	24
30	10.5	5.2	20.3	10.1	26.5	13.3	37.5	18.8	49.0	24.5	53.1	26.5	30
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	36
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	42
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	48
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	54
60	41.4	20.7	81.2	40.6	106.0	53.0	150.0	75.0	196.0	98.0	212.0	106.0	60
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	66
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	72
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	78
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	84
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	90
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	96

VERTICAL THRUST BLOCK
AT PIPE BEND

North Central Texas Council of Governments

STANDARD SPECIFICATION REFERENCE 6.7.
DATE NOV. '96 | STANDARD DRAWING NO. 4030

GENERAL NOTES FOR ALL THRUST BLOCKS:

1. CONCRETE FOR BLOCKING SHALL BE CLASS "B".
2. ALL CALCULATIONS ARE BASED ON INTERNAL PRESSURE OF 200 PSI FOR DUCTILE IRON, P.V.C., AND 150 PSI FOR CONCRETE PIPE.
3. 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.
4. WALL THICKNESS (T) ASSUMED HERE FOR ESTIMATING PURPOSES ONLY.
5. POUR CONCRETE FOR BLOCK AGAINST UNDISTURBED EARTH.
6. 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.
7. THE SOIL BEARING PRESSURES ARE BASED ON 1000 LBS./S.F. IN SOIL AND 2000 LBS./S.F. IN ROCK.
8. USE POLYETHYLENE WRAP OR EQUAL BETWEEN CONCRETE AND BEND, TEE, OR PLUG TO PREVENT THE CONCRETE FROM STICKING TO IT.
9. CONCRETE SHALL NOT EXTEND BEYOND JOINTS.

THRUST BLOCK
GENERAL NOTES

North Central Texas Council of Governments

STANDARD SPECIFICATION REFERENCE 6.7.
DATE NOV. '96 | STANDARD DRAWING NO. 4040

AS-BUILT RECORD DRAWING

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Douglas W. Weaver
G & A Consultants, LLC.
Date: 11/23/2015

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DOUGLAS W. WEAVER
117386
LICENSED
PROFESSIONAL ENGINEER

OWNER/DEVELOPER
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C/O LENART DEVELOPMENT COMPANY, LLC
520 CENTRAL PARKWAY E. SUITE 104
PLANO, TX 75074
Ph. (972) 422-9880
Contact: Steve Lenart

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LAND SURVEYING LANDSCAPE ARCHITECTURE
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611 Dallas Drive, Suite 114 • Roanoke, TX 76262 • P: 682.831.9712 • F: 817.690.4043
TBPE Firm No. 1798

LEWIS PARK ESTATES

LEWIS PARK ESTATES
Lot 1-16, 1-20, Block A, B
LEWIS PARK ESTATES
60.858 Acres
in the
JAMES ANDERSON SURVEY, ABSTRACT NO. 17
CITY OF LUCAS
COLLIN COUNTY, TEXAS

STANDARD WATER DETAILS

G&A CONSULTANTS, LLC.
TBPE F-1798

Drawn By: TJF
Date: 11/07/2014
Scale: CUSTOM
Revisions:

14026

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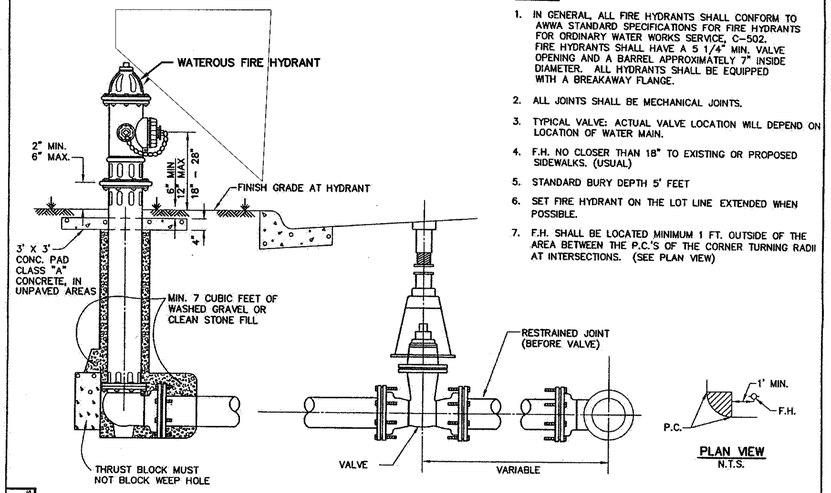
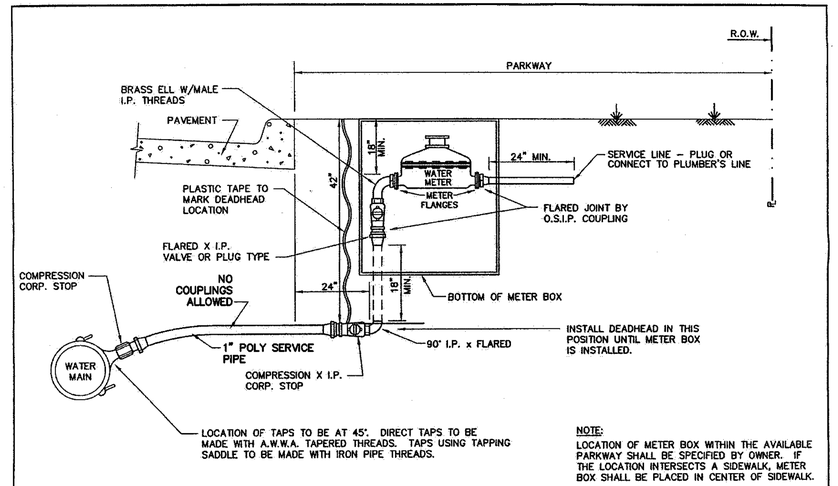


NOTES:

1. IN GENERAL, ALL FIRE HYDRANTS SHALL CONFORM TO AWWA STANDARD SPECIFICATIONS FOR FIRE HYDRANTS FOR ORDINARY WATER WORKS SERVICE, C-502. FIRE HYDRANTS SHALL HAVE A 5 1/4" MIN. VALVE OPENING AND A BARREL APPROXIMATELY 7" INSIDE DIAMETER. ALL HYDRANTS SHALL BE EQUIPPED WITH A BREAKAWAY FLANGE.
2. ALL JOINTS SHALL BE MECHANICAL JOINTS.
3. TYPICAL VALVE: ACTUAL VALVE LOCATION WILL DEPEND ON LOCATION OF WATER MAIN.
4. F.H. NO CLOSER THAN 18" TO EXISTING OR PROPOSED SIDEWALKS. (USUAL)
5. STANDARD BURY DEPTH 5' FEET
6. SET FIRE HYDRANT ON THE LOT LINE EXTENDED WHEN POSSIBLE.
7. F.H. SHALL BE LOCATED MINIMUM 1 FT. OUTSIDE OF THE AREA BETWEEN THE P.C.'S OF THE CORNER TURNING RADII AT INTERSECTIONS. (SEE PLAN VIEW)

4120 DN CHANGES APPROVED

FIRE HYDRANT INSTALLATION	North Central Texas Council of Governments	STANDARD SPECIFICATION REFERENCE 6.7.	
		DATE NOV. '96	STANDARD DRAWING NO. 4120



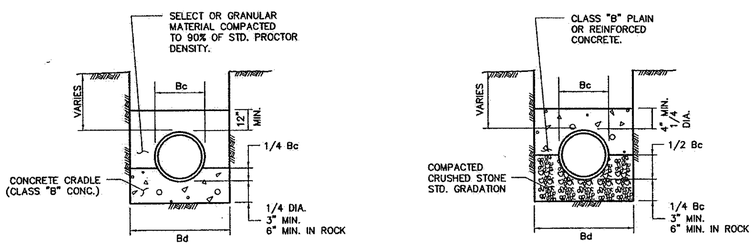
NOTE:
LOCATION OF METER BOX WITHIN THE AVAILABLE PARKWAY SHALL BE SPECIFIED BY OWNER. IF THE LOCATION INTERSECTS A SIDEWALK, METER BOX SHALL BE PLACED IN CENTER OF SIDEWALK.

4140 DN CHANGES APPROVED

WATER SERVICE INSTALLATION 1" LINE	North Central Texas Council of Governments	STANDARD SPECIFICATION REFERENCE 6.7.	
		DATE NOV. '96	STANDARD DRAWING NO. 4140

GENERAL NOTES:

1. ALL FIRE HYDRANTS TO BE WATEROUS FIRE HYDRANTS OR EQUAL, APPROVED BY CITY OF LUCAS PUBLIC WORKS DIRECTOR.
2. ALL FITTINGS TO BE FORD BRASS OR EQUAL, APPROVED BY CITY OF LUCAS PUBLIC WORKS DIRECTOR.
3. ALL METERS AND SERVICE TAPS SHALL BE 1" POLY OR LARGER.



CLASS "A"

CLASS "B" CONCRETE CRADLE N.T.S.
PLAIN CONC. LF 2.8
REINF. CONC. LF 3.4 P=0.4%

CLASS "A-1"

CLASS "B" CONCRETE CAP N.T.S.
PLAIN CONC. LF 2.8
REINF. CONC. LF 3.4 P=0.4%
REINF. CONC. LF 4.8 P=1.0%

NOTES:

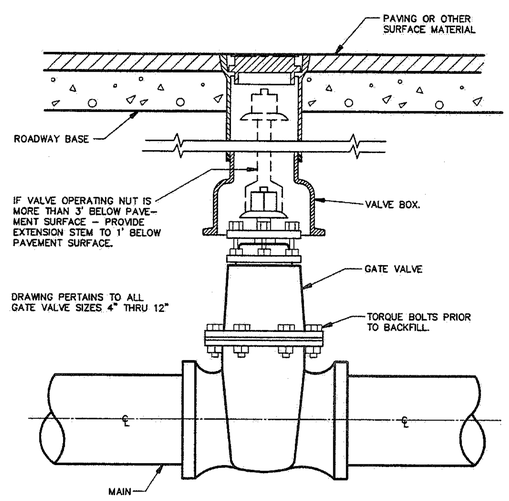
1. LF. = LOAD FACTOR TO BE USED TO DETERMINE 3 EDGE BEARING BASED ON TYPE OF EMBEDMENT.
2. FREE-FALL OF CONCRETE NOT TO EXCEED 5 FT. MAXIMUM.
3. P = Rho FOR STEEL %
4. Bc = OUTSIDE DIAMETER OF PIPE
5. Bd = TRENCH WIDTH

3010 DN CHANGES APPROVED

EMBEDMENT CLASS "A" & "A-1"	North Central Texas Council of Governments	STANDARD SPECIFICATION REFERENCE 6.2.	
		DATE NOV. '96	STANDARD DRAWING NO. 3010

NOTE:

IN UNPAVED AREAS, INSTALL 2' x 2' x 6" CONCRETE VALVE PAD FLUSH WITH THE TOP OF VALVE BOX. REINFORCE WITH #3 BARS ON 6" CENTERS BOTH WAYS.



GATE VALVE BOX AND EXTENSION STEM

N.T.S.

GATE VALVE 4" TO 12" BOX & EXTENSION STEM	North Central Texas Council of Governments	STANDARD SPECIFICATION REFERENCE 6.7.	
		DATE NOV. '96	STANDARD DRAWING NO. 4050

AS-BUILT RECORD DRAWING

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LEWIS PARK ESTATES

LEWIS PARK ESTATES
Lot 1-16, 1-20, Block A, B
LEWIS PARK ESTATES
60.858 Acres
in the
JAMES ANDERSON SURVEY, ABSTRACT NO. 17
CITY OF LUCAS
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STANDARD WATER DETAILS

G&A CONSULTANTS, LLC.
TBPE F-1798

Drawn By: TJF
Date: 11/07/2014
Scale: 1" = 1"
Revisions:

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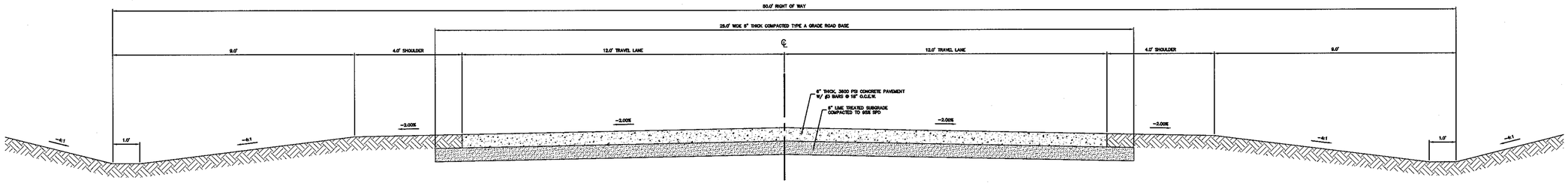
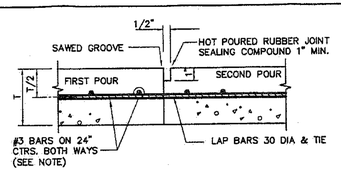
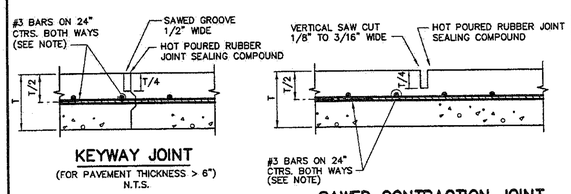


TYPICAL ROADWAY SECTION
NOT TO SCALE



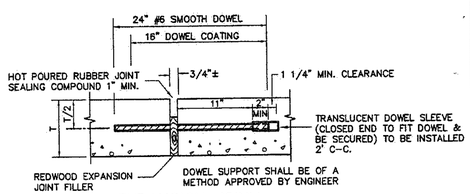
CONSTRUCTION JOINT
N.T.S.



KEYWAY JOINT
(FOR PAVEMENT THICKNESS > 6")
N.T.S.

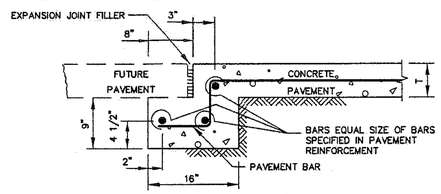
SAWED CONTRACTION JOINT
N.T.S.

NOTE:
ALTERNATE REINFORCEMENT #4 BARS ON 30" CTRS. BOTH WAYS.

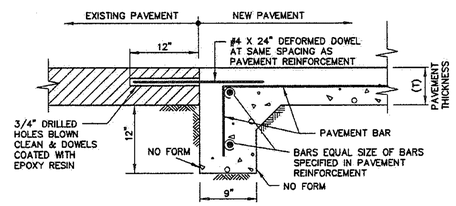


EXPANSION JOINT
(SPACED 600 FT. MAXIMUM; LOCATE AT STRUCTURES AND AT INTERSECTION P.C.'S & P.T.'S)
N.T.S.

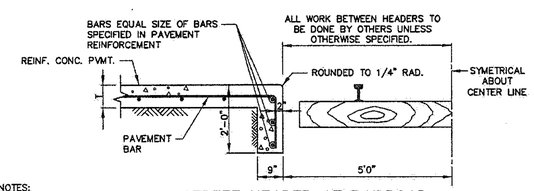
REINFORCED CONCRETE PAVEMENT	North Central Texas Council of Governments	STANDARD SPECIFICATION REFERENCE 5.8.	
JOINTS		DATE NOV. '96	STANDARD DRAWING NO. 2050



STREET HEADER FOR FUTURE PAVEMENT
N.T.S.



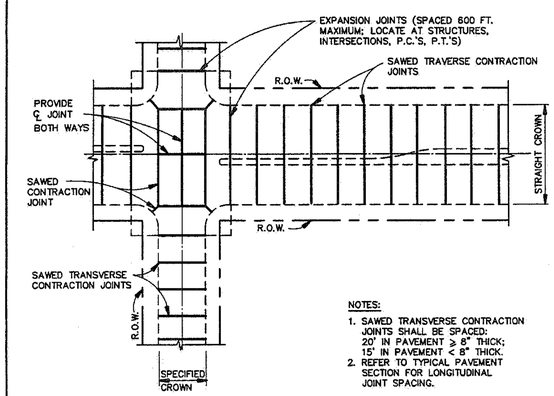
STREET HEADER AT EXISTING PAVEMENT
N.T.S.



NOTES:
1. PAVEMENT BARS TO BE BENT DOWN INTO HEADER.
2. HEADER AND PAVEMENT TO BE MONOLITHIC.

STREET HEADER AT RAILROAD
N.T.S.

REINFORCED CONCRETE PAVEMENT	North Central Texas Council of Governments	STANDARD SPECIFICATION REFERENCE 8.5.	
STREET HEADERS		DATE NOV. '96	STANDARD DRAWING NO. 2070



NOTES:
1. SAWED TRANSVERSE CONTRACTION JOINTS SHALL BE SPACED: 20' IN PAVEMENT ≥ 8" THICK; 15' IN PAVEMENT < 8" THICK.
2. REFER TO TYPICAL PAVEMENT SECTION FOR LONGITUDINAL JOINT SPACING.

SPACING DIAGRAM FOR TRANSVERSE JOINTS
N.T.S.

REINFORCED CONCRETE PAVEMENT	North Central Texas Council of Governments	STANDARD SPECIFICATION REFERENCE 5.8.	
TRANSVERSE JOINT SPACING		DATE NOV. '96	STANDARD DRAWING NO. 2060

AS-BUILT RECORD DRAWING

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STANDARD PAVING DETAILS

G&A CONSULTANTS, LLC.
TBPE F-1798

Drawn By: TJF
Date: 11/07/2014
Scale: CUSTOM
Revisions:

14026

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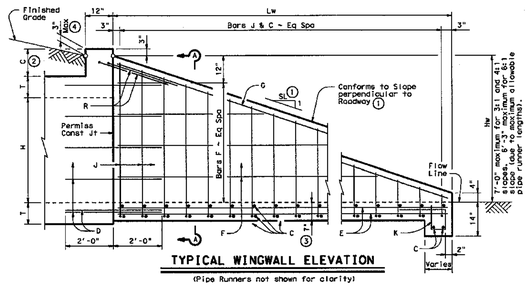
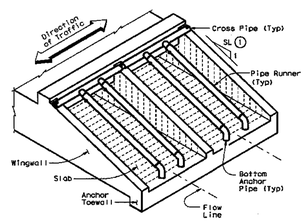


TYPICAL WINGWALL ELEVATION

(Pipe Runners not shown for clarity)



ISOMETRIC VIEW OF TYPICAL INSTALLATION

Formulas: (All values are in Feet)
Hw = H + T + C - 0.250'
Lw = (Hw - 0.333') (SL)

For Cast-in-place culverts:
Atw = (N) (S) + (N+1) (U)
For Precast culverts:
Atw = (N) (2U+S) + (N-1) (0.500')

Total Wingwall Area (S.F.)
= (0.5) (Hw + 0.333') (Lw) (N+1)
Total Concrete Volume (C.Y.)
= (Wingwall Area) (0.583') +
(Lw) (Atw) (0.583') +
(Atw) (1.167') (1.167' - 0.583')] ÷ (27)
Pipe Runner Length
= (Lw) (SL) - (1.917')
Total Reinforcing (Lbs)
= (1.55) (Lw) (Atw) +
(44.43) (Atw) +
(K2) (Hw) (N+1) (Lw)

C = Height of Curb above top of Top Slab
Hw = Height of Wingwall
K = Constant Value for use in formulas

Slope SL:1	K1	K2
3:1 ~	1.054 ~	7.45
4:1 ~	1.031 ~	8.49
6:1 ~	1.014 ~	10.30

Atw = Anchor Toewall Length
Lw = Length of Wingwall
N = Number of Culvert Barrels
SL:1 = Side Slope Ratio (Horizontal : 1 Vertical)

See applicable box culvert standard for H, S, T, and U values.

GENERAL NOTES:

Designed according to current AASHTO Standard and Interim Specifications.

The Safety End Treatments shown herein are intended for use in those installations where out of control vehicles are likely to traverse the openings approximately perpendicular to the Pipe Runners.

Pipe Runners are designed for a traversing load of 1,800 pounds at yield as recommended by Research Report 280-1, "Safety Treatment of Roadside Cross-Drainage Structures", Texas Transportation Institute, March 1981.

All reinforcing steel shall be Grade 60. All reinforcing shall be adjusted as necessary to provide a minimum clear cover of 1 1/2".

All concrete shall be Class "C" and shall have a minimum compressive strength of 3600 psi.

The quantities for Pipe Runners, reinforcing steel, and concrete, resulting from the formulas given herein are for Contractor's Information only.

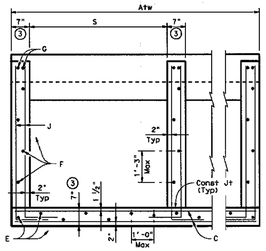
Pipe Runners, Cross Pipes, and Anchor Pipes shall conform to the requirements of ASTM A53 (Type E or S, Grade B), ASTM A500 (Grade B), or API 5L/X52.

Bolts and nuts shall conform to ASTM A307.

All steel components, except the concrete reinforcing, shall be galvanized after fabrication. Galvanizing damaged during transport or construction shall be repaired in accordance with the specifications.

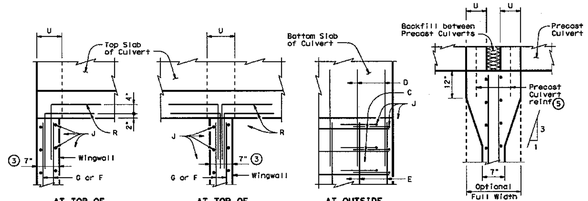
See BCS standard sheet for additional dimensions and information.

Alternate design drawings bearing the seal of a professional engineer will be acceptable for precast construction of the Safety End Treatments.



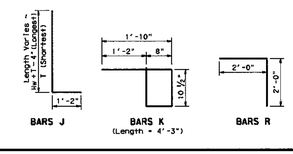
SECTION A-A

(Showing typical Wingwall and Wing Slab reinforcing)
(Pipe Runners not shown for clarity)



AT TOP OF EXTERIOR WINGWALL (Cast-in-Place Culvert)
AT TOP OF INTERIOR WINGWALL (Cast-in-Place Culvert)
AT OUTSIDE OF BOTTOM SLAB (Cast-in-Place Culvert)
AT INTERIOR WINGWALL (Precast Culvert)

PLAN VIEWS OF CORNER DETAILS



BARS J
BARS K (Length = 4'-3")
BARS R

TABLE OF REINFORCING BAR SIZES & SPACING		
Bar	Size	Spacing
C	#4	10" Max
D	#4	match F & E
E	#4	1'- 0" Max
F	#4	1'- 3" Max
G	#6	Shown
J	#4	10" Max
K	#4	1'- 0" Max
R	#4	Shown

1. Recommended values of slope are: 3:1, 4:1, & 6:1. Slope shall be 3:1 or flatter.
2. 0" min to 5'-0" max. Estimated curb heights are shown elsewhere in the plans. For structures without railing and curbs taller than 1'-0", refer to ECD standard.
3. Wingwall and slab thicknesses may be the same as the adjacent culvert wall and slab thicknesses (7" Minimum). If thicknesses greater than the minimum (7") are used, no changes will be made in quantities and no additional compensation will be allowed.
4. For vehicle safety, curbs shall project no more than 3" above finished grade. Curb heights shall be reduced, if necessary, to meet these requirements. No changes will be made in quantities and no additional compensation will be allowed for this work.
5. For Culverts with C = 0", the precast culvert reinforcing may extend 1'-0" minimum into Wingwall. Wingwall Bars D and R may be omitted. Otherwise, refer to the "Wingwall Connection Detail" on the SCP-MD standard.

SHEET 1 OF 2

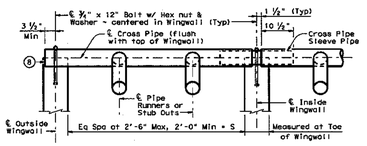
Texas Department of Transportation
Bridge Division

SAFETY END TREATMENT
FOR 0° SKEW BOX CULVERTS
(MAXIMUM Hw = 7'-0")
TYPE I ~ CROSS DRAINAGE

SETB-CD

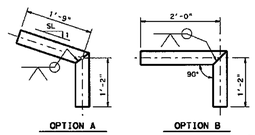
FILE: setbcd6a.dgn	DN: GAF	CK: CAT	DW: JRP	CK: GAF
©TxDOT May 2005	DISTRICT	FEDERAL AID PROJECT		SHEET
REVISIONS				
	COUNTY		CONTROL	SECT	JOB	HIGHWAY

DISCLAIMER:
The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.



NOTE: At Contractor's option, the Cross Pipe may be made continuous across the Inside Wingwalls. If such option is selected, the Sleeve Pipe shall be omitted and a 25/16" diameter through hole be made in the Cross Pipe to accept the anchor bolt at the centerline of each Inside Wingwall.

CROSS PIPE INSTALLATION DETAILS

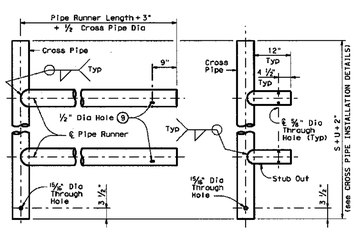


OPTION A
OPTION B

BOTTOM ANCHOR PIPE DETAILS (10)

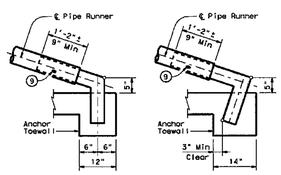
(6) Cross Pipe shall be the same size as the Pipe Runner. Cross Pipe Stub Out shall be the same size as the Anchor Pipe.
(7) Note that actual slope of Safety Pipe Runner may vary slightly from Side Slope.
(8) Care shall be taken to ensure that Riprap concrete does not flow into the Cross Pipe so as to permit disassembly of the bolted connection to allow cleanout access.
(9) After Installation, the 1/2" hole shall be inspected to ensure that the top of the Safety Pipe Runner with the Bottom Anchor Pipe is adequate.
(10) At fabricator's option, a heat bend to a smooth 5" radius or a manufactured elbow (of the same material as the Runner) may be substituted for the mitered and welded joint in the Bottom Anchor Pipe.

MAXIMUM PIPE RUNNER LENGTHS & REQUIRED PIPE RUNNER AND ANCHOR PIPE SIZES (6)						
Maximum Pipe Runner Length	Required Pipe Runner Size			Required Anchor Pipe Size		
	Pipe Size	Pipe O.D.	Pipe I.D.	Pipe Size	Pipe O.D.	Pipe I.D.
10'- 0"	3" STD	3.500"	3.068"	2" STD	2.375"	2.067"
19'- 8"	4" STD	4.500"	4.026"	3" STD	3.500"	3.068"
34'- 2"	5" STD	5.563"	5.047"	4" STD	4.500"	4.026"



OPTION A2
OPTION A1

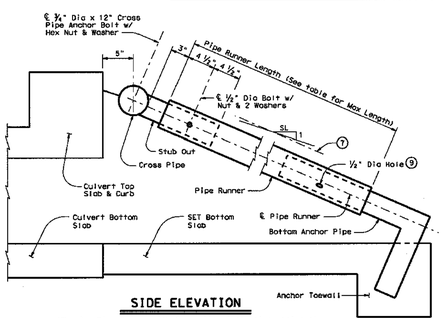
FOR USE IN OUTSIDE CULVERT BAY



OPTION B1
OPTION B2

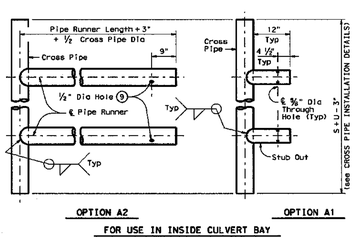
BOTTOM ANCHOR TOEWALL DETAILS

(Wingwall not shown for clarity)



SIDE ELEVATION

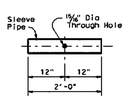
(Showing Pipe Runner with Cross Pipe Connection option A1 and anchor Pipe option B2. Wingwall not shown for clarity)



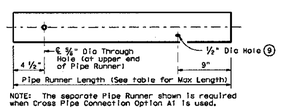
OPTION A2
OPTION A1

FOR USE IN INSIDE CULVERT BAY

CROSS PIPE AND CONNECTIONS DETAILS



CROSS PIPE SLEEVE PIPE DETAILS



NOTE: The separate Pipe Runner shown is required when Cross Pipe Connection Option A1 is used.

PIPE RUNNER DETAILS

SHEET 2 OF 2

Texas Department of Transportation
Bridge Division

SAFETY END TREATMENT
FOR 0° SKEW BOX CULVERTS
(MAXIMUM Hw = 7'-0")
TYPE I ~ CROSS DRAINAGE

SETB-CD

FILE: setbcd6a.dgn	DN: GAF	CK: CAT	DW: JRP	CK: GAF
©TxDOT May 2005	DISTRICT	FEDERAL AID PROJECT		SHEET
REVISIONS				
	COUNTY		CONTROL	SECT	JOB	HIGHWAY

SECTION A-A

SIDEWALK GROOVE DETAIL

SIDEWALK EXPANSION JOINT DETAIL

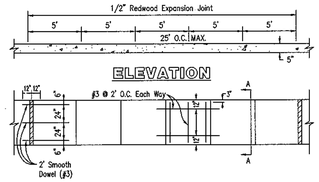
SIDEWALK NOTES:

A.) REQUIRED MIN. COMPRESSIVE STRENGTH OF CONC. = 3000 PSI @ 28 DAYS.

B.) A MIN. 4" SAND CUSHION SHALL BE PLACED ON A SUBGRADE COMPACTED TO 95% STD. PROCTOR DENSITY AND SAND SHALL BE COMPACTED TO 98% STD. PROCTOR DENSITY.

C.) FORMS SHALL BE SET TRUE TO LINE AND GRADE AND SHALL BE A MIN. OF 5-1/2" DEEP.

D.) FORMS SHALL BE SET UP SO THAT NO CONCRETE MAY FLOW UNDER THEM.



PLAN

DETAIL OF SIDEWALK

AS-BUILT RECORD DRAWING

THE INFORMATION ON THESE PLANS HAS BEEN REVISED TO REFLECT CHANGES TO PUBLIC IMPROVEMENTS MADE DURING CONSTRUCTION PROVIDED TO ENGINEER BY THE CONTRACTOR. UNLESS OTHERWISE NOTED, THE CONSTRUCTION OF THE PUBLIC IMPROVEMENTS IS IN GENERAL CONFORMANCE WITH THESE PLANS AND BASED UPON INFORMATION PROVIDED BY THE CONTRACTOR, AND THE RESPONSIBILITY FOR ACCURACY AND COMPLETENESS BELONGS TO THE CONTRACTOR.

Douglas W. Weaver
G & A Consultants, LLC.

Date: 11/23/2015

STATE OF TEXAS
DOUGLAS W. WEAVER
117386
LICENSED
PROFESSIONAL ENGINEER

OWNER/DEVELOPER
CADG LEWIS PARK LLC
C/O LENART DEVELOPMENT COMPANY, LLC
520 CENTRAL PARKWAY E. SUITE 104
PLANO, TX 75074
Ph. (972) 422-9880
Contact: Steve Lenart

SITE PLANNING CIVIL ENGINEERING PLATTING
CONSULTANTS, LLC
LAND SURVEYING LANDSCAPE ARCHITECTURE
111 Hillside Drive • Lewisville, TX 75067 • P: 972.436.9710 • F: 972.436.9716
611 Dallas Drive, Suite 114 • Roanoke, TX 76262 • P: 682.831.9712 • F: 817.898.4043
TBPE Firm No. 1798

LEWIS PARK ESTATES

LEWIS PARK ESTATES
Lot 1-16, 1-20, Block A, B
LEWIS PARK ESTATES
60.858 Acres
in the
JAMES ANDERSON SURVEY, ABSTRACT NO. 17
CITY OF LUCAS
COLLIN COUNTY, TEXAS

TXDOT CONSTRUCTION DETAILS

G&A CONSULTANTS, LLC.
TBPE F-1798

Drawn By: TJF
Date: 11/07/2014
Scale: 1" = 1'
Revisions:

14026

C33

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