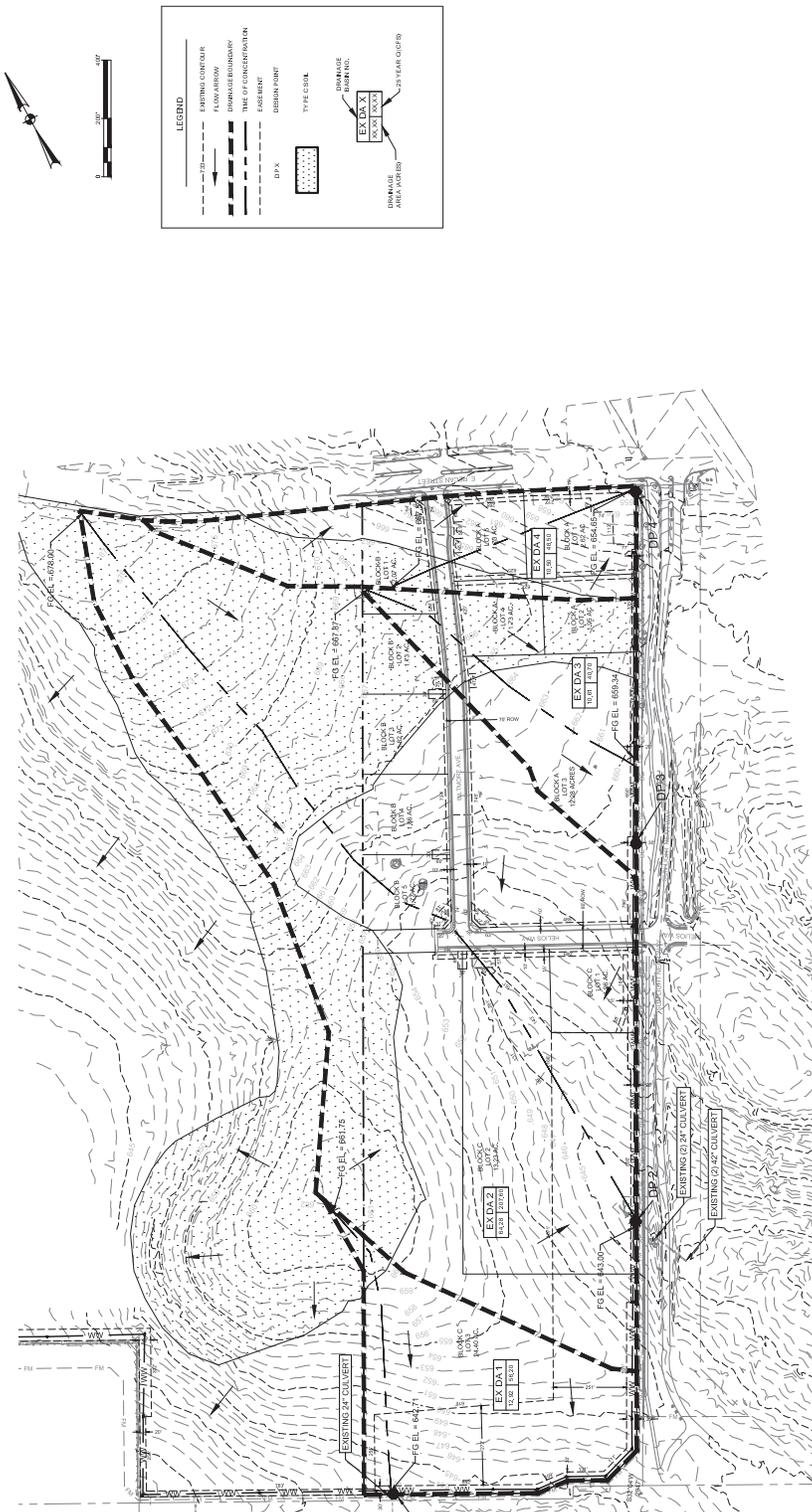


No.	Date	Description



11142/016
 11/14/2016

Project No.: 131018
 Date: 11/14/2016
 Checked By: JWA
 Sheet Title: EXISTING CONDITIONS AND DRAINAGE AREA MAP
 3 OF 16
 Sheet Number: 131018



ASSOCIATED REPORTS AND PLANS:
 ENGINEERS REPORT BY HALF ASSOCIATES, INC. DATED 05/24/2016

TABLE 3
 EXISTING CONDITIONS SUMMARY TABLE
 HEC-HMS STORMWATER RUNOFF CALCULATIONS FOR EXISTING DRAINAGE CONDITIONS

Basin	Area (Ac)	Imp. Cover (%)	CN	Tc (hr)	DP (ft)	Cs (%)	Cs2 (%)	Cs3 (%)	Cs4 (%)	Cs5 (%)	Cs6 (%)	Cs7 (%)	Cs8 (%)	Cs9 (%)	Cs10 (%)	Cs11 (%)	Cs12 (%)	Cs13 (%)	Cs14 (%)	Cs15 (%)	Cs16 (%)	Cs17 (%)	Cs18 (%)	Cs19 (%)	Cs20 (%)	
EX DA 1	12.52	0.00	84.3	18.5	1	0.60	42.70	56.20	78.50																	
EX DA 2	64.28	0.00	83.8	37.8	2	0.60	154.70	207.00	295.40																	
EX DA 3	10.50	0.00	83.3	15.3	4	0.10	36.50	48.50	66.20																	

Sheet Flow	Length		Slope		Manning's		Concentration Factor		Time		Time			
	ft	ft	ft	ft	n	n	ft	ft	min	min	min	min		
Basin	100	0.005	0.130	0.255	0.023	0.023	Unchanged	0.105	100	0.518	1.534	0.568	19.48	11.09
EX DA 1	100	0.005	0.130	0.246	0.009	0.021	Unchanged	0.221	1001	0.511	1.504	0.106	37.79	22.67
EX DA 2	100	0.004	0.130	0.262	0.011	0.011	Unchanged	0.188					28.72	15.43
EX DA 3	100	0.019	0.114	0.198	0.016	0.016	Unchanged	0.108					15.23	8.17

NOTE:
 THERE WILL BE NO DEMOLITION ON THE SITE

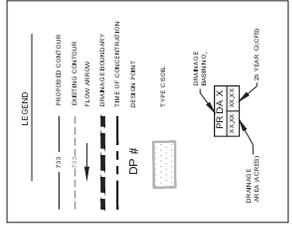
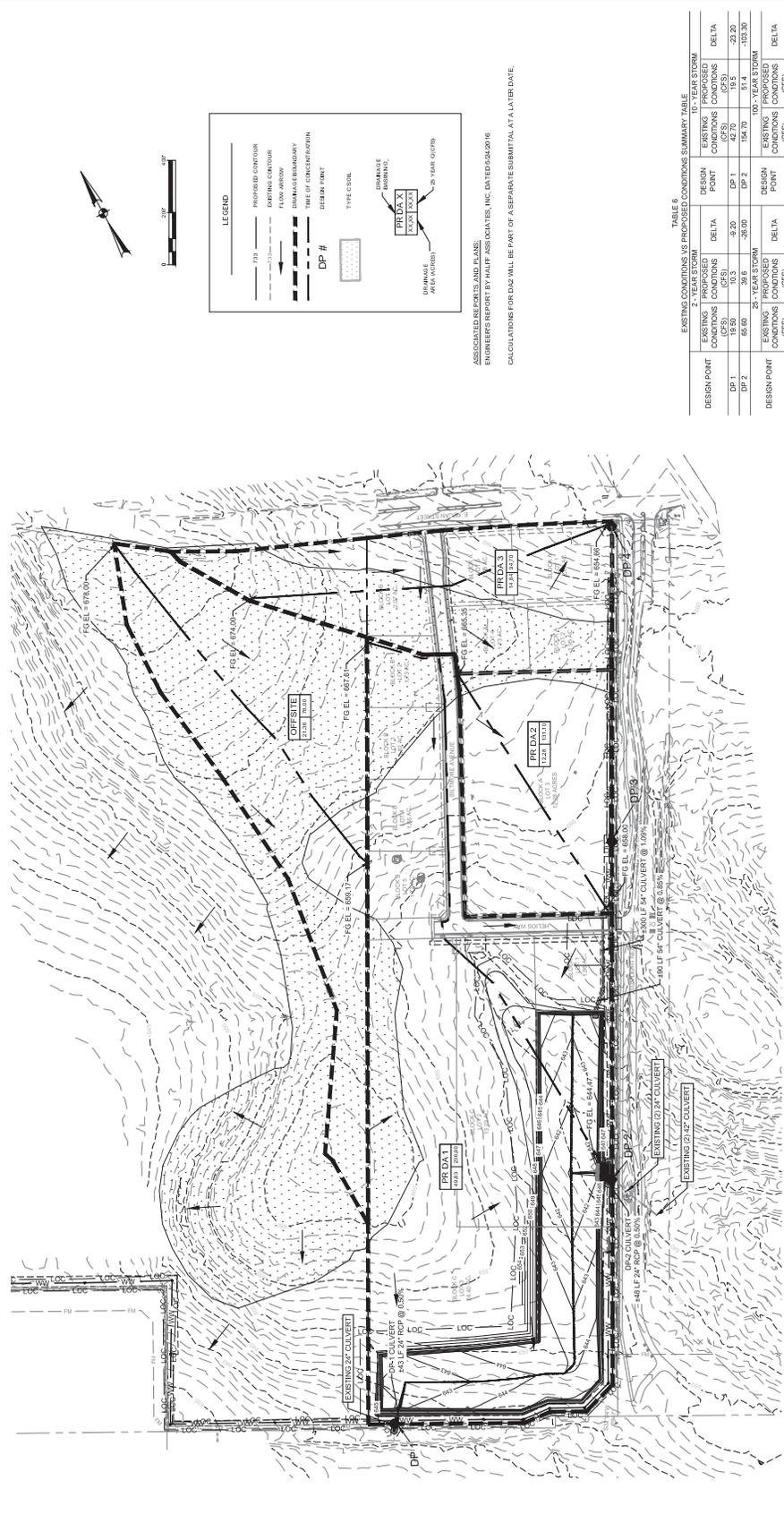
TIMMERMAN
WASTEWATER AND
COMMERCE TEXAS PROPERTIES, INC.
 2190 FM 685
 HULLTO, TEXAS 78634

HALF
 5800 AMBERLEY BLVD.
 SUITE 120
 HOUSTON, TEXAS 77056
 TEL: (817) 777-8800
 FAX: (817) 526-1411
 TMS# TMS# 0012

No.	Date	Description



PROJECT NO.: 31018
 DRAWING NO.: 1114-0216
 DATE: 11/14/2016
 CHECKED BY: MA
 SHEET TITLE: PROPOSED GRADING AND DRAINAGE AREA
 SHEET NO.: 4 OF 16



ASSOCIATED METERS AND PLANS
 ENGINEERING REPORT BY HUNT ASSOCIATES, INC. DATED 09/24/2016
 CALCULATIONS FOR DAs WILL BE PART OF A SEPARATE SUBMITTAL AT A LATER DATE.

TABLE 4
 EXISTING CONDITIONS VS PROPOSED CONDITIONS SUMMARY TABLE

DESIGN POINT	EXISTING PROPOSED CONDITIONS (CFS)	DELTA	DESIGN POINT	10-YEAR STORM EXISTING PROPOSED CONDITIONS (CFS)	DELTA
DP 1	18.50	-8.20	DP 1	42.70	-23.20
DP 2	33.00	-26.00	DP 2	54.70	-21.70
DESIGN POINT	EXISTING PROPOSED CONDITIONS (CFS)	DELTA	DESIGN POINT	EXISTING PROPOSED CONDITIONS (CFS)	DELTA
DP 1	56.20	-32.50	DP 1	78.50	-22.30
DP 2	207.00	-100.50	DP 2	295.40	-107.60

TABLE 5
 PROPOSED CONDITIONS SUMMARY TABLE

DESIGN POINT	EXISTING CULVERT CAPACITY (CFS)	PROPOSED CULVERT CAPACITY (CFS)	DELTA
DP 1	26.89	26.1	-1.70
DP 2	52.8	52.8	0.0

TABLE 6
 PROPOSED CONDITIONS SUMMARY TABLE

DESIGN POINT	EXISTING PROPOSED CONDITIONS (CFS)	DELTA	DESIGN POINT	EXISTING PROPOSED CONDITIONS (CFS)	DELTA
DP 1	18.50	-8.20	DP 1	42.70	-23.20
DP 2	33.00	-26.00	DP 2	54.70	-21.70
DESIGN POINT	EXISTING PROPOSED CONDITIONS (CFS)	DELTA	DESIGN POINT	EXISTING PROPOSED CONDITIONS (CFS)	DELTA
DP 1	56.20	-32.50	DP 1	78.50	-22.30
DP 2	207.00	-100.50	DP 2	295.40	-107.60

TABLE 7
 CULVERT FLOWS AND VELOCITIES

CULVERT FLOWS	DA	DA	DA	DA	DA	DA	DA	DA
	1	2	3	4	5	6	7	8
DP 1	27.24'	35.50'	8.71'	55.85'	9.02'	66.40'	9.86'	
DP 2	36.00'	4.43'						

1) Flows were calculated using HEC-CHAS. Velocities were calculated using Hydrus.
 2) Time of Concentration Calculations were calculated using TR-55.

TABLE 8
 SHEET FLOW

Length	Slope	Manning's n	Flow	Flow	Flow	Flow	Flow	Flow
			1	2	3	4	5	6
PR DA 1	1.00	0.011	0.13	0.176	0.045	0.138	1.197	0.013
PR DA 2	1.00	0.011	0.13	0.176	0.045	0.138	1.197	0.013

1) Flows were calculated using HEC-CHAS.

TABLE 9
 SHEET FLOW

Length	Slope	Manning's n	Flow	Flow	Flow	Flow	Flow	Flow
			1	2	3	4	5	6
PR DA 1	1.00	0.011	0.13	0.176	0.045	0.138	1.197	0.013
PR DA 2	1.00	0.011	0.13	0.176	0.045	0.138	1.197	0.013

1) Flows were calculated using HEC-CHAS.

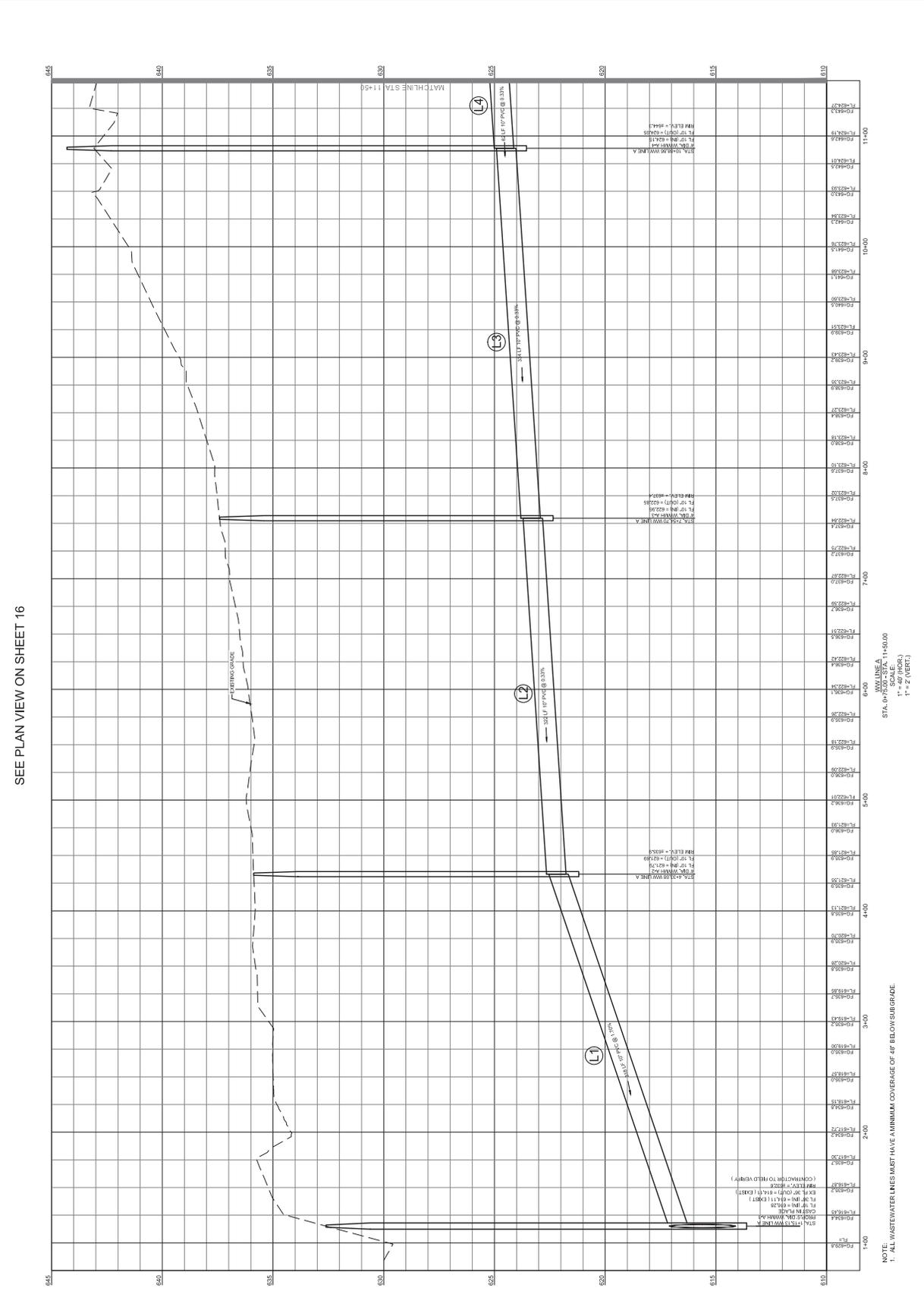
TIMMERMAN
REGIONAL DETENTION
WASTEWATER AND
COMMERCE TEXAS PROPERTIES, INC
 2190 FM 685
 HUTTO, TEXAS 78634

HALFF
 5000 AMBERLEY BLVD.
 SUITE 120
 AUSTIN, TEXAS 78729
 TEL: (512) 777-6600
 FAX: (512) 552-6141
 TMS: TMS 4012

No.	Date	Description



Project No.: 31012
 Issued: 11/14/2016
 Drawn By: JWA
 Checked By: JWA
 Sheet Title: WASTEWATER PLAN AND PROFILE (1 OF 9)
 Sheet Number: 7 OF 16



SEE PLAN VIEW ON SHEET 16

WASTEWATER
 STA. 0+50 TO STA. 11+00
 SCALE:
 1" = 40' (HORIZ.)
 1" = 2' (VERT.)

NOTE:
 1. ALL WASTEWATER LINES MUST HAVE MINIMUM COVERAGE OF 46"

No.	Date	Description



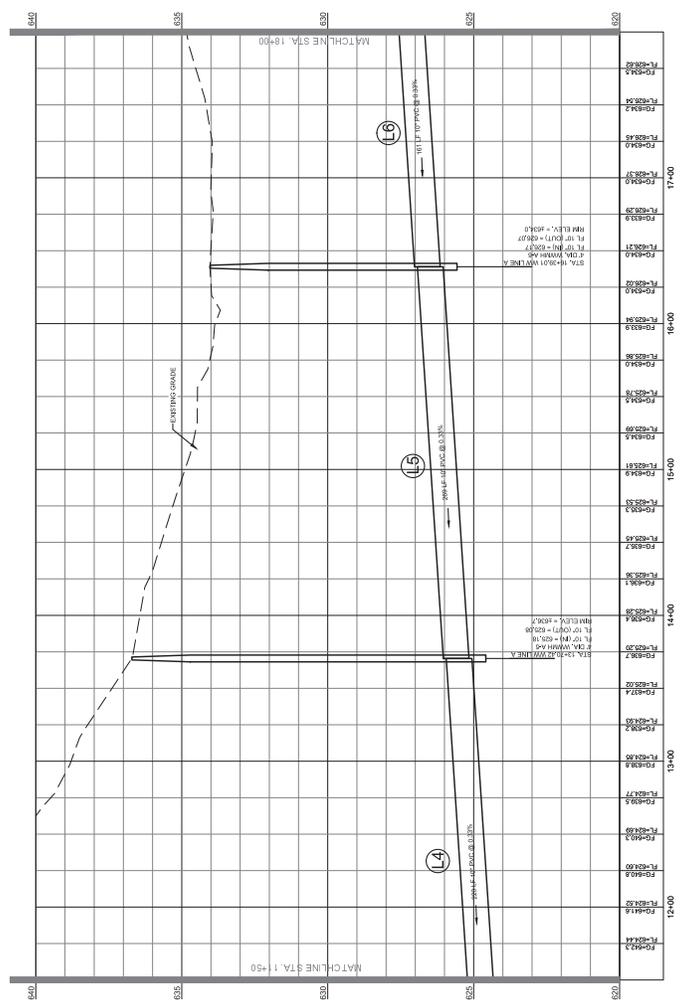
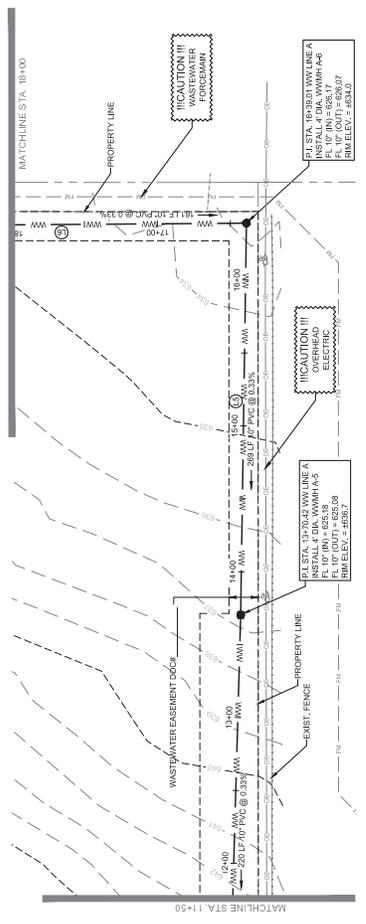
11114/2016
 TRAVIS A. WILLIAMS
 LICENSE NO. 11114
 STATE OF TEXAS
 MECHANICAL
 TRAVIS WILLIAMS ENGINEERING, P.C.
 1500 AMHERST DRIVE, SUITE 1200
 FORT WORTH, TEXAS 76102
 TRAVIS@TAWILLIAMS.COM
 (817) 777-6600

Project No.: 13018
 Revised: 11/14/2018
 Drawn By: LMA
 Checked By: LMA
 Sheet Title: WASTEWATER PLAN AND PROFILE (3 OF 9)
 Sheet Number: 9 OF 16



LINE #	DIRECTION	LENGTH	START	END	PLACEMENT	START STA.	END STA.
L4	S89°37'30"W	286.52'	N 102°28'24.96" E 2.33826328'	E 2.33826328'	WW LINE A	10+80.0	11+08.6
L5	S89°37'30"W	286.52'	N 102°28'24.96" E 2.33826328'	E 2.33826328'	WW LINE A	13+764.2	14+051.0
L6	S89°37'30"W	286.52'	N 102°28'24.96" E 2.33826328'	E 2.33826328'	WW LINE A	16+548.4	16+835.0

SYMBOL	DESCRIPTION
(Circle with dot)	EX. TREE
(Circle with cross)	EX. BENCHMARK
(Circle with 'X')	EX. CONTROL POINT
(Circle with 'P')	EX. POWER POLE
(Circle with 'W')	EX. GUY WIRE
(Circle with 'E')	EX. WASTEWATER CLEANOUT
(Circle with 'S')	EX. WASTEWATER MANHOLE
(Circle with 'R')	EX. RAIN MANHOLE
(Circle with 'H')	EX. HYDRO-PNEUMATIC TANK
(Circle with 'A')	PROF. WASTEWATER LINE
(Circle with 'B')	PROF. RAIN LINE

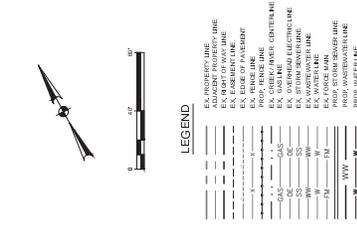


NOTE:
 1. ALL WASTEWATER LINES MUST HAVE A MINIMUM COVERAGE OF 48" BELOW SUBGRADE.

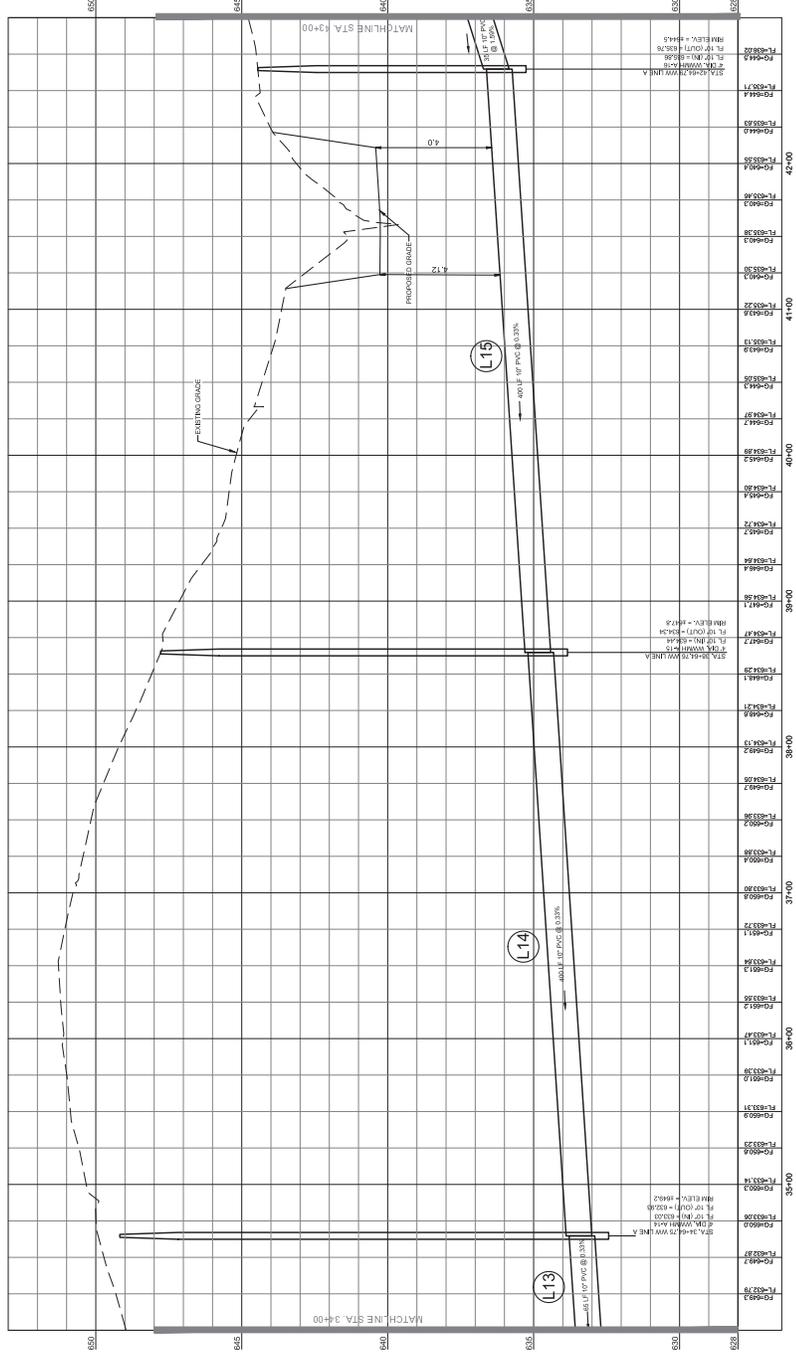
No.	Date	Description

111142016

Project No.:	13018
Issued:	11/14/2018
Checked By:	LWA
Drawn By:	LWA
Sheet Title:	WASTEWATER PLAN
AND PROFILE (6 OF 9)	
Sheet Number:	12 OF 16



LINE #	DIRECTION	LENGTH	START STA.	ALIGNMENT	END STA.
1.3	N27°40'37"E	100.00'	N 335821.24	WW LINE A	34+44.75
1.4	N27°30'37"E	400.00'	N 335821.24	WW LINE A	34+44.75
1.5	N27°29'44"E	400.00'	N 335821.24	WW LINE A	41+44.75



NOTE:
 1. ALL WASTEWATER LINES MUST HAVE A MINIMUM COVER OF 48" BELOW GRADE.

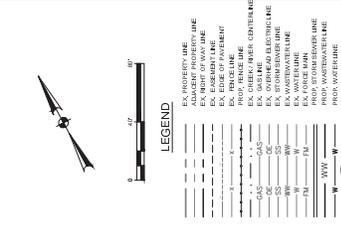
Matchline Sta. 34+00
 Matchline Sta. 43+00

No.	Date	Description



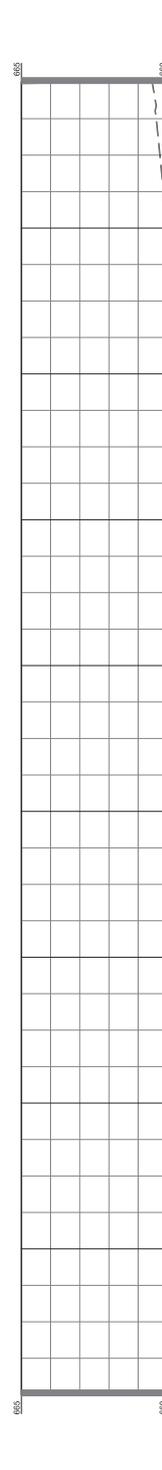
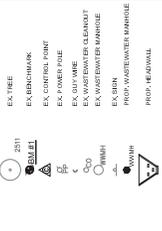
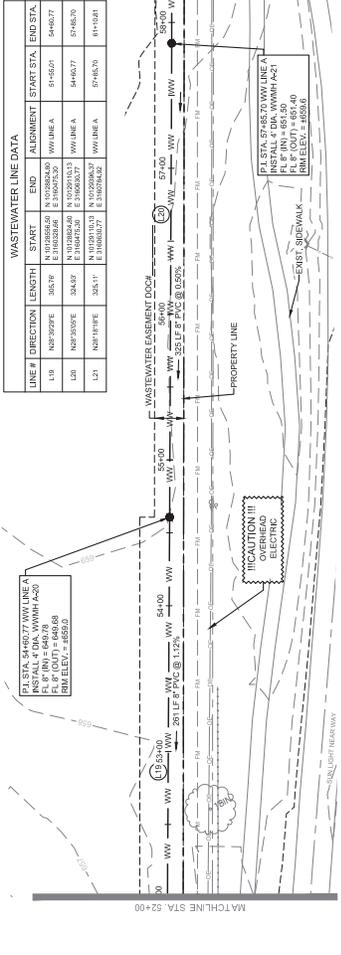
THE SEAL, SIGNATURE AND EXPIRATION DATE OF THIS LICENSE ARE NECESSARY FOR THE VALIDITY OF THIS PLAN. ANY CHANGES TO THIS LICENSE OR THIS PLAN MUST BE APPROVED BY THE BOARD OF ENGINEERING EXAMINERS. ANY VIOLATION OF THIS LICENSE OR THIS PLAN IS A VIOLATION OF THE PROFESSIONAL ENGINEERING ACT AND IS SUBJECT TO PENALTIES AS PROVIDED BY THE BOARD OF ENGINEERING EXAMINERS.

Project No.: 13102
Issued: 11/14/2016
Checked By: LMA
Sheet Title: WASTEWATER PLAN AND PROFILE (6 OF 9)
Sheet Number: 14 OF 16



WASTEWATER LINE DATA

LINE #	DIRECTION	LENGTH	START	END	ALIGNMENT	START STA.	END STA.
L19	N 87° 22' 00" E	385.79	N 1072869.60 E 1165223.68	N 1072869.60 E 1165223.68	WW LINE A	51+65.01	54+50.81
L20	N 87° 30' 00" E	344.89	N 1072875.50 E 1165057.50	N 1072875.50 E 1165057.50	WW LINE A	54+50.77	57+95.66
L21	N 87° 18' 00" E	324.11	N 1072870.00 E 1165057.50	N 1072870.00 E 1165057.50	WW LINE A	57+95.50	61+19.61



NOTE:
1. ALL WASTE WATER LINES MUST HAVE A MINIMUM COVER OF 48" BELOW SUBGRADE.

SCALE:
1" = 40' (HORIZ.)
1" = 2' (VERT.)

WALL LINE A
STA. 52+00 TO STA. 61+00

WALL LINE A
STA. 54+00 TO STA. 61+00

WALL LINE A
STA. 57+00 TO STA. 61+00

WALL LINE A
STA. 58+00 TO STA. 61+00

WALL LINE A
STA. 59+00 TO STA. 61+00

WALL LINE A
STA. 60+00 TO STA. 61+00

WALL LINE A
STA. 61+00 TO STA. 61+00

