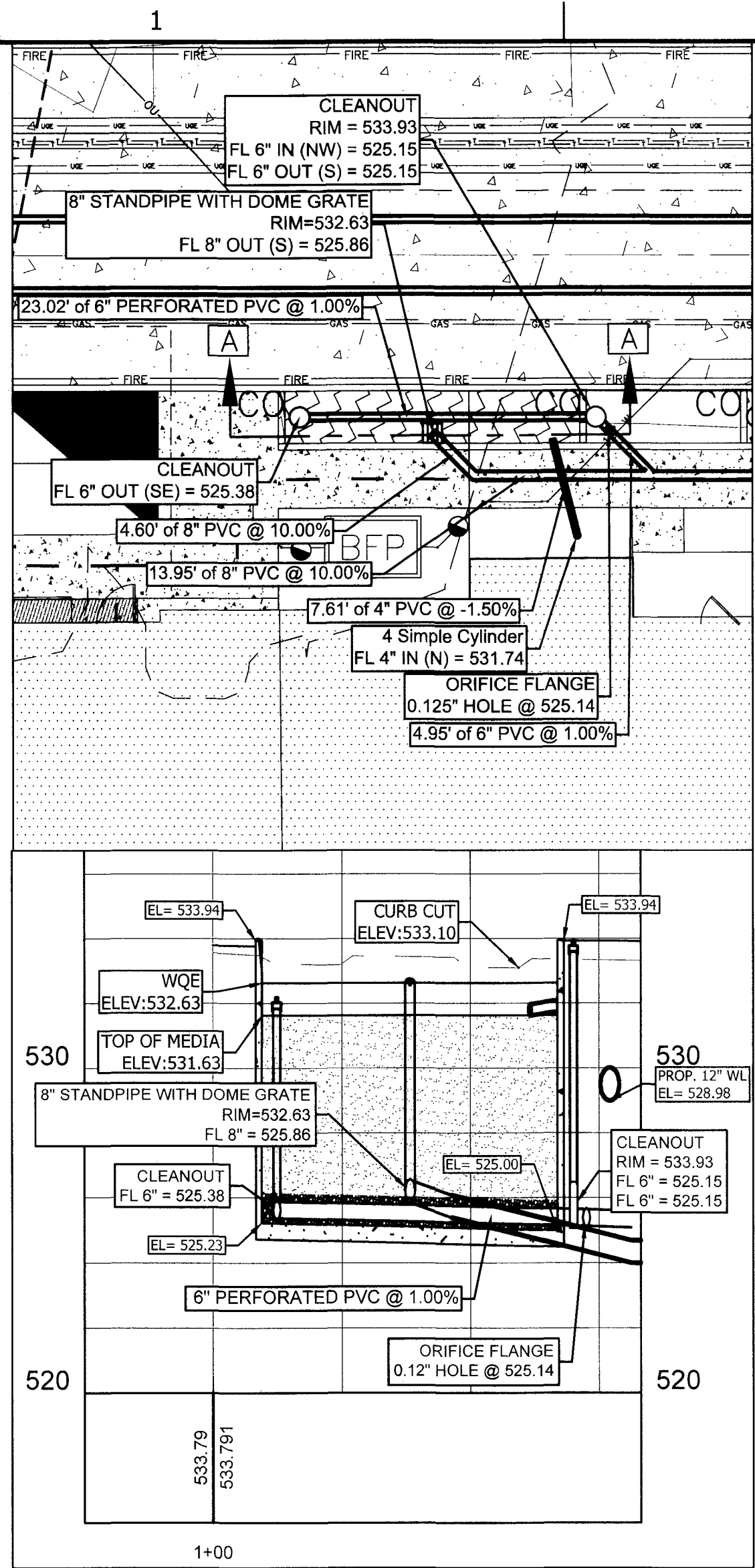




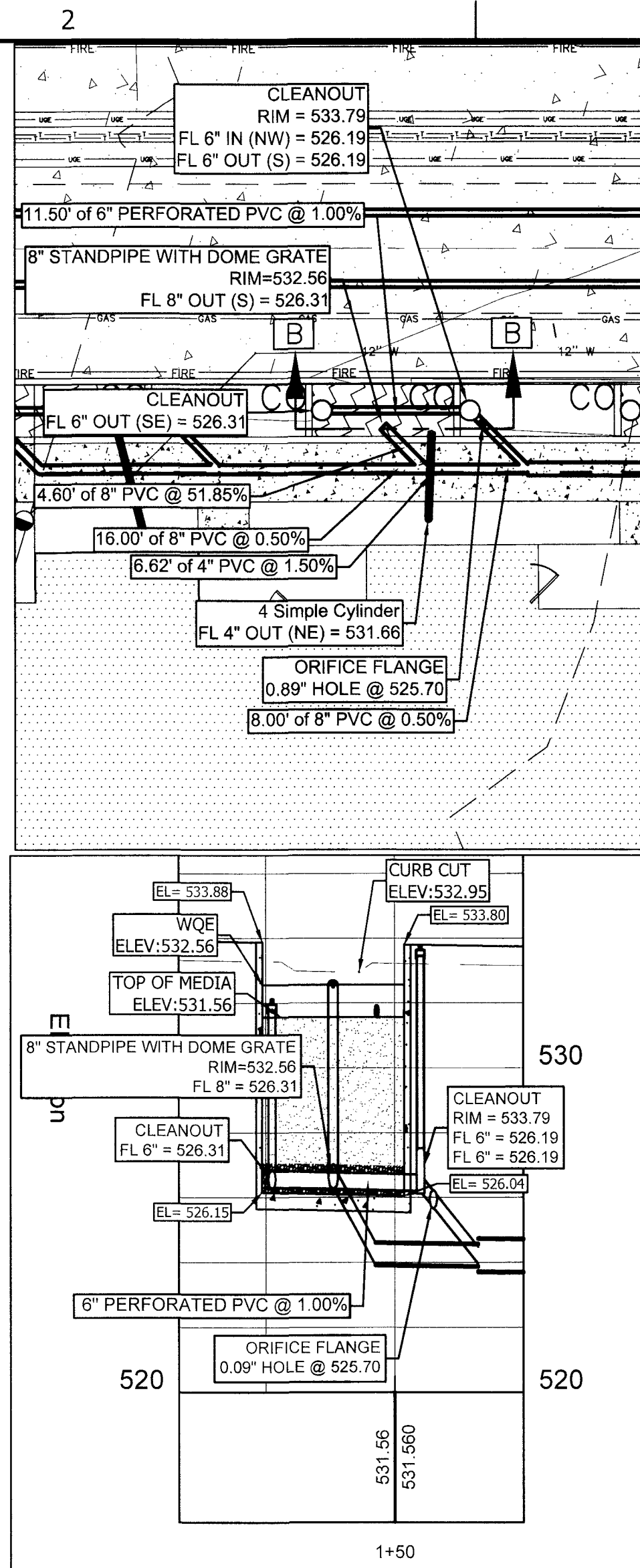
ROADWAY RAIN GARDEN A

APPENDIX R-11 RAIN GARDEN - FULL FILTRATION- CALCULATIONS FOR DEVELOPMENT PERMITS

Project Name: Austin South Lamar Apartments
Address: 1515 South Lamar
Project No.: 0881.40.001
Date: May 1, 2019

DRAINAGE AREA DATA		
Drainage Area to Control (Ac.)	0.05	2,260.78
Drainage Area Impervious Cover (IC)	79.63 %	
Capture Depth (CD) = 0.5" * ((IC-20)/10)*0.1	1.10 in.	
WATER QUALITY CONTROL CALCULATIONS		
	Required	Provided
The Water Quality Control is to be Rain Garden		
25-year Peak Flow Rate to Control (Q25)	0.35 cfs	
100-year Peak Flow Rate to Control (Q100)	0.47 cfs	
Water Quality Volume (WQV = CD*DA*3630)	207 cf	211 cf
Filtration Pond Area (A ₂ =WQV/(D*0.24*U))	89 sf	91 sf
Depth of Ponding (D)	Max. 1.0 ft	1.00 ft
Depth of Filtration Media (L)	Min. 1.5 ft	5.50 ft
Effective Porosity Water Quality Volume (WQV _{eff} =0.24*A ₂ *L)	120 cf	
Ponded Water Quality Volume (WQV _{ponded} = A ₂ *D)	91 cf	
Total Water Quality Volume (WQV _{ponded} +WQV _{eff})	207 cf	211 cf
Water Quality Elevation		532.63 ft msl
Elevation of Splitter/Overflow Weir	Min WQE ft msl	532.63 ft msl
Length of Weir		2.09 ft
Required Head to Pass Q100	Max. 0.5 ft	0.11 ft
Pond Freeboard Provided to Pass Q100	Min. 0.25 ft	0.30 ft
Top of Pond		533.11 ft
Drawdown Time	Max. 48 hr	55.45 hr
Underdrain Orifice Size (Dia.)		0.12 in.
Underdrain Orifice Size (Area)		0.01 sq in
Pond Plantings (Min. 20% of Filtration Area)	18 plants	18 plants

DRAWDOWN CALCULATION	
Surface Area	91.00
Orifice Coefficient	0.6
H ₁ (ft)	532.63
H ₂ (ft)	524.89
t(hr)	55.45
A _o (sf)	0.000079
Orifice Diameter (in.)	0.12



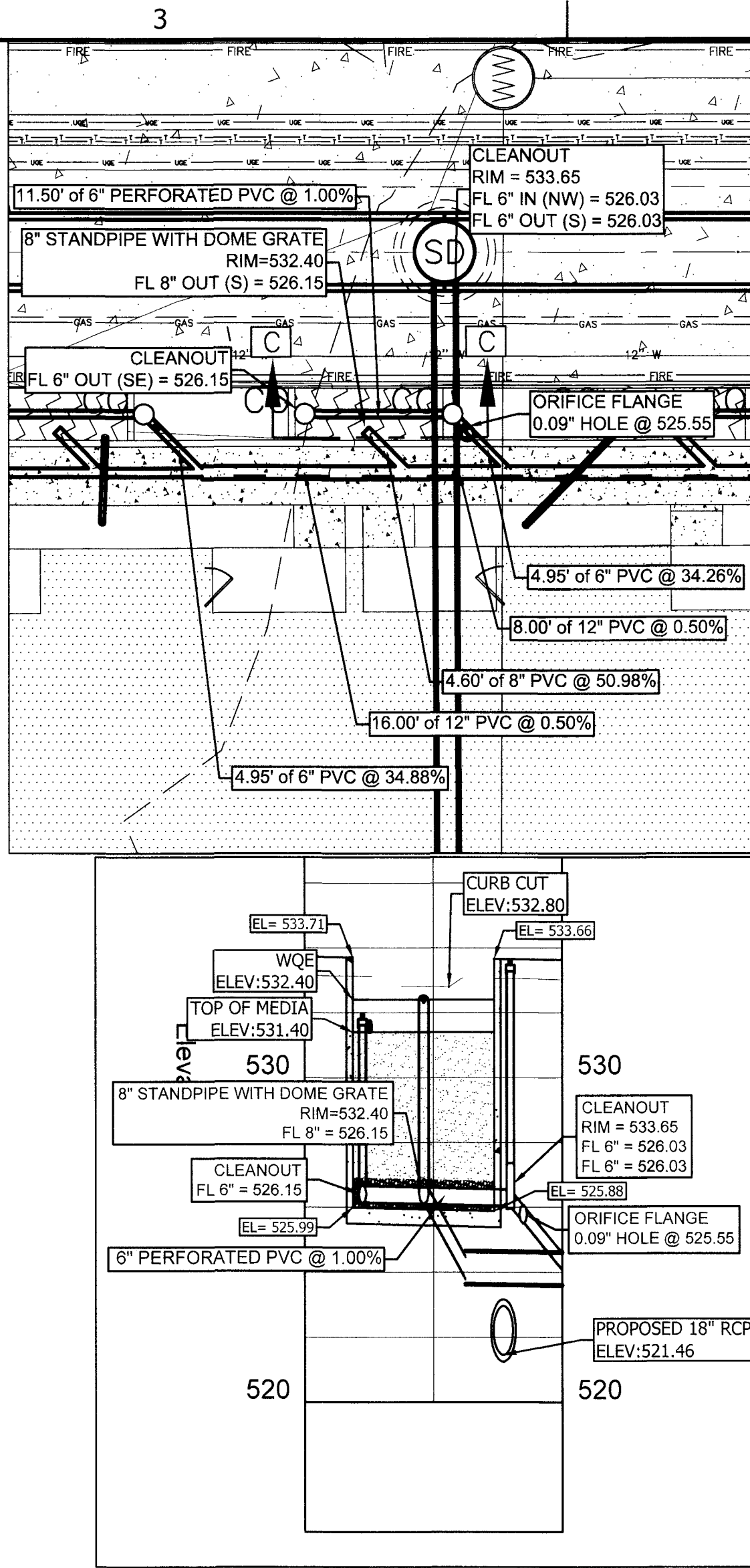
ROADWAY RAIN GARDEN B

APPENDIX R-11 RAIN GARDEN - FULL FILTRATION- CALCULATIONS FOR DEVELOPMENT PERMITS

Project Name: Austin South Lamar Apartments
Address: 1515 South Lamar
Project No.: 0881.40.001
Date: May 1, 2019

DRAINAGE AREA DATA		
Drainage Area to Control (Ac.)	0.02	1,055.78
Drainage Area Impervious Cover (IC)	73.56 %	
Capture Depth (CD) = 0.5" * ((IC-20)/10)*0.1	1.04 in.	
WATER QUALITY CONTROL CALCULATIONS		
	Required	Provided
The Water Quality Control is to be Rain Garden		
25-year Peak Flow Rate to Control (Q25)	0.16 cfs	
100-year Peak Flow Rate to Control (Q100)	0.22 cfs	
Water Quality Volume (WQV = CD*DA*3630)	91 cf	92 cf
Filtration Pond Area (A ₂ =WQV/(D*0.24*U))	44 sf	44 sf
Depth of Ponding (D)	Max. 1.0 ft	1.00 ft
Depth of Filtration Media (L)	Min. 1.5 ft	4.50 ft
Effective Porosity Water Quality Volume (WQV _{eff} =0.24*A ₂ *L)	48 cf	
Ponded Water Quality Volume (WQV _{ponded} = A ₂ *D)	44 cf	
Total Water Quality Volume (WQV _{ponded} +WQV _{eff})	91 cf	92 cf
Water Quality Elevation		532.56 ft msl
Elevation of Splitter/Overflow Weir	Min WQE ft msl	532.56 ft msl
Length of Weir		2.09 ft
Required Head to Pass Q100	Max. 0.5 ft	0.11 ft
Pond Freeboard Provided to Pass Q100	Min. 0.25 ft	0.28 ft
Top of Pond		532.95 ft
Drawdown Time	Max. 48 hr	48.00 hr
Underdrain Orifice Size (Dia.)		0.09 in
Underdrain Orifice Size (Area)		0.01 sq in
Pond Plantings (Min. 20% of Filtration Area)	9 plants	9 plants

DRAWDOWN CALCULATION	
Surface Area	44.00
Orifice Coefficient	0.6
H ₁ (ft)	532.56
H ₂ (ft)	525.93
t(hr)	48.00
A _o (sf)	0.00004
Orifice Diameter (in.)	0.09



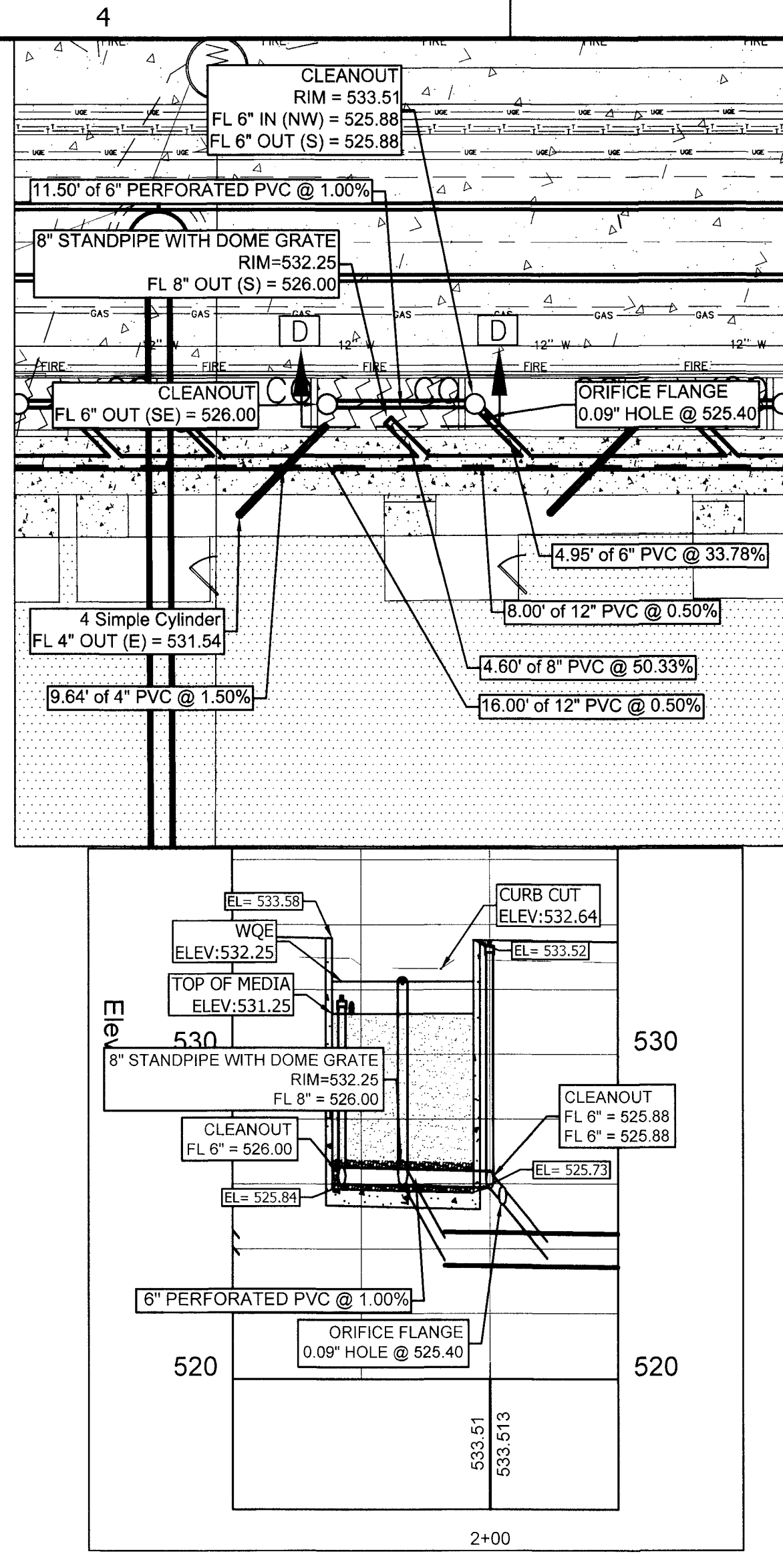
ROADWAY RAIN GARDEN C

APPENDIX R-11 RAIN GARDEN - FULL FILTRATION- CALCULATIONS FOR DEVELOPMENT PERMITS

Project Name: Austin South Lamar Apartments
Address: 1515 South Lamar
Project No.: 0881.40.001
Date: May 1, 2019

DRAINAGE AREA DATA		
Drainage Area to Control (Ac.)	0.02	1,047.77
Drainage Area Impervious Cover (IC)	75.70 %	
Capture Depth (CD) = 0.5" * ((IC-20)/10)*0.1	1.06 in.	
WATER QUALITY CONTROL CALCULATIONS		
	Required	Provided
The Water Quality Control is to be Rain Garden		
25-year Peak Flow Rate to Control (Q25)	0.16 cfs	
100-year Peak Flow Rate to Control (Q100)	0.22 cfs	
Water Quality Volume (WQV = CD*DA*3630)	92 cf	92 cf
Filtration Pond Area (A ₂ =WQV/(D*0.24*U))	44 sf	44 sf
Depth of Ponding (D)	Max. 1.0 ft	1.00 ft
Depth of Filtration Media (L)	Min. 1.5 ft	4.50 ft
Effective Porosity Water Quality Volume (WQV _{eff} =0.24*A ₂ *L)	48 cf	
Ponded Water Quality Volume (WQV _{ponded} = A ₂ *D)	44 cf	
Total Water Quality Volume (WQV _{ponded} +WQV _{eff})	92 cf	92 cf
Water Quality Elevation		532.40 ft msl
Elevation of Splitter/Overflow Weir	Min WQE ft msl	532.40 ft msl
Length of Weir		2.09 ft
Required Head to Pass Q100	Max. 0.5 ft	0.11 ft
Pond Freeboard Provided to Pass Q100	Min. 0.25 ft	0.29 ft
Top of Pond		532.80 ft
Drawdown Time	Max. 48 hr	48.00 hr
Underdrain Orifice Size (Dia.)		0.09 in
Underdrain Orifice Size (Area)		0.01 sq in
Pond Plantings (Min. 20% of Filtration Area)	9 plants	9 plants

DRAWDOWN CALCULATION	
Surface Area	44.00
Orifice Coefficient	0.6
H ₁ (ft)	532.40
H ₂ (ft)	525.77
t(hr)	48.00
A _o (sf)	0.00004
Orifice Diameter (in.)	0.09



ROADWAY RAIN GARDEN D

APPENDIX R-11 RAIN GARDEN - FULL FILTRATION- CALCULATIONS FOR DEVELOPMENT PERMITS

Project Name: Austin South Lamar Apartments
Address: 1515 South Lamar
Project No.: 0881.40.001
Date: May 1, 2019

DRAINAGE AREA DATA		
Drainage Area to Control (Ac.)	0.02	1,048.28
Drainage Area Impervious Cover (IC)	74.55 %	
Capture Depth (CD) = 0.5" * ((IC-20)/10)*0.1	1.05 in.	
WATER QUALITY CONTROL CALCULATIONS		
	Required	Provided
The Water Quality Control is to be Rain Garden		
25-year Peak Flow Rate to Control (Q25)	0.16 cfs	
100-year Peak Flow Rate to Control (Q100)	0.22 cfs	
Water Quality Volume (WQV = CD*DA*3630)	91 cf	92 cf
Filtration Pond Area (A ₂ =WQV/(D*0.24*U))	44 sf	44 sf
Depth of Ponding (D)	Max. 1.0 ft	1.00 ft
Depth of Filtration Media (L)	Min. 1.5 ft	4.50 ft
Effective Porosity Water Quality Volume (WQV _{eff} =0.24*A ₂ *L)	48 cf	
Ponded Water Quality Volume (WQV _{ponded} = A ₂ *D)	44 cf	
Total Water Quality Volume (WQV _{ponded} +WQV _{eff})	91 cf	92 cf
Water Quality Elevation		532.25 ft msl
Elevation of Splitter/Overflow Weir	Min WQE ft msl	532.25 ft msl
Length of Weir		2.09 ft
Required Head to Pass Q100	Max. 0.5 ft	0.11 ft
Pond Freeboard Provided to Pass Q100	Min. 0.25 ft	0.28 ft
Top of Pond		532.64 ft
Drawdown Time	Max. 48 hr	48.00 hr
Underdrain Orifice Size (Dia.)		0.09 in
Underdrain Orifice Size (Area)		0.01 sq in
Pond Plantings (Min. 20% of Filtration Area)	9 plants	9 plants

DRAWDOWN CALCULATION	
Surface Area	44.00
Orifice Coefficient	0.6
H ₁ (ft)	532.25
H ₂ (ft)	525.62
t(hr)	48.00
A _o (sf)	0.00004
Orifice Diameter (in.)	0.09

SITE PLAN APPROVAL Sheet 35 of 87
FILE NUMBER SP-2018-0296C APPLICATION DATE JULY 2, 2018
APPROVED BY COMMISSION ON NA UNDER SECTION 112 OF
CHAPTER 25-5 OF THE CITY OF AUSTIN CODE.
EXPIRATION DATE (25-5-81, LDC) 11/16/22 CASE MANAGER ROSEMARY AVILA

Director, Development Services Department: 12/1/19 ZONING CS-V
RELEASED FOR GENERAL COMPLIANCE: 12/1/19
Rev. 1 Correction 1
Rev. 2 Correction 2
Rev. 3 Correction 3

Final plot must be recorded by the Project Expiration Date, if applicable. Subsequent Site Plans which do not comply with the Code current at the time of filing, and all required Building Permits and/or a notice of construction (if a building permit is not required), must also be approved prior to the Project Expiration Date.

AUSTIN SOUTH LAMAR APARTMENTS
1515 SOUTH LAMAR
AUSTIN, TRAVIS COUNTY, TEXAS
RAIN GARDENS A-D PROFILES (PRIVATE)