SCS TR55 METHOD TO COMPUTE TIME OF CONCENTRATION

(adjusted based on experience and engineering judgement)

PROJECT **Bouldin Creek Commons**
LOCATION **2043 S Lamar Blvd**
DATE **5/25/2017**
COND. **EXISTING**
BY: **Ambar**

WSHED NAME **EX-1**
N VALUE (SEE BELOW) **0.11**

	n value	% Land use	Inc n
Undeveloped			
Conc.,gravel,asphalt,bare soil	0.011	31.8	0.003498
Grass Short Prairie	0.15	68.2	0.1023
Grass dense	0.24	0	0
Grass bermuda	0.41	0	0
Woods Light Underbrush	0.4	0	0
woods Dense underbrush	0.8	0	0

based on information for imperviousness from Corps of Engineers

Land Use		% Conc	% Grass	n value	% land use	INC N
Low D.	Residential	25	75	0.21	0	0
Med. D.	Residential	41	59	0.17	0	0
High D.	Residential	47	53	0.15	0	0
Multifamily		70	30	0.09	0	0
Mobile Home Parks	me Park	20	80	0.23	0	0
C.B.D.		95	5	0.02	0	0
Strip Commercial		90	10	0.04	0	0
Shopping Center		95	5	0.02	0	0
Instutional-Schools		40	60	0.17	0	0
Industrial		90	10	0.04	0	0
Highway ROW		35	65	0.19	0	0
Public Utilities		60	40	0.12	0	0
Vacant urban land and Parks		6	84	0.24	0	0
Other		0	0	0	0	0
					TOT N VALUE	0.11

TOTAL IS 100

SHEET FLOW

LENGTH	**100** FT.	MAX 300'
2 YR 24 HOUR PRECIP	**3.44** IN.	FROM TP40
SLOPE	**0.02** FT/FT	

SHALLOW CONCENTRATED FLOW

1=PAVED 2=UNPAVED	**1**
LENGTH	**371.7** FT
SLOPE	**0.0417003** FT/FT
COMPUTED VELOCITY FROM FIGURE 3.1=	4.2

SUMMARY:

		SCS Method Tc(Hrs)	SCS Method Tc(Min)
WATERSHED NUMBER	**EX-1**		
SHEET FLOW		**0.12**	**7.37**
SHALLOW FLOW		**0.02**	**1.49**
CHANNEL FLOW		**0.00**	**0.00**
	6.9		
	Total	**0.15**	**8.87**
	Lag	**0.09**	**5.32**

SCS TR55 METHOD TO COMPUTE TIME OF CONCENTRATION

(adjusted based on experience and engineering judgement)

PROJECT **Bouldin Creek Commons**
LOCATION **2043 S Lamar Blvd**
DATE **5/26/2017**
COND. **PROPOSED**
BY: **Ambar**

WSHED NAME **PR-1**
N VALUE (SEE BELOW) **0.05**

	n value	% Land use	Inc n
Undeveloped			
Conc.,gravel,asphalt,bare soil	0.011	75.4	0.008294
Grass Short Prairie	0.15	24.6	0.0369
Grass dense	0.24	0	0
Grass bermuda	0.41	0	0
Woods Light Underbrush	0.4	0	0
woods Dense underbrush	0.8	0	0

based on information for imperviousness from Corps of Engineers

Land Use		% Conc	% Grass	n value	% land use	INC N
Low D.	Residential	25	75	0.21	0	0
Med. D.	Residential	41	59	0.17	0	0
High D.	Residential	47	53	0.15	0	0
Multifamily		70	30	0.09	0	0
Mobile Home Pa	me Park	20	80	0.23	0	0
C.B.D.		95	5	0.02	0	0
Strip Commercial		90	10	0.04	0	0
Shopping Center		95	5	0.02	0	0
Instutional-Schools		40	60	0.17	0	0
Industrial		90	10	0.04	0	0
Highway ROW		35	65	0.19	0	0
Public Utilities		60	40	0.12	0	0
Vacant urban land and Parks		6	84	0.24	0	0
Other		0	0	0	0	0
					TOT N VALUE	0.05

TOTAL IS 100

SHEET FLOW

LENGTH	**100** FT.	MAX 300'
2 YR 24 HOUR PRECIP	**3.44** IN.	FROM TP40
SLOPE	**0.0150** FT/FT	

SHALLOW CONCENTRATED FLOW

1=PAVED 2=UNPAVED	1
LENGTH	**441.7** FT
SLOPE	**0.03** FT/FT
COMPUTED VELOCITY FROM FIGURE 3.1=	3.5

SUMMARY:

		SCS Method Tc(Hrs)	SCS Method Tc(Min)
WATERSHED NUMBER	**PR-1**		
SHEET FLOW		**0.07**	**4.40**
SHALLOW FLOW		**0.04**	**2.11**
CHANNEL FLOW		**0.00**	**0.00**
	Total	**0.11**	**6.51**
	Lag	**0.07**	**3.91**

PEAK RUNOFF RATES (CFS)

	EX-1	PR-1	POND	Elevation
2 Year	6.3	8.4	6.2	541.4
10 Year	12.8	15.1	12.7	542.0
25 Year	16.6	18.9	15.3	542.4
100 Year	22.9	25.3	22.8	543.0

DETENTION POND-1

ELEVATION (FT)	AREA (AC)
539.0	0
540.0	0.02201
541.0	0.07373
542.0	0.07373
543.0	0.07373
544.0	0.07373
545.0	0

APPENDIX R-3

PARTIAL SEDIMENTATION/FILTRATION POND CALCULATIONS FOR DEVELOPMENT PERMITS

DRAINAGE AREA DATA:

Drainage Area to Control (DA)	2.81 ac.
Drainage Area Impervious Cover	75.4 %
Capture Depth (CD)	1.05 in.

WATER QUALITY CONTROL CALCULAIIONS:	REQUIRED	PROVIDED
The Water Quality Control is to be PARTIAL SEDIMENTATION FILTRATION		
25-year Peak Flow Rate to Control (Q25)	18.9 cfs	
100-year Peak Flow Rate to Control (QIOO)	25.3 cfs	
Water Quality Volume (WQV = CD*DA*3630)	10,751.1 cf	10,766.6 cf
Maximum Ponding Depth above Sand Bed (H)		5.0 ft
Sedimentation Pond Area		704.8 sf
Sedimentation Pond Volume (minimum 20% ofWQV)	2,150.2 cf	3,524.2 cf
Filtration Pond Area (WQV/(4 + 133 *H))	1,317.3 sf	1,319.2 sf
Filtration Pond Volume		7,242.3 cf
Water Quality Elevation	547 ft msl.	
Elevation of Splitter/Overflow Weir	MIN WQ EL ft msl.	547 ft msl.
Height of Gabion Wall	WQ EL-0.5' ft msl.	546.5 ft msl.
Top Wall of Pond		548.2 ft msl.
Length of Splitter Weir		8.5 ft
Required Head to Pass Q100	MAX 1.0 ft	0.9 ft
Pond Freeboard Provided to Pass QIOO	MIN 0.25 ft	0.3 ft
48 Hour Drawdown Time Orifice Opening diameter (inches)		1.2 in.

SPLITTER BOX WEIR LENGTH CALC.

weir equation: $q = 3.33\,(b - 0.2\,h)\,h^{3/2}$

Q (100-yr storm) =	25.3 cfs
max Q over weir	25.62 cfs
b = length of weir	8.5 ft.
h = head abv. Weir	0.95 ft.

SPLITTER BOX ORIFICE CALCULATION

Orifice flow equation: $Q = C\,o\,A(2gH)\,0.5$

No. of openings	3
Width of Opening =	2 ft.
Height of Opening =	1.6 ft.
Flow line of opening =	542.45 msl
A = Total area of openings	9.6 sqft.
C_o = Orifice Coefficient	0.6
Q (25-yr storm) =	18.9 cfs
Max. Q thru opening(s) =	89.51 cfs
g = Gravitation Const.	32.2 ft./sec.^{2}
H = head on orifice	3.75 ft.

SPLITTER BOX ORIFICE VELOCITY

Orifice Velocity Q = VA

Q (25-yr storm) =	18.9 cfs
V = VELOCITY MAX.	1.99 ft./sec.
A = Total area of openings	9.6 sqft.
Vel. thru openings =	1.97 ft./sec.

SEDIMENTATION POND

ELEVATION (FT)	INC. DEPTH (FT)	INC. AREA (SF)	AVG AREA (SF)	INC. VOL (CF)	CUM VOL (CF)
542	0	704.8	0.0	0.0	0.0
543	1	704.8	704.8	704.8	704.8
544	1	704.8	704.8	704.8	1409.7
545	1	704.8	704.8	704.8	2114.5
546	1	704.8	704.8	704.8	2819.4
547	1	704.8	704.8	704.8	3524.2
548	1	704.8	704.8	704.8	4229.1

FILTRATION POND

ELEVATION (FT)	INC DEPTH (FT)	INC. AREA (SF)	AVG AREA (SF)	INC. VOL (CF)	CUM VOL (CF)
542	0	1448.5	0.0	0.0	0.0
543	1	1448.5	1448.5	1448.5	1448.5
544	1	1448.5	1448.5	1448.5	2896.9
545	1	1448.5	1448.5	1448.5	4345.4
546	1	1448.5	1448.5	1448.5	5793.9
547	1	1448.5	1448.5	1448.5	7242.3
548	1	1448.5	1448.5	1448.5	8690.8

TOTAL

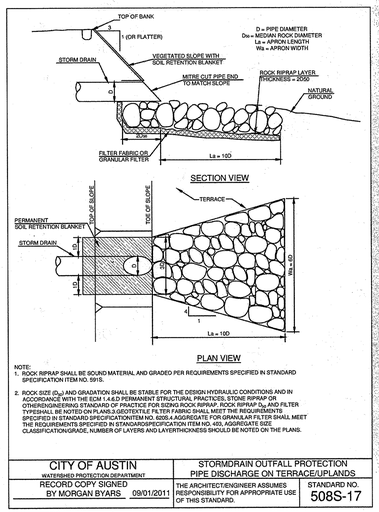
ELEVATION (FT)	INC DEPTH (FT)	INC. AREA (SF)	AVG AREA (SF)	INC. VOL (CF)	CUM VOL (CF)
542	0	2153.3	0	0	0
543	1	2153.3	2153.3142	2153.314	2153.314
544	1	2153.3	2153.3142	2153.314	4306.628
545	1	2153.3	2153.3142	2153.314	6459.943
546	1	2153.3	2153.3142	2153.314	8613.257
547	1	2153.3	2153.3142	2153.314	10766.57
548	1	2153.3	2153.3142	2153.314	12919.89

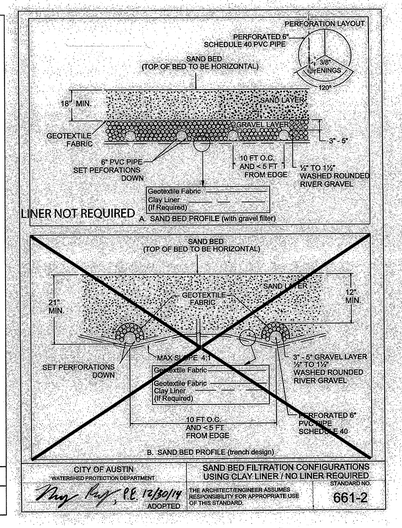
48-Hour Drawdown Calcs.
0.0623065 cfs
2.5 Head on Outlet Pipe
1.1785065 sq in
1.2252682 in

TIME OF CONCENTRATION

			SHEET FLOW				SHALLOW CONCENTRATED FLOW					
DRAINAGE AREA	IMPERVIOUS COVER (%)	MANNINGS N	LENGTH (ft.)	2 YR 24 HR PRECIPITATION (in.)	SLOPE (ft/ft)	TC (min)	PAVED?	LENGTH (ft.)	SLOPE (ft/ft)	TC (min)	TOTAL TC (min)	LAG TIME (min)
EX-1	31.7	0.11	100	3.44	0.02	7.37	YES	372	0.04	1.49	8.87	5.32
PR-1	75.4	0.05	100	3.44	0.02	4.40	YES	442	0.03	2.11	6.51	3.91

SCS TR-55 METHOD
* = MINIMUM TC





FOR CITY USE ONLY:

SITE PLAN APPROVAL SHEET 13 OF 31
FILE NUMBER SP-2016-0481C APPLICATION DATE OCTOBER 14, 2016
APPROVED BY COMMISSION ON 2/28/18 UNDER SECTION 112 OF
CHAPTER 25-5 OF THE CITY OF AUSTIN CODE. MICHAEL
EXPIRATION DATE (25-5-81,LDC) 2/28/21 CASE MANAGER SIMMONS-SMITH
PROJECT EXPIRATION DATE (ORD.#970905-A) DWPZ DDZ X
Director, Development Services Department
RELEASED FOR GENERAL COMPLIANCE: ZONING: CS,CS-MU-CO, CS-V-MU-CO
Rev. Correction 1
Rev. Correction 2
Rev. Correction 3
Final plat 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 note required), must also be approved prior to the Project Expiration Date.

DATE	REVISION / DESCRIPTION	REV

CLIENT INFORMATION
SOUTH LAMAR PROPERTIES
900 BLUEBONNET LANE
AUSTIN, TX 78704
CONTACT: SCOTT TRAINER
PHONE: (512) 965-1369

kbge ENGINEERING CONSULTING
KIMBELL I BRUEHL I GARCIA I ESTES
105 West Riverside Drive, Ste 110, Austin, Texas 78704
T (512) 439-0400 www.kbge-eng.com
TBPE No.F-12802

PLOTTED ON: 12/13/17 12:17:48 PM
PLOTTED BY: AMBAR ALEXATOS
FILE: \\KBGESERVER\KIMBELL BRUEHL\PROJECTS\305 - SOUTH LAMAR MARKET\CAD\13 WATER QUALITY CALCULATIONS & DETAILS.DWG

BOULDIN CREEK COMMONS

2043 S LAMAR BLVD
CITY OF AUSTIN, TRAVIS COUNTY, TEXAS

WATER QUALITY CALCULATIONS & DETAILS

December 13, 2017

STATE OF TEXAS
BRYANT R. BELL
111283
LICENSED PROFESSIONAL ENGINEER

CHECKED BY: BRYANT R BELL, P.E.
JOB NUMBER: 305-001
ISSUE DATE: 12/13/17
SHEET: 13 OF 31

SP-2016-0481C