BRODIE OAKS REDEVELOPMENT

DRAINAGE STUDY

APRIL 2021

LJA Project #A593-1001

Prepared For:

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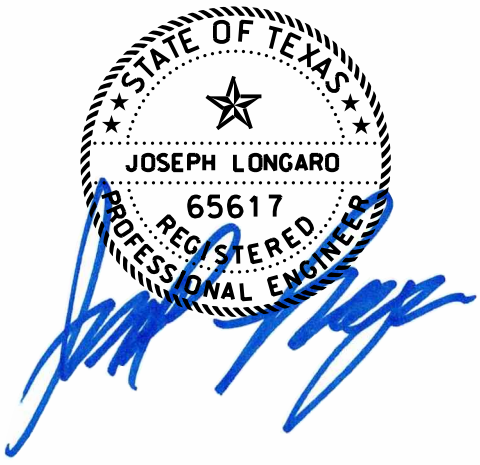
05.14.2021



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I. INTRODUCTION

The purpose of this report is to provide an overview of the existing and proposed drainage system for the Brodie Oaks Shopping Center as well as describe the existing water quality methodology and compare that to the proposed methodology planned for this project. This report will address the comments received from the drainage reviewer during the Project Assessment phase of the PUD process. This report is being submitted with the formal PUD application as requested.

The Brodie Oaks Shopping Center is located at the northeast intersection of S. Lamar Boulevard and Loop 360 / Capital of Texas Highway. The Brodie Oaks PUD area will consist of the existing shopping center (eight (8) platted lots) and a 2.79-acre TXDOT Parcel – totaling 37.58 acres with an estimated impervious cover of 84.2%. A location map is provided as ***Exhibit 1***. An aerial map is provided as ***Exhibit 2***.

II. EXISTING DRAINAGE ANALYSIS

As mentioned above, the site sits on 37.58 acres with an estimated impervious cover of 84.2%. Based on a recent tree and topographic survey, there are four (4) existing drainage areas on the site as shown on the Existing Drainage Area Map provided as ***Exhibit 3***.

Drainage Area EX A-3 includes the old "Toys R Us" building and parking lot. The drainage area is calculated to be 2.99 acres with an estimated impervious cover of 73.9%. This area sheet flows directly to the adjacent parkland uncontrolled and untreated.

Drainage Area EX A-4 includes the loading dock area behind the shopping center. This drainage area is calculated to be 3.26 acres with an estimated impervious cover of 73.0%. This area sheet flows directly to the adjacent parkland uncontrolled and untreated.

Drainage Area EX-A2 is basically Texas Department of Transportation (TXDOT) right-of-way (ROW) and is not part of the Brodie Oaks Shopping Center but is included in the Brodie Oaks PUD. This 2.79-acre parcel has an estimated impervious cover of 20.1% (just the driveway) and drains directly toward the S. Lamar / 360 intersection. The runoff from this area drains uncontrolled and untreated.

Drainage Area EX A1 is where most of the site drains. As can be seen on ***Exhibit 3***, the drainage area of this basin is 28.54 acres with an estimated impervious cover of 94.5%. This stormwater drains through the existing apartment complex (The Retreat at Barton Creek) via a 60" RCP located adjacent and downstream where it drains to an existing wet pond that also serves the apartment complex. This wet pond's overflow weir is located underneath the existing apartment driveway where it spills into an existing filtration pond and the water infiltrates into the ground. There is a weir located at the top of the filtration pond where the excess stormwater drains into a small tributary that drains directly to Barton Creek.

A drainage area map of this wet pond and the filtration pond located on the apartment complex is shown on ***Exhibit 3***. Most of the apartment complex drains to the wet pond with a portion of the apartment site bypassing the wet pond and draining directly to the filtration pond. The Brodie Oaks Shopping Center stormwater drains to the wet pond and then to the filtration pond via an existing 60" storm sewer pipe.

A. 60" Storm Sewer Pipe Through Apartment Site

As stated earlier, the existing Brodie Oaks Shopping Center (Drainage Area EX A1) drains to the existing wet pond through an existing 60" storm sewer line through the existing apartment complex – as shown on ***Exhibit 3***. The estimated flow rate (based on current City of Austin ATLAS 14 precipitation values) shows a peak 100-year discharge of 267 cfs that enters the 60" pipe. Based on our calculations (***Appendix A***), this 60" pipe has a maximum capacity of 405 cfs; as such, the existing pipe already has capacity for the 100-year ATLAS storm.

III. PROPOSED DRAINAGE ANALYSIS

The proposed improvements planned for this site is a mixed-use development and proposes 1,700 multifamily units; 200-room hotel; 1,260,000 sq. ft. of office; 110,000 sq. ft. of retail; and, 30,000 sq. ft. of restaurant spread over 9 buildings.

As stated previously, the site in its existing condition has four (4) separate drainage areas/points of study and these same four (4) drainage areas will exist in the proposed conditions as well. Based on this, we have provided the following analysis for the same four (4) points of study as mentioned above and depicted in the Proposed Condition Drainage Area Map (***Exhibit 4***).

Drainage Area A-3 in the proposed condition will be 3.08 acres with 5.8% impervious cover and consists of the proposed re-irrigation field. This 5.8% impervious cover is just for sidewalk and pedestrian/bicycle uses. This area will be permitted to sheet flow back to the parkland uncontrolled and will not be routed through the proposed water quality ponds.

Drainage Area A-4 is mainly the proposed irrigation area. This area has a drainage area of 3.44 acres with an estimated impervious cover of 5.8%. This 5.8% impervious cover is just for sidewalk and pedestrian/bicycle uses. This area will be permitted to sheet flow back to the parkland uncontrolled and will not be routed through the proposed water quality ponds.

Drainage Area A-2 – this analysis point, as previously stated, was previously TXDOT ROW. The existing roadway will be demolished and replaced with a building and open space. As stated above, a portion of this site will be a building and that building will be designed to drain its roof to the north with the remaining area being proposed irrigation area that drains to the S. Lamar / 360 intersection. This area has a drainage area of 1.34 acres with an estimated impervious cover of 6.7%. This 6.7% of impervious cover is just for sidewalks and pedestrian/bicycle uses. This area will be permitted to flow back to the S. Lamar / 360 intersection uncontrolled and will not be routed through the proposed water quality ponds.

Drainage Area A-1 consists of drainage areas DEV-A1A and DEV-A1B where Drainage Area A-1 was broken out to show the specific drainage areas going to each pond. Specifically, Drainage Area "DEV-A1A" drains to Water Quality Pond 1, and Drainage Area "DEV-A1B" drains to Water Quality Pond 2. This area has a proposed drainage area of 29.72 acres with an estimated impervious cover of 68.1%.

Overall, the site's impervious cover is reduced from 84.2% to 54%, which is a net reduction of impervious cover of 10.8 acres. In addition, by comparing ***Exhibit 3*** and ***Exhibit 4*** you can see that the total stormwater discharge leaving the site at all points is less than existing. This analysis is tabulated as shown below.

TABLE A		
DRAINAGE AREA	**EXISTING 100 / 25 YEAR (cfs)**	**PROPOSED 100 / 25 YEAR (cfs)**
A1	267 /205	250 / 190
A2	34 / 25	18 / 11
A3	38 / 29	36 / 26
A4	42 / 32	41 / 29

IV. STORMWATER DETENTION

In the existing condition, the Brodie Oaks Shopping Center does not have on-site detention. As can be seen from *Table A*, above, the 100-year and 25-year discharges are proposed to be less than the existing conditions at all points leaving the site mainly due to the reduction of impervious cover. Based on the above table, ***Exhibit 3***, and ***Exhibit 4*** along with the email from the City of Austin's Watershed Management Division (copy provided in ***Appendix B,***) on-site detention will not be required.

A. CONVEYANCE OF EXISTING 60" STORM PIPE

As mentioned above, Drainage Area A-1 drains to the existing storm pipe that runs through the existing apartment complex into the existing wet pond. As stated above, the existing 60" storm-pipe has adequate capacity for the existing shopping center and this pipe has a maximum capacity of 405 cfs. As shown in ***Exhibit 4***, the proposed 100-year discharge entering the 60" pipe is estimated at 250 cfs; as such, the existing storm-pipe is adequately sized. We also ran the 25-year discharge through the pipe and noted that the velocity of the water leaving the pipe is estimated at 21.6'/sec, which technically exceeds the 20'/sec maximum as noted in Section 5.3.2 of the City of Austin's Drainage Criteria Manual. A waiver from this section of the code is included in ***Appendix D*** of this report.

V. EXISTING STRUCTURAL WATER QUALITY

As stated previously, the existing Brodie Oaks Shopping Center and the adjacent apartment complex (The Retreat at Barton Creek) both share the existing wet pond and associated filtration pond located at the downstream end of the apartment complex. The proposed Brodie Oaks Shopping Center improvements will reduce the impervious cover and subsequently storm flow into the existing wet pond; thus, allowing more storage and treatment of more stormwater from the apartment complex. This will be discussed in more detail in the Proposed Water Quality section of this report.

VI. PROPOSED WATER QUALITY (SOS WATER QUALITY)

The Brodie Oaks Shopping Center proposes to meet the SOS Ordinance water quality requirements which exceeds the requirements as established in the Redevelopment Ordinance. Specifically, the Redevelopment Ordinance would permit standard sedimentation/filtration ponds to treat the storm run-off because the existing and proposed impervious cover is greater than 40%. However, we are proposing to meet full SOS water quality with the construction of retention / irrigation ponds and providing open space area for re-irrigation.

Based on the above, the project proposes to construct two (2) water quality ponds as shown in ***Exhibit 4.*** The internal drainage scheme shown in ***Exhibit 4*** indicates the proposed drainage areas and impervious cover that drains to each pond. This exhibit indicates that Water Quality Pond 1A has a drainage area of 25.87 acres and a proposed impervious cover of 70.0% and captures the majority of the site's run-off. Water Quality Pond 1B has a drainage area of 3.85 acres with a proposed impervious cover of 55.0% and captures the remaining drainage area.

The proposed pond volumes and associated required re-irrigation fields were calculated utilizing the City of Austin's "Slat Tool". A copy of these calculations is provided as ***Exhibit 4***. The infiltration rate assumed for both calculations is 0.2"/hour where we are proposing to engineer the existing soil to ensure that infiltration rate if the infiltration rates are less than that as determined by the City of Austin acceptable testing protocols as shown in Section 1.6.7.4(c) (In-situ Testing) of the City of Austin's Environmental Criteria Manual. Specifically, the following note would be proposed on future site plans:

> *"If the testing requirements as stated in section 1.6.7.4(c) of the City of Austin Environmental Criteria Manual do not support a 0.2" infiltration rate then the upper 12" of existing soil will be amended to ensure a permeability of no less than 0.2 in/hr. Textural composition of soil shall be in accordance with COA Standard Specification Item 601S, Table 601S.3 if necessary."*

Due to the site's existing improvements and impervious cover and the site still being a functioning shopping center, obtaining the In-situ testing is not feasible at this time.

As also can be seen on ***Exhibit 4***, the re-irrigation areas are shown in dark green on-site and a hatched green area off-site in the parkland area. Permission to re-irrigate in the parkland is permitted based on the easement dedicated in the Warranty Deed recorded in Volume 7649, Page 274 of the Official Public Records of Travis County, Texas. A copy of this Warranty Deed is provided in ***Appendix C***.

As the Slat Tool calculation indicates, a total of 9.5 acres of re-irrigation area is required to disperse the required water quality volumes with 2.6 acres coming from the adjacent parkland and 7.5 acres coming from irrigation on-site – for a total of 10.1 acres being proposed for re-irrigation. We expect to lose some irrigation area during final design; as such, the small 0.6 acres of overage will act as a buffer to our total amount of required re-irrigation area.

A. UNTREATED AREA

As can been seen on ***Exhibit 4***, there is a small area located on the northwest corner of the site that is basically the roadway that connects down the hill to the existing office site and Loop 360. This small area is estimated at 0.1 acres and is proposed to remain in place, with only an asphalt or concrete overlay being proposed. This area is too low and cannot be conveyed to the proposed water quality ponds; as such, it will remain untreated in the proposed condition. It should be noted that it remains un-treated in the existing condition as well.

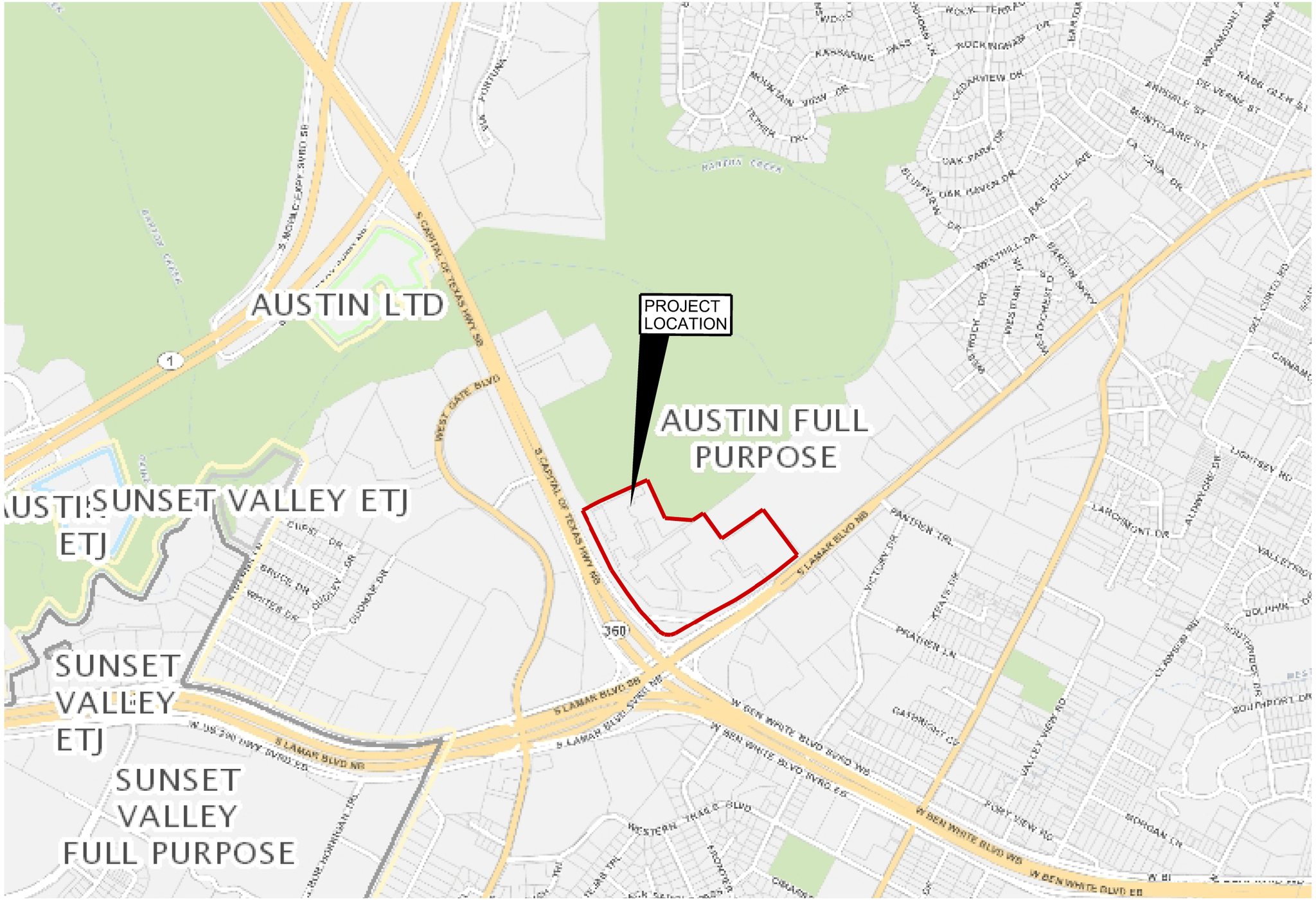
B. ADDITIONAL WATER QUALITY BENEFIT

As discussed above, the project is proposing to provide SOS water quality removal and with that the site will meet SOS water quality pond sizing requirements. As such, based on the Slat Tool calculations shown on ***Exhibit 4,*** this is an estimated 2.0" and 1.4" of rainfall run-off captured on the site for Water Quality Ponds 1A and 1B, respectively, before the ponds reach their overflow elevation and drain into the proposed storm-sewer system. What this basically accomplishes is having more volume in the wet pond for the apartment complex as 100% of the water quality volume from the Brodie Oaks Shopping Center is now no longer going into the two existing ponds on the apartment complex. Thereby making 100% of that volume available for the apartment complex, and in essence providing an increased water quality benefit for the apartment complex and less runoff entering Barton Creek.

VII. SUMMARY & CONCLUSION

Based on the above information, the Brodie Oaks PUD drainage plan will not cause an adverse effect to the adjacent park or apartment complex. All drainage points leaving the site will be less than what currently exists. As such, this report also concluded that on-site detention is not required. In addition, the Brodie Oaks PUD is proposing an overall reduction of impervious cover from 87% to 54% and providing full compliance with the SOS ordinance water quality requirements.

Lastly, by meeting the SOS water quality requirements for the Brodie Oaks Shopping Center, this automatically provided additional water quality benefit to the Retreat at Barton Creek Apartment Complex and overall, a major improvement to the water quality of Barton Creek.



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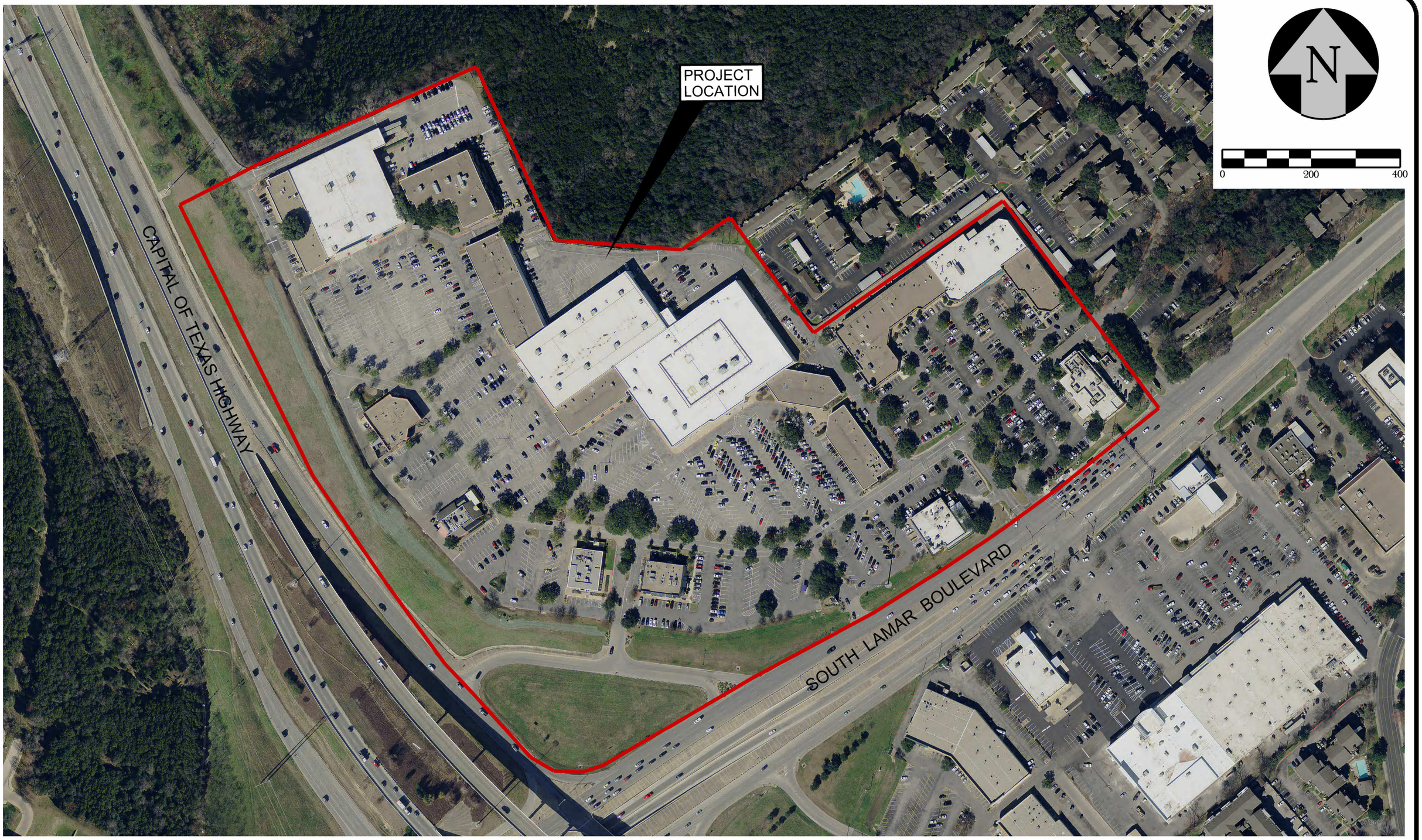
BRODIE OAKS SHOPPING CENTER

LOCATION MAP
EXHIBIT 1



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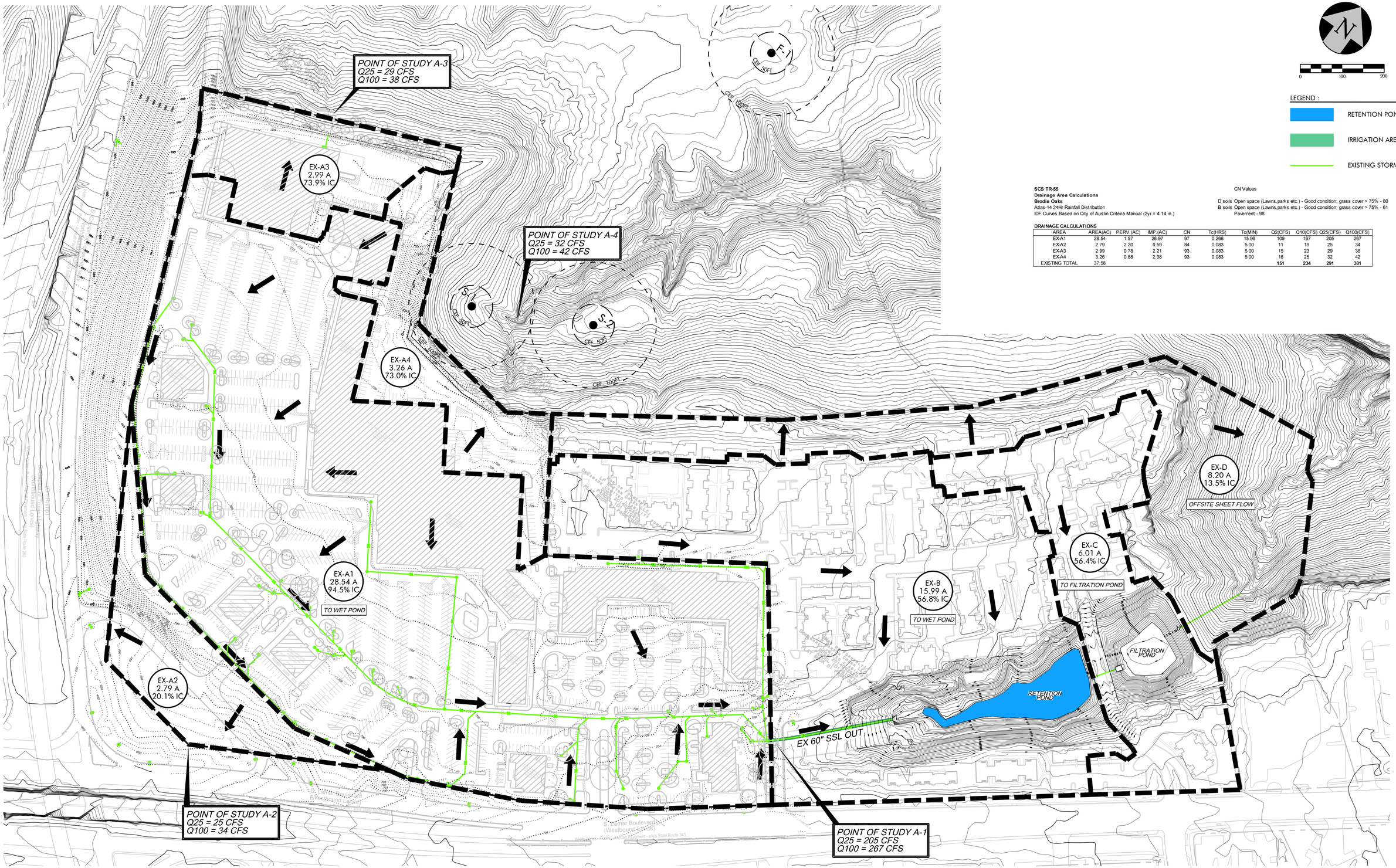
BRODIE OAKS SHOPPING CENTER

AERIAL PHOTOGRAPH
EXHIBIT 2



SCS TR-55
Drainage Area Calculations
Brodie Oaks
Atlas-14 24Hr Rainfall Distribution
IDF Curves Based on City of Austin Criteria Manual (2yr = 4.14 in.)

CN Values

D soils Open space (Lawns,parks etc.) - Good condition; grass cover > 75% - 80
B soils Open space (Lawns,parks etc.) - Good condition; grass cover > 75% - 61
Pavement - 98

DRAINAGE CALCULATIONS

AREA	AREA(AC)	PERV (AC)	IMP (AC)	CN	Tc(HRS)	Tc(MIN)	Q2(CFS)	Q10(CFS)	Q25(CFS)	Q100(CFS)
EX-A1	28.54	1.57	26.97	97	0.266	15.96	109	167	205	267
EX-A2	2.79	2.20	0.59	84	0.083	5.00	11	19	25	34
EX-A3	2.99	0.78	2.21	93	0.083	5.00	15	23	29	38
EX-A4	3.26	0.88	2.38	93	0.083	5.00	16	25	32	42
EXISTING TOTAL	37.58						**151**	**234**	**291**	**381**

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A593-1001 BRODIE OAKS
DRAINAGE EXISTING - EXISTING RETENTION POND
APRIL 20, 2021

DEVELOPED CONDITION (SOS)

Site Location	Within Barton Springs Zone	
	Drainage Area A	*Drainage Area B*
Drainage Area, An (Ac)	25.87	3.85
Developed IC, IC_D (%)	70.0	55.0
SCM 1	Retention Basin	Retention Basin
Water Qual. Vol, WQV (in)	2.00	1.40
Actual Volume (ft3)	187816	19566
Drawdown Time, DDT (hrs)	60	60
Flowrate (gpm)	390.24	41
SCM 2	Infiltration Field	Infiltration Field
Infiltration Rate (in/hr)	0.20	0.20
Appx. Min. Infilt. Field Area (Ac	8.62	0.90
Average Irrigation Rate (gpm)	390.2	40.6
Error with Input Values?	NO	NO

0 100 200

LEGEND :

- RETENTION POND
- IRRIGATION AREA ONSITE - 7.53 ACRE USED
- PROPOSED STORMSEWER TO RETENTION
- PROPOSED STORMSEWER OVERFLOW OUT
- PROPOSED IRRIGATION
- IRRIGATION AREA PARKLAND - 2.60 ACRE

SCS TR-55
Drainage Area Calculations
Brodie Oaks
Atlas-14 24Hr Rainfall Distribution
IDF Curves Based on City of Austin Criteria Manual (2yr = 4.14 in.)

CN Values

D soils Open space (Lawns,parks etc.) - Good condition; grass cover > 75% - 80
B soils Open space (Lawns,parks etc.) - Good condition; grass cover > 75% - 61
Pavement - 98

DRAINAGE CALCULATIONS

AREA	AREA(AC)	PERV.(AC)	IMP.(AC)	CN	Tc(HRS)	Tc(MIN)	Q2(CFS)	Q10(CFS)	Q25(CFS)	Q100(CFS)
EX-A1	28.54	1.57	26.97	97	0.266	15.96	109	167	205	267
EX-A2	2.79	2.20	0.59	84	0.083	5.00	11	19	25	34
EX-A3	2.99	0.78	2.21	93	0.083	5.00	15	23	29	38
EX-A4	3.26	0.88	2.38	93	0.083	5.00	16	25	32	42
EXISTING TOTAL	37.58						**151**	**234**	**291**	**381**
A-1A	25.87	7.76	18.11	93	0.346	20.76	83	133	165	216
A-1B	3.85	1.73	2.12	90	0.309	18.54	12	20	25	34
A-2	1.34	1.25	0.09	81	0.083	5.00	5	9	11	16
A-3	3.08	2.90	0.18	81	0.083	5.00	10	20	26	36
A-4	3.44	3.24	0.20	81	0.083	5.00	12	22	29	41
PROPOSED TOTAL	37.58						**122**	**204**	**256**	**343**

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DRAINAGE DEVELOPED - RETENTION POND
BRODIE OAKS
APRIL 20, 2021

Culvert Calculator Report
60" to Pond Atlas14 25yr EX

Solve For: Headwater Elevation

Culvert Summary					
Allowable HW Elevation	695.00	ft	Headwater Depth/Height	1.52	
Computed Headwater Eleva	682.33	ft	Discharge	205.00	cfs
Inlet Control HW Elev.	682.33	ft	Tailwater Elevation	667.00	ft
Outlet Control HW Elev.	682.13	ft	Control Type	Inlet Control	

Grades					
Upstream Invert	674.72	ft	Downstream Invert	665.00	ft
Length	305.00	ft	Constructed Slope	0.031869	ft/ft

Hydraulic Profile					
Profile	S2		Depth, Downstream	2.41	ft
Slope Type	Steep		Normal Depth	2.32	ft
Flow Regime	Supercritical		Critical Depth	4.08	ft
Velocity Downstream	21.90	ft/s	Critical Slope	0.006239	ft/ft

Section					
Section Shape	Circular		Mannings Coefficient	0.013	
Section Material	Concrete		Span	5.00	ft
Section Size	60 inch		Rise	5.00	ft
Number Sections	1				

Outlet Control Properties					
Outlet Control HW Elev.	682.13	ft	Upstream Velocity Head	2.22	ft
Ke	0.50		Entrance Loss	1.11	ft

Inlet Control Properties					
Inlet Control HW Elev.	682.33	ft	Flow Control	Submerged	
Inlet Type	Square edge w/headwall		Area Full	19.6	ft²
K	0.00980		HDS 5 Chart	1	
M	2.00000		HDS 5 Scale	1	
C	0.03980		Equation Form	1	
Y	0.67000				

Culvert Calculator Report
60" to Pond Atlas14 25yr

Solve For: Headwater Elevation

Culvert Summary					
Allowable HW Elevation	695.00	ft	Headwater Depth/Height	1.40	
Computed Headwater Elev	681.72	ft	Discharge	190.00	cfs
Inlet Control HW Elev.	681.72	ft	Tailwater Elevation	667.00	ft
Outlet Control HW Elev.	681.71	ft	Control Type	Inlet Control	

Grades					
Upstream Invert	674.72	ft	Downstream Invert	665.00	ft
Length	305.00	ft	Constructed Slope	0.031869	ft/ft

Hydraulic Profile					
Profile	S2		Depth, Downstream	2.30	ft
Slope Type	Steep		Normal Depth	2.23	ft
Flow Regime	Supercritical		Critical Depth	3.94	ft
Velocity Downstream	21.57	ft/s	Critical Slope	0.005734	ft/ft

Section					
Section Shape	Circular		Mannings Coefficient	0.013	
Section Material	Concrete		Span	5.00	ft
Section Size	60 inch		Rise	5.00	ft
Number Sections	1				

Outlet Control Properties					
Outlet Control HW Elev.	681.71	ft	Upstream Velocity Head	2.03	ft
Ke	0.50		Entrance Loss	1.02	ft

Inlet Control Properties					
Inlet Control HW Elev.	681.72	ft	Flow Control	Submerged	
Inlet Type	Square edge w/headwall		Area Full	19.6	ft²
K	0.00980		HDS 5 Chart	1	
M	2.00000		HDS 5 Scale	1	
C	0.03980		Equation Form	1	
Y	0.67000				

Culvert Calculator Report
60" to Pond Atlas14 100yr EX

Solve For: Headwater Elevation

Culvert Summary					
Allowable HW Elevation	695.00	ft	Headwater Depth/Height	2.13	
Computed Headwater Elev	685.35	ft	Discharge	267.00	cfs
Inlet Control HW Elev.	685.35	ft	Tailwater Elevation	667.00	ft
Outlet Control HW Elev.	684.01	ft	Control Type	Inlet Control	

Grades					
Upstream Invert	674.72	ft	Downstream Invert	665.00	ft
Length	305.00	ft	Constructed Slope	0.031869	ft/ft

Hydraulic Profile					
Profile	S2		Depth, Downstream	2.85	ft
Slope Type	Steep		Normal Depth	2.72	ft
Flow Regime	Supercritical		Critical Depth	4.52	ft
Velocity Downstream	23.10	ft/s	Critical Slope	0.009218	ft/ft

Section					
Section Shape	Circular		Mannings Coefficient	0.013	
Section Material	Concrete		Span	5.00	ft
Section Size	60 inch		Rise	5.00	ft
Number Sections	1				

Outlet Control Properties					
Outlet Control HW Elev.	684.01	ft	Upstream Velocity Head	3.18	ft
Ke	0.50		Entrance Loss	1.59	ft

Inlet Control Properties					
Inlet Control HW Elev.	685.35	ft	Flow Control	Submerged	
Inlet Type	Square edge w/headwall		Area Full	19.6	ft²
K	0.00980		HDS 5 Chart	1	
M	2.00000		HDS 5 Scale	1	
C	0.03980		Equation Form	1	
Y	0.67000				

Culvert Calculator Report
60" to Pond Atlas14 100yr

Solve For: Headwater Elevation

Culvert Summary					
Allowable HW Elevation	695.00	ft	Headwater Depth/Height	1.94	
Computed Headwater Elev	684.44	ft	Discharge	250.00	cfs
Inlet Control HW Elev.	684.44	ft	Tailwater Elevation	667.00	ft
Outlet Control HW Elev.	683.46	ft	Control Type	Inlet Control	

Grades					
Upstream Invert	674.72	ft	Downstream Invert	665.00	ft
Length	305.00	ft	Constructed Slope	0.031869	ft/ft

Hydraulic Profile					
Profile	S2		Depth, Downstream	2.73	ft
Slope Type	Steep		Normal Depth	2.61	ft
Flow Regime	Supercritical		Critical Depth	4.42	ft
Velocity Downstream	22.79	ft/s	Critical Slope	0.008244	ft/ft

Section					
Section Shape	Circular		Mannings Coefficient	0.013	
Section Material	Concrete		Span	5.00	ft
Section Size	60 inch		Rise	5.00	ft
Number Sections	1				

Outlet Control Properties					
Outlet Control HW Elev.	683.46	ft	Upstream Velocity Head	2.88	ft
Ke	0.50		Entrance Loss	1.44	ft

Inlet Control Properties					
Inlet Control HW Elev.	684.44	ft	Flow Control	Submerged	
Inlet Type	Square edge w/headwall		Area Full	19.6	ft²
K	0.00980		HDS 5 Chart	1	
M	2.00000		HDS 5 Scale	1	
C	0.03980		Equation Form	1	
Y	0.67000				

Culvert Calculator Report
60" to Pond Atlas14 Update

Solve For: Discharge

Culvert Summary					
Allowable HW Elevation	695.00	ft	Headwater Depth/Height	4.06	
Computed Headwater Eleva	695.00	ft	Discharge	405.92	cfs
Inlet Control HW Elev.	695.00	ft	Tailwater Elevation	667.00	ft
Outlet Control HW Elev.	689.68	ft	Control Type	Inlet Control	

Grades					
Upstream Invert	674.72	ft	Downstream Invert	665.00	ft
Length	305.00	ft	Constructed Slope	0.031869	ft/ft

Hydraulic Profile					
Profile	S2		Depth, Downstream	3.81	ft
Slope Type	Steep		Normal Depth	3.62	ft
Flow Regime	Supercritical		Critical Depth	4.89	ft
Velocity Downstream	25.29	ft/s	Critical Slope	0.021684	ft/ft

Section					
Section Shape	Circular		Mannings Coefficient	0.013	
Section Material	Concrete		Span	5.00	ft
Section Size	60 inch		Rise	5.00	ft
Number Sections	1				

Outlet Control Properties					
Outlet Control HW Elev.	689.68	ft	Upstream Velocity Head	6.71	ft
Ke	0.50		Entrance Loss	3.36	ft

Inlet Control Properties					
Inlet Control HW Elev.	695.00	ft	Flow Control	N/A	
Inlet Type	Square edge w/headwall		Area Full	19.6	ft²
K	0.00980		HDS 5 Chart	1	
M	2.00000		HDS 5 Scale	1	
C	0.03980		Equation Form	1	
Y	0.67000				

Joseph Longaro

From: Lauren Crone
Sent: Wednesday, April 7, 2021 8:54 AM
To: Joseph Longaro
Subject: FW: RSMP Feasibility - Brodie Oaks Shopping Center

Joe,

Response from RSMP staff below.

Lauren Crone, P.E.
Project Manager

LJA Engineering | TBPE Firm No. F-1386
Austin Office
7500 Rialto Boulevard, Building II, Suite 100
Austin, TX 78735
C: 512.971.7693
P: 512.439.4700
D: 512.439.4737
www.lja.com

From: WPD RSMP <rsmp@austintexas.gov>
Sent: Wednesday, April 7, 2021 8:52 AM
To: Lauren Crone <lcrone@lja.com>
Subject: Re: RSMP Feasibility - Brodie Oaks Shopping Center

[EXTERNAL EMAIL]

Lauren,

We do not make the determination of whether detention is required. That is a drainage review conversation with DSD LUR staff.

Since participation in the RSMP is an alternative means of compliance to mitigating increases in runoff through provision of on-site detention, it is never required. Detention can always be provided even if a site is feasible for RSMP participation. Code and Criteria outline the drainage requirements and should be met by the applicant. If, as you state below, the flows at all points of analysis leaving the site are decreasing from existing to proposed conditions, it sounds like the drainage meets the requirements for not needing detention.

Thank You,

RSMP Team
City of Austin Watershed Protection Department, Watershed Engineering Division

505 Barton Springs Road, 12th Floor
RSMP@austintexas.gov
Visit our website
Sign up for our mailing list to get the latest announcements from the program: http://eepurl.com/gGR2XP
How are we doing? Complete a short survey here: https://us4.list-manage.com/survey?u=d2bd55222e61b070467ec5821&id=b6a440a4bd&attribution=false

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From: Lauren Crone <lcrone@lja.com>
Sent: Tuesday, April 6, 2021 2:57 PM
To: WPD RSMP <rsmp@austintexas.gov>
Subject: RE: RSMP Feasibility - Brodie Oaks Shopping Center

RSMP Staff,

Per our email discussion below, we are seeking confirmation that our site in question does not require RSMP. I have attached an existing and proposed condition drainage area map for your reference. The proposed impervious cover on site is decreasing from current conditions and flow at all points leaving the site is less in proposed conditions than existing conditions, meaning detention is not required. Because of this, we believe that RSMP participation is not required for this project. Can you confirm?

Thank you,

Lauren Crone, P.E.
Project Manager

LJA Engineering | TBPE Firm No. F-1386
Austin Office
7500 Rialto Boulevard, Building II, Suite 100
Austin, TX 78735
C: 512.971.7693
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From: WPD RSMP <rsmp@austintexas.gov>
Sent: Tuesday, March 2, 2021 1:41 PM
To: Lauren Crone <lcrone@lja.com>
Subject: Re: RSMP Feasibility - Brodie Oaks Shopping Center

[EXTERNAL EMAIL]

Lauren,

Participation in the RSMP is a method of alternative compliance to providing on-site detention for mitigating increases in flows due to increased or changed impervious cover (i.e. straight increases or redevelopment where drainage patterns are changing so flows at some point from the site increase).

If you look at code and criteria, it is all based on increases in runoff and impervious cover. Typically, if a redevelopment is proposing decreases in impervious cover, flows from the site also decrease. The exception is when a site is developed in one area and not in another and the location of impervious cover on the site changes such that even though the net impervious cover remains the same or decreases, the flows from the site increase (DCM 1.2.2). Basically, the point of "needing" RSMP is moot because the site may not need detention so there's nothing to need an alternative for.

Please let me know if that doesn't make sense.

Thank You,

Emily Booth
RSMP Team
City of Austin Watershed Protection Department, Watershed Engineering Division
505 Barton Springs Road, 12th Floor
RSMP@austintexas.gov
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Sign up for our mailing list to get the latest announcements from the program: http://eepurl.com/gGR2XP
How are we doing? Complete a short survey here: https://us4.list-manage.com/survey?u=d2bd55222e61b070467ec5821&id=b6a440a4bd&attribution=false

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From: Lauren Crone <lcrone@lja.com>
Sent: Tuesday, March 2, 2021 1:28 PM
To: WPD RSMP <rsmp@austintexas.gov>
Subject: RE: RSMP Feasibility - Brodie Oaks Shopping Center

Thank you for your quick response. We were under the impression that if we were not intending to provide detention for the site, we would need RSMP participation. Please let me know if this is incorrect. The impervious cover is decreasing quite a bit with the proposed improvements.

Thank you,

Lauren Crone, P.E.
Project Manager

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Austin Office
7500 Rialto Boulevard, Building II, Suite 100
Austin, TX 78735
C: 512.971.7693
P: 512.439.4700
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www.lja.com

From: WPD RSMP <rsmp@austintexas.gov>
Sent: Tuesday, March 2, 2021 1:24 PM
To: Lauren Crone <lcrone@lja.com>
Subject: Re: RSMP Feasibility - Brodie Oaks Shopping Center

[EXTERNAL EMAIL]

Lauren,

From a brief review of the request form, it appears that this development is decreasing impervious cover from existing to proposed conditions. Could you provide more information as to why you are requesting RSMP for this development?

Thank You,

RSMP Team
City of Austin Watershed Protection Department, Watershed Engineering Division
505 Barton Springs Road, 12th Floor
RSMP@austintexas.gov
Visit our website
Sign up for our mailing list to get the latest announcements from the program: http://eepurl.com/gGR2XP
How are we doing? Complete a short survey here: https://us4.list-manage.com/survey?u=d2bd55222e61b070467ec5821&id=b6a440a4bd&attribution=false

---

From: Lauren Crone <lcrone@lja.com>
Sent: Tuesday, March 2, 2021 1:00 PM
To: WPD RSMP <rsmp@austintexas.gov>
Subject: RSMP Feasibility - Brodie Oaks Shopping Center

*** External Email - Exercise Caution ***

RSMP Staff,

Please see the attached RSMP Feasibility Determination Request Form for the Brodie Oaks Shopping Center. Please advise as to if a meeting is necessary to discuss the feasibility of this project. Thank you for your help.

Lauren Crone, P.E.
Project Manager

LJA Engineering | TBPE Firm No. F-1386
Austin Office
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Austin, TX 78735
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5-00
certified copy

DEC 23-81 1783 * 9.00

WARRANTY DEED OF GIFT

2-75-6070

DEC 23-81 1784 * 5.00

THE STATE OF TEXAS §
§ KNOW ALL MEN BY THESE PRESENTS:
COUNTY OF TRAVIS §

That FRED A. GOTTESMAN of Orleans Parish, Louisiana, acting herein by and through his attorney-in-fact, Sanford L. Gottesman, in order to aid and assist the City of Austin in the preservation of natural, open space areas for the use and enjoyment of its citizens, has GIVEN, GRANTED AND CONVEYED, and by these presents does GIVE, GRANT AND CONVEY unto THE CITY OF AUSTIN, a municipal corporation, all of the following described real property for parkland and recreational purposes with the restrictions and upon the covenants and conditions below stated, in Travis County, Texas, to-wit:

> Lot E-1, BARTON CREEK PLAZA, a subdivision in Travis County, Texas, according to the map or plat thereof recorded in Volume 81, Page 3697, Plat Records of Travis County, Texas.

TO HAVE AND TO HOLD the above described premises, together with all and singular the rights and appurtenances thereto in anywise belonging, unto the said Grantee, its successors and assigns forever; and Grantor herein does hereby bind himself, his heirs, executors and administrators to WARRANT AND FOREVER DEFEND all and singular the said premises unto the said Grantee, its successors and assigns, against every person whomsoever lawfully claiming or to claim the same or any part thereof, by through or under him, but not otherwise.

This conveyance is made and accepted subject to any and all easements, covenants, rights-of-way, conditions, restrictions, mineral reservations and royalty reservations, if any, relating to the hereinabove described property, to the extent, and only to the extent, that the same may still be in force and effect and either shown of record in the office of the County Clerk of Travis County, Texas, or apparent on the property.

This conveyance is further made and accepted subject to the covenant made by Grantee, by the acceptance hereof, and

2-75-6071

the condition, that the above described property shall be used only as a permanent public park for pleasure and recreational purposes and any improvements shall be operated and maintained for such purposes at the sole expense of the Grantee herein, such covenant and condition to be binding upon and to be observed by the Grantee herein, as well as its successors and assigns, and to run in favor of and be enforceable by Grantor and any person who now or hereafter shall own any part of Barton Creek Plaza Subdivision, a subdivision in Travis County, Texas, according to the map or plat thereof recorded in Volume 81, Page 369-70, Plat Records of Travis County, Texas. In the event of and upon any violation or non-observance of the above covenant and condition, this conveyance shall be null and void and the above described property shall then and there wholly and absolutely revert, without suit or re-entry, to the Grantor herein, his heirs, successors, and assigns; and no act or ommission upon the part of the beneficiaries of this clause shall constitute a waiver of the operation or enforcement of such covenant and condition.

It is further understood and agreed that Grantor herein expressly excepts and reserves unto Grantor, his heirs, successors and assigns (and with respect to any cutting, trimming and/or removal of vegetation pursuant to (iii) below, following at least ten (10) days written notice to the Director of the Parks and Recreation Department of the City of Austin and with the approval of the Director of the applicable utility with respect to which such cutting, trimming and/or removal is to be performed (which approval shall not be unreasonably withheld)) a non-exclusive, perpetual right-of-way and easement over, under, across and through the herein described property, for purposes of (i) placing, constructing, operating, using, repairing, maintaining, replacing, relocating, inspecting, and removing telephone, telegraph or electric poles, lines, and overhead systems; underground electric, telephone, gas, water, sewer and wastewater lines, pipes and systems; cable television lines; drainage and irrigation systems, including ditches, culverts, pipes, sprinklers, lines and related facilities (together with the right to divert and cause water to be put on the property for irrigation and drainage purposes); and any other utilities whatsoever; (ii) as allowed by applicable ordinances of the City of Austin, placing and maintaining dirt and other fill material for embankments,

2-75-6072

excavation and/or grading as may be necessary or appropriate for any roads, driveways and/or parking areas placed or located on the balance of the lots in said Barton Creek Plaza Subdivision; and (iii) all rights and privileges reasonably necessary or appurtenant thereto, including temporary construction easements required for any easement granted pursuant to the provisions hereof and the right of access to the property, together with the right to cut, trim, and remove any trees, shrubbery or other vegetation, as may be necessary to accomplish any of the purposes set forth in this paragraph.

EXECUTED December 22, 1981, to be effective for all purposes as of December 23, 1981.

FRED A. GOTTESMAN

By: Fred A. Gottesman by Sanford L. Gottesman
Sanford L. Gottesman,
Attorney in Fact

Accepted this 23 day of December, 1981.

THE CITY OF AUSTIN

By: Richard C. Lillie (NO SEAL)
Its CITY MANAGER

THE STATE OF TEXAS §

COUNTY OF TRAVIS §

BEFORE ME, the undersigned authority, on this day personally appeared Sanford L. Gottesman, Attorney in Fact of Fred A. Gottesman, known to me to be the person whose name is subscribed to the foregoing instrument, and acknowledged to me that he executed the same for the purposes and consideration therein expressed, and in the capacity therein stated.

GIVEN UNDER MY HAND AND SEAL OF OFFICE on this the 22 day of December, 1981.

NOTARY SEAL

Wm. Terry Bray
Notary Public, Travis County, TEXAS
(Print Name) WM. TERRY BRAY
MY COMMISSION EXPIRES JUNE 30, 1984

My Commission Expires:

15/05
12/22/81

7649 276

FILED

2-75-6073

DEC 23 4 57 PM '81

COUNTY CLERK
TRAVIS COUNTY, TEXAS

7649 274

STATE OF TEXAS
COUNTY OF TRAVIS

I hereby certify that this instrument was FILED on the date and at the time stamped hereon by me; and was duly RECORDED, in the Volume and Page of the named RECORDS of Travis County, Texas, as stamp hereon by me, on

DEC 23 1981

COUNTY CLERK
TRAVIS COUNTY, TEXAS

7649 277

LJA ENGINEERING

7500 Rialto Boulevard, Building II, Suite 100, Austin, Texas 78735
t 512.439.4700 LJA.com TBPE F-1386

April 22, 2021

Jay Baker, P.E.
City of Austin
Development Services Department
P.O. Box 1088
Austin, Texas 78767-1088

RE: Brodie Oaks Redevelopment
PUD Application
Waiver Request from Drainage Criteria Manual, Section 5.3.2 (Maximum Velocities)

Dear Jay:

This letter is to be reviewed in conjunction with the report titled "Brodie Oaks Redevelopment Drainage Study" dated April 2021 by LJA Engineering, Inc. The purpose of this letter is to request a waiver from the City of Austin's Drainage Criteria Manual, Section 5.3.2 (Maximum Velocities). As stated in the report, there is an existing 60" storm-pipe that leaves the site and drains to an existing wet pond located in the adjacent apartment complex called "The Retreat at Barton Creek". This storm pipe, in its existing condition, drains the majority of the existing Brodie Oaks Shopping Center with an estimated 100-year/25-year flow rate of 267 cfs and 205 cfs, respectively. See ***Appendix A*** of the aforementioned report for more details.

In its existing condition the 25-year flow rate shows a 25-year velocity of 21.9'/sec leaving the pipe. In the proposed condition the 100-year/25-year flow rates as proposed are at 250 cfs and 190 cfs, respectively, with an estimated velocity of 21.6'/sec in the 25-year event.

We are requesting a waiver to this requirement for several reasons as noted below.

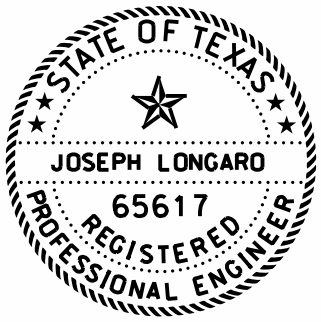
1. The proposed flow rate is less than the existing.
2. The current velocity in the pipe is 21.9'/sec and the proposed is slightly less at 21.6'/sec.
3. The outfall of the pipe drains to an existing wetpond and the pipe is submerged in the normal pool condition. This condition would eliminate any erosion potential downstream.
4. The pipe is existing. Under normal circumstances the pipe would have been sized to meet this criterion. But since the pipe is existing, we do not exceed the maximum by very much, and due to the costs associated with replacing this pipe, we are requesting the pipe to remain in-place.

Based on the above we respectfully request a waiver from Section 5.3.2 of the City of Austin's Drainage Criteria Manual and allow the existing 60" pipe to remain in-place.

Please review the above and let me know if you have any questions or need any additional information.

Sincerely,
LJA ENGINEERING, INC.

Joseph Longaro, P.E.
Senior Vice President



cc: Milo Burdette, Barshop & Oles Company
Jewels Cain, Armbrust & Brown, PLLC
David Armbrust, Armbrust & Brown, PLLC
Rebecca Leonard, Lionheart
Abby Gillfillan, Lionheart