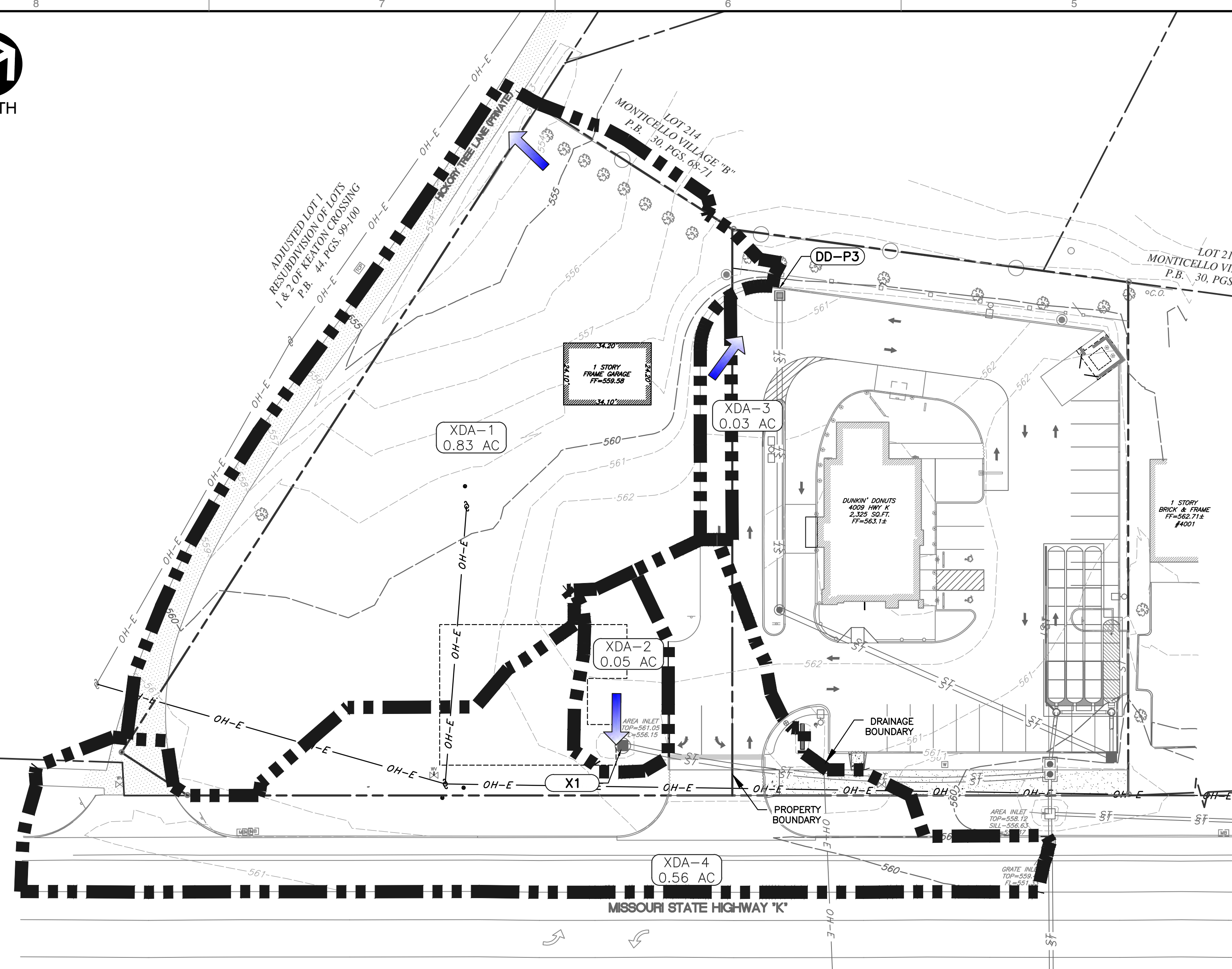




NORTH



### EXISTING DEVELOPMENT

EXISTING DRAINAGE AREAS (15-YR/20-MIN)					
XDA#	Description	Subareas	Area (AC)	PI*	Q (cfs)
1	SHEET FLOW OFFSITE HICKORY TREE LANE	IMPERVIOUS	0.09	3.85	0.33
		PERVIOUS	0.75	1.87	1.40
		<b>TOTALS</b>	<b>0.83</b>		<b>1.73</b>
2	TO EX. AREA INLET (X1)	IMPERVIOUS	0.00	3.85	0.00
		PERVIOUS	0.05	1.87	0.10
		<b>TOTALS</b>	<b>0.05</b>		<b>0.10</b>
3	TO OFFSITE - PER DUNKIN DONUTS (AREA P3)**	IMPERVIOUS	0.03	3.85	0.10
		PERVIOUS	0.00	1.87	0.00
		<b>TOTALS</b>	<b>0.03</b>		<b>0.10</b>
4	SHEET FLOW OFFSITE MO HWY K**	IMPERVIOUS	0.33	3.85	1.27
		PERVIOUS	0.23	1.87	0.44
		<b>TOTALS</b>	<b>0.56</b>		<b>1.70</b>
<b>EXISTING DRAINAGE AREA TOTALS</b>			<b>1.48</b>		<b>3.63</b>

\*15-year runoff factor includes factor for ground saturation

DIFFERENTIAL RUNOFF CALCULATION (25-YEAR)					
DISTURBED AREA					
AREA (SF)	AREA (AC)	PI	Q (CFS)		
41,626	0.96				
EXISTING SITE RUNOFF					
AREA (SF)	AREA (AC)	PI	Q (CFS)		
37,746	0.87	2.31	2.00		
3,880	0.09	4.75	0.42		
<b>TOTAL</b>	<b>41,626</b>	<b>0.96</b>	<b>2.54</b>	<b>2.42</b>	9.3%
PROPOSED SITE RUNOFF					
AREA (SF)	AREA (AC)	PI	Q (CFS)		
11,445	0.26	2.31	0.61		
30,181	0.69	4.75	3.29		
<b>TOTAL</b>	<b>41,626</b>	<b>0.96</b>	<b>4.08</b>	<b>3.90</b>	72.5%
DIFFERENTIAL RUNOFF (CFS)					
PROPOSED	EXISTING	DIFFERENTIAL*			
3.90	2.42	1.49			

\*The differential for this site is greater than 1 cfs. Therefore, detention is required. PI factors per 405.230.C (and include AMC)

PROPOSED ONSITE DRAINAGE AREA (15-YR/20-MIN)					
PDA#	Description	Subareas	Area (AC)	PI*	Q (cfs)
1	SHEET FLOW OFFSITE HICKORY TREE LANE	CONCRETE/ASPHALT	0.03	3.85	0.13
		LANDSCAPE/GRASS	0.20	1.87	0.37
		<b>TOTALS</b>	<b>0.23</b>		<b>0.50</b>
2	TO INLET 4 (TO DETENTION)	CONCRETE/ASPHALT	0.39	3.85	1.51
		LANDSCAPE/GRASS	0.04	1.87	0.08
		<b>TOTALS</b>	<b>0.43</b>		<b>1.59</b>
3	TO OFFSITE - PER DUNKIN DONUTS (AREA P3)**	CONCRETE/ASPHALT	0.03	3.85	0.10
		LANDSCAPE/GRASS	0.00	1.87	0.00
		<b>TOTALS</b>	<b>0.03</b>		<b>0.10</b>
4	SHEET FLOW OFFSITE MO HWY K	CONCRETE/ASPHALT	0.10	3.85	0.39
		LANDSCAPE/GRASS	0.02	1.87	0.04
		<b>TOTALS</b>	<b>0.12</b>		<b>0.43</b>
5	TO INLET 2 (TO DETENTION)	CONCRETE/ASPHALT	0.08	3.85	0.31
		LANDSCAPE/GRASS	0.00	1.87	0.00
		<b>TOTALS</b>	<b>0.08</b>		<b>0.31</b>
6	ROOFTOP DOWNSPOUTS (TO DETENTION)	ROOF	0.06	3.85	0.23
		LANDSCAPE/GRASS	0.00	1.87	0.00
		<b>TOTALS</b>	<b>0.06</b>		<b>0.23</b>
<b>PROPOSED DRAINAGE AREA TOTALS</b>			<b>0.96</b>		<b>3.16</b>
PROPOSED OFFSITE DRAINAGE AREAS (15-YR/20-MIN)					
DA#	Description	Subareas	Area (AC)	PI*	Q (cfs)
X1	SHEET FLOW OFFSITE HICKORY TREE LANE	IMPERVIOUS	0.06	3.85	0.24
		PERVIOUS	0.08	1.87	0.14
		<b>TOTALS</b>	<b>0.14</b>		<b>0.38</b>
X4	SHEET FLOW OFFSITE MO HWY K**	IMPERVIOUS	0.28	3.85	1.08
		PERVIOUS	0.10	1.87	0.19
		<b>TOTALS</b>	<b>0.38</b>		<b>1.27</b>
<b>DRAINAGE AREA TOTALS</b>			<b>1.48</b>		<b>4.81</b>

\*15-year runoff factor includes factor for ground saturation

\*\*See The Improvement Plans for Dunkin Donuts & Baskin Robbins by Civil & Environmental Consultants, Inc., dated September 2015.

SUMMARY OF DIRECT FLOWS TO INLETS - 15yr/20min			
Inlet ID	Existing (cfs)	Proposed (cfs)	Difference (cfs)
DUNKIN DONUTS-P3	0.10	0.10	0.00
MO HWY K	1.70	1.70	-0.01
EXISTING INLET X1	0.10	0.00	-0.10
PROPOSED INLET 2	0	0.31	0.31
PROPOSED INLET 4	0	1.59	1.59
BLDG. DOWNSPOUTS	0	0.23	0.23
<b>TOTALS</b>	<b>3.63</b>	<b>4.82</b>	<b>1.18</b>

#### NOTES:

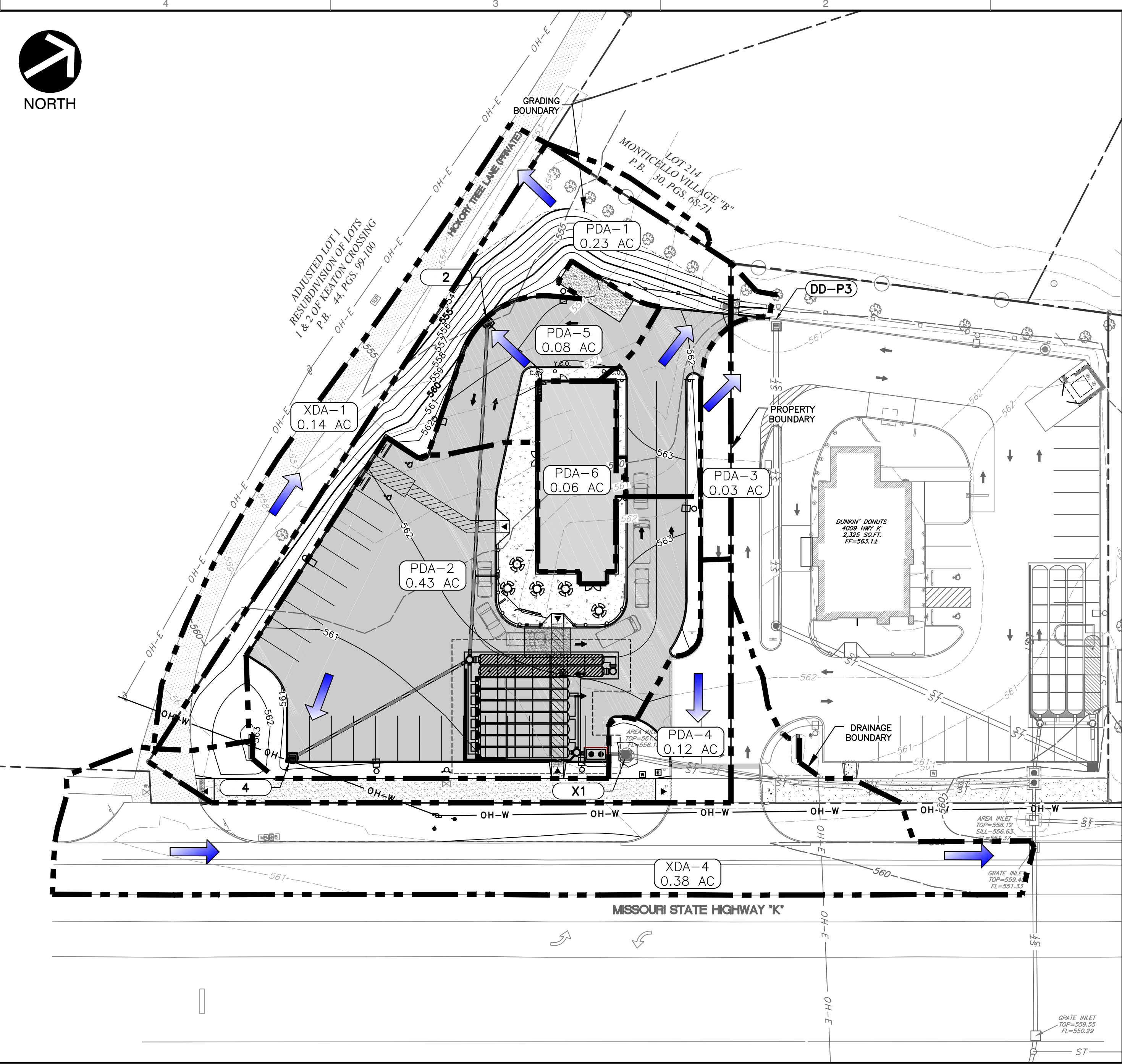
- SEE SHEET C001 FOR GENERAL NOTES
- CONTRACTOR SHALL REFER TO OTHER PLANS WITHIN THIS CONSTRUCTION SET FOR OTHER PERTINENT INFORMATION. IT IS NOT THE ENGINEER'S INTENT THAT ANY SINGLE PLAN SHEET IN THIS SET OF DOCUMENTS FULLY DEPICT ALL WORK ASSOCIATED WITH THIS PROJECT.

#### DRAINAGE NOTES:

- THE PROPOSED PROJECT IS WITHIN DUCKETT CREEK SEWER DISTRICT
- THE TOTAL PROJECT SITE IS 0.96 ACRES. THE TOTAL DISTURBED AREA IS 0.91 ACRES. THE DISTURBED AREA INCLUDES 0.07 ACRES OF RIGHT-OF-WAY.
- WATERSHED: DARDENE CREEK
- PER THE NATIONAL RESOURCE CONSERVATION SERVICE (NRCS) THE SITE IS WITHIN HYDROLOGIC SOIL GROUP 'C' HAVING A SLOW INFILTRATION RATE WHEN THOROUGHLY WET.
- UNDERGROUND DETENTION HAS BEEN SIZED TO ACCOUNT FOR THE DIFFERENTIAL FROM THE PROJECT SITE (LOT 2) ONLY.



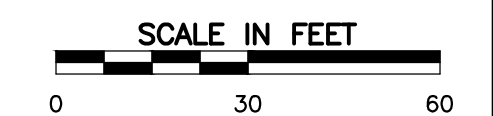
NORTH



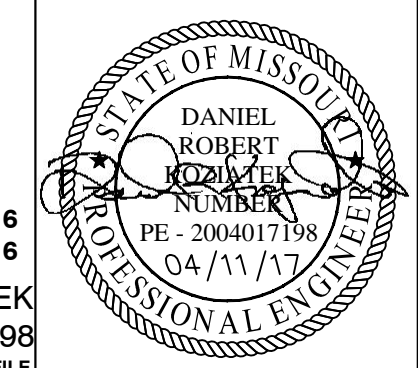
### PROPOSED DEVELOPMENT

CURVE NUMBER CALCULATIONS			
SITE AREA	AREA (SF)	AREA (AC)	
TOTAL SITE AREA	43,626	0.96	
PROPOSED CURVE NUMBER (CN) FOR TOTAL SITE			
COVER	SITE AREA (SF)	CN	COMPOSITE CN
IMP AREA	30,181	98	84
PER AREA (SOIL 'C')	11,445	74	
<b>TOTAL AREA</b>	<b>41,626</b>		<b>0.96 Acres</b>
EXISTING CURVE NUMBER (CN) FOR TOTAL SITE			
COVER	SITE AREA (SF)	CN (SOIL TYPE D)	COMPOSITE CN
IMP AREA	3,880	98	76
PER AREA (SOIL 'C')	37,746	74	
<b>TOTAL AREA</b>	<b>41,626</b>		<b>0.96 Acres</b>
CURVE NUMBER CALCULATIONS - DRAINAGE AREAS			
CURVE NUMBER (CN) FOR PROPOSED BYPASS			
COVER	SITE AREA (AC)	CN	COMPOSITE CN
IMP AREA	0.16	98	84
PER AREA (SOIL 'C')	0.22	74	
<b>TOTAL AREA</b>	<b>0.38</b>		<b>16565 sf</b>
CURVE NUMBER (CN) FOR PROPOSED DETENTION			
COVER	SITE AREA (AC)	CN (SOIL TYPE D)	COMPOSITE CN
IMP AREA	0.53	98	96
PER AREA (SOIL 'C')	0.04	74	
<b>TOTAL AREA</b>	<b>0.58</b>		<b>25062 sf</b>

CURVE NUMBER CALCULATIONS - DRAINAGE AREAS			
CURVE NUMBER (CN) FOR PROPOSED BYPASS			
COVER	SITE AREA (AC)	CN	COMPOSITE CN
IMP AREA	0.16	98	84
PER AREA (SOIL 'C')	0.22	74	
<b>TOTAL AREA</b>	<b>0.38</b>		<b>16565 sf</b>
CURVE NUMBER (CN) FOR PROPOSED DETENTION			
COVER	SITE AREA (AC)	CN (SOIL TYPE D)	COMPOSITE CN
IMP AREA	0.53	98	96
PER AREA (SOIL 'C')	0.04	74	
<b>TOTAL AREA</b>	<b>0.58</b>		<b>25062 sf</b>



SCALE IN FEET



P&Z CUP#25.16  
OCT. 31, 2016  
DANIEL KOZIATEK  
2004017198  
\*HAND SIGNATURE ON FILE

REVISION RECORD	
NO	DESCRIPTION
1	INITIAL IMPROVEMENT PLAN SUBMITTED TO CITY, COUNCILVILLE FIRE AND UTILITIES
2	REVISIONAL TO CITY OF EVALUATION
3	FINAL SUBMITAL TO CITY, COTTLEVILLE FIRE AND UTILITIES FOR APPROVAL
4	
5	
6	
7	
8	

**Civil & Environmental Consultants, Inc.**  
 CERTIFICATION/LICENSE NO. 2002013942  
 4848 Park 370 Blvd., Suite F - Hazelwood, MO 63042  
 314-656-4566 • 866-250-3679  
 www.cedinc.com

**QUICK SERVE PROPERTIES, LLC**  
 7201 OLIVE BLVD.  
 UNIVERSITY CITY, MO 63130

**WICKED GREENZ**  
 4015 HIGHWAY K  
 OFALLON, MISSOURI 63368  
 DRAINAGE AREA MAPS

DATE: SEPT. 2016 DRAWN BY: MRV  
 DVG SCALE: 1" = 30' CHECKED BY: DRK  
 PROJECT NO.: 162-880  
 APPROVED BY: DRK\*

DRAWING NO.: **HD1**  
 SHEET 12 OF 14