

Stormwater Management Plan

Streets of West Pryor
Lee's Summit, MO
West Detention Pond

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Prepared By:

SM Engineering
5507 High Meadow Circle
Manhattan, KS 66503



Samuel D. Malinowsky, P.E.

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INTRODUCTION

This storm water report has been prepared to address the improvements associated with the preliminary development plan for Lot 7 and Tract C, Streets of West Pryor. This development is located north and northwest of the intersection of Black Twig Lane and Lowenstein Road within the Streets of West Pryor mixed use development. The preliminary development plan for Streets of West Pryor was approved in 2017 and included Lot 7 and Tract C. This report will address the required storm water improvements associated with the proposed preliminary development plan for Lot 7 and Tract C.

EXISTING APPROVED DEVELOPMENT PLAN

The original 2017 preliminary development showed Lot 7 being developed with a 165 unit senior housing facility along with multiple sport courts and associated parking. Tract C was shown to be comprised of 29 single family lots. Tract C is configured such that it is on 3 sides of an existing storm water detention pond that serves a 46.4 acre drainage area of which Lot 7 and Tract C are a part of. The detention pond has been constructed while the proposed improvements on Tract C and Lot 7 were never taken to the final development plan stage. Figure 1 shows the existing approved preliminary development plan for Lots 7 and Tract C.

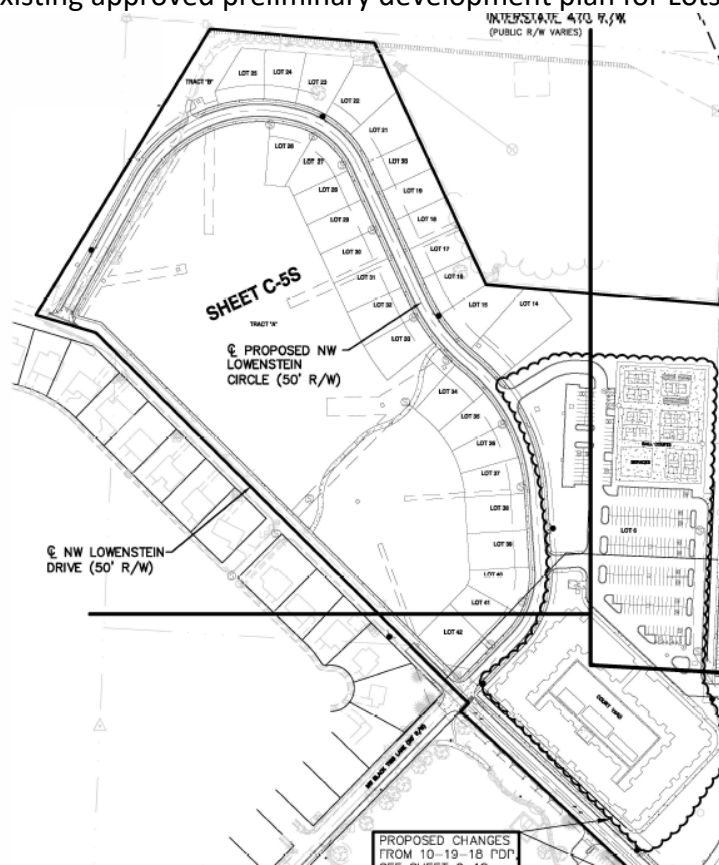


Figure 1. Existing Approved PDP For Lot 7 and Tract C

PROPOSED IMPROVEMENTS

Due to market demand and site costs associated with mine remediation the Streets of West Pryor development team is proposing to increase the density of Lot 7 and Tract C. On Lot 7 we are showing the construction of 2, multi family apartment structures with a total of 184 units along with an 88 unit hotel and shared amenity area. On Tract C we are showing to construct 83 townhome units. As a result of the increased density there will be an increase in the stormwater runoff. Figure 2 is an illustration of the proposed improvements.

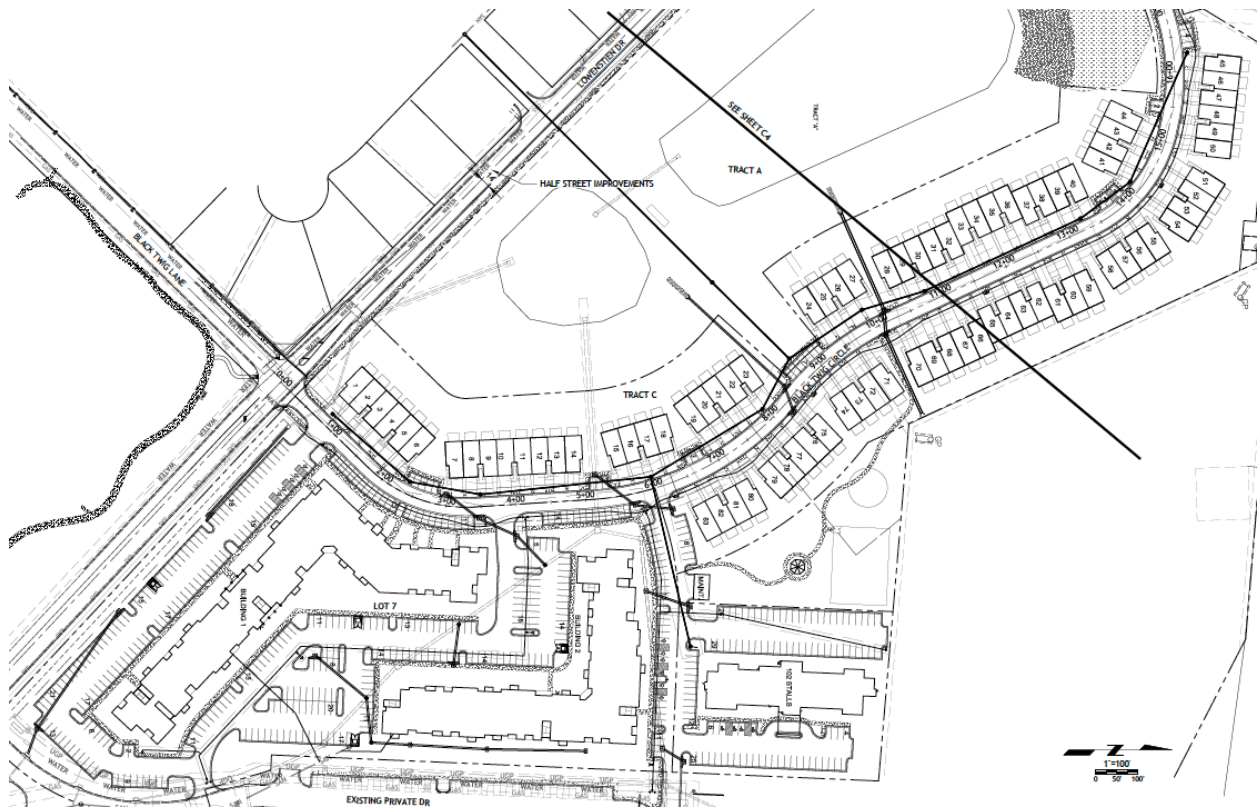


Figure 2. Proposed Improvements To Lot 7 And Tract C

DRAINAGE ANALYSIS METHODS AND CALCULATIONS

As discussed above the area draining to the west detention pond shown above in Figure 2 is 46.4 acres in size. To properly model the functionality of the existing detention pond required, input data was used from the original drainage study for the entire Streets of West Pryor of which Lot 7 and Tract C are a part. In the original drainage study a basin size of 46.9 acres was used. In order to properly model the affect of the increased density a 46.9 acre basin size was used in our calculations.

A curve number of 94 was used for both Lot 7 and Tract C as both of these lots are considered commercial in nature. This is an increase of 11 over the original CN value of 83 used for the single family housing that was proposed for Tract C and an increase of 3 over the mixed use CN of 91 for Lot 7.

As part of the original Streets of West Pryor development there were some modifications to the existing watersheds in order to facilitate the development. The original watershed that drained to the west was 24.9 acres in size. As such, this area is what dictates the amount of runoff that can be realized, post development. Per APWA 5608.4 the allowable release rates are listed in Table 1 below.

The drainage analysis was prepared using Hydrology Studio software to analyze the increased runoff and how it affected the pond outlet. The Hydrology Studio printouts are attached in Appendix A with a summary of the west basin discharge rates illustrated in the Table 1 below. The SCS method for determining runoff was used per APWA Section 5600, Storm Drainage Systems and Facilities – Kansas City Metropolitan Chapter.

Table 1: Summary of Discharge Rates

Design Storm	Allowable Release Rate (cfs/acre)	Proposed Pond Release Rates (cfs)	Proposed Pond Release Rates (cfs)
50% (2 yr)	0.5	1.67	1.67
10% (10 yr)	2.0	9.95	9.95
1% (100 yr)	3.0	23.85	23.85

As illustrated above, in all cases the total release rate is less than the allowable release rate. It should be noted that the pond release rates above are actually less than what was previously anticipated even though the CN values were increased. This is due to the fact that during pond construction the outlet orifices were raised up 2' while maintaining the same pond volume. This in affect increased the size of the detention pond above the permanent pole resulting in reduced release rates.

CONCLUSION

As shown above if constructed as proposed the preliminary development plan improvements for Lot 7 and Tract C, Streets of West Pryor will not increase the storm water runoff over what is allowed per APWA.