

Drainage Plan

BLACKSTONE ADDITION

Wichita, Sedgwick County, Kansas

Baughman Company, P.A.
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Existing Site Conditions

The proposed Blackstone Addition is located north on 13th Street North and in between 135th and 151st Streets West. The property is bounded on the west by Dry Creek. The development consists of approximately 60 acres of existing agricultural ground.

The soil types on the site consist of Type B and Type C. The western portion for the site is Type B whereas the Eastern portion of the site is Type C. Type D soil is present near the center of the property. All of the soil types are of the silty loam variety.

The Preliminary FEMA FIRM map (as provided by Sedgwick County) establishes Base Flood Elevations (BFE) ranging from a 1372.0 to a 1364.6 across and adjacent to portions of the proposed site. The site will be filled, where necessary, to raise the property above these elevations. The FEMA Floodway is also located on the site. These locations will be sequestered in Reserves.

Proposed Site Conditions

The proposed site will consist of a residential subdivision with associated streets, ponds, and utilities. The proposed subdivision will consist of approximately 105± lots. Storm sewer will be utilized throughout the subdivision to convey the runoff to detention pond systems. The detention ponds will limit the overall site developed runoff to at least the existing runoff. The pond is located near the center of the development in the Type D soils. The pond will discharge into a storm water sewer system that will drain into the proposed Cheryl's Hollow Addition. Backyard drainage along Dry Creek will be graded to allow direct runoff into the creek. All lots adjacent to Dry Creek will be raised to at least 1 foot above the adjacent BFE to not allow floodwaters to enter the development. All storm water sewer will also be protected from flood water inundation. The ditch along 13th Street North has a high point at an elevation of 1272.3. This elevation is above the BFE at this point and will be graded into Lots 5 and 6 to not allow flood waters to flow in the ditch.

Proposed Pond

The proposed pond will be located near the center of the development. The pond will discharge into the proposed storm sewer system proposed in Cheryl’s Hollow Addition. The pond will detain *at least* the developed runoff from the proposed subdivision. The pond’s outlet will consist of a 24” RCP.

The static water surface elevation of the pond will be at a 1362.0. The 100-year design water surface elevation will be a 1365.2. The pond will have a maximum 100-yr discharge of 11 cfs. This outlet and storm water system will then drain an eastern portion of the subdivision and discharge approximately 40 cfs into Cheryl’s Hollow Addition.

Per agreement with Ruggles & Bohm, PA, Cheryl’s Hollow Addition will accept the discharge of <50 cfs at the southwest corner of the plat into its pond. Cheryl’s Hollow Addition will then be allowed to drain <50 cfs at its north east corner into the proposed (future) Silverton Addition.

The backyard grades on the lots adjacent to the pond will be graded to 1 foot above 100-year WSE and the minimum openings on the structures on these lots will be 2 feet higher than that of the lowest lot corner.

Pond Summary

Static Water Surface Elevation	=	1362.0
100 year Design Surface Elevation	=	1365.2
Outlet	=	24” RCP

Offsite Flow

There is very little, if any, offsite flow. The ditch along 13th Street will carry drainage from Lots 1-6, Block C. A portion of the ditch as well as 13th Street is located in Zone AO (depth 1”). Upon development, the existing high point of 1372.3 will be graded into the corner (as shown on the grading plan) of Lot 5 to not allow the flood waters to inundate the ditch flowing to the east.

Detention Summary

The proposed development meets or exceeds current City of Wichita requirements pertaining to detention of existing and proposed runoff rates. The following summary chart relates existing and proposed discharges at critical points of the site.

POINT	Q₂ Existing	Q₂ Proposed	Q₁₀₀ Existing	Q₁₀₀ Proposed
Overall Site Runoff Produced	103 cfs	122 cfs	265 cfs	310 cfs
North Site Basin	6.0 cfs	3.5 cfs	42 cfs	10 cfs
Center Basin	13 cfs	11 cfs	100 cfs	44 cfs

The overall site flow is portrays that flow produced by developing the site as if there were *no* detention. The center basin flow is after detention effect of

the pond. The north site basin has a lower proposed runoff due to the redirecting existing flow into the proposed pond.

The detention pond will accept a maximum 100 year runoff of 280 cfs and discharging via a 24" storm water sewer pipe a runoff of 11 cfs. The pond is detaining approximately 270 cfs of developed runoff.

Overall Site Flow Summary

The proposed development provides adequate detention as required by the City of Wichita. The existing site detains approximately 270 cfs in the proposed pond. The existing agricultural land produces approximately 265 cfs of runoff. The proposed development produces approximately 310 cfs of runoff. Per City of Wichita requirements, the pond only has to detain 50 cfs.

NOTES:

The Preliminary FEMA FIRM Map Panel 310 shows a BFE of a 1370 and a 1365 approximately 2000 feet north of 13th Street. The BFE boundary is separated by a Zone X boundary at this point. The BFE listed as a 1370 is an error in mapping and a BFE of 1365 was used in this area. The study of this region in 1999 notes a BFE of 1365 as does the FIS Profile.

The mapped FEMA Floodway encroaches the property in two locations. These locations are contained in Reserves and will not include any development.

All BFE's used in grading and drainage calculations were converted to NGVD. The Preliminary FEMA FIRM Maps are in NAVD.

Drainage Plan Comments

To accompany email per Scott Lindebak (21 November 2005) Subject
“*Drainage Plan & Concepts (11/30/05)*”

1. Black and Veatch FIS workmap is included in the re-submittal.
2. The flood boundary has not been delineated offsite of the proposed development. Our available topography only extends approximately 50’ into the west offsite property. However, this is a studied area and based on floodplain boundaries that extend into our plat, the BFE appears to be accurate and follow the existing topography. All lots along the west edge of the plat will be filled (where needed) to at least 1 foot above the BFE.
3. The existing ditch at the south west corner of the development has a elevation of 1372.3 (per our site topography). This elevation will be matched at the corner of the plat (Lots 5, 6 Block C). This elevation will act as a natural levee and not allow floodwaters to enter the development.
4. Per agreement with Cheryl’s Hollow Addition, this development can release up to 50 cfs of runoff at the southeast corner of the plat. Based on our revised PondPack calculations for the overall (Blackstone and Cheryl’s Hollow) the pond will release less than the 90 cfs capacity of the CMPA. However, these calculations are for our use only and *DO NOT* reflect the design or plan for Cheryl’s Hollow Addition.
5. An existing conditions workmap is provided in the re-submittal as well as a soil survey map.
6. Supporting PondPack documentation is provided in the re-submittal.
7. Basin 7 has been revised. Basin 14 and Basin 9 have been revised.
8. There is approximately 5.1 acres draining into Storm Water System 4 undetained. Per Pondpack calculations this has a 100-yr discharge of approximately 35 cfs. Per StormCad calculations, the discharge is approximately 40 cfs. Both of these calculations are including the pond discharge of 11 cfs. Yes, detention modeling is used in PondPack and rational method is used in StormCad. However, the higher runoff will be utilized in order to be more conservative.
9. Flowline of the proposed culvert crossing are included on the Revised Grading Plan.
10. Offsite drainage agreements will be obtained.
11. Based on proposed grading, the site appears to have adequate ponding areas before offsite overflow is possible. Emergency overland grading is utilized in the subdivision to keep floodwaters directed toward the detention pond. However, areas along the east side of the plat may have emergency overflow to the north or east. These areas do have a 1 foot of ponding available before offsite overflow.

12. There will be no storm sewer stub into the backyards of Lots 36 & 37, Block B. Basin 16 will drain undetained offsite to the north. The minimum pad will still be utilized as a 1366.1 due to the proximity of the FEMA floodplain elevations.
13. The grading plan has been revised to allow for emergency overflows of storm sewers.
14. Flow arrow has been revised.
15. Spot elevations on requested lots have been revised
16. A DWR permit will be obtained for the fill in the floodplain.