

DRAINAGE PLAN
GRAY'S 6TH
ADDITION
TO
WICHITA, SEDGWICK COUNTY, KANSAS

PREPARED BY



08 MARCH 2007



DRAINAGE PLAN GRAY'S 6TH ADDITION

FINAL REPORT

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PROJECT NARRATIVE

EXISTING CONDITIONS

The site is located at the southwest corner of Hoover Road and MacArthur Road. The site consists of 4.2 acres open space and is generally flat. The site is generally flat and drains to the intersection of Hoover and MacArthur Roads.

Gas pipelines run adjacent to Hoover Road as well as overhead electric.

PROPOSED CONDITIONS

The site is proposed to be developed into duplexes and/or apartments. The site will include streets as well as utilities and drainage structures. The existing ditch along Erosion control will be provided during construction to alleviate sedimentation runoff to the existing ditches. Also, a concrete channel/flume will be constructed to allow flow to the existing ditch sections. These sections will diminish erosion along the back lot lines.

OFFSITE CONDITIONS

The site is generally flat and drains to the northeast. There does not appear to be any water from offsite enter the property. The surrounding subdivision appears to drain to the front of their respective lots and not onto the proposed property.

The site drains via ROW ditches in Hoover and MacArthur Roads to an existing 24" CMP at their respective intersections. This pipe then conveys the water to the east and into the Wichita Drainage Ditch.

EXISTING CONDITIONS RUNOFF CALCULATIONS

DRAINAGE METHODS & STANDARDS

The following methods and standards, although not a complete list, were used in calculating the existing conditions runoff values.

- Ø STORM SERIES
 - Rational Method utilized for runoff
 - 24-hour; 2-yr, 5-yr, 10-yr, 25-yr, 50-yr, 100-yr Storm Events

- Ø OFFSITE FLOW
 - Areas per existing topography and site visits
 - Time of Concentration using City of Wichita minimum 15 min

SITE CHARACTERISTICS

The proposed site is currently open space. A rational 'C' factor of 0.68 was used for these conditions. The site runoff flows to the northeast and into the adjacent ROW ditches. A time of concentration of 15 minutes was used.

EXISTING CONDITIONS HYDROLOGIC ANALYSIS

It appears that no offsite runoff encroaches the property. The site drains via sheet flow to the adjacent ditches and then to the 24" CMP.

DOWNSTREAM DRAINAGE CAPACITY

There is an existing 24" CMP which conveys runoff to the east and into the Wichita Drainage Ditch. This pipe will convey approximately 21 cfs without overtopping the intersection. The pipe appears to handle the 10-yr event, not including storage in the adjacent ditches.

POST-DEVELOPMENT HYDROLOGIC ANALYSIS

DRAINAGE METHODS & STANDARDS

The following methods and standards, although not a complete list, were used in developing the drainage and grading plans.

- Ø STORM SERIES
 - Rational Method utilized
 - 24-hour; 2-yr, 5-yr, 10-yr, 25-yr, 50-yr, 100-yr Storm Events Modeled

- Ø STORM WATER SEWER PIPES / Channels / Swales
 - Calculated in HydraFlow Hydrographs
 - Developed 'C' = 0.83 (Multi-Family)
 - Minimum Tc = 15 min

DETENTION FACILITIES

There is no detention provided on this site. The site will drain to the ROW ditches and then into the Wichita Drainage Ditch.

We recommend installing a concrete block drainage system developed by Modular Drainage. The block will be installed at a minimum grade of 0.3% from the southwest corner of the property to the ditches along Hoover Road and MacArthur Road. The usual 1.0% minimum rear lot grade for grass surfaces cannot be accomplished here due to a very flat site and pipelines running adjacent to Hoover Road. No 'cut' will be allowed over the pipelines, therefore they have to left as existing grade.

POTENTIAL UPSTREAM/DOWNSTREAM IMPACTS

No potential upstream impacts are expected with this development. The site will convey runoff via concrete lined channels and into the adjacent roadside ditches.

FLOODPLAIN SUBMITTAL

SOURCE OF FLOODPLAIN INFORMATION

No FEMA SFHA exists on this property as of March 5, 2007.

FEDERAL, STATE, & LOCAL PERMITTING

US ARMY CORPS OF ENGINEERS

There does not appear to be any US Army Corps of Engineers jurisdiction on this property.

KANSAS DEPT OF AGRICULTURE – DWR PERMITTING

There is not 240+ acres draining onto this site, therefore no DWR permit is expected.

FEMA

No FEMA SFHA exists on this property.

KANSAS DEPT OF TRANSPORTATION

There does not appear to be any KDOT permitting needed on the proposed project.

SEDGWICK COUNTY ROW

There will be discharge into the roadside ditches of Hoover and MacArthur Roads and may require county permits.

DRAINAGE PLAN

Scale 1:100

SUPPORTING CALCULATIONS

APPENDIX A: USGS Soils Survey

APPENDIX B: HydraFlow Express
- 24" CMP

USGS Soils Survey

HydraFlow

24" CMP