Section 5.17 - Drainage

Developers and builders must refer to the most current Flood Insurance Rate Maps (FIRM) and Flood Boundary-Floodway Maps prepared by the Federal Emergency Management Agency (FEMA) for the City of Keller to determine whether their property is within the boundaries of a designated Flood Hazard Area. Keller's Floodplain Administrator is the Director of Public Works. Plats are reviewed by the Director of Public Works or designee to determine that the potential for flooding in the area will not increase due to the proposed development, and that the proposed development is sufficiently protected from a 100-year frequency storm runoff from a fully developed upstream watershed. If the development area is within a Flood Hazard Area, construction cannot begin until the developer or builder has received an approved Floodplain Development Permit from the Director of Public Works (see Article Nine for permit form).

A. General Requirements

1. Drainage Facilities

Drainage facilities shall be designed and constructed according to Design Standards and Technical Construction Standards of this UDC so that adequate facilities are provided to serve the development and the entire fully developed watershed. The developer is responsible for construction of all drainage facilities as identified in the drainage study and, in the event that underground water is encountered, a subsurface drainage system shall be installed with discharge of said system being carried to the nearest storm drain system or natural water shed system. The developer shall provide all necessary easements and rights-of-way for drainage facilities.

2. Natural Drainage Pathway

The developer shall insure that the Post-Development runoff follows the Pre-Development drainage pathway and that the natural water-course is of adequate size to convey peak runoff.

3. No Adverse Effects on Other Properties

The developer shall be responsible for the necessary facilities to provide drainage controls such that properties within the drainage area, whether upstream or downstream of the development, are not adversely affected by runoff from the development.

4. Developer and Engineer Responsible For Design

The requirements set forth in Design Standards and Technical Construction Standards of this UDC are considered minimum requirements. The developer and his engineer shall bear the total responsibility for the adequacy of the design. The review of the drainage design plans by the Director of Public Works or designee in no way relieves the developer of this responsibility.

B. Design of Facilities

1. Standards

Design and construction of storm sewer systems shall be in accordance with Design Standards and Technical Construction Standards of this UDC. Natural drainage courses, curbs, inlets, manholes, etc., shall be designed and constructed in accordance with these standards.

2. Drainage Study

A drainage study shall be provided for each development in accordance with Design Standards and Technical Construction Standards of this UDC. The study shall be provided to insure that all upstream and downstream watershed components are accounted for and will not be adversely impacted. Adverse impact is considered a tenth of a foot (0.1')

maximum increase for one (1), ten (10), and one hundred (100) year water surface elevation (WSEL) and four thousandths of a foot (0.004') if the building is impacted. The study shall include a pre-development versus post development runoff analysis and a storm water runoff routing analysis designed to predict the post development runoff rate and the downstream drainage system ability to accommodate post development runoff.

C. Dedication of Drainage Easements

1. General Requirements

When a subdivision or addition is traversed by a watercourse, drainage way, channel and/or stream, a drainage easement shall be required. The easement shall substantially conform to the natural alignment of the watercourse, and should be of such width and construction as will be adequate for the purpose (i.e., the easement shall be adequate for an open channel of natural appearance with landscaped banks and sufficient width for maximum potential volume of flow, unless otherwise approved by the City). Any increased velocity, depth, or flow rate shall be mitigated to predevelopment rates. An improved open drainage system or closed drainage system may be allowed if approved by the Director of Public Works as part of a master drainage study.

2. Access Easements

For any drainage easement to be maintained by the City, the property owner must provide sufficient access on each side of and parallel to all floodways and open drainage ways for drainage maintenance purposes. The access shall be above the base flood elevation and have a slope of 6:1 or less and be accessible by vehicles and equipment. Minimum access width and location shall be determined by the Director of Public Works or designee.

3. Drainage Easements

Where topography or other conditions are such as to make impractical the inclusion of drainage facilities within street rights-of-way, perpetual, unobstructed easements at least fifteen feet (15') in width, depending on slopes, for drainage facilities shall be provided across property outside the street rights-of-way and with satisfactory access to the street. Easements shall be indicated on the plat. Drainage easements shall extend from the street to a natural watercourse or to other drainage facilities. When a proposed drainage system will carry water across private land outside the proposed subdivision, an agreement from the property owner shall be secured by the developer.

4. Maintenance of Drainage Easements

Drainage easements will be the property owner's responsibility to keep unobstructed and maintained, including erosion control. Property owners shall keep these drainage ways on their property mowed, clean, and free of debris, silt, or other substances which would result in unsanitary conditions. The City of Keller shall not be responsible for the maintenance or erosion control of the area within the drainage easement.

D. Floodplain Dedication Requirement

1. All areas within any subdivision located in a floodplain as referenced by the current panel number(s) on the FEMA Flood Insurance Rate Maps (FIRM) in place at the time of subdivision submittal or the City's Master Drainage Plan in effect at the time of submittal, shall be wholly contained in a public drainage easement.

2. The floodplain and floodway shall remain in their natural state except for areas designated for recreational purposes and permitted improvements by the City due to the pending development of properties adjacent to or upstream of the required improvements and.

3. Floodplains and floodways will be the property owner's responsibility to keep unobstructed and maintained, including erosion control. Property owners shall keep floodplains and floodways on their property mowed, clean, and free of debris, silt, or other substances which would result in unsanitary conditions. The City of Keller shall not be responsible for the maintenance or erosion control of the floodplains and floodway area.

4. Drainage easements that encompass floodplain areas shall be in accordance with the City's Drainage Master Plan for drainage facilities.

E. Grading

1. Site, street, lot or development grading shall conform to Design Standards and Technical Construction Standards of this UDC.

2. A permit for grading is required and issued by the Director of Public Works or designee (see Article Nine for Grading Permit application).

F. Plans, Specifications, and Design Calculations

1. The developer shall provide engineered plans, specifications, and design calculations for all drainage facilities.

2. All open drainage courses shall be designed in a natural landscaped manner to prevent erosion.

3. The types of methods used for erosion prevention shall be shown on the construction plans and Released for Construction by the Director of Public Works or City Engineer.

4. Any site graded and not actively worked on for seven (7) consecutive days or less than 50% of the time over a thirty (30) day period must have erosion and sediment control best management practices installed in the interim time between grading and construction activities.