



MEMO: Residential Subdivision & Lot Development Grading Plan Guidance

I. Purpose

The subdivision regulations for the City of Garden City require the submittal of a Drainage Plan to the City for review and approval as part of final construction plans required for Final Plat approval (Sec.70-2:7.130, Sec.70-2:8.030.C, & 70-2:9.120).

The referenced subdivision regulations include the requirement that “*Drainage patterns shall be shown for each lot and block*” (Sec.70-2:7.130 A.3)

City Municipal Code Sec. 18-10 also states:

Developers and/or contractors and utility companies and/or their agents shall submit sufficient and detailed documentation such as the city engineer and building official may require prior to the issuance of a building permit, to insure the orderly construction on lands in approved subdivisions, plats, tracts, or parcels within the city. Additional documentation and requirements include:

(a) *Minimum grade elevation. A minimum mean grade elevation of 18 inches above curb height is hereby established as a standard elevation in the city. Note: Grade elevation shall mean soil grade above the curb.*

In any given block along any given street, a new residence shall not be constructed on a lot adjoining an established residence or a residence which is under construction at a grade height greater than four inches above or below said adjoining structure without review and approval by the building official and/or the city engineer.

Each plot plan, when submitted for a building permit shall reflect:

- (1) The mean elevation of the structure above the curb; and*
- (2) The elevation of the structure in relation to structures on either side when applicable, along with the location of the structure of the lot and distances from each property line. The method of drainage for the structure and lot shall be shown.*

(b) *Drainage plan required. The developer and/or contractor shall submit to the building official documentation setting forth the surface water drainage on the plot when applying for a building permit. This drainage plan shall be in substantial conformance with that filed on the final plat of record. It shall be understood that the surface water drainage plan shall be uniform for a minimum of a platted block, and that any deviation from the requirements of this section shall be approved at the time of platting by the city.*

This memo is to provide guidance on the Department’s new expectations to meet the requirements both for subdivision plans, and building permits. This guidance is supplementary and does not supersede any requirements already present in City Code, Subdivision Regulations, or Zoning Regulations. This guidance is subject to change.

The guidance herein is not applicable to commercial subdivisions where individual lot development will necessitate an independent site plan review in accordance with the zoning code.

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II. Lot Drainage Typicals

The method of grading for all residential lots shall be determined as shown in the attached Exhibit 1 – Typical FHA-HUD Lot Grading. Except in special circumstances, Type A or Type B shall be used, as Type C is not compatible with the requirement for finish grade to be 18 inches above the curb. To the fullest extent possible, runoff shall be directed to the street (Type A).

III. Subdivision Grading & Drainage Plans

Subdivision drainage plans shall incorporate final lot grading for all lots. Historically only mass grading has been shown, without considering final grading on individual lots. This approach has failed to ensure the subdivision can drain properly after lots are developed. Subdivision drainage plans shall now include the following information and design considerations as it relates to individual lot grading:

1. The type of grading pattern (Type A, B, or C) for each lot shall be determined in accordance with Exhibit 1 and labeled as such on the plan.
2. The finish grade for each lot shall be shown and approximate building pad shown.
3. Contours shall be shown at such intervals as appropriate to show drainage patterns.
4. Show any walls necessary
5. Final grade elevations shall be shown at all property corners and at spot grade locations as shown in Exhibit 2 for each lot, as well as any other grade breaks.
6. Abutting off-site area drainage patterns shall be shown. Accommodation for offsite drainage directed toward the subdivision shall be shown.
7. Plans shall include Exhibit 1 or those portions of Exhibit 1 applicable to the grading plan. Exhibit 2 may also be included but is not required.
8. The plans shall indicate that “mass grading of the subdivision shall be to final grade along all property lines (lot lines) as part of the Infrastructure Improvements”.
9. Subdivision lot drainage plans shall be stamped by the proper licensed professional. This stamp shall be present on the drainage plan(s), not just the cover sheet if included in a larger infrastructure package.

An example of a grading plan is attached as Exhibit 3 (not all items above are shown in the example).

Additional design considerations in development of drainage plans to consider:

- a. To the fullest extent possible, runoff shall be directed to the street (Type A). The build-up necessary at the rear lot line for Type A may necessitate a wall or a backslope. When possible such backslope should be made beyond the lot line. When backslope is within the lot, backslope shall be a 4:1 or steeper to minimize the area draining to the rear. If abutting undeveloped ground, provisions for future tie-in to the fill grade should be considered.
- b. Drainage from each lot shall be discharged directly to the public right of way, private street, or a drainage conveyance tract, not across other lots or along other lot lines.
- c. Any drainage plans with Type B lots shall show how the rear lot drainage is conveyed. This conveyance may be via paved alley, drainage tract(s), or secondary street frontage if applicable. Conveyance shall not be via easements where fences and other appurtenances become a problem for maintenance and integrity of the drainage facility.
- d. See Standard Drawing II-19 of the 2017 General Improvements Handbook (or successor) for additional requirements for alleys. Note 1 on Std. II-19 is referring to Type A grading, while Note 2 is referring to Type B.

This section focuses on new expectations for individual lot grading detail within the drainage plan. The drainage plans and studies will still be required to show the overall subdivision drainage conveyances, accommodation of off-site drainage, runoff mitigation, water quality



impacts, storm sewer design and calculations, and other items in accordance with the Subdivision Regulations, Zoning Regulations, and City Code, not covered in this guidance.

IV. Building Permits

When a Grading Plan per Section III. above has been approved for the lot

Permittee will receive a copy of the Subdivision Grading Plan and this document. The permittee must grade the lot in accordance with the approved grading plan, or submit a revision to the approved grading plan by a licensed design professional as required by the subdivision regulations. The exact location of the building pad may vary from the plan within the allowable building envelope, so long as the drainage plan is able to be properly implemented. Permittee shall maintain design grade along all property lines.

When a Grading Plan has been approved which predates this memo and shows mass grading for the subdivision but not individual lot grading

Permittee will receive a copy of the Subdivision Grading Plan and this document. The grading plan, though not specifically labeled with Type A or B, will show mass grading as facilitating one or the other. The permittee shall submit Exhibit 2 for the lot with planned spot grades labeled appropriately on the figure for the appropriate ‘type’. These grades do not need to be in USGS elevation, but may be relative to Final Grade, Finish Floor, street curb at one corner or center of lot, or other assumed elevation point, or as cut/fills from a given point. Permittee shall maintain design grade along all property lines to facilitate proper flow direction.

When a lot has no approved grading plan

Permittee will receive a copy of this document. The permittee shall indicate which grading Type (per Exhibits 1 and 2) permittee intends to construct. This will depend on the natural slope of the ground along the lot lines on each side of the property. If Type A is indicated, permittee must ensure that drainage from other properties, particularly directly rear the proposed site, is accommodated if it currently drains onto the proposed site. If Type B is proposed, permittee shall indicate where drainage routes after reaching the rear lot line.

At a minimum, the permittee shall submit Exhibit 2 for the lot with planned spot grades labeled appropriately on the appropriate “type”. These grades do not need to be in USGS elevation, but may be relative to Final Grade, Finish Floor, street curb at one corner or center of lot, or other assumed elevation point, or as cut/fills from a given point. Permittee shall maintain existing grade along all property lines. Alternatively, the permittee may instead submit their own plot plan however all information required on Exhibit 2 shall be shown.

V. Effectiveness

This guidance is in effect on the date of execution by the Director, below.

Signed,

Adam Schart, PE
Contract City Engineer

Trent Maxwell
Director
Neighborhood & Development Services

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EXHIBIT 1

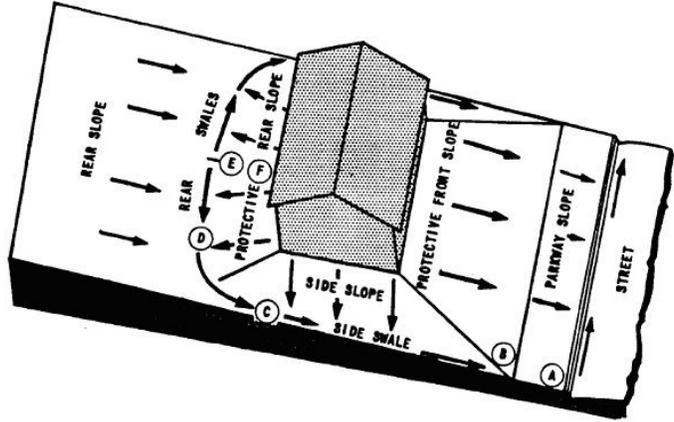
TYPICAL FHA-HUD LOT GRADING

TYPE "A" LOT GRADING

ALL DRAINAGE TO STREET

Rear yard swales behind the house carry surface water from rear yard to side yard swales (1% minimum) which carry it to street for disposal through the street gutters and the public storm drainage system.

- A Curb-top on lot line extension at highest lot corner.
- A-B Parkway slope
- B-C Side yard swale
- C-D Swale turn with 10' radius
- D-E Rear swale
- E-F Protective rear slope up from high point of swales

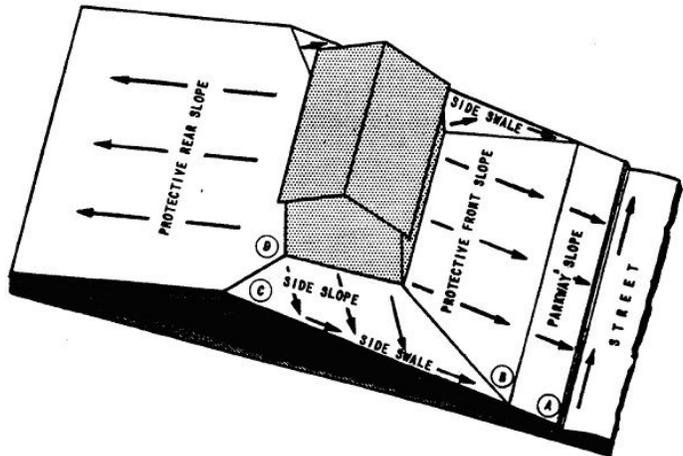


TYPE "B" LOT GRADING

DRAINAGE BOTH TO STREET & TO REAR LOT LINE

Only side swales are needed to drain both to the street and to the rear lot line. They should extend back of the line of the rear building wall; then splash blocks from rear roof downspouts should be placed to direct roof water to the side swales for drainage directly to the abutting street. Thus the amount of water carried on the rear slope to easements or other properties is kept as small as possible. This reduces erosion and disposal problems.

- A Curb-top on lot line extension at highest lot corner
- A-B Parkway slope
- B-C Side swale
- C-D Protective side slope at extension of rear wall



TYPE "C" LOT GRADING

ALL DRAINAGE TO REAR LOT LINE

Front swales are essential to carry surface water from the front yard to side-yard swales which carry it to the rear for disposal in easements or across other properties. Proper cross-section of the street gutter, curb and parkway strip are essential to stop street water from flowing onto the lot.

- A Curb-top at high side of driveway near low lot corner
- A-B Parkway slope
- B Driveway grade change from upgrade drive in street to downgrade drive on lot
- C-D Driveway downgrade point out from front of building
- D-E Front swale
- E-F Protective front slope from highpoint of swales

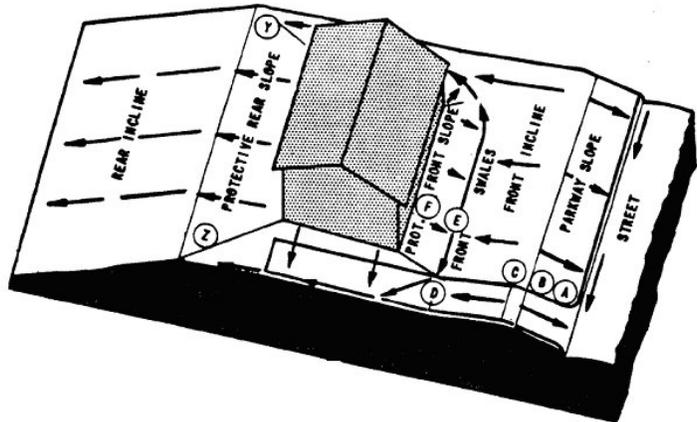
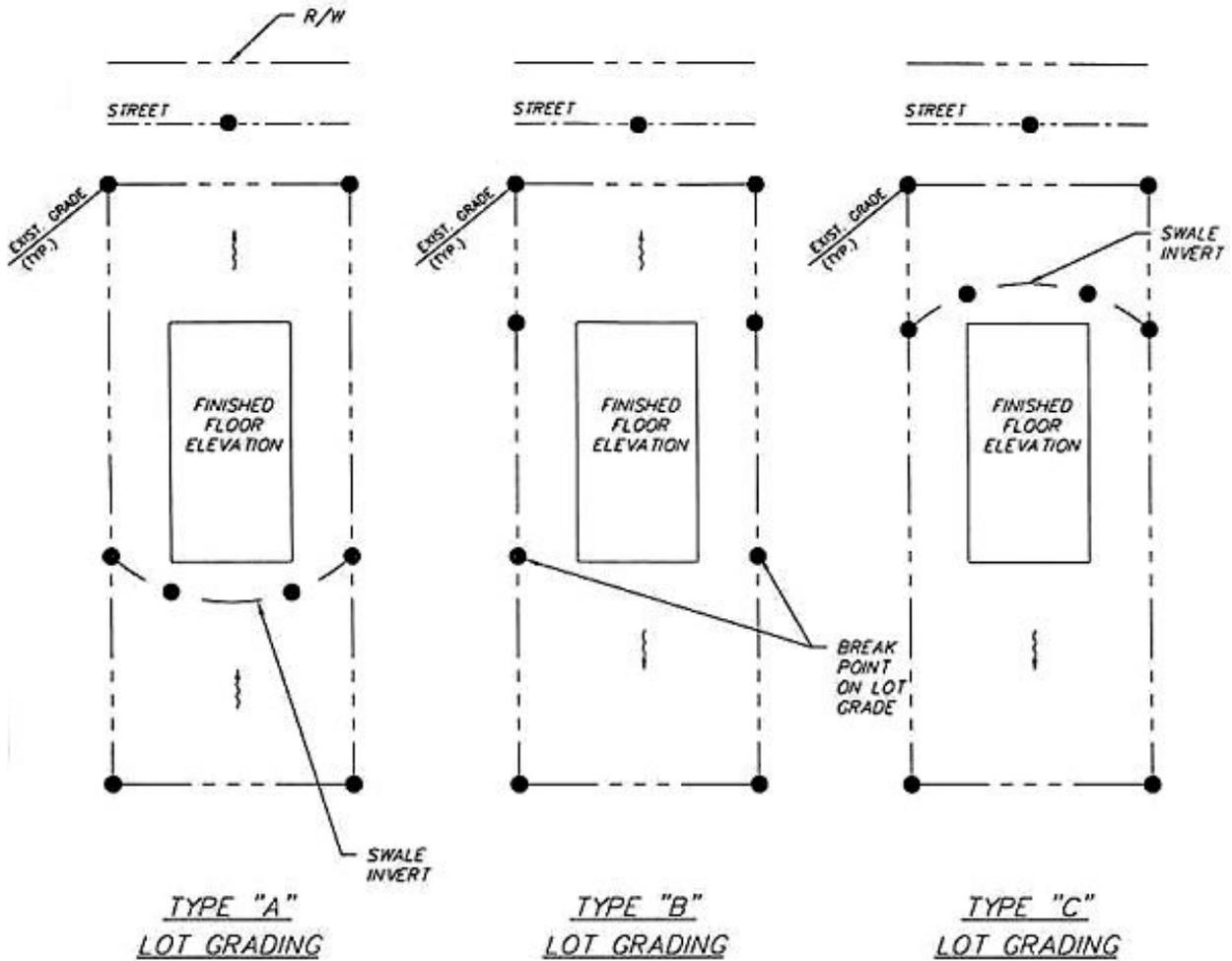


EXHIBIT 2

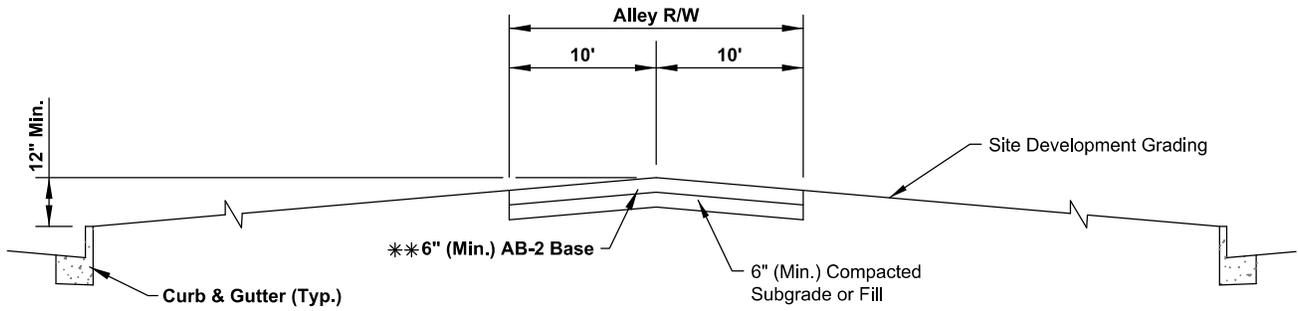
SPOT GRADE PATTERN FOR FINAL LOT GRADING APPROVAL



NOTE:

- SPOT GRADES: Four corners, grade break points along side of property, swale, crown of street, and finished grade elevation.

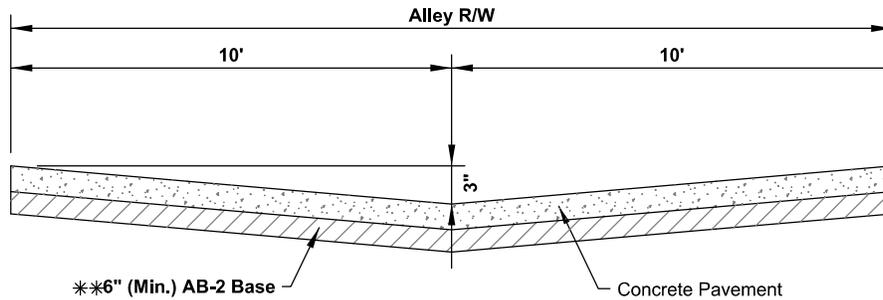
When no subdivision drainage plan exists, elevations at spot grades shall be submitted. Elevations may be actual elevations, relative elevations, or cut/fills.



Alley Grade
AB-2 Base Typical Section Mid-Block

NOTES:

1. Typical site development grading shall have the alley a minimum of 12" above the curb and be graded so the drainage flows away from the alley towards the curb & gutter.
2. The alley shall be paved with concrete pavement when the typical site development grading cannot be obtained and portions of the site development grading drains toward the alley. Site development grading shall be approved by the Public Works Department
3. The alley shall be paved with concrete pavement when used for industrial, commercial, and residential access with a minimum width of 20' unless approved otherwise by the Public Works Department.



Alley Pavement Section

1. Residential/Light Commercial Areas:
7" (Min.) Concrete Pavement
over 6" (Min.) AB-2 Base
2. Heavy Commercial/Industrial Areas:
8" (Min.) Concrete Pavement
over 6" (Min.) AB-2 Base

NOTE: Subgrade and AB-2 Base shall be compacted to 95% Standard Proctor. Testing shall be the responsibility of the Contractor.

** Refer to the most current version of the KDOT Specifications for AB-2 Base. The AB-3 Base gradation using local aggregates is acceptable.

CITY OF GARDEN CITY, KANSAS PUBLIC WORKS DEPARTMENT	
STREET DESIGN STANDARDS TYPICAL SECTIONS	
Revisions:	Date: MARCH 2018
	Dr. No.: II-19