Thoughts about Drainage November 3, 2021

- I. Goals
 - A. Explain what we're learning about Homer's drainage issues
 - B. Describe what we're still working on
 - C. Brainstorm next steps
- II. Case Studies
 - A. Local Problem Iris Court
 - 1. Subdivision development failed to address all the downstream impacts
 - 2. Drainage from City roads flows onto private property without a drainage easement
 - B. Neighborhood Problem Lillian Walli Subdivision
 - 1. Subdivision development failed to address all the downstream impacts
 - 2. Drainage from upstream flows affects private property and public infrastructure
 - C. Multi-neighborhood Problem Mt. Augustine Drive
 - 1. Subdivision development failed to address all the downstream impacts
 - 2. Highway development failed to address all the downstream impacts
- III. Factors that affect drainage issues
 - A. Regulations
 - 1. HCC 22.10.050 Improvement Requirements General. This section of the HCC regulate what must be done before the final plat can be released by the KPB. It addresses streets as well as water/sewer and other utilities, but not drainage works.
 - 2. HCC.10.051 Easements and rights-of-way. This section specifies what easements shall be established on a plat. Drainage works are not mentioned.
 - 3. Homer City Code (HCC) regarding subdivision development d
 - 4. HCC 21.50.030 Site Development standards Level Two and HCC 21.50.040 Site Development standards – Level Three. These sections specify that "[d]evelopment shall not adversely impact other properties by causing damaging alternation of surface water drainage, surface water ponding, slope failure, erosion, siltation, or root damage to neighboring trees, or other adverse effects". This requirement does not exist for Level One developments.
 - 5. HCC does not regulate ground water's contribution to drainage or erosion issues.
 - B. Patterns of practice
 - 1. There is a difference in how the City administers SWPs/DAPs for single-lot commercial developments and subdivisions.
 - 2. The City routinely allows water to be discharged onto private property without drainage easements.
 - 6. The City reviews the design of water, sewer & road improvements for private subdivision developments, but not drainage works.
- IV. Possible Mitigations
 - A. Change HCC to prohibit adverse downstream impacts for subdivision development.

- B. Change HCC to regulate ground water impacts.
- C. Review and inspect drainage works in the same manner as roads/utilities.
- D. Continue research
 - 1. Continue ground water research
 - 2. Develop dynamic model for analyzing neighborhood drainage projections.
- E. Consider Drainage Districts to address neighborhood issues.

Attachments

Item	Pages
Iris Court Case Study	4
Lillian Walli Subdivision Case Study	5-8
Mt. Augustine Drainage Case Study	9-12
HCC 22.10.500 Improvement Requirements – General	13
HCC 22.10.051 Easements and Rights-of-Way	13-14
HCC 21.50.020 – Site Development Standards – Level One	15-16
HCC 21.50.030 – Site Development Standards – Level Two	16-17
HCC 21.50.040 – Site Development Standards – Level Three	17
Excerpts from draft Muni. of Anchorage Stormwater Manual	18-19



1 inch = 50 feet

4











Figure 5. Drainage Improvements and Temporary Beehive Vault Re-direct, Mt. Augustine Neighborhood





H laner-

22.10.050 Improvement requirements - General.

a. The Kenai Peninsula Borough shall not release any final plat for a subdivision in the City for filing at the State Recorder's office until the subdivider or developer of the subdivision either enters a subdivision agreement for, or constructs and obtains written City approval of, the following improvements, according to the standards and procedures required under HCC Title 11:

1. Streets in all rights-of-way dedicated by the plat;

2. All other utilities and public improvements to be constructed in the rights-of-way and easements dedicated by the plat, including water, sewer, electric, communications, and gas lines, as applicable; and

3. Abandonment or relocation of existing water or sewer service lines required due to conflict with new or relocated property lines, as required by the Public Works Department.

b. The Commission may exempt a plat from the provisions of subsection (a) of this section as provided in HCC 22.10.040.

c. The subdivider shall be required to dedicate street rights-of-way according to the standards and specifications of Chapter 11.04 HCC and the City of Homer Design Criteria Manual. Beyond a minimum of 60 feet, the subdivider may agree to a note attached to said subdivision plat providing sufficient setback to allow future expansion of the right-of-way without removal of improvements. Horizontal alignments are subject to City review; the City may require realignment of streets on proposed plats if the alignments do not conform to Chapter 11.04 HCC and the Design Criteria Manual. Final plat approval shall thus be subject to the approval of horizontal alignments by the City Public Works Engineer.

d. All street and utility main improvements to be constructed as part of a subdivision improvement project shall be constructed according to the procedures of Chapter 11.20 HCC. The City shall accept no such improvements unless a development agreement is executed prior to construction of such improvements.

e. All streets constructed as part of a subdivision improvement project shall be monumented according to the procedures of Chapter 11.20 HCC (HCC 11.20.090(d)). [Ord. 10-57 §§ 8, 9, 2011; Ord. 87-8(S), 1987].

22.10.051 Easements and rights-of-way.

doesn't mantion dro essemante

ocant new

a. The subdivider shall dedicate in each lot of a new subdivision a 15-foot-wide utility easement immediately adjacent to the entire length of the boundary between the lot and each existing or proposed street right-of-way.

b. The subdivider shall dedicate in each lot of a new subdivision any water and/or sewer easements that are needed for future water and sewer mains shown on the official Water/Sewer Master Plan approved by the Council.

c. The subdivider shall dedicate easements or rights-of-way for sidewalks, bicycle paths or other nonmotorized transportation facilities in areas identified as public access corridors in the Homer Non-Motorized Transportation and Trail Plan, other plans adopted by the City Council, or as required by the Kenai Peninsula Borough Code.

d. The City Council may accept the dedication of easements or rights-of-way for non-motorized transportation facilities that are not required by subsection (c) of this section, if the City Council determines that accepting the dedication would be consistent with the adopted plans of the City. [Ord. 10-57 § 10, 2011; Ord. 90-5, 1990].

Handa

21.50.010 Site development standards - General.

a. All development in all zoning districts must comply with minimal site development standards. There are various levels of standards set forth in this chapter.

b. The level of site development standards required is specified in the applicable zoning district regulations. [Ord. 13-27 § 12, 2013; Ord. 08-29, 2008].

This section establishes level one site development standards. a. Slopes. All development on a site affected by a slope of 15 percent or more, bluff 3 due to us of the standards addition to the requirements of this section. (4) steep

b. Drainage. All development activity on lands shall conform to the following:

1. Development shall provide a drainage system that is designed to deposit all runoff into either an engineered drainage system or into a natural drainage.

2. Where open-ditch construction is used to handle drainage within the development, a minimum of 15 feet shall be provided between any structures and the top of the bank of the defined channel of the drainage ditch.

3. When a closed system is used to handle drainage within the development, all structures shall be a minimum of 10 feet from the closed system.

c. Landscaping Requirements. All development activity on lands shall conform to the following:

1. Development activities shall not adversely impact other properties by causing damaging alteration of surface water drainage, surface water ponding, slope failure, erosion, siltation, intentional or inadvertent fill or root damage to neighboring trees, or other damaging physical impacts. The property owner and developer shall take such steps, including installation of culverts or buffers, or other methods, as necessary to comply with this requirement.

2. Upon completion of earthwork, all exposed slopes and all cleared, filled, and disturbed soils shall be protected against subsequent erosion by methods such as, but not limited to, landscaping, maintenance of native vegetative cover, or plantings to minimize invasive species.

3. All exposed, cleared, filled and disturbed soils shall be revegetated within nine months following the initiation of earthwork, or reseeded by the next August 31st. Native revegetation is acceptable if the site naturally revegetates within that nine-month period. If native revegetation is not successful within that nine-month period, the property owner and developer shall revegetate by other means no later than the end of that nine-month period.

4. Drainage can be stabilized by other means than vegetation, if approved in writing by the City Engineer.

d. A stormwater plan approved under Chapter 21.75 HCC is required for development that:

1. Creates more than 25,000 square feet of new impervious surface area on a lot;

2. Increases the total impervious surface area of a lot beyond one acre;

3. Includes grading, excavation or filling that cumulatively moves 1,000 cubic yards or more of material; or

4. Includes grading, excavation or filling that creates a permanent slope of 3:1 or more, and that has a total height, measured vertically from toe of slope to top of slope, exceeding 10 feet. [Ord. 15-08(S)(A) § 1, 2015; Ord. 13-27 § 13, 2013; Ord. 10-56 § 3, 2011; Ord. 10-54 § 1, 2011; Ord. 08-29, 2008].

21.50.030 Site development standards – Level two.

This section establishes level two site development standards.

a. Site Development.

1. Development shall not adversely impact other properties by causing damaging alteration of surface water drainage, surface water ponding, slope failure, erosion, siltation, or root damage to neighboring trees, or other adverse effects.

2. Upon completion of earthwork, all exposed slopes and all cleared, filled, and disturbed soils shall be protected against subsequent erosion by methods such as, but not limited to, landscaping, planting, and maintenance of vegetative cover.

3. All exposed, cleared, filled and disturbed soils shall be revegetated within nine months following the initiation of earthwork.

b. Slopes. All development on a site affected by a slope of 15 percent or more, bluff, coastal bluff or ravine, as described in HCC 21.44.020, shall be subject to the requirements of Chapter 21.44 HCC in

16

maintained thereafter, with all shrubs, trees, and ground cover being replaced as needed. [Ord. 15-08(S)(A) § 2, 2015; Ord. 13-27 § 14, 2013; Ord. 10-56 § 4, 2011; Ord. 08-29, 2008].

21.50.040 Site development standards - Level three.

This section establishes level three site development standards.

a. Site Development.

1. Development shall not adversely impact other properties by causing damaging alteration of surface water drainage, surface water ponding, slope failure, erosion, siltation, or root damage to neighboring trees, or other adverse effects.

2. Upon completion of earthwork, all exposed slopes and all cleared, filled, and disturbed soils shall be protected against subsequent erosion by methods such as, but not limited to, landscaping, planting, and maintenance of vegetative cover.

b. Landscaping Requirements. Landscaping shall include the retention of native vegetation to the maximum extent possible and shall include, but is not limited to, the following:

1. A buffer of three feet minimum width along all lot lines where setbacks permit; except where a single use is contiguous across common lot lines, such as, but not limited to, shared driveways and parking areas. Whenever such contiguous uses cease the required buffers shall be installed.

2. In addition to the types of plantings listed in the definition of "landscaping" in HCC 21.03.040, landscaping may include planter boxes and hanging basket plantings. Amenities for public use such as bike racks, benches, trash receptacles and information kiosks may be substituted for an equal area of required landscaping. [Ord. 13-27 § 15, 2013; Ord. 13-11(A) § 10, 2013].

1.4.3 Local and State Codes Related to Stormwater

- <u>AMC Title 21 Land Use Planning</u>. This title has several chapters that deal with the requirement for storm drainage construction for private development.
- <u>AMC Title 23 Building Codes</u>. This title has several chapters that deal with various building regulations.
- <u>AMC Title 24 Streets and ROW</u>. This title has several chapters that deal with construction within street Right-of-Way (ROW) and public places.
- <u>State of Alaska 18 AAC 70 Water Quality Standards</u>. This chapter provides standards for water quality.
- <u>State of Alaska 18 AAC 72 Wastewater Disposal</u>. This chapter requires plan reviews for all nondomestic waste treatment and discharge systems.

1.5 Municipal Stormwater Policies

The purpose of MOA stormwater policies is to ensure that stormwater management is provided with land development activities. Responsible stormwater management is the treatment, retention, detention, infiltration, and conveyance of stormwater and other surface waters without adversely impacting adjoining, nearby, or downstream properties and/or receiving waters. The following objectives and policies shall be followed during site development.

- A. The system shall follow drainageways and drainage basins as established in current MOA Watershed Management Services (WMS) mapping and area drainage studies, or, where no mapping or drainage study information exists, along existing drainageways and natural drainage swales and divides. Stream and drainage features used in drainage analyses shall be approved by WMS.
- B. If drainage is directed offsite or out of the ROW, it must be directed into an established natural water course or an existing storm drainage facility. In cases where municipal drainage systems are not available or if the designer elects to keep project runoff onsite, the project must keep and manage onsite runoff generated from the required conveyance design storms.
- C. If drainage is managed on-site, it must be demonstrated that on-site systems are adequate for site conditions both now and throughout the system's life expectancy with no adverse impacts to the site or to adjacent properties.
- D. There shall be no adverse impacts on existing drainage or on a downstream property or watercourse, except as provided for below. All adverse impacts shall be addressed through addition of infiltration, retention, and/or detention controls within the project or through correction of downstream conveyance limitations or problems sufficient to achieve compliance with the Stormwater Management Requirements presented in this manual.
- E. Flow that originates within or passes through a municipal right-of-way or easement may not be directed onto private property unless an easement is granted by the property owner. Any water that flows along a water course or drainageway that is to be maintained by the MOA must be located in an easement. Easements may also be required in situations where other organizations,

18

such as homeowners associations, are responsible for maintenance.

- F. Where flow from a proposed system that may incur adverse impacts is directed across property lines, a notarized letter of non-objection shall be obtained from the owner of any downstream property that could be affected. Concentrated drainage flows shall not be discharged onto downstream properties unless the owner of the affected land has granted an easement or letter of non-objection (see above bullet for discussion of easements) expressly authorizing such discharge. Exceptions may be granted by the MOA upon request if the discharge is into an established natural drainage way or other watercourse (such as a creek) and the designer demonstrates that the facility is capable of handling the additional runoff without causing flooding, icing, erosion, or siltation on adjacent properties or otherwise adversely impacting the watercourse on adjacent properties.
- G. Natural and constructed drainageways shall be incorporated into development designs as drainage collectors, collecting runoff from adjacent properties. Drainage structures shall be constructed and appropriate easements established for both constructed and natural drainageways so that they are accessible to maintenance personnel and can be maintained at a reasonable cost, as determined by the Street Maintenance Department. Easements shall be in place or acquired by the proposed project.
- H. Drainage and cut bank impacts on existing on-site septic systems affected by the project shall be mitigated in land development, re-development, road, and drainage projects.
- 1. Improvements shall be designed and constructed in a manner that minimizes the potential for icings in streams, or constructed or natural drainageways.
- J. Drainage patterns shall not be altered in a manner that impedes runoff from adjoining property or otherwise causes an accumulation of water or reduction in flow capacity that may impact drainage from or into adjacent properties.
- K. For new construction, roof drainage concentrated by downspouts or similar devices shall not be directed toward urban streets (without ditches) or toward other impervious surfaces intended for public walking or driving.
- L. Driveways and buffer areas of commercial projects or residential projects of triplex size or greater shall be designed so that no surface drainage originating off of the right-of-way is permitted to drain onto the traveled way of a municipal public road. This applies to all municipal rights-of-way and to private roads that may potentially become owned or maintained by the municipality in the future. This does not apply to private, onsite grading and drainage routing.
- M. These design criteria and other references herein present the Stormwater Management Requirements for projects under the jurisdiction of the MOA. At the sole discretion of the Municipal Engineer, the MOA may impose greater standards and criteria when deemed appropriate to protect the safety and welfare of the public.

1.6 Drainage Design Variances

This manual presents the minimum requirements for stormwater management. Whether expressly stated or not, throughout the criteria, any deviation from these standards in which the minumum requirements are not met shall require a written variance from the Municipal Engineer. Variance is not required for

19