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EXHIBIT A TO ORDINANCE NO. 141-13

1050.083 PRIVATE WATERWAYS

(a) Any waterway on private property that does not convey public water as deemed by the City Engineer or is not named on the City of Avon Master River and Ditch Location Map must be maintained by the property owner and is considered a private waterway (ditch or swale). If the waterway lies between multiple properties, the expense to maintain the waterway shall be shared by all property owners which flow into said waterway.

(b) If the maintenance of the waterway is deemed to become a nuisance and has not been properly maintained by the property owners then the City may enter the property to perform maintenance on the waterway and assess the property owners the cost of the maintenance.

(c) Any private waterway may be relocated by a property owner as long as the relocated waterway continues to maintain the existing drainage and the relocation is approved by the City Engineer.

1050.111 STORMWATER CONVEYANCE DESIGN CRITERIA

(a) All storm water management practices shall be designed to convey storm water to allow for the maximum removal of pollutants and reduction in flow velocities. This shall include but not be limited to:

(1) Stream / Storm Sewer Discharge. The storm water facility (storm sewer main or natural watercourse) that will convey the discharge from the site shall be analyzed to determine if it is capable of conveying the additional storm sewer discharge from the site of a 100 year/24 hour storm. If the designated outlet is not capable of conveying the discharge from the site during the 100 year/24 hour storm, then additional storage must be placed onsite to store the additional volume for a period of 36 hours.

(2) Stream relocation or enclosure. The City Engineer may allow the enclosure or relocation of a Stream of the State only if the applicant shows proof of compliance with all appropriate permits from the Ohio EPA, the U.S. Army Corps, and other applicable federal, state, and local agencies as required in Section 1050.07 of this chapter, and the activity is in compliance with this ordinance and Section 1050.08, all as determined by the City Engineer. At a minimum, stream relocation designs must show how the project will minimize changes to the vertical stability, floodplain form, channel form, and habitat of upstream and downstream channels on and off the property. Relocation of a major ditch needs to comply with Section 1050.08 with the approval of the City Engineer. Roadside ditch

enclosure must be in compliance with Section 1050.08. Relocation of minor ditches must show that all affected drainage flowing into that ditch has been accommodated as approved by the City Engineer and complies with Section 1050.083.

1050.117 DEVELOPMENT WITHIN A FLOODPLAIN OR FLOODWAY

The following subsection deals with any development that may occur in the floodway or 100-year flood plain.

~~(a) Subdivisions:~~

(a) Permitting Sequence

(1) For Subdivisions or Commercial Developments that must have Planning Approval

(A) Flood Plain Development Permit – must be submitted and Approved prior to Final Plat Approval by Planning

(B) CLOMR – if the B.F.E is indicated that it will be raised during the Flood Plain Development Permit, then a CLOMR must be submitted and approved by FEMA prior to Flood Plain Development Permit approval by the City.

(C) LOMR – If any areas are being brought out of the flood plain as indicated in the Flood Plain Development Permit or by a CLOMR, then a LOMR (or LOMR-F if the area will have fill placed within the floodplain or floodway) must be submitted and accepted by FEMA prior to receiving any Building Permits (this includes building permits for structures, not for subdivision site work)

(D) Certificate of Compliance – Prior to Final Acceptance of a subdivision by Council, A Certificate of Compliance must be issued by the City for the subdivision. This shall include reviewing the As-builts of the subdivision for any roads, BMPs, and final grading within the subdivision.

(2) For Structures

(A) Flood Plain Development Permit – must be submitted and Approved prior to topography map approval. This may be omitted if a Flood Plain Development Permit was issued for a house within a subdivision that had previously received a Flood Plain Development Permit.

(B) CLOMR – if the B.F.E is indicated that it will be raised during the Flood Plain Development Permit, then a CLOMR must be submitted and approved by FEMA prior to Flood Plain Development Permit approval by the City. This may be omitted if a CLOMR was issued for a house within a subdivision that had previously received a CLOMR.

(C) LOMR – If any areas are being brought out of the flood plain as indicated in the Flood Plain Development Permit or by a CLOMR,

then a LOMR (or LOMR-F if the area will have fill placed within the floodplain or floodway) must be submitted and accepted by FEMA prior to receiving any Building Permits (this includes building permits for structures, not for subdivision site work). This may be omitted if a LOMR (or LOMR-F) was issued for a house within a subdivision that had previously received a LOMR (or LOMR-F).

(D) Flood Plain Landscaping Permit – once the Final Grade has been accepted by the City, but before landscaping has been performed, a Flood Plain Landscaping Permit must be submitted to the City. Once the landscaping has been performed, another Final Grade check will be performed by the City. This is to check to ensure that the grading around a structure has not exceeded the limits of the Flood Plain Development Permit.

(E) Certificate of Compliance – Prior to Final Occupancy, A Certificate of Compliance must be issued by the City for the structure. This shall occur once the Flood Plain Landscaping Permit has been issued by the City.

(b) Subdivisions:

(1) All subdivision proposals shall be consistent with the need to minimize flood damage and are subject to all applicable standards in these regulations

(2) All subdivision proposals shall have public utilities and facilities such as sewer, gas, electrical, and water systems located and constructed to minimize flood damage;

(3) All subdivision proposals shall have adequate drainage provided to reduce exposure to flood damage; and

(4) In all areas of special flood hazard (Floodway or 100-year flood plain) where base flood elevation data are not available, the applicant shall provide a hydrologic and hydraulic engineering analysis that generates base flood elevations for all subdivision proposals and other proposed developments containing at least 50 lots or five acres, whichever is less. If a development is less than 50 lots or five acres, this hydrologic and hydraulic analysis may be required at the discretion of the City Engineer.

(5) All new and replacement water supply systems shall be designed to minimize or eliminate infiltration of flood waters into the systems;

(6) New and replacement sanitary sewerage systems shall be designed to minimize or eliminate infiltration of flood waters into the systems and discharge from the systems into flood waters; and

(7) On-site waste disposal systems shall be located to avoid impairment to or contamination from them during flooding.

(8) The applicant shall meet the requirement to submit technical data to FEMA in Section 1464.20(a)(1)D. when a hydrologic and hydraulic analysis is completed that generates base flood elevations as required by section 1050.117(~~a~~b)(4).

(9) (~~b~~The applicant shall meet the permitting sequence as described in section 1050.117(a)(1).

(c) Residential structures:

(1) New construction and substantial improvements shall be anchored to prevent flotation, collapse, or lateral movement of the structure resulting from hydrodynamic and hydrostatic loads, including the effects of buoyancy. Where a structure, including its foundation members, is elevated on fill to or above the base flood elevation, the requirements for anchoring and construction materials resistant to flood damage are satisfied as long as all requirements of the LOMR-F are satisfied.

(2) New construction and substantial improvements shall be constructed with methods and materials resistant to flood damage.

(3) New construction and substantial improvements shall be constructed with electrical, heating, ventilation, plumbing and air conditioning equipment and other service facilities that are designed and/or elevated so as to prevent water from entering or accumulating within the components during conditions of flooding.

(4) New construction and substantial improvement of any residential structure, including manufactured homes, shall have the lowest floor, including basement, elevated to 0.5' above the flood protection elevation (B.F.E) unless a LOMA or LOMR has been approved by both the City and FEMA.

(5) If there is no flood protection elevation data available based on the County Flood Insurance Maps, then the structure shall have the lowest floor, including basement, elevated at least one and one-half feet above the highest adjacent natural grade unless approved by both the City Engineer and the Flood Plain Administrator.

(6) New construction and substantial improvements, including manufactured homes, that do not have basements and that are elevated to the flood protection elevation using pilings, columns, posts, or solid foundation perimeter walls with openings sufficient to allow unimpeded movement of

flood waters may have an enclosure below the lowest floor provided the enclosure meets the following standards:

(A) Be used only for the parking of vehicles, building access, or storage; and

(B) Be designed and certified by a registered professional engineer or architect to automatically equalize hydrostatic flood forces on exterior walls by allowing for the entry and exit of flood waters; or

(C) Have a minimum of two openings on different walls having a total net area not less than one square inch for every square foot of enclosed area, and the bottom of all such openings being no higher than one foot above grade. The openings may be equipped with screens, louvers, or other coverings or devices provided that they permit the automatic entry and exit of flood waters.

(7) Manufactured homes shall be affixed to a permanent foundation and anchored to prevent flotation, collapse or lateral movement of the structure resulting from hydrodynamic and hydrostatic loads, including the effects of buoyancy. Methods of anchoring may include, but are not limited to, use of over-the-top or frame ties to ground anchors.

(8) Repair or rehabilitation of historic structures upon a determination that the proposed repair or rehabilitation will not preclude the structure's continued designation as a historic structure and is the minimum necessary to preserve the historic character and design of the structure, shall be exempt from the development standards of this section.

(9) In AO Zones, new construction and substantial improvement shall have adequate drainage paths around structures on slopes to guide flood waters around and away from the structure.

(10) ~~(10)~~ If a new residential structure is being built into an existing residential subdivision after this ordinance is enacted, then the final floor elevation of the new residential structure must be within 6" of the final floor elevation indicated on the final plat for the residential subdivision.

(11) ~~(e~~Applicant shall adhere to the permitting requirement set forth in section 1050.117(a)(2).

(d) Non-residential structures

(1) New construction and substantial improvement of any commercial, industrial or other nonresidential structure shall meet the requirements of

Section 1050.117(ed) unless it is superseded within the rest of subsection 1050.117(de).

(2) New construction and substantial improvement of any commercial, industrial or other nonresidential structure shall either have the lowest floor, including basement, elevated to or above the level of the flood protection elevation; or, together with attendant utility and sanitary facilities, shall meet all of the following standards:

(A) Be dry floodproofed so that the structure is watertight with walls substantially impermeable to the passage of water to the level of the flood protection elevation;

(B) Have structural components capable of resisting hydrostatic and hydrodynamic loads and effects of buoyancy; and

(C) Be certified by a registered professional engineer or architect, through the use of a Federal Emergency Management Agency Floodproofing Certificate, that the design and methods of construction are in accordance with Section 1050.117(ed)(2)(A) and 1050.117(ed)(2)(B).

(de) Accessory Structures

(1) Relief to the elevation or dry floodproofing standards may be granted for accessory structures containing no more than 600 square feet. Such structures must meet the following standards:

(A) They shall not be used for human habitation;

(B) They shall be constructed of flood-resistant materials;

(C) They shall be constructed and placed on the lot to offer the minimum resistance to the flow of flood waters;

(D) They shall be firmly anchored to prevent flotation;

(E) Service facilities such as electrical and heating equipment shall be elevated or floodproofed to or above the level of the flood protection elevation (B.F.E); and

(F) They shall meet the opening requirements of Section 1050.117(bc)(6)(C).

(G) They shall not be located within the Floodway.

(ef) Recreational Vehicles

(1) Recreational vehicles must meet at least one of the following standards:

(A) They shall not be located on sites in special flood hazard areas for more than 180 days; or

(B) They must be fully licensed and ready for highway use; or

(C) They must meet all standards of Section 1050.117(bc)

(fg) Above-ground gas or liquid storage tanks

(1) All above-ground gas or liquid storage tanks shall be anchored to prevent flotation or lateral movement resulting from hydrodynamic and hydrostatic loads if they are located on a lot that is within 1000' of a Floodway, 100-year Flood Plain, or a 500-year Flood Plain.

(gh) Assurance of flood-carrying capacity.

(1) Pursuant to the purpose and methods of reducing flood damage stated in these chapters, the following additional standards are adopted to assure that the reduction of the flood-carrying capacity of watercourses is minimized:

(2) Development in Floodways.

(A) In floodway areas, development shall cause no increase in flood levels during the occurrence of the base flood discharge (i.e. There is no increase in the flood levels during a 100-year storm). Prior to issuance of a floodplain development permit, the applicant must submit a hydrologic and hydraulic analysis, conducted by a registered professional engineer, demonstrating that the proposed development activity within the floodplain would not result in any increase in the base flood elevation; or

(B) Development in floodway areas causing increases in the base flood elevation may be permitted provided all of the following are completed by the applicant:

(i) Meet the requirements to submit technical data in Section 1464.20(a);

(ii) An evaluation of alternatives, which would not result in increased base flood elevations and an explanation why these alternatives are not feasible;

(iii) Certification that no structures are located in areas that would be impacted by the increased base flood elevation;

(iv) Documentation of individual legal notices to all impacted property owners within and outside the community, explaining the impact of the proposed action on their property; and

~~(v~~(v) A CLOMR approval by FEMA prior to the acceptance of the Flood Plain Development Permit

(vi) A LOMR (or LOMR-F) approval by FEMA prior to issuance of any building permits for structures.

(vii) Certificate of Compliance issued by the City Prior to final Occupancy Permit issuance.

(viii) Concurrence of the Mayor of Avon and the Chief Executive Officer of any other communities impacted by the proposed actions.

(~~vii~~ix) Concurrence of the City Engineer of Avon

(3) Development in Riverine Areas with Base Flood Elevations but No Floodways.

(A) In riverine special flood hazard areas identified by FEMA where base flood elevation data are provided but no floodways have been designated, the cumulative effect of any proposed development, when combined with all other existing and anticipated development, shall not increase the base flood elevation more than one foot at any point. Prior to issuance of a floodplain development permit, the applicant must submit a hydrologic and hydraulic analysis, conducted by a registered professional engineer, demonstrating that this standard has been met; or

(B) Development in riverine special flood hazard areas identified by FEMA where base flood elevation data are provided but no floodways have been designated causing more than one foot increase in the base flood elevation may be permitted provided all of the following are completed by the applicant:

(i) An evaluation of alternatives which would result in an increase of one foot or less of the base flood elevation and an explanation why these alternatives are not feasible;

(ii) Compliance with Section 1050.117(gh)(2)(B) of this section.

(4) Alterations of a Watercourse.

(A) For the purpose of these chapters, a watercourse is altered when any change occurs within its banks. The extent of the banks shall be established by a field determination of the "bankfull stage." The field determination of bankfull stage shall be based on methods presented in Chapter 7 of the USDA Forest Service General Technical Report RM-245, Stream Channel Reference Sites: An Illustrated Guide to Field Technique or other applicable publication available from a Federal, State, or other authoritative source. For all proposed developments that alter a watercourse, the following standards apply:

(B) The bankfull flood-carrying capacity of the altered or relocated portion of the watercourse shall not be diminished. Prior to the issuance of a floodplain development permit, the applicant must submit a description of the extent to which any watercourse will be altered or relocated as a result of the proposed development, and certification by a registered professional engineer that the bankfull flood-carrying capacity of the watercourse will not be diminished.

(C) Adjacent communities, the U.S. Army Corps of Engineers, and the Ohio Department of Natural Resources, Division of Water, must be notified prior to any alteration or relocation of a watercourse. Evidence of such notification must be submitted to the Federal Emergency Management Agency.

(D) The applicant shall be responsible for providing the necessary maintenance for the altered or relocated portion of said watercourse so that the flood- carrying capacity will not be diminished. The Floodplain Administrator may require the permit holder to enter into an agreement with the City, specifying the maintenance responsibilities. If an agreement is required, it shall be made a condition of the floodplain development permit.

(E) The applicant shall meet the requirements to submit technical data in Section 1464.20.a.1.C. when an alteration of a watercourse results in the relocation or elimination of the special flood hazard area, including the placement of culverts.

(5) LOMAS / LOMRS

(A) In areas that used to be in floodways or floodplains, but have been modified with either a Letter of Map Amendment (LOMA) or a Letter of Map Revision (LOMR), the following must be followed for residential and non-residential structures.

(i) The lowest level of the structure, including basements, must not be below the B.F.E unless the following is followed:

a. The ground surface around the building and within 20' from the edge of the SFHA (Special Flood Hazard Area) must be 0.5' above the BFE.

b. The setback is the distance from the edge of the SFHA to the nearest wall of the basement.

c. The ground around the ~~bulding~~building must be suitable compacted fill; the fill material (or soil of similar classification and degree of permeability) must extend to at least 5' below the bottom of the basement floor slab if the soil below is not considered suitable.

d. The fill material must be compacted to at least 95% of Standard Laboratory Maximum Dry Density, according to ASTM Standard D-698. Fill soils must be fine-grained soils of low permeability, such as those classified as CH (clay of high plasticity), CL (clay of low plasticity, SC (Sand with Clayey Fines), or ML (Silt) according to ASTM Standard D-2487, *Classification of Soils for Engineering Purposes*.

e. The fill material must be homogeneous and isotropic; that is, the soil must be all of one material, and the engineering properties must be the same in all directions.

f. The elevation of the basement floor should be no more than 5' below the BFE.

g. The must be a granular drainage layer beneath the floor slab, and a ½ HP sump pump (in accordance with Section 1050.18(a) with a backup power supply must be provided to remove the seepage flow. The pump must discharge above the BFE and away from the building.

h. The drainage system must be equipped with a positive means of preventing backflow.

i. Foundation drains must discharge via gravity to a stormsewer or other method as approved by the City Engineer.

j. The basement must be designed to withstand any hydrostatic pressures.

k. All work will be supervised by a licensed professional engineer. At the end of the project, a certified letter stating that all work was done in compliance with this section.

l. A notarized letter, signed by the property owner, that acknowledges that there could be potential flooding of the basement and relieves the City of Avon from any and all responsibility should flooding occur.

m. Sump pump discharge shall be routed above the BFE before ~~downturning~~down turning for discharge to gravity drainage.

(ii) All other items indicated within section 1050.117(~~b~~c) must be adhered to.

1050.18 MISCELLANEOUS STORM WATER

(a) Sump Pumps

(1) Sump Pump Requirements

(A) Residential Homes with Basements

(i) A primary sump pump is required for all homes that have basements.

(B) Residential homes with no basement but with a crawl space

(i) A primary sump pump is required except for the following:

a) If the footer tile around the crawl space can flow by gravity to an approved storm outlet, the sump pump requirement may be waived if approved by the City

Engineer. A yard inlet with a grate to allow for the discharge of potential surcharge must be connected to the storm connection between the home and the approved storm outlet. A sump pump is still highly recommended for this situation.

(C) Residential homes with no basement or crawl space

(i) A primary sump pump is not required

a) If there is a footer tile around the slab, then a gravity line must be run to an approved storm outlet. A yard inlet with a grate to allow for the discharge of potential surcharge must be connected to the storm connection between the home and the approved storm outlet.

b) If this is not able to be installed, then a sump pump may be required by the City Engineer.

(D) An external sump pump is required, but, an internal sump pump will be accepted. If an internal sump pump is installed, all requirements in section 1050.18 must be followed.

(E) No water-driven sump pumps are allowed for either the primary sump pump or secondary sump pump.

(F) Battery Back-up Required. In addition to the required sump pump as indicated in this section, an auxiliary battery back-up pump is required. The battery back-up pump shall discharge separately from the required sump pump, directly to an area above grade. The discharge shall terminate a minimum of 5 feet beyond the foundation wall. Insect control at the point of termination shall be provided by a flap, screens, or other approved methods.

(i) Buildings equipped with an additional emergency power source may have an additional standard electric backup sump pump.

(2) Discharge: Primary Sump Pump.

(A) The primary sump pump may discharge to either the storm sewer lateral connecting into the storm sewer main line or a road side ditch.

(B) The primary sump pump may also discharge to daylight if there is no storm water conveyance method in which the storm sewer lateral can flow to by gravity

(i) If discharging to daylight, the sump pump discharge must be outside of 5' from the home but within 10' of the home and must discharge onto the lawn.

(ii) The sump pump may not discharge onto the driveway or other non-impervious surface without later discharging onto pervious area in which the flow may infiltrate into the groundwater system before entering the city storm water conveyance system.

(3) Secondary Sump Pump.

(A) Battery Back-up Required. In addition to the required sump pump as stipulated in section 1050.18(a)(1), an auxiliary battery back-up pump is required as indicated below. The battery back-up pump shall discharge separately from the required sump pump. Insect control at the point of termination shall be provided by a flap, screens, or other approved methods.

(i) Buildings equipped with an additional emergency power source may have an additional standard electric backup sump pump.

(B) The secondary sump pump can be either an external or internal sump pump and must discharge to daylight. A secondary sump pump is recommended for all homes, but required for those homes in a floodway, 100-year flood plain, or a 500-year flood plain.

(i) The secondary sump pump discharge must be outside of 5' from the home but within 10' of the home and must discharge onto the lawn.

(ii) The secondary sump pump may not discharge onto the driveway or other non-impervious surface without later discharging onto pervious area in which the flow may infiltrate into the groundwater system before entering the city storm water conveyance system.

(4) Sizing. Inaccurate sizing of the Sump Pump and the Sump Pit are a major cause for sump pump failure during flooding conditions. The sizing will be based on the area in which the footer tile drains into the sump crock,

which is typically the basement and/or crawl space area. Below in Table 9 are the recommendations for sizing:

Table 9: Sizing Criteria

Basement and crawl space (sf)	Minimum Pump Size	Minimum Pump Flow Rate	Minimum Pit Size **	Number of Pumps
< 2500 sf	½ hp	72 gpm	24" dia x 30" deep	1
>2500 sf	½ hp	72 gpm	24" dia x 30" deep*	2

* For a house with the basement / crawl space > 2500 sf, a dual sump pump system must be put into place. The two sump pump systems will be placed at opposite corners of the house unless approved by the City Engineer.

** If the 24" dia x 30" deep sump pit is not available, then two 18" x 22" sump pits may be used with an equalization pipe connecting the two.

(b) Site Discharge. No property may discharge storm water onto a neighboring property unless a storm water easement is in place or allowed by the City Engineer.

(1) An upstream property may discharge water to a downstream property owner as long as the area of discharge is natural and undisturbed. This upstream property may be maintained, but it cannot be altered to increase the flow downstream.

(2) A downstream property may create a vegetated or natural buffer which impedes the natural flow of water from an upstream property.

(3) Any BMP or water detention facility used for either a commercial or industrial property or a residential subdivision must have the effluent of the BMP or water detention facility flow into either a Stream of the State or a major ditch unless authorized by the City Engineer.

(c) Storm Sewer System Damage. No property owner / contractor shall cause damage to the existing storm sewer conveyance system through:

(1) Disposal of items that create permanent or temporary blockage of the storm sewer conveyance system

(2) Physically deform the existing system

(d) Multi-User Private Storm Sewer Maintenance. When there is a private yard drain (a.k.a. there is no water from the City right-of-way draining to it) which drains multiple properties, then maintenance and financial responsibility of that drain and the subsequent drainage pipe is the responsibility of all property owners that

drain into the outflow pipe. If there is a disagreement concerning the property owners that are responsible then the following needs to occur:

(1) The drainage line needs to be televised to see what structures are tied into the outflow pipe. The City Engineer, upon receiving this information, will decide what properties drain to the participating drainage structures. The City is not responsible for ensuring that responsible property owners participate financially.

(e) Landscaping.

(1) Any and all residents and commercial or industrial businesses must complete a permit prior to any landscaping design being performed on their property. This includes the design of any landscaping mounds or vegetation that will affect the drainage of the property. If there is a question, please contact the City Engineer. This permit shall be picked up at the Building Department at Avon City Hall. There is no fee for this permit.

(2) Any landscapers performing work within the City of Avon must be registered with the Building Department.

(3) Prior to performing work on a property within the City of Avon, it is suggested that the landscaping company pick up a copy of the approved final grade topography map (for residences) or approved site plan (for any commercial or industrial businesses).

(4) The landscaping company must conform with the drainage concept as depicted on the approved final grade topography map or approved site plan.

(5) If the landscaping company plans to not conform with the drainage concept, then a new topography map or site plan must be submitted for approval by the City Engineer.

(6) Violations of any of these provisions shall be subject to the penalties set forth in Section 1050.99, below.

(f) Landscaping within a Flood Plain

(1) Any landscaping which results in a grade change (raising or lowering of the existing ground must submit a Flood Plain Landscaping Permit. This permit shall be picked up at the Building Department at Avon City Hall.

(2) Any landscapers performing work within the City of Avon must be registered with the Building Department.

(3) Prior to performing work on a property within the City of Avon, it is required that the landscaping company pick up a copy of the approved final grade topography map (for residences) or approved site plan (for any commercial or industrial businesses).

(4) The landscaping company must conform with the drainage concept as depicted on the approved final grade topography map or approved site plan.

(5) If the landscaping company plans to not conform with the drainage concept, then a new topography map or site plan must be submitted for approval by the City Engineer.

(6) After the work is finished, a new final grade must be performed at the expense of the resident / contractor. The initial fee is paid for through the permit fee. If multiple final grade inspections occur, further fees may be assessed.

(7) Any work within a Flood Plain or Flood Way must follow the permitting process as described in Section 1050.117(a).

(8) Violations of any of these provisions shall be subject to the penalties set forth in Section 1050.99, below.