

**RULE NO.: R161-15.22**

**NOTICE OF DECISION ON APPEAL  
OF AN ADOPTED RULE**

**ADOPTION DATE: April 27, 2016**

By: Marc A. Ott, City Manager

The City Manager has reached a decision regarding the appeal of Rule R161-15.22. Notice of Adoption of Rule R161-15.22 was posted on April 27, 2016. An appeal of the adopted rule by Mr. Bob Thompson was received by the City Clerk on May 25, 2016. Notice of the Appeal was posted May 25, 2016. This Notice of Decision on Appeal of an Adopted Rule is issued under Chapter 1-2 of the City Code.

The City Manager hereby affirms the appealed rule, and provides his justification in the accompanying memorandum with attachments.

AUSTIN CITY CLERK  
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## CERTIFICATION BY CITY ATTORNEY

By signing this Notice of Decision on Appeal of an Adopted Rule, (R161-15.22), the City Attorney certifies that the City Attorney has reviewed the decision on appeal and finds that decision on appeal is a valid exercise of the City Manager's authority.

## REVIEWED AND APPROVED

*for* *Marc A. Ott*  
Marc A. Ott,  
City Manager

Date *June 24, 2016*

*A Morgan*  
Anne Morgan,  
City Attorney

Date: *6/24/16*

This NOTICE OF DECISION ON APPEAL OF AN ADOPTED RULE was posted on a central bulletin board at City Hall by the City Clerk. Time and date stamp is on the front of the Notice.



## MEMORANDUM

**TO:** Marc A. Ott, City Manager

**FROM:** Joseph G. Pantalion, P.E., Director *JGP*  
Watershed Protection Department

**DATE:** June 23, 2016

**SUBJECT:** Memo to City Manager Regarding Appeal on Eaves of the Adopted Rule R161-15.22, Drainage Charge Administration

### Action Requested

Review, approval and signature of the attached memo and accompanying *Notice of Decision on Appeal of an Adopted Rule*.

### Background

On June 25, 2015 City Council adopted a new methodology to assess drainage charges via changes to City Code 15-2. This new method went into effect Oct 1, 2015 and new bills were sent out Nov 1, 2015 (for Oct 2015 service). Also, at the time, the City adopted Emergency Rules to support the Code changes until Administrative Rules could be adopted. The Administrative Rules (Rule 161-15.22) were adopted on April 27, 2016 after a public comment and response process. Public comments included comments about eaves. The comments and City response are attached. The City maintained its position on eaves with the adopted rules. These adopted Administrative Rules then replaced the Emergency Rules. On May 25, 2016, an appeal to the newly adopted Administrative Rules was submitted regarding the definition of impervious cover for roof overhangs (eaves).

### Response to Appeal

The Watershed Protection Department (WPD) considers the total building roof area, including the horizontal projection of overhangs (i.e. eaves), as impervious cover. The appeal suggests that eaves should not be counted as impervious cover for a number of reasons listed below. This memo summarizes the Watershed Protection Department's response to the concerns in the appeal.

- 1) Inconsistency in City Regulations
  - a. Drainage charge rules should not create inconsistency with established practice
    - A consistency concern with eaves existed prior to this drainage charge revision and will not be resolved based on the drainage charge eave definition. For purposes of data collection efficiency and administrative cost effectiveness, impervious cover is measured using the City's latest aerial planimetric data which includes eaves as impervious cover. However, the residential permitting process specifically excludes incidental eaves (width < 2ft) from impervious cover estimates. WPD is striving to minimize differences in impervious definitions, but complete consistency has not been possible across all applications at this time. Additional examples include objects such as pervious pavement, partially paved roads, gravel drives or flagstones that require precise delineation for permitting, whereas the drainage charge allows impervious cover to be assessed

differently for simplicity. While rule consistency is always desired, changes for purposes of consistency should be based on scientific evidence and consideration of cost effectiveness. Hydrologic science and modeling results strongly support WPD's decision to count eaves as impervious cover for drainage charge assessment and is further explained below.

- b. Inconsistency creates confusion/frustration
  - Impervious cover computed for the drainage charge does not affect permitting, which is typically performed in advance of construction, while drainage charges are assessed after construction.
  - Using aerial planimetric data, which includes roof overhangs, to quantify impervious cover for the drainage charge is scientifically based and consistent with methods used to design and construct drainage systems which reflect much of WPD's cost of service.
- c. Other cities do not treat eaves inconsistently like Austin
  - Only two other Texas cities are known to use aerial planimetric data to assess the drainage charge. Houston considers eaves impervious for both the drainage charge and for building permitting.
  - In the same manner as Austin, San Antonio uses aerial planimetric data which depicts the total rooftop area (including overhangs/eaves) as impervious cover for the drainage charge and yet uses building footprints as impervious cover for zoning and permitting process.
- d. Scientific speculation should not be the basis for DUF policy
  - WPD's conclusion that reduced time of concentration (increased speed of runoff) impacts peak flow substantially more than soil absorption is not speculation, but based on hydrologic science and backed by City studies which include detailed modeling results. Additional information is provided in Attachment 1, *Detailed Response to Appeal*.

## 2) Concern about Burden Shift to Single Family Properties

- a. Most of the single family class increase with the new methodology is due to eaves being counted as impervious cover.
  - The increased DUF share for the single family class is not mostly due to eaves, but rather due to the change in methodology for assigning impervious cover to individual properties for assessing the drainage charge. The previous method was based on the Equivalent Residential Unit (ERU) approach that assigned a constant amount of 1,763 sqft of IC to all residential properties, regardless of size. The new approach uses the actual amount of impervious cover measured individually for each property based on aerial planimetric data. The citywide median single family property's impervious cover is currently 3,100 sqft. The shift from a constant 1,763 sqft to a median of 3,100 sqft (a 76% increase) accounts for most of the class-wide increase, as does a considerable number of very large residential properties.
- b. Council was not informed of definition of eaves as impervious cover or its financial effect.
  - Council was informed that planimetric data from aerials representing the horizontal projection of impervious features on the ground would be used for the drainage charge. At both the Apr 15, 2015 PUC meeting and the May 21, 2015 Council meeting, the use of aerial planimetric data and rooftops were specified in the presentation. However, the difference between aerials and building permits was not discussed.
  - The financial effect of the new methodology, and in particular impact to the Single Family class, was discussed in detail with Council. However, the effect of eaves as impervious cover is minimal, as described above and in Attachment 1, *Detailed Response to Appeal*.

## Attachments

- 1) Detailed Response to Appeal
- 2) Appeal
- 3) Initial Comment and City Response

CC: Sue Edwards, Assistant City Manager  
Peggy MacCallum, Chief Financial Manager, Watershed Protection Department

## ATTACHMENT 1: DETAILED RESPONSE TO APPEAL

The appellant has expressed concern regarding WPD's position in asserting eaves as impervious based on hydrologic science principles and modeling results. WPD staff is presenting additional information on this topic.

- 1) Hydrologic theory and detailed modeling results from many studies strongly support WPD's decision. Typically, roof eaves extend the impervious roof area further downward, collect the storm water falling on the roof, and drain concentrated flow to the roof edge (including the eave portion). This concentrated flow then falls on the ground (when no gutters are installed) with a continuous compaction force to the pervious surface (if no hard surface was built under the eave). Typically, the ground slope under eaves are significant and inclined away from the walls. As a result, the rainfall-runoff process from eaves reduces normal infiltration rate (due to rainfall compaction and sloping outward), generates concentrated ground runoff, and above all, shortens the time of concentration as compared to a flatter pervious ground surface. It is true that concentrated runoff will also wet the ground area under the eave with some infiltration. However, concentrated flow from the roof and the compacted ground surface would result in a fundamentally different hydrologic process as compared to the process of rainfall over natural terrain. Past City hydrologic studies have demonstrated that downstream flood peak flow is much more sensitive to time of concentration than to small infiltration changes. In other words, the entire roof including the rooftop eave area will significantly change the time of concentration (acting as a sloping impervious area) while the comparatively minor ground infiltration under the eave, in general, has minimal effect on the downstream peak flow for larger storms. This is not scientific speculation. The recent comprehensive and detailed two-dimensional modeling on green storm-water infrastructure in the Brentwood area of Austin validated this rainfall-runoff phenomenon by showing that installing many components of green infrastructure (higher infiltration and added storage) such as raingardens, filter strips, cisterns, etc., the peak flood flow for a large storm (say a 100-year storm) would not see a significant peak flow reduction. Many recent publications, including EPA's *Flood Loss Avoidance Benefits of Green Infrastructure for Stormwater Management* (December, 2015), provide an assessment on the benefits of smaller scale, on-site stormwater controls, often referred to as Green Infrastructure (GI). These studies largely reveal that the overall effects of GI on flood control are relatively small. In judging eaves hydrologic effect, it is the time of concentration (slope and flow velocity) not the limited infiltrated amount under the eaves that predominantly determines the eave's hydrologic impact on the rainfall-runoff process. Hence, the eave area acts very similar to the rest of the roof surface in affecting the time of concentration and the peak flow. Thus, it is appropriate to treat it as impervious area.

The appellant performs several calculations to support the position that counting eaves as impervious cover accounts for much of (or most) of the burden shift to the Single Family class. WPD staff has determined that there is very little impact due to fully counting eaves as impervious (around \$0.50/mo for the typical single family residence) and the calculations below are provided in support of this position.

- 1) The appellant assumes a median home is 45% impervious because the prior City's response included an example 45% IC% value. The 45% was intended as an example, not an assertion of an actual median. The median home is closer to 37% impervious, as has been stated in several City budget presentations of the typical home. This changes the appellant's calculations of a median single family property charge from \$13.76/mo to \$11.84/mo (without the Single Family discount and using the FY16 rate of \$0.005/sqft of IC).
- 2) The appellant compares the FY15 flat rate of \$9.80/mo to the FY16 median charge. This comparison does not consider the budget change between FY15 and FY16. It is more accurate to compare what the flat rate would have been for FY16, which had previously been reported ranging from \$10.40 to \$10.55/mo.

- 3) The appellant assumes a range of 15%-25% of on-the-ground impervious cover that may exist (on average) underneath eaves. WPD has not studied this item in detail, but generally agrees this estimate may be reasonable. Of an estimated 400 sqft of eaves for a typical home, this would reduce the eaves over non-impervious amount to 320 sqft. ( $400 \times 0.8$ ).
- 4) What is primarily contested is how this remaining 320 sqft of eaves over non-impervious surfaces should be treated. This ground under eaves may have absorptive capacity, but not expected to offset the impact of roof slope and speed of runoff, especially with gutters and that the ground is most often sloped away from the foundation. In prior response to comments for illustrative purposes, WPD assumed eaves over non-impervious areas could roughly be treated as 75% impervious. This would reduce the eave impervious amount to 240 sqft ( $320 \times 0.75$ ), which means only about 80 sqft (320-240) might be removed from the calculation.
- 5) The appellant states the additional charge due to eaves is approximately \$2.42/mo, but based on the items presented above, the amount is closer to \$0.50/mo. Considering an increase of the citywide rate would be needed to offset the reduced amount for eaves adjustments, the amount potentially saved by single family customers would be even less.
- 6) The appellant disputed a statement in the City's response that incorporating impervious cover percentage as part of the drainage charge "had a mitigating effect on this single family burden increase since generally single family lots are less dense than other land uses." In a June 17, 2015 memo to Council, WPD reported an analysis of the impact of a hypothetical charge without incorporating impervious cover percentage and found an average single family charge would increase from \$11.70/mo to \$15.30/mo, which is a change from about 28% of the total DUF to about 35% of the total DUF. This is primarily due to the reduction in each charge that the Adjustment Factor provides for properties that are less dense (typically residential) as opposed to those that are more dense (commercial).
- 7) As stated in the City's prior response, there are many administrative and equity concerns that arise if eaves were to be considered pervious. In addition to City staff honestly believing that eaves are more impervious than not, these administrative and equity concerns make any conversion expensive and subject to more challenges.

## **ATTACHMENT 2: APPEAL**

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To: **Marc Anthony Ott, City Manager, Austin, Texas**  
c/o City Clerk, Austin, Texas

From: **Bob Thompson**  
3310-A Doolin Drive  
Austin, Texas 78704  
(512)-444-0019

Subject: **Appeal of Drainage Charge Admin. Rule No. R161-15.22, Section 9.5.5(B)(a)**

Date: **May 25, 2016**

**Dear Mr. Ott:**

On behalf of myself and many thousands of other similarly situated single family homeowners, including 15 of the 32 persons who previously submitted comments regarding the proposed Drainage Charge Administrative Rules, I appeal the decision by the Watershed Protection Department (WPD) to include in the definition of impervious area [c.f., Section 9.5.5(B)(a) of the Drainage Charge Administrative Rules], for purposes of the Drainage Utility Fee (DUF), incidental roof overhangs of up to two feet, above pervious ground cover below. (Such incidental roof overhangs are herein referred to as "rooftop eaves" for short.)

The reasons for appealing this rule are detailed below. I incorporate into this appeal, by reference, my prior comments dated February 15, 2016, which appeared in Attachment B to the Comments and Responses for City of Austin Proposed Drainage Charge Administrative Rules, as well as the comments of the other 14 individuals protesting against this same rooftop eave rule, whose comments appeared in the same Comments and Responses or in Attachments A and C thereto. The "Common Responses for Drainage Charge Administrative Rules Comments" appeared as Attachment D to these Comments and Responses, and contains the comments and responsive arguments from WPD regarding the rooftop eave issue, as well as other issues in the rules.

There are two primary reasons that WPD should not have included incidental rooftop eaves as impervious cover for purposes of the DUF:

- (1) Such inclusion not only conflicts with, but is actually diametrically opposed to, the longstanding treatment of incidental rooftop eaves [as not being considered to be impervious cover] by the City of Austin under its regulation of the permitted impervious cover (IC) within zoning districts and for building permits. Therefore the WPD policy is completely inconsistent with the longstanding COA policy with which homeowners and developers are intimately familiar.
- (2) This "redefinition" of incidental rooftop eaves as IC by WPD may be seen to be largely responsible for the huge increase in the Drainage Fee burden borne by single family property owners, from about \$18.3M to about \$24.2M, or from about 22% to



about 29% of the total DUF collected—once the “phase-in” cap is removed. [These figures are extracted from WPD materials published in mid-2015; excerpts are attached hereto.] Such momentous cost-shifting, primarily from non-residential property owners to single family property owners, should have been explicitly authorized by the Austin City Council, once Council had been properly advised that the redefinition of rooftop eaves as IC would result in such cost-shifting. The City Council was not advised that the rooftop eave policy was being revised, or that it would have this much financial effect. An Administrative Rule is not the proper place to make such momentous fiscal decisions.

Before elaborating further on these two primary points, it may be helpful to provide some context by addressing some related issues, and some of the responses given by WPD within their Attachment D.

The definition of impervious cover found in the Austin City Codes, as well as in the Ordinance No. 20150625-021 directing a revised DUF, is “any surface that prevents the infiltration of water into the ground, such as roads, parking areas, concrete, and buildings.” Although “buildings” are mentioned, rooftop overhangs or eaves are not mentioned. The part of a “building” which “prevents” the infiltration of water into the ground is the ground-level foundation—not the roof. Particularly, incidental eaves do not prevent such infiltration, provided that there are avenues for pervious cover beneath eaves to become wet during a rainstorm. [And numerous such avenues have been discussed elsewhere in the referenced material.] Perhaps this is why Austin decided long ago not to include incidental eaves as IC in the context of complying with IC restrictions in zoning districts and for building permits. [Residential Permit Application “C” contains the instruction that for impervious cover, “Roof overhangs which do not exceed two feet or which are used for solar screening are not included in building coverage or impervious cover.”] In the discussion of zoning IC limitations, only two dimensional (ground-level) plats are presented. Austin homeowners who have dealt with the City regarding impervious cover uniformly think of IC as “ground-level” impediments to water infiltration—such as concrete. Likewise, they think of the grass and flower beds which they maintain up to the edge of their foundation as pervious cover which helps to absorb and therefore retard water runoff, and for which they should not be penalized thru an incrementally higher DUF which effectively pretends that such vegetation is concrete.

The WPD response within Attachment D properly notes that there is no uniform treatment of eaves as IC or as not-IC, among other cities. Some cities treat them one way, and other cities treat them the other way. However, I will venture to guess that few if any other cities treat eaves simultaneously and inconsistently both ways, as WPD would have Austin do! Most cities would recognize that inconsistent policy is bad policy. Austin confronted this policy decision long ago, and decided to treat incidental eaves as not impervious cover. WPD should be willing to conform their own DUF policy to this prior decision, for the sake of consistency and avoiding confusion among the public.

Likewise, the WPD response within Attachment D notes that they have located no scholarly academic studies of the effects of eaves upon water infiltration into the ground, or upon runoff. [Ideally, one would desire measurements of water infiltration and runoff around

houses identical except for the presence or absence of eaves.] This absence of data should have been sufficient for WPD to conform their DUF policy to the existing non-IC treatment of eaves. Instead, WPD presents scientific speculation (without any reported experimental data collection) of the possible effects of rooftops upon water flow concentration, and upon the eventual "time of concentration" of floodwaters in the surrounding storm drain system, in an apparent attempt to justify an inconsistent DUF treatment of eaves as IC.

It is, of course, easy to offer countervailing scientific speculation. For example, rainwater whose flow may be concentrated upon a rooftop, does not reach the surrounding drainage system until it has transited the surrounding acreage of the homeowner, where flow concentrations may reasonably be expected to be broken up and diffused to a great extent, with considerable absorption into the pervious ground around the house, including the pervious ground cover beneath any eaves. Very few homeowners have the experience of observing concentrated "rivers" of runoff flowing away from their houses after a rainfall. The "time of concentration" parameter mentioned by WPD sounds like a parameter commonly found in Corp of Engineers' water runoff codes, which are typically applied to an entire watershed, typically covering square miles rather than only an acre or so around someone's house. In such large scale analysis, considerable spacial and temporal "averaging" effects typically occur to diffuse localized flow concentrations. The rainstorm itself may have spatial and temporal variations as it moves through or near the watershed, and flows from one part of the watershed may peak at different times from flows elsewhere in the watershed. All of this scientific speculation should be beside the point: scientific speculation should not be the basis of DUF policy.

It may also be observed that if WPD's "rooftop flow concentration" arguments were taken seriously, they might be more logically applied to justify a higher DUF for all rooftops (not just eaves), as opposed to ground-level impervious cover such as sidewalks. This much alteration in Austin's treatment of IC is evidently too much even for WPD; however, they are fine with inconsistent definitions of IC by different City Departments.

When a single family property owner buys a lot and works with a designer to obtain plans for construction of a house upon the lot, he and his designer are well aware of the limitation that for an SF3 zoned lot, IC must be less than 45%. This limitation is motivated to restrain the amount of rainwater runoff and lessen the contribution of such SF lots to flooding. In enforcing this 45% limitation, the Planning and Development Review Department does not consider incidental eaves of less than two feet width to be IC. Very many SF3 lots within Austin are built out to this 45% IC entitlement limit. This existing, longstanding treatment of eaves as not-IC is what SF property owners, and their neighborhood associations, are familiar with. Now, with this new WPD policy of defining IC differently for eaves, a lot which has the maximum 45% IC according to the Planning and Development Review Department, will probably have 50% IC according to the WPD, as a result of their different, inconsistent definition of IC. This can only cause massive confusion among homeowners. Moreover, they may be justifiably irritated that they are being charged an incremental DUF on the vegetated area around their foundations, underneath their eaves. Homeowners do not understand why this vegetated area is considered to be contributing to runoff, any more than an equal square footage of vegetation not overhung by an eave.

WPD also states, in an attempt to justify inconsistent treatment of eaves as IC or as not-IC, that "City of Austin engineers" consider eaves as IC when designing drainage improvements. However, single family property owners are unaware of these internal COA deliberations. The only familiarity that SF property owners have had with IC has been with the zoning IC limitations, for which eaves are not treated as IC. Therefore to such SF property owners, this new WPD policy of treating eaves as IC will be starkly inconsistent.

WPD also asserts that "for commercial site plan permitting purposes, the City considers all roof eaves as impervious cover." Although the treatment of IC for commercial property may logically differ from its treatment for residential property, I would note that this allegation by WPD is at least controversial. Attached to this appeal is a copy of some email correspondence between WPD personnel and Mr. Ron Thrower, an experienced consultant to developers. Mr. Thrower asserts that 17 of 18 engineers that he polled were found to disagree with WPD's statement of how eaves have been treated in commercial site planning.

Next consider the second major point of this appeal: that the redefinition of eaves as IC causes a major portion of the increase in the DUF cost burden borne by SF property owners. WPD's own figures [see two pages of attachments] show that, disregarding the phase-in "cap", the SF cost burden was projected to increase from \$18.3M under the prior "ERU Method" to \$24.2M under the new IC-based method (and including the redefinition of eaves as IC). Correspondingly, the pie chart distribution of DUF costs indicates that the SF property owner share of the total DUF was projected to increase from 22% of the total DUF to 29% under the new method. This projected cost increase of \$5.9M represents a relative 32% increase to such SF property owners. [Note that  $\$24.2\text{M}/\$18.3\text{M} = 1.32$ , and consistently,  $29\%/22\% = 1.32$ .] It was previously alleged, and it remains true, that most of this increase is attributable to the redefinition of eaves as IC, although this conclusion was not disclosed to City Council by WPD.

WPD appears to wish to dispute this conclusion, in some comments in their Attachment D. Let us consider their own example in some detail. They consider the example of a median single family property with 3,100 SF of impervious cover (per the WPD definition), corresponding to 45% IC (per the WPD definition), with 400 SF of eaves. It may be deduced that the lot size is  $3100 \text{ SF} / 0.45 = 6,888.89 \text{ SF}$ .

From the WPD website, it may be seen that the formula for DUF for the 2015-2016 FY has been  $\text{DUF} = \$0.005 \times \text{IC}(\text{SF}) \times [1.5425 \times (\% \text{IC}) + 0.1933]$ . The term in brackets is called an adjustment factor. It may be immediately computed that if eaves are treated as 100% IC per the new WPD definition, then for this median property,  $\text{DUF} = \$13.76$  per month.

By comparison, under the former ERU method, the charge was \$9.80 per month for most SF property. [ $\$13.76/\$9.80 = 1.40$ ]

Now consider the case that eaves are not considered to be IC, and suppose that the homeowner has completely pervious cover at ground level beneath the eaves. For this case,  $\text{IC} = 2700 \text{ SF} = 39.19\% \times 6,888.89 \text{ SF}$ . The DUF may again be immediately computed to be

**DUF = \$10.77 per month. Although this is more than the former ERU charge of \$9.80 per month, it is much less than the charge of \$13.76 per month under the WPD redefinition of eaves as IC. [ $\$10.77/\$9.80 = 1.10$ ;  $\$13.76/\$10.77 = 1.28$ ;  $\$13.76 - \$10.77 = \$2.99$  per month excess DUF charge.]**

**Although the DUF should ideally be individualized property-by-property, for purposes of projections the question arises as to what percentage of the ground underneath eaves is typically IC? Everyone agrees that actual IC on the ground should be treated as IC, whether or not eaves are overhead. The City possesses no data on this question. My own observations suggest that typically, only 15% - 25% of the ground underneath incidental eaves is actually IC. This corresponds to sidewalks that approach a door, or concrete patios adjacent to the building foundation, or perhaps a driveway approaching a garage. Most SF homeowners appear to maintain pervious vegetation under most of their eaves.**

**Suppose that a typical SF property possesses 20% of actual IC on the ground beneath its eaves. Then for the WPD example, but disregarding eaves above pervious ground cover as not being IC, there would be actual IC = 2780 SF = 40.35% x 6,888.89 SF, and the DUF may again be immediately computed to be \$11.34 per month. This is again more than the former ERU charge of \$9.80 per month, but it remains much less than the charge of \$13.76 per month under the WPD redefinition of eaves as 100% IC. [ $\$11.34/\$9.80 = 1.16$ ;  $\$13.76/\$11.34 = 1.21$ ;  $\$13.76 - \$11.34 = \$2.42$  per month excess DUF charge.]**

**It is this excess charge of perhaps \$2.42 per month = \$29.04 per year for the typical SF home with the median amount of IC, which is solely attributable to the redefinition of eaves as IC by WPD. The fact of the redefinition of eaves as IC was not emphasized to Council, and the fiscal impact of this redefinition was completely undisclosed. It is clear that this impact is very significant. If the DUF of \$13.76 per month which results from treating eaves as 100% IC corresponds to the \$24.2M collected in the aggregate from SF property owners, then if eaves were disregarded and only tend to overhang 20% IC, the reduced DUF of \$11.34 per month would only bring in \$19.9M and there would result a revenue shortfall of about (\$4.3M). However, everyone agrees that WPD must have adequate DUF revenues, and so under such an interpretation of eaves which produces less DUF fees from SF property owners, the overall DUF coefficient should be increased to recapture the lost revenues. I estimate that an increase of a bit over 5% should be sufficient to recapture the lost revenues.**

**The final upshot of this estimate is that if eaves were disregarded as IC for the DUF just as they are for zoning IC limitations, and if typical eaves overlay about 20% of actual IC on the ground below, and if the DUF coefficient were adjusted to preserve the overall DUF revenues, then the SF property owner share of the DUF fees would only have increased from \$18.3M under the ERU method to about \$21M under this revised DUF method, rather than to \$24.2M under the proposed DUF method which treats all eaves as IC. The SF property owner portion of the DUF "pie" would only have increased from 22% to about 25%, rather than to 29% as proposed by WPD. It is correct to state that most of the increase proposed for SF property by WPD resulted from the redefinition of eaves as IC, and this was not disclosed to Council. Under the revised DUF method which disregards eaves as IC above pervious ground cover below, the DUF "pie" would be comprised of 25%**

SF property, 19% MF property, and 56% non-residential (mainly commercial) property. Compared to the former ERU method "pie", SF property would increase from 22% to 25%; MF property would decrease from 27% to 19%; and non-residential property would increase from 51% to 56%.

However, with WPD not only transiting to an IC-based DUF, but also redefining eaves to now be 100% IC, there is an additional 4% shift in the cost burden of the DUF "pie" onto SF property, with a (1%) reduction to MF property and a (3%) reduction to non-residential property. It is this additional 4% cost shift—corresponding to over \$3M—onto SF property owners which results solely from the WPD redefinition of eaves as IC. This is what was completely undisclosed to City Council. This is what was slipped into being by WPD as an Administrative Rule, via the redefinition of eaves as impervious cover. This is improper. This is the subject of my Appeal.

In their commentary within Attachment D, WPD states that they attribute increases in the SF property portion of the DUF to the fact that the prior ERU method charges were based on an underestimate of the amount of SF impervious cover. This may have been correct, and indeed, even without a redefinition of eaves as IC, the SF portion of the DUF "pie" would increase from 22% to 25%. WPD simply does not wish to admit that there is a significant additional incremental increase in the SF cost burden of around 4% of the DUF "pie" which is attributable solely to the redefinition of eaves as IC.

Also within Attachment D, WPD offers the suggestion that if eaves were "only" counted as 75% IC, rather than as 100% IC, the DUF savings to the SF home with median IC would only be slight. In the first place, this suggestion is extremely self-serving by WPD, since if one "assumes" that eaves are only a tiny [25%] bit pervious, naturally the savings resulting from this perviousness will be small. Moreover, WPD appears to have under-computed even these small savings. Going back to the suggested parameters, eaves with 75% IC would produce total IC = 3000 SF = 43.55% x 6,888.89 SF, and the DUF may be immediately computed to be DUF = \$12.98 per month, down from \$13.76 per month for eaves which are 100% IC. Therefore, the small 25% pervious cover underneath these eaves would actually produce a DUF savings of  $\$13.76 - \$12.98 = \$0.76$  per month—rather than the savings of \$0.35 per month claimed by WPD. As stated above, we believe that a more realistic estimate of the typical pervious cover beneath eaves would produce much more significant savings: perhaps around \$2.42 per month = \$29.04 per year for a more typical SF property.

WPD also included within Attachment D the peculiar statement that "Adjusting the charge for the percent of impervious cover has had a mitigating effect on the increased charges for single-family residences." A more accurate statement of the situation is that the new DUF formula is quite sensitive to IC, since it enters both as IC(SF) as well as in the adjustment factor as (%IC). Since the %IC term tends to dominate the adjustment factor, the DUF is approximately quadratically dependent upon the IC of the lot in question. If anything, this extra sensitivity to IC hurts SF property as a class, since if eaves are converted from non-IC to IC as proposed by WPD, the percentage impact of this change upon the DUF is about twice the percentage increase of the IC itself. In general, the sensitivity of the DUF to IC means that SF property with relatively large IC may bear a much higher burden, while SF

property with relatively low IC will bear a lower burden. But all SF property will be hurt by having eaves newly counted as IC.

If this Appeal is successful, and WPD is directed to not treat as impervious cover eaves above pervious ground below, the required revisions may be efficiently accomplished in several ways. First of all, we protestants have always been willing to allow WPD adequate time to accomplish the revision. We are hopeful that this might be accomplished by the beginning of the next fiscal year, but if that is impractical, then it should be done by the succeeding fiscal year. Second, it is universally agreed that the change should be revenue-neutral overall. Hence, the rate coefficient should be adjusted to preserve the overall revenue from the DUF.

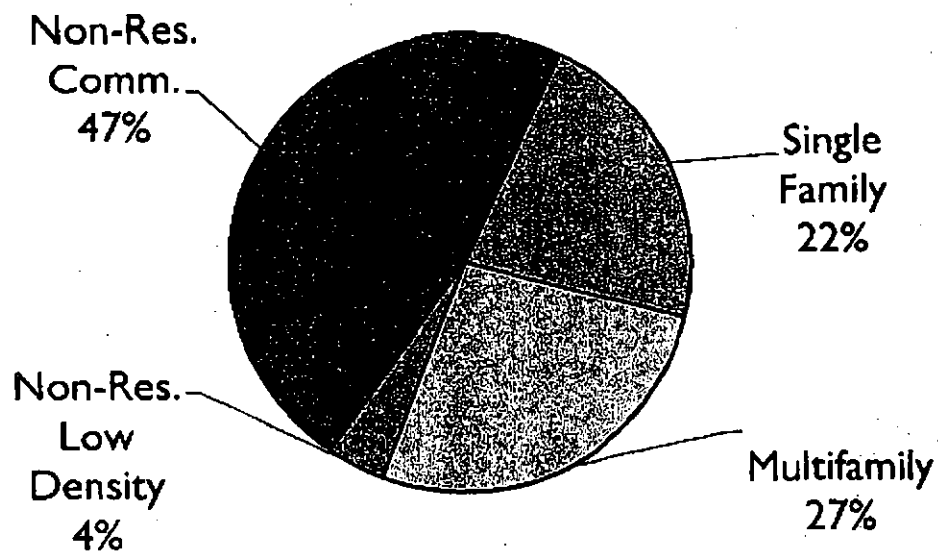
Third, if WPD is wedded to its approach of aerial data acquisition to assess IC, then it should first subtract two feet from the observed rooftop perimeter to eliminate the area of the incidental eaves. Next, it should add back two feet of IC which appears from the aerial data to be "approaching" the building. This would be such things as sidewalks, driveways, or patios; and the IC under the eaves would be two feet times the observed width of the approaching feature. As an alternative procedure, WPD might trade off accuracy for simplicity, and assume an average percentage of IC underneath SF eaves. However, if this is done, WPD should adopt a realistically small percentage (e.g., more like 20% than 75%). The most important thing is that SF property owners should be able to demonstrate on appeal if their property actually has less IC than has been presumed by WPD. The governing rule should be that underneath incidental eaves, the only IC is actual IC on the ground. It might also be noted that no one is pointing a gun to the head of WPD and demanding that they rely upon aerial data. A simpler approach would be for WPD to instead rely upon TCAD data or site plan data, or to simply assume that all SF property has been developed to the maximum IC permitted for its zoning district (e.g., 45% for SF3 property). Then any property owner who had less IC could demonstrate this upon appeal.

WPD has protested within Attachment D that it would be expensive for them to administer the change to remove eaves from the estimate of IC. They suggest that the administrative cost might approach \$0.35 per month per SF property. However, this fear seems overblown. Since Austin probably contains some 200,000 SF properties (houses and duplexes, combined), this would correspond to a cost of some \$0.84M annually. However, most of the cost is a one-time charge to revise the computer coding to subtract the two feet of eaves, and once automated, the ongoing costs should be fairly modest. Adopting some approach other than relying upon aerial data could well bring cost savings in the long run. Given the unavoidable challenge of interpreting aerial data correctly despite tree foliage, it might even turn out that another approach would be more accurate.

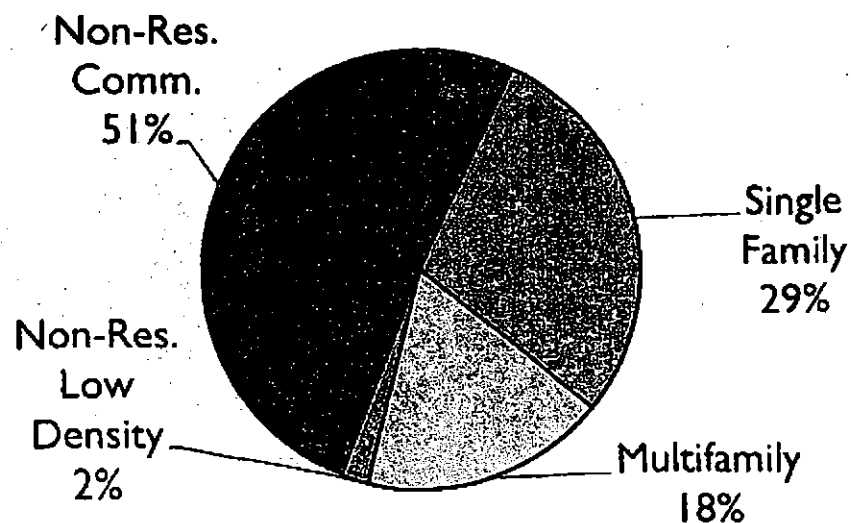
In conclusion, for the reasons explained herein, I appeal the decision by WPD to include within their Administrative Rules, in Section 9.5.5(B)(a), a definition of impervious area which includes incidental rooftop eaves of up to two feet width, above pervious ground cover below. The definition should instead be made consistent with that long employed by the Planning and Development Review Department for the limitation of impervious cover within zoning districts.

# Current & Proposed Share of Charge by Land Use Category

**Current Share: ERU Method**



**Proposed Share: Amount & Pct. Impervious Area**



Example: Transition Cap on Increase for Single Family Customers						
Proposed Citywide FY 16 Monthly Base Rate (\$/ft <sup>2</sup> impervious area):		\$ 0.00500		Revised Citywide FY 16 Monthly Base Rate with 50% Cap (\$/ft <sup>2</sup> impervious area):		\$ 0.00525
Annual Drainage Charge						
Land Use	FY15	FY16	FY16 with 50% Cap	% Change from FY15 to FY16	% Change with 50% Cap	% Change with 75% Cap
Single Family	\$ 18.3M	\$ 24.2M	\$ 21.1M	32%	15%	25%
Multi Family	\$ 17.1M	\$ 15.4M	\$ 16.2M	-10%	-5%	-8%
Non Residential	\$ 39.6M	\$ 43.9M	\$ 46.2M	11%	17%	14%
TOTAL		\$ 83.5M				

The analysis indicates that the phase-in option would reduce the FY16 increase in drainage charge for single family customers as a class from 32% to 15% using a 50% cap, and from 32% to 25% using a 75% cap. Due to the reduction in revenue from single family customers, the citywide base rate would need to be adjusted upward to achieve the same annual budget. The effect of increasing the base rate for all customers would result in a greater drainage charge increase for nonresidential customers, e.g., from 11% to 17% using a 50% cap.

The impact of the 50% or 75% cap on the drainage charge increase to single family monthly charges is illustrated in the graphs attached to this memo. The analysis shows that the phase-in option will result in the greatest reduction in charge to customers with impervious cover greater than 4,000 square feet which is greater than the citywide median value of 3,100 square feet. Since the largest portion of benefit from the cap would be realized by those with the largest amounts of impervious cover, as opposed to what may be typical for lower-income single family owners, staff recommends that no cap be adopted.

- B. **Drainage Charge Exemptions:** At its June 25 meeting, City Council briefly considered the possibility of discontinuing all exemptions to the drainage charge that are not state mandated. At that time, WPD was specifically requested to inform potentially impacted parties and to "ask for feedback on how that would affect their operations."

Section 580.003 of the Texas Local Government Code states that the City may not collect a drainage charge "from a state agency or a public or private institution of higher education." However, the City currently provides four other exemptions that are allowed, but not mandated, by Section 552.053. These are listed in Section 15-2-13 of the recently amended City Code:

- 1) a county;
- 2) the City, if the property is publicly maintained right-of-way;
- 3) an independent school district;
- 4) property owned and occupied by an organization that is exempt from taxation (as a religious organization) and that participates in a program that provides housing for the homeless, at a monetary amount at least equal to the drainage charge.

The City contacted Travis County, the City of Austin Public Works Department, the seven independent school districts with properties in the City, and the 18 organizations that receive funding allowed by the exemption that pertains to religious organizations. Letters and email received so far as written feedback from a number of the independent school districts and organizations involved with housing for the homeless are attached. The way that the exemption for religious organizations has been working is unique and is also explained in the attachments. Feedback from the Travis County Commissions Court will be transmitted to the Council at a later date.



**Subj:** FW: Impervious Cover  
**Date:** 4/29/2016 9:06:50 A.M. Central Daylight Time  
**From:** ront@throwerdesign.com  
**To:** JRT3308@aol.com

FYI

## Ron Thrower Thrower Design

510 South Congress Avenue, Suite 207  
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**From:** Nuccitelli, Saul [mailto:Saul.Nuccitelli@austintexas.gov]  
**Sent:** Friday, April 29, 2016 8:59 AM  
**To:** Ron Thrower; Hollon, Matt  
**Cc:** Lesniak, Chuck  
**Subject:** RE: Impervious Cover

Hi Ron,

Not sure if you've read the response to comments that were sent out on Wednesday to stakeholders as part of the adoption of the DUF Admin Rules. I'm attaching it for your reference. In particular, there is multi-page response to the eaves comment.

Please keep in mind, this response and interpretation is focused on the assessment of eaves as part of the drainage charge, in particular affirming the use of the aerial planimetric data for the assessment of the drainage fee. Since the drainage charge is computing unique charges for over 200,000 accounts citywide, there needs to be an efficient and automated way to compute the charge. As with anything in hydrology, there is not a totally correct answer, but we've found that response time (time of concentration) is more of a driver of flood impact than infiltration, which for this topic correlates that roof pitch drives more peak flow than the soil under eaves may offset. We feel this is a more fair and efficient way to distribute the drainage charge rather than trying to manipulate the aerial planimetric data to somehow partially offset some estimate of eaves. Even if we tried, we wouldn't know which buildings have eaves, much less gutters.

This response (and the recently adopted DUF admin rules) does not change existing building permitting practice for the definition of Building Coverage and its exclusion of eaves <2ft wide in zoning calculations. Perhaps that addresses your biggest concern.

Hope that helps.

**Saul A. Nuccitelli II, PE, CFM**  
Value Engineering, Safety, and Data Management Division  
Watershed Protection Department, City of Austin  
505 Barton Springs Drive, 12<sup>th</sup> Floor, Austin, TX 78704

Friday, April 29, 2016 AOL: JRT3308

P: (512) 974-6550  
saul.nuccitelli@austintexas.gov

**From:** Ron Thrower [mailto:ront@throwerdesign.com]  
**Sent:** Friday, April 29, 2016 8:03 AM  
**To:** Nuccitelli, Saul <Saul.Nuccitelli@austintexas.gov>; Hollon, Matt <Matt.Hollon@austintexas.gov>  
**Cc:** Lesniak, Chuck <chuck.lesniak@austintexas.gov>  
**Subject:** RE: Impervious Cover

Saul, Matt, Chuck,

First – thanks for the dialogue. Chuck and I took it up in the hall yesterday morning, so I'm looping him in.

Second – from what I gather now from you all at the City is that your position is that all overhangs are 100% impervious cover. As I mentioned to Chuck yesterday, this means that every site plan that I have done in the past 30 years is in error, which is disconcerting to me. But I'm not alone, which should be disconcerting to the City. I polled 18 engineers yesterday. Of those 18, only one counted all overhangs as impervious cover. Four count an overhang over 2' as impervious cover (which is how we have done it). But that leaves 13 that do not count overhangs at all.

I'm not sure that you all appreciate the impact of an "all overhang as IC" position especially when it comes to urban development. Think about this. Overhangs provide architectural and important elements to design with shaded window awnings or larger, deeper overhangs to deal with the sun in certain areas. Further, this position is now a direct impact to urban development where the impervious cover is set by "zoning" with two outcomes – 1) The potential yield is reduced because of the overhangs now exceeding IC for projects in Urban Watersheds, and 2) Buildings without overhangs are severely deficient in design that then detracts from an intended urban form.

It is severally incomprehensible to assume that every overhang, regardless of depth (or height for that matter – consider an overhang 60' in the air) impacts the ability for rainwater to hit the ground and be absorbed. The overhang does not cover the ground. Rainwater gets to the areas under an overhang with almost any and every storm event.

I continue to be troubled over this issue and have stirred up a bit of a hornets nest. I know the City has spent a lot of time wringing their hands over this issue and now the development community as well. At some point the departmental silos need to make a decision on what is best for Austin. An approach to impervious cover that is a typical City of Austin over-the-top, belt and suspenders that does not make a lot of sense, or, understand that these types of decisions are contrary to many other policies for Austin – units, yields, shade, design, health, form, etc..

**Ron Thrower**  
**Thrower Design**

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Friday, April 29, 2016 AOL: JRT3308

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**From:** Nuccitelli, Saul [mailto:Saul.Nuccitelli@austintexas.gov]  
**Sent:** Tuesday, April 26, 2016 5:06 PM  
**To:** Hollon, Matt; Ron Thrower  
**Subject:** RE: Impervious Cover

Hi Ron,

Happy to talk with you about this whenever. Meanwhile, here is a (somewhat) short answer.

For the drainage utility fee (DUF), starting in Nov 2015, we started charging lot by lot impervious cover based on aerial mapping (which includes rooftops). This is consistent with our historical use of aerial mapping for drainage design and construction projects (which is a driver for our department's cost of service). We understand that there is an inconsistency on eave interpretation between drainage impact and building permitting (that existed even before the DUF changed). While we continue to feel the best science is to include rooftops as IC, we are working on ways to possibly resolve that inconsistency.

I also understand your point about the Solar Farm and I think we should add more clarity in the code/rules, not just on eaves, but on all impervious surfaces that overhang the ground. Awnings, shade structures, solar panels, etc. We should continue to better answer the question - When should an impervious surface be considered impervious cover?

Saul A. Nuccitelli B, PE, CFM  
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---

**From:** Hollon, Matt  
**Sent:** Tuesday, April 26, 2016 3:02 PM  
**To:** Ron Thrower <ront@throwerdesign.com>  
**Cc:** Nuccitelli, Saul <Saul.Nuccitelli@austintexas.gov>  
**Subject:** RE: Impervious Cover

Ron,

Greetings! Saul Nuccitelli is the man you want to talk to about this issue—he is super knowledgeable about it after many discussions related to the Drainage Utility Charge (based on impervious cover). I've cc-ed him on here and his phone is 512.974.6550.

Matt

---

Matt Hollon | Environmental Program Manager, Planning & GIS  
City of Austin | Watershed Protection Department  
505 Barton Springs Rd. 11th Floor; Austin, Texas 78704  
512.974.2212 voice | 512.974.2846 fax

Friday, April 29, 2016 AOL: JRT3308

**From:** Ron Thrower [mailto:ront@throwerdesign.com]  
**Sent:** Tuesday, April 26, 2016 11:52 AM  
**To:** Hollon, Matt <Matt.Hollon@austintexas.gov>  
**Subject:** Impervious Cover

Matt,

Seems like I have been around a long time, yet still seems like I am finding out new things every day. This time it is "what is impervious cover?". I understand what it states in the ECM and what was previously in the LDC. For decades it was determined that incidental overhangs were not considered impervious cover and that incidental was an overhang of 2' or less. Mind you, this has been the understanding for decades because overhangs / eaves do not cover the ground are only a real impediment with larger overhangs. Now I'm hearing that this applies to single-family only and that all commercial overhangs, regardless of the overhang depth, is 100% impervious cover.

As a side note – I argued with the City in their determination that the solar panels on the Solar Farm in Webberville were not counted as impervious cover because these were large panels that throw a lot of shade and do impede rainfall from hitting the ground. The city argument for not counting it was because the water would hit the panel and then drop to the ground. My response was "Like a roof". But they decided that for all that development for the Solar Farm that only the roads and actual buildings count as impervious cover which equated to a less than 18% impervious cover and...no water quality required.

So, when is an overhang impervious and when is it not?

## Ron Thrower Thrower Design

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—Original Message—

**From:** "McGehee, Dana" <Dana.McGehee@austintexas.gov>  
**To:** "McGehee, Dana" <Dana.McGehee@austintexas.gov>  
**Subject:** Drainage Utility Fee Rules Adopted  
**Date:** Wed, 27 Apr 2016 20:09:18 +0000

Hello,

The final drainage utility fee rule was adopted today, April 27, 2016. Attached to this email you will find several documents:

Friday, April 29, 2016 AOL: JRT3308

- Rule Adoption Notice
- Adopted Rule
- Backup Documents:
  - Redline version of DCM Section 9 showing changes from original emergency rule (underlined) and from the rule proposed on January 28, 2016 (highlighted) – Pages 1-9
  - Comments and Responses Spreadsheet – Pages 10-15
  - Attachments A, B, and C: comment letters from stakeholders – Pages 16-22
  - Attachment D: Common Responses for Fee Structure, WPD Programs and Roof Eaves/Austin Drainage Charge – Pages 23-27

The rule will be hosted on the City's online code website, MuniCode (<https://www.municode.com/library/>), in the near future as a new Drainage Criteria Manual Section 9.

In the meantime, you may review and download the DUF rule either by accessing Watershed's FTP site (<ftp://ftp.ci.austin.tx.us/wpdrrpostings/Drainage%20Utility%20Fee%20Rule/>) or on the City of Austin's Drainage Charge website (<http://www.austintexas.gov/drainagecharge>).

Please note that it may take a day or so to get the final documents up on the Drainage Charge Website.

Please feel free to contact me with any questions.

Regards,  
Dana

Dana McGehee  
City of Austin  
Watershed Protection Department  
Phone: (512) 974-2634  
505 Barton Springs Road, Suite 1200  
Austin, TX 78704

 Please consider the environment before printing this email.

## **ATTACHMENT 3: INITIAL COMMENT AND CITY RESPONSE**

**COMMENTS ON DRAINAGE UTILITY FEE ADMINISTRATIVE RULES**

By

**Bob Thompson, Ph. D.**

**February 15, 2016**

Rule 9.5.5(B)(a) states that “The impervious area for structures shall be determined by whichever is larger—the roof area, the foundation area, or exterior wall area. Consequently, horizontal projections of the overhang of a house (eaves for example) are considered impervious area.” I believe that this rule should be revised to exclude from the definition of impervious area, for purposes of the Drainage Utility Fee (DUF), incidental roof overhangs of up to two feet, above pervious ground cover below. This revision should be made effective at the beginning of the next fiscal year. Revenues lost due to this revision, primarily from single family property owners who possess such incidental overhangs, may be recovered by a very small increase in the overall DUF rate coefficient. Reasons for this recommended revision are listed below.

- (1) Impervious cover has been defined elsewhere in Austin City Codes, as well as in the Ordinance No. 20150625-021 directing a revised DUF, as “any surface that prevents the infiltration of water into the ground, such as roads, parking areas, concrete, and buildings.” (Underlining added for emphasis.) Although “buildings “ are mentioned, rooftop overhangs are not. Likewise, City Code Section 25-8-63(B) makes reference to “impermeable construction covering the natural land surface.” (Underlining added.) For decades, Austin has enforced limitations on the amount of impervious cover permitted on a lot when it is developed, in the context of zoning districts and building permits. (For example, within the common SF3 zoning district for most houses and duplexes, impervious cover must be no more than 45%.) The purpose of this prior limitation of the amount of impervious cover has also been to restrain the amount of runoff water from the developed lots. However, during all of this lengthy development history of limiting impervious cover, incidental rooftop overhangs have been excluded from the definition of impervious cover. (For example, City of Austin Residential Permit Application “C” contains the instruction that for impervious cover, “Roof overhangs which do not exceed two feet or which are used for solar screening are not included in building coverage or impervious cover.” (Underlining added for emphasis.) Similarly, and consistently, Section 25-2-513 (B) of the COA Code regarding “required yards” (i.e., setbacks) states that “A window sill, belt course, cornice, flue, chimney, eave, box window, or cantilevered bay window may project two feet into a required yard....” [without violating the required setback]. Therefore, the proposed Rule 9.5.5(B)(a) amounts to a redefinition of incidental rooftop overhangs as impervious cover for purposes of the DUF, which is inconsistent and contradictory to the treatment of the same overhangs elsewhere in the codes. My proposed revision is to rectify this inconsistency, by treating incidental rooftop overhangs for the DUF the same as they are treated in the zoning and building permit limitations of impervious cover: as excluded from IC treatment.

- (2) This historical treatment of impervious cover under the zoning district and building permit limitations, which exclude incidental rooftop overhangs as IC, is very well known among the development community, neighborhood associations, and those members of the public who have been involved with the development of a lot. The 45% IC limitation for single family house lots is similarly well known. (For example, it was mentioned in the 2-11-16 American Statesman article on the development rules for “tiny lots”.) These IC limitations are a significant factor limiting the density achievable in the development of a new lot, and so the details of the definitions are well understood, and frequently discussed in negotiation of zoning cases before the city. (Only two dimensional development plats are employed in these negotiations about IC.) Many thousands of SF3 lots have been developed right up to the 45% limitation, throughout the city. (It was my surprised observation that many WPD sample calculations of percentage IC significantly exceeded 45% for SF3 property that initially led me to the realization that WPD was using a more stringent and inconsistent definition of IC for purposes of the DUF. I thought it very unusual that there would be so many “illegal lots” in existence!) I believe that using inconsistent definitions of impervious cover in different parts of the city codes and regulations, all within the same context of trying to limit runoff water, can only lead to unfortunate confusion for everyone. Such inconsistency is very poor policy!
- (3) Sample calculations have indicated that the inclusion of incidental rooftop overhangs as impervious cover may often increase the percentage impervious cover of a single family house by 15% (i.e., a factor of 1.15) or more, above what it would be if such overhangs were excluded. Because impervious cover enters twice in the computation of the DUF, the DUF may often be increased by 20% or more—although this will vary from property to property, depending upon the size of the house and lot and other impervious cover upon the lot. This is a fairly significant relative financial impact to the single family homeowner. Indeed, a pie chart distributed by the Watershed Protection Department (WPD) indicates that the share of DUF revenues borne by Single Family customers is projected to increase from 22% to 29%, as a result of the change from a flat rate DUF (e.g., \$9.80 per month for many SF customers) to the IC-based DUF with the redefinition of IC to include incidental roof overhangs. This increase of 7 absolute percentage points, equal to a relative increase of 32% (i.e.,  $29/22 = 1.32$ ), made these single family property owners the largest “losers” from this change in the method of calculation of the DUF. Indeed, some property owners have reported relative increases of more than 300% in their DUF. Using the rough estimate given above that the DUF may be increased by perhaps 20% due solely to the inclusion of incidental rooftop overhangs as IC, one may estimate that if such overhangs were excluded—consistent with the historical treatment under zoning and building permit restrictions—then the Single Family share of the DUF “pie” would only have increased from 22% to about 25%, rather than to 29%. (The missing 4% of the pie would be redistributed to other customers, with about 3% going to Non-residential Commercial property and 1% to Multifamily property.)



- (4) However, it has not been widely appreciated that the majority of the increase in the DUF falling upon Single Family property owners actually results from this redefinition of impervious cover to include incidental rooftop overhangs as IC for the new DUF. In particular, City Council was not advised that this redefinition of IC would have this much financial impact, nor was the general public so advised. (Here, I am not alleging any duplicity; I do not think that WPD personnel themselves realized at the time the inconsistency of treatment, or the financial impact that it would have.) However, City Council was clearly sympathetic to the plight of SF homeowners facing such large DUF increases, since they authorized a one-year phase in of the new DUF. It is simply unfair to implement such a momentous redefinition of impervious cover in an administrative Rule, not subject to explicit and focused Council consideration and action.
- (5) Some WPD staff have objected that with the aerial photo methodology of assessing impervious cover, it would be difficult or inconvenient to subtract out the rooftop overhang area from the total building area including the overhangs, seen from above. However, the building rooftop dimensions are clearly and necessarily available, and as an engineering matter, it is fairly easy to subtract 2 feet from these dimensions to exclude the overhangs. The coding which has already been accomplished is far more difficult than the change required to implement the exclusion of incidental rooftop overhangs. "Inconvenience" is not an adequate excuse for refusing to maintain a consistent definition of impervious cover, and instead placing a large "extra burden" upon the backs of SF homeowners. This Rule 9.5.5(B)(a) is simply unfair and inequitable to single family homeowners.
- (6) Much has been made by WPD personnel about the fairness of a DUF based upon the impervious cover which causes the runoff whose control requires expenditures funded by the DUF. However, as many homeowners have testified, the pervious ground cover which they maintain beneath incidental rooftop overhangs clearly acts to retard the amount of runoff from their lot. The grass and vegetation maintained by the homeowners do not suffer from lack of rainfall. Wind, rain squalls, splashing, and permeation through the ground soil are completely adequate to spread the moisture to the pervious ground cover beneath incidental overhangs. This is particularly true during heavy rainfall events, which are most significant in motivating water runoff expenditures. Then the pervious cover beneath incidental overhangs will become saturated, and will have done all it can do and as much an uncovered ground can do to retard runoff. Single family homeowners who maintain such pervious ground cover beneath their roof overhangs think of themselves as being environmentally conscious and good citizens. It is unfair and inequitable for them to be given no credit, but to be financially penalized via an increased DUF, which effectively pretends that this pervious ground cover near the foundation is actually concrete.

## **Attachment D: Common Responses for Drainage Charge Administrative Rules Comments**

### **1. Fee Structure**

In previous years, the drainage charge for non-residential properties was determined by the amount of impervious cover alone. The current fee structure also incorporates an adjustment factor that takes into account the percentage of impervious cover for each property. In previous years, the residential fee was based on an average estimated impact for all residences in the City, from large houses to small apartments. Each unit paid the same fee, with the exception of high-rise apartments, which were given a 50% discount. The fee was assessed to each housing unit, regardless of the characteristics of the property on which it was located. Now that the fee is determined by the characteristics of each individual property, houses that are larger and/or that have large driveways or patios are no longer receiving the advantage that city-wide averaging previously afforded. Smaller residences, on the other hand, are being assessed lower and more equitable fees. The goal of the current fee structure is to achieve greater conformance with state law with respect to being more equitable and reasonable, and being directly related to impact on the City's drainage system. In addition, the drainage charge rate is designed to produce only the revenue required by the budget. In this sense, the fee structure is what we call "revenue neutral" -- it is designed to produce the exact same fee (the revenue requirements for the year) that the previous fee structure would have produced. The main difference is that this year the fee is allocated differently among properties to better reflect each property's actual impact.

### **2. WPD Programs**

The Watershed Protection Department encompasses almost all City programs that address the flooding, erosion, and water quality of the City's waterways. The City maintains more than 400 miles of creek and stream segments, providing erosion control, bank stabilization, vegetated swales and infiltration areas. It also designs, constructs, and maintains more than 1,000 miles of underground storm drain pipes that now has more than 34,000 inlets and manholes. It also maintains 1,100 city detention and water quality ponds and dams, and inspects 6,400 commercial ponds. It removes hundreds of tons of trash and debris from storm drains, waterways, and Lady Bird Lake. It has projects and programs that manage drainage and flooding, including flood monitoring and warning systems, ATXfloods.com, flood mapping and modeling, development review, adherence to the National Flood Insurance Program, and the removal of flood risks through purchase of flood-prone residential properties. It is responsible for water quality compliance, discharge permits, inspections and monitoring.

### **3. Roof Eaves**

A number of the administrative rule comments focus on the desire to have ground area under rooftop eaves removed from the calculation of impervious cover, especially for residential properties. Some comments use the term "incidental eave," defining it as a projecting overhang of 24 inches or less. The Watershed Protection Department (WPD) staff has evaluated this suggested change based on hydrologic science and the principles of fairness, reasonableness, and cost effectiveness. The two key elements

involved in the evaluation are: (1) whether a rooftop eave behaves more like impervious cover or pervious cover, and (2) whether the suggested change would make the drainage charge more fair and accurate. The following is a summary of the evaluation and our response to all comments on rooftop eaves.

## **1. Benchmarking**

In reviewing whether other municipalities consider eaves/rooftops as impervious, we found a mixed result. To begin with, there is typically not clarity within each municipality between three potentially different uses of impervious cover – zoning/permitting, drainage charge assessment, and drainage system evaluation and design. Focusing primarily on drainage charge assessment, there are typically three data sources used for assessment of impervious area: tax plats, aerial imagery, and site plans. Tax plats often report “living area” which is an interior wall area, not an exterior wall or eaves measurement. As a result, both Fort Worth and El Paso drainage charges specifically reference “living area” as their data source for residential charges. Dallas bases residential charges on lot size. Both San Antonio and Houston are utilizing aerial imagery for impervious assessments and both specify use of building roofs as their measurement for impervious cover. A cursory review at the national level also showed variation between defining rooftops as impervious or not. The EPA considers rooftops impervious, but municipalities in other states are mixed. WPD staff has not found a national source or study that evaluated and drew conclusions on this specific topic. It is therefore left to WPD staff to consider best-available science and understanding on this topic as discussed below.

## **2. Scientific Justification**

Physically, the roof eaves extend the impervious roof area, collect the storm water falling on the roof, and drain concentrated flow to the roof edge. Also, one must consider that generally not all of the roof’s perimeter is where runoff falls. This is because roofs are often pitched (sloped) such that the rooftop runoff flows toward and concentrates along the down slope portions of the perimeter rather than the entire perimeter, which would include gabled roof edges. This concentrated flow, including the eave area’s contribution, would then fall on to the ground (if no gutter is installed) with considerable impact to the pervious surface (if no hard surface was built under the eave). As a result, the rainfall-runoff process reduces normal ground infiltration rate, generates concentrated ground runoff, and above all, significantly shortens the time of concentration (i.e. stormwater runoff time) as compared to a pervious surface if no structure with eaves were in place. It is true that the concentrated storm water will wet the ground area and some water would infiltrate into soil under the eave, but the concentrated flow over the roof and over the ground surface would result in a fundamentally different hydrologic process as compared to the process of rainfall over a pervious area with trees, bushes and grass. Past City hydrologic studies have demonstrated that flood peak flow is much more sensitive to the time of concentration change than to the change of infiltration rate or impervious area. In other words, the entire roof including the rooftop eave area will significantly change the time of concentration (acting as a sloping impervious area) while the reduced ground infiltration under the eave has inappreciable effect on the downstream peak flow for large storms. The recent comprehensive and detailed dynamic

modeling on green storm-water infrastructure in the Brentwood area of Austin validated this rainfall-runoff phenomenon, that is, even with a large number of green infrastructure components absorbing volume such as raingardens, rain barrels, cisterns, etc., the peak flood flow for a large storm (say a 100-year storm) would not provide appreciable peak flow reduction. Thus, it is the size of drainage area and the area's time of concentration that predominantly determine the magnitude of peak flow. For most cases, the more impervious cover, the shorter the time of concentration. However, this is not always true, depending on the primary flow paths of a drainage area. Considering eaves, it is the time of concentration (driven by slope of roof), not the eave area or the ground area under the eave that predominantly determines the eave's hydrologic impact on the rainfall-runoff process. Hence, the eave roof area acts very similar to the rest of the roof surface in affecting the time of concentration and peak flow. Thus, it is reasonable hydrologically to treat eaves as impervious area.

Nevertheless, the rooftop eave area together with the pervious area under the eave would not act exactly the same as concrete cover ground. On one hand, concrete on the ground would not allow infiltration, whereas some may occur under an eave. On the other hand, concrete on the ground would typically be flatter than a rooftop eave and thus the time of concentration would be slower. Although it is very difficult to accurately determine whether the eave area should be counted as some fraction less than 100% impervious cover, but if so, that fraction would be very small. In summary, the rooftop eave area plays a very similar hydrologic role to the rest of the rooftop area.

For illustration purposes if eaves were to not be counted as impervious, consider a potential drainage fee reduction for a median house in Austin. Let us conservatively assume the area under eaves to be 75% impervious and 25% pervious, based on the reasoning above that rainfall concentration is a larger factor than infiltration in assessing downstream impact. The median of a single-family (S-F) house in Austin has about 3,100 square feet of impervious area, of which roughly 75% typically accounts for the primary building/house. The amount of area under the eaves varies widely from property to property, and especially if gabled eaves, guttered eaves and impervious area under eaves were not counted as potentially pervious area. The maximum possible incidental eave area, assuming ideal conditions, might be as much as 400 square feet. Assuming 25% perviousness of the 400 sq. ft. eave area would be 100 sq. ft. pervious. This assumes each house would have no gutters installed, water falls off all sides of the roof (no gables), and all areas under rooftop eaves were pervious surfaces (rather than portioning out standard items under eaves like driveways, patios, sidewalks, AC pads, etc.), the 100 sq. ft. of pervious area would save a S-F homeowner, on average, not more than \$0.44 per month based on the 2016 City drainage rate and assuming 45% lot impervious. However, if eaves were somehow removed from the citywide impervious database, the citywide drainage charge base rate would have to be re-adjusted upward to recoup the WPD's drainage revenue loss. Hence, the actual monthly savings per S-F house would be even less than \$0.44 per month, perhaps \$0.35 per month or less as a rough estimate. Commenters have stated that a significant portion of the cost burden shift that occurred between single family and other land uses (commercial, multi-family) was due to this eave interpretation. City data simply shows this is not correct. The burden shift was primarily due to the prior City Equivalent Residential Unit (ERU) being previously assigned as a median 1,763 sq. ft. impervious cover, rather than

the median 3,100 sq. ft. we understand it to be today (and the fact that 50% of S-F residential properties exceed the median). That resulted in a fixed drainage charge from prior years for single family properties that was arguably low. The incorporation of impervious cover percentage, based on hydrologic reasoning, in the calculation of the fee had a mitigating effect on this single family burden increase since generally single family lots are less dense than other land uses.

### **3. Data Limitations for Area under Eaves**

The City's planimetric data that quantifies impervious cover on each property derives from aerial photography. Only the roof area of buildings can be seen, and the depth or even the presence of overhangs cannot be discerned. Roof gutters cannot be reliably detected. In conclusion, the City's planimetric data cannot provide the needed information for determining gutter lengths or ground surface conditions under an eave.

### **4. Administration Consideration on Eave Area Reduction**

If the City were to proceed with a universal 100 square feet of impervious cover deduction from structures or give another constant amount or percentage deduction to all property owners, it could weaken the fairness, accuracy, and cost-effectiveness of the current drainage charge structure. Some of the issues associated with the potential change would be:

- Gutters – Many (perhaps most) residential houses are either fully or partially guttered. The portion of a roof that drains storm water to gutters should be treated as 100% impervious (very concentrated flow with shorter time of concentration). If the City decides to give some credit to the ground area under eaves without gutters, an accurate measurement of the qualifying area would be impossible without site visits or detailed information from the owner, and it would be a burdensome undertaking.
- Existence and variable width of eaves - Taking a short cut by assuming two feet around the perimeter of each structure (a possibility with the planimetric data) would grossly overestimate the qualifying area for all buildings. It would be unfair to, give credit to guttered eaves, gabled eaves and structures that have no eaves. Measuring only the pervious areas within 24 inches of the edge of unguttered, downslope eave edges would require on-site visits. Initial observations indicate that the qualifying area would vary considerably from property to property, and that many properties would have none at all.
- Impervious areas under eaves - Not all ground under eaves are pervious areas (driveways, patios, sidewalks, AC pads, etc.), which would also require someone to inspect and measure each property with the owners' permission.
- Fixed impervious deduction burden shift - Providing a constant square footage allowance would tend to shift some of the fee burden from properties with low impervious cover to those with higher amounts (basically a residential to commercial shift, but also a shift from smaller houses

to larger houses). A fixed deduction would require an adjustment to the overall drainage fee rate.

- Percent Impervious deduction burden shift - Providing a percentage allowance to all properties based on total amount of impervious area on each property would have little practical impact since the fee rate would need to increase by approximately an identical percentage in order to generate equal drainage revenue. Alternately, providing a percentage allowance on the coverage of structures only (not total impervious cover of a property) would shift some burden to properties with relatively large parking lots, private drives, or other on-the-ground impervious areas. A percent reduction would require an adjustment to the overall fee rate.
- Offsetting costs for eave credit - Even if downslope, unguttered area under eaves (with no impervious below) could be accurately measured citywide, some of the gain that an eave credit would afford would be wiped out by a corresponding rate increase. The City would have to hire more staff or contract with an outside firm to collect data, which would increase the administration cost. Consequently, it would increase the cost to all property owners and further lower the conservatively estimated \$0.35 or less per month fee reduction on an average. In brief, there is relatively little benefit to property owners in general; it is difficult to implement; and it does not improve fairness, accuracy, and cost effectiveness.

## **5. Code/Criteria Consistency on Impervious Cover**

City Code Section 15-2-5 (A) states that *"Impervious cover shall be calculated in accordance with the Environmental Criteria Manual and City Code Section 25-8-63 (Impervious Cover Calculations)."* The emergency drainage administrative rules further state that impervious area *"is defined by City Code Sections 15-2-1 (B) (4), 15-2-5, 25-8-63 and Environmental Criteria Manual Section 1.8.1."* Eaves are not specially mentioned in any of these sections that define impervious cover. However, it is mentioned in 25-1-21, which excludes "incidental projecting eaves" from the definition of "building coverage," but it also similarly excludes "ground level paving," which indicates building coverage is not describing/defining impervious coverage, but the limit of the building extent. What is common to all definitions of impervious cover is *"the total area of any surface that prevents the infiltration of water into the ground, such as roads, parking areas, concrete, and buildings."* (Underlining added.) The Environmental Criteria Manual (ECM) states further that *"Impervious cover calculations shall include all roads, driveways, parking areas, buildings, concrete, and other impermeable construction covering the natural land surface. Buildings or structures raised above the ground (e.g., pier and beam foundation) shall be considered impervious cover."* (Underlining added.) Pier and beam houses, sheds on cinderblocks, and other similar features that may not be completely in contact with the ground surface are interpreted as impervious cover. Similar to eaves' hydrologic function, wood decks are specifically mentioned in both Code 25-8-63 and ECM Section 1.8.1. Quoting ECM, *"For an uncovered wood deck that has drainage spaces between the deck boards and that is located over a pervious surface, 50 percent of the horizontal area of the deck shall be counted as impervious. A covered deck shall be considered impervious."* WPD has interpreted City Code and the Environmental Criteria Manual to

mean that the entire horizontal coverage of rooftops, including eaves as part of a building structure, comprises the total area of the surface that prevents the infiltration of water into the ground.

#### **6. Impervious Cover Definition Compatibility among City Offices**

Comments have noted that the City's residential development review does not count area under roof eaves as impervious cover unless it is to be occupied by another impervious surface (porch, patio, driveway, sidewalk, etc.). Commercial development review, however, does count roof eaves as impervious cover. In either case, the purposes are different than the determination of a drainage fee structure. Development review is concerned with zoning, subdivision and construction requirements. The drainage fee structure is concerned with the equitable allocation of program service costs among the eligible properties in the city, based strictly on the best estimates of actual current impact that each property imposes. Other WPD program areas include roof eaves in the calculation of impervious cover for drainage analysis and for sizing drainage infrastructure. Projecting roof eaves are treated differently depending on the mission and application to be served by each City office. The WPD interpretation for use in calculating the drainage charge will not impact development review and zoning compliance. WPD staff is currently coordinating with other departments to improve consistency on the definition of impervious cover. This consistency concern with eaves existed before the new drainage charge methodology was developed and will not be resolved either way based on solely the drainage charge eave definition. Also, any revisions to improve consistency will need to be based on best-available science and principles of fairness and reasonableness among all customers rather than revisions made specifically for the sake of consistency with existing rules.

In considering all the aspects discussed above, WPD continues to interpret all rooftop eave areas as impervious cover. This determination is consistent with the existing City Code and Environmental Criteria Manual Section 1.8.1 for decks and buildings. It maintains the drainage charge structure to be land-use neutral, fair, reasonable, and nondiscriminatory.