

**RULE NO.: R161-16.20**

**POSTING DATE: October 5, 2016**

### **NOTICE OF PROPOSED RULE**

The Director of Watershed Protection Department proposes to adopt the following rule after November 6, 2016.

Comments on the proposed rule are requested from the public. Comments should be submitted to Dana McGehee, 505 Barton Springs Road, Suite 1200, Austin Texas, 78704, 974-2634, or via email at [dana.mcgehee@austintexas.gov](mailto:dana.mcgehee@austintexas.gov). To be considered, comments must be submitted before November 6, 2016, the 32nd day after the date this notice is posted. A summary of the written comments received will be included in the notice of rule adoption that must be posted for the rule to become effective.

An affordability impact statement regarding the proposed rule has been obtained and is available for inspection or copying at the address noted in the preceding paragraph.

### **EFFECTIVE DATE OF PROPOSED RULE**

A rule proposed in this notice may not become effective before the effective date established by a separate notice of rule adoption. A notice of rule adoption may not be posted before November 6, 2016 (the 32nd day after the date of this notice) or not after January 3, 2017 (the 90th day after the date of this notice).

If a proposed rule is not adopted on or before January 3, 2017 it is automatically withdrawn and cannot be adopted without first posting a new notice of a proposed rule.

### **TEXT OF PROPOSED RULE**

A copy of the complete text of the proposed rule is available for public inspection and copying at the following locations. Copies may be purchased at the locations at a cost of ten cents per page:

Watershed Protection Department, located at 505 Barton Springs Road, Suite 1200, Austin, TX, 78704; and

Office of the City Clerk, City Hall, located at 301 West 2nd Street, Austin, Texas.

## **BRIEF EXPLANATION OF PROPOSED RULE**

R161-16.20: Revises the Drainage Criteria Manual Section 6.5.0, *Channel Drop Structures*, to correct the reference to clarify that Figure 6-2 is located in Appendix D.


## **AUTHORITY FOR ADOPTION OF PROPOSED RULE**

The authority and procedure for the adoption of a rule to assist in the implementation, administration, or enforcement of a provision of the City Code is established in Chapter 1-2 of the City Code. The authority to regulate design and construction of drainage facilities and improvements is established in Section 25-7-121 of the City Code.


## **CERTIFICATION BY CITY ATTORNEY**

By signing this Notice of Proposed Rule (R161-16.20), the City Attorney certifies the City Attorney has reviewed the rule and finds that adoption of the rule is a valid exercise of the Director's administrative authority.

## **REVIEW AND APPROVED**

  
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Joe Pantalion, P.E., Director  
Watershed Protection Department

Date: 9/15/16

  
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Anne Morgan  
City Attorney

Date: 10/3/16

This Notice of Proposed Rule was posted on a central bulletin board at City Hall by the City Clerk. Date and time stamp is on the front of the notice.

## DCM 6.5.0 - CHANNEL DROP STRUCTURES

The function of a drop structure is to reduce channel velocities by allowing for flatter upstream and downstream channel slopes. Two commonly used drop structures are shown in Figure 6-2 in Appendix E D of this manual.

The flow velocities in the upstream and downstream channels of the drop structure need to satisfy the permissible velocities allowed for channels. The design parameters for the sloping channel drop and the vertical channel drop are given below.

### 6.5.1 - Sloping Channel Drop

- A. Approach Apron. A minimum ten (10) foot long riprap apron should be constructed immediately upstream of the drop to protect against the increasing velocities and turbulence which result as the water approaches the sloping portion of the drop structure. The same riprap and bedding design should be used as specified for the portion of the drop structure immediately downstream of the drop.
- B. Chute. The chute shall have roughened faces and shall be no steeper than 2:1. The length, L, of the chute depends upon the hydraulic characteristics of the channel and drop. For a unit discharge, q, of 30 cubic feet per second per foot, L would be about 15 feet, that is, about ½ of the q value. The L should not be less than ten (10) feet, even for low q values.
- C. Downstream Apron. The length of the downstream apron shall be sized according to Table 6-3 and shall be constructed of reinforced concrete or riprap depending on structural requirements.

Table 6-2 Minimum Roughness Coefficients of New or Altered Channels	
Type of Channel and Description	Mannin g's Coeff icients
1. Grass lined	
a. Bermuda (with regular mowing)	.040
b. St. Augustine (with regular mowing)	.045
c. Native grasses and vegetation not mowed regularly	.060
2. Concrete	

a. Concrete lined (rough finish)	.020
b. Concrete lined (smooth finish-culverts)	.015
c. Concrete rip-rap (exposed rubble)	.025
3. Gabion	.035
4. Rock-cut	.025
Source: 1. Chow, V.T. Open Channel Hydraulics. 1959. 2. WRC Engineering, Inc. Boulder County Storm Drainage Criteria Manual. 1984.	

Table 6-3 Length of Downstream Apron	
Maximum Unit Discharge, $q$ (cfs/ft)	Length of Downstream Apron, $L_B$ (ft)
0-14	10
15	15
20	20
25	20
30	25
Source: City of Austin, Watershed Engineering Division.	

### 6.5.2 - Vertical Channel Drops

The design criteria for the vertical channel drop is based upon the height of the drop and the normal depth and velocity of the approach and exit channels. The channel must be prismatic throughout, from the upstream channel through the drop to the downstream channel.

The steepest allowable sideslope for the riprap stilling basin is 4:1. The riprap should extend up the side slopes to a depth equal to one (1) foot above the normal depth projected upstream from the downstream channel. The maximum fall allowed at any one drop structure is four (4) feet from the upper channel bottom to the lower channel bottom.

A description of the drop structure and the design procedure, going from upstream to downstream, is given below and shown on Figure 6-2 in Appendix ~~E~~ D of this manual.

- A. Approach Channel: The upstream and downstream channels will normally be grass-lined trapezoidal channels.
- B. Approach Apron: A minimum ten (10) foot long riprap apron is provided upstream of the drop to protect against the increasing velocities and turbulence which result as the water approaches the vertical drop.
- C. Downstream Apron: The riprap stilling basin is designed to force the hydraulic jump to occur within the basin and is designed for essentially zero scour.