Design Criteria Manual Updates

Amy Cannon, PE, CFM
Public Works & Transportation Department
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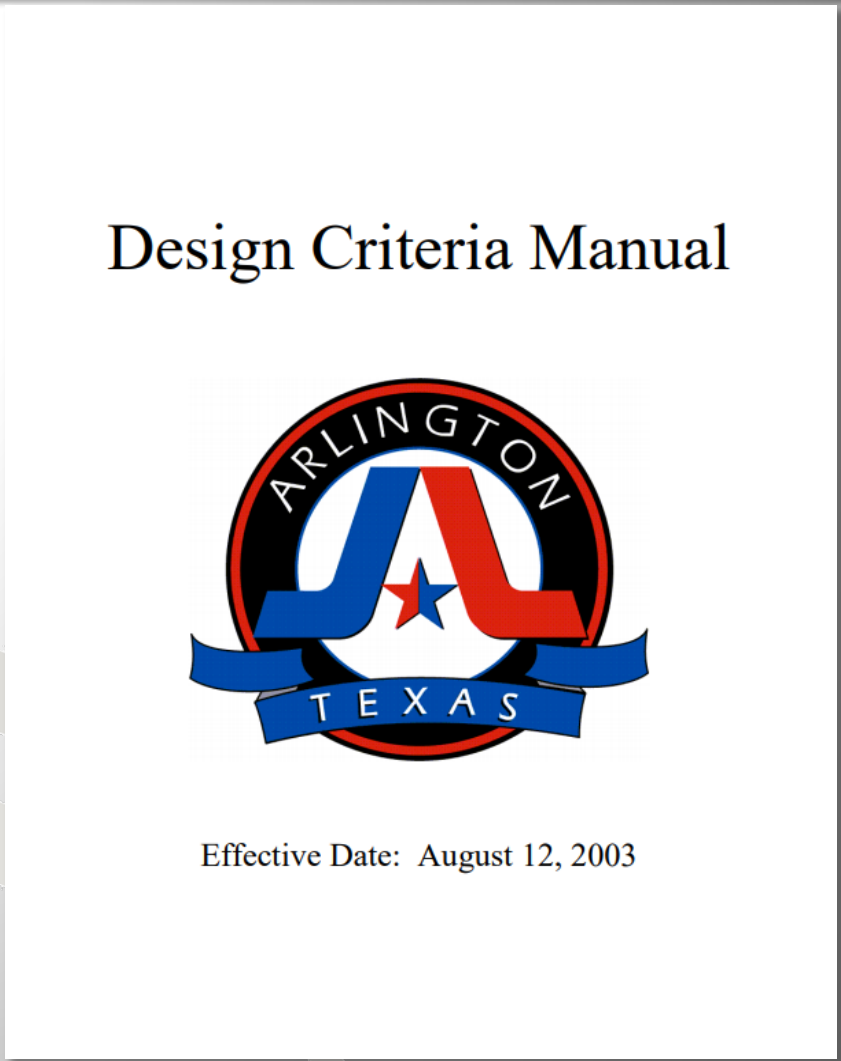
ARLINGTON℠
THE AMERICAN DREAM CITY

DCM Update Background

- Current Design Criteria Manual Adopted in 2003
  - Ordinance
  - Minor updates since adoption
- Effort to update DCM started in 2012
- Departments Involved:
  - Public Works & Transportation
  - Water Utilities
  - Parks and Recreation
  - Planning and Development
  - Fire


Design Criteria Manual

Effective Date: August 12, 2003

HB 3167

- Effective **September 1, 2019**
- Amends Chapter 212 of Texas Local Government Code - Subdivision of Land (plats)
  - Changes to Plat Process will be handled by Planning and Development Services
- City is required to provide detailed comment letters with code references
  - Standard City Policies must be codified

DCM Update Goals

- Incorporate City policies into design criteria
- Clarifies current criteria
- Address issues created due to lack of specific criteria
- Update to industry standard practices and licensing requirements
- Incorporates state and federal regulatory requirements
- Moves guidance documents to actual requirements

DCM Materials

ENGINEERING

Design Criteria Manual
Standard Specifications & Special Provisions
Paving/Drainage/Water/Sewer Details
Abandonment of Easements & Right-of-Way
Prequalification Statement for Public Improvements (Paving, Drainage & Water/Sewer)
Monuments & Benchmarks

DESIGN CRITERIA MANUAL

- Download the Design Criteria Manual
- Download the Draft version of the updated Design Criteria Manual - COMING SOON

This Design Criteria Manual was written by and includes criteria from the following departments:

- Department of Public Works and Transportation
- Water Utilities Engineering Department
- Planning and Development Services
- Parks and Recreation Department
- Fire Department

This manual is intended to provide criteria for the most commonly encountered infrastructure designs in the C
Jurisdiction (ETJ). This manual was developed for users with knowledge and experience in the applications of

- Email questions and comments to DCMupdates@arlingtontx.gov

Proposed Format Changes

Current DCM

- Organized by Type of Development
  - Subdivisions
  - Commercial Sites
  - Capital Improvements
- References but does not require the use of guidance documents

Proposed DCM

- Organized by Type of Improvements
  - Water Utilities
  - Transportation
  - Stormwater
  - Parks
- Removes Checklists and Appendices

Stormwater Criteria Updates

- Removes stormwater design criteria from other ordinances and consolidates to DCM
- Adopts some of NCTCOG's Integrated Stormwater Management (iSWM) Hydrology and Hydraulic Technical Standards
- Incorporates City's Watershed Study Technical Standards to maintain engineering models
- Adds criteria for allowable materials and maintenance access

Stormwater Criteria Updates Submittals

Current Requirement	Current Section	Proposed Requirement	Proposed Section
Stormwater Submittal requirements for planning and zoning, public improvements, construction	Various locations in the UDC and DCM, and meetings with PDS Staff	Consolidate and clarify stormwater submittal requirements and applicability of stormwater standards	5.2
No current written standards on types of stormwater models considered acceptable by the City.	N/A	Acceptable Hydraulic and Hydrology modeling software	5.2
Use of available flow rates from watersheds	DCM 4.6.F.1, 5.6.F.1, 6.6.F.1	Use of City watershed models and FEMA Effective data	5.8.1
Update to Flood Study Matrix	DCM 4.6.F.7, 5.6.F.7, 6.6.F.7	Requires existing conditions models to be submitted for all proposed construction whether in the mapped floodplain or not	5.8.2

Stormwater Criteria Updates Submittals

CHAPTER 5 – STORMWATER:
TECHNICAL GUIDELINES
FOR ACCEPTABLE SUBMITTAL

Y N N/A	ITEM	ADDITIONAL INFORMATION
General Guidelines		
☐ ☐	All drainage related plans and studies sealed by an Engineer	
☐ ☐	Drainage plan creates no adverse impacts	No new or increased flooding of existing insurable, habitable structures as defined by FEMA
☐ ☐	Drainage studies and design plans based upon fully developed watershed or drainage area runoff conditions.	
☐ ☐	Stormwater carried to an "adequate and acceptable outfall"	An adequate outfall is generally a stream, channel or improved system that does not create or increase flooding or erosive conditions downstream. Water bodies that are not connected to a natural or improved stormwater conveyance system such as a stream, channel, or underground system shall not be considered an acceptable outfall. Off-site conveyance to reach an adequate and acceptable outfall shall be contained within a drainage easement or the public right of way. Outfalls to privately maintained stormwater facilities such as constructed ponds, channels or underground systems may require separate agreements with private property owners in accordance with City Code.
☐ ☐	Proposed discharge rates and velocities from a new land disturbance or redevelopment do not alter drainage patterns, concentrate flow, connect to an existing stormwater infrastructure, or exceed the runoff from existing (pre-project) conditions, unless no adverse impacts will be created.	

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Stormwater Criteria Updates
Drainage Easements

Current Requirement	Current Section	Proposed Requirement	Proposed Section
Drainage easement required for 25 year fully urbanized floodplain plus 1-foot of freeboard with 10-feet additional buffer on both sides of the floodplain	DCM4.6.F.5.a, 5.6.F.5.a, 6.6.F.5.a	Constructed/Modified Channels: Drainage easement required for 100 year fully urbanized floodplain with 10-feet additional buffer on both sides of the floodplain. Natural Streams: 100 year fully urbanized floodplain	2.2.1.A
Concentrated runoff from a site to an adjacent property requires an easement or letter of permission.	DCM 4.6.F.11, 5.6.F.11, 6.6.F.11	Drainage easement required for concentrated flow on an adjacent property	5.4.3

Stormwater Criteria Updates
Drainage Easements

Current Requirement	Current Section	Proposed Requirement	Proposed Section
Detention ponds are not required to be within easements	UDC 6.2.3.B and D; DCM 4.3.A.2, 5.3.A.2	Detention ponds and private BMPs are required to be within dedicated easements.	2.2.2
Storage/Retention Pond Design Guidelines	DCM 4.6.F.9, 5.6.F.9	10-foot wide access easement is to be provided around the facility for maintenance	5.9.1

Stormwater Criteria Updates Maintenance Agreements

Current Requirement	Current Section	Proposed Requirement	Proposed Section
Stormwater Storage Facilities require a maintenance agreement.	DCM 4.6.F.9, 5.6.F.9	Operation schedule required to be submitted in the maintenance agreement.	5.9
BMP maintenance responsibility shall be included either as a maintenance statement on the plat or by a maintenance agreement filed by separate instrument.	UDC 6.5.2.B.3	Maintenance Agreements shall be filed with County for every detention pond and BMP. Agreements shall include estimate of maintenance costs and funding sources. The post construction BMP installation verification and inspection shall be submitted to the City or included in the as-built letter.	5.10.3

Stormwater Criteria Updates
Design Storm Criteria

Current Criteria Type of Facility	Current Design Storm	Proposed Type of Facility	Proposed Design Storm
On-Grade Inlets	5-year	Curb Inlets	25-year
Low Point Inlets	25-year	Drop Inlets	25-year
Storm sewers upstream of low points	5-year	Storm Drain	25-year
Storm sewers downstream of low points	25-year		
Street right-of-way	100-year	Street Right of Way	100-year
Channels and Creeks	25-year	Channels and Streams	100-year
Creek culverts and bridges	25-year	Stream Culverts and Bridges	25-year
Permanent bar ditch and associated culverts	5-year	Roadside ditch and associated culverts	25-year
		Stormwater Storage Facilities	2-, 25-, 100-year

Stormwater Criteria Updates Hydrology

Current Requirement	Current Section	Proposed Requirement	Proposed Section
Rainfall intensity to be determined using Hydro-35 and TP-40	DCM 4.6.F.1.c, 5.6.F.1.c, 6.6.F.1.c	Rainfall intensity to be based off of iSWM Rainfall Tables for Tarrant County	5.6.3
Rational Method Criteria updates	DCM 4.6.F.1.a, 5.6.F.1.a, 6.6.F.1.a	Adopt standard engineering practice for Rational Method and limit subbasin sizes to 20 acres	5.6.5
The Modified Rational Method is allowed for determination of peak runoff	DCM 4.6.F.1.a, 5.6.F.1.a, 6.6.F.1.a	Modified language to match iSWM criteria and standard engineering practice	5.6.6
Runoff coefficients based on old zoning types	DCM 4.6.F.1.a, 5.6.F.1.a, 6.6.F.1.a	Runoff coefficients updated to current land use designations	5.6.5

Stormwater Criteria Updates
Erosion Clear Zone

Current Requirement	Current Section	Proposed Requirement	Proposed Section
Erosion clear zone varies from 50 feet from the toe of the stream to 3:1 slope from the toe plus 10 feet. Separate Creek Buffer Zone requires 25 feet from the existing top of bank.	UDC 6.5.2.A.1.c	Erosion Clear Zone will include horizontal and vertical area based upon the location of the 2-year water surface elevation. Minimum setback is 50-feet from the 2-year bank stations.	5.7.5

Stormwater Criteria Updates
Minimum Finished Floor

Current Requirement	Current Section	Proposed Requirement	Proposed Section
Recommend a minimum 1' FFE over the top of curb elevation at T-intersections, low points, or as required.	DCM 4.6.F.9.13	Recommend a minimum 1' FFE over the top of curb elevation at T-intersections, low points, or as required.	5.3
Flume Design Criteria	DCM 4.6.F.14a, 5.6.F.14a, 6.6.F14a	• Flume and vegetated swale design criteria updated to include 1 foot of freeboard from top of curb to adjacent FFE • MFFE required to be shown on lots adjacent to flumes, minimum, defined minimum flume and vegetated swale slope	5.7.5F

Stormwater Criteria Updates
Compensatory Storage

Current Requirement	Current Section	Proposed Requirement	Proposed Section
Applicants have option to dedicate 100-year fully developed drainage easement in the floodplain or provide compensatory storage is required when there is fill in the floodplain.	DCM 4.6.F.6, 5.6.F.6, 6.6.F.6	Compensatory storage is required for fill in the floodplain. Clarifies how compensatory storage is measured.	5.8.3

Stormwater Criteria Updates
Stormwater Storage Facilities

Current Requirement	Current Section	Proposed Requirement	Proposed Section
Stormwater Storage Facilities to be evaluated at the 5-, 25-, and 100-year storms	DCM 4.6.F.9, 5.6.F.9	Stormwater Storage Facilities to be evaluated at the 2-, 25-, and 100-year storms	5.9
Detention required if there is downstream flooding unless PE can prove excess flow will not change flood heights or stream velocities by more than 5%.	DCM 4.6.F.9, 5.6.F.9, 6.6.F.9	Stormwater storage facilities shall be designed and constructed when proposed discharge from a new land disturbance or redevelopment outfalls to an existing system with flooding or a system without capacity to contain design storm	5.1.2; 5.9
Detention is an allowable BMP if it retains the first 1" of runoff and releases it slowly over 24-48 hours.	DCM 4.3.A.2, 5.3.A.2	Detention is an allowable BMP if it retains the first 1" of runoff and releases it slowly over 24-48 hours. A sediment forebay must be included.	5.9

Stormwater Criteria Updates
Stormwater Storage Facilities

Current Requirement	Current Section	Proposed Requirement	Proposed Section
N/A	N/A	Sedimentation ponds need to have excess materials removed prior to final inspection if used as a permanent facility	5.11.3.F
Storage/Retention Pond Design Guidelines	DCM 4.6.F.9, 5.6.F.9	• Computation method restrictions are clarified • Design tables are required on the plan sheet • Slopes shall not be more than 4:1 • Clarification on when pilot channels must be provided • Spillway and flow path must be designated in case of outlet clogging.	5.9.1

Stormwater Criteria Updates
Stormwater BMPs

Current Requirement	Current Section	Proposed Requirement	Proposed Section
Number of BMPs is determined by the site acreage of disturbed area.	DCM 4.3.A.2, 5.3.A.2	Number of BMPs is determined by the site acreage of impervious area.	5.10.2
A list of BMPs was provided.	DCM 4.3.A.2, 5.3.A.2	Removed tree preservation, dedication of the floodplain, landscaping, cluster design and LID as BMPs. Added other BMP options including habitat restoration, rain gardens, etc.	5.10.3
BMPs shall be evaluated during the conceptual design and included in the public stormwater system if installed.	DCM 6.3.A	BMP section applies to both public and private improvements.	5.1

Transportation Criteria Updates

CURRENT DCM CRITERIA	PROPOSED DCM CRITERIA
The minimum roadway grade is 0.5% (Sections 4.6 E.3, 5.6 E.3 & 6.6 E.3)	The minimum roadway grade is 1% (Section 4.5.4)
No requirements for traffic roundabouts	Consider the feasibility of traffic roundabouts vs typical intersections (Section 4.6)
No requirements for concrete ribbons on county-type roadways	30-inch concrete ribbon placed on each side of asphalt county-type roadways (Section 4.7)
4-foot minimum sidewalk width (Sections 4.6 E.7, 5.6 E.7 & 6.6 E.6)	5-foot minimum sidewalk width (Section 4.10.2)
Minimum driveway radius of 2.5 feet on local and minor collectors (Section 4.5.E, 5.5.E, & 6.5.C)	Minimum driveway radius of 5 feet on local and minor collectors (Section 4.9.2)

Transportation Criteria Updates

CURRENT DCM CRITERIA	PROPOSED DCM CRITERIA
No Accessible Pedestrian Signal (APS) design required	Adding Accessible Pedestrian Signal (APS) design requirements (Section 4.13.2.B.8)
High Pressure Sodium (HPS) street lights (Section 6.5 G.2.a)	LED (light-emitting diode) lights for arterial and major collector roadways (Section 4.15.3.A)
All 24-feet wide fire lanes shall have a 30-foot inside radius and 54-foot outside radius (Section 4.8.C.7 & 5.7.C.9)	Adding option for 30-feet wide fire lane with a minimum inside radius of 20 feet (Section 4.5.6.E)
Bridges used as fire access shall be constructed to carry a 60,000 lb load (Section 4.8.C.9 & 5.7.C.9)	Increased minimum load capacity to 80,000 lb (Section 4.5.6.G)

Transportation Criteria Updates

CURRENT DCM CRITERIA	PROPOSED DCM CRITERIA
Assess the effects of specific development activity on the existing and planned roadway system. (Section 3.6.B.1)	Expanded the purpose of Traffic Impact Analysis. (Section 4.4.1)
TIA requirement for release of permit language is vague (Section 3.6.B.3.e)	Added clarifying language for TIA acceptance for release of permit (Section 4.15.3.A)
None	Adding subsection for Right of Way Abandonment (Section 4.4.2.E)
None	Added “Required by City Traffic Engineer” to Special Circumstances (Section 4.2.2F)

Transportation Criteria Updates

CURRENT DCM CRITERIA	PROPOSED DCM CRITERIA
Submit TIA no later than zoning case submittal; submitted 20 working days prior to City Council action. (Section 3.6.B.4.b)	Added TIA submittal and approval language. TIA shall be reviewed & accepted prior project application being deemed complete (Section 4.4.3.A)
Comprehensive plan not noted (Section 3.6.B.4.c.3)	Expanded the traffic impacts to include the proposed comprehensive plan (Section 4.4.3.B.4)
Passerby traffic percentage rates obtained from latest ITE Trip Generation Manual (Section 3.6.B.6)	Adding City approval of passerby rates (Section 4.4.3.B.7)

Transportation Criteria Updates

CURRENT DCM CRITERIA	PROPOSED DCM CRITERIA
K-Values (Section 4.6.E.3, 5.6.E.3 & 6.6.E.3)	K-Values revised to be consistent with latest AASHTO Green Book (Section 4.5.4)
Horizontal Alignment (Section 4.6.E.4, 5.6.E.4 & 6.6.E.4)	Centerline radius revised to be consistent with latest AASHTO Green Book. Local Streets added (Section 4.5.5)
5 inches of concrete over 8 inches of lime/cement subgrade	Paving requirements have been updated for Private Access Easements to 10 inches of lime and 8 inches of cement subgrade (Section 4.7)
No mention of number of driveways allowed	Auxiliary Lanes section has been updated. A maximum of 3 driveways can be constructed with a continuous deceleration lane (Section 4.9.4.B)

Transportation Criteria Updates

CURRENT DCM CRITERIA	PROPOSED DCM CRITERIA
Mid-Block crossings only at established school crossing controlled by crossing guards (Section 6.5.D.6.g.2)	Mid-Block crossing will also with at a warranted signalized pedestrian crossing (Section 4.11.4.D.3)
Traffic signal pull boxes – 2 foot concrete aprons (Section 6.5.E.2.c)	Adding requirement for 10-inch concrete apron to be constructed with pull boxes (4.13.2.B.7.i)
Fiber optic cable requirements on major roads and intersections (Section 6.5.F.1)	Adding requirement that Owner is responsible to add fiber optic conduits on major roadways and intersections when required to build roadway (Section 4.14.1)
Separate streetlight poles requirements (Section 6.5.F)	Combined pole type sections and unified all street types (Section 4.15.1.G)

Water Utilities Criteria Updates

- Incorporates regulatory requirements from the Texas Commission on Environmental Quality (TCEQ)
- Removes design criteria from other ordinances and consolidates to DCM
- Subsequent Connection Charge
  - Simplifies language
  - Expands methods for calculating charge
- City Participation for Public Water and Sewer
  - Simplifies language
  - Revises to match Texas Local Government Code

Water Utilities Criteria Updates

CURRENT DCM CRITERIA	PROPOSED DCM CRITERIA
Water lines shall be a minimum of 6 inches throughout the distribution system (Section 4.4.D.1)	Distribution mains shall be a minimum of 8 inches in diameter, with the exception of a dead-end main within a cul-de-sac which shall be 6 inches in diameter. (Section 3.1.2)
Current manual allows water main minimum allowable radius per outdated requirements.(Section 4.4.D.2)	Mains should generally be constructed in a straight alignment. In conditions where the design engineer intends for the contractor to use pipe joint deflection in lieu of fittings, the drawings shall include and make specific reference to the manufacturer's deflection tolerances. In no case shall the designed deflection be greater than the manufacturer's maximum joint deflection. (Section 3.1.2.)

Water Utilities Criteria Updates

CURRENT DCM CRITERIA	PROPOSED DCM CRITERIA
Current manual says dead end systems shall be avoided where possible, but if necessary shall not exceed 2,000 feet.(Section 4.4.D.1)	Water mains shall be constructed in a looped configuration. Water mains located within a cul-de-sac are not required to be looped under certain conditions. (3.1.3)
No mention of water services connected to transmission mains.	Service connections are generally prohibited on transmission mains. In lieu of connection to a transmission main, WU may require a parallel distribution main to be installed. Exceptions will require approval by WU.(Section 3.1.4)
No mentioned of water services connections to fire service mains.	Domestic and irrigation service connections are prohibited on private fire services and public fire hydrant leads.(Section 3.1.4)

Water Utilities Criteria Updates

CURRENT DCM CRITERIA	PROPOSED DCM CRITERIA
Current manual states fire hydrant spacing (Section 4.4.D.4)	References current Fire Prevention Ordinance (Section 3.1.7)
Current manual states sanitary sewer main minimum allowable radius for PVC pipe shall be greater than Radius=300*Diameter. (Section 4.4.D.2)	WU prefers that sanitary sewer mains be constructed in a straight alignment for maintenance reasons and location accuracy. However, WU will allow a curved alignment in certain situations in accordance with TCEQ's rules on deflection of pipe. TCEQ Chapter 217 requires that sanitary sewer mains shall be installed in accordance with 80% of the manufacturer's instructions. It should also be noted that if we do not follow the manufacturer's instructions, the manufacturer would void the pipe warranty. (3.2.3)

Water Utilities Criteria Updates

CURRENT DCM CRITERIA	PROPOSED DCM CRITERIA
Current manual states a minimum velocity of 2 ft/s shall be mainained. (Section 4.4.6.E.1)	Mains shall be designed to produce a minimum velocity of 3.0 feet per second or greater when flowing half full based on Manning's equation using an "n" value of 0.013. Exceptions will require approval by WU. (Section 3.2.3)
Current manual states on sewer services 5" and larger in size, an approved manhole shall be installed at the City sewer main. (Section 4.4.6.E.2)	A manhole is required at service connections 8 inches and larger. (Section 3.2.4)
No mention of aerial crossings, siphons, lift stations and force mains.	Prohibits aerial crossing, siphons, lift stations and force mains with exception approved by Director.

Parks Criteria Updates

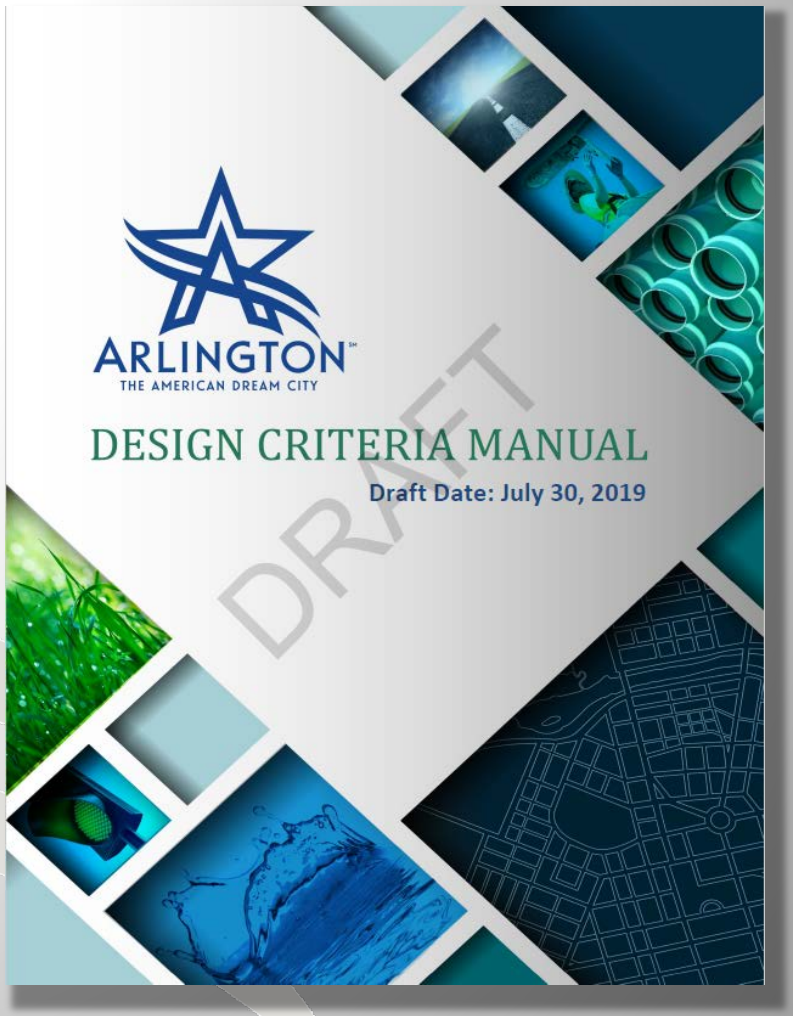
CURRENT DCM CRITERIA	PROPOSED DCM CRITERIA
Hackberry and Green Ash trees are allowed (Section 6.2)	Remove Hackberry and Green Ash trees. Replace with Chinquapin Oak and Bald Cypress. Tree species survival rate is higher. (Section 6.2)
None	Added verbiage regarding the Monarch Butterfly Initiative. Has become a city-wide priority since last DCM rewrite (Section 6.3)
Did not specify current license required (Section 6.5 & 6.6.2)	Added requirement that Landscape Architects and Irrigators must have a current/active license. Ensure valid license (Section 6.5 & 6.6.2)
Slope steepness requirement is	Changed slope steepness from 3:1 to 4:1.

Parks Criteria Updates

CURRENT DCM CRITERIA	PROPOSED DCM CRITERIA
None	Added section on Temporary Stabilization. Elaborate on when stabilization is necessary and the types of temporary stabilization that are allowed (Section 6.5(G))
None	Add Live Oak tree. Added because of the size of tree canopy. (Section 6.6)
None	Incorporates Forestry and Beautification Tree Design Guidelines to facilitate maintenance and preservation of City assets

Next Steps

- August 20 – Council Work Session
- September 10
  - First Ordinance Reading
- September 19 or 24
  - Second Ordinance Reading



Questions and Discussion

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