

# Tarrant County

## ENGINEERING STANDARDS MANUAL



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### Tarrant County Transportation Services Department

Randall Skinner  
Director, Transportation Services  
100 E. Weatherford, Room 401  
Fort Worth, Texas 76196  
Email: [rskinner@tarrantcountytexas.gov](mailto:rskinner@tarrantcountytexas.gov)  
Phone: 817-884-1173

### County Judge

Tim O'Hare

### Commissioner Precinct 1

Roy Charles Brooks

### Commissioner Precinct 2

Alisa Simmons

### Commissioner Precinct 3

Gary Fickes

### Commissioner Precinct 4

Manny Ramirez

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## Section 1. General Provisions

### 1.01. Title

This Engineering Standards Manual of Tarrant County, Texas ("Tarrant County" or simply the "County") is called the "Engineering Standards Manual" within the remainder of this document.

### 1.02. Authority

The Tarrant County Commissioners Court (the "Commissioners Court") adopts this Engineering Standards Manual through the authority granted to it by the U.S. Constitution, the Texas Constitution, and the laws of the State of Texas, specifically [Texas Local Government Code \(TLGC\) Chapter 232](#), as amended.

### 1.03. Severability

If any portion of this Engineering Standards Manual is found to be unconstitutional by a court of competent jurisdiction, such finding will not invalidate the remainder of the Engineering Standards Manual, which will continue in full force as if the invalidated portion were not a part thereof.

### 1.04. Purpose

The County adopts this Engineering Standards Manual for the following purposes:

- A. To promote the health, safety, and general welfare of the community within the unincorporated areas of the County;
- B. To ensure that Public Improvements and Infrastructure are built to a consistent standard and do not burden the County with the cost of unnecessary maintenance over the lifespan of the Public Improvement or Infrastructure facility;
- C. To promote Best Management Practices (BMPs) that ensure Public Improvements and Infrastructure conserve resources and operate efficiently; and
- D. To eliminate administrative delays and inefficiencies in the review of Construction Plans for Public Improvements and infrastructure.

### 1.05. Compliance with Subdivision Rules Required

- A. The County will not approve an Application for Construction Plans for Public Improvements and Infrastructure under this Engineering Standards Manual unless it complies with all County regulations pertaining to the Subdivision and development of land.
- B. The County will use the following in reviewing an Application:
  1. This Engineering Standards Manual, as amended;
  2. Court Orders, as amended; and
  3. Other applicable federal, state, and local regulations.
- C. References to applicable laws, Court Orders, County regulations, and plans, including this Engineering Standards Manual and the Subdivision Regulations, mean those documents as they exist or as amended.
- D. The property owner is responsible for complying with applicable laws, Court Orders, regulations, and plans.
- E. The County is not responsible for enforcing regulations outside of its authority.

### **1.06. Public Improvements for Roads and Drainage Required**

- A. The Subdivider is responsible for Public Improvements necessary for the proper development of the Subdivision under TLGC Section 232.003.
- B. The Subdivider must design and construct Public Improvements according to this Engineering Standards Manual, the Subdivision Regulations, and any other standards the Commissioners Court adopts by Court Order under TLGC Section 232.003.
- C. The Subdivider must submit Record Drawings cataloging all changes to design from Construction Release to Final Acceptance of the Subdivision.
- D. The Approval or the recording of a Plat does not impose any obligation upon the County concerning the maintenance of any improvement.



## Section 2. Drainage Design Standards

### 2.01. General Requirements

- A. This **Section 2** applies to all Plats and Replats involving Construction Plans or Public Improvements.
- B. All drainage structures and appurtenances shall be designed and sized by an Engineer.
- C. Drainage calculations shall be based on methods described herein or other method(s) approved by The Department based on commonly accepted engineering practices.
- D. Record Drawings are required before the release of the Construction Bond.
- E. Standards as Minimum Requirements
  - 1. The standards and methods described in these standards represent minimum requirements. The Department may approve alternatives that exceed the standards of this **Section 2**.
  - 2. Civil Construction Plans, design calculations, and details are the responsibility of the Developer's Engineer.
    - a. The County's review and approval of Construction Plans do not represent that the County has re-engineered or verified the engineering of the proposed Public Improvements.
    - b. The Subdivider or Developer's Engineer is responsible for all engineering and recognizes that specific site circumstances or conditions may require improvements constructed to exceed the minimum standards contained herein.
    - c. The Developer's Engineer is responsible for the applicability and accuracy of the Construction Plans and specifications.
- F. Lot-to-lot drainage, defined as artificially concentrated or redirected flow from one individually owned private lot to another lot, is prohibited unless demonstrated by Hydrologic and Hydraulic (H&H) analyses that there are no adverse impacts to adjacent lots or that flows are contained in a private drainage easement.
- G. Adverse Drainage Impacts Prohibited
  - 1. The Post-Development stormwater discharge shall not cause adverse drainage impacts to adjacent or downstream properties.
  - 2. Adverse drainage impacts include the following list.
    - a. New or increased flooding of existing insurable, habitable structures as defined by FEMA.
    - b. Increases in water surface elevations for the 5-, 10-, 25-, and 100-year storm events unless contained in the existing channel, roadway, drainage easement, and/or right-of-way. Roadway drainage criteria shall also be met.
    - c. Increases in downstream discharges for the 5-, 10-, 25-, and 100-year storm events.
    - d. Post-development velocities for the 5-, 10-, 25- and 100-year storm events that are increased by more than 5% above pre-development velocities or that exceed the maximum permissible velocity of the receiving drainage system. If existing velocities exceed the maximum permissible velocities, no additional increases in velocity will be allowed. Exceptions to these criteria require a certified geotechnical/ geomorphologic study that provides documentation that a higher velocity will not increase erosion.

3. If, in the opinion of The Department, the Post-Development runoff has the potential to cause adverse impacts, alternative approaches to routing or detention must be considered in order to reduce any peak discharge, velocities, or concentrated flow onto adjacent properties.
- H. Documents and Standards Adopted by Reference
1. Stormwater discharges from all Development projects shall conform to all applicable federal, state, and local regulations, including but not limited to the National Pollutant Discharge Elimination System (NPDES) requirements of the Clean Water Act (CWA), the requirements of the Texas Commission on Environmental Quality (TCEQ), and the **Texas Water Code**.
  2. Drainage calculations shall be based on methods described herein or other method(s) approved by The Department based on commonly accepted engineering practices.
  3. Development within the 100-Year Storm Event Floodplain, as determined by FEMA, shall be in accordance with the *Tarrant County Floodplain Management Regulations*.
- I. All road and street drainage structures shall be complete within twenty-four (24) months from the date of Plat or Construction Plans approval, whichever is most recent unless an extension of time is granted by The Department. If infrastructure is not completed, the County may enforce completion through the Construction Bond.

## 2.02. Drainage Design Calculations

- A. All appropriate calculations showing runoff and capacity of onsite and receiving drainage structures, including creeks and ditches, shall be provided for all drainage areas and structures, including design and 100-year flow rates, velocities, hydraulic grade lines, capacities, and headwater depths.
- B. The Subdivider or Developer's Engineer shall provide evidence in enough detail for The Department to determine whether no adverse impacts to adjacent properties will be created.



### 2.03. Hydrologic Analysis

The following methods are acceptable approaches for estimating runoff:

**Table 1: Hydrology Methods**

Hydrologic Method	Drainage Area Size Limitation
Rational Method	< 100 acres
Modified Rational Method	< 100 acres
Unit Hydrograph (SCS)	Any size
Unit Hydrograph (Snyder's)	> 1 acre
TxDOT Regression Equation	10 to 100 square miles (rural design applications)
USGS Regression Equation	3 to 40 square miles (urban design applications)

#### A. Land Use

1. The Subdivider or Developer's Engineer shall evaluate onsite runoff conditions for Pre-Development (existing) conditions and Post-Development conditions.
2. Where the subject property is located within a larger watershed or where off-site flows travel through the subject property, the Subdivider or Developer's Engineer shall evaluate runoff conditions for all off-site watersheds and drainage areas based on Fully Developed Conditions.
3. Runoff coefficients shall be as specified in Table 2. Other runoff coefficients may be used at the approval of The Department.

**Table 2: Recommended Runoff Coefficient Values**

Description of Area	Runoff Coefficients
Lawns	0.10 – 0.35
Agricultural	0.30
Forest	0.15
Open Water	1.00
Business:	
Downtown Areas	0.95
Neighborhood Areas	0.70
Residential:	
Single Family (1/8 ac lots)	0.65
Single Family (1/4 ac lots)	0.60
Single Family (1/2 ac lots)	0.55
Single Family (1+ ac lots)	0.45
Multi-Family Units (Light)	0.65
Multi-Family Units (Heavy)	0.85



Commercial/Industrial: Light Areas	0.70
Heavy Areas	0.80
Parks, Cemeteries	0.25
Playgrounds	0.35
Railroad Yard Areas	0.40
Streets (Asphalt, Concrete)	0.95
Driveways, Sidewalks, Roofs	0.95
Gravel Areas	0.50
Graded or No Plant Cover	0.30 – 0.60

4. Fully Developed Watershed conditions shall be determined based on the land use specified in the latest municipal development plan information, where available.
5. For areas of the County that are not contained in a development plan, a runoff coefficient of 0.70, equivalent to a medium-density Commercial/Industrial land use, shall be used to determine Fully Developed Conditions flows. Alternative future land use assumptions shall be proposed with supporting documentation, subject to final approval by The Department.

B. Time of Concentration

1. The Subdivider or Developer's Engineer must identify the flow path along which the longest travel time is likely to occur.
2. Time of concentration must be calculated and shown on plans.

C. Rainfall Estimation

1. Rainfall rates for drainage design purposes shall be estimated in accordance with standard technical information for Tarrant County provided in Table 3 and approved by The Department.

Table 3: Tarrant County Rainfall Data

Hours	Minutes	Design Frequency (years)			
		5	10	25	100
		Rainfall Intensity (inches/hour)			
<b>0.083333</b>	5	7.08	8.00	9.17	11.09
	6	6.76	7.65	8.79	10.66
	7	6.47	7.32	8.44	10.26
	8	6.21	7.03	8.12	9.89
	9	5.97	6.76	7.82	9.56
	10	5.74	6.51	7.55	9.24
	11	5.54	6.29	7.30	8.95
	12	5.35	6.08	7.07	8.68
	13	5.18	5.88	6.85	8.43
	14	5.01	5.70	6.65	8.20
<b>0.25</b>	15	4.86	5.53	6.46	7.98
	16	4.72	5.37	6.28	7.77
	17	4.59	5.22	6.12	7.57
	18	4.46	5.08	5.96	7.39



Hours	Minutes	Design Frequency (years)			
		5	10	25	100
		Rainfall Intensity (inches/hour)			
	19	4.34	4.95	5.81	7.21
	20	4.23	4.83	5.67	7.05
	21	4.13	4.71	5.54	6.89
	22	4.03	4.60	5.41	6.74
	23	3.94	4.49	5.29	6.60
	24	3.85	4.39	5.18	6.46
	25	3.76	4.30	5.07	6.33
	26	3.68	4.21	4.97	6.21
	27	3.60	4.12	4.87	6.09
	28	3.53	4.04	4.77	5.98
	29	3.46	3.96	4.68	5.87
<b>0.5</b>	30	3.39	3.88	4.60	5.76
	31	3.33	3.81	4.51	5.66
	32	3.27	3.74	4.43	5.57
	33	3.21	3.68	4.36	5.47
	34	3.15	3.61	4.28	5.38
	35	3.10	3.55	4.21	5.30
	36	3.04	3.49	4.14	5.22
	37	2.99	3.43	4.08	5.14
	38	2.94	3.38	4.01	5.06
	39	2.90	3.33	3.95	4.98
	40	2.85	3.27	3.89	4.91
	41	2.81	3.22	3.84	4.84
	42	2.76	3.18	3.78	4.77
	43	2.72	3.13	3.73	4.71
	44	2.68	3.09	3.67	4.65
<b>0.75</b>	45	2.65	3.04	3.62	4.58
	46	2.61	3.00	3.57	4.52
	47	2.57	2.96	3.53	4.47
	48	2.54	2.92	3.48	4.41
	49	2.50	2.88	3.44	4.36
	50	2.47	2.84	3.39	4.30
	51	2.44	2.81	3.35	4.25
	52	2.41	2.77	3.31	4.20
	53	2.38	2.74	3.27	4.15
	55	2.35	2.71	3.23	4.10
	55	2.32	2.67	3.19	4.06
	56	2.29	2.64	3.16	4.01
	57	2.26	2.61	3.12	3.97
	58	2.24	2.58	3.09	3.92
	59	2.21	2.55	3.05	3.88
<b>1</b>	60	2.19	2.52	3.02	3.84
<b>2</b>	120	1.34	1.55	1.88	2.42
<b>3</b>	180	0.98	1.15	1.40	1.81
<b>6</b>	360	0.57	0.68	0.83	1.09
<b>12</b>	720	0.33	0.40	0.48	0.64
<b>24</b>	1440	0.19	0.23	0.28	0.38



**2.04. Hydraulic Design & Analysis**

**Table 4: Hydraulic Design Criteria**

Minimum Design Standards for Various Facilities		
Structure Type	Design Frequency	Check Frequency (Fully Developed)
Closed Storm Sewers	10-yr	100-yr
Engineered Open Channels	25-yr	100-yr
Roadside Ditches	5-yr	100-yr
Driveway Culverts	5-yr	100-yr
Minor Culverts (< 20 feet wide)	25-yr	100-yr
Bridge Class Culverts (> 20 feet wide)	25-yr	100-yr
Span Bridge	25-yr	100-yr
Detention Ponds	5-, 10-, 25-, 100-yr	100-yr

A. General Design Requirements

1. The design of the drainage system shall account for the off-site flows that are routed through the Development and the impacts of the Development and the drainage system on downstream facilities.
2. All drainage features shall be analyzed to show an adequate capacity to convey the design frequency shown in **Table 4**.
3. All drainage systems, Structures, and Appurtenances shall be evaluated for the 100-Year Storm Event (Check Storm) to ensure no adverse impacts are caused by the proposed drainage improvement. The design and 100-year headwater and tailwater elevations shall be shown on all culvert profiles.
4. All drainage ways shall be designed to function properly without permitting settlement or erosion. Ditches and open channel linings shall be suitable for calculated velocities. Maximum permissible velocities are shown in **Table 5**.

**Table 5: Maximum Permissible Flow Velocities for Drainage Features**

Type of Section/ Feature	Maximum Permissible Velocity
Natural Streams	7 fps
Constructed/Modified Open Channels (Concrete Materials)	15 fps
Pipes	15 fps
Culverts (at Outfall)	7 fps



B. Street Drainage

1. Cross drainage structures must be designed such that there is no overtopping of the Roadway.

**Table 6: Street Drainage Criteria**

Road Classification	Cross Drainage Structures (Design Storm)	Cross Drainage Structures (Check Storm)	Open Lane Requirements (Check Storm)
Local	No overtopping	Maximum one (1) foot overtopping	Entire ROW may be used to convey flows
Collector		Maximum one (1) foot overtopping	One 12-foot traffic lane open at all times
Arterial		No overtopping	One 12-foot traffic lane in each direction open at all times

C. Closed Storm Sewer

1. All structures located within County Right-of-Way shall be reinforced concrete pipe (RCP) or concrete box (RCB) unless prior approval is obtained from The Department.
2. Closed storm sewers shall be designed so that the Hydraulic Grade Line (HGL) of the design storm is six inches below the top of curb.
3. Storm sewer design shall provide for full function of inlet structures under design storm conditions.
4. Junction boxes or manholes shall be utilized instead of bends at horizontal changes in direction.
5. The maximum distance between manholes shall not exceed 550 feet for pipes smaller than 60 inches in diameter. For pipes 60 inches in diameter and larger, or equivalently sized boxes, the maximum allowable distance between manholes is 800 feet.

D. Open Channel Design

1. The use of existing channels in their original condition is encouraged when possible.
2. New open channels shall have a minimum flowline grade of one-half percent (0.50%) with maximum 4H:1V side slopes.
3. The flow generated by the 100-Year Storm Event must be contained within a dedicated Drainage Easement.



E. Roadside Ditch and Cross Drainage Structures

1. Roadside Ditches

The typical roadside ditch section shall have a minimum flowline grade of one-half percent (0.50%), a maximum flowline grade of eight percent (8.0%), and 4H:1V side slopes. Up to 3H:1V side slopes may be permitted as a design exception in areas where space is constrained and other cases as approved by The Department.

2. Driveway Culverts

- a. A driveway culvert permit is required for any new driveway connection or culvert installation along roadways maintained by the County.
- b. All driveway culverts must meet the requirements of the County's Property Access and Culvert Policy.

## 2.05. Downstream Evaluation

### A. Downstream Evaluation

1. The purpose of the downstream evaluation is to protect downstream properties from adverse impacts that may occur from increased runoff and increased velocities due to upstream Development.
2. The downstream evaluation shall include the entire zone of influence, described as the area from the outfall of the Development to a point downstream where the effect of the Development no longer has a significant impact on the receiving drainage system.
  - a. The Department must review and approve the determination of the zone of influence based on a detailed hydrologic and hydraulic modeling analysis developed by the Developer or Subdivider's Engineer.
  - b. The findings of the downstream evaluation shall be a part of the Drainage Plan submitted with the Construction Plans and must be approved prior to the issuance of any permits.
3. For all Development and Subdivisions, the downstream evaluation shall include the following:
  - a. Hydrologic analysis of the site in its Pre-Development condition with off-site existing conditions watershed. Hydrologic analysis of the site in its Post-Development condition with off-site existing conditions watershed.
  - b. Drainage path that defines extent of the analysis.
  - c. Capacity analysis of all existing constraint points along the drainage path, such as existing Floodplain developments, stormwater detention facilities, other natural and manmade ponds, underground storm drainage systems, culverts, bridges, tributary confluences, or channels.
  - d. Comparison of the site Pre-Development, off-site existing conditions watershed and site Post-Development, off-site existing conditions watershed analysis (5-year, 10-year, 25-year, and 100-Year Storm Event) of runoff, capacity, water surface elevation, and velocity of downstream conditions for the zone of influence.

### B. Outfall Design

1. All Pre-Development and Post-Development outfall locations, where runoff leaves the project site, shall be identified and classified as sheet flow or concentrated flow. The Subdivider or Developer's Engineer shall calculate the Pre-Development and Post-Development flow rate and velocity at each outfall location on the site.
2. The Developer or Subdivider's Engineer shall make every attempt to maintain existing sheet flow conditions at outfalls.
3. The Developer or Subdivider's Engineer shall incorporate the following design elements when evaluating concentrated flow outlet conditions.
  - a. Energy dissipators, erosion/scour protection, or a combination shall be provided when the outfall velocities exceed 7 feet per second or the erosive velocities for the lining of the receiving channel, ditch, or swale, whichever is lower.
  - b. Outfall protection shall be designed for the maximum calculated velocity.
  - c. The design of permanent erosion control features or energy dissipators shall conform to standard engineering practices and design guidance.

- d. Erosion protection shall be provided at the downstream end of concrete flumes or concentrated flow locations.

## 2.06. Stormwater Detention Requirements

### A. General

1. Stormwater detention may be required to mitigate adverse flood impacts of the 5-, 10-, 25- and 100-Year Storm Events.
2. In some instances, detention may be shown to exacerbate potential flooding conditions downstream. In lieu of a detention facility, the Developer or Subdivider's Engineer may provide a completed downstream assessment demonstrating that no detention is required, subject to approval by The Department.

### B. Design Criteria

1. Stormwater detention facilities shall generally be designed using standard hydrologic methodologies outlined in Table 1.
2. Underground detention systems are allowable, but gravity drainage is required. Design and materials are subject to approval by The Department.
3. Surface detention facilities shall be designed to drain within 24 hours. Extended detention up to 48 hours may be allowed for water quality purposes.

### C. Detention Pond

1. Side slopes shall be 4H:1V maximum.
2. The bottom of all detention ponds shall have a minimum two percent (2.0%) slope and a concrete pilot channel with a minimum one-half percent (0.5%) slope from the most upstream point and any inlet points to the pond outlet.
3. A minimum one (1) foot freeboard above the 100-year design water surface elevation must be provided between adjacent inhabitable structures.
4. Spot elevations for proposed and existing grades in the area of the Stormwater Detention Ponds shall be shown with differentiation on the plans.
5. Embankments for stormwater detention ponds shall be designed, signed, and sealed by an Engineer and meet the requirements of the TCEQ Texas Dam Safety Program.

### D. Outlet Structures

1. Outlets shall be typically composed of one or all of the following elements:
  - a. Reinforced concrete pipes (RCP);
  - b. Reinforced concrete box structure;
  - c. Reinforced concrete weir;
  - d. V-notch structure; or
  - e. Other structures, as approved by The Department.
2. For any stormwater Detention Pond, a stabilized earthen or concrete overflow structure must be provided just above the 100-Year Storm Event WSEL and have a minimum depth or diameter of twelve (12) inches.



3. Spot elevations for proposed and existing grades for at least one hundred and fifty (150) feet downstream of all outlet structures shall be shown with differentiation on the Drainage Plan.
- E. Construction and Inspection of Stormwater Detention Ponds
1. The Department shall inspect stormwater Detention Ponds for functionality, cleanliness, and vegetation prior to Final Acceptance.
  2. The Department must inspect and approve the stormwater Detention Pond prior to release of the Maintenance Bond.
  3. All detention ponds shall retain one hundred percent (100%) vegetative coverage prior to Final Acceptance, unless otherwise approved by The Department.
  4. The Developer or Subdivider's Engineer must submit Engineer certification that embankment materials used and compaction achieved meet the minimum requirements of the approved design.
- F. Maintenance
1. A Stormwater Detention Pond shall be fully contained within a single Lot or Common Lot and be owned by an individual Lot Owner or a Homeowners' Association (HOA) or Property Owners' Association (POA).
  2. Maintenance of the Stormwater Detention Pond is the responsibility of the facility owner. This requirement must be shown or recorded with the Final Plat such that it remains in force upon sale or transfer of the property. Tarrant County will not be responsible for the maintenance of the Stormwater Detention Pond.
  3. At a minimum, the following maintenance access guidelines apply to any stormwater Detention Pond:
    - a. A maintenance ramp shall be provided for vehicular access for maintenance purposes. The slope of the ramp shall not exceed 6H:1V, and the minimum width shall be twelve (12) feet.
    - b. All open Detention Ponds shall have an access boundary with minimum width of 10 feet adjacent to the entire top bank of the pond. The access boundary shall be clear of obstructions to vehicles and shall have a cross slope of 10H:1V or flatter.
  4. Access shall be provided for cleaning of each underground stormwater detention facility.

## 2.07. Stormwater Quality

### A. Stormwater Pollution Prevention Plan (SW3P)

1. The Developer or Subdivider must include a Stormwater Pollution Prevention Plan (SW3P) with the Construction Plans. A copy of the plan, as approved by the County, or any applicable permits must be available for review at the construction site.
2. The SW3P shall govern the control measures necessary to prevent and control soil erosion, sedimentation, and water pollution, which may degrade receiving waters, including rivers, streams, lakes, reservoirs, groundwater, and wetlands.
3. The contractor is responsible for complying with the requirements of the TCEQ General Permit for Stormwater Discharges Associated with Construction Activities (TXR150000) (Construction General Permit) and all other permits required for stormwater pollution prevention.
  - a. Development that disturbs less than one (1) acre and is not part of a common plan for a larger Subdivision or Development that would disturb one (1) or more acres, are not required to have coverage under the Construction General Permit.
  - b. Individual Lots in a Subdivision are considered part of a larger common plan of development, regardless of when construction activity takes place on that lot in relation to the other lots, and are required to have BMPs and comply with the Construction General Permit.
  - c. If the disturbed acreage is at least one (1) acre but less than 5 acres and not part of a larger common plan of development, the contractor must comply with the requirements for Stormwater Discharges from Small Construction Activities.
  - d. If the disturbed acreage is five (5) acres or more, the contractor must comply with the requirements for Stormwater Discharges from Large Construction Activities.
  - e. Additional information on the Texas Construction General Permit can be found on the TCEQ website.
4. An erosion and sedimentation control plan must be prepared and submitted to The Department.
5. The control measures contained herein shall be installed and maintained throughout the construction contract and coordinated with any permanent or temporary pollution control features specified elsewhere in the Construction Plans, and in the specifications to ensure effective and continuous water pollution control throughout the construction and post-construction periods.
  - a. These control measures shall not be used as a substitute for the permanent pollution control measures, unless approved by The Department.
6. The controls may include silt fences, straw bale dikes, rock berms, diversion dikes, interceptor swales, sediment traps and basins, pipe slope drains, inlet protection, stabilized construction entrances, seeding, sodding, mulching, soil retention blankets, or other structural or non-structural stormwater pollution controls. Design guidance for these controls is maintained by the North Central Texas Council of Governments (NCTCOG) iSWM website.

B. General Requirements

1. The owner shall provide proof of compliance with applicable local, state, and federal environmental regulations upon request by the County.
2. All pervious disturbed areas within a construction site shall be seeded or hydromulched, or seeded within fourteen (14) days of final grading (*CO #93677*).
3. Erosion control mats shall be installed in roadside ditches and slopes steeper than 4H:1V. These areas shall be seeded or hydromulched as soon as the Roadway and ditch elevation verifications have been submitted and approved by The Department.
4. Grass areas shall be established with one hundred percent (100%) coverage with appropriate grass for the growing season prior to final acceptance. The SWPPP remains in effect until grass areas have been established with 70% coverage.
  - a. An approved perennial grass shall be planted at the soonest growing season for that grass before acceptance by The Department.
  - b. If one hundred percent (100%) coverage cannot be established prior to acceptance, temporary cover protection of all disturbed areas will be required, as well as the addition of the cost of one hundred percent (100%) vegetative coverage into the Maintenance Bond, when applicable.
5. Disposal areas and stockpiles shall not be located in any wetland, waterbody, or streambed.
6. The Developer or Subdivider's contractor shall clean paved surfaces as necessary to remove sediment that has accumulated on the roadway.
7. All erosion control measures must be maintained in good working order. The County reserves the right to inspect any construction site and require changes be made if the site becomes a source of erosion or pollution.

## 2.08. Drainage Easements

- A. The Developer or Subdivider must dedicate all drainage Easements in accordance with the requirements of the Subdivision Regulations and this **Section 2**.
- B. Off-site drainage Easements may be required downstream to address adverse impacts to adjoining properties (see subsection **2.01.G** above).
  1. These Easements may be required to encompass streambank stabilization measures, rock riprap, headwalls, or velocity dissipators.
  2. The Easement shall include sufficient area to disperse concentrated flows to Pre-Development conditions.
  3. The Developer or Subdivider is responsible for obtaining Easements prior to Plat or Construction Plans approval.
- C. Drainage Easements shall be provided for access and maintenance of channels, swales, and other drainage structures and systems.
- D. Drainage Easements shall be provided for channels, swales, and other drainage facilities to contain the 100-Year Storm Event flood.
- E. Closed storm sewer systems outside of County Right-of-Way require fifteen (15) feet minimum drainage easement when serving more than one (1) lot or property.

- F. Open channels will require a dedicated Erosion Hazard Setback and Maintenance Easement of 10 feet, parallel to and measured from the top of the open channel bank, on both sides of the channel. Alternate dimensions for the easement may be proposed by the Engineer with a supporting geomorphic evaluation. This easement may be reduced to one side of the open channel if stabilization measures are provided to prevent channel erosion and meander.
- G. Drainage Easements shall be maintained by the Lot, parcel, or property Owner or Homeowners' Association (HOA) or Property Owners' Association (POA) according to recorded restrictive covenants. The County is not responsible for the maintenance of drainage easements.

## 2.09. Drainage Plan Requirements

- A. Drainage Plans must include all appropriate calculations depicting the anticipated flow of all drainage onto and from the proposed Development or Subdivision and showing all major topographic features on or adjacent to the property, including, but not limited to, all watercourses, 100-year Floodplain boundaries, ravines, bridges, and culverts.
- B. Drainage Plans must show how and where stormwater will be collected, handled, and routed within the proposed Development or Subdivision along with how and where stormwater will outfall to a recognized drainage way.
- C. Drainage Plans must also include such off-site drainage improvements as are necessary to assure that the proper transition between onsite and off-site drainage can be maintained.
- D. Drainage Plans and accompanying calculations and studies must be sealed by the Developer or Subdivider's Engineer.
- E. If the Development or Subdivision is phased, the Drainage Plan must include the areas where the future phases will be developed.
- F. Drainage Plans shall adhere to the County's Civil Plan Checklist's requirements.

## Section 3. Roadway Construction and Design Standards

### 3.01. Construction Standards

#### A. General

##### 1. Minimum Standards

- a. The standards established by **Section 3** are the minimum specifications for the preparation and construction of streets dedicated to the public.
- b. Any work, methods, materials, and equipment not addressed in this **Section 3** shall conform to the current edition of TxDOT's Roadway Design Manual and Standard Specifications for Construction and Maintenance of Highways, Streets, and Bridges. With approval by The Department, the most current version of the Public Works Construction Standards manual published by the North Central Texas Council of Governments may be used as an alternative.

##### 2. Notice Required Prior to Construction

- a. The Subdivider or Developer must notify The Department at least forty-eight (48) hours prior to the commencement of any major construction items such as sub-grade stabilization, concrete curb and gutter, and asphalt paving.
- b. The County will periodically inspect all subdivision roads and drainage structures while under construction to ascertain that the construction work, methods, and materials meet County specified standards.
- c. The Subdivider or Developer must furnish all construction and testing reports to the Director of Transportation certifying that the construction requirements of this regulation have been met. The test results must be approved by The Department prior to constructing the next course of the pavement.

##### 3. Stop Work Order

- a. The Department shall issue a Stop Work Order whenever the Subdivider or Developer fails to adhere to the Plat, plans, or specifications approved by Commissioners Court.
- b. The Subdivider or Developer may not continue construction until the deficiencies listed in the Stop Work Order are corrected.
- c. If the Subdivider or Developer fails to correct the deficiencies, the Commissioners Court may withhold acceptance of the road or Subdivision.

##### 4. Staking and Benchmarks

- a. The Subdivider or Developer must provide all staking necessary to provide alignments and grades for construction of roadways, structures, and miscellaneous items.
- b. All benchmarks provided in the plans shall be established by the Subdivider or Developer.
- c. Construction stakes shall be set at sufficiently frequent intervals to ensure that all roadway, structures, and miscellaneous items are constructed in accordance with the lines and grades shown in the Construction Plans.
- d. The Subdivider or Developer shall, upon request, make available to The Department all survey records made in the performance of this work.

B. Preparing Right of Way

1. All Right-of-Way preparation or clearing and grubbing shall be completed before starting the subgrade preparation.
2. Subgrade shall be free of boulders, stumps, and other foreign matter.

C. Subgrade

1. Prior to the start of construction on subgrade, a soil analysis shall be made by a certified soil laboratory to determine what type of soil stabilizer (lime, cement, etc.) is required.
2. Tests must be made to determine the appropriate stabilizers and optimum quantities for desired results to meet road design.
3. The subgrade shall be scarified and shaped in conformity with the typical sections and the lines and grades indicated, or as established by The Department, by the removal of existing material or addition of approved material. All unsuitable material shall be removed and replaced with an approved material.
4. Fills must be placed and compacted on horizontal lifts not exceeding twelve inches (12") depth to the specified density. Fill sections whose depth exceeds eight feet (8'), at any point on the cross-section, shall require a slope stability analysis or approval of The Department.
5. The subgrade shall be compacted by approved mechanical equipment to a density of not less than ninety-five percent (95%).
  - a. Prior to the placement of any base material, tests from a certified soils laboratory shall be supplied by the Subdivider or Developer to The Department stating that the subgrade has been compacted to ninety-five percent (95%) density to a depth of six inches (6") for all subgrade and for the full depth of all fills.
  - b. If the subgrade fails to meet the density specified, it shall be reworked as necessary to obtain the density required at the sole expense of the contractor.

D. Base Materials

1. The base material must meet the requirements of TXDOT Item 247, Flexible Base.
2. The base material shall be compacted to not less than ninety-five percent (95%) density for a full depth of six inches (6").
3. Base course shall be maintained by blading, and the surface, upon completion, shall be smooth and in conformity with the typical section indicated, and to the established lines and grades.
4. All irregularities, depressions, or weak spots which develop shall be corrected immediately by scarifying the areas affected, adding suitable material as required, reshaping, and recompacting by sprinkling and rolling.
5. Substitution of base materials with full-depth HMAC requires the approval of The Department.
6. Should the base course, due to any reason or cause, lose the required stability, density, or finish before the surface is complete, it shall be recompacted and refinished at the sole expense of the contractor.

E. Surface

1. Hot Mix Asphaltic Concrete Pavement (HMAC)

- a. The asphaltic material for Prime Coat shall meet the requirements for Item 310, Prime Coat, TxDOT Specifications. Prime Coat shall be applied at a rate not to exceed 0.35 gallons per square yard of surface. The tack coat shall be applied between HMAC lifts at a rate between 0.04 and 0.01 gallons per square yard.
- b. The surface course shall be two inches (2") of HMAC meeting the specifications of Item 340, Type D, in the current TxDOT Specifications. Aggregate used in the mix shall be as shown on the TxDOT Quality Monitoring Schedule.
- c. Prior to placing HMAC, the base shall be proof rolled, any soft spots repaired, and then the area shall be proof rolled again.
- d. All asphaltic mixtures shall be placed with a spreading and finishing machine. The mix shall be compressed thoroughly and uniformly compacted immediately after placing to the required density. All compaction rolling shall be complete before the material cools below 175 degrees Fahrenheit.
- e. The completed surface shall be approved by the Subdivider or Developer's Engineer and The Department for riding surface, finish, and appearance.

2. Rigid Pavement

Concrete pavement shall not be used to construct roadways without the approval of The Department.

F. Roadway Cross Sections and Standards

1. See Figure 1 and Figure 2 for details related to Local Roadway construction.
2. If provided, Collector Roadways shall be designed based on traffic volumes and other features as needed. Additionally, the Right-of-Way and shoulder-to-shoulder width for Collector Roadways shall be approved by The Department and conform with **TLGC Chapter 232.003**.
3. If provided, Arterial Roadways shall be designed based on traffic volumes and other features as needed. Additionally, the Right-of-Way and shoulder-to-shoulder width for Arterial Roadways shall be approved by The Department and conform with **TLGC Chapter 232.003**.
4. In order to enforce the roadway cross sections and standards and to comply with **TLGC Chapter 232.003**, The Department shall determine and approve if a road or a section of a road is functioning as a Local Roadway, Collector Roadway, or Arterial Roadway.

G. Variations to the Roadway Cross Sections and Standards

1. The Department may approve variations to roadway cross sections and standards, which may require additional Right-of-Way and shoulder-to-shoulder width.
  - a. Additional Right-of-Way may be required at some road intersections to accommodate turn lanes, utilities, sidewalks, traffic control devices and/or sight distances.
  - b. If the existing geometrical configuration does not address safety, design, topography, and traffic management considerations, then The Department may require the dedication of additional Right-of-Way to address such.
2. In agreement with **TLGC Chapter 232.003**, variations shall be reasonable regarding the construction of each street or road.

3. In agreement with TLGC Chapter 232.0031, the County may not impose a higher standard for streets or roads in a subdivision than the County imposes on itself for the construction of streets or roads with a similar type and amount of traffic.

### **3.02. Pavement Design**

- A. A geotechnical investigation and analysis supporting the appropriate pavement design for the proposed conditions shall be provided for review by The Department.
- B. All pavement sections shall be designed for a minimum 20-year design life.
- C. Pavement design methodology shall be based on the American Association of State Highway and Transportation Officials (AASHTO) Guide for Design of Pavement Structures, current edition.

### **3.03. Driveways**

- A. The size and location of new driveways are subject to the approval of The Department.
- B. Driveways on opposite sides of the roadway must align to the maximum extent feasible to prevent conflicting traffic movements.
- C. Improvements to existing driveways may be required whenever development indicates the need for improvements, as determined by The Department.



### 3.04. Layout and Geometry of Roads and Streets

#### A. Adequate Roadways Required

1. All Roadways must conform to specifications included within this Engineering Standards Manual.
2. The Subdivider is responsible for the cost of Right-of-Way and Roadway improvements.
3. The Department may require additional Right-of-Way at certain Roadway intersections for utilities, drainage, traffic control devices, and removal of sight distance obstructions.
4. A Subdivision constructed on an existing County Roadway may be liable for damage caused to the County Roadway during construction (TLGC Section 251.160).

#### B. General Requirements

1. Roadway Design According to County Specifications
  - a. When laying out roads, the Subdivider must consider other existing and planned roads, topography, drainage requirements, and the number of Lots the road serves.
  - b. The arrangement of new Roadways shall allow existing Roadways to continue between adjacent properties or developments.
    - i. The roadway shall be designed to allow for the continuation of efficient movement of traffic and utility extensions.
    - ii. The roadway continuation may not be required in cases where the connection will result in traffic from a Collector Roadway or Arterial Roadway being funneled into an existing Local Roadway.
2. Right-of-Way Dedication and Roadway Construction
  - a. If a Roadway runs through or along the perimeter of a proposed Subdivision, the Subdivider must dedicate Right-of-Way and construct all interior Roadways. The County may require that perimeter Roadways be proportionately constructed by the Subdivider, with the Subdivider's construction being roughly proportionate to the Subdivision's impact on the Roadway.
  - b. A waiver of this requirement must be approved by The Department.

3.05. Roadway Cross Sections

Figure 1: Local Road Section, Rural – 70' ROW n.t.s.

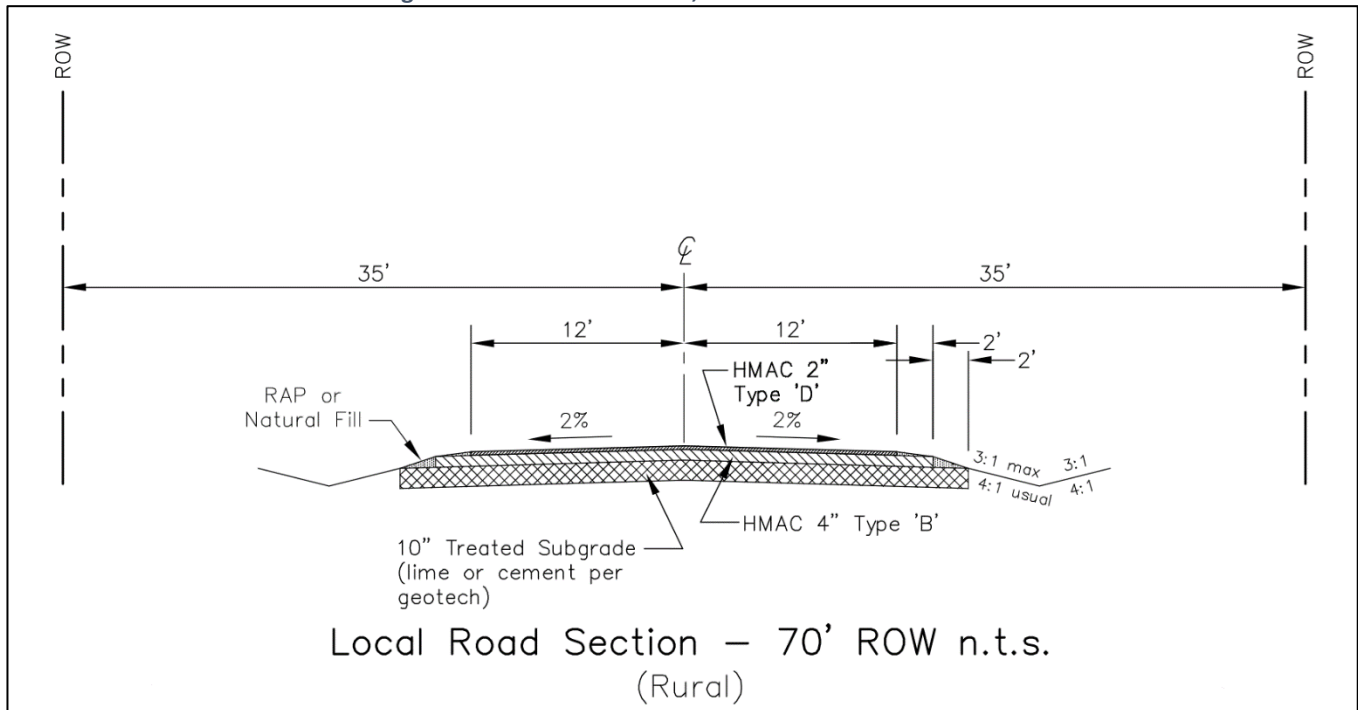
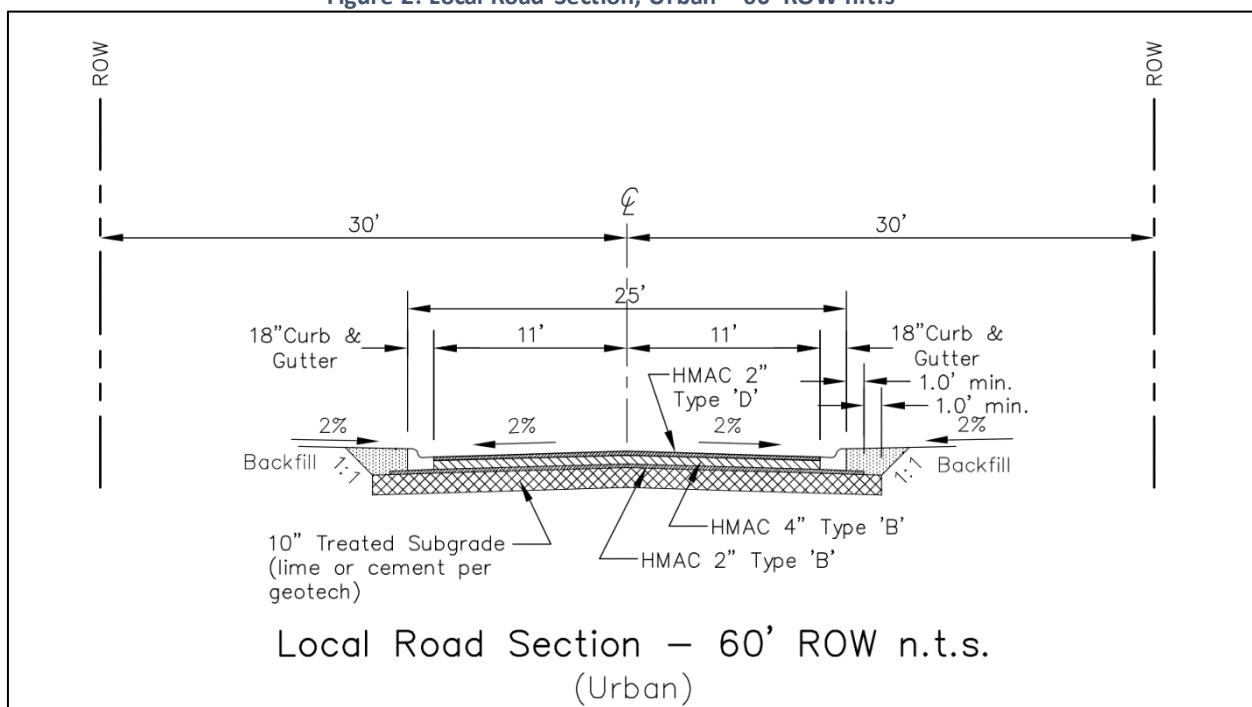


Figure 2: Local Road Section, Urban – 60' ROW n.t.s



## Section 4. Definitions

### 4.01. Terms Beginning With "#-D"

1. 100-Year Storm Event

A rainfall event equal to or exceeding the 1-percent Annual Exceedance Probability (AEP) Flood (also known as the 100-year flood).

2. Adverse Impact

Changes to drainage patterns, flooding, erosion, and water quality on adjacent property caused by development of a property.

3. Access

A means of approaching or entering a place.

4. Alley

A small public roadway; see Roadway, Public.

5. Applicant

The Person or entity responsible for the submission of an Application for construction or development regulated by these standards. The Applicant must be the actual owner of the property for which an Application is submitted or shall be a duly authorized representative of the property owner. May also refer to Subdivider.

6. Application

The completed form that begins the process to authorize a Plat or Land Use and the required package of materials, such as planning documents, survey, Plat, completed checklist, Construction Plans, drawings, studies, and other informational materials the County may require.

7. Approval

A determination by the County that an Application complies with the minimum provisions of this Engineering Standards Manual. Such approval does not constitute approval of the engineering or surveying contained in the plans, as the design Engineer or Registered Professional Land Surveyor that sealed the plans is responsible for the adequacy of such plans.

8. Appurtenance

Equipment, hardware, fasteners, or other objects or devices associated infrastructure or utilities, particularly water or wastewater, and that are necessary to assist in the efficient operation of the system.

9. Arterial Roadway

See Roadway, Arterial

10. Base Flood

The flood having a one percent (1%) chance of being equaled or exceeded in any given year. Also, the flood resulting from the 100-Year Storm Event.

11. Base Flood Elevation (BFE)

The Water Surface Elevation resulting from any flood within the Special Flood Hazard Area (SFHA) that has a 1% chance of equaling or exceeding that level in any given year, also called the 100-Year Storm Event. The BFE is used to delineate the Base Flood in plan view. The BFE may be calculated by the applicant's engineer or as shown on the FIRM and found in the accompanying FIS for Zones A, AE, or AH for Tarrant County. The BFE shall be in relation to the datum specified in the FIS for Tarrant County.

12. Best Management Practices (BMPs)

Physical, structural, or managerial procedures that decrease the potential for facilities to pollute downstream channels, lakes, and waterways.

13. Block

A unit of land, typically subdivided into a group of Lots or Tracts, that is bounded by a segment of Roadway on each side.

14. Building

Any Structure built for support, shelter, or enclosure of persons, animals, personal property, records, or other movable property and when separated in a manner sufficient to prevent fire, each portion of such Building shall be deemed a separate Building.

15. Building Permit

A Permit the County issues for construction of a Non-Residential Use Building, Multi-Family Residential Use Building, or Public Building under TLGC Chapter 233, Subchapter C after reviewing plans for conformance with the fire code.

16. Collector Roadway

See Roadway, Collector

17. Commissioners Court

The governing body of Tarrant County, Texas.

18. Common Lot

Designated Lots in a Subdivision that a Homeowners' Association (HOA) or Property Owners' Association (POA) owns and maintains for the common use of Homeowners' Association (HOA) or Property Owners' Association (POA) members.

19. Construction Bond

A type of Fiscal Security used to guarantee the completion of Public Improvements if the Subdivider fails or refuses to complete construction or cure defects on deficiencies in construction.

20. Construction Plans

A set of drawings detailing Public Improvements associated with a Subdivision, including paving, water, wastewater, drainage, and other required plans (see 6.01 of the Subdivision Regulations). Submittal of Construction Plans does not authorize construction to begin (see Section 6.01 of the Subdivision Regulations).

21. Construction Release

Authorization by The Department to begin construction of Public Improvements (see Section 6.03 of the Subdivision Regulations).

22. County

Tarrant County, Texas. Also used to refer collectively to the authority of the Commissioners Court, County Judge, The Department, Transportation Services Director, and other officials designated in this Engineering Standards Manual or Subdivision Regulations.

23. County Clerk

The person(s) designated to provide clerical and official services for the County.

24. County Judge

The constitutional County Judge of Tarrant County, Texas.

25. Court Order

An order of the Tarrant County Commissioners Court.

26. Cul-de-Sac

A Roadway having only one vehicular Access to another Roadway and terminated on the opposite end with a vehicular turnaround.

27. Dead-End Road

See Roadway, Dead-End.

28. The Department

The responsible Tarrant County department authorized to administer the County's Subdivision Regulations.

29. Developer

Any person, partnership, firm, association, corporation (separately or in combination), or any officer, agent, employee, representative, or trustee thereof, who performs or participates in the performing of any act of Development, including development of a Subdivision where activities are performed that are regulated under the intent, scope, and purview of these standards.

30. Development

Activity that takes place on or within land or earth that results in a change to the physical characteristics and profile of the land.

31. Drainage Plan

Also refers to "drainage study". A plan for handling stormwater affecting existing and proposed property and/or roadways due to development, including water surface elevations, floodplains, velocities, and mitigation measures. Drainage plans or studies include all areas handling stormwater, including Special Flood Hazard Area (SFHA)s and areas outside of Special Flood Hazard Area (SFHA)s.

32. Driveway Approach

The area between a Roadway and private property intended to provide Access for vehicles from the Roadway of a public street to a definite area of the private property (e.g., parking area or driveway) and used for ingress and egress of vehicles.

## 4.02. Terms Beginning With "E-K"

33. Easement

An interest in land owned by another person consisting of the right to use or control the land or area above or below it for a specific limited purpose.

34. Engineer

A person duly authorized under the provisions of the Texas Administrative Code, as amended, to practice the profession of engineering in the State of Texas.

35. Engineering Standards Manual

The Engineering Standards Manual of Tarrant County establishes the drainage and roadway standards that work in concert with the Development Regulations Manual.

36. Existing Conditions Watershed

The land use of any watershed or drainage area at the time the Applicant submits a request for Plat Approval.

37. Extraterritorial Jurisdiction (ETJ)

The unincorporated area outside a municipality but contiguous to and extending outward from its corporate limits over a distance specified in which a municipality may exercise its authoritative powers. (see [TLGC Chapter 42.021](#))

38. FEMA

Federal Emergency Management Agency.

39. Final Acceptance

The acceptance by the County of infrastructure improvements constructed by the Subdivider in conjunction with the development of land.

40. Final Plat

See Plat, Final.

41. Fiscal Security

A guarantee by a Subdivider, often through the purchase of a Construction Bond, that gives the County funding if the Subdivider cannot complete the Public Improvements.

42. Flood and Flooding

A general and temporary condition of partial or complete inundation of normally dry land areas from:

- a. The overflow of inland waters; or
- b. The unusual and rapid accumulation or runoff of surface waters from any source.

43. Flood Insurance Rate Map (FIRM)

The official map of a community, on which FEMA has delineated both the Special Flood Hazard Area (SFHA)s and the risk premium zones applicable to the community.

44. Flood Insurance Study (FIS)

The official report provided by FEMA. The report contains flood profiles, water surface elevation of the base flood, as well as the Flood Insurance Rate Map (FIRM).

45. Floodplain

Also referred to as "flood-prone area". Any land area susceptible to being inundated by water from any source (see definition of Flood and Flooding). A floodplain is a plan view depiction of the extent of flooding based on calculated water surface elevations. The County regulates the FEMA floodplain as defined in the Tarrant County Flood Damage Rules.

46. Fully Developed Conditions

May refer to the maximum extent of a Subdivision, especially one constructed in phases where one or more phases may require oversized Public Improvements or to the build-out of a defined area when all the land within the area develops to its maximum extent (see Section [2.03.A Land Use](#)).

47. Fully Developed Watershed

Any watershed or drainage area at full build-out based on the best available information for planned future land use.

48. Homeowners' Association (HOA) or Property Owners' Association (POA)

A formal organization operating under recorded land agreements. (see Section [2.06.F; Texas Property Code Chapter 209](#))

49. Hydraulic Grade Line (HGL)

The surface or profile of water flowing in an open channel or a pipe that is partially full.

50. Infrastructure

The underlying framework of a system needed to support commercial and residential Development.

51. Integrated Stormwater Management Program (iSWM)

The most recently issued set of guidelines created by the North Central Texas Council of Governments to mitigate adverse impacts. (see iSWM technical references at [iswm.nctcog.org](http://iswm.nctcog.org))

52. iSWM

See Integrated Stormwater Management Program (iSWM).

### 4.03. Terms Beginning With "L-O"

53. Land Use

The primary use of a Tract or Lot based on the existing or planned Structures or activities. The County does not regulate Land Use except under TLGC Chapter 232, TLGC Chapter 233, and TAC Chapter 285 (see Section 12 of the Subdivision Regulations).

54. Legal Description

A formal description of real property, complete enough that a particular piece of land can be located and identified by:

a. Metes and Bounds

- i. The territorial limits of real property as measured by distances and angles from designated landmarks and in relationship to adjoining properties.

b. Lot and Block

- i. A description of the Lot number and Block number followed by a reference to a Tract within a Plat recorded with the County.

55. Letter of Acceptance

A letter from The Department to the Subdivider indicating that the Commissioners Court formally accepts the Public Improvements for ownership and maintenance (see Section 6.07 the Subdivision Regulations).

56. Local Roadway

See Roadway, Local.

57. Lot

A tract of land, especially one having specific boundaries.

58. Lot, Flag

A property with zero or minimal Roadway frontage having Access primarily by means of a narrow strip of property or Easement across a separate property (see Section 5.04.E of the Subdivision Regulations).

59. Maintenance Bond

A type of Fiscal Security used to guarantee the performance of Public Improvements before the County accepts the Public Improvements.

60. Manual on Uniform Traffic Control Devices

The Manual on Uniform Traffic Control Devices, or MUTCD, defines the standards used by road managers nationwide to install and maintain traffic control devices on all public streets, highways, and bikeways open to public traffic. The MUTCD is published by the Federal Highway Administration (FHWA) under 23 Code of Federal Regulations (CFR), Part 655, Subpart F.

61. Multi-Family Residential Use

Use of a Building as a residence or a dwelling that is connected to any other residence or Building, either on the same Lot or an abutting Lot.

62. NCTCOG

See North Central Texas Council of Governments.

63. Non-Residential Use

A use carried out for commercial, industrial, or institutional purposes by a commercial establishment or within a public building that does not include dwelling accommodations other than temporary sleeping quarters, such as hotels, not exceeding thirty (30) consecutive calendar days (for residential uses, see Single-Family Residential Use and Multi-Family Residential Use).

64. North Central Texas Council of Governments

(Also "NCTCOG") The non-profit metropolitan planning organization responsible for coordination between counties, municipalities, and other government and subgovernment units in the Dallas-Fort Worth region. NCTCOG is responsible for directing transportation and other planning funds to entities within its jurisdiction, conducting studies, and promoting education and cooperation on Land Use and economic issues.

65. Order of the Commissioners Court for Final Acceptance

An order of the Commissioners Court acknowledging the completion, inspection, and conformance of all Public Improvements and accepting ownership and maintenance of the Public Improvements

66. Owner

The owner of property or land of record.

#### 4.04. Terms Beginning With "P-S"

67. Permit

Authorization to begin a regulated activity such as construction.

68. Person

An individual, firm, association, organization, partnership, trust, foundation, company, or corporation.

69. Plat

a. *When used as a noun*, a scaled map that a Registered Professional Land Surveyor prepares for a Subdivider to divide property into one (1) or more Lots. A Plat also contains the owner's signature and attestation, information about the Subdivider's property and neighboring properties, Public Right-of-Way and Easement dedication, and notes about the intended function of the Subdivision and infrastructure constructed to serve the Subdivision.

b. *When used as a verb*, the act of creating a Plat and filing it in the Tarrant County Plat Records.

70. Plat, Final

A map of specific land showing the location and boundaries of individual parcels of land subdivided into Lots, with streets, Alleys, and Easements drawn to scale, and recorded in the County Clerk's Office.

71. Post-Development

The physical characteristics, including the land use, of a property after completion of Development.

72. Pre-Development

The physical characteristics, including the land use, of a property at the time the applicant submits a request for plat approval.



73. Public Improvement

A facility or service and its associated Public Right-of-Way, Easement, or other property necessary to provide Roadways for transportation of persons or goods or storm drainage. The County or Subdivider may construct Public Improvements individually or jointly through a development agreement, with the County ultimately assuming ownership and responsibility for operations and maintenance by Order of the Commissioners Court for Final Acceptance.

74. Record Drawings

An engineering document that depicts the final configuration, size, and position of proposed Public Improvements that the County can use to determine future maintenance and repair needs. Record Drawings also reflect changes in the field that may cause the Public Improvements to differ from the specifications of the approved Construction Plans.

75. Registered Professional Land Surveyor

A person duly authorized under the provisions of the Texas Administrative Code, as amended, to practice the profession of surveying in the State of Texas.

76. Replat

A Plat that re-subdivides or revises any part or all of a recorded plat.

77. Right-of-Way

An area of land described on a Plat or deed record that the County or the State maintains and that the public may use as a Roadway, drainageway, or sidewalk if the use is consistent with County or State law. Utilities or other entities (e.g., franchise utility providers, such as gas, electric, antenna, and cable television) may use the Public Right-of-Way with the Approval of the Commissioners Court.

78. River

Relating to, formed by, or resembling a river (including tributaries), stream, brook, etc.

79. Roadway

The portion of a Right-of-Way that allows for the passage of vehicles between properties or between intersecting Roadways.

80. Roadway, Arterial

A Roadway designed to provide primary Access to non-residential properties and to allow the passage of large volumes of primarily commercial traffic between freeways and other Arterial Roadways or Collector Roadways.

81. Roadway, Collector

A Roadway designed to allow the passage of moderate to large volumes of mixed traffic between Arterial Roadways and other Collector Roadways or Local Roadways.

82. Roadway, Dead-End

A Roadway having one point of Access from an intersecting Roadway with the other end terminating or transitioning to a private driveway.

83. Roadway, Local

A Roadway designed to provide primary Access to residential properties and to allow the passage of residential traffic to a Collector Roadway.

84. Roadway, Public

A public street, Alley, road, Right-of-Way, or other public way, including paved and unpaved portions.

85. Single-Family Residential Use

Use of a Building as a residence or dwelling that is not connected to any other residence or building and that requires notification and inspection under Section 12.04 of the Subdivision Regulations (see Multi-Family Residential Use for residential Buildings that are connected to any other residence or Building).

86. Special Flood Hazard Area (SFHA)

The land in the Floodplain subject to a one percent (1%) or greater chance of flooding in any given year. Areas of special flood hazard are depicted on the County Flood Insurance Rate Map (FIRM) as Zones A, AO, AH, or AE.

87. Stormwater Facilities

Examples of stormwater facilities include:

- a. Detention Pond or Retention Pond;
- b. Facilities designed to collect and hold water to a certain capacity for release into another facility, stream, or creek;
- c. Channels;
- d. Open ditches, depressions, or flumes designed for the linear conveyance of water from a certain area to another facility, stream, or creek;
- e. Pipes;
- f. Enclosed drainage channels or drainage lines;
- g. Inlets;
- h. Structures designed for the intake of stormwater;
- i. Outfall; and
- j. Structures designed to transfer stormwater into another facility, stream, or creek at a designed rate and velocity.

88. Structure

Anything constructed or erected that requires location on the ground or attached to something having a location on the ground.

89. Subdivider

A Person or corporation that divides land to create a Subdivision of Lots for sale and Building construction. The term is generally used interchangeably with "Developer," "Applicant," or "contractor" unless the text explicitly refers to those terms in a way that is separate and distinct from Subdivider.

90. Subdivision

The division or platting of a tract or parcel of land into smaller parts. The term includes "Addition" and other Subdivision or re-Subdivision of land defined and regulated under TLGC Chapter 232.

91. Subdivision Regulations

The Subdivision Regulations of Tarrant County adopted under TLGC Chapter 232 for the purpose of regulating Subdivision and Land Use within the County, and any amendments to these Subdivision Regulations.

92. Surveyor

See Registered Professional Land Surveyor.

#### 4.05. Terms Beginning With "T-Z"

93. TCEQ

Texas Commission on Environmental Quality.

94. Tract

A property identifiable by Legal Description but typically described in abstract or with boundaries divided from an original land grant or division of a land grant.

95. Utility Easement

See Easement.

96. Water Surface Elevation

The height, in relation to the datum shown in the Flood Insurance Study (FIS) for Tarrant County, of floods of various magnitudes and frequencies.