SECTION 300

ROADWAY

INTRODUCTION

The latest published edition of the following documents shall be the accepted standard for materials and/or procedures for the construction, modification, alteration, or expansion of the City of Fairfield's roadway infrastructure:

1. ***City of Fairfield Design, Construction, and Materials Specification Handbook***
2. ***City of Fairfield Codified Ordinances***
3. ***City of Fairfield Thoroughfare Plan***
4. ***City of Fairfield Comprehensive Plan***
5. ***Ohio Manual of Uniform Traffic Control Devices (OMUTCD)***
6. ***Ohio Department of Transportation Location and Design Manual Volume 1 Roadway Design (ODOT L&D)***
7. ***Ohio Department of Transportation Construction and Materials Specification (ODOT CMS)***
8. ***Ohio Department of Transportation Construction Administration Manual of Procedures (ODOT MOP)***
9. ***Ohio Department of Transportation State Highway Access Management Manual***
10. ***Ohio Department of Transportation Pavement Design Manual***
11. ***Ohio Department of Natural Resources Rainwater and Land Development Manual***
12. ***American Association of State Highway and Transportation Officials "A Policy on Geometric Design of Highways and Streets" (AASHTO)***
13. ***Ohio Department of Transportation Traffic Engineering Manual (ODOT TEM)***
14. ***Transportation Research Board Highway Capacity Manual***
15. ***Institute of Transportation Engineers Traffic Engineering Handbook***
16. ***Ohio EPA Laws and regulations (OEPA)***

If a conflict exists between reference sources, the more restrictive requirement shall prevail. The Public Works Director shall provide interpretation as requested.

Plan approval by the City of Fairfield does not imply nor assure approval by any other governing jurisdiction. Plans are approved subject to the conditions of compliance with all applicable laws, rules, regulations, and standards. The proposed project may be constructed only in accordance with the approved plans. There may be no deviation from the approved plans without the written approval of the City. Approval of the plans does not constitute an assurance that the proposed project will operate in compliance with all Ohio laws and regulations. Plans should also note "All work within the right of way within City limits will require a permit from Public Works". Permits can be found at https://www.fairfield-city.org/448/Permits-Specifications

301.00 DESIGN INTERSECTIONS

a) At street and alley intersections, property line corners shall be rounded by an arc, the minimum radius of which shall be 15 feet and 10 feet respectively. In business districts, a chord may be substituted for such arcs.

b) Street curb intersections shall be rounded by radii of at 25 feet.

c) The above minimum radii shall be increased when the smallest angle of intersection is less than 90 degrees. (Ord.141-83. Passed 9-26-83)

302.00 MINIMUM PAVEMENT WIDTHS

Minimum pavement widths, back to back of curb, required to be installed at the subdivider's expense, shall be as follows:

a) Primary and secondary thoroughfares, as shown on the Thoroughfare Plan.

b) Collector streets, 38 feet.

c) Local and minor streets, 28 feet.

d) The pavement of a turning circle at the end of a cul-de-sac street will have a minimum outside diameter of 80 feet. A "T" or "Y" shaped paved space, when approved by the Commission, in place of a turning circle, will extend entirely across the width of the street right of way and will be at least 20 feet wide with the flared portion rounded by minimum radii of 20 feet.

e) Alleys, full width of right of way, 20 feet. (Ord.141-83. Passed 9-26-83)

303.00 STREET DESIGN STANDARDS

	Primary & Secondary	Industrial	Collector	Local & Cul-de-sac
Minimum centerline grade	0.50%	0.50%	0.50%	0.50%
Maximum centerline grade	5.0%	5.0%	10.0%	12.0%
Minimum length of vertical curve (See Note 2)	100'	100'	50'	50'
Minimum length of tangent between horizontal curves	100'	100'	50'	50'
Minimum edge of pavement radius	40'	50'	25'	25'
Minimum stopping sight distance (See Note 3)	Refer to ODOT L&D Manual	Refer to ODOT L&D Manual	Refer to ODOT L&D Manual	Refer to ODOT L&D Manual
Maximum centerline grade approaching an intersection (See Note 4)	2.0%	2.0%	4.0%	6.0%
Cul-de-sac pavement turnaround diameter from back-to-back of curb (See Note 5)	N/A	120'	N/A	80’
Minimum traffic lane width for multi-lane streets (See Note 6)	12'	12'	12'	11.5'
Minimum Centerline Radius	Refer to ODOT L & D Manual	Refer to ODOT L & D Manual	Refer to ODOT L & D Manual	100'
Maximum driveway grade (See Note 9)	15%	15%	15%	15%

a) Any exceptions to these standards must be approved in writing by the Public Works Director.

b) All changes in street grades shall be connected by vertical curves of a minimum length in feet equivalent to 15 times the algebraic difference between the rates in grade.

c) Vertical sight distance shall be measured from an eye level of 3.5 feet to the top of a 2-foot-

high object.

d) The grades shall be shown every 10 feet around the radius of intersecting streets to the point of curve or tangency for a distance of 50 feet from an intersection with the front of curb or edge of pavement of another street.

e) A "T" or "Y" shaped turnaround shall not be used unless approved by the Planning Commission and the design has been approved by the Public Works Director.

f) Minimum pavement widths as detailed in the Thoroughfare Plan for the City of Fairfield shall be used for all two lane streets except that all industrial streets shall have a minimum width of 38 feet as measured from back-to-back of the curb and all cul-de-sacs at the termini of said industrial streets shall be offset to eliminate the need for semi-trucks to negotiate an "s"-curve into and through the turning circle. Exit curves as measured along the edge of pavement within an industrial cul-de-sac shall be a minimum radius of 45 feet. Underdrains are required on all newly developed streets and shall be 6-inch perforated plastic pipe with an approved geotextile fabric wrap around the pipe and shall be installed 6 to 12 inches behind and parallel to the back of curb and approximately 3 feet below subgrade on both sides of the roadway. Under drains shall be used to drain the subgrade. The under drains shall be connected to a positive drainage outlet (i.e. curb inlets) and shall be backfilled with #8 sized granular material.

g) The minimum design speed for all projects shall be equal to or greater than the legal speed for the facility and the preferred design speed shall be 5 miles per hour higher than the posted legal speed.

h) Sump collector lines are required in all residential developments. The 8-inch sump collector line shall be located approximately 2 feet behind the curb and approximately 2 feet below grade. When used in parallel with underdrains, the sump collector line should be located above the underdrain pipe. Cleanouts on the sump collector lines will be required every 200 feet. Tie-ins to sump lines must be done using approved commercial fittings and shall be inspected by the City of Fairfield Public Works Department. A minimum of 24 hours notification is required for inspection request. The proposed sump line tie in shall be shown on the site plan. Concrete collars shall not be permitted. **See the Two-Way Clean Out (For Sanitary and Storm Applications) drawing on Page 27 of the Standard Construction Drawings.** The 8-inch sump collector line shall be PVC (SDR-35, schedule 40, or approved equal). All private sump lines connecting to the 8-inch sump collector line shall be of the same material and properly bedded within the public right-of-way. **See the Sump or Downspout Drain drawing on Page 5 of the Standard Construction Drawings.**

i) All residential and commercial driveways which are new construction will be reviewed on a case by case basis. For any design questions regarding these driveways not described in Sections 304.04 or 308.00, the City of Fairfield Public Works and Fire Departments shall make the final determination involving a workable driveway design. Driveways shall not be constructed or widened to within 5 feet of a utility pole, fire hydrant, catch basin, etc. Driveway flares shall not project across the neighboring property line

j) Curb ramps shall be installed according to the most recent ODOT standard drawings BP-7.1. Detectable warnings shall be cast in place (2'x 4') by Armor Tile, ADA Solutions, or Tuftile and match Federal Color #20109 (Dark Red in Color).

k) All newly constructed, repaired, or replaced sidewalk and/or curb ramps shall be made completely compliant with the latest edition of the American with Disabilities Act (ADA). This includes providing proper slopes and cross-slopes of all sidewalk and curb ramps and the provision of truncated dome paver warning devices at all curb ramps. Sidewalk and curb ramp cross-slopes for new construction shall be designed to no greater than 1.5%. The maximum acceptable resultant construction cross-slope is 2.0%. For longitudinal slope, the maximum grade is 5% with replacement ramps required to replace up to 15 feet of existing sidewalk in order to accommodate the ramp.

304.00 PAVEMENT STANDARDS

304.01 Rigid Pavement

The use of rigid pavement in the City is not preferred and requires prior approval and acceptance by the Public Works Director or his/her designee. Concrete pavement shall be designed and as specified by the design engineer. If approved, concrete pavement shall be a minimum 7 inches thick for residential streets and 9 inches thick for commercial streets. Curb and gutter shall not be integral to the roadway pavement. The concrete pavement design shall include a minimum 6 inches of Aggregate Base.

304.02 Flexible Pavement

a) Flexible pavement for commercial/industrial, primary, secondary, and collector streets shall consist of minimum thickness of asphalt concrete base, asphalt intermediate course, and asphalt surface course as designed and as specified by the design engineer over a uniformly compacted subgrade. Tack coat will be applied at a minimum rate of 0.1 gallon per square yard unless otherwise specified by the design engineer. The surface lift shall be installed just before the final acceptance of the subdivision.

b) A minimum design for local residential streets will be 5 inches of Asphalt Concrete Base, 1.5

inches of Asphalt Concrete Intermediate Course and 1.5 inches of Asphalt Concrete Surface Course.

c) A minimum design for industrial streets will be 8 inches of Asphalt Concrete Base, 1.5 inches of Asphalt Concrete Intermediate Course and 1.5 inches of Asphalt Concrete Surface Course.

d) The City of Fairfield reserves the right to increase the pavement thickness, require underdrains or require additional subgrade preparation as typical traffic loadings are anticipated or if poor soils are encountered.

304.03 Pavement Design and Acceptance

Design of rigid and flexible pavement shall be based on traffic volumes, geotechnical investigation, and methods set forth in the current Pavement Design Manual from the State of Ohio Department of Transportation. The City will not accept maintenance responsibility for new construction of public streets constructed by a developer until 80% of the final build-out has been completed.

304.04 Driveways, Culverts, and Sidewalks

a) Concrete residential drive aprons within the public right-of-way shall be 7 inches thick. Concrete commercial drive aprons within the public right-of-way shall be 9 inches thick. Concrete sidewalk within the public right-of-way shall be 4 inches thick. Concrete sidewalk that is part of the drive/apron shall be the same thickness as the drive apron. All driveway aprons behind concrete curb must be concrete. Aprons in areas where no curb is present may be asphalt if approved by the Public Works Director or his/her designee. Asphalt aprons must be an equal or greater thickness than what is required for concrete.

b) Culverts are required under all drive aprons that do not have curb or if deemed necessary by the Public Works Director or his/her designee. Culverts shall be a minimum of 12 inches in diameter and shall be reinforced concrete pipe.

c) Proposed driveways on thoroughfares are required to have turnarounds built equal to or greater than the required dimensions of a parking stall. These turnarounds are to ensure that vehicles will be able to enter the highway without backing. **See the Item 452 – Non-Reinforced Concrete Pavement Drive Apron drawing on Page 8 of the Standard Construction Drawings.**

304.05 Road Cut Restoration / Trench Excavation (Same as 204.01)

a) Open road cuts require an Open Road Cut permit approved by the Public Works Director or his/her Designee. Roadway restoration shall be per Public Works standard drawings for typical restoration sections. Trenches not backfilled and resurfaced by the end of the work day shall be plated in accordance to standard drawing. Steel plates shall be accompanied by appropriate signage warning motorists of the hazard in the roadway. The plates must be secured and wedged in a manner acceptable to the Public Works Department, and plates are not to be used between November 1 and April 1 except for emergency circumstances. Plates used between November 1 and April 1 must be recessed for all locations.

b) Low Strength Mortar (LSM) backfill is required for all trench work within 3 feet of the edge of pavement/back of curb of the public street. LSM shall be of an approved mix design and have a compressive strength of no greater than 50 psi. The mix design must be submitted to the Public Works Department for approval at least 48 hours in advance of delivery.

c) Open no more trench in advance of pipe laying than is necessary to expedite the work.

d) Trench excavation will be performed according to OSHA and any State of Ohio regulations.

e) For trenches outside the public Right-of-Way, a Right-of-Way Permit may be required from the Public Works Director or his/her Designee to lay back slopes in the public right-of-way.

f) No boring, drilling, or tunneling shall be permitted in a public roadway, or right of way, unless authorized by permit and review by the Public Works Department.

g) For pavement excavation, the Contractor shall use such methods as; drilling, chipping, or sawing to assure the breaking of pavement along straight lines. The face of the remaining pavement shall be approximately vertical. If the Contractor removes or damages pavement or surfaces beyond the limits specified, such pavement and surfaces shall be repaired or replaced at the Contractors' expense. The Public Works Department must be notified 24 hours in advance and an inspector present for any pavement restoration to be acceptable.

See the Trench Plate Detail, Trench Detail, and Full Depth Asphalt Concrete pavement drawings on Pages 2, 3, and 10, respectively, of the Standard Construction Drawings.

304.06 Cold Weather Placement of Concrete

a) ACI 306R (latest edition), published by the American Concrete Institute, shall be followed when cold weather is expected and/or encountered, as determined by the City Engineer.

1) Cold weather is determined as follows:

   i. The average daily air temperature (average of the highest and lowest temperatures from midnight to midnight) is below 40 degrees Fahrenheit, and

   ii. The air temperature is not greater than 50 degrees Fahrenheit for more than one half of any 24-hour period.

b) In no case will the placement of concrete be allowed to be placed on frozen (less than 33 degrees Fahrenheit) ground or sub base.

c) Prior to allowing placing any concrete during cold weather, the Contractor shall submit a formal written cold weather placement policy/procedure to the Public Works Department.

d) Concrete shall be kept above freezing by the continuous use of blankets or other approved methods for a minimum of 7 days after being placed and finished.

305.00 WORK WITHIN THE PUBLIC RIGHT-OF-WAY

All work within the public right-of-way requires a permit to be approved by the Public Works Director or his/her designee. **See Appendix A for detailed information on work within the public right-of-way**

306.00 TRAFFIC IMPACT STUDIES

Traffic studies for new development and redevelopment within the City shall follow the procedures outlined by this document and must be approved by the City Engineer or his/her designee. **See Appendix B for detailed information on Traffic Impact Studies**

307.00 SMALL CELL DESIGN GUIDELINES

Small cell infrastructure within the public right-of-way requires a permit to be approved by the Public Works Director or his/her designee. **See Appendix C for detailed information on Small Cell Design Guidelines**

308.00 ACCESS MANAGEMENT STANDARDS AND GUIDELINES

1. PURPOSE & INTENT

a) Access Management is an efficient way of dealing with the problems associated with traffic congestion and safety caused by motorists turning at driveways and intersections. Congestion and the threat of accidents become greater as the number of driveways and

intersections increase and the distance between them decreases.

b) The City of Fairfield is committed to the following principles: promoting public safety by minimizing accidents; improving the driving experience by increasing mobility and decreasing delay; providing necessary and safe access to property; and minimizing costs by making more efficient use of existing and proposed roads.

c) The City considers: (1) modifications to existing roadways to provide better access management, (2) proper access management along all new roadways, and (3) proper management and design of the site access and circulation systems associated with planned new developments.

2. DRIVEWAY TYPES

a) Farm or Field Drives: A driveway providing access to an agricultural tract of land.

b) Single Family Residential: A driveway providing access to a single-family residence.

c) Multi-Family Residential: A driveway providing access to multiple single-family residences or to multi-family dwelling units.

d) Commercial: A driveway providing access to an office, business, commercial, or institutional building or buildings, or to an industrial facility (that services fewer than ten trucks per day).

e) Industrial/Retail: A driveway serving a retail center (such as a community shopping center) or an industrial facility (that services ten or more trucks per day).

For Access Management purposes, driveways are also classified by traffic volumes as follows:

a) Low Volume Driveway (LVD): greater than 5 and up to 100 two-way vehicle trips in one or more 60-minute periods of a day

b) Medium Volume Driveway (MVD): greater than 100 and up to 200 two-way vehicle trips in one or more 60-minute periods of a day

c) High Volume Driveway (HVD): greater than 200 two-way vehicle trips in one or more 60-minute periods of a day.

3. DRIVEWAY LOCATION & SPACING

a) Residential properties will be limited to one drive per lot. Driveway turnarounds will be required for residential properties on streets with a speed limit above 25 mph.

b) The number of driveways afforded any one site shall be minimized. (The need for more than one driveway must be substantiated by a Traffic Impact Study.)

c) Access for multiple properties shall be combined, where feasible.

d) Driveways shall be located in accordance with applicable sight distance requirements (Stopping Sight Distance (SSD) and Intersection Sight Distance (ISD) as contained in Section 200 of the ODOT Location and Design Manual).

e) Minimum driveway spacing (centerline to centerline), which is based on posted speed limits, shall be determined as follows:

Posted Speed (mph)	Minimum Distance (feet)
25	150
30	200
35	250
40	325
45	500
50	550
55	600

f) Driveway spacing shall consider the location of driveways on both sides of a roadway.

f) Driveways shall be located where they will not cause problems with movements to and from an existing or planned street, highway, or driveway on the opposite side of the roadway.

g) Driveways shall be located a sufficient distance from an adjacent public road intersection so as not to interfere with the traffic operations at the intersection. The following provides the minimum acceptable distances between drive locations and adjacent intersections. For all functional classifications set forth in the Thoroughfare Plan, where two roads of different functional classes intersect, the restrictions and distances of the higher-level roadway will apply along the lower classified roadway. (The defined distances are measured from the centerline of the intersecting road to the centerline of the proposed driveway).

Higher Roadway Classification	Minimum Distance from Intersection
Major Arterials	600 feet
Minor Arterials, Collectors	300 feet

4. ACCESS MANAGEMENT STANDARDS

Reference the latest version of the ODOT State Highway Access Management Manual.

5. DRIVEWAY GEOMETRICS AND DESIGN

a) All drive aprons located within the public right-of-way shall be constructed of concrete or asphalt. The thickness of the concrete and aggregate base shall be consistent with the standards found in 304.04 of this manual.

b) The portion of a driveway and/or parking area located outside of the Right-of-Way shall be constructed of concrete, asphalt, pavers, or other durable and permanent material as approved by the City Engineer. New gravel driveways or parking areas or expansion of existing gravel driveways or parking areas shall not be permitted.

Driveway Design Standards

Driveway Type	Residential		Commercial		Industrial/Retail	
Design Vehicle	P		SU-30		WB-50/WB-67	
Width (ft)	Min.	Max.	Min.	Max.	Min.	Max.
One-Way	-	-	12	20	14	26
Two-Way	9	24	24	36*	26	38*
Right Turn Radius**	15	25	25	35	35	75

* The chart assumes one lane for ingress and one lane for egress. Additional lanes will increase the width requirement.

** Flares are generally preferred and when used are typically half the width of the tree lawn up to five feet maximum on either side of the drive.

P: Passenger car
SU-30: Single-unit truck; 30 feet in length
WB-50: Large semi-trailer truck; 55 feet in length
WB-67: Interstate semi-trailer truck; 74 feet in length

c) Two-way driveways shall intersect the highway at an intersection angle between 80º and 90º.

d) An angle less than 80º will not be permitted on new two-way driveways. One-way operation driveways (right in only or right out only) shall not have an angle less than 45º

e) Drives shall not be obstructed within the right-of-way by gates, or similar obstacles. Any access with a gate shall be designed so that the longest vehicle can completely clear the traveled way when the gate is closed and as it is opened.

f) High volume driveways that do not meet signal warrants may be denied certain traffic movements if traffic volumes and conditions on the highway would make the full movement operation unsafe.

6. DRIVEWAY ISLANDS

a) In some situations, it is desirable to prohibit certain movements through the use of median or channelizing islands. Median islands can be used to separate inbound and outbound traffic. A curbed island prevents egressing traffic from encroaching on the side of the drive used by ingress traffic. Channelizing islands further designate the correct turning path and define the merge area thus reducing conflicting movements. The geometry shall physically define the permitted movements and block the prohibited movements.

b) Median islands shall be at least 4 feet wide -- with a maximum of 6 feet at the intersection. Median widths exceeding 6 feet are undesirable because they create turning problems, expand the intersection, and make it difficult to provide proper lane alignments with opposing existing or future driveways or roadways. Median islands shall be at least 25 feet in length. An island median shall be used to prevent encroachment on other driveway lanes whenever any combination of egress and ingress lanes exceeds 3 lanes. A median island shall be offset at least 12 feet from the edge of the traveled lane on the main road. The nose of a median island shall taper in height from 2 inches to 6 inches over a distance of 4 feet.

7. RIGHT-IN/RIGHT-OUT

In some situations, it is desirable to prohibit left turn movements through the use of right-in/right-outs. When applicable, the City requires new development and redevelopment to employ the standards of the Butler County Engineer’s Office for right-in/right-outs without an acceleration lane (with a right drop lane). Other configurations such as a right-in only, all-in/right-out, etc. will be considered on a case by case basis at the discretion of the City Engineer.