

2014

MINIMUM STANDARDS AND SPECIFICATION FOR PUBLIC INFRASTRUCTURE IMPROVEMENTS



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INTROCUCTION

Capital improvements play a very important role within the City of Alton infrastructure and in order to assist developers, engineers, architects, designers and contractors during the design and construction of public infrastructure the City has developed and adopted this standards and specification manual.

The purpose of this manual is to be used as a general guideline for all the City departments during in-house design as well as reference for reviewing proposed new infrastructure and/or improvement, permitting and inspection. This manual is also intended to be followed for design professional during the preparation of plans and specification for all proposed project within the City limits.

The City of Alton is committed to regulated and provide orderly growth to the residents by ensuring proper design of streets, sidewalk, storm drainage, sanitary sewer, parks, and any other public infrastructure.

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PAVEMENT DESIGN

Flexible Pavement

The following design criteria shall be applicable to flexible pavement designs.

VARIABLE	ALLEYS	LOCAL	COLLECTOR	ARTERIAL
A. Right of Way Width	MIN. 20'	MIN. 50'	MIN. 80'	MIN. 100'
B. Street Width Measured from Back of Curb to Back of Curb	MIN. 18'	MIN. 32'	MIN. 40'	MIN. 52'
C. Curb and Gutter Width	N/A	MIN. 18"	MIN. 24"	MIN. 24"
D. Hot Mix Asphaltic Concrete Type "D" (HMAC)	1 ½"	2"	2 ½"	3" Or More
E. Flexible Base Compacted Thickness	6"	6"	8"	12"
F. Prepared Sub-grade Compacted Thickness	6"	6"	6"	12"

- Geotechnical report with recommendations by a professional engineer shall be submitted with design data as part of the construction documents.
- Subgrade density shall not be less than 95% maximum dry density, as determined by standard proctor (ASTM D698). Subgrade shall be lime stabilized if plasticity index (PI) of the soil is greater than 18%. All compacted subgrade shall extend one foot behind the proposed back of curb.
- Flexible base density shall not be less than 95% maximum dry density, as determined by standard proctor (ASTM D698). Flexible base shall be lime stabilized if plasticity index (PI) of the soil is greater than 12%. All compacted flexible base shall extend one foot behind the proposed back of curb.

- Hot mix asphaltic concrete (HMAC) shall be Type “D”, limestone aggregate and density shall not be less than 95% of maximum theoretical density.

Any deviation shall be approved by the City Engineer prior to construction.

Concrete Pavement

The following design criteria shall be applicable to concrete pavement designs.

- Thickness designs for Concrete Highways and Street Pavement, Portland Cement Association, EB109P, Reprinted 1995
- Concrete Streets: Typical Pavement Sections and Jointing Details, Portland Cement Association, IS211P, 1980
- Design and Construction of Joints for Concrete Streets, Portland Cement Association, IS061P, 1992
- Construction Specification Guideline for Concrete Streets and Local Roads, Portland Cement Association, IS119P, 1998
- Guide Specifications for Concrete Curbs and Combined Curbs and Gutters, Portland Cement Association, IS110P, 1983
- A minimum 30-year period shall be utilized for all designs

Concrete Foundations

- Bar-lift Plastic Chairs, or approved equal, shall be used to secure steel at center of concrete thickness on all building foundations.

Sidewalk Design

The following design criteria shall be applicable to sidewalk designs.

- Sidewalk alignment must match existing alignment in area or be set a minimum of three foot from the back of curb.
- Sidewalk shall slope toward the street with a maximum cross-slope of $\frac{1}{4}$ inch per foot or 1:50 (2%), 1-inch above the top of curb, and a maximum longitudinal slope of $\frac{1}{2}$ inch per foot or 1:20 (5%) or less whenever technically feasible.
- Sidewalk shall be 5 foot minimum width when placed at an offset behind the curb, and minimum of 6 foot width when placed immediately adjacent to the curb.
- Ramps shall be placed at all intersection with roadways and other pedestrian crossings or where required by law/City.
- Curb and Gutter must be saw cut for construction of any sidewalk and/or ramps.
- Flatwork is required to meet Texas Accessibility Standards (Texas Civil Statutes, Article 9102).
- Sidewalks and ramps shall be constructed of 4" thick concrete reinforced with 6" x 6" No. 6 gage wire mesh or No. 3 bars @ 8" O.C.E.W. Sidewalk shall be 6" at driveways.
- Bar-lift Plastic Chairs, or approved equal, shall be used to secure steel at center of concrete thickness
- Subgrade shall be compacted to 90% standard proctor.
- Contraction joints shall be scored every 6 feet and expansion joints every 30 feet.
- Sidewalk shall have a broom finish transverse to the walkway. Exposed aggregate, pavers, tile and stained or painted concrete are not permitted within the right of way.
- All concrete shall be 5-sack concrete and shall have a minimum compressive strength of 3000 psi.

- Membrane curing compound shall be applied at a minimum of 1 gallon per 180 square feet of area.
- Any admixtures to the concrete mix (i.e. fiber mesh, plasticizers, etc.) shall require approval from the City Engineer prior to construction

Residential Driveway apron Design

The following design criteria shall be applicable to residential driveway apron designs.

- Minimum driveway width allowed is 12 ft. and maximum is 25 ft.
- Curb cut must be a minimum of 6-feet from a side property line.
- Flow line of new gutter shall match existing flow line.
- Curb and gutter must be saw cut.
- Driveway aprons shall be constructed of concrete with a minimum of 6 inches in thickness, reinforced with 6" x 6" No. 6 wire mesh, No. 3 bars @ 12" O.C.E.W. or No. 4 bars @ 18" O.C.E.W.
- Bar-lift Plastic Chairs, or approved equal, shall be used to secure steel at center of concrete thickness.
- Concrete shall have a broom finish. Exposed aggregate, pavers, tile and stained or painted concrete are not permitted within the right of way.
- All concrete shall be 5-sack concrete and shall have a minimum compressive strength of 3000 psi.
- Membrane curing compound shall be applied at a minimum of 1 gallon per 180 square feet of area.

- Subgrade shall be compacted to 90% standard proctor.
- Expansion joint required at property line and intersection with sidewalks. Longitudinal expansion joint required at mid-point of driveway if width is greater than 18 feet.
- If a manhole falls within a driveway pad, the manhole lid shall be placed flush with the elevation of the driveway.
- Any driveway placed where a drainage bar ditch exists, shall maintain the flow line of the ditch with the placement of a concrete culvert.
- Concrete culvert shall not be less than 15" in diameter and shall have safety end treatments at both sides.
- Driveway wings shall not exceed a 12:1 slope.
- Any admixtures to the concrete mix (i.e. fiber mesh, plasticizers, etc.) shall required approval from the City Engineer prior to construction.

Commercial Driveway Apron Design

The following design criteria shall be applicable to commercial driveway apron designs.

- Minimum width allowed is 25 ft and maximum is 45 ft.
- Curb cut must be a minimum of 6-feet inside the property line.
- Flow line of new gutter shall match existing flow line.
- Curb and gutter must be saw cut.
- Driveway aprons shall be constructed of concrete with a minimum of 6 inches in thickness, reinforced with No. 3 bars @ 12" O.C.E.W. or No. 4 bars @ 18" O.C.E.W. No wire mesh shall be allowed.
- Driveways exceeding HS-20 loads to be reviewed and approved by City Engineer.

- Bar-lift Plastic Chairs, or approved equal, shall be used to secure steel at center of concrete thickness.
- Concrete shall have a broom finish. Exposed aggregate, pavers, tile and stained or painted concrete are not permitted within the right of way.
- All concrete shall be 5-sack concrete and shall have a minimum compressive strength of 3000 psi.
- Membrane curing compound shall be applied at a minimum of 1 gallon per 180 square feet of area.
- Subgrade shall be compacted to 95% standard proctor.
- Expansion joint required at property line and intersection with sidewalks. Longitudinal sawed contraction joint required at 15 ft minimum. See commercial concrete driveway & typical joint layout for details.
- If a manhole falls within a driveway pad, the manhole lid shall be placed flush with the elevation of the driveway.
- Any driveway placed where a drainage bar ditch exists, shall maintain the flow line of the ditch with the placement of a concrete culvert.
- Concrete culvert shall not be less than 15" in diameter and shall have safety end treatments at both sides.
- Driveway wings shall not exceed a 12:1 slope.
- Any admixtures to the concrete mix (i.e. fiber mesh, plasticizers, etc.) shall require approval.

- Additionally, decorative concrete shall require approval of the pattern and finish from the City Engineer prior to construction.

Parking Lot Design

The following design criteria shall be applicable to off-street parking lot designs.

- Parking facilities shall have an all-weather surfacing (paved) and shall be connected by an all-weather surfaced driveway to the paved street or alley. An all-weather surface parking facility shall be of asphalt or Portland cement concrete construction.
- Capacity of the parking facility shall be calculated using the most stringent between Texas Accessibility Standards (Table #1) and the City Zoning Ordinance 2001-16

TABLE #1

Total Parking in Lot	Required Minimum number of Accessible Spaces	Total Parking in Lot	Required Minimum number of Accessible Spaces
1 to 25	1	201 to 300	7
26 to 50	2	301 to 400	8
51 to 75	3	401 to 500	9
76 to 100	4	501 to 1000	2 percent of total
101 to 150	5	1001 and over	20 plus 1 for each
151 to 200	6		100 over 1000

- Parallel parking is discouraged unless it can be situated where persons entering and exiting vehicles will be out of the flow of traffic. If parallel parking is provided it shall comply with Texas Accessibility Standards sections 4.6 and 4.6.2(a).
- No parking space shall be less than eighteen feet (18') in length and nine feet (9') in width. Exception: parking spaces may be reduced in length when a tire stop curb is

installed sixteen feet (16') from the maneuvering lane and a clear space of two feet (2') is provided for a vehicle overhang. The overhang is not permitted over public property, a sidewalk, or a setback in which parking is not permitted. Such reduction is permitted only when the width of the maneuvering lane is maintained at twenty-six feet (26') or greater. Handicapped spaces shall be at least fifteen (15') feet wide.

- e. Sixty degree angled parking shall be at least twenty (20') feet in length when measured at right angles to the parking line and nine (9') feet wide when measured perpendicular to the parking angle. Maneuvering space shall be at least sixteen (16') feet wide in clear distance.
- f. Forty-five degree angled parking shall be at least nineteen (19') feet in length when measured at right angles to the parking line and nine and nine (9') feet wide when measured perpendicular to the parking angle. Maneuvering space shall be at least twelve (12) feet wide.
- g. No off- street parking facility shall be located, either in whole or in part, in a public street or sidewalk, parkway, alley, or other public right-of-way.
- h. No off-street parking or loading space shall be located, either in whole or in part, within any fire lane required by the city or within aisles, driveways or maneuvering areas necessary to provide reasonable access to any parking space. Tandem parking is prohibited, unless specifically authorized by variance granted by the Zoning Board of Adjustment.

- i. For multi-family and non-residential uses, parking spaces shall be striped or otherwise clearly designated on the parking facility surface, and shall not include any fire lane or other area necessary for aisles or maneuvering vehicles.
- j. For multi-family and non-residential uses, handicapped parking shall be provided at the rate of one space for each ten (10) parking spaces or fraction thereof. A minimum of one handicapped parking space is required for those lots with less than ten (10) parking spaces. Handicapped spaces shall be a minimum of fifteen (15) feet wide.
- k. Handicapped parking shall be required at the rate of one handicapped space for each ten non-handicapped parking spaces or fraction thereof. Single-family and Duplexes are exempt from the requirement to provide handicapped parking spaces. Triplexes and other multi-family residential properties are required to provide handicapped parking spaces.
- l. In case of mixed uses, the parking spaces required shall equal the sum of the requirements of the various uses computed separately.
- m. All loading areas and their ingress and egress shall be heavy-duty pavements. The parking and loading spaces shall be clearly marked by colored paint, buttons, or other approved traffic and parking devices.
- n. The minimum ingress-egress requirements for off-street parking lots are:
 - i. All ingress and egress driveways shall have a curb and gutter between the parking lot and the public street.
 - ii. One-way entrance and exit driveways shall be a minimum of twelve (12) feet and a maximum of twenty-five (25) feet wide at the property line.

- iii. Two-way entrances and exits shall be a minimum of twenty-five (25) feet and a maximum of forty-five (45) feet wide at the property line.
- iv. The curb radius shall be between five (5) and twenty-five (25) feet. The width of the driveway, street length, and traffic volumes must be considered when setting curb radii so as to minimize hazards from entering and exiting public street traffic flow.
- v. Obstruction to visibility at the intersection of ingress and egress driveways with public streets or alleys shall comply with the provisions of the City ordinance and shall not be less than required by the Manual of Uniform Traffic Control Devices, Texas Supplement.
- vi. Entrance and exit driveways shall be as near to the middle of the block as practical and must not be located closer than one hundred twenty-five (125) feet from the centerline of intersecting public roadways whenever technically feasible. The City on a plat layout diagram must approve the exact location of the off-street parking lot ingress and egress point(s) at the time of issuance of the building permit. Both the City and TXDOT must approve ingress and egress points involving intersections with roadways under the jurisdiction of the Texas Department of Transportation. The City reserves the right to reduce the number of ingress and egress points or combine one-way ingress and egress driveways where requirements of traffic safety demand. The cost of such reductions or driveway combination will be borne by the applicant.

- vii. As a general guide, parking lots with more than seventy-five (75) parking spaces shall have more than one (1) entrance and one (1) exit and parking lots with more than one hundred fifty (150) parking spaces shall have entrances and exits on more than one (1) public street or alley, one of which must be a public street. The specific requirements for the number of ingress and egress driveways will be determined by the nature of the establishment, anticipated traffic flow in and around the parking lot, and the requirements for traffic and pedestrian safety.

- n. Where none of the foregoing rules and guides are applicable to an existing situation, the method for computing the parking requirement shall be the one established by "Traffic Engineering & Practice," Louis Pisnatro, Prentice Hall or "Parking in the City Center," Wilbur Smith & Associates, New Haven, Connecticut, or other parking data from Acceptable Publications.

DRAINAGE DESIGN

Storm drainage design criteria shall comply with the Master Capital improvement Plan, Master Drainage Plan, Drainage Design Manual and current ordinances of the City of Alton. If conflict occurs between these guidelines the most stringent requirement shall govern the design criteria.

EROSION PREVENTION AND SEDIMENT CONTROL

In order to comply with EPA and TCEQ and City regulation a Storm Water Pollution Prevention Plan (SWPPP) shall be implemented for each construction site proposing to disturb an area larger than one (1) acre. A TPDES Construction General Permit TXR150000 coverage will be required for this entire construction site prior to the issuance of a city permit. Operator shall comply with all federal, State and local regulation applicable.

SWPPP shall include but not be limited to:

- a. Site and activity description.
 - Contact information about the operator.
 - Information about construction site.
 - At minimum identify drainage patterns, final slopes after grading, disturbed and undisturbed areas, location of structural control measures, location of off-site materials, waste and equipment storage, discharge points, fueling areas, concrete washout areas, and others.
- b. Controls to reduce pollutants or best management practices (BMP) to be implemented for a specific pollutant.
- c. Inspections, maintenance, and recordkeeping requirements.
- d. Compliance with other programs.
- e. Actions during construction.
- f. Action to terminate coverage.

- g. It is important to remember that SWPPP must be modified as necessary if BMPs implemented are deemed inappropriate. All these changes must be documented.
- h. After final stabilization is reached the operator shall file a Notice of Termination (NOT) with TCEQ.
- i. Records must be maintained for three years after NOT is filed.

WATER DESIGN

Water distribution design criteria shall comply with 30 Texas Administrative Code Chapter 290, Master Capital Improvement Plan and most current ordinances of the City of Alton. If conflict occurs between these guidelines the most stringent requirement shall govern the design criteria.

Because the City of Alton territory lays into Sharyland Water Supply Corporation (SWSC) Certificate of Convenience and Necessity (CCN) as determined by TCEQ, it is the responsible entity for supplying potable water to the City of Alton. All water design not only has to be review and approve by the City of Alton but also by SWSC in order to get the respective permit and formal notice to proceed.

FIRE PROTECTION

Fire protection design criteria shall comply with Master Capital Improvement Plan and the most current ordinances of the City of Alton. If conflict occurs between these guidelines the most stringent requirement shall govern the design criteria.

SANITARY SEWER DESIGN

Sanitary Sewer design criteria shall comply with the 30 Texas Administrative Code (TAC) Chapters 217, Master Capital Improvement Plan, and current ordinances of the City of Alton. If conflict occurs between these guidelines the most stringent requirement shall govern the design criteria.

APPENDIX