

MEMORANDUM

TO: DEVELOPMENT COMMUNITY

VIA: CHRISTOPHER STEUBING, P.E., CFM, CITY ENGINEER *CLS*

FROM: IDAHOSA IGBINOBA, RS, ENGINEER *IIUI*

DATE: AUGUST 14, 2009

SUBJECT: DESIGN STANDARDS AMENDMENT AUGUST 2009

Per section 5-28 of the Development Code, the City Engineer may from time-to-time add to, delete from, or revise the design standards without council action. The revision must be approved by the City Manager. The following amendments are being proposed to the City of Sugar Land's Design Standards.

Please review the proposed amendments attached below, share them with your staff as applicable. *The language shown in italics is the official language that is being proposed to be adopted into the design standards.* Forward all comments and questions to Idahosa Igbinoba of the Engineering Department no later than 2 weeks from the posting date. He may be reached through e-mail at iigbinoba@sugarlandtx.gov.

Upon receipt of any comments the Engineering staff will review and take them into consideration. City staff may contact you to discuss further if needed. Upon review of all comments, any major revisions will be made and the amendment will be reposted if necessary. If no more major revisions are made then a formal announcement will be made when the standards have been approved and are effective.

We have tried to clarify what and how much is changing in each section below each heading. Please use this as a comparison with your current copy of the design standards.

1.2.4 Final Approval:

- The following paragraph will be added to this section to require signature block on plans for the Traffic Engineer for all traffic signal and ITS-related projects:

The reproducible plan set for all traffic signal and ITS-related projects shall include a signature block for plan approval by the Traffic Engineer.

1.4.2 Initial Acceptance:

- The following will be added to this section to establish time limit for punch list, before re-inspection is required. Comply with Governmental Accounting Standards Board rule. (GASB 34):

(A) (1) - Follow-up inspections of all public infrastructures shall be scheduled within 60 days of the initial inspection. A complete re-inspection and a new punch list may be required after the sixty (60) day period.

(F)- The City has received the final cost documentation including all bid component and field changes.

4.8.2 Fire Hydrant Locations:

- The following paragraph will be modified to clarify flushing valves terminology. Section 4.9 (heading) will be deleted and the paragraph that follows listed as item (I) in section 4.8.2:

Fire hydrants (flushing valves) shall be color coded on the fire hydrant, bonnet and cap. All fire hydrants shall be blasted to near white metal, primed with 3 mil DFT inorganic zinc (carbon-zinc 11 or approved equal) and final coated with rust type enamel as per specification. The color-coded paint shall be as follows:

| <i>Color</i> | <i>Water Main Diameter (In.)</i> |
|---------------|----------------------------------|
| <i>Orange</i> | <i>Greater than 16"</i> |
| <i>Green</i> | <i>12" - 16"</i> |
| <i>White</i> | <i>8"</i> |
| <i>Yellow</i> | <i>6"</i> |

4.13.1 Water Service Connections in Single Family Residential Areas:

- The following paragraph will be added to this section to establish requirements for developers to install water service leads before paving goes in:

Residential water service leads shall be installed and tested before the installation of paving. All service leads shall be included in all hydrostatic and bacteriological testing.

4.7.2 Valve Spacing:

- The following paragraph will be added to this section to clarify valve spacing requirements:

At the discretion of the City Engineer, additional valves may be required on any public water main for maintenance purposes.

4.15.3 (C) (2) Minimum rated design discharge pressure shall be 60 psi:

- The following section will be modified to clarify the pressure rating requirements for water plant booster pumps:

The minimum rated design discharge pressure shall be 60 psi or as demonstrated by hydraulic modeling that a lower pressure at the booster would allow the system to maintain a minimum pressure of 45 psi under all operating conditions with the exception of emergency conditions.

4.15.6.6 Water Plant Restroom Requirement:

- Add this section to clarify the requirement for restroom in water plant:

Restroom facilities shall be provided at water plants. A temporary facility with provisions for a permanent sanitary sewer connection to be constructed later will be adequate.

4.15.9 Emergency Power:

- The following sentence will be added to the end of the first paragraph to clarify the sizing for right angle drive on water plants:

Right angle drives shall be sized accordingly to the handle weight of the down hole pumping assembly without the motor or short shaft.

4.15.10.1 General:

- The first paragraph of this section will be modified to require chlorination after storage tank:

A chlorination system for all groundwater plants must be provided. Provisions for post-chlorination prior to entering the distribution system shall be provided at the discretion of the City Engineer with TCEQ approval.

4.15.10.1 General:

- The second paragraph of this section will be modified to allow for flexibility in choosing chlorination methods:

Disinfection methods shall be approved by the City Engineer.

4.15.10.2 (1) (A) Types of Systems:

- The following section will be modified to require fixed rate chlorinator at water plants:

Chlorination of the plant's groundwater supply shall be accomplished by providing a fixed rate chlorinator for each well feeding the plant.

4.15.10.3 Design Requirements:

- The following paragraph will be added to this section to clarify the requirement for chlorine gas at all chlorinators:

A chlorine gas leak detector shall be provided at all chlorinators.

5.1 General:

- The following paragraph will be added to this section to clarify the number of taps to the public water main:

No more than one water line tap shall be allowed for each property. The domestic water and irrigation line may be separately metered off the single tap. All far side service leads larger than two (2) inches in diameter or longer than 80 feet shall be installed by the developer. All domestic and irrigation meters shall be installed on the side of the street nearest the property within a public easement or right-of-way. All fire vaults shall be located on private property adjacent to the public right-of-way. If a fire vault is required, an isolation valve shall be installed on the property line.

5.2.4.6.1 Manholes:

- The last paragraph is being modified per the following to change "inflow dish" to "inflow protector":

All sanitary manholes shall be fitted with an inflow protector to prevent storm water intrusion to the sanitary sewer collection system.

5.2.4.6.1 Manholes:

- The following paragraph will be added to this section to address riser and clean out requirement for far side sanitary service lead:

All commercial developments with a far side (across the street) sanitary service lead shall provide a six (6) inch riser and cleanout on the property side. Public maintenance of the far side lead shall end at this riser.

5.3.3.4 Wet Well Detention Time:

- Delete the statement below to eliminate odor control requirement based on 180 minutes:

Odor control shall be provided for the wet well if the total detention time in the wet well and force main system exceeds 180 minutes.

7.4 Pavement Structure Requirements:

- The following paragraph will be added to this section to clarify when vehicles will be allowed on new pavement:

Vehicles of all types are prohibited from driving on new pavement for three (3) days after the concrete pour and until the concrete has reached a minimum compressive strength of 3,000 psi. Pavement protection such as a dirt layer of at least 12 inches is required for track equipment at pavement crossings.

7.4 Pavement Structure Requirements:

- The following paragraph will be added to this section to create a slump requirement for concrete:

The slump for concrete without a water reducer shall be no more than five (5) inches. The slump for concrete using a water reducer shall be no more than six (6) inches.

7.4 Pavement Structure Requirements:

- The following paragraph will be added to this section to clarify tolerance level for bird bath:

Any standing water or "bird baths" remaining more than eight (8) hours after flooding the street shall be considered unacceptable and a remedy will be required. Grinding of pavement up to 1/8 -inch thickness is an acceptable remedy. For areas requiring adjustment greater than 1/8-inch, foam lifting or other remedies are required. If the pavement is removed and replaced, the pavement must be removed and replaced to a construction joint.

7.4 Pavement Structure Requirements:

-The following paragraph will be added to this section to establish finish requirements for streets/bridge surfaces:

All concrete streets and bridge surfaces shall have a medium broom finish.

7.4 Pavement Structure Requirements:

- The following paragraph will be added to this section to require the use of mechanical vibrators for proper consolidation of concrete:

Hand-manipulated mechanical vibrators shall be used for proper consolidation of concrete along forms, at joints, and in areas not covered by mechanically controlled vibrators.

7.6 Grading and Layout Requirements:

- The first paragraph of this section will be modified to revise gutter line gradient from 0.30 to 0.35 percent:

The minimum gradient on a street gutter line shall be 0.35 percent.

7.7.2 Pavement Markings:

- The following paragraph will be added to this section to clarify the requirement for temporary traffic control striping:

Tabs, tape or buttons shall be used for all temporary traffic control striping. Permanent paint or thermoplastic striping is prohibited for temporary uses.

7.7.2 Pavement Markings:

-The following paragraph will be added to this section to establish standards for removing traffic control striping:

The removal of existing traffic control striping shall be performed using water blasting, sand blasting or shot blasting. Removal of striping by any methods other than the methods approved by the City is prohibited.

7.7.4.1 General:

-The following paragraph will be added to this section to establish standards for flashing message signs:

Message signs shall be provided for all primary approaches for at least 72 hours prior to traffic signal activation.

8.0 SITE DEVELOPMENT REQUIREMENTS

8.1 General

- The following paragraph will be added to this section to standardize traffic control plan details for driveway connection and to require SWPP plan:

Site development plans shall include: (A) Traffic Control Plan that is in conformance with the latest version of the TX-MUTCD standards. (B) Storm Water Pollution Prevention Plan that complies with the TCEQ Best Management Practice.

Construction Details:

We are adding the following notes to the construction details:

General Notes:

- FOLLOW-UP INSPECTIONS OF ALL PUBLIC INFRASTRUCTURES SHALL BE SCHEDULED WITHIN 60 DAYS OF THE INITIAL INSPECTION. A COMPLETE RE-INSPECTION AND A NEW PUNCH LIST MAY BE REQUIRED AFTER THE SIXTY (60) DAY PERIOD.

Concrete/Paving Notes:

- VEHICLES OF ALL TYPES ARE PROHIBITED FROM DRIVING ON NEW PAVEMENT FOR THREE (3) DAYS AFTER THE CONCRETE POUR AND UNTIL THE CONCRETE HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI. PAVEMENT PROTECTION SUCH AS A DIRT LAYER OF AT LEAST 12 INCHES IS REQUIRED FOR TRACK EQUIPMENT AT PAVEMENT CROSSINGS.

- HAND-MANIPULATED MECHANICAL VIBRATORS SHALL BE USED FOR PROPER CONSOLIDATION OF CONCRETE ALONG FORMS, AT JOINTS AND IN AREAS NOT COVERED BY MECHANICALLY CONTROLLED VIBRATORS.

Storm Sewer Notes:

- ALL COMMERCIAL DEVELOPMENTS WITH A FAR SIDE (ACROSS THE STREET) SANITARY SERVICE LEAD SHALL PROVIDE A SIX (6) INCH RISER AND CLEANOUT ON THE PROPERTY SIDE. PUBLIC MAINTENANCE OF THE FAR SIDE LEAD SHALL END AT THIS RISER.

APPENDIX F

Pavement Geometric Design Guidelines:

We are adding AASHTO Exhibit 3-14: Minimum Radius for Design of Rural Highways, Urban Freeways, and High-Speed Urban Streets Using Limiting Values of e and f to appendix F.

The following statement will be added to this section to clarify when exhibit 3-14 shall be applied:

Any geometric limitation that occurs due to site constraints or existing conditions may be addressed utilizing the AASHTO horizontal curvature minimum radius standards (Exhibit 3-14) and shall be authorized through the specific approval process.

Appendix F-5

GEOMETRIC STREET DESIGN STANDARDS (Minimum Standards)

The word “recommended” will be added to the heading of this section to clarify the City intent:

GEOMETRIC STREET DESIGN STANDARDS (Recommended Minimum Standards)

| Metric | | | | | | US Customary | | | | | |
|---------------------|---------------|----------------------|-------------------|-----------------------|--------------------|--------------------|---------------|----------------------|-------------------|------------------------|---------------------|
| Design Speed (km/h) | Maximum e (%) | Limiting Values of f | Total (e/100 + f) | Calculated Radius (m) | Rounded Radius (m) | Design Speed (mph) | Maximum e (%) | Limiting Values of f | Total (e/100 + f) | Calculated Radius (ft) | Rounded Radius (ft) |
| 20 | 4.0 | 0.18 | 0.22 | 14.3 | 15 | 15 | 4.0 | 0.175 | 0.215 | 70.0 | 70 |
| 30 | 4.0 | 0.17 | 0.21 | 33.7 | 35 | 20 | 4.0 | 0.170 | 0.210 | 127.4 | 125 |
| 40 | 4.0 | 0.17 | 0.21 | 60.0 | 60 | 25 | 4.0 | 0.165 | 0.205 | 203.9 | 205 |
| 50 | 4.0 | 0.16 | 0.20 | 98.4 | 100 | 30 | 4.0 | 0.160 | 0.200 | 301.0 | 300 |
| 60 | 4.0 | 0.15 | 0.19 | 149.1 | 150 | 35 | 4.0 | 0.155 | 0.195 | 420.2 | 420 |
| 70 | 4.0 | 0.14 | 0.18 | 214.2 | 215 | 40 | 4.0 | 0.150 | 0.190 | 563.3 | 565 |
| 80 | 4.0 | 0.14 | 0.18 | 279.8 | 280 | 45 | 4.0 | 0.145 | 0.185 | 732.2 | 730 |
| 90 | 4.0 | 0.13 | 0.17 | 375.0 | 375 | 50 | 4.0 | 0.140 | 0.180 | 929.0 | 930 |
| 100 | 4.0 | 0.12 | 0.16 | 491.9 | 490 | 55 | 4.0 | 0.130 | 0.170 | 1190.2 | 1190 |
| | | | | | | 60 | 4.0 | 0.120 | 0.160 | 1505.0 | 1505 |
| 20 | 6.0 | 0.18 | 0.24 | 13.1 | 15 | 15 | 6.0 | 0.175 | 0.235 | 64.0 | 65 |
| 30 | 6.0 | 0.17 | 0.23 | 30.8 | 30 | 20 | 6.0 | 0.170 | 0.230 | 116.3 | 115 |
| 40 | 6.0 | 0.17 | 0.23 | 54.7 | 55 | 25 | 6.0 | 0.165 | 0.225 | 185.8 | 185 |
| 50 | 6.0 | 0.16 | 0.22 | 89.4 | 90 | 30 | 6.0 | 0.160 | 0.220 | 273.6 | 275 |
| 60 | 6.0 | 0.15 | 0.21 | 134.9 | 135 | 35 | 6.0 | 0.155 | 0.215 | 381.1 | 380 |
| 70 | 6.0 | 0.14 | 0.20 | 192.8 | 195 | 40 | 6.0 | 0.150 | 0.210 | 509.6 | 510 |
| 80 | 6.0 | 0.14 | 0.20 | 251.8 | 250 | 45 | 6.0 | 0.145 | 0.205 | 660.7 | 660 |
| 90 | 6.0 | 0.13 | 0.19 | 335.5 | 335 | 50 | 6.0 | 0.140 | 0.200 | 836.1 | 835 |
| 100 | 6.0 | 0.12 | 0.18 | 437.2 | 435 | 55 | 6.0 | 0.130 | 0.190 | 1065.0 | 1065 |
| 110 | 6.0 | 0.11 | 0.17 | 560.2 | 560 | 60 | 6.0 | 0.120 | 0.180 | 1337.8 | 1340 |
| 120 | 6.0 | 0.09 | 0.15 | 755.5 | 755 | 65 | 6.0 | 0.110 | 0.170 | 1662.4 | 1660 |
| 130 | 6.0 | 0.08 | 0.14 | 950.0 | 950 | 70 | 6.0 | 0.100 | 0.160 | 2048.5 | 2050 |
| | | | | | | 75 | 6.0 | 0.090 | 0.150 | 2508.4 | 2510 |
| | | | | | | 80 | 6.0 | 0.080 | 0.140 | 3057.8 | 3060 |
| 20 | 8.0 | 0.18 | 0.28 | 12.1 | 10 | 15 | 8.0 | 0.175 | 0.255 | 59.0 | 60 |
| 30 | 8.0 | 0.17 | 0.25 | 28.3 | 30 | 20 | 8.0 | 0.170 | 0.250 | 107.0 | 105 |
| 40 | 8.0 | 0.17 | 0.25 | 50.4 | 50 | 25 | 8.0 | 0.165 | 0.245 | 170.8 | 170 |
| 50 | 8.0 | 0.16 | 0.24 | 82.0 | 80 | 30 | 8.0 | 0.160 | 0.240 | 250.8 | 250 |
| 60 | 8.0 | 0.15 | 0.23 | 123.2 | 125 | 35 | 8.0 | 0.155 | 0.235 | 348.7 | 350 |
| 70 | 8.0 | 0.14 | 0.22 | 175.3 | 175 | 40 | 8.0 | 0.150 | 0.230 | 465.3 | 465 |
| 80 | 8.0 | 0.14 | 0.22 | 228.9 | 230 | 45 | 8.0 | 0.145 | 0.225 | 502.0 | 500 |
| 90 | 8.0 | 0.13 | 0.21 | 303.6 | 305 | 50 | 8.0 | 0.140 | 0.220 | 760.1 | 760 |
| 100 | 8.0 | 0.12 | 0.20 | 393.5 | 395 | 55 | 8.0 | 0.130 | 0.210 | 963.5 | 965 |
| 110 | 8.0 | 0.11 | 0.19 | 501.2 | 500 | 60 | 8.0 | 0.120 | 0.200 | 1204.0 | 1205 |
| 120 | 8.0 | 0.09 | 0.17 | 666.6 | 665 | 65 | 8.0 | 0.110 | 0.190 | 1487.4 | 1485 |
| 130 | 8.0 | 0.08 | 0.18 | 831.3 | 830 | 70 | 8.0 | 0.100 | 0.180 | 1820.9 | 1820 |
| | | | | | | 75 | 8.0 | 0.090 | 0.170 | 2213.3 | 2215 |
| | | | | | | 80 | 8.0 | 0.080 | 0.160 | 2675.6 | 2675 |
| 20 | 10.0 | 0.18 | 0.28 | 11.2 | 10 | 15 | 10.0 | 0.175 | 0.275 | 54.7 | 55 |
| 30 | 10.0 | 0.17 | 0.27 | 26.2 | 25 | 20 | 10.0 | 0.170 | 0.270 | 99.1 | 100 |
| 40 | 10.0 | 0.17 | 0.27 | 46.6 | 45 | 25 | 10.0 | 0.165 | 0.265 | 157.8 | 160 |
| 50 | 10.0 | 0.16 | 0.26 | 75.7 | 75 | 30 | 10.0 | 0.160 | 0.260 | 231.5 | 230 |
| 60 | 10.0 | 0.15 | 0.25 | 113.3 | 115 | 35 | 10.0 | 0.155 | 0.255 | 321.3 | 320 |
| 70 | 10.0 | 0.14 | 0.24 | 160.7 | 160 | 40 | 10.0 | 0.150 | 0.250 | 428.1 | 430 |
| 80 | 10.0 | 0.14 | 0.24 | 209.9 | 210 | 45 | 10.0 | 0.145 | 0.245 | 552.9 | 555 |
| 90 | 10.0 | 0.13 | 0.23 | 277.2 | 275 | 50 | 10.0 | 0.140 | 0.240 | 696.8 | 695 |
| 100 | 10.0 | 0.12 | 0.22 | 357.7 | 360 | 55 | 10.0 | 0.130 | 0.230 | 879.7 | 880 |
| 110 | 10.0 | 0.11 | 0.21 | 453.5 | 455 | 60 | 10.0 | 0.120 | 0.220 | 1094.6 | 1095 |
| 120 | 10.0 | 0.09 | 0.19 | 596.5 | 595 | 65 | 10.0 | 0.110 | 0.210 | 1345.8 | 1345 |
| 130 | 10.0 | 0.08 | 0.18 | 738.9 | 740 | 70 | 10.0 | 0.100 | 0.200 | 1838.8 | 1840 |
| | | | | | | 75 | 10.0 | 0.090 | 0.190 | 1980.3 | 1980 |
| | | | | | | 80 | 10.0 | 0.080 | 0.180 | 2378.3 | 2380 |
| 20 | 12.0 | 0.18 | 0.30 | 10.5 | 10 | 15 | 12.0 | 0.175 | 0.295 | 51.0 | 50 |
| 30 | 12.0 | 0.17 | 0.29 | 24.4 | 25 | 20 | 12.0 | 0.170 | 0.290 | 92.3 | 90 |
| 40 | 12.0 | 0.17 | 0.29 | 43.4 | 45 | 25 | 12.0 | 0.165 | 0.285 | 146.7 | 145 |
| 50 | 12.0 | 0.16 | 0.28 | 70.3 | 70 | 30 | 12.0 | 0.160 | 0.280 | 215.0 | 215 |
| 60 | 12.0 | 0.15 | 0.27 | 104.9 | 105 | 35 | 12.0 | 0.155 | 0.275 | 298.0 | 300 |
| 70 | 12.0 | 0.14 | 0.26 | 148.3 | 150 | 40 | 12.0 | 0.150 | 0.270 | 396.4 | 395 |
| 80 | 12.0 | 0.14 | 0.26 | 193.7 | 195 | 45 | 12.0 | 0.145 | 0.265 | 511.1 | 510 |
| 90 | 12.0 | 0.13 | 0.25 | 255.0 | 255 | 50 | 12.0 | 0.140 | 0.260 | 643.2 | 645 |
| 100 | 12.0 | 0.12 | 0.24 | 327.9 | 330 | 55 | 12.0 | 0.130 | 0.250 | 809.4 | 810 |
| 110 | 12.0 | 0.11 | 0.23 | 414.0 | 415 | 60 | 12.0 | 0.120 | 0.240 | 1003.4 | 1005 |
| 120 | 12.0 | 0.09 | 0.21 | 539.7 | 540 | 65 | 12.0 | 0.110 | 0.230 | 1228.7 | 1230 |
| 130 | 12.0 | 0.08 | 0.20 | 665.0 | 665 | 70 | 12.0 | 0.100 | 0.220 | 1489.8 | 1490 |
| | | | | | | 75 | 12.0 | 0.090 | 0.210 | 1791.7 | 1790 |
| | | | | | | 80 | 12.0 | 0.080 | 0.200 | 2140.5 | 2140 |

Note: In recognition of safety considerations, use of $e_{max} = 4.0\%$ should be limited to urban conditions.

Exhibit 3-14. Minimum Radius for Design of Rural Highways, Urban Freeways, and High-Speed Urban Streets Using Limiting Values of e and f