

**HARRIS COUNTY STORM SEWER CALCULATION FORM**

PROJECT: Discount Tire - Willow Brook DESIGN STORM: 2 YR  
 PROJ. NO.: 0280-0706 DATE: 6/30/08  
 PREPARED BY: vmm DATE: 6/30/08  
 CHECKED BY: kbp DATE: 6/30/08

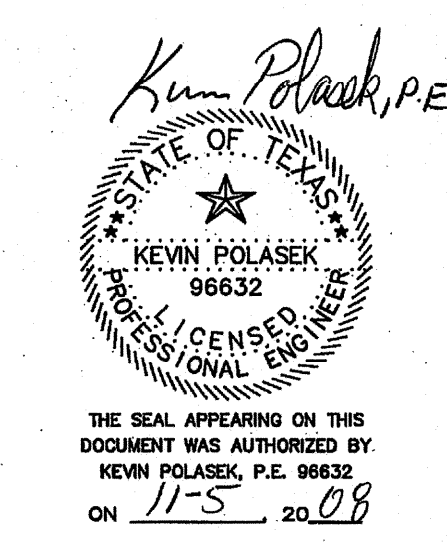
PRINTED: 9:05 AM

| LINE   | MH or Inlet | AREA | "C"  | "CA" | "TC" | "I"  | Q     | L    | LINE | DESIGN | OTHER | FLOWLINE | ACT  | HYD   | ELEV. HYD. GRAD. | TOP OF | T.P. ELEV. | TP   |        |        |      |       |       |        |        |        |        |        |      |
|--|-------------|------|------|------|------|------|-------|------|------|--------|-------|----------|------|-------|------------------|--------|------------|------|--------|--------|------|-------|-------|--------|--------|--------|--------|--------|------|
|  | FROM        | TO   | INCR | ACCU | INCR | INCR | ACCU  | FT   | SIZE | SLOPE  | "N"   | Q        | V    | GRAD  | H                | UPSTM  | DNSTM      | PIPE | UPSTM  | DNSTM  | LESS |       |       |        |        |        |        |        |      |
|  |             |      | ac   | ac   | in   | in   | cfs   |      | IN   | %      | VALUE | cfs      | fps  | %     |                  |        |            | FT   |        |        | HG   |       |       |        |        |        |        |        |      |
| A  | 1           | 2    | 0.20 | 0.71 | 0.80 | 0.16 | 24.41 | 3.45 | 0.55 | 1.98   | 170   | 12       | 0.44 | 0.011 | 2.80             | 3.6    | 0.75       |      | 113.29 | 112.54 | 2.52 | 0.219 | 0.373 | 114.40 | 114.03 | 113.54 | 116.33 | 117.38 | 1.93 |
| A  | 2           | 3    | 0.22 | 1.89 | 0.80 | 0.18 | 26.19 | 3.33 | 0.59 | 5.21   | 123   | 18       | 0.30 | 0.011 | 6.81             | 3.9    | 0.37       | 0.00 | 112.64 | 112.17 | 2.55 | 0.176 | 0.216 | 114.12 | 113.90 | 113.67 | 117.38 | 117.95 | 3.26 |
| A  | 3           | 4    | 0.21 | 2.14 | 0.80 | 0.17 | 26.43 | 3.31 | 0.56 | 5.89   | 50    | 18       | 0.35 | 0.011 | 7.36             | 4.2    | 0.18       | 0.00 | 112.17 | 112.00 | 3.33 | 0.224 | 0.112 | 114.03 | 113.91 | 113.50 | 117.95 | 117.80 | 3.92 |
| A  | 4           | 5    | 0.00 | 2.49 | 0.80 | 0.00 | 26.74 | 3.29 | 0.00 | 6.88   | 162   | 24       | 0.18 | 0.011 | 11.37            | 3.6    | 0.29       | 0.00 | 112.00 | 111.71 | 2.19 | 0.068 | 0.107 | 113.90 | 113.80 | 113.71 | 117.80 | 116.80 | 3.90 |
| A  | 5           | 6    | 0.00 | 4.03 | 0.80 | 0.00 | 27.78 | 3.23 | 0.00 | 11.00  | 200   | 24       | 0.19 | 0.011 | 11.68            | 3.7    | 0.38       | 0.00 | 111.71 | 111.33 | 3.50 | 0.169 | 0.337 | 113.91 | 113.58 | 113.33 | 116.80 | 117.00 | 2.89 |
| A  | 6           | 7    | 0.00 | 5.57 | 0.80 | 0.00 | 28.53 | 3.18 | 0.00 | 15.13  | 222   | 30       | 0.11 | 0.011 | 16.11            | 3.3    | 0.24       | 0.00 | 111.33 | 111.06 | 3.08 | 0.097 | 0.215 | 113.80 | 113.58 | 113.58 | 117.00 | 117.30 | 3.20 |
| A  | 7           | out  | 0.00 | 5.57 | 0.80 | 0.00 | 28.53 | 3.18 | 0.00 | 15.13  | 50    | 30       | 0.11 | 0.011 | 16.11            | 3.3    | 0.06       | 0.00 | 111.06 | 111.03 | 3.08 | 0.097 | 0.049 | 113.58 | 113.53 | 113.30 | 113.53 | 113.53 | 3.72 |
| Starting HG = 113.927 => @ SOFIT OF OUTFALL PIPE |             |      |      |      |      |      |       |      |      |        |       |          |      |       |                  |        |            |      |        |        |      |       |       |        |        |        |        |        |      |
| B  | 1           | A2   | 0.45 | 0.96 | 0.80 | 0.36 | 24.93 | 3.41 | 1.23 | 2.65   | 127   | 15       | 0.33 | 0.011 | 4.40             | 3.6    | 0.42       |      | 112.96 | 112.54 | 2.16 | 0.120 | 0.153 | 114.06 | 113.90 | 113.79 | 117.25 | 117.38 | 3.19 |
| Starting HG = 113.90 => @ HGL OF STR. A2         |             |      |      |      |      |      |       |      |      |        |       |          |      |       |                  |        |            |      |        |        |      |       |       |        |        |        |        |        |      |
| C  | 1           | A3   | 0.04 | 0.04 | 0.80 | 0.03 | 20.67 | 3.74 | 0.12 | 0.12   | 101   | 12       | 0.44 | 0.011 | 2.80             | 3.6    | 0.44       |      | 112.63 | 112.19 | 0.15 | 0.001 | 0.001 | 113.91 | 113.90 | 113.19 | 115.35 | 117.95 | 1.44 |
| Starting HG = 113.90 => @ HGL OF STR. A3         |             |      |      |      |      |      |       |      |      |        |       |          |      |       |                  |        |            |      |        |        |      |       |       |        |        |        |        |        |      |
| D  | 1           | A4   | 0.35 | 0.35 | 0.80 | 0.28 | 23.31 | 3.53 | 0.99 | 0.99   | 222   | 12       | 0.44 | 0.011 | 2.80             | 3.6    | 0.98       |      | 114.77 | 113.79 | 1.26 | 0.055 | 0.122 | 114.91 | 114.79 | 114.79 | 117.80 | 117.80 | 2.89 |
| Starting HG = 113.91 => @ HGL OF STR. A4         |             |      |      |      |      |      |       |      |      |        |       |          |      |       |                  |        |            |      |        |        |      |       |       |        |        |        |        |        |      |
| A  | STUB        | 1    | 0.51 | 0.51 | 0.80 | 0.41 | 23.88 | 3.49 | 1.42 | 1.42   | 28    | 12       | 0.44 | 0.011 | 2.80             | 3.6    | 0.12       |      | 113.41 | 113.29 | 1.81 | 0.114 | 0.032 | 114.43 | 114.40 | 114.29 | --     | --     | --   |
| Starting HG = 114.40 => @ HGL OF STR. A1         |             |      |      |      |      |      |       |      |      |        |       |          |      |       |                  |        |            |      |        |        |      |       |       |        |        |        |        |        |      |
| A  | STUB        | 5    | 1.54 | 1.54 | 0.80 | 1.23 | 25.79 | 3.35 | 4.13 | 4.13   | 10    | 15       | 0.33 | 0.011 | 4.40             | 3.6    | 0.03       |      | 111.76 | 111.73 | 3.36 | 0.291 | 0.029 | 113.83 | 113.80 | 112.98 | --     | --     | --   |
| Starting HG = 113.80 => @ HGL OF STR. A5         |             |      |      |      |      |      |       |      |      |        |       |          |      |       |                  |        |            |      |        |        |      |       |       |        |        |        |        |        |      |
| A  | STUB        | 6    | 1.54 | 1.54 | 0.80 | 1.23 | 25.79 | 3.35 | 4.13 | 4.13   | 10    | 15       | 0.33 | 0.011 | 4.40             | 3.6    | 0.03       |      | 111.38 | 111.35 | 3.36 | 0.291 | 0.029 | 113.80 | 113.58 | 112.80 | --     | --     | --   |
| Starting HG = 113.58 => @ HGL OF STR. A6         |             |      |      |      |      |      |       |      |      |        |       |          |      |       |                  |        |            |      |        |        |      |       |       |        |        |        |        |        |      |
| B  | STUB        | 1    | 0.51 | 0.51 | 0.80 | 0.41 | 23.88 | 3.49 | 1.42 | 1.42   | 15    | 15       | 0.33 | 0.011 | 4.40             | 3.6    | 0.05       |      | 113.01 | 112.96 | 1.16 | 0.035 | 0.005 | 114.21 | 114.21 | 114.21 | --     | --     | --   |
| Starting HG = 114.06 => @ HGL OF STR. B1         |             |      |      |      |      |      |       |      |      |        |       |          |      |       |                  |        |            |      |        |        |      |       |       |        |        |        |        |        |      |

**FLOODPLAIN INFORMATION:**  
 ACCORDING TO THE FEDERAL EMERGENCY MANAGEMENT AGENCY FLOOD INSURANCE RATE MAP NO. 48201C0435 L, LAST REVISED JUNE 18, 2007, THE SUBJECT TRACT LIES WITHIN AN AREA DESIGNATED AS ZONE X (UNSHADED), DEFINED AS AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN, AND ZONE X (SHADED), DEFINED AS AREAS OF 0.2% ANNUAL CHANCE FLOOD; AREAS OF 1% ANNUAL CHANCE FLOOD WITH AVERAGE DEPTHS OF LESS THAN ONE FOOT OR WITH DRAINAGE AREAS LESS THAN ONE SQUARE MILE; AND AREAS PROTECTED BY LEVEES FROM 1% ANNUAL CHANCE FLOOD.

**BENCHMARK NOTE:**  
 PROJECT BENCHMARK:  
 FEMA RM 150770 LOCATED ON BRETON RIDGE DRIVE +/- 100' NORTH OF FM 1960. ELEV.=120.92' (NAVD88, 2001 ADJ.)

**LEGAL DESCRIPTION:**  
 A SUBDIVISION CONTAINING 7.0021 ACRES (305,011 S.F.) BEING ALL OF RESTRICTED RESERVE "D", OUT OF WILLOW CENTRE SUBDIVISION RESTRICTED RESERVE "D", SECTION ONE REPLAT, AS RECORDED IN FILM CODE NO. 360084 OF THE H.C.M.R., LOCATED IN THE G.W. CHILDRESS SURVEY, ABSTRACT NO. 217, IN HARRIS COUNTY, TEXAS.



| REV. NO. | DESCRIPTION | DATE | APP. |
|----------|-------------|------|------|
|          |             |      |      |

**DISCOUNT TIRE (DISTRIBUTION) HOUSTON - WILLOWBROOK**

**DRAINAGE AREA MAP**

**TERRA ASSOCIATES, INC. CONSULTING ENGINEERS**

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 HOUSTON, TEXAS ZIP 77042  
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 FAX: 713-993-0743

DRAWN BY: DAB    SCALE: 1" = 40'    CONTRACT: 1  
 CHECKED BY: KBP    DATE: NOVEMBER 2008    PROJECT No. 0280-0706  
 FILE NAME: C9-DRNG.DWG    PLOT SCALE: 1:1    SHEET C9 OF 15