

**MIN. LENGTH OF PIPE (FEET) TO BE RESTRAINED**  
(SOURCES: EBAN IRON RESTRAINT LENGTH CALCULATION PROGRAM FOR PVC PIPE, RELEASE 3.1, AND DIPRA THRUST RESTRAINT FOR DUCTILE IRON PIPE, RELEASE 3.2.)

| FITTING TYPE           | PIPE SIZE |     |     |     |     |     |     |     |     |     |     |     |
|------------------------|-----------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
|                        | 4"        | 6"  | 8"  | 10" | 12" | 16" | 20" | 24" | 30" | 36" | 42" | 48" |
| 90° HORIZ. BEND        | 14        | 20  | 25  | 30  | 35  | 45  | 54  | 62  | 68  | 112 | 124 | 135 |
| 45° HORIZ. BEND        | 6         | 8   | 11  | 13  | 15  | 19  | 22  | 26  | 41  | 46  | 51  | 56  |
| 22.5° HORIZ. BEND      | 3         | 4   | 5   | 6   | 7   | 9   | 11  | 12  | 19  | 22  | 25  | 27  |
| 11.25° HORIZ. BEND     | 1         | 2   | 3   | 3   | 4   | 4   | 5   | 6   | 10  | 11  | 12  | 13  |
| 90° VERT. OFFSET       | 29        | 41  | 53  | 64  | 74  | 95  | 115 | 134 | 214 | 246 | 278 | 304 |
| 45° VERT. OFFSET       | 12        | 19  | 24  | 29  | 34  | 39  | 48  | 56  | 89  | 102 | 114 | 126 |
| 22.5° VERT. OFFSET     | 6         | 9   | 12  | 14  | 17  | 19  | 23  | 27  | 43  | 49  | 55  | 60  |
| 11.25° VERT. OFFSET    | 1         | 2   | 4   | 4   | 6   | 7   | 8   | 11  | 13  | 15  | 16  | 16  |
| PLUG (DEAD END)        | 32        | 45  | 59  | 70  | 83  | 107 | 129 | 151 | 214 | 246 | 278 | 304 |
| IN-LINE VALVE          | 47        | 63  | 81  | 97  | 114 | 147 | 177 | 211 | 304 | 346 | 398 | 450 |
| TEE (BRANCH RESTRAINT) | 1         | 1   | 2   | 2   | 3   | 3   | 4   | 4   | 6   | 7   | 8   | 8   |
| 20'X #                 | 1         | 1   | 21  | 38  | 52  | 65  | 80  | 109 | -   | -   | -   | -   |
| 24'X #                 | 1         | 1   | 16  | 34  | 49  | 62  | 86  | 108 | 129 | -   | -   | -   |
| 30'X #                 | 1         | 1   | 8   | 28  | 44  | 58  | 83  | 106 | 127 | 208 | -   | -   |
| 36'X #                 | 1         | 1   | 22  | 39  | 54  | 80  | 103 | 124 | 206 | 240 | -   | -   |
| 42'X #                 | 1         | 1   | 15  | 33  | 49  | 77  | 100 | 122 | 205 | 239 | 270 | -   |
| 48'X #                 | 1         | 1   | 7   | 27  | 44  | 73  | 97  | 120 | 203 | 238 | 269 | 298 |
| 6'X #                  | 23        | -   | -   | -   | -   | -   | -   | -   | -   | -   | -   | -   |
| 8'X #                  | 21        | 35  | -   | -   | -   | -   | -   | -   | -   | -   | -   | -   |
| 10'X #                 | 16        | 32  | 46  | 58  | -   | -   | -   | -   | -   | -   | -   | -   |
| 12'X #                 | 13        | 29  | 44  | 57  | 69  | -   | -   | -   | -   | -   | -   | -   |
| 16'X #                 | 7         | 26  | 41  | 55  | 67  | 80  | -   | -   | -   | -   | -   | -   |
| 20'X #                 | 1         | 21  | 38  | 52  | 65  | 80  | 109 | -   | -   | -   | -   | -   |
| 24'X #                 | 1         | 16  | 34  | 49  | 62  | 86  | 108 | 129 | -   | -   | -   | -   |
| 30'X #                 | 1         | 8   | 28  | 44  | 58  | 83  | 106 | 127 | 208 | -   | -   | -   |
| 36'X #                 | 1         | 1   | 22  | 39  | 54  | 80  | 103 | 124 | 206 | 240 | -   | -   |
| 42'X #                 | 1         | 1   | 15  | 33  | 49  | 77  | 100 | 122 | 205 | 239 | 270 | -   |
| 48'X #                 | 1         | 1   | 7   | 27  | 44  | 73  | 97  | 120 | 203 | 238 | 269 | 298 |
| 6'X #                  | 23        | -   | -   | -   | -   | -   | -   | -   | -   | -   | -   | -   |
| 8'X #                  | 21        | 35  | -   | -   | -   | -   | -   | -   | -   | -   | -   | -   |
| 10'X #                 | 16        | 32  | 46  | 58  | -   | -   | -   | -   | -   | -   | -   | -   |
| 12'X #                 | 13        | 29  | 44  | 57  | 69  | -   | -   | -   | -   | -   | -   | -   |
| 16'X #                 | 99        | 90  | 78  | 75  | 45  | -   | -   | -   | -   | -   | -   | -   |
| 20'X #                 | 123       | 116 | 107 | 105 | 81  | 45  | -   | -   | -   | -   | -   | -   |
| 24'X #                 | 146       | 140 | 132 | 131 | 111 | 82  | 45  | -   | -   | -   | -   | -   |
| 30'X #                 | 209       | 204 | 197 | 188 | 177 | 153 | 116 | 75  | -   | -   | -   | -   |
| 36'X #                 | 243       | 238 | 233 | 228 | 217 | 198 | 168 | 135 | 74  | -   | -   | -   |
| 42'X #                 | 273       | 270 | 265 | 259 | 252 | 234 | 211 | 183 | 133 | 72  | -   | -   |
| 48'X #                 | 301       | 298 | 294 | 289 | 283 | 268 | 249 | 226 | 183 | 131 | 71  | -   |

**RECLAIMED WATER MAIN PRESSURE TEST CRITERIA**

19R

**RECLAIMED WATER #3 STANDARD DETAILS**

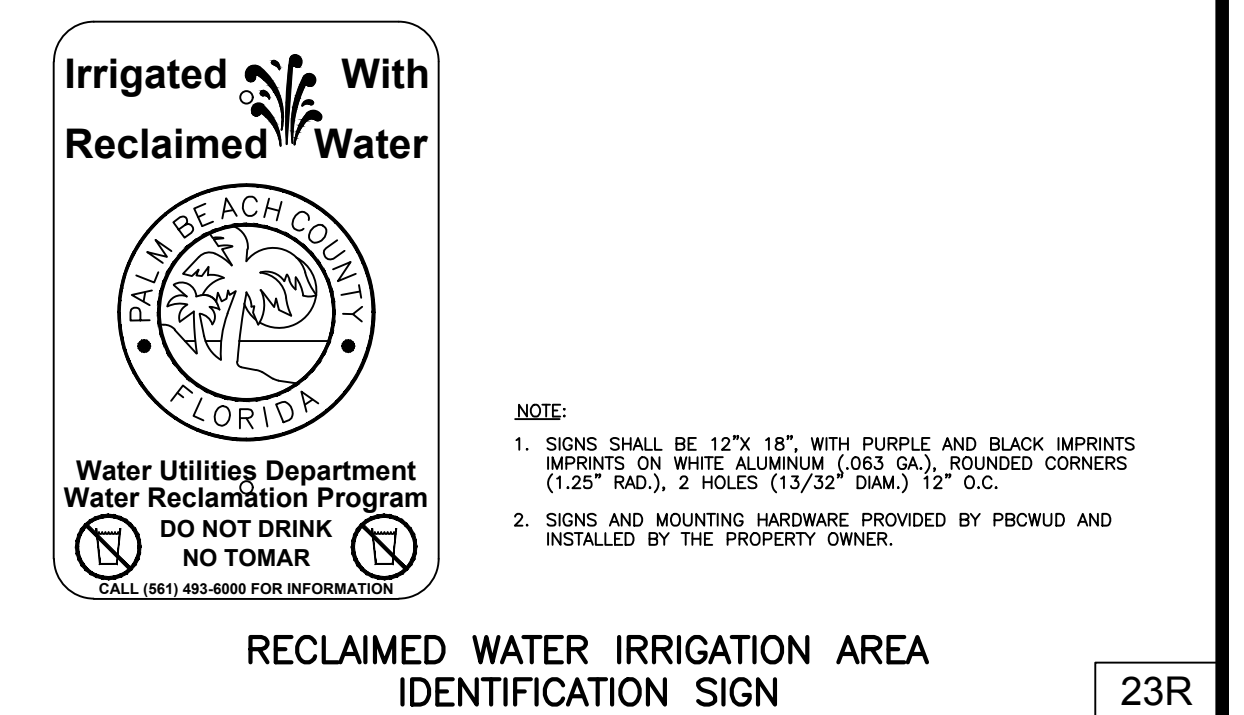
CONSULTANT:

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1-800-432-4770  
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UTILITIES NOTIFICATION CENTER



**MECHANICAL THRUST RESTRAINT MINIMUM PIPE LENGTHS**

24R