

350 Rabro Drive Hauppauge, NY 11788 FAX 631-348-0279

| JOB NAME      |          |
|---------------|----------|
| CUSTOMER      |          |
| CUSTOMER P.O. |          |
| MERCER NO.    |          |
| DATE:         | DWG. NO. |

# STYLE 451 EXPANSION JOINT

| COATING OF HYPALON PAINT YES NO   | RETAINING RINGS  DUCTILE IRON (BAKED ENAMEL)  HOT DIPPED GALVANIZED  STAINLESS STEEL             |
|---|--|
|   | SMOOTH<br>LEAKPROOF<br>TUBE  |
|   | CARCASS MADE OF<br>MULTIPLE PLIES OF TOUGH<br>ELASTOMER-IMPREGNATED<br>FABRIC OR TIRE CORD       |
|   |  |
|   | CONTROL RODS (#)  See - MERCER SUPPLIED PSI RATED SINCE ELECTROPLATED SALVANIZED STAINLESS STEEL |
| DRILLING<br>STANDARD 150 Lb.  | NO - BY OTHERS, OR PIPE MUST BE ANCHORED   |
| RIGID STEEL MATING FLANGE   |  |
| (WELD NECK OR SLIP ON TYPE) VANSTONE OR FLOATING STUB FLANGES NOT RECOMMENDED, AND FLANGE HARDWARE SUPPLIED BY OTHERS | GUSSET  DUCTILE  GALVANIZED  STAINLESS  STEEL  |
|   | COMPRESSION SLEEVES — SUPPLIED BY MERCER RUBBER  |
|   | ☐ YES - MATERIAL ☐ NO ☐ DUCTILE ☐ CALVANIZED   |

☐ STAINLESS STEEL

| Tube | Cover |                  | Rating  |
|------|-------|------------------|---------|
|      |       | Natural Rubber   | 180°F   |
|      |       | Chlorobutyl      | 250°F * |
|      |       | Neoprene         | 225°F   |
|      |       | Nitrile (Buna N) | 210°F   |
|      |       | EPDM             | 250°F * |
|      |       |                  |         |

Temperature

\* Intermittent use only

Expansion joints installed in piping systems must be anchored on both sides of the joint. In this case no control rods are necessary providing piping movements are within allowables. If control rods are installed as a safety measure, the locking nuts must be backed off with a clearance equal to the specified axial movement. The expansion joint will exert a thrust force on the anchors. To calculate pressure thrust on anchors use the following equation:

#### Pressure Thrust = (Pressure Thrust Area) x (Rated Working Pressure)

Expansion joints installed in unanchored piping or connected to isolated equipment must have control rods. Once control rods are installed the joint will no longer act as an expansion joint, since the pressure will extend the joint into the nuts of the control rods. The joint will no longer take up axial motion. It will make up for misalignment, transverse and possibly angular motion. In this case the nuts of the control rods should be threaded tight to control rod gussets, thereby locking out control rods. Initial misalignment should be kept to a maximum of 1/8". Expansion joint flanges must be in contact with a continuous surface, or a maximum of 1/16" standard raised face. Depressions or protrusions typical of victaulic or similar type flanges must be covered with a steel spacer flange first. Rubber flanges will not retain loose elements in valve bodies that rely on contact with a steel flange. In these applications, a steel spacer flange must be inserted between the rubber expansion joint and the valve body.

#### PRESSURE RATINGS

Natural Rubber 250 psig@150°F / 225 psig@180°F 250 psig@150°F / 180 psig@225°F Chlorobutyl 250 psig@150°F / 180 psig@225°F 250 psig@150°F / 200 psig@210°F Neoprene Nitrile (Buna N) **EPDM** 250 psig@150°F / 180 psig@225°F

#### \* RUBBER EXPANSION JOINTS ARE NOT TO BE **INSTALLED IN OCCUPIED SPACE \***

#### STYLE 451 DIMENSIONS, ALLOWABLE MOVEMENTS and OPERATING PRESSURES

| QUANTITY | SIZE<br>(in) | FACE<br>TO FACE<br>F.F.<br>(in) | FLANGE<br>OD<br>(in) | DIA.<br>BOLT<br>CIRCLE<br>(in) | NO.<br>OF<br>HOLES | DIA.<br>OF<br>HOLES<br>(in) | AXIAL<br>COMPRESSION<br>(in) | AXIAL<br>EXTENSION<br>(in) | LATERAL<br>DEFLECTION<br>(in) | VACUUM<br>RATING<br>(in Hg.) | PRESSURE<br>THRUST<br>AREA<br>(in <sup>2</sup> ) |
|----------|--------------|---------------------------------|----------------------|--------------------------------|--------------------|-----------------------------|------------------------------|----------------------------|-------------------------------|------------------------------|--|
|          | 1 1/2        | 6                               | 5                    | 3 7/8                          | 4                  | 5/8                         | 1 3/4                        | 7/8                        | 1                             | 29                           | 10   |
|          | 2            | 6                               | 6                    | 4 3/4                          | 4                  | 3/4                         | 1 3/4                        | 7/8                        | 1                             | 29                           | 13   |
|          | 2 1/2        | 6                               | 7                    | 5 1/2                          | 4                  | 3/4                         | 1 3/4                        | 7/8                        | 1                             | 29                           | 16   |
|          | 3            | 6                               | 7 1/2                | 6                              | 4                  | 3/4                         | 1 3/4                        | 7/8                        | 1                             | 29                           | 20   |
|          | 4            | 6                               | 9                    | 7 1/2                          | 8                  | 3/4                         | 1 3/4                        | 7/8                        | 1                             | 29                           | 28   |
|          | 5            | 6                               | 10                   | 8 1/2                          | 8                  | 7/8                         | 1 3/4                        | 7/8                        | 1                             | 29                           | 38   |
|          | 6            | 6                               | 11                   | 9 1/2                          | 8                  | 7/8                         | 1 3/4                        | 7/8                        | 1                             | 29                           | 50   |
|          | 8            | 6                               | 13 1/2               | 11 3/4                         | 8                  | 7/8                         | 1 3/4                        | 7/8                        | 1                             | 29                           | 79   |
|          | 10           | 8                               | 16                   | 14 1/4                         | 12                 | 1                           | 1 3/4                        | 7/8                        | 1                             | 29                           | 113  |
|          | 12           | 8                               | 19                   | 17                             | 12                 | 1                           | 1 3/4                        | 7/8                        | 1                             | 29                           | 154  |

MS-1121.DWG

FORM NO.



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| MERCER NO.    |          |
| DATE:         | DWG. NO. |

### STYLE 451 EXPANSION JOINT

| COATING OF HYPALON PAINT YES NO   | DUCTILE IRON RETAINING RINGS  DUCTILE IRON (BAKED ENAMEL)  HOT DIPPED GALVANIZED                    |
|---|---|
|   | SMOOTH<br>LEAKPROOF<br>TUBE   |
|   | CARCASS MADE OF MULTIPLE PLIES OF TOUGH ELASTOMER-IMPREGNATED FABRIC OR TIRE CORD                   |
|   |   |
|   | CONTROL RODS (#)  YES - MERCER SUPPLIED PSI RATED ZINC ELECTROPLATED GALVANIZED                     |
| DRILLING<br>STANDARD 150 Lb.  | STAINLESS STEEL NO - BY OTHERS, OR PIPE MUST BE ANCHORED  |
| RIGID STEEL MATING FLANGE (WELD NECK OR SLIP ON TYPE) VANSTONE OR FLOATING STUB FLANGES NOT RECOMMENDED, AND FLANGE HARDWARE SUPPLIED BY OTHERS | GUSSET  GUSSET  GALVANIZED  STAINLESS  STEEL  |
|   | COMPRESSION SLEEVES SUPPLIED BY MERCER RUBBER  YES - MATERIAL NO DUCTILE GALVANIZED STAINLESS STEEL |

| Tube | Cover |                  | Temperature<br>Rating |
|------|-------|------------------|-----------------------|
|      |       | Natural Rubber   | 180°F                 |
|      |       | Chlorobutyl      | 250°F *               |
|      |       | Neoprene         | 225°F                 |
|      |       | Nitrile (Buna N) | 210°F                 |
|      |       | EPDM             | 250°F *               |

Expansion joints installed in piping systems must be anchored on both sides of the joint. In this case no control rods are necessary providing piping movements are within allowables. If control rods are installed as a safety measure, the locking nuts must be backed off with a clearance equal to the specified axial movement. The expansion joint will exert a thrust force on the anchors. To calculate pressure thrust on anchors use the following equation:

Pressure Thrust = (Pressure Thrust Area) x (Rated Working Pressure) Expansion joints installed in unanchored piping or connected to isolated equipment must have control rods. Once control rods are installed the joint will no longer act as an expansion joint, since the pressure will extend the joint into the nuts of the control rods. The joint will no longer take up axial motion. It will make up for misalignment, transverse and possibly angular motion. In this case the nuts of the control rods should be threaded tight to control rod gussets, thereby locking out control rods.

Initial misalignment should be kept to a maximum of 1/8".

Expansion joint flanges must be in contact with a continuous surface, or a maximum of 1/16" standard raised face. Depressions or protrusions typical of victaulic or similar type flanges must be covered with a steel spacer flange first. Rubber flanges will not retain loose elements in valve bodies that rely on contact with a steel flange. In these applications, a steel spacer flange must be inserted between the rubber expansion joint and the valve body.

#### PRESSURE RATINGS

Natural Rubber 250 psig@150°F / 225 psig@180°F Chlorobutyl 250 psig@150°F / 180 psig@225°F Neoprene 250 psig@150°F / 180 psig@225°F Nitrile (Buna N) 250 psig@150°F / 200 psig@210°F **EPDM** 250 psig@150°F / 180 psig@225°F

\* RUBBER EXPANSION JOINTS ARE NOT TO BE **INSTALLED IN OCCUPIED SPACE \*** 

#### STYLE 451 DIMENSIONS. ALLOWABLE MOVEMENTS and OPERATING PRESSURES

|          |      | FACE    | ,      | DIA    | NO.   | DIA   |             |           |            |          | PRESSURE           |
|----------|------|---------|--------|--------|-------|-------|-------------|-----------|------------|----------|--------------------|
|          |      | _       |        | DIA.   | 1     | DIA.  |             |           |            |          |                    |
| QUANTITY | SIZE | TO FACE | FLANGE | BOLT   | OF    | OF    | AXIAL       | AXIAL     | LATERAL    | VACUUM   | THRUST             |
|          | (in) | F.F.    | OD     | CIRCLE | HOLES | HOLES | COMPRESSION | EXTENSION | DEFLECTION | RATING   | AREA               |
|          |      | (in)    | (in)   | (in)   |       | (in)  | (in)        | (in)      | (in)       | (in Hg.) | (in <sup>2</sup> ) |
|          | 14   | 8       | 21     | 18 3/4 | 12    | 1 1/8 | 2 1/8       | 1         | 1 1/4      | 15       | 214                |
|          | 16   | 8       | 23 1/2 | 21 1/4 | 16    | 1 1/8 | 2 1/8       | 1         | 1 1/4      | 15       | 269                |
|          | 18   | 8       | 25     | 22 3/4 | 16    | 1 1/4 | 2 1/8       | 1         | 1 1/4      | 15       | 330                |
|          | 20   | 8       | 27 1/2 | 25     | 20    | 1 1/4 | 2 1/8       | 1         | 1 1/4      | 15       | 398                |
|          | 24   | 10      | 32     | 29 1/2 | 20    | 1 3/8 | 2 5/8       | 1 1/4     | 1 1/2      | 15       | 573                |
|          | 30   | 10      | 38 3/4 | 36     | 28    | 1 3/8 | 2 5/8       | 1 1/4     | 1 1/2      | 15       | 855                |
|          | 36   | 10      | 46     | 42 3/4 | 32    | 1 5/8 | 2 5/8       | 1 1/4     | 1 1/2      | 15       | 1195               |

CHKD DATE

<sup>\*</sup> Intermittent use only



350 Rabro Drive Hauppauge, NY 11788 Tel 631-582-1524 FAX 631-348-0279

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| MERCER NO.    |          |
| DATE:         | DWG. NO. |

## STYLE 451FA EXPANSION JOINT

| STILL 4311 A L  | AI ANSION JOINT                                  |        |               |   |                            |
|---|--|--------|---------------|---|----------------------------|
| FILLED ARCH   | / RETAINING RINGS                                |        |               |   |                            |
|   | DUCTILE IRON (BAKED ENAMEL)                      | )      |               |   |                            |
| COATING OF  | ☐ HOT DIPPED GALVANIZED                          | ,      |               |   |                            |
| COATING OF HYPALON PAINT                              | ☐ STAINLESS STEEL                                |        |               |   | Temperatu                  |
| □YES □ NO \ ( )                                       |  | Tube   | Cover         |   | Rating                     |
|   |  |        |               | Neoprene  | 225°F                      |
|   |  |        |               | •   |                            |
|   | SMOOTH<br>LEAKPROOF                              |        |               |   |                            |
|   | TUBE   |        |               |   |                            |
|   | CARCASS MADE OF                                  |        |               |   |                            |
|   | MULTIPLE PLIES OF TOUGH                          |        |               |   |                            |
|   | ELASTOMER-IMPREGNATED                            |        |               |   |                            |
|   | FABRIC OR TIRE CORD                              | Expa   | nsion joints  | s installed in piping systems m   | nust be anchored on both   |
|   |  |        |               | t. In this case no control rods   |                            |
|   |  |        |               | nts are within allowables. If cor<br>e, the locking nuts must be ba     |                            |
|   |  |        |               | cified axial movement. The exp  |                            |
|   |  |        |               | he anchors. To calculate press<br>g equation:                           | sure thrust on anchors     |
|   |  |        |               | g equation.<br>= (Pressure Thrust Area) x (Ra                           | ated Working Pressure)     |
|   |  |        |               | installed in unanchored pipin   |                            |
|   |  | equip  | ment must     | have control rods. Once control   | rol rods are installed the |
|   | CONTROL RODS (#)  See See Supplied               | -      | -             | er act as an expansion joint, s<br>into the nuts of the control rod     | •                          |
|   | PSI RATED  |        |               | tion. It will make up for misalig                                       |                            |
|   | ☐ ZINC ELECTROPLATED☐ GALVANIZED                 |        |               | motion. In this case the nuts   |                            |
|   | ☐ STAINLESS STEEL                                |        | -             | t to control rod gussets, there<br>ent should be kept to a maximu       | •                          |
| DRILLING  | □ NO - BY OTHERS, OR PIPE                        |        | •             | anges must be in contact with a   |                            |
| STANDARD 150 Lb.                                      | MUST BE ANCHORED                                 | maxin  | num of 1/16'  | standard raised face. Depression  | ons or protrusions typical |
|   |  |        |               | ar type flanges must be covered   |                            |
|   |  |        |               | es will not retain loose elements<br>steel flange. In these application |                            |
|   |  | must l | be inserted l | between the rubber expansion jo   | int and the valve body.    |
| RIGID STEEL MATING FLANGE                             |  |        |               |   |                            |
| (WELD NECK OR SLIP ON TYPE) VANSTONE OR FLOATING STUB | GUSSET   |        |               |   |                            |
| FLANGES NOT RECOMMENDED,<br>AND FLANGE HARDWARE       | DUCTILE GALVANIZED GALVANIZED STAINLESS          | PRE    | SSURE         | RATING  |                            |
| SUPPLIED BY OTHERS                                    | □ STAINLESS<br>STEEL                             | Neop   | orene         | 250 psig@150  | 0°F / 180 psig@225°F       |
|   | COMPRESSION SLEEVES                              |        |               |   |                            |
|   | SUPPLIED BY MERCER RUBBER  ☐ YES - MATERIAL ☐ NO |        |               |   |                            |
|   | DUCTILE  |        |               |   |                            |
|   | ☐ GALVANIZED<br>☐ STAINLESS STEEL                |        |               |   |                            |
|   |  |        |               |   |                            |

# \* RUBBER EXPANSION JOINTS ARE NOT TO BE INSTALLED IN OCCUPIED SPACE \*

# STYLE 451FA DIMENSIONS, ALLOWABLE MOVEMENTS and OPERATING PRESSURES

| QUANTITY | SIZE<br>(in) | FACE<br>TO FACE<br>F.F.<br>(in) | FLANGE<br>OD<br>(in) | DIA.<br>BOLT<br>CIRCLE<br>(in) | NO.<br>OF<br>HOLES | DIA.<br>OF<br>HOLES<br>(in) | AXIAL<br>COMPRESSION<br>(in) | AXIAL<br>EXTENSION<br>(in) | LATERAL<br>DEFLECTION<br>(in) | VACUUM<br>RATING<br>(in Hg.) | PRESSURE<br>THRUST<br>AREA<br>(in <sup>2</sup> ) |
|----------|--------------|---------------------------------|----------------------|--------------------------------|--------------------|-----------------------------|------------------------------|----------------------------|-------------------------------|------------------------------|--|
|          | 2            | 6                               | 6                    | 4 3/4                          | 4                  | 3/4                         | 7/8                          | 7/16                       | 1/2                           | 29                           | 3  |
|          | 3            | 6                               | 7 1/2                | 6                              | 4                  | 3/4                         | 7/8                          | 7/16                       | 1/2                           | 29                           | 7  |
|          | 4            | 6                               | 9                    | 7 1/2                          | 8                  | 3/4                         | 7/8                          | 7/16                       | 1/2                           | 29                           | 13   |
|          | 6            | 6                               | 11                   | 9 1/2                          | 8                  | 7/8                         | 7/8                          | 7/16                       | 1/2                           | 29                           | 28   |
|          | 8            | 6                               | 13 1/2               | 11 3/4                         | 8                  | 7/8                         | 7/8                          | 7/16                       | 1/2                           | 29                           | 50   |
|          | 10           | 8                               | 16                   | 14 1/4                         | 12                 | 1                           | 7/8                          | 7/16                       | 1/2                           | 29                           | 78   |
|          | 12           | 8                               | 19                   | 17                             | 12                 | 1                           | 7/8                          | 7/16                       | 1/2                           | 29                           | 113  |

| DWN | CHKD | DATE |
|-----|------|------|
|     |      |      |