WARNING: READ AND COMPLY WITH ALL OPERATING INSTRUCTIONS AND WARNINGS FOR MULTI-STRAND STRESSING BEFORE STARTING ANY WORK ON OPERATION.

CAUTION: WHEN PRESSURIZING GROUT CAPS, COVER WITH TEFLON TAPE OR PASTE ON THREADS.

NOTE: ALL PARTS AND OTHER NOTES ABOVE ARE THE FRONT FLEXIBLE FILLER ACCESS.

INTERMEDIATE WAX INJECTION DETAIL

INSTALLATION PROCEDURE:
1. PREASSEMBLE THE MULTI-PLANE ANCHOR, SPIRAL AND PIPE TRUMPTET, USE PREMIUM 100% SILICONE BETWEEN BREATHER AND TRUMPTET TO HAVE A STRONG CONNECTION. GREASE THE BOLTS TO FACILITATE REMOVAL LATER.
2. BOLT THE MULTI-PLANE ANCHOR (MPA) WITH TRUMPTET TO THE FRONT PIPE USING THREADING HOLES IN MPA. THE MPA SHALL BE ORIENTED SUCH THE FLEXIBLE PORT HOLE POINTS UP. THE SPIRAL SHOULDBE ATTACHED TO THE MPA IN SUCH A MANNER THAT THE SPIRAL ENDS INTERFERE WITH THE 3/4" NPT ATTACHMENT IF USING SIDE FLEXIBLE FILLER CAP IN MPA, OR ALONGSIDE THE SPIRAL WITH ANCHOR. USE PLUG TO UNUSED PORT IN MPA AS SHOWN.
3. INSTALL PIPE NIPPLE WITH FOAM INSULATION FOR ANY PIPE NIPPLE CAP IN CONCRETE.
4. CONCRETE CAN NOW PROCEED.
5. AFTER COMPLETION OF CONCRETE PLACEMENT, PROVE THAT THE DUCTS ARE CLEAR OF ANY OBSTRUCTIONS OR DAMAGE. PASS A TORPEDO THROUGH THE DUCT TO ENSURE CLEARANCE.
6. PROVE THAT ALL FLEXIBLE FILLER VENTS ARE FREE AND CLEAR. THE CONCRETE HAS GAINED STRENGTH, THE STRESSING OPERATION MAY BEGIN.
7. INSTALL STRAPS BY PUSHING OR PULLING INDIVIDUALLY OR AS A BUNDLE INTO DUCTS. ALLOW SUFFICIENT TAIL FEET.
8. INSTALL DUCTS INTO DUCTS. ALLOW SUFFICIENT TAIL FEET.
9. CHECK THE WEDGE PLATE FOR RUST, DIRT AND GRIT.
10. CHECK WEDGES FOR RUST, DIRT AND GRIT. DISCARD RUSTY WEDGES. USE ONLY CLEAN WEDGES.
11. INSTALL WEDGE PLATE, OMIT THE WEDGES OVER THE STRANDS AND LOOSELY SEAT IN WEDGE HOLES.
12. AFTER THE STRESSING OPERATION IS COMPLETED AND THE ELONGATIONS FALL WITHIN +/- 1%, OBTAIN APPROVAL FROM THE ENGINEER TO CUT THE STRAND TAILS APPROPRIATELY.
13. PREPARE THE DUCT FOR THE ENTRANCE TO THE DUCT AND MAKE A STRONG CONNECTION.
14. INSTALL STAY BOLTS OR USING BOLTS. CONNECT THE 3/4" NPT CAP INTO NIPPLE. INSTALL 1/2" HOLE IN CAP USING 1/2" DIAMETER BIT TO PREVENT CEMENT PASTE ENTERING THE CAP.
15. INSTALL THE DUCT SYSTEM AS SHOWN ON SHOP DRAWINGS. INSTALL 3/4" PIPING INTO TRUMPTET AND HEAT SHINING.
16. 1" HOLE IN CAP USING 1/2" DIAMETER BIT TO PREVENT CEMENT PASTE ENTERING THE CAP.
17. PRESSURE TEST DUCT SYSTEM FOR FLEXIBLE PIPE INTERIOR PRESSURES 582-622.

FLEXIBLE FILLER Operation CAN NOW PROCEED
18. REMOVE FLEXIBLE FILLER PORT PIPES AND INSTALL PLUGS.
19. INSTALL PIPE NIPPLE WITH FOAM INSULATION FOR ANY PIPE NIPPLE CAP IN CONCRETE.
20. INSTALL GROUT CAP WITH O-RING USING SIX BOLTS.
21. INSTALL PIPE NIPPLE WITH FOAM INSULATION FOR ANY PIPE NIPPLE CAP IN CONCRETE.

RRODUCT REINFORCEMENT NOT SHOWN FOR CLARITY. USE TEFLON TAPE FOR ALL THREADS.

TEFLON TAPE OR PASTE ON THREADS. 5'-2" TOTAL LENGTH OF TRANSITION (MPA & TRUMPTET)
SEE MAT'L SPEC.

WITH TWO GROUT PORTS-GALV.

27-0.6"/37-0.5" MULTI-PLANE ANCHOR

PM00021200C

68 27 248

QS60021200C

68 27 216

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NOTES FOR MANUFACTURING PARTS:
1. GALVANIZE ACCORDING TO ASTM A123 AND TAKE CARE HOW CASTINGS ARE ORDERED TO PREVENT RUST.
2. DRILL & TAP HOLED Holes AND GROUT PORTS AND MACHINE AND MILLING, GRINDING, DRILLING, AND MILLING.
3. GROOVE IN BOTTOM OF ANCHOR AND SPRAY THEM WITH ZINC RICH PAINT ACCORDING TO ASTM A789, ENSURE THROUGHHOLE.
NOTES:
1. SPIRAL IS MADE FROM STANDARD #6 REBAR, NO PART NUMBER MARKING IS SHOWN.
2. KEEP SPIRAL AND MPA AXIS ALIGNED, IF USING SIDE PORT, ROTATE SPIRAL TO CLEAR.

NO. OF FULL TURNS: 8
DEVELOPED LENGTH: 34" - 1" ± 0.250"
WEIGHT: 51.2 LBS.
**DETAIL A**

THREAD FITS INTO 27-0.6" MPA CASTING (SEE DRAWING 68 27 216)

**SECTION A-A**

- **NOTE:**
  - HIGH-DENSITY POLYETHYLENE, CONFORMING TO THE FOLLOWING:
  1. Meets requirements of ASTM D3350 with a minimum cell class of H40SHTAC.
  2. Contains antioxidants with a minimum oxidative induction time (OIT) according to ASTM D638 of 40 minutes.
  3. Treated finished material has a minimum failure time of 24 hours when tested for stress crack resistance using ASTM F2118 at an applied stress of 800 PSL.
ALTERNATE LOCATION: ALL MARKINGS CAN BE STAMPED HERE

VENDOR ID "DSI" AND PART NO.
HEAT CODE IN RFCFSS

ARROW (RAISED CHARACTER) MUST POINT UP DURING INSTALLATION

BOTTOM VIEW

27-0.6" CAST WEDGE PLATE

MATERIAL: DUCTILE IRON 50-55-06 ASTM A536

DIMENSIONS: INCHES

QUALITY PLAN NUMBER: CN0001435F

WEIGHT 48.2 LBS.
REV. DATE NAME ECN

SCALE 1/3 1/4
DRAWING NUMBER: 68 27 172
ISO View

Top View

Section A-A

27-0.6" NYLON CAP WITH O-RING FOR FLEXIBLE FILLER

- O-RING MATERIAL: HMNR, WEARING RUBBER
- SPECIFICATIONS: 390-2.2.1.7.
- #449 O-RING
- 10" x 10-1/2" x 1/4"

Notes:
1. USE 1/8"-11UNC 316L S.S. HEX BOLTS 4-1/4" LONG W/SMALL O'RING WASHER
2. INSTALL O-RING IN GROOVE USING DROPS OF LIQUID ADHESIVE BEFORE SHAPING. DON'T USE EXCESSIVE ADHESIVE. O-RING MUST STAY IN PLACE UNTIL INSTALLATION.
3. THE NYLON CONFORMS TO ASTM D5989, WITH CELL CLASSIFICATION S-68401. (ULTIMATE STRENGTH 10,000 PSI MIN. WITH UV STABILIZED ADDED)
4. DRILL 1/2" (12.7) HOLE IN PORT BEND USING CAUTION. RECOMMEND USING HOLE SAW BIT OR SPACE BIT (BY OTHERS). BE CAREFUL TO PREVENT CHANCE TO THREADED OR CAP.
5. WHEN PRESSURIZING CEMENT CAPS, DO NOT STAND BEHIND CAPS!
MATERIAL: 5" SDR 17 HDPE PIPE.

SPECIFICATIONS:
1. PIPE SHALL BE OF HIGH-DENSITY POLYETHYLENE AND SHALL HAVE A MAXIMUM DIMENSION RATIO (DR) OF 17 AS ESTABLISHED BY EITHER ASTM D3035 OR ASTM F714, AS APPROPRIATE FOR MANUFACTURING PROCESS USED.
2. PIPE SHALL HAVE A MINIMUM PRESSURE RATING OF 125 PSI.
3. MEETS REQUIREMENTS OF ASTM D3350 WITH A MINIMUM CELL CLASS OF 445574C.
4. CONTAINS ANTIOXIDANTS WITH A MINIMUM OXIDATIVE-INDUCTION TIME (OIT) ACCORDING TO ASTM D3895 OF 40 MINUTES.
5. REMOLDED FINISHED MATERIAL HAS A MINIMUM FAILURE TIME OF THREE HOURS WHEN TESTED FOR STRESS CRACK RESISTANCE USING ASTM F2136 AT AN APPLIED STRESS OF 348 PSI.
6. MINIMUM BEND RADIUS = 30 FT.
CUT TO WIDTH IN FIELD AS NEEDED (IN THIS DIRECTION)

CLOSED TAB

LENGTH VARIES TO FIT PIPE SIZE

TOP VIEW

CLOSED TAB

END VIEW (NOT TO SCALE)

NOTE: FOLLOW MANUFACTURER'S INSTALLATION INSTRUCTIONS.

<table>
<thead>
<tr>
<th>PIPE SIZE</th>
<th>STRAND SYSTEM</th>
<th>BAR SYSTEM</th>
<th>HEAT SHRINK SLEEVE SIZE</th>
<th>PART NUMBER</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 1/2&quot; IPS DR 17</td>
<td>7-0.6&quot;</td>
<td>1&quot;, 1 1/4&quot;, 1 3/8&quot;</td>
<td>KLNN/L 63-450 BK</td>
<td>U00039063</td>
</tr>
<tr>
<td>3&quot; SDR 17</td>
<td>12-0.6&quot;</td>
<td>1 3/4&quot;, 1 3/8&quot;</td>
<td>KLNN/L 90-450 BK</td>
<td>U00039090</td>
</tr>
<tr>
<td>4&quot; SDR 17</td>
<td>19-0.6&quot;</td>
<td>2 1/2&quot;, 3&quot;</td>
<td>KLNN/L 115-450 BK</td>
<td>U00039115</td>
</tr>
<tr>
<td>5&quot; SDR 17</td>
<td>27-0.6&quot; &amp; 31-0.6&quot;</td>
<td></td>
<td>KLNN/L 125-450 BK</td>
<td>U00039125</td>
</tr>
</tbody>
</table>

KLNN HEAT SHRINK SLEEVE

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0.6" BARE 270 KSI STRAND

NOTES:
1. NO PART NUMBER OR IDENTIFICATION MARKS ON STRAND.
2. RUST PRODUCING VISIBLE FITTING TO THE UN-AYED EYE IS NOT ALLOWED.

MATERIAL:
0.6" 270 KSI LOW RELAX STRAND
ASTM A416
3-PART WEDGE FOR 0.6" STRAND

NOTES:
1. SHARP EDGES MUST BE BROKEN.
2. VIBRATE TO SURFACE FINISH OF 63 µIN. MAX.
3. DIP IN SQ70 OIL OR EQUIV. FOR CORROSION PROTECTION.
4. MAKE SURE THAT THE BUTTRESS THREAD IS ORIENTED IN THE DIRECTION SHOWN ON THIS DRAWING.
5. NO STAMPED PART NUMBER

MATERIAL:
12L14
ALL HARDENED

DIMENSIONS: INCH:mm
mm FOR REFERENCE ONLY

QUALITY PLAN NUMBER: Q60000065000

TOLERANCES: ±.010±.25" UNLESS NOTED

WEIGHT 0.19 LBS.

REV. DATE NAME

SCALE 2:1

MATERIAL: SEE ABOVE

PART NUMBER: 68 00 0536

DRAWING NUMBER: 68 00 0536

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**WASHER FOR NYLON CAPS**

**STAINLESS STEEL 316L BOLTS AND WASHER FOR NYLON CAPS**

<table>
<thead>
<tr>
<th>POS.</th>
<th>PART NUMBER</th>
<th>DESCRIPTION (ALL PARTS 316L STAINLESS STEEL UNLESS NOTED)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>00 00 771</td>
<td>3/8&quot;-18 UNC BOLT, 2-3/4&quot; LONG (1&quot; LONG THREAD)</td>
</tr>
<tr>
<td>2</td>
<td>00 00 772</td>
<td>3/8&quot;-18 UNC BOLT, 3-1/2&quot; LONG (1&quot; LONG THREAD)</td>
</tr>
<tr>
<td>3</td>
<td>00 00 774</td>
<td>TYPE A NARROW WASHER FOR 3/8&quot;-UNC BOLT</td>
</tr>
<tr>
<td>4</td>
<td>00 00 776</td>
<td>3/8&quot;-18 UNC COUPLER, ZINC COATED</td>
</tr>
<tr>
<td>5</td>
<td>00 00 777</td>
<td>3/8&quot;-18 UNC HEX NUT</td>
</tr>
<tr>
<td>6</td>
<td>00 00 778</td>
<td>5/16&quot;-18 UNC BOLT, 7/8&quot; LONG, ZINC PLATED</td>
</tr>
<tr>
<td>7</td>
<td>00 00 783</td>
<td>3/8&quot;-18 UNC BOLT, 3-1/4&quot; LONG (1&quot; LONG THREAD)</td>
</tr>
<tr>
<td>8</td>
<td>00 00 784</td>
<td>3/8&quot;-18 UNC BOLT, 4-1/4&quot; LONG (FULL THREAD)</td>
</tr>
<tr>
<td>9</td>
<td>00 00 789</td>
<td>3/8&quot;-18 UNC CARRIAGE BOLT, 4-1/2&quot; LONG</td>
</tr>
<tr>
<td>10</td>
<td>00 00 790</td>
<td>3/8&quot;-18 UNC CARRIAGE BOLT, 5-1/2&quot; LONG</td>
</tr>
</tbody>
</table>

**NOTE:**

THE 316L S.S. BOLTS ARE SPECIAL ORDER. ALL WASHERS, HEX NUTS & COUPLERS HAVE NO MARKINGS.

---

**Dimensions:**
- **Scale:** 1/3
- **Drawing Number:** 00 00 770

**Contact Information:**
- **Phone:** 630-739-1100
- **Fax:** 630-739-1405
- **Address:**
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3/4" NPT PIPE NIPPLES

PRESSURE RATED: 150 PSI

3/4" NPT THREAD TYP.

LENGTH VARIES

Ø1.050 [26.7] (NOMINAL)

MATERIAL:
SCH 40
BLACK WELDED STEEL

SCALE 1:1

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3/4" NPT, 14 THREADS PER INCH, 0.55" THREAD ENGAGEMENT

PRESSURE RATED: 150 PSI

MATERIAL: BRASS

WEIGHT: 0.77 LBS.

SCALE: 3/4" = 1"

DIMENSIONS: INCH (mm)
0.787 [20.0] Min. ID
1.220 [31.0] Hex
1.984 [50.4]
2.500 [63.5]
3.474 [88.2]
4.723 [120.0]

DRAWING NUMBER: 00 00 838

PART NUMBER: 00 00 838

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PRESSURE RATED: 150 PSI
1/2" NPT PIPE NIPPLES

LENGTH VARIES

0.840 (NOMINAL)

PRESSURE RATED: 150 PSI
1/2" NPT, 14 THREADS PER INCH, 0.53" THREAD ENGAGEMENT

PRESSURE RATED: 150 PSI

DIMENSIONS: INCH (mm) FOR REFERENCE ONLY

WEIGHT ~ LBS.

REV. DATE NAME

QUALITY PLAN NUMBER:

MATERIAL: BRASS

SCALE 3/4" = 1"

DRAWING NUMBER:

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PRESSURE RATED: 150 PSI
3/4" NPT PIPE NIPPLES

LENGTH VARIES

3/4" NPT THREAD TYP.

PRESSURE RATED: 150 PSI
3/4" NPT FEMALE COUPLER

PRESSURE RATED: 150 PSI

MATERIAL: SCH 40 BLACK
SCALE: 1:1

DIMENSIONS: INCH [mm] mm FOR REFERENCE ONLY

QUALITY PLAN NUMBER: Q00000020P

REV. DATE NAME EDN

PART NUMBER: 00 00 881

DRAWING NUMBER: 00 00 881

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3/4" NPT 90° ELBOW, FEMALE-FEMALE

PRESSURE RATED: 150 PSI
INSTALLATION PROCEDURE:

(SEE MANUFACTURER INSTRUCTION MANUAL FOR DETAILED INSTRUCTIONS)

1. CUT PIPE ENDS PRECISELY AT RIGHT ANGLES TO THE PIPE AXIS.
2. CLEAN BOTH PIPE ENDS CAREFULLY.
3. SCRAP BOTH PIPES ENDS AS REQUIRED TO REMOVE THE OXIDE LAYER COMPLETELY
4. CLEAN BOTH PIPE ENDS WITH CONCENTRATED ISOPROPYL ALCOHOL.
5. USE REROUNDING TOOLS TO CORRECT OVAL PIPE IF NEEDED.
6. USE ALIGNMENT CLAMPS TO Secure THE ALIGNMENT OF CONNECTED PIPES
7. PROVIDE SUPPORT TO THE PIPE AND COUPLER TO PREVENT ANY MOVEMENT.
8. ENSURE THERE IS NO EXISTING GAPS BETWEEN COUPLE AND PIPE FACE.
9. ATTACH LEADS OF THE FUSION PROCESSOR TO THE COUPLER.
10. SCAN THE BARCODE ON THE COUPLER AND CONFIRM THE COUPLER’S SIZE ON THE PROCESSOR SCREEN.
11. INITIATE FUSION Process.
12. UNPLUG THE LEADS AS SOON AS THE FUSION PROCESS ENDS.
13. CHECK COOLING TIME OF THE PROVIDED COUPLER BASED ON COUPLER’S SIZE.
14. DO NOT ALLOW MOVEMENT OR APPLIED PRESSURE ON THE JOINTS BEFORE COOLING TIME ENDS.
WELDING OPERATIONS:
DRILL A HOLE USING SPECIFIED CONE DRILL TOOL WHEREVER NEEDED IN HDPE PIPE. HEAT UP HDPE GROUT PORT AND THE HOLE IN DUCT FOR ABOUT 10 SECONDS USING PES-TEC WELDING EQUIPMENT. RELEASE THE GROUT PORT AND PRESS INTO THE HOLE IN DUCT BY HAND FOR 15 SECONDS.

MATERIAL: POLYETHYLENE
COLOR: BLACK (UV PROTECTED)
USAGE: FOR SMOOTH HDPE PIPE
PRESSURE RATED: 150 PSI

3/4" NPT THREAD

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