

GENERAL: THE DETAILED PROCEDURES NECESSARY FOR THE APPLICATION OF INSULATING BLOCK AND/OR PIPE COVERING TO TURBINE CYLINDERS, VALVE COVERS, STEAM CHESTS, PIPES, FLANGES OR OTHER PARTS ARE DESCRIBED IN THIS SPECIFICATION. THE INSULATION AND THICKNESS WILL BE SHOWN ON THE INSULATION DRAWING FOR EACH CLASS OF TURBINE.

THIS SPECIFICATION IS DIVIDED INTO TWO PARTS AS FOLLOWS:-

- PART I. APPLICATION OF BLOCK.
PART II. APPLICATION OF MOLDED PIPE COVERING.

PART I. APPLICATION OF BLOCK.

GENERAL: WHERE TEMPERATURE DOES NOT EXCEED 600°F., MATERIAL 7302 SILICATE BLOCKS SHALL BE APPLIED IN A SINGLE LAYER DIRECTLY TO THE SURFACE BEING INSULATED. WHEN TEMPERATURE EXCEEDS 600°F., A LAYER OF MATERIAL 7309-1 HI-TEMP BLOCK COVERED BY A LAYER OF MATERIAL 7302 SILICATE INSULATION SHALL BE USED.

OPERATIONS:-

1. SELECTING, CUTTING AND FITTING BLOCKS
2. ATTACHING ANCHOR POINTS.
3. ATTACHING RETAINING WIRES.
4. COVERING TURBINE ASSEMBLY FLANGES.
5. COVERING PIPE FLANGES.
6. PATCHING, FILLING AND FINISHING WITH MATERIAL 7311 CEMENT.
7. COVERING PIPES OF LARGE DIAMETER.

1. SELECTING, CUTTING AND FITTING BLOCKS.

BLOCK SHAPES SHALL BE SELECTED TO CONFORM AS NEARLY AS PRACTICAL TO THE SHAPE OR CONTOUR BEING COVERED. INSULATION MAY BE CUT WITH EITHER A HAND OR A POWER SAW, DEPENDING ON THE QUANTITY AND AMOUNT OF FITTING NECESSARY.

IN GENERAL, THE LONG DIMENSION OF BLOCKS OR FORMS SHOULD BE PLACED 90° TO THE CURVATURE OF THE SURFACE BEING COVERED.

WHEN FITTING BLOCKS, SLIGHT DIFFERENCES IN CONTOUR BETWEEN THE INSULATION AND THE PART TO BE COVERED ARE PERMISSIBLE. IN SUCH CASES, THE INSULATION BLOCKS SHALL BE SECURED OVER A THIN COATING OF INSULATION CEMENT MATERIAL 7311 APPLIED DIRECTLY TO THE SURFACE OF THE PART. BLOCKS SHALL BE APPLIED WHILE THE CEMENT IS WET.

WHERE SEVERAL LAYERS OF BLOCKS ARE REQUIRED, THE JOINTS OF THE TOP LAYER SHALL BE STAGGERED WITH RELATION TO THE INNER LAYER. EACH LAYER SHALL BE WIRED DOWN TO THE ANCHOR POINTS AND ALL JOINTS AND OPENINGS FINISHED WITH CEMENT MATERIAL 7311.

2. ATTACHING ANCHOR POINTS

ON ALLOY STEEL CASTINGS OR FORGINGS, AT POSITIONS SHOWN ON "CYLINDER (AND OTHER) INSULATION PAD" DRAWINGS INSULATION PADS TO STYLE NUMBER 270A091M01 WILL BE WELDED IN PLACE.

CAUTION: NO FURTHER WELDING OF ANY ANCHOR POINTS DIRECTLY TO ANY ALLOY STEEL CASTINGS OR FORGINGS SHALL BE DONE WITHOUT ENGINEERING APPROVAL.

EYE BOLT STUDS, STYLE NUMBER 270A091M01, SHALL BE WELDED TO THE INSULATING PADS ONLY WHERE REQUIRED TO ANCHOR INSULATION, USING A NELSON (OR EQUAL) STUD WELDING GUN. (SEE FIGURE 1)

ON CARBON STEEL CASTINGS OR FORGINGS, EYE BOLT STUDS MAY BE WELDED DIRECTLY TO THE CASTING OR FORGING USING THE STUD WELDING GUN. THE STUDS SHALL BE LOCATED SO THAT RETAINING WIRES ATTACHED TO THEM SHALL RUN AT RIGHT ANGLES TO THE CURVATURE OF THE SURFACE BEING COVERED, OR AT RIGHT ANGLES TO THE LONG DIMENSION ON FLAT SURFACES.

3. ATTACHING RETAINING WIRES

FOR SERVICE TEMPERATURES UP TO 500°F., SOFT GALVANIZED OR BLACK STEEL WIRE, MATERIAL 3657-1, OF 16 GAGE SIZE SHALL BE USED FOR RETAINING WIRES. FOR SERVICE TEMPERATURES ABOVE 500°F., STAINLESS STEEL WIRE, .062 DIA., OF 7860-2 MATERIAL SHALL BE USED.

THE WIRES SHALL PASS OVER THE BLOCKS OR SHAPES AND BE TIED TO THE ANCHOR POINTS SECURING THE BLOCKS FIRMLY IN PLACE.

WIRE LOOPS SHALL BE USED ON PIPE INSULATION AND SHALL BE TWISTED TOGETHER AND BENT TO PREVENT SNAGGING. THE PITCH BETWEEN LOOPS SHALL NOT EXCEED 15 INCHES.

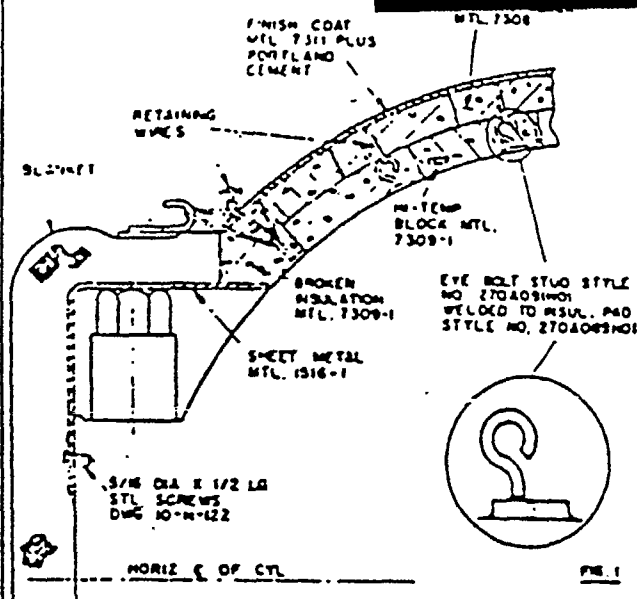
4. COVERING TURBINE ASSEMBLY FLANGES

INSULATION SHALL BE STOPPED A SUFFICIENT DISTANCE FROM ALL FLANGES TO ALLOW ACCESS TO OR REMOVAL OF BOLTS AND ASSOCIATED PARTS AT OR ADJACENT TO THE FLANGES.

IN GENERAL, INDUSTRIAL TURBINE ASSEMBLY FLANGES FOR TEMPERATURES TO 550°F. SHALL BE COVERED WITH GLASS FILLED ASBESTOS CLOTH COVERED BLANKETS AS SHOWN IN FIGURE 1. (SEE PROCESS SPECIFICATION 600354 PARTS I, II AND III.)

PLAINTIFF'S EXHIBIT

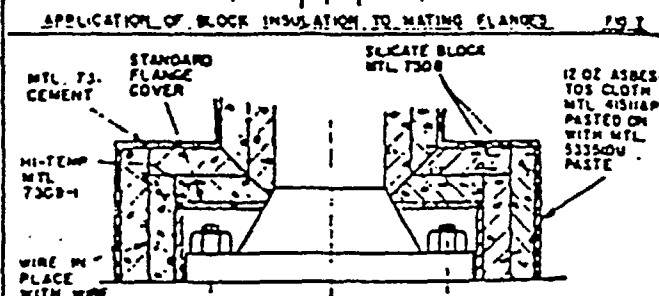
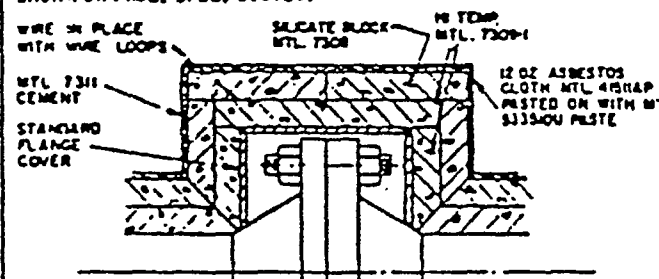
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ON SPECIAL INSTALLATIONS AND ON INSTALLATIONS FOR TEMPERATURES OVER 950°F., BLOCKS MAY BE REQUIRED FOR JOINT COVERING. IN SUCH CASES, THE JOINT SHALL BE PROTECTED BY A COVERING OF 1/16 INCH SHEET STEEL, MATERIAL 1516-1 REINFORCED WITH SUITABLE ANGLES TO ASSURE RIGIDITY OR AS PROVIDED IN PROCESS SPEC 600729. BLOCKS SHALL THEN BE APPLIED TO THE PROTECTING SURFACES.

5. COVERING PIPE FLANGES

WHEN STANDARD PIPE FLANGES ARE INVOLVED, COVER THEM WITH SHEET METAL COVERS AND INSULATE AS SHOWN ON FIGURES 2 AND 3 WHEN PRESSURE RATING AND FLANGE DIMENSIONS ARE BEYOND THE SCOPE OF THESE STANDARD FLANGE COVERS USE ARRANGEMENT AS SHOWN ON PROC. SPEC. 600729.



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6. PATCHING, FILLING AND FINISHING WITH 7311 MATERIAL

INSULATION CEMENT MATERIAL 7311 SHALL BE USED WITH 7309-1 OR 7308 BLOCK FOR PATCHING, FILLING IRREGULAR AREAS AND FOR APPLYING THE FINISHING COAT OVER THE FINAL LAYER OF BLOCK. MATERIAL 7311 IS APPLIED BY MIXING WITH A MINIMUM AMOUNT OF WATER TO PRODUCE A STIFF MIX AND THEN TROWELING IN PLACE. A FINISH COAT, 1/4 TO 1/2 INCH IN THICKNESS, SHALL THEN BE APPLIED BY ADDING A MIXTURE OF 20% BY WEIGHT OF PORTLAND CEMENT TO MATERIAL 7311.

7. COVERING PIPES OF LARGE DIAMETER

LARGE PIPES (OVER 10 IN.) SHALL BE COVERED AS PREVIOUSLY DESCRIBED IN OPERATIONS 1 AND 3 WITH BLOCK INSULATION AND FINISHED AS DESCRIBED IN PART II OPERATION 3.

PART II. APPLICATION OF MOLDED PIPE COVERING.

GENERAL: MATERIAL 7310, HI-TEMP. PIPE COVERING AND MATERIAL 5779 SILICATE PIPE COVERING ARE MOLDED TO FIT STANDARD PIPE SIZES. MATERIAL 7310 CONSISTS OF A SINGLE LAYER OF HI-TEMP. INSULATION IN SIZES UP TO 1-1/2 IN. INCL. AND A DOUBLE LAYER OF A HI-TEMP. AND A SILICATE INSULATION IN SIZES OVER 1-1/2 IN.)

PIPE COVERING SHALL BE SECURED IN PLACE BY MEANS OF WIRE LOOPS OF SOFT STEEL 16 GAGE WIRE, MATERIAL 3657-1, FOR TEMPERATURES UP TO 500°F. AND WITH STAINLESS STEEL .062 DIA. WIRE, MATERIAL 7860-2, FOR TEMPERATURES OVER 500°F. WIRE LOOPS SHALL BE TWISTED TOGETHER AND LEFT IN A MANNER TO PREVENT SNAKING. THE PITCH BETWEEN LOOPS SHALL NOT EXCEED 15 INCHES. INSULATION CEMENT, MATERIAL 7311, SHALL BE USED FOR FITTING, PATCHING AND FINISHING PIPE COVERING INSULATION.

OPERATIONS-

1. SELECTING AND FITTING PIPE COVERING.
2. COVERING PIPE FLANGES.
3. FINISHING.

1. SELECTING AND FITTING PIPE COVERING**STRAIGHT PIPE SECTIONS**

ON STRAIGHT SECTIONS OF PIPE SPLIT CYLINDRICAL MOLDED SECTIONS OF PIPE COVERING SHALL BE USED. EACH LAYER SHALL BE INDIVIDUALLY APPLIED, ONE OVER THE OTHER, UNTIL THE SPECIFIED THICKNESS HAS BEEN ATTAINED. THE END JOINTS BETWEEN SECTIONS SHALL BE TIGHTLY BUTTED IN EACH LAYER, AND THE LONGITUDINAL JOINTS FROM SECTION TO SECTION SHALL BE STAGGERED AND TIGHTLY DRAWN TOGETHER BY MEANS OF WIRE LOOPS. THE LONGITUDINAL AND CIRCUMFERENTIAL JOINTS FOR EACH LAYER SHALL ALSO BE STAGGERED WITH RELATION TO THE ADJACENT LAYER.

CURVED PIPE SECTIONS

ON CURVED SECTIONS OF PIPE USE SPLIT, MOLDED CURVED PIPE COVERING WHEN AVAILABLE AND WIRE IN PLACE.

WHEN CURVED SHAPES ARE NOT AVAILABLE, SHORT LENGTHS OF STRAIGHT MOLDED PIPE COVERING OR BLOCKS MAY BE USED. THESE SHALL BE WIRED IN PLACE OVER A WET LAYER OF CEMENT MATERIAL 7311 APPLIED DIRECTLY TO THE PIPE SURFACE. WHEN SUCH IRREGULAR SHAPES ARE USED THE OUTSIDE SURFACES SHALL BE FINISHED NEATLY AND SMOOTHLY USING 7311 CEMENT TO PRODUCE THE DESIRED RESULTS.

2. COVERING PIPE FLANGES (MOLDED INSULATION)

PIPE INSULATION SHALL BE STOPPED A SUFFICIENT DISTANCE FROM FLANGES TO ALLOW ACCESS TO AND REMOVAL OF FLANGE BOLTS.

CENTRAL STATION TURBINE PIPE FLANGES AND OTHER LARGE PIPE FLANGES SHALL BE COVERED AS DESCRIBED IN PROC. SPEC. 600729. ON SMALL PIPE FLANGES WHERE MOLDED PIPE COVERING OR BLOCK FORMS APPLY, INSULATE AS SHOWN IN FIG. 4.

3. FINISHING

WHEN PIPE INSULATION IS SECURED IN PLACE FILL ALL JOINTS AND OPENINGS WITH CEMENT 7311 MIXED WITH A MINIMUM OF WATER TO PRODUCE A STIFF MIX. TROWEL IN PLACE UNTIL A SMOOTH NEAT APPEARANCE IS OBTAINED.

FINISH EXTERNAL TO THE TURBINE SHALL BE COVERED WITH 12 OUNCE PER SQUARE YARD ASBESTOS CLOTH (MATERIAL 41511AP) PASTED ON WITH MATERIAL 533510U PASTE. A FINAL COAT OF PASTE SHALL BE APPLIED OVER THE ASBESTOS CLOTH.

ON CROSS-OVER PIPES, WHEN PASTE IS DRY, 342 CHEESEMAN ELLIOT (OR EQUAL) PAINT SHALL BE APPLIED IN ACCORDANCE WITH FINISH SPECIFICATION 318C.

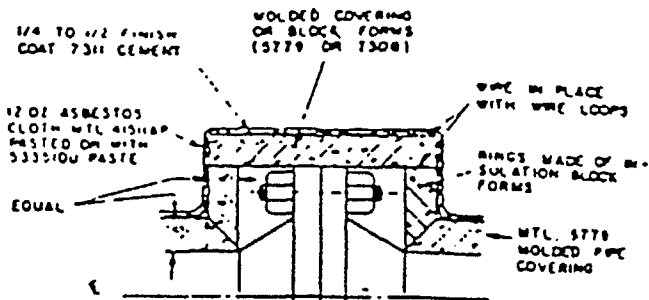


FIG. 4

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GENERAL: THE DETAILED PROCEDURES NECESSARY FOR THE APPLICATION OF INSULATING BLOCK AND/OR PIPE COVERING TO TURBINE CYLINDERS, VALVE COVERS, STEAM CHESTS, PIPES, FLANGES OR OTHER PARTS ARE DESCRIBED IN THIS SPECIFICATION. THE INSULATION TYPE AND THICKNESS WILL BE SHOWN ON THE INSULATION DRAWING FOR EACH CLASS OF TURBINE.

THIS SPECIFICATION IS DIVIDED INTO TWO PARTS AS FOLLOWS:-

- PART I. APPLICATION OF BLOCK.
PART II. APPLICATION OF MOLDED PIPE COVERING.

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PART I. APPLICATION OF BLOCK.

GENERAL: WHERE TEMPERATURE DOES NOT EXCEED 600°F., MATERIAL 7308 SILICATE BLOCKS SHALL BE APPLIED IN A SINGLE LAYER DIRECTLY TO THE SURFACE BEING INSULATED.

WHEN TEMPERATURE EXCEEDS 600°F. A LAYER OF MATERIAL 7309-1 HI-TEMP BLOCK COVERED BY A LAYER OF MATERIAL 7308 SILICATE INSULATION SHALL BE USED.

OPERATIONS:

1. SELECTING, CUTTING AND FITTING BLOCKS.
2. ATTACHING ANCHOR POINTS.
3. ATTACHING RETAINING WIRES.
4. COVERING TURBINE ASSEMBLY FLANGES.
5. COVERING PIPE FLANGES.
6. PATCHING, FILLING AND FINISHING WITH MATERIAL 7311 CEMENT.
7. COVERING PIPES OF LARGE DIAMETER.

1. SELECTING, CUTTING AND FITTING BLOCKS.

BLOCK SHAPES SHALL BE SELECTED TO CONFORM AS NEARLY AS PRACTICAL TO THE SHAPE OR CONTOUR BEING COVERED. INSULATION MAY BE CUT WITH EITHER A HAND OR A POWER SAW, DEPENDING ON THE QUANTITY AND AMOUNT OF FITTING NECESSARY.

IN GENERAL, THE LONG DIMENSION OF BLOCKS OR FORMS SHOULD BE PLACED 90° TO THE CURVATURE OF THE SURFACE BEING COVERED.

WHEN FITTING BLOCKS, SLIGHT DIFFERENCES IN CONTOUR BETWEEN THE INSULATION AND THE PART TO BE COVERED ARE PERMISSIBLE. IN SUCH CASES, THE INSULATION BLOCKS SHALL BE SECURED OVER A THIN COATING OF INSULATION CEMENT MATERIAL 7311 APPLIED DIRECTLY TO THE SURFACE OF THE PART. BLOCKS SHALL BE APPLIED WHILE THE CEMENT IS WET.

WHERE SEVERAL LAYERS OF BLOCKS ARE REQUIRED, THE JOINTS OF THE TOP LAYER SHALL BE STAGGERED WITH RELATION TO THE INNER LAYER. EACH LAYER SHALL BE WIRED DOWN TO THE ANCHOR POINTS AND ALL JOINTS AND OPENINGS FINISHED WITH CEMENT MATERIAL 7311.

2. ATTACHING ANCHOR POINTS

ON ALLOY STEEL CASTINGS OR FORGINGS, AT POSITIONS SHOWN ON "CYLINDER (AND OTHER) INSULATION PAD" DRAWINGS INSULATION PADS TO STYLE NUMBER 270A09101 WILL BE WELDED IN PLACE.

CAUTION: NO FURTHER WELDING OF ANY ANCHOR POINTS DIRECTLY TO ANY ALLOY STEEL CASTINGS OR FORGINGS SHALL BE DONE WITHOUT ENGINEERING APPROVAL.

EYE BOLT STUDS, STYLE NUMBER 270A09101, SHALL BE WELDED TO THE INSULATING PADS ONLY WHERE REQUIRED TO ANCHOR INSULATION, USING A NELSON (OR EQUAL) STUD WELDING GUN. (SEE FIGURE 1)

ON CARBON STEEL CASTINGS OR FORGINGS, EYE BOLT STUDS MAY BE WELDED DIRECTLY TO THE CASTING OR FORGING USING THE STUD WELDING GUN. THE STUDS SHALL BE LOCATED SO THAT RETAINING WIRES ATTACHED TO THEM SHALL RUN AT RIGHT ANGLES TO THE CURVATURE OF THE SURFACE BEING COVERED, OR AT RIGHT ANGLES TO THE LONG DIMENSION ON FLAT SURFACES.

3. ATTACHING RETAINING WIRES

FOR SERVICE TEMPERATURES UP TO 500°F., SOFT GALVANIZED OR BLACK STEEL WIRE, MATERIAL 3657-1, OF 16 GAGE SIZE SHALL BE USED FOR RETAINING WIRES. FOR SERVICE TEMPERATURES ABOVE 500°F. STAINLESS STEEL WIRE, .062 DIA., OF 7860-2 MATERIAL SHALL BE USED.

THE WIRES SHALL PASS OVER THE BLOCKS OR SHAPES AND BE TIED TO THE ANCHOR POINTS SECURING THE BLOCKS FIRMLY IN PLACE.

WIRE LOOPS SHALL BE USED ON PIPE INSULATION AND SHALL BE TWISTED TOGETHER AND BENT TO PREVENT SNAGGING. THE PITCH BETWEEN LOOPS SHALL NOT EXCEED 15 INCHES.

4. COVERING TURBINE ASSEMBLY FLANGES

INSULATION SHALL BE STOPPED A SUFFICIENT DISTANCE FROM ALL FLANGES TO ALLOW ACCESS TO OR REMOVAL OF BOLTS AND ASSOCIATED PARTS AT OR ADJACENT TO THE FLANGES.

IN GENERAL, INDUSTRIAL TURBINE ASSEMBLY FLANGES FOR TEMPERATURES TO 950°F. SHALL BE COVERED WITH GLASS FILLED ASBESTOS CLOTH COVERED BLANKETS AS SHOWN IN FIGURE 1. (SEE PROCESS SPECIFICATION 600359 PARTS I, II AND III.)

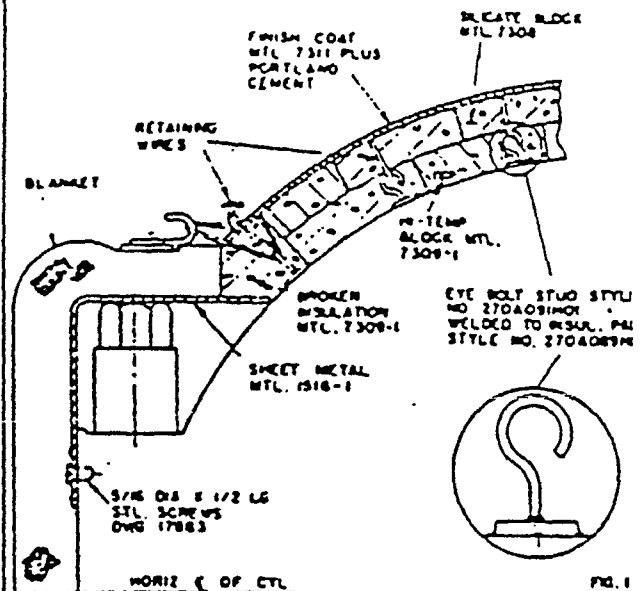
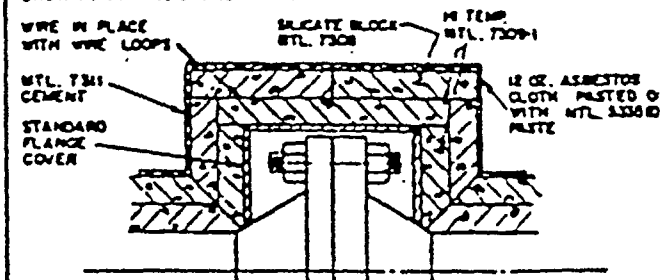


FIG. 1

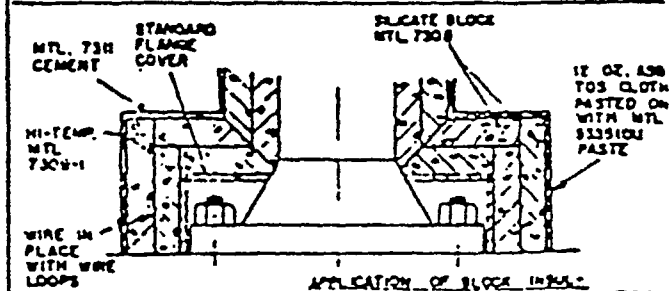
ON SPECIAL INSTALLATIONS AND ON INSTALLATIONS FOR TEMPERATURES OVER 950°F. BLOCKS MAY BE REQUIRED FOR JOINT COVERS. IN SUCH CASES, THE JOINT SHALL BE PROTECTED BY A COVERING 1/16 INCH SHEET STEEL, MATERIAL 1516-1 REINFORCED WITH SUABLE ANGLES TO ASSURE RIGIDITY OR AS PROVIDED IN PROCESS SP 600729. BLOCKS SHALL THEN BE APPLIED TO THE PROTECTING SURFACES.

5. COVERING PIPE FLANGES

WHEN STANDARD PIPE FLANGES ARE INVOLVED, COVER THEM WITH SHEET METAL COVERS AND INSULATE AS SHOWN ON FIGURES 2 AND 3 WHEN PRESSURE RATING AND FLANGE DIMENSIONS ARE BEYOND THE SCOPE OF THESE STANDARD FLANGE COVERS USE ARRANGEMENT SHOWN ON PROC. SPEC. 600729.



APPLICATION OF BLOCK INSULATION TO TURBINE FLANGE FIG. 2



APPLICATION OF BLOCK INSULATION TO SINGLE FLANGE FIG. 3

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6. PATCHING, FILLING AND FINISHING WITH 7311 MATERIAL

INSULATION CEMENT MATERIAL 7311 SHALL BE USED WITH 7309-1 OR 7308 BLOCK FOR PATCHING, FILLING IRREGULAR AREAS AND FOR APPLYING THE FINISHING COAT OVER THE FINAL LAYER OF BLOCK. MATERIAL 7311 IS APPLIED BY MIXING WITH A MINIMUM AMOUNT OF WATER TO PRODUCE A STIFF MIX AND THEN TROWELING IN PLACE. A FINISH COAT, 1/4 TO 1/2 INCH IN THICKNESS, SHALL THEN BE APPLIED BY ADDING A MIXTURE OF 20% BY WEIGHT OF PORTLAND CEMENT TO MATERIAL 7311.

7. COVERING PIPES OF LARGE DIAMETER

LARGE PIPES (OVER 10 IN.) SHALL BE COVERED AS PREVIOUSLY DESCRIBED IN OPERATIONS 1 AND 3 WITH BLOCK INSULATION AND FINISHED AS DESCRIBED IN PART II OPERATION 3.

PART II. APPLICATION OF MOLDED PIPE COVERING

GENERAL: MATERIAL 7310, HI-TEMP. PIPE COVERING AND MATERIAL 5779 SILICATE PIPE COVERING ARE MOLDED TO FIT STANDARD PIPE SIZES. MATERIAL 7310 CONSISTS OF A SINGLE LAYER OF HI-TEMP. INSULATION IN SIZES UP TO 1-1/2 IN. INCL. AND A DOUBLE LAYER OF A HI-TEMP. AND A SILICATE INSULATION IN SIZES OVER 1-1/2 IN.)

PIPE COVERING SHALL BE SECURED IN PLACE BY MEANS OF WIRE LOOPS OF SOFT STEEL 16 GAGE WIRE, MATERIAL 3657-1, FOR TEMPERATURES UP TO 500°F. AND WITH STAINLESS STEEL .062 DIA. WIRE, MATERIAL 7860-2, FOR TEMPERATURES OVER 500°F. WIRE LOOPS SHALL BE TWISTED TOGETHER AND LEFT IN A MANNER TO PREVENT SNAGGING. THE PITCH BETWEEN LOOPS SHALL NOT EXCEED 15 INCHES. INSULATION CEMENT, MATERIAL 7311, SHALL BE USED FOR FITTING, PATCHING AND FINISHING PIPE COVERING INSULATION.

OPERATIONS—

1. SELECTING AND FITTING PIPE COVERING.
2. COVERING PIPE FLANGES.
3. FINISHING.

1. SELECTING AND FITTING PIPE COVERING

STRAIGHT PIPE SECTIONS

ON STRAIGHT SECTIONS OF PIPE SPLIT CYLINDRICAL MOLDED SECTIONS OF PIPE COVERING SHALL BE USED. EACH LAYER SHALL BE INDIVIDUALLY APPLIED, ONE OVER THE OTHER, UNTIL THE SPECIFIED THICKNESS HAS BEEN ATTAINED. THE END JOINTS BETWEEN SECTIONS SHALL BE TIGHTLY BUTTED IN EACH LAYER, AND THE LONGITUDINAL JOINTS FROM SECTION TO SECTION SHALL BE STAGGERED AND TIGHTLY DRAWN TOGETHER BY MEANS OF WIRE LOOPS. THE LONGITUDINAL AND CIRCUMFERENTIAL JOINTS FOR EACH LAYER SHALL ALSO BE STAGGERED WITH RELATION TO THE ADJACENT LAYER.

CURVED PIPE SECTIONS

ON CURVED SECTIONS OF PIPE USE SPLIT, MOLDED CURVED PIPE COVERING WHEN AVAILABLE AND WIRE IN PLACE. WHEN CURVED SHAPES ARE NOT AVAILABLE, SHORT LENGTHS OF STRAIGHT MOLDED PIPE COVERING OR BLOCKS MAY BE USED. THESE SHALL BE WIRED IN PLACE OVER A WET LAYER OF CEMENT MATERIAL 7311 APPLIED DIRECTLY TO THE PIPE SURFACE. WHEN SUCH IRREGULAR SHAPES ARE USED THE OUTSIDE SURFACES SHALL BE FINISHED NEATLY AND SMOOTHLY USING 7311 CEMENT TO PRODUCE THE DESIRED RESULTS.

2. COVERING PIPE FLANGES (MOLDED INSULATION)

PIPE INSULATION SHALL BE STOPPED A SUFFICIENT DISTANCE FROM FLANGES TO ALLOW ACCESS TO AND REMOVAL OF FLANGE BOLTS. CENTRAL STATION TURBINE PIPE FLANGES AND OTHER LARGE PIPE FLANGES SHALL BE COVERED AS DESCRIBED IN PROC. SPEC. 600729. ON SMALL PIPE FLANGES WHERE MOLDED PIPE COVERING OR BLOCK FORMS APPLY, INSULATE AS SHOWN IN FIG. 4.

3. FINISHING

WHEN PIPE INSULATION IS SECURED IN PLACE FILL ALL JOINTS AND OPENINGS WITH CEMENT 7311 MIXED WITH A MINIMUM OF WATER TO PRODUCE A STIFF MIX. TROWEL IN PLACE UNTIL A SMOOTH NEAT APPEARANCE IS OBTAINED.

PIPING EXTERNAL TO THE TURBINE SHALL BE COVERED WITH 12 OUNCE PER SQUARE YARD ASBESTOS CLOTH (UNDERWRITERS GRADE) PASTED ON WITH MATERIAL 533510U PASTE. A FINAL COAT OF PASTE SHALL BE APPLIED OVER THE ASBESTOS CLOTH.

ON CROSS-OVER PIPES, WHEN PASTE IS DRY, 342 CHEESEMAN ELLIOT (OR EQUAL) PAINT SHALL BE APPLIED IN ACCORDANCE WITH FINISH SPECIFICATION 118C.

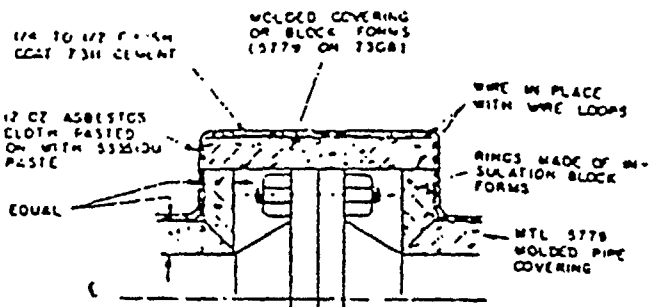


FIG 4

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PROCESS SPECIFICATION APPLICATION OF BLOCK AND MOLDED INSULATION

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GENERAL: THE DETAILED PROCEDURES NECESSARY FOR THE APPLICATION OF INSULATING BLOCK AND PIPE COVERING TO TURBINE CYLINDERS, VALVE COVERS, STEAM CHESTS, PIPES, FLANGES, OR OTHER PARTS ARE DESCRIBED IN THIS SPECIFICATION. THE INSULATION TYPE AND THICKNESS WILL BE SHOWN ON THE INSULATION DRAWING FOR EACH CLASS OF TURBINE.

THIS SPECIFICATION IS DIVIDED INTO TWO PARTS AS FOLLOWS--

PART I - APPLICATION OF BLOCK.

PART II - APPLICATION OF MOLDED PIPE COVERING.

PART I - APPLICATION OF BLOCK

GENERAL: WHERE TEMPERATURE DOES NOT EXCEED 600°F., MATERIAL 46102BB CALCIUM SILICATE BLOCKS SHALL BE APPLIED IN A SINGLE LAYER DIRECTLY TO THE SURFACE BEING INSULATED.

WHEN TEMPERATURE RANGES FROM 601° TO 1050°F., A DOUBLE LAYER OF MATL. 46102BB BLOCK INSULATION SHALL BE USED.

OVER 1050°F., A DOUBLE LAYER CONSISTING OF MATERIAL 46101AA (INNER) AND 46102BB (OUTER) SHALL BE USED.

OPERATIONS:

1. SELECTING, CUTTING AND FITTING BLOCKS.
2. ATTACHING ANCHOR POINTS.
3. ATTACHING RETAINING WIRES.
4. COVERING TURBINE ASSEMBLY FLANGES.
5. COVERING PIPE FLANGES.
6. PATCHING, FILLING AND FINISHING WITH MATERIAL 46110BA CEMENT.
7. COVERING PIPES OF LARGE DIAMETER.

1. SELECTING, CUTTING AND FITTING BLOCKS.

BLOCK SHAPES SHALL BE SELECTED TO CONFORM AS NEARLY AS PRACTICAL TO THE SHAPE OR CONTOUR BEING COVERED. INSULATION MAY BE CUT WITH EITHER A HAND OR A POWER SAW, DEPENDING ON THE QUANTITY AND AMOUNT OF FITTING NECESSARY.

IN GENERAL, THE LONG DIMENSION OF BLOCKS OR FORMS SHOULD BE PLACED 90° TO THE CURVATURE OF THE SURFACE BEING COVERED.

WHEN FITTING BLOCKS, SLIGHT DIFFERENCES IN CONTOUR BETWEEN THE INSULATION AND THE PART TO BE COVERED ARE PERMISSIBLE. IN SUCH CASES, THE INSULATION BLOCKS SHALL BE SECURED OVER A THIN COATING OF INSULATION CEMENT MATERIAL 46110BA APPLIED DIRECTLY TO THE SURFACE OF THE PART. BLOCKS SHALL BE APPLIED WHILE THE CEMENT IS WET.

WHERE SEVERAL LAYERS OF BLOCKS ARE REQUIRED, THE JOINTS OF THE TOP LAYER SHALL BE STAGGERED WITH RELATION TO THE INNER LAYER. EACH LAYER SHALL BE WIRED DOWN TO THE ANCHOR POINTS AND ALL JOINTS AND OPENINGS FINISHED WITH CEMENT MATERIAL 46110BA.

2. ATTACHING ANCHOR POINTS

ON ALLOY STEEL CASTINGS OR FORGINGS, AT POSITIONS SHOWN ON "CYLINDER (AND OTHER) INSULATION PAD" DRAWINGS, INSULATION PADS TO STYLE NUMBER 270A091H01 WILL BE WELDED IN PLACE.

CAUTION: NO FURTHER WELDING OF ANY ANCHOR POINTS DIRECTLY TO ANY ALLOY STEEL CASTINGS OR FORGINGS SHALL BE DONE WITHOUT ENGINEERING APPROVAL.

EYE BOLT STUDS, STYLE NUMBER 270A091H01, SHALL BE WELDED TO THE INSULATING PADS ONLY WHERE REQUIRED TO ANCHOR INSULATION, USING A NELSON (OR EQUAL) STUD WELDING GUN. (SEE FIGURE 1)

ON CARBON STEEL CASTINGS OR FORGINGS, EYE BOLT STUDS MAY BE WELDED DIRECTLY TO THE CASTING OR FORGING USING THE STD WELDING GUN. THE STUDS SHALL BE LOCATED SO THAT RETAINING WIRES ATTACHED TO THEM SHALL RUN AT RIGHT ANGLES TO THE CURVATURE OF THE SURFACE BEING COVERED, OR AT RIGHT ANGLES TO THE LONG DIMENSION ON FLAT SURFACES.

3. ATTACHING RETAINING WIRES

FOR SERVICE TEMPERATURES UP TO 500°F., SOFT GALVANIZED OR BLACK STEEL WIRE, MATERIAL 3657-1, OF 16 GAGE SIZE SHALL BE USED FOR RETAINING WIRES. FOR SERVICE TEMPERATURES ABOVE 500°F., STAINLESS STEEL WIRE, .062 DIA., OF 7860-2 MATERIAL SHALL BE USED.

THE WIRES SHALL PASS OVER THE BLOCKS OR SHAPES AND BE TIED TO THE ANCHOR POINTS SECURING THE BLOCKS FIRMLY IN PLACE.

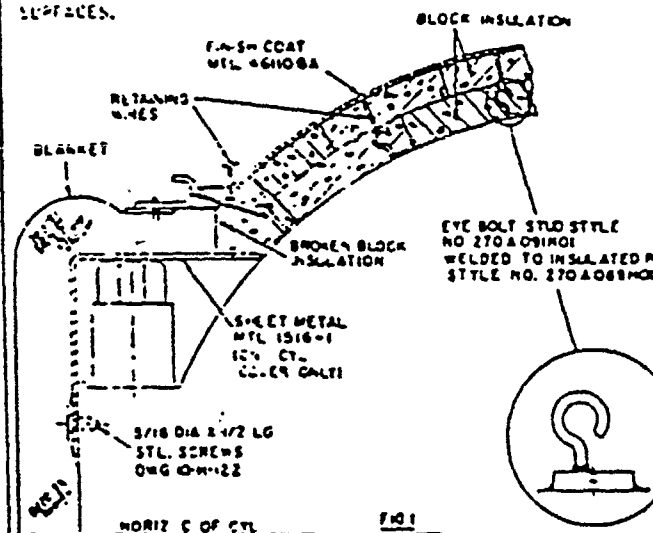
WIRE LOOPS SHALL BE USED ON PIPE INSULATION AND SHALL BE TWISTED TOGETHER AND BENT TO PREVENT SAGGING. THE PITCH BETWEEN LOOPS SHALL NOT EXCEED 15 INCHES.

4. COVERING TURBINE ASSEMBLY FLANGES

INSULATION SHALL BE STOPPED A SUFFICIENT DISTANCE FROM ALL PARTS TO ALLOW ACCESS TO OR REMOVAL OF BOLTS AND ASSOCIATED PARTS AT ALL JOINTS TO THE FLANGES.

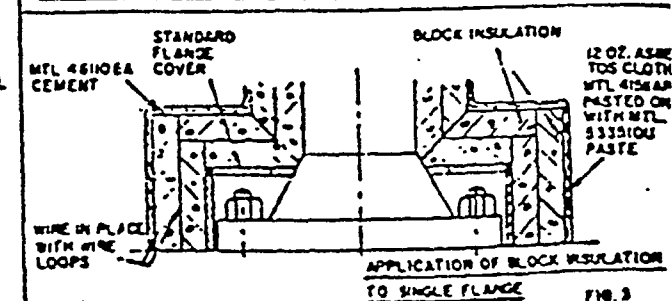
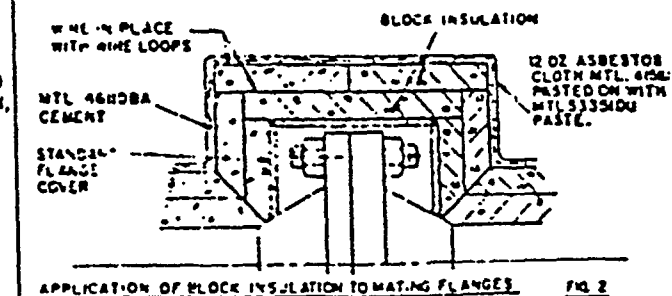
IN GENERAL, THE TURBINE ASSEMBLY FLANGES SHALL BE COVERED WITH BLOCK INSULATION AS SHOWN IN FIGURE 1. (SEE PROCESS SPEC 600729).

IN SPECIAL INSTALLATIONS, BLOCKS MAY BE REQUIRED FOR JOINT COVERING. IN SUCH CASES, THE JOINT SHALL BE PROTECTED BY A COVERING OF 1/16 INCH SHEET STEEL, MATERIAL 1516-1 REINFORCED WITH SUITABLE ANGLES TO ASSURE RIGIDITY OR AS PROVIDED IN PROCESS SPEC. 600729. BLOCKS SHALL THEN BE APPLIED TO THE PROTECTING SURFACES.



5. COVERING PIPE FLANGES

WHEN STANDARD PIPE FLANGES ARE INVOLVED, COVER THEM WITH SHEET METAL COVERS AND INSULATE AS SHOWN ON FIGURES 2 AND 3. WHEN PRESSURE RATING AND FLANGE DIMENSIONS ARE BEYOND THE SCOPE OF THESE STANDARD FLANGE COVERS USE ARRANGEMENT AS SHOWN IN PROCESS SPEC. 600729.



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PROCESS SPECIFICATION APPLICATION OF BLOCK AND MOLDED INSULATION

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6. PATCHING, FILLING AND FINISHING WITH 46110BA MATERIAL

INSULATION CEMENT MATERIAL 46110BA SHALL BE USED WITH 46601AA OR 46102BB BLOCK FOR PATCHING, FILLING IRREGULAR AREAS AND FOR APPLYING THE FINISHING COAT, 3/4 TO 1/2 INCH THICK, OVER THE FINAL LAYER OF BLOCK.

MATERIAL 46110BA IS APPLIED BY MIXING WITH A MINIMUM AMOUNT OF WATER TO PRODUCE A STIFF MIX AND THEN TROWELING IN PLACE.

7. COVERING PIPES OF LARGE DIAMETER

LARGE PIPES (OVER 10 IN.) SHALL BE COVERED AS PREVIOUSLY DESCRIBED IN OPERATIONS 1 AND 3 WITH BLOCK INSULATION AND FINISHED AS DESCRIBED IN PART II, OPERATION 3.

PART II - APPLICATION OF MOLDED PIPE INSULATION

GENERAL: MATERIAL 46601BA, HI-TEMP. PIPE INSULATION AND MATERIAL 54251AM SILICATE PIPE INSULATION ARE MOLDED TO FIT STANDARD PIPE SIZES. MATERIAL 46601BA CONSISTS OF A SINGLE LAYER OF HI-TEMP. INSULATION IN SIZES UP TO 1-1/2 IN., INCL., AND A DOUBLE LAYER OF A HI-TEMP. AND A SILICATE INSULATION IN SIZES OVER 1-1/2 IN.)

OPERATIONS:

1. SELECTING AND FITTING PIPE INSULATION.
2. COVERING PIPE FLANGES.
3. SECURING INSULATION.
4. FINISHING.

2. SELECTING AND FITTING PIPE INSULATION.

STRAIGHT PIPE SECTIONS

ON STRAIGHT SECTIONS OF PIPE, SPLIT CYLINDRICAL MOLDED SECTIONS OF PIPE INSULATION SHALL BE USED. EACH LAYER SHALL BE INDIVIDUALLY APPLIED, ONE OVER THE OTHER, UNTIL THE SPECIFIED THICKNESS HAS BEEN ATTAINED. THE END JOINTS BETWEEN SECTIONS SHALL BE TIGHTLY BUTTED IN EACH LAYER, AND THE LONGITUDINAL JOINTS FROM SECTION TO SECTION SHALL BE STAGGERED AND TIGHTLY DRAWN TOGETHER BY MEANS OF WIRE LOOPS. THE LONGITUDINAL AND CIRCUMFERENTIAL JOINTS FOR EACH LAYER SHALL ALSO BE STAGGERED WITH RELATION TO THE ADJACENT LAYER.

CURVED PIPE SECTIONS

ON CURVED SECTIONS OF PIPE USE SPLIT, MOLDED CURVED PIPE INSULATION WHEN AVAILABLE, AND WIRE IN PLACE.

WHEN CURVED SHAPES ARE NOT AVAILABLE, SHORT LENGTHS OF STRAIGHT MOLDED PIPE INSULATION OR BLOCKS MAY BE USED. THESE SHALL BE WIRED IN PLACE OVER A WET LAYER OF CEMENT MATERIAL 46110BA APPLIED DIRECTLY TO THE PIPE SURFACE. WHEN SUCH IRREGULAR SHAPES ARE USED, THE OUTSIDE SURFACES SHALL BE FINISHED NEATLY AND SMOOTHLY, USING 46110BA CEMENT TO PRODUCE THE DESIRED RESULTS.

2. COVERING PIPE FLANGES (MOLDED INSULATION)

PIPE INSULATION SHALL BE STOPPED A SUFFICIENT DISTANCE FROM FLANGES TO ALLOW ACCESS TO AND REMOVAL OF FLANGE BOLTS.

CENTRAL STATION TURBINE PIPE FLANGES AND OTHER LARGE PIPE FLANGES SHALL BE COVERED AS DESCRIBED IN PROCESS SPEC. 600729. ON SMALL PIPE FLANGES WHERE MOLDED PIPE INSULATION OR BLOCK FORMS APPLY, INSULATE AS SHOWN IN FIG. 4.

3. SECURING INSULATION

PIPE INSULATION SHALL BE SECURED IN PLACE BY MEANS OF WIRE LOOPS OF SIXT STEEL 16 GAGE WIRE, MATERIAL 3657-1, FOR TEMPERATURES UP TO 500°F. AND WITH STAINLESS STEEL .062 DIA. WIRE, MATERIAL 7860-2, FOR TEMPERATURES OVER 500°F. WIRE LOOPS SHALL BE TWISTED TOGETHER AND LEFT IN A MANNER TO PREVENT SNAGGING. THE PITCH BETWEEN LOOPS SHALL NOT EXCEED 15 INCHES.

4. FINISHING

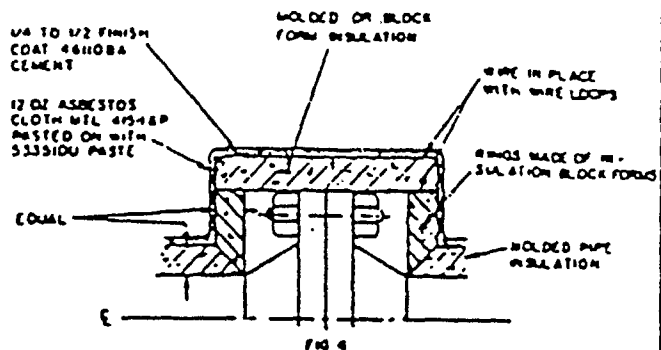
INSULATION CEMENT, MATERIAL 46110BA, SHALL BE USED FOR FITTING, PATCHING AND FINISHING PIPE INSULATION.

WHEN PIPE INSULATION IS SECURED IN PLACE, FILL ALL JOINTS AND OPENINGS WITH CEMENT 46110BA MIXED WITH A MINIMUM OF WATER TO PRODUCE A STIFF MIX. TROWEL IN PLACE UNTIL A SMOOTH NEAT APPEARANCE IS OBTAINED.

PIPING EXTERNAL TO THE TURBINE SHALL BE COVERED WITH 12 OUNCE PER SQUARE YARD ASBESTOS CLOTH (MATERIAL 41511AP) PASTED ON WITH MATERIAL 53351DU PASTE. A FINAL COAT OF PASTE

SHALL BE APPLIED OVER THE ASBESTOS CLOTH.

ON CROSS-OVER PIPES, WHEN PASTE IS DRY, PAINT SHALL BE APPLIED IN ACCORDANCE WITH FINISH SPECIFICATION 118C.



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