

NOTES TO DESIGNER: ALL TABLES ARE BASED ON A COEFFICIENT OF THERMAL EXPANSION FOR STEEL OF 0.0000117/C. ALL TABULATED DIMENSIONS ARE GIVEN IN MILLIMETERS.

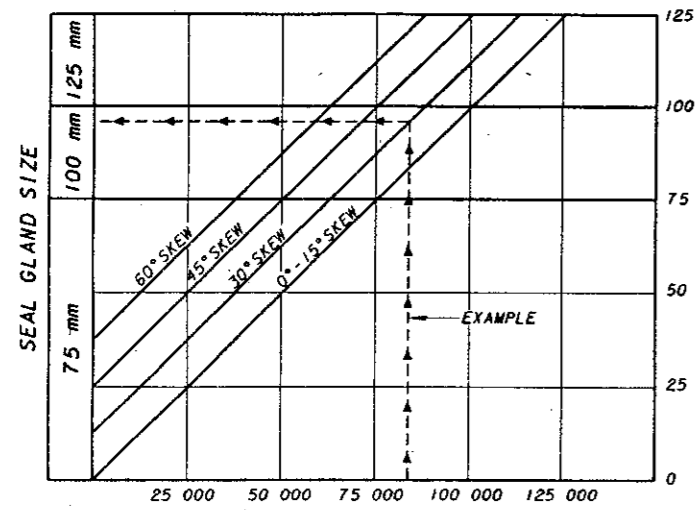


TABLE A
DISTANCE FOR DETERMINING SEAL GLAND SIZE

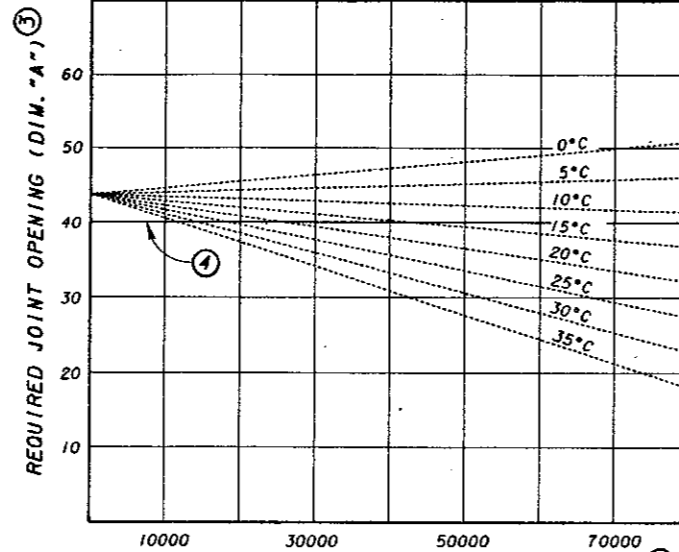


TABLE B
DISTANCE FOR DETERMINING JOINT OPENING

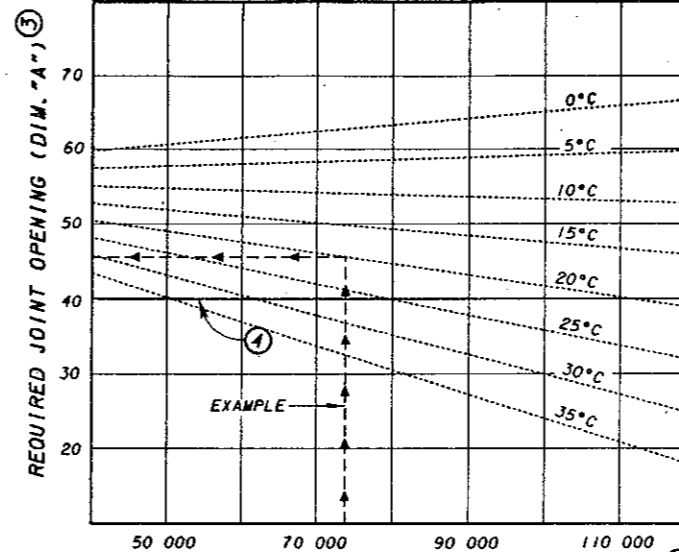


TABLE C
DISTANCE FOR DETERMINING JOINT OPENING

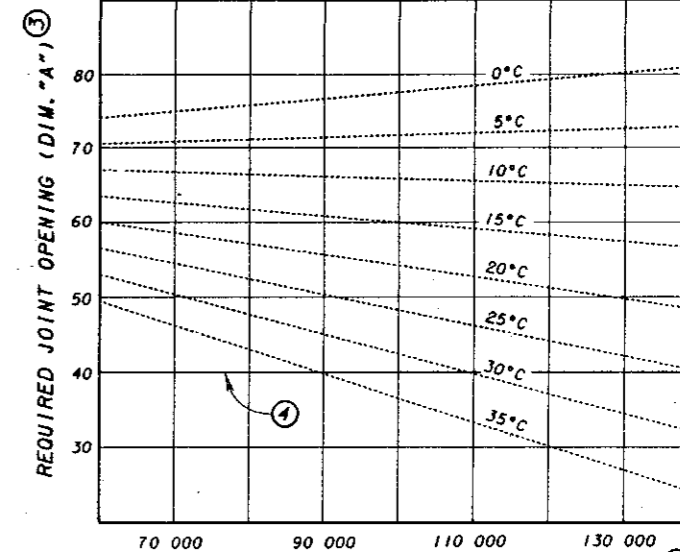


TABLE D
DISTANCE FOR DETERMINING JOINT OPENING

GENERAL NOTES:

MATERIALS: ALL STEEL PARTS OF THE JOINT ASSEMBLY SHALL BE ASTM A709M, GRADE 250. THE FINISHED STEEL ASSEMBLY SHALL BE METALIZED. THE THICKNESS OF THE COATING SHALL BE 150-200 MICROMETERS. THE WIRE USED FOR THE METALLIZING SHALL CONSIST OF 85% ZINC AND 15% ALUMINUM. SURFACE PREPARATION AND APPLICATION SHALL CONFORM TO SSPC COATING SYSTEM GUIDE NO. 2300, "GUIDE FOR THERMAL SPRAY METALLIC COATING SYSTEMS". A SEALER AS PER SSPC PAINT SPECIFICATION NO. 27, SHALL BE APPLIED TO METALLIZED SURFACES THAT WILL BE IN CONTACT WITH CONCRETE. THERE IS NO NEED TO METALLIZE THE SURFACES OF THE RETAINERS TO WHICH THE GLANDS WILL BE BONDED. THESE SURFACES MAY BE MASKED TO PREVENT THE BUILDUP OF OVERSPRAY WITHIN THE RETAINER GROOVE.

THE PREFORMED STRIP SEAL GLAND SHALL BE EXTRUDED POLYCHLOROPRENE MATERIAL MEETING THE REQUIREMENTS OF ASTM D2628M. DUE TO THE CONFIGURATION OF THE STRIP SEAL, THE RECOVERY TEST IS NOT APPLICABLE. PHYSICAL PROPERTIES SHALL MEET THE REQUIREMENTS SPECIFIED IN TABLE "E" ON THIS SHEET.

EACH LOT OF STRIP SEAL GLANDS SHALL BE TESTED BY THE MANUFACTURER OR AN ACCREDITED LABORATORY TO ENSURE COMPLIANCE WITH THESE PROVISIONS. TWO CERTIFIED COPIES OF THE QUALIFICATION TEST DATA INDICATING THAT THE TESTED MATERIALS COMPLY WITH THESE PROVISIONS SHALL BE SUBMITTED TO THE ODOT TESTING LABORATORY.

THE STEEL RETAINER AND POLYCHLOROPRENE GLAND SHALL BE SUPPLIED BY THE SAME MANUFACTURER AND SHALL BE DESIGNED TO FUNCTION AS AN INTEGRAL UNIT.

LUBRICANT-ADHESIVE USED TO INSTALL THE PREFORMED STRIP SEALS SHALL BE A ONE PART MOISTURE CURING POLYURETHANE COMPOUND, MEETING THE REQUIREMENTS OF ASTM D4070M, AND AS SPECIFIED BY THE SEAL GLAND MANUFACTURER. IT SHALL HAVE A SUITABLE CONSISTENCY AT THE TEMPERATURE AT WHICH THE SEALS ARE INSTALLED AND SHALL BE COMPATIBLE WITH THE SEALS AND THE STEEL RETAINERS.

SPLICE OR JOINT IN SEAL GLAND: SEAL GLANDS FOR BRIDGE DECK JOINTS SHALL BE FURNISHED IN ONE CONTINUOUS PIECE UNLESS SHOP FABRICATED SPLICES ARE SHOWN ON THE PLANS OR APPROVED BY THE DIRECTOR. FIELD SPLICING SHALL NOT BE PERMITTED.

COMPLETED SPLICES SHALL HAVE NO OFFSETS ON EXTERIOR SURFACES, AND AFTER INSTALLATION, THERE SHALL BE NO EVIDENCE OF BOND FAILURE AT THE SPLICES.

FOR OTHER THAN STRAIGHT SEALS WITHOUT INTERMEDIATE SPLICES, SEAL GLANDS SHALL BE SHOP FABRICATED IN ACCORDANCE WITH APPROVED SHOP DRAWINGS, SHOP DRAWING DIMENSIONS FOR EXISTING JOINTS OR FOR JOINTS WHICH ARE BEING MODIFIED SHALL BE BASED ON FIELD MEASUREMENTS PROVIDED BY THE CONTRACTOR.

PREPARATION FOR INSTALLATION: TO AVOID THE SUBSEQUENT CONTAMINATION OF THE PREPARED SURFACES, ALL SURFACES OF ELASTOMERIC STRIP SEAL GLANDS SHALL BE CLEANED WITH METHYL ETHYL KETONE (MEK), TOLUENE (T) OR ANOTHER APPROVED SOLVENT USING CLEAN DISPOSABLE CLOTHS.

NO MORE THAN 24 HOURS BEFORE APPLICATION OF THE LUBRICANT ADHESIVE, ONLY THE SURFACES OF THE STEEL RETAINER TO WHICH ADHESIVE IS APPLIED SHALL BE CLEANED TO SSPC VISUAL STANDARD SP-6.

INSTALLATION: IMMEDIATELY PRIOR TO APPLICATION OF LUBRICANT-ADHESIVE, BONDING SURFACES SHALL BE CLEAN, DRY AND WARMER THAN 7 DEGREES C. AND THEY SHALL BE MAINTAINED AT OR ABOVE THIS TEMPERATURE UNTIL THE ADHESIVE HAS CURED. LUBRICANT-ADHESIVE SHALL BE APPLIED LIBERALLY TO BOTH STEEL AND ELASTOMERIC BONDING SURFACES USING A STIFF BRUSH IF NECESSARY TO ACHIEVE A COMPLETE AND RELATIVELY UNIFORM COATING. THE BULBED EDGES OF THE ELASTOMERIC SEAL SHALL BE INSERTED INTO THE RETAINER GROOVES. AFTER-INSTALLATION, EXCESS LUBRICANT-ADHESIVE SHALL BE REMOVED FROM THE EXPOSED SEAL SURFACES.

SEAL GLANDS SHALL BE INSTALLED WITH EQUIPMENT DESIGNED OR SPECIFICALLY ADAPTED FOR THE INSTALLATION OF ELASTOMERIC JOINT SEAL GLANDS. THIS EQUIPMENT SHALL NOT ELONGATE THE SEAL GLAND OR CAUSE STRUCTURAL DAMAGE TO THE COMPLETED INSTALLATION.

ALL EXPOSED METALLIZED SURFACES OF THE JOINT ARMOR DAMAGED DUE TO SHIPPING, FIELD WELDING, INSTALLATION OR REMOVAL OF TEMPORARY SUPPORTS SHALL BE REPAIRED. THE REPAIRS SHALL BE MADE USING ANY METHOD OF ASTM A780, EXCEPT THAT SURFACE PREPARATION SHALL MEET THE REQUIREMENTS OF SSPC-SP3, "POWER TOOL CLEANING".

THE JOINT ARMOR SHOULD NOT BE PAINTED, EXCEPT THE METALLIZED SURFACES DAMAGED DURING CROSSFRAME INSTALLATION. THESE AREAS SHALL BE CLEANED AND PAINTED IN CONFORMANCE WITH THE STRUCTURE'S PAINT SYSTEM REQUIREMENTS. OVERSPRAY FROM PAINTING NEED NOT BE REMOVED.

MEASUREMENT FOR PAY PURPOSES SHALL BE BASED ON THE LINEAR METERS OF SEALED JOINT SYSTEM, MEASURED HORIZONTALLY ALONG THE JOINT CENTERLINE AND BETWEEN THE OUTER LIMITS OF THE FABRICATED JOINT. THIS PAY ITEM SHALL INCLUDE ALL LABOR, MATERIALS AND EQUIPMENT NECESSARY TO COMPLETE THE JOINT IN PLACE, WHICH INCLUDES: THE JOINT ARMOR, RETAINERS, GLAND, ANCHORING DEVICES, PLATE "A", PLATE "B", TEMPORARY SUPPORTS AND THE END CROSSFRAME TOP GUSSET PLATES. PAYMENT WILL BE MADE PER LINEAR METER FOR ITEM 516, "STRUCTURAL EXPANSION JOINTS, INCLUDING ELASTOMERIC STRIP SEALS".

THERMAL NEUTRAL POINT OF THE SUPERSTRUCTURE IS THAT POINT WHICH HAS ZERO HORIZONTAL MOVEMENT DURING TEMPERATURE CHANGES.

LEGEND

- ① - THIS IS THE ACTUAL DISTANCE FROM THE CENTERLINE OF JOINT TO THE THERMAL NEUTRAL POINT OF THE SUPERSTRUCTURE MEASURED ALONG THE CENTERLINE OF ROADWAY. THIS DIMENSION SHALL BE A MAXIMUM OF 87 985 mm FOR 60° SKEWS, 100 555 mm FOR 45° SKEWS, 113 120 mm FOR 30° SKEWS AND 125 690 mm FOR 0° THRU 15° SKEWS.
- ② - THIS DISTANCE FOR EXPANSION JOINTS HAVING SKEW ANGLES OF 15° OR LESS IS THE ACTUAL DISTANCE TO THE THERMAL NEUTRAL POINT OF THE SUPERSTRUCTURE ALONG CENTERLINE OF ROADWAY. THIS DISTANCE FOR EXPANSION JOINTS HAVING SKEW ANGLES OVER 15° BUT NOT GREATER THAN 60° IS ARRIVED AT BY MULTIPLYING THE ABOVE DEFINED DISTANCE ALONG THE CENTERLINE OF ROADWAY BY THE COSINE OF THE EXPANSION JOINT SKEW ANGLE.
- ③ - THIS IS THE JOINT OPENING (DIMENSION "A") REQUIRED AT THE TIME OF ABUTMENT BACKWALL CONCRETE PLACEMENT, BASED ON THE DAY'S ANTICIPATED PEAK AMBIENT TEMPERATURE.
- ④ - MINIMUM JOINT OPENING (DIMENSION "A") AT TIME OF SEAL GLAND INSTALLATION SHALL NOT BE LESS THAN 40 mm. IF THE JOINT OPENING IS LESS, INSTALLATION SHALL BE POSTPONED UNTIL THE TEMPERATURE DROPS A SUFFICIENT AMOUNT TO ALLOW THE MINIMUM 40 mm OPENING.

EXAMPLE

GIVEN - DISTANCE FROM THE CENTERLINE OF JOINT TO THERMAL NEUTRAL POINT OF SUPERSTRUCTURE ALONG CENTERLINE OF ROADWAY IS 83 820 mm; SKEW ANGLE OF THE EXPANSION JOINT IS 30°; ANTICIPATED AMBIENT TEMPERATURE AT TIME OF JOINT INSTALLATION IS 20°C.

FIND - REQUIRED STRIP SEAL GLAND SIZE AND JOINT OPENING (DIMENSION "A") AT TIME OF JOINT ARMOR INSTALLATION.

SOLUTION:

(A) - ENTER TABLE "A" AT ① WITH 83 820 mm AND FIND THAT THE REQUIRED STRIP SEAL GLAND SIZE IS 100 mm.

(B) - ENTER TABLE "C" AT ② WITH 83 820 mm x COSINE OF 30° = 72 590 mm AND FIND REQUIRED JOINT OPENING AT 20°C IS 46 mm.

NOTE: STEP (B) REQUIRED ONLY AT TIME OF CONSTRUCTION.

TABLE E (PHYSICAL PROPERTIES OF SEAL ELEMENT)		
PROPERTY	REQUIREMENT	ASTM METHOD
TENSILE STRENGTH, MIN MPa	13.8	D412M
ELONGATION @ BREAK, MIN PERCENT	250	D412M
HARDNESS, TYPE A DUROMETER, POINTS	60 ± 5	D2240M(MODIFIED)
OVEN AGING, 70 HR @ 100°C TENSILE STRENGTH, LOSS, MAX ELONGATION, LOSS, MAX HARDNESS, TYPE A DUROMETER, POINTS CHANGE	20 PERCENT 20 PERCENT 0 TO +10	D573M D2240M(MODIFIED)
OIL SWELL, ASTM OIL 3 70 HR @ 100°C, WEIGHT CHANGE MAX	45 PERCENT	D471M
OZONE RESISTANCE 20 PERCENT STRAIN, 300 PPHM IN AIR, 70 HR @ 40°C (WIPE WITH TOLUENE TO REMOVE SURFACE CONTAMINATION)	NO CRACKS	D1149M
LOW TEMPERATURE STIFFENING 7 DAYS @ -10°C HARDNESS, TYPE A DUROMETER, POINTS CHANGE	0 TO +15	D2240M D2240M(MODIFIED)
COMPRESSION SET, 70 HR @ 100°C MAX	40 PERCENT	D395M METHOD B

DESIGN AGENCY: BUREAU OF BRIDGES
 STRUCTURAL DESIGN
 STATE OF OHIO DEPARTMENT OF TRANSPORTATION
 ENGINEER OF BRIDGES: Richard L. Engel
 DATE: 8-20-95
 CHECKED: J.S.
 DESIGNED: A.J.M.
 REVISED: L.M.W.
 STANDARD: STRIP SEAL EXPANSION JOINTS FOR STEEL STRINGER STRUCTURES
 EXJ-4-87M
 5 / 5