

SUGGESTED SEQUENCE REPAIR (4) - INSTALLATION OF NEW WASHERS AND STEEL KEEPER RINGS

GENERAL

1. THE STEEL ANCHOR PIPES SHALL BE DEWATERED COMPLETELY (DECK LEVEL ANCHORS ONLY). ANY GREASE ON THE STEEL ANCHOR PIPE, PE PIPE, OR STEEL KEEPER RINGS SHALL BE REMOVED WITH CLEAN RAGS AND AN APPROVED SOLVENT THAT IS NON-REACTIVE WITH POLYVINYL CHLORIDE, POLYETHYLENE, STEEL OR NEOPRENE RUBBER.
2. FOLLOW THE APPROPRIATE PROCEDURE LISTED BELOW FOR INSTALLATION OF THE INNER AND OUTER STEEL KEEPER RINGS. SEE REPAIR (3) ON SHEET NO. 11 FOR DETERMINATION OF PROPER PROCEDURE.
3. THERE SHALL NOT BE MORE THAN 1/8" GAP BETWEEN THE WASHER AND THE PE PIPE OR THE WASHER AND THE STEEL ANCHOR PIPE.
4. EXISTING HOLES IN THE STEEL ANCHOR PIPE AND THE HEADS OF THE NEW 3/8" DIAMETER COUNTERSUNK BOLTS SHALL BE FILLED FLUSH TO THE OUTSIDE SURFACE OF THE STEEL ANCHOR PIPE WITH 100% HIGH GRADE SILICONE SEALANT AFTER THE STEEL KEEPER RINGS HAVE BEEN INSTALLED.
5. THE EXISTING PROTECTIVE BOOTS (REPAIR (3)) SHALL BE REINSTALLED IMMEDIATELY AFTER COMPLETING REPAIR (4) (SEE NOTE 2).

PROCEDURE A: EXISTING STEEL KEEPER RING - ONE PIECE

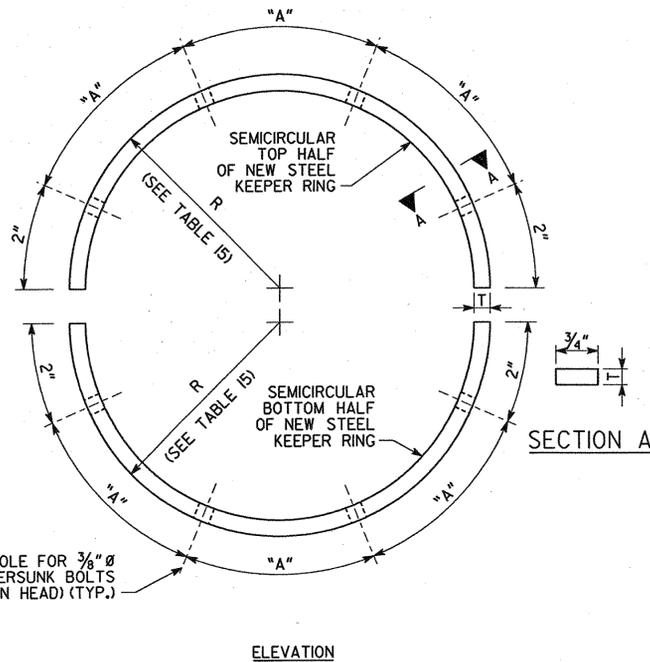
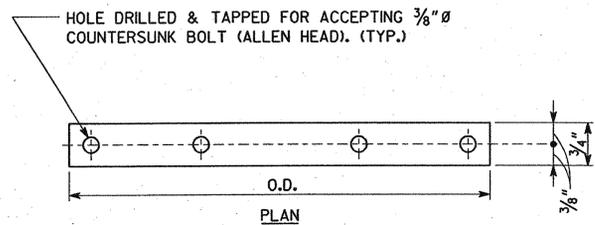
1. TEMPORARILY SECURE THE STEEL KEEPER RING TO THE ANCHOR PIPE BY UTILIZING THE EXISTING HOLES. THE STEEL KEEPER RING SHALL NOT BE FREE TO PIVOT OR SHIFT DURING MEASUREMENT, MARKING AND DRILLING. THE CONTRACTOR SHALL SUBMIT FOR THE ENGINEER'S APPROVAL A METHOD TO SECURE THE STEEL KEEPER RING TO ENSURE THAT THERE IS NO MOVEMENT BETWEEN THE VARIOUS COMPONENTS.
2. MEASURE THE LOCATION OF THE STEEL KEEPER RING WITHIN THE STEEL ANCHOR PIPE AND MARK THE LOCATION ON THE EXTERIOR OF THE STEEL ANCHOR PIPE.
3. MARK THE LOCATION OF THE NEW SET-SCREW HOLES ON THE EXTERIOR OF THE STEEL ANCHOR PIPE. AVOID LOCATING NEW BOLT HOLES OVER THE EXISTING STEEL KEEPER RING SET-SCREW HOLES.
4. VERIFY MEASUREMENTS AFTER MARKING AND BEFORE EACH HOLE IS DRILLED.
5. DRILL HOLES IN THE STEEL ANCHOR PIPE AND INTO THE STEEL KEEPER RING. REMOVE KEEPER RING AFTER ALL HOLES ARE DRILLED. TAP HOLES IN KEEPER RINGS TO ACCEPT 3/8" DIAMETER BOLTS. THE HOLES IN THE STEEL ANCHOR PIPE SHALL THEN BE SUFFICIENTLY COUNTERSUNK TO FIT THE HEADS OF THE 3/8" DIAMETER COUNTERSUNK BOLTS AND ALLOW FOR SILICONE SEAL. (CARE SHALL BE TAKEN SUCH THAT THE DRILL BIT DOES NOT COME IN CONTACT WITH THE PE PIPE.)
6. THE STEEL KEEPER RINGS SHALL BE ATTACHED IN PLACE WITH EIGHT (8) 3/8" DIAMETER COUNTERSUNK BOLTS.

PROCEDURE B: EXISTING STEEL KEEPER RING - TWO SEMICIRCULAR HALVES

1. TEMPORARILY SECURE THE TWO SEMICIRCULAR HALVES OF THE STEEL KEEPER RING TO THE ANCHOR PIPE BY UTILIZING THE EXISTING HOLES. THE TWO SEMICIRCULAR HALVES OF THE STEEL KEEPER RING SHALL NOT BE FREE TO PIVOT OR SHIFT DURING MEASUREMENT, MARKING AND DRILLING. THE CONTRACTOR SHALL SUBMIT FOR THE ENGINEER'S APPROVAL A METHOD TO SECURE THE STEEL KEEPER RINGS TO ENSURE THAT THERE IS NO MOVEMENT BETWEEN THE VARIOUS COMPONENTS.
2. MEASURE THE LOCATION OF THE TWO SEMICIRCULAR HALVES OF THE STEEL KEEPER RING WITHIN THE STEEL ANCHOR PIPE AND MARK THE LOCATION ON THE EXTERIOR OF THE STEEL ANCHOR PIPE.
3. MARK THE LOCATION OF THE NEW BOLT HOLES ON THE EXTERIOR OF THE STEEL ANCHOR PIPE. AVOID LOCATING NEW SET-SCREW HOLES OVER THE EXISTING STEEL KEEPER RING SET-SCREW HOLES.
4. VERIFY MEASUREMENTS AFTER MARKING AND BEFORE EACH HOLE IS DRILLED.
5. DRILL HOLES IN THE STEEL ANCHOR PIPE AND INTO THE STEEL KEEPER RINGS. REMOVE KEEPER RINGS AFTER ALL HOLES ARE DRILLED. TAP HOLES IN KEEPER RINGS TO ACCEPT 3/8" DIAMETER BOLTS. THE HOLES IN THE STEEL ANCHOR PIPE SHALL THEN BE SUFFICIENTLY COUNTERSUNK TO FIT THE HEADS OF THE 3/8" DIAMETER COUNTERSUNK BOLTS AND ALLOW FOR SILICONE SEAL. (CARE SHALL BE TAKEN SUCH THAT THE DRILL BIT DOES NOT COME IN CONTACT WITH THE PE PIPE.)
6. THE TWO SEMICIRCULAR STEEL KEEPER RING HALVES SHALL BE ATTACHED IN PLACE WITH EIGHT (8) 3/8" DIAMETER COUNTERSUNK BOLTS (FOUR (4) BOLTS PER EACH HALF).

PROCEDURE C: NEW STEEL KEEPER RING - TWO SEMICIRCULAR HALVES

1. TEMPORARILY SECURE THE TWO SEMICIRCULAR HALVES OF THE NEW STEEL KEEPER RING TO THE ANCHOR PIPE BY UTILIZING THE EXISTING HOLES. THE TWO SEMICIRCULAR HALVES OF THE STEEL KEEPER RING SHALL NOT BE FREE TO PIVOT OR SHIFT DURING MEASUREMENT, MARKING AND DRILLING. THE CONTRACTOR SHALL SUBMIT FOR THE ENGINEER'S APPROVAL A METHOD TO SECURE THE STEEL KEEPER RINGS TO ENSURE THAT THERE IS NO MOVEMENT BETWEEN THE VARIOUS COMPONENTS.
2. MEASURE THE LOCATION OF THE TWO SEMICIRCULAR HALVES OF THE NEW STEEL KEEPER RING WITHIN THE STEEL ANCHOR PIPE AND MARK THE LOCATION ON THE EXTERIOR OF THE STEEL ANCHOR PIPE.
3. MARK THE LOCATION OF THE NEW SET-SCREW HOLES ON THE EXTERIOR OF THE STEEL ANCHOR PIPE. AVOID LOCATING NEW SET-SCREW HOLES OVER THE EXISTING STEEL KEEPER RING SET-SCREW HOLES.
4. VERIFY MEASUREMENTS AFTER MARKING AND BEFORE EACH HOLE IS DRILLED.
5. DRILL HOLES IN THE STEEL ANCHOR PIPE AND INTO THE NEW STEEL KEEPER RINGS. REMOVE KEEPER RINGS AFTER ALL HOLES ARE DRILLED. TAP HOLES IN KEEPER RINGS TO ACCEPT 3/8" DIAMETER BOLTS. THE HOLES IN THE STEEL ANCHOR PIPE SHALL THEN BE SUFFICIENTLY COUNTERSUNK TO FIT THE HEADS OF THE 3/8" DIAMETER COUNTERSUNK BOLTS AND ALLOW FOR SILICONE SEAL. (CARE SHALL BE TAKEN SUCH THAT THE DRILL BIT DOES NOT COME IN CONTACT WITH THE PE PIPE.)
6. THE TWO NEW SEMICIRCULAR STEEL KEEPER RING HALVES SHALL BE ATTACHED IN PLACE WITH EIGHT (8) 3/8" DIAMETER COUNTERSUNK BOLTS (FOUR (4) BOLTS PER EACH HALF).



NEW STEEL KEEPER RING

(CONSISTS OF 2 SEMICIRCULAR HALVES)
(HOLES TO BE DRILLED AND TAPPED IN THE FIELD)

TABLE 15 DIMENSIONS FOR NEW STEEL KEEPER RINGS

STEEL KEEPER RING TYPE	CABLES	LOCATION	QUANTITY REQUIRED (3)	STEEL KEEPER RINGS (2)		
				2R (1)	"T"	"A"
TYPE I	7 TO 29 & 44 TO 66	AT DECK	30±	7.89"±	0.5"±	2.80"±
TYPE II	6, 30 TO 33, 40 TO 43 & 67	AT DECK	18±	8.85"±	0.5"±	3.30"±
TYPE III	4, 5, 34 TO 39, 68 & 69	AT DECK	25±	10.91"±	0.5"±	4.38"±
TYPE IV	1 TO 3 & 70 TO 72	AT DECK	14±	12.95"±	0.5"±	5.45"±
TYPE V	7 TO 29 & 44 TO 66	AT TOWER	8±	11.84"±	1.5"±	4.87"±
TYPE VI	6, 30 TO 33, 40 TO 43 & 67	AT TOWER	4±	13.04"±	1.5"±	5.49"±
TYPE VII	4, 5, 34 TO 39, 68 & 69	AT TOWER	6±	14.91"±	1.5"±	6.47"±
TYPE VIII	1 TO 3 & 70 TO 72	AT TOWER	3±	16.79"±	1.5"±	7.46"±

(1) CONTRACTOR TO FIELD VERIFY DIMENSIONS. SEE GENERAL NOTES ON SHEET NO. 7.
(2) SEE SPECIAL PROVISIONS FOR SURFACE FINISH AND TOLERANCE.
(3) ESTIMATED QUANTITIES BASED ON 2001 FIELD INSPECTION, ACTUAL QUANTITIES MAY DIFFER.

REPAIR LEGEND	
REPAIR	DESCRIPTION
(1)	STEEL ANCHOR PIPE CRACK REPAIR
(2)	HEAT STRAIGHTENING OF STEEL ANCHOR PIPE
(3)	REMOVAL OF EXISTING PROTECTIVE BOOTS, STEEL KEEPER RINGS AND WASHERS
(4)	INSTALLATION OF NEW WASHERS AND STEEL KEEPER RINGS
(5)	PROTECTIVE BOOT RETROFIT
(6)	MISCELLANEOUS CONCRETE REPAIRS
(7)	TIE-DOWN BOOT REPAIR
(8)	MISCELLANEOUS ELECTRICAL REPAIRS
(9)	CABLE STAY PROTECTIVE TAPE REPAIR

NOTES

1. FOR GENERAL NOTES SEE SHEET NO. 7.
2. CARE SHALL BE TAKEN NOT TO DAMAGE THE PE PIPE AND THE PROTECTIVE TAPE AROUND THE PE PIPE. REPAIR (4) WILL COMMENCE WITHIN 24 HOURS AFTER COMPLETION OF REPAIR (3). AT LOCATIONS WHERE REPAIRS (2) OR (1) ARE TO BE COMPLETED, REPAIR (4) WILL BE SEQUENCED AS NOTED IN REPAIR (2) OR (1) PROCEDURES RESPECTIVELY. REPAIR (5) WILL BE COMPLETED IMMEDIATELY AFTER COMPLETION OF REPAIR (4) TO AVOID ANY WATER INFILTRATING INTO THE STEEL ANCHOR PIPES. IN THE EVENT REPAIR (5) CANNOT BE COMPLETED IMMEDIATELY AFTER COMPLETION OF REPAIR (4), THEN THE EXISTING PROTECTIVE BOOTS SHALL BE REINSTALLED IMMEDIATELY UNTIL START OF REPAIR (5).

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GEORGIA
DEPARTMENT OF TRANSPORTATION
OPERATIONS DIVISION-OFFICE OF MAINTENANCE
KEEPER RING & WASHER RETROFIT 2 OF 5
TALMADGE MEMORIAL BRIDGE RETROFIT
CHATHAM COUNTY CSNHS-M002-00 (373)

NO SCALE MARCH 2006

BRIDGE SHEET 12 OF 26	DESIGNED K.J.B. DRAWN R.B.H.	CHECKED T.S. DESIGN GROUP MAINTENANCE	REVIEWED APPROVED
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