

1 DETERMINE ANCHOR TYPE

SURFACE	ANCHOR TYPE
CONCRETE BRIDGE DECK 6" MIN	$\frac{7}{8}$ " ϕ ALL THREAD ANCHOR OR KELI BOLT
CONCRETE BRIDGE DECK 8" MIN.	$1\frac{1}{4}$ " ϕ ALL THREAD ANCHOR OR KELI BOLT
CONCRETE ROADWAY 6" MIN	$1\frac{1}{4}$ " ϕ ANCHOR PIN x 12"
ASPHALT ROADWAY 3" MIN	$1\frac{1}{4}$ " ϕ ANCHOR PIN x 20"

2 DETERMINE ZONEGUARD SYSTEM CONFIGURATION

ZONEGUARD HAS BEEN TESTED IN TWO CONFIGURATIONS, NAMELY STANDARD & MINIMUM DEFLECTION CONFIGURATION. THE ONLY DIFFERENCE IN THESE TWO IS THE QUANTITY OF ANCHORS USED. THE STANDARD CONFIGURATION IS ANCHORED AT THE ENDS OF THE RUN ONLY. THE MINIMUM DEFLECTION CONFIGURATION IS ANCHORED AT THE ENDS OF THE RUN AND EVERY 33'4" ALONG THE LENGTH OF THE RUN. REFER TO SHEET E-1020 FOR DETAILS.

IN GENERAL IF UNANCHORED CONCRETE BARRIER IS SPECIFIED THE STANDARD CONFIGURATION IS AN APPROPRIATE ALTERNATE. IF LESS DEFLECTION IS DESIRED THE MINIMUM DEFLECTION SYSTEM SHOULD BE USED.

3 DETERMINE ANCHOR LOCATIONS

BASED UPON ZONEGUARD CONFIGURATION CHOSEN, DETERMINE ANCHOR LOCATIONS FROM E-1020

KELI BOLT INSTALLATION INSTRUCTIONS

KELI BOLT NOTES

- 1) THE KELI BOLT IS MANUFACTURED BY KELKEN CONSTRUCTION SYSTEMS.
- 2) MATERIAL SPECIFICATION IS ASTM F1554 GRADE 55 GALVANIZED TO ASTM A153. EACH ANCHOR INCLUDES ONE A563 GRADE DH NUT AND ONE F436 FLAT WASHER.
- 3) ANCHOR IS SHIPPED PRECOATED WITH KELISLIP, WHICH IS A PAINT LIKE PRODUCT THAT ALLOWS FOR THE REMOVAL OF THE ANCHORS

FIRST INSTALLATION PROCEDURE

1) DETERMINE IF BOLT HAS BEEN SHIPPED FROM THE FACTORY OR IF IT HAS ALREADY BEEN INSTALLED. IF IT HAS BEEN SHIPPED FROM THE FACTORY IT WILL HAVE BEEN PRECOATED WITH KELISLIP, PROCEED TO STEP 2. IF IT HAS BEEN INSTALLED PREVIOUSLY PROCEED TO "SUBSEQUENT INSTALLATION PROCEDURE BELOW.

2) DRILL A 1" ϕ HOLE FOR THE $\frac{7}{8}$ " ANCHOR OR A $1\frac{3}{8}$ " ϕ HOLE FOR THE $1\frac{1}{4}$ " ANCHOR, FOR THE EMBEDMENT DEPTHS AS SHOWN, AND BLOW HOLE CLEAN.

3) PRIOR TO INJECTING KELIGROUT INTO HOLE, CONFIRM HOLE DEPTH MEETS OR EXCEEDS EMBEDMENT DEPTH AND DEBRIS IS BLOWN FREE OF HOLE.

4) INJECT THE RESIN INTO THE HOLE, AND PUSH ANCHOR AND NUT ASSEMBLY THROUGH ZONEGUARD FOOT SECTION AND INTO THE HOLE. EMBEDDING THE ANCHOR PAST THE THREADS MAY RESULT IN ANCHOR NOT BEING ABLE TO BE REMOVED.

5) DO NOT DISTURB THE ANCHOR FOR 1 HOUR, ALLOW 24 HOURS FOR FULL CURE.

6) FOR FURTHER INSTRUCTIONS REGARDING KELIGROUT, SUCH AS SHELF LIFE, ETC. SEE TECHNICAL INFORMATION INCLUDED WITH EVERY SHIPMENT OF KELIGROUT.

ANCHOR REMOVAL PROCEDURE

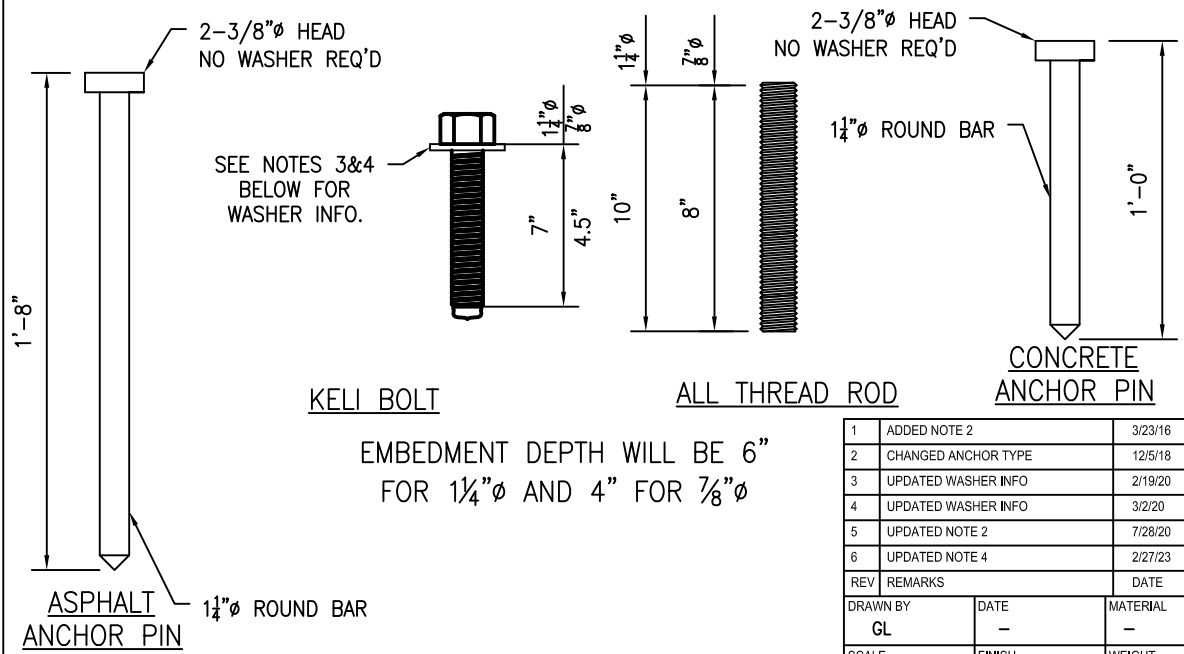
USING A SOCKET, TURN THE BOLT OUT OF THE HOLE COUNTER CLOCKWISE.

SUBSEQUENT INSTALLATION PROCEDURE

IF ANCHOR HAS BEEN USED PREVIOUSLY, IT MUST BE RECOATED WITH KELISLIP PRIOR TO REUSE. DIP THE LEFT HAND THREAD ANCHORS SECTION INTO THE QUART OF KELISLIP, OR BRUSH IT ON. ALLOW THE EXCESS TO DRIP BACK INTO THE CAN OR ANOTHER CAN. ALLOW MINIMUM 1 HOUR DRY TIME BEFORE PROCEEDING TO STEP 2 ABOVE

MATERIAL USAGE

	APPROXIMATE NUMBER OF ANCHORS PER 32 OZ KELIGROUT 101-P	APPROXIMATE RECOATINGS PER QUART OF KELISLIP
$\frac{7}{8}$ " ANCHOR	40	60
$1\frac{1}{4}$ " ANCHOR	12	40



NOTES:

- 1) ZONEGUARD SHALL NOT BE ANCHORED INTO AN EARTH OR DIRT SURFACE. FOR INSTALLATIONS ON SURFACES OTHER THAN CONCRETE OR ASPHALT CONTACT THE MANUFACTURER.
- 2) KELIBOLTS ARE INSTALLED WITH KELIGROUT (SEE INSTRUCTIONS). ALL THREAD RODS SHOULD BE INSTALLED WITH HILTI RE-500 ADHESIVE. IF USING ADHESIVE OTHER THAN RE-500, 1-1/4" AND 7/8" ALL THREAD RODS MUST MEET 35 KIPS/17.5 KIPS ULTIMATE TENSILE STRENGTH RESPECTIVELY. EMBEDMENT DEPTH MAY BE INCREASED TO MEET THESE REQUIREMENTS. BOLTING THROUGH A BRIDGE DECK IS PERMISSIBLE WITH THE PRIOR APPROVAL OF THE OWNER. IF BOLTING THROUGH BRIDGE DECK, SEE DRAWING 1032. ANCHORS USED TO SECURE BARRIER MUST NOT BE TESTED TO THE ULTIMATE LOAD.
- 3) $1\frac{1}{4}$ " ϕ KELI BOLT REQUIRES INCLUDED FLAT WASHER ONLY (SEE NOTE 2 LEFT).
- 4) $\frac{7}{8}$ " ϕ KELI BOLT REQUIRES $\frac{1}{4}$ " X 3" X 4" PLATE WASHER ONLY (DWG 412275).

REV	REMARKS	DATE	CHK
1	ADDED NOTE 2	3/23/16	NC
2	CHANGED ANCHOR TYPE	12/5/18	GL
3	UPDATED WASHER INFO	2/19/20	DH
4	UPDATED WASHER INFO	3/2/20	DH
5	UPDATED NOTE 2	7/28/20	DH
6	UPDATED NOTE 4	2/27/23	CC

DRAWN BY	DATE	MATERIAL
GL	-	-
SCALE	FINISH	WEIGHT
NONE	GALV.	-

Description
ANCHOR TYPES AND INSTALLATION DETAILS

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