NOTES:
1. ALL FILLETS SHALL HAVE A MINIMUM RADIUS OF 1/16 [2].
   THE BOLT SHOULD BE TRIMMED BACK.

DESIGNATOR   L       T (MIN)
-----------------------
FBB01        1-1/4    1-1/8
              [35]     [30]
FBB02        2         1-3/4
              [50]     [45]
FBB03        10        4
              [255]    [100]
FBB04        18        4
              [460]    [100]
FBB05        25        4
              [640]    [100]

1 D x 1/16 DEEP
[25 D x 1.5 DEEP]
RECESS BOTH SIDES

5/8-11 [M16x2]
MODIFIED HEAVY
HEX NUT

GUARDRAIL BOLT AND RECESSED NUT

FBB01-05

SHEET NO. DATE:
1 of 2 6/30/2005
The geometry and material specifications for this oval shoulder button-headed bolt and hex nut are found in AASHTO M 180. The bolt shall have 5/8-11 [M16x2] threads as defined in ANSI B1.1 [ANSI B1.13M] for Class 2A [6g] tolerances. Bolt material shall conform to ASTM A307 Grade A [ASTM F 568M Class 4.6], with a tensile strength of 60 ksi [400 MPa] and yield strength of 36 ksi [240 MPa]. Material for corrosion-resistant bolts shall conform to ASTM A325 Type 3 [ASTM F 568M Class 8.8.3], with tensile strength of 120 ksi [830 MPa] and yield strength of 92 ksi [660 MPa]. This bolt material has corrosion resistance comparable to ASTM A588 steels. Metric zinc-coated bolt heads shall be marked as specified in ASTM F 568 Section 9 with the symbol “4.6.”

Nuts shall have ANSI B1.1 Class 2B [ANSI B1.13M Class 6h] 5/8-11 [M16x2] threads. The geometry of the nuts, with the exception of the recess shown in the drawing, shall conform to ANSI B18.2.2 [ANSI B18.2.4.1M Style 1] for zinc-coated hex nuts (shown in drawing) and ANSI B18.2.2 [ANSI B18.2.4.6M] for heavy hex corrosion-resistant nuts (not shown in drawing). Material for zinc-coated nuts shall conform to the requirements of AASHTO M 291 (ASTM A 563) Grade A [AASHTO M 291M (ASTM A 563M) Class 5], and material for corrosion-resistant nuts shall conform to the requirements of AASHTO M 291 (ASTM A 563) Grade C3 [AASHTO M 291M (ASTM A 563M) Class 8S3].

When zinc-coated bolts and nuts are required, the coating shall conform to either AASHTO M 232 (ASTM A 153/A 153M) for Class C or AASHTO M 298 (ASTM B 695) for Class 50. Zinc-coated nuts shall be tapped over-size as specified in AASHTO M 291 (ASTM A 563) [AASHTO M 291M (ASTM A 563M)], except that a diametrical allowance of 0.020 inch [0.510 mm] shall be used instead of 0.016 inches [0.420 mm].

<table>
<thead>
<tr>
<th>Designator</th>
<th>Stress Area of Threaded Bolt Shank (in² [mm²])</th>
<th>Min. Bolt Tensile Strength (kips [kN])</th>
</tr>
</thead>
<tbody>
<tr>
<td>FBB01-05</td>
<td>0.226 [157.0]</td>
<td>13.6 [62.8]</td>
</tr>
</tbody>
</table>

Dimensional tolerances not shown or implied are intended to be those consistent with the proper functioning of the part, including its appearance and accepted manufacturing practices.

**INTENDED USE**

These bolts and nuts are used in numerous guardrail and median barrier designs.