# Frames and Covers

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### FC 600 Handhole Covers

#### Scope FC 600.1 Replacement Handhole Covers

#### Table FC 600–1: Concrete — Cover

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<td>HC-1&lt;sup&gt;c&lt;/sup&gt;</td>
<td>10’-6” x 17”</td>
<td>Brooks Products&lt;sup&gt;a&lt;/sup&gt;</td>
<td>36PBCC238</td>
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<td>HC-2</td>
<td>13” x 24”</td>
<td>Christy Concrete Products&lt;sup&gt;b&lt;/sup&gt;</td>
<td>38PBCC238</td>
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<td>HC-3</td>
<td>17” x 30”</td>
<td>J&amp;R Concrete Products</td>
<td>66PBCC238</td>
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<sup>a</sup> Brooks Products (formerly Carson-Brooks)
<sup>b</sup> Old Castle Enclosure Solutions is the parent company of Christy Concrete
<sup>c</sup> Limited to streetlight use

#### Table FC 600–2: Plastic (HDPE) — Cover

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<td>HC-4&lt;sup&gt;c&lt;/sup&gt;</td>
<td>10’-6” x 17”</td>
<td>New Basis&lt;sup&gt;a&lt;/sup&gt;</td>
<td>SEC1419EDEH0</td>
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<td>HC-5</td>
<td>13” x 24”</td>
<td>Carson Industries&lt;sup&gt;b&lt;/sup&gt;</td>
<td>SEC1324EDAA0</td>
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<td>17” x 30”</td>
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<td>SEC1730EDAA0</td>
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<sup>a</sup> New Basis (formerly Associated Plastics)
<sup>b</sup> Old Castle Enclosure Solutions is the parent company of Carson Industries (formerly Carson-Brooks)
<sup>c</sup> Limited to streetlight use

#### Table FC 600–3: FPR and RPM — Cover

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<th>Rating</th>
<th>Manufacturers’ Reference Numbers</th>
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<td>HC-8</td>
<td>17” x 30”</td>
<td>Parkway</td>
<td>CDR Systems&lt;sup&gt;a&lt;/sup&gt;</td>
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<td>HC-9</td>
<td>13” x 24”</td>
<td>Light Traffic</td>
<td>Quazite Corp.&lt;sup&gt;b&lt;/sup&gt;</td>
<td>A6001969-ED</td>
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<td>HC-10</td>
<td>17” x 30”</td>
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<sup>a</sup> Hubbell Power Systems is the parent company of CDR Systems.
<sup>b</sup> Hubbell Power Systems is the parent company of Quazite Corp. (formerly Power and Communication Systems Company — P&C)

**Note(s):**

1. Due to variations between manufacturers, replacement covers should be chosen to match the manufacturer of the box or previous cover.

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**Effective Date:** 10-24-2014

**What’s Changed?** Table FC 600–1, Table FC 600–2, and Table FC 600–3 SAP Numbers added. Parent company notes also added
FC 601  24" x 36" Steel Pull Box Cover — Light Traffic

Scope FC 601.1  Fabricated 24" x 36" Steel Pull Box Cover for Light Traffic Installations

Figure FC 601–1: Fabricated 24" x 36" Steel Pull Box Cover for Light Traffic Installations

Note(s):
1. Four 1/2" x 2-1/2" Penta head stainless bolts to be furnished with each cover.
2. All manufacturers' covers to be interchangeable.
3. Cover to be hot dip galvanized per ASTM A123 after fabrication.
4. Cover to be marked with model number on underside.
5. Cover frame: See FC 603.
6. All welds will be designed to meet H-20 traffic loading.

What's Changed? Note 3 was updated for clarity.
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Note(s):
1. Four 1/2" x 2-1/2" Penta head stainless bolts to be furnished with each cover.
2. Cover will be subjected to a degreasing, derusting, and etching process and then covered with one coat of Subalox #511FD primer and then one coat of Subox #5FD light gray paint. Paint of equal quality may be substituted if Company approval is obtained. The dip method is preferred. Hot dip galvanizing is an acceptable alternate to painting.
3. Cover to be marked with model number on underside.
4. Cover frame: See FC 603.
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FC 603 24" x 36" Steel Pull Box Frame

Scope FC 603.1 24" x 36" Steel Pull Box Frame for Cover FC 601 (Steel: Light-traffic) — FC 618 (RPM Parkway)

Figure FC 603–1: 24" x 36" Steel Pull Box Frame

Note(s):
1. Frame to be marked with model number.
2. Frame to be hot dipped galvanized after fabrication.
3. Frame for use with cover FC 601 (Steel: Light-Traffic) and FC 618 (RPM: Parkway).
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FC 606  30" x 48" Steel Pull Box Cover (Light Traffic) — FC 618 (RPM Parkway)

Scope FC 606.1  30" x 48" Steel Pull Box Cover (Light Traffic) — FC 618 (RPM Parkway)

Figure FC 606–1: 30" x 48" Steel Pull Box Cover (Light Traffic) — FC 618 (RPM Parkway)

Note(s):

1. Six 1/2" x 2-1/2" Penta head stainless bolts to be furnished with each cover.
2. All manufacturers' covers to be interchangeable.
3. Cover to be hot dip galvanized per ASTM A123 after fabrication.
4. Cover to be marked with model number on underside.
5. Cover frame: See FC 608.
6. All welds will be designed to meet H-20 traffic loading.
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Note(s):

1. Six 1/2" x 2-1/2" bolts head stainless bolts to be furnished with each cover.
2. Cover will be subjected to degreasing, derusting, and etching process and then covered with one coat of Subalox #511FD primer and then one coat of Subox #5FD light gray paint. Paint of equal quality may be substituted if Company approval is obtained. The dip method is preferred but galvanizing is an acceptable alternate to painting.
3. Cover to be marked with model number on underside.
4. Cover frame: See FC 608.

For Reference Only: 30" x 48" Steel Pull Box Cover — Parkway

Figure FC 607–1: 30" x 48" Steel Pull Box Cover — Parkway
FC 608 30" x 48" Steel Pull Box Frame for Covers FC 606 (Steel Light — Traffic) — FC 618 (RPM Parkway)

Scope FC 608.1 30" x 48" Steel Pull Box Frame

Figure FC 608–1: 30" x 48" Steel Pull Box Frame for Covers FC 606 (Steel Light — Traffic) — FC 618 (RPM Parkway)

Note(s):
1. Frames to be marked with model number
2. Frames to be hot dipped galvanized after fabrication

What's Changed?

Approved by: [Signature]
Effective Date: 05-16-2005

FC 608

Underground Structures Standards

30" x 48" Steel Pull Box Frame for Covers FC 606 (Steel Light — Traffic) — FC 618 (RPM Parkway)
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FC 612  36" x 60" Steel Pull Box Cover — Light Traffic (Two Piece)

Scope FC 612.1  Fabricated 36" x 60" Steel Pull Box Cover for Light Traffic Installations (Two Piece)

Figure FC 612–1: Fabricated 36" x 60" Steel Pull Box Cover for Light Traffic Installations (Two Piece)

Note(s):
1. Eight 1/2" x 2-1/2" Penta head stainless bolts to be furnished with each cover.
2. All manufacturers' covers to be interchangeable.
3. Cover to be hot dip galvanized per ASTM A123.
4. Cover to be marked with model number on underside.
5. Cover frame: See FC 614.
6. All welds will be designed to meet H-20 traffic loading.
FC 613  36" x 60" Steel Pull Box Cover — Parkway (Two Piece)

Scope FC 613.1  36" x 60" Steel Pull Box Cover — Parkway (Two Piece)

Figure FC 613–1: 36" x 60" Steel Pull Box Cover — Parkway (Two Piece)

Note(s):
1. Four 1/2" x 2-1/2" Penta head stainless bolts to be furnished with each cover.
2. All manufacturers' covers to be interchangeable. (Fit either side).

Effective Date: 05-16-2005

What's Changed?

For Reference Only
3. Cover will be subjected to a degreasing, derusting, and etching process and then covered with one coat of Subalox #511FD primer and then with one coat of Subalox #4 medium gray heavy duty paint. Paint of equal quality may be substituted if Company approval is obtained. The dip method is preferred. Hot dip galvanizing is an acceptable option to painting.
4. Covers to be marked with model numbers on underside.
5. Cover frame: See FC 614
Scope FC 614.1 36" x 60" Steel Pull Box Frame

Figure FC 614–1: 36" x 60" Steel Pull Box Frame for Covers UGS 612 (Steel Light — Traffic) — FC 618 (RPM Parkway)

Note(s):
1. Frames to be marked with model number
2. "I" beam guide blocks are 1/2" x 1/2" x 1-3/4" long. Guide blocks are to be used on frames furnished with light-traffic type covers or with RPM covers.
3. Frames to be hot dipped galvanized after fabrication.
4. Frames to be used with RPM covers must have a removable cross beam for center support.
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FC 615  36" x 60" Lift Assist Steel Pull Box Cover - Full Traffic

Scope FC 615.1  36" x 60" Lift Assist Steel Pull Box Cover - Full Traffic

Figure FC 615–1: 36" x 60" Lift Assist Steel Pull Box Cover - Full Traffic

Note(s):
1. Cover Notes:
   a. Covers to be used with frame, clearance between cover and frame shall be 3/16" all around.
   b. Four (4) 1/2-13 NC x 1-1/2" Penta Head stainless steel bolts per cover.
   c. Steel cover plate shall be ASTM A-36 manufactured with 1/4" thick plate.
   d. Cover is to be hot-dip galvanized after fabrication.
   e. All manufacturer's cover to be interchangeable.
2. Frame Notes
   a. Steel frames shall be ASTM A-36.
   b. Frames shall be hot-dip galvanized after fabrication.
3. Design Criteria
   a. All frames and shapes shall be ASTM A-36.
   b. HS-20 load condition per AASHTO and ASTM C857.
   c. Load impact: 30% minimum.
   d. AWS ER70-6 CO gas shielding wire.

Approved by: [Signature]

Effective Date: 01-29-2021

What's Changed? 36" X 60" Lift Assist Steel Pullbox cover updates
Figure FC 615–1: 48" x 78" Lift Assist Steel Pull Box Cover - Full Traffic

Note(s):

1. Cover Notes:
   a. Covers to be used with frame, clearance between cover and frame shall be 3/16" all around.
   b. Four (4) 1/2-13 NC x 1-1/2" Penta Head stainless steel bolts per cover.
   c. Steel cover plate shall be ASTM A-36 manufactured with 1/4" thick plate.
   d. Cover is to be hot-dip galvanized after fabrication.
   e. All manufacturer's cover to be interchangeable.

2. Frame Notes:
   a. Steel frames shall be ASTM A-36.
   b. Frames shall be hot-dip galvanized after fabrication.

3. Design Criteria:
   a. All frames and shapes shall be ASTM A-36.
   b. HS-20 load condition per AASHTO and ASTM C857.
   c. ASTM C 1802-18b, Load Level 6.
   d. Load impact: 30% minimum.
   e. AWS ER70-6 CO gas shielding wire.
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FC 618  Polymer Concrete (RPM) Pull Box Covers — Parkway

Scope FC 618.1  Polymer Concrete (RPM) Pull Box Covers — Parkway

Figure FC 618–1: Polymer Concrete (RPM) Pull Box Cover

- 1/2" (MIN) letters molded-in
- Bolt Down Slot See Note 1.
- Lifting-eye slot on each end. (Blind Hole)
- See Note 3.

Bolt-Down Slot

Lifting-Eye Slot

What's Changed?

Polymer Concrete (RPM) Pull Box Covers — Parkway

Effective Date: 04-24-2020

RR

Approved by:

SCE Public

UGS
Table FC 618–1: Polymer Concrete (RPM) Pull Box Cover Data

<table>
<thead>
<tr>
<th>Size</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>MAX Wt. Lb</th>
<th>Cover Bolts</th>
</tr>
</thead>
<tbody>
<tr>
<td>2’ x 3’</td>
<td>39-1/2”</td>
<td>27-1/2”</td>
<td>5”</td>
<td>75</td>
<td>4</td>
</tr>
<tr>
<td>2-1/2’ x 4’</td>
<td>51-1/2”</td>
<td>33-1/2”</td>
<td>5”</td>
<td>80</td>
<td>6</td>
</tr>
<tr>
<td>3’ x 5&quot;a/</td>
<td>63-9/16”</td>
<td>39-1/2”</td>
<td>5”</td>
<td>75</td>
<td>2 EA (4 Total)</td>
</tr>
</tbody>
</table>

a/ 3’ x 5" cover is supplied in 2 pieces (31-3/4" x 39-1/2" ea.)

Lifting-eye slot should be in narrow end — 2 required in each piece. Covers to be designed to fit on removable cross beam in center. See FC 614. Quazite uses tongue and groove covers so their box does not need the center support beam.

Note(s):
1. Bolt down slots to be located the same as on parkway steel covers.
2. 1/2” x 2-1/2” SS penta head bolts with captive steel washers to be furnished with each cover.
3. All covers will be 1-3/4” thick at ends and sides for a minimum of 2” back from the outer cover perimeter.
4. Manufacturers’ covers are to be interchangeable, except Quazite.
5. Approved Manufactures:
   a. Armorcast Products Co.
   b. Jensen Precast
   c. Quazite
   d. Oldcastle Infrastructure

What's Changed? The approved manufacturer information has been updated. Utility Vault Co. replaced with Oldcastle Infrastructure.
# Pull Box Cover and Frame: Manufacturers’ and SAP Numbers

## Table FC 619–1: Pull Box — RPM Covers (Parkway)

<table>
<thead>
<tr>
<th>Item Number</th>
<th>Nominal Size (Inside)</th>
<th>Manufacturers’ Reference Numbers</th>
<th>SAP</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Oldcastle Infrastructure</td>
<td>Jensen Precast<strong>a</strong></td>
</tr>
<tr>
<td>PC-1</td>
<td>2’ x 3’</td>
<td>23 Cover RPM</td>
<td>12-20-10</td>
</tr>
<tr>
<td>PC-2</td>
<td>2’-6” x 4’</td>
<td>264 Cover RPM</td>
<td>12-20-23</td>
</tr>
<tr>
<td>PC-3</td>
<td>3’ x 5’</td>
<td>35 Cover RPM</td>
<td>12-20-42</td>
</tr>
</tbody>
</table>

**a** Jensen Precast (formerly Brooks Products)

**b** Hubbell Power Systems is the parent company of Quazite Corp. (formerly Power and Communication Systems Company P&C)

## Table FC 619–2: Pull Box — Steel and Cast Iron Covers (Light Traffic and Full Traffic)

<table>
<thead>
<tr>
<th>Item Number</th>
<th>Nominal Size (Inside)</th>
<th>Rating<strong>a</strong></th>
<th>Manufacturers’ Reference Numbers</th>
<th>SAP</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Oldcastle Infrastructure</td>
<td>Jensen Precast<strong>b</strong></td>
</tr>
<tr>
<td>PC-4</td>
<td>2’ x 3’</td>
<td>(LT)</td>
<td>23 Cover Steel</td>
<td>SC2436-TRG</td>
</tr>
<tr>
<td>PC-5</td>
<td>2’-6” x 4’</td>
<td>(LT)</td>
<td>264 Cover Steel</td>
<td>SC3048-TRG</td>
</tr>
<tr>
<td>PC-6</td>
<td>2’-6” x 4’</td>
<td>(FT)</td>
<td>264 Cover Cast</td>
<td>08-10-20, 08-10-21</td>
</tr>
<tr>
<td>PC-7</td>
<td>3’ x 5’</td>
<td>(LT)</td>
<td>35 Cover Steel</td>
<td>SC3660-TRG</td>
</tr>
</tbody>
</table>

**a** (LT) — Light Traffic, (FT) — Full Traffic

**b** Jensen Precast (formerly Brooks Products)

## Table FC 619–3: Replacement Pull Box Cover Frame — 6” Precast Concrete with Steel Frame

<table>
<thead>
<tr>
<th>Item Number</th>
<th>Pull Box Size</th>
<th>Manufacturers’ Reference Numbers</th>
<th>SAP</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Oldcastle Infrastructure</td>
<td>Jensen Precast<strong>a</strong></td>
</tr>
<tr>
<td>PC-8</td>
<td>2’ x 3’</td>
<td>23-06TX</td>
<td>PB2436-T6E</td>
</tr>
<tr>
<td>PC-9</td>
<td>2’-6” x 4’</td>
<td>264-06TX</td>
<td>PB3048-T6E</td>
</tr>
<tr>
<td>PC-10</td>
<td>3’ x 5’</td>
<td>35-06TX</td>
<td>PB3660-T6E</td>
</tr>
</tbody>
</table>

**a** Jensen Precast (formerly Brooks Products)

---

**What’s Changed?** The approved manufacturer information has been updated. Utility Vault Co. replaced with Oldcastle Infrastructure. Utility Vault Co. parent company note removed.

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Approved by: [Signature]

Effective Date: 04-24-2020
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FC 620  27" and 30" Round Manhole Cover and Ring

Scope FC 620.1  27" and 30" Round Manhole Cover and Ring

Figure FC 620–1: 27" and 30" Round Manhole Cover and Ring

1" DIA "Pick Hole" for Lifting

Typical All Bolts

28-3/4" DIA Bolt Circle

31-1/2" DIA

1" x 4" Smooth Surface

Index Marks — Ring and Cover

Section B-B

Drill and Tap

1/8" Clearance

1/2 - 13 NC x 4" Mach. Bolt 4 Req'd.

1/4" x 11/32" Gasket Groove 30-3/8" CC - With 3/8" DIA Neoprene Gasket (Edison SAP 10117695)

Section A-A


1" 1/2" 1" 1" 1/8" 1/2" 7/16" 11/16" DIA

Gasket

What's Changed?

Effective Date: 05-16-2005

Approved by: 

27" and 30" Round Manhole Cover and Ring

FOR REFERENCE ONLY

SEE FC 621
Note(s):
1. Standard manhole cover/frame size is 30”.
2. 27” cast-iron manhole covers are only available for replacement purposes.
3. All cast-iron manhole covers shall have ribs.
4. Covers will be furnished with: stainless steel bolts, gasket, and pick hole plug. All items will be Edison approved. O-Ring gasket will be 3/8” diameter rubber material conforming to the material and physical requirements of ASTM C443 standard gaskets. Pick hole plugs (R&D Co. #PHP002) are available from Wesco, Santa Fe Springs, CA.

What’s Changed? Note 3 changed to reflect that all manhole covers shall be ribbed.
# Table FC 621-1: Cast Iron Manhole Covers

<table>
<thead>
<tr>
<th>Manhole Cover Size</th>
<th>Dimensions — Inches</th>
<th>Cover Weights</th>
<th>Hern Iron Works Catalog No.</th>
<th>Neenah Foundry Co.</th>
<th>D&amp;L Foundry Inc.</th>
</tr>
</thead>
<tbody>
<tr>
<td>27&quot;</td>
<td>31-1/8 31-1/8 33 37-1/2 28-5/16 29-7/8</td>
<td>205 lb</td>
<td>A-1105-MOD</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>30&quot;</td>
<td>34-1/8 30-1/8 36 40-1/2 31-5/16 32-7/8</td>
<td>290 lb</td>
<td>A-1106-MOD</td>
<td>2777 R-1581</td>
<td>A-1108</td>
</tr>
</tbody>
</table>

= For Reference Only
Scope FC 622.1 30" Round Polymer Concrete Manhole Cover and Cast Iron Frame — Parkway Loading

Figure FC 622–1: 30" Round Polymer Concrete Manhole Cover and Cast Iron Frame — Parkway Loading

Note(s):
1. Standard manhole cover/frame size is 30".
2. 27" polymer concrete manhole covers are only available for replacement purposes.
3. Covers will be furnished with stainless steel bolts with captive washers and “T” style gasket. All items will be Edison approved. Stainless steel bolts with captive washers are available from Inwesco Co., Azusa, CA (Cat. #85A84). “T” style gasket (R&D Co. #TG101) is available from Maydwell & Hartzell Co., Los Angeles, CA.
4. Covers will be medium gray in color, similar to natural concrete.
5. Stainless steel reinforcing plates are to be embedded into cover at each bolt down location.
6. Area around perimeter on bottom side of cover will be smooth, flat, and free of any pockets or imperfections.
<table>
<thead>
<tr>
<th>Manhole Cover Size</th>
<th>Dimensions — Inches</th>
<th>Cover Weights</th>
<th>Armorcast</th>
</tr>
</thead>
<tbody>
<tr>
<td>27&quot;</td>
<td>31-1/8 27-1/8 33 37-1/2 28-5/16 29-7/8</td>
<td>60 lb</td>
<td>6001951</td>
</tr>
<tr>
<td>30&quot;</td>
<td>34-1/8 30-1/8 36 40-1/2 31-5/16 32-7/8</td>
<td>70 lb</td>
<td>6001674</td>
</tr>
</tbody>
</table>

= For Reference Only
FC 623  30" Round Composite Manhole Cover and Cast Iron Frame — HS 20 Loading

Scope FC 623.1  30" Round Composite Manhole Cover and Cast Iron Frame — HS 20 Loading

Figure FC 623–1: 30" Round Composite Manhole Cover and Cast Iron Frame — HS 20 Loading

Note(s):
1. Standard manhole cover/frame size is 30 inches.
2. Covers will be black color, similar to asphalt.
3. Covers may be used in parkways (Non-Traffic) for the following structures: SS 541, SS 564, SS 587, SS 590. (SAP 10205271)
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Concrete-Filled Manhole Cover

Scope FC 625.1 Concrete-Filled Manhole Cover

Figure FC 625–1: Concrete-Filled Manhole Cover (Parkway Use Only)

1. Cover designed for Alhambra Foundry frame No. A-1105 or equal.
2. Concrete may be poured on job-site or cover may be purchased pre-poured. If poured on job-site, the cover must be in place at time of pouring and index marks (notches) cut in the cover edge and outside frame.
3. 28-day concrete compressive strength to equal 3000 psi.
4. Total weight = 185 lb.
5. Parking use only.

The word "EDISON" shall be imprinted in block letters in the center of the covers. Brass letters may be substituted for covers poured on the job-site.

Concrete Surface to be broom finished or matched to the surrounding pavement.

Steel Pan and Ring, Galv. After Fabrication

11/16" Drill for 5/8-11 NC x 1-1/2" SS Cap Screw (4 Places)

EDISON

Bolt Down Detail (4 Req'd)

Grind

7/8"

2"

1-1/2"

1/16" DIA

2-3/4"

26" DIA

28-3/4" B.C.

31-1/8" DIA

1/4"

Section A-A

FOR REFERENCE ONLY

What’s Changed?
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**FC 627**

30" Round Swiveloc Manhole Cover and Frames – Ductile Iron — HS-20 Loading

**Scope FC 627.1**

30" Round Swiveloc Manhole Cover – Ductile Iron — HS-20 Loading

Figure FC 627–1: 30" Round Swiveloc Manhole Cover – Ductile Iron — HS-20 Loading

Table FC 627–1: Swiveloc Cover- Ductile Iron (Traffic)

<table>
<thead>
<tr>
<th>Manufacturer</th>
<th>Part Number</th>
<th>SAP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Neenah Foundry</td>
<td>0150T102</td>
<td>10209895</td>
</tr>
</tbody>
</table>

**Effective Date:** 04-24-2020

**What’s Changed?** Updated Figure FC 627-1 with non-skid surface call out.
**Scope FC 627.2**  
**Manhole Frames - Gray Iron — HS-20 Loading**

**Figure FC 627–2: Manhole Frames - Gray Iron— HS-20 Loading**

**Table FC 627–2: Manhole Frames – Gray Iron — HS-20 Loading**

<table>
<thead>
<tr>
<th>Manhole Frames</th>
<th>Manufacturer</th>
<th>Part Number</th>
<th>SAP</th>
</tr>
</thead>
<tbody>
<tr>
<td>8&quot;</td>
<td>Neenah Foundry</td>
<td>NF-0150T132F</td>
<td>10209493</td>
</tr>
<tr>
<td>2&quot;</td>
<td>Neenah Foundry</td>
<td>NF-158T109</td>
<td>10209896</td>
</tr>
</tbody>
</table>
Scope FC 627.3  Vault Frame – Ductile Iron — HS-20 Loading

Figure FC 627–3: Vault Frame – Ductile Loading — HS-20 Loading

Note(s):
1. This frame is for the 4’ x 5’ vault cover only. See FC 661.
Figure FC 627–4: Manhole and Vault Frame - Details — HS-20 Loading

Note(s):
1. Covers shall be furnished with: Penta head security bolt and washer, gasket, and pick hole plug. All items shall be Edison approved. O-Ring gasket shall be 1/4" diameter rubber material conforming to the material and physical requirements of ASTM C443 standard gaskets. Pick hole plugs (SAP 10117694) are available from Wesco, Santa Fe Springs, CA.
2. Manhole and vault frames are compatible with manhole cover FC 621.
Frame and Cover (Fabricated) for 3' x 3' x 3' Residential Vault

Figure FC 630–1: Frame and Cover (Fabricated) for 3' x 3' x 3' Residential Vault

Figure FC 630–1: Plan and Section A-A

- Weld hinges to pads and hood.
- 17-1/2" 17-1/2"
- 35"
- 19-1/2" 19-1/2"
- 39"
- 39"
- 39"
- 19-1/2" 19-1/2"
- 17-1/2" 17-1/2"
- 19-1/2" 19-1/2"
- 17-1/2" 17-1/2"
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- 1/2"
- 1/2"
- 1/2"
Fabrication Instructions

Fabricate Frame and Cover by Continuous Welds

Weld tight and grind off roughness.

Attach hinges here. (Weld)

1-1/2" I.D. Stl 1/2 Ring for Check Line (2 Req'd)

1" 1-1/2"

42" Rad. 21-1-4"

4" 4"

Ventilation Louvres

2-1/2"

2"

6"

1"

Fabricate from 12 GA. hot rolled steel.

Half Ring — 2 Req’d. (R. and L. Hand)

Handle 3/8" DIA Mild Steel

Finish: 2 coats of "farbertite" on all parts: applied as recommended by the manufacturer.

Hood Cover — End View

Figure FC 630–1.2: Hood Cover — End View and Front View Cut-Away
Figure FC 631–1: Frame and Cover (Fabricated) for 3’ x 4’-1/2” x 3’ Residential Vault

Frame and Cover (Fabricated) for 3’ x 4’-1/2” x 3’ Residential Vault

Scope FC 631.1 Frame and Cover (Fabricated) for 3’ x 4’-1/2” x 3’ Residential Vault

What’s Changed?
Figure FC 631–1.2: Hood Cover — End View and Front View Cut-Away

Hood Cover — End View

Finish: 2 coats of farberlite on all parts: applied as recommended by the manufacturer.

Front View Cut-Away

Fabricate from 12 Ga. Hot Rolled Steel

3/8" DIA Mild Stl Handle

Half Ring
2 Req’d — One Each End

Attach hinges here. (Weld)

Weld tight and grind off roughness.

Rad. 21-1/4"

Ventilation Louvres

1-1/2" I.D. Stl 1/2 Ring for Check Line 2 Req’d.

2 Req’d — One Each End

1" 1/2" 42"

2-1/2" 6" 1"

42"

18" 2"

3/8" DIA Mild Stl Handle

For Reference Only
FC 632  Frame and Cover (Fabricated) for 3' x 6' x 3' Residential Vault

Scope FC 632.1  Frame and Cover (Fabricated) for 3' x 6' x 3' Residential Vault

Figure FC 632–1: Frame and Cover (Fabricated) for 3' x 6' x 3' Residential Vault

Fabrication Instructions
Fabricate Frame And Cover by Continuous Welds

Section A-A

Drill frame and tap thru to accommodate cover — 6 Holes Req'd.

Section B-B

Drill 1/4" Hole — One Each Strap

Hood Position

Wall

2" x 2" 1/4" L Iron Barrier & Transformer Hanger Support

Frame: 2" x 2" x 1/4" L — Mitered Corners

Hood Position

Barrier

Weld

3" x 5" x 1/4" Pad for Hasp Staple

Figure FC 632–1.1: Plan, Elevation, Section A-A, and Section B-B
Weld tight and grind off roughness.

Rad. 21-1/4"

Attach hinges here. (Weld)

1-1/2" I.D. St'l 1/2
Ring for Check Line
2 - Req'd

1" 1" 1" 1"

42"

Ventilation Louvres

Handle 3/8" DIA Mild St'l

Half Ring — 2 Req'd
(R. and L. Hand)

Fabricate from 12 Ga. Hot Rolled Steel

Finish: 2 coats of “farbertite” on all parts: applied as recommended by the manufacturer.

Figure FC 632–1.2: Hood Cover — End View and Front View Cut-Away

Hood Cover — End View

FOR REFERENCE ONLY
FC 640 48" Square Precast Concrete (Traffic-Type) Vault Cover

Scope FC 640.1 48" Square Precast Concrete (Traffic-Type) Vault Cover

Figure FC 640–1: Typical Center Line Section

Note(s):
1. See FC 620.
Table FC 640–1: Bill of Materials — 48" Square Precast Concrete (Traffic-Type) Vault Cover

<table>
<thead>
<tr>
<th>Concrete</th>
<th>Reinf.</th>
<th>113.4 Lb</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.30 Cu. Yd. Concrete 3750 PSI</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mark</th>
<th>No.</th>
<th>Lgth.</th>
<th>Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>BC1</td>
<td>16</td>
<td>4'-2&quot;</td>
<td>5</td>
</tr>
<tr>
<td>BC2</td>
<td>4</td>
<td>3'-0&quot;</td>
<td>4</td>
</tr>
<tr>
<td>TC1</td>
<td>8</td>
<td>4'-2&quot;</td>
<td>4</td>
</tr>
<tr>
<td>TC2</td>
<td>4</td>
<td>3'-0&quot;</td>
<td>4</td>
</tr>
<tr>
<td>TC3</td>
<td>16</td>
<td>0'-6&quot;</td>
<td>3</td>
</tr>
</tbody>
</table>

1/2" x 12" machine bolt (13 threads per inch). Bend 90° at 9" below bolt head. 4 Req'd.
1" x 1" x 1/8" Angle x 54" Long 4 Req'd.
1/4" x Plate x 3/4" x 6" Long — Key 1 Req'd.
FC 641 48" x 60" Precast Concrete Vault Cover (Traffic-Type)

Scope FC 641.1 48" x 60" Precast Concrete Vault Cover (Traffic-Type)

Figure FC 641–1: 48" x 60" Precast Concrete Vault Cover (Traffic-Type)

Note(s):
1. 3/8" x 6" expansion felt required around perimeter of cover. Attach to neck and grease between felt and cover (see VA 470).
2. See FC 620.

FOR REFERENCE ONLY
## Table FC 641–1: Bill of Material

<table>
<thead>
<tr>
<th>Concrete</th>
<th>Rebar</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.48 Cu. Yd. (3000 PSI)</td>
<td>175 Lb</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mark</th>
<th>Shape</th>
<th>Size</th>
<th>Length</th>
<th>Pcs. Req’d.</th>
</tr>
</thead>
<tbody>
<tr>
<td>BC1</td>
<td>Perimeter</td>
<td>#6</td>
<td>20'-9&quot;</td>
<td>1</td>
</tr>
<tr>
<td>BC2</td>
<td>Straight</td>
<td>#6</td>
<td>5'-3&quot;</td>
<td>4</td>
</tr>
<tr>
<td>BC3</td>
<td>Straight</td>
<td>#6</td>
<td>1'-9&quot;</td>
<td>4</td>
</tr>
<tr>
<td>BC4</td>
<td>Straight</td>
<td>#6</td>
<td>1'-6&quot;</td>
<td>4</td>
</tr>
<tr>
<td>BC5</td>
<td>Straight</td>
<td>#6</td>
<td>1'-5&quot;</td>
<td>2</td>
</tr>
<tr>
<td>BC6</td>
<td>Straight</td>
<td>#6</td>
<td>11&quot;</td>
<td>4</td>
</tr>
<tr>
<td>BC7</td>
<td>Straight</td>
<td>#6</td>
<td>13&quot;</td>
<td>1</td>
</tr>
<tr>
<td>BC8</td>
<td>Straight</td>
<td>#6</td>
<td>18&quot;</td>
<td>4</td>
</tr>
<tr>
<td>BC9</td>
<td>Straight</td>
<td>#6</td>
<td>4'-3&quot;</td>
<td>6</td>
</tr>
<tr>
<td>BC10</td>
<td>Straight</td>
<td>#6</td>
<td>3'-2&quot;</td>
<td>8</td>
</tr>
<tr>
<td>TC1</td>
<td>Straight</td>
<td>#3</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>TC2</td>
<td>Welded Wire Mesh</td>
<td>6&quot; x 6&quot;/6# x 6#</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

1/2" Dia. x 12" machine bolt (13 th'ds. per inch). Bend 90° at 9" below bolt head — 4 req’d.
1" x 1" x 1/8" Angle x 54" Long — 2 req’d.
1" x 1" x 1/8" Angle x 66" Long — 2 req’d.
1/4“ PL x 3/4“ x 6“ Long — Key — 1 req’d.
1/2“ “Star Holzin” Inserts — 4 req’d.
Manhole Cover and Ring — Per FC 620.

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For Reference Only

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What's Changed?

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Effective Date: 05-16-2005

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Approved by: [Signature]
FC 642  5" x 8" Two Piece — Vault Cover (Traffic-Type)

Scope FC 642.1  5" x 8" Two Piece — Vault Cover (Traffic-Type)

Figure FC 642–1: 5" x 8" Two Piece — Vault Cover (Traffic-Type)

Note(s):
1. Concrete: 3000 PSI — See GI 020
2. All reinforcing steel to have minimum of 1-1/2" concrete cover.
3. Reinforcing steel to be as follows:

Table FC 642–1: Reinforcing Steel Data for 5" x 8" Two Piece — Vault Cover

<table>
<thead>
<tr>
<th>Mark</th>
<th>Pcs. Req'd</th>
<th>Size</th>
<th>Length</th>
<th>Shape</th>
</tr>
</thead>
<tbody>
<tr>
<td>BC1</td>
<td>9</td>
<td>#5</td>
<td>44&quot;</td>
<td>Straight</td>
</tr>
<tr>
<td>BC2</td>
<td>6</td>
<td>#5</td>
<td>62-1/2&quot;</td>
<td>Straight</td>
</tr>
<tr>
<td>TC1</td>
<td>18</td>
<td>#3</td>
<td>12&quot;</td>
<td>Straight</td>
</tr>
</tbody>
</table>

4. One key only required. Corner key is preferred installation.
5. See FC 641.
6. See VA 470.
Figure FC 643–1: 6' x 8' Two Piece — Vault Cover — H-20 Loading

1/2" DIA Kohler Inserts at 17" O.C. in Bottom of Casting 3" Clear of M.H. Openings — 4 Places

1" Lift Hole Cast in (4 Req'd)

Non-Skid Checker Plate Imprinted on Concrete Surface

Alhambra Foundry
See Note 4. Cover and Frame

FOR REFERENCE ONLY

What's Changed?
Table FC 643–1: Bill of Materials — 6' x 8' Two Piece — Vault Cover — H-20 Loading

<table>
<thead>
<tr>
<th>Mark</th>
<th>B1</th>
<th>B2</th>
<th>B3</th>
<th>B4</th>
<th>B5</th>
<th>B6</th>
<th>B7</th>
<th>B8</th>
<th>B9</th>
<th>B10</th>
<th>B11</th>
<th>B12</th>
<th>T1</th>
<th>T2</th>
<th>T3</th>
<th>T4</th>
<th>C1</th>
<th>C2</th>
<th>C3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size</td>
<td>#5</td>
<td>#4</td>
<td>#5</td>
<td>#5</td>
<td>#5</td>
<td>#6</td>
<td>#6</td>
<td>#6</td>
<td>#6</td>
<td>#4</td>
<td>#4</td>
<td>#4</td>
<td>#5</td>
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<td>#4</td>
<td>#5</td>
<td>#4</td>
<td>#4</td>
<td>#5</td>
</tr>
<tr>
<td>Length</td>
<td>75&quot;</td>
<td>40&quot;</td>
<td>30&quot;</td>
<td>25&quot;</td>
<td>23&quot;</td>
<td>61&quot;</td>
<td>61&quot;</td>
<td>23&quot;</td>
<td>17&quot;</td>
<td>14&quot;</td>
<td>32&quot;</td>
<td>30&quot;</td>
<td>51&quot;</td>
<td>60&quot;</td>
<td>40&quot;</td>
<td>60&quot;</td>
<td>75&quot;</td>
<td>75&quot;</td>
<td>58&quot;</td>
</tr>
<tr>
<td>Pieces Req'd</td>
<td>4</td>
<td>4</td>
<td>2</td>
<td>2</td>
<td>8</td>
<td>4</td>
<td>4</td>
<td>6</td>
<td>2</td>
<td>8</td>
<td>4</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>4</td>
<td>11</td>
<td></td>
</tr>
</tbody>
</table>

Note(s):
1. All concrete to be 3000 PSI (GI 020).
2. Checker plate finish imprinted in concrete surface (non-skid) or S.C.E. approved alternate.
3. 3/8" thick by 8" expansion felt around perimeter and between covers. Attach to neck and grease between felt and covers (see VA 470).
FC 644  5'-6" x 8'-0" Vault Frame — Traffic

Scope FC 644.1  5'-6" x 8'-0" Vault Frame — Traffic

Figure FC 644–1:  5'-6" x 8'-0" Vault Frame — Traffic

Note(s):
1. For placement for steel see FC 650.
2. For installation of manhole coating in this cover see FC 655.
Table FC 644–1: List of Materials — 5'-6" x 8'-0" Vault Frame — Traffic

<table>
<thead>
<tr>
<th>Item</th>
<th>Quan.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2 Ea.</td>
<td>3/16&quot; Sheet Steel Bent to Shape 74&quot; Long.</td>
</tr>
<tr>
<td>2</td>
<td>2 Ea.</td>
<td>3/16&quot; Sheet Steel Bent to Shape 96&quot; Long — Welded to Item No. 1.</td>
</tr>
<tr>
<td>3</td>
<td>4 Ea.</td>
<td>3/16&quot; Sheet Steel — Cut to Shape and Tack Welded in Corner Gaps.</td>
</tr>
<tr>
<td>4</td>
<td>24 Ea.</td>
<td>#3 Rebar x 17&quot; Bent to Shape and Welded to Frame — Space 12&quot; from center line.</td>
</tr>
</tbody>
</table>

Inner Frames (2). To be Primed and Painted after Welding

<table>
<thead>
<tr>
<th>Item</th>
<th>Quan.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>4 Ea.</td>
<td>3/16&quot; Sheet Steel Bent to Shape 51-1/2&quot; Long.</td>
</tr>
<tr>
<td>6</td>
<td>4 Ea.</td>
<td>3/16&quot; Sheet Steel Bent to Shape and Ends Coped Out to Fit Item No. 5. 73&quot; Long. Weld to Item No. 5.</td>
</tr>
<tr>
<td>7</td>
<td>4 Ea.</td>
<td>1&quot; Diameter x 11&quot; Galvanized Iron Pipe. (Furnish)</td>
</tr>
</tbody>
</table>

Table FC 644–2: Reinforcing Schedule — 5'-6" x 8'-0" Vault Frame — Traffic

<table>
<thead>
<tr>
<th>Mark</th>
<th>Quan.</th>
<th>Type</th>
<th>Size</th>
<th>Length Each</th>
<th>Weight in Lb.</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1</td>
<td>12</td>
<td>5/8&quot; Dia.</td>
<td>5'-1/2&quot;</td>
<td>62.90</td>
<td></td>
</tr>
<tr>
<td>B1</td>
<td>12</td>
<td>5/8&quot; Dia.</td>
<td>18' - 5-1/2&quot;</td>
<td>230.38</td>
<td></td>
</tr>
</tbody>
</table>

Note(s):
1. For method of dimensioning shapes see GI 025.
FC 650 Slab Cover Details — Pouring and Framing

Scope FC 650.1 Slab Cover Details — Pouring and Framing

Figure FC 650–1: Slab Cover Details — Pouring and Framing

Note(s):
1. Same number of steel reinforcing shapes are used in each half of cover.
2. For steel schedule see FC 644.
3. Manhole casting shown is FC 620 — a traffic type iron casting — to be installed as shown only when specified.
4. See GI 020.

Pans require:
1.29 cu. yd. of concrete
0.48 cu. yd. of paving mat’l.
1.77 total for normal installation (without M.H. casting)
FC 655  5'-6" x 8'-0" Two Piece Slab Cover with 27" Manhole Casting-Method of Installation in Existing Vault

Scope FC 655.1  5'-6" x 8'-0" Two Piece Slab Cover with 27" Manhole Casting-Method of Installation in Existing Vault

Figure FC 655–1: 5'-6" x 8'-0" Two Piece Slab Cover with 27" Manhole Casting-Method of Installation in Existing Vault

- Remove existing casing and a portion of the vault roof exposed roof steel as shown.
- Heat and bend vertical wall steel to be exposed approx. 2" above broken wall, if exist.
- Replace concrete around new slab cover to original roof thickness. If necessary, ceiling may be lowered to provide 1" clearance between steel and finished ceiling surface. Conduit, when encountered in roof, will be rerouted around opening (over wall). For vault that is necked, break out to same dimensions. Cut, heat, and bend back (180°—8" dia.) exposed roof steel. Steel to clear finished side of new opening 2 inches. For neck slab, see Note 1.
- Lower ceiling in breakout area, if necessary, to allow 1" clearance between steel and finished ceiling surface.

Figure FC 655–1.1: Air View — Typical Vault

Notes:
- Old Vault Opening
- Vertical wall steel will be exposed approx. 2" as shown.
- Not shown: Top of Outer Frame Set to Grade
- Outer Frame Inner Frame
- S1
- T1
- S1
- T1
- Pavement
- Roof
- Vault Wall
- Side View
- End View

Figure FC 655–1.2: Side View and End View
5'-6" x 8'-0" Two Piece Slab Cover with 27" Manhole Casting - Method of Installation in Existing Vault

Approved by:
UGS
SCE Public

Underground Structures Standards

Effective Date: 05-16-2005

Figure FC 655–1: Section at Center Line

Table FC 655–1: List of Material

<table>
<thead>
<tr>
<th>Quantity</th>
<th>Description</th>
<th>Mark</th>
<th>Quan.</th>
<th>Type</th>
<th>Size</th>
<th>Lgth.</th>
<th>Each</th>
<th>Wgt.</th>
<th>Lb</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 Cu. Yds.</td>
<td>2 Piece 5'-6&quot; x 8'-0&quot; Slab Cover. FC 644</td>
<td>T1</td>
<td>6</td>
<td>10</td>
<td>5/8&quot; Dia.</td>
<td>9'-0&quot;</td>
<td>93.6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 Only</td>
<td>Manhole Casting FC 620</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 Cu. Yds.</td>
<td>Concrete. See GI 020.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10 Straight</td>
<td>5/8&quot; Dia. 9'-0&quot; Slab Cover. FC 644</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6 Straight</td>
<td>5/8&quot; Dia. 7'-6&quot; Manhole Casting FC 620</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 Cu. Yds.</td>
<td>± Concrete. See GI 020.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table FC 655–2: Reinforced Steel for Vault Roof

<table>
<thead>
<tr>
<th>Mark</th>
<th>Quan.</th>
<th>Type</th>
<th>Size</th>
<th>Lgth.</th>
<th>Each Wgt.</th>
<th>Lb</th>
</tr>
</thead>
<tbody>
<tr>
<td>T1</td>
<td>10</td>
<td>Straight</td>
<td>5/8&quot; Dia.</td>
<td>9'-0&quot;</td>
<td>93.6</td>
<td></td>
</tr>
<tr>
<td>S1</td>
<td>6</td>
<td>Straight</td>
<td>5/8&quot; Dia.</td>
<td>7'-6&quot;</td>
<td>46.8</td>
<td></td>
</tr>
</tbody>
</table>

For reinf. steel in these covers, see Note 3.

27" Galv. Iron Pipe — Pour in place. 2 req'd in each half of cover for lifting purposes.

Note(s):
1. Neck slab to grade as shown in VA 446.
2. See FC 620.
3. See FC 644.

FOR REFERENCE ONLY
Scope FC 660.1  4' x 5' Precast Concrete Vault Cover (Traffic Type)

Figure FC 660–1: 4' x 5' Precast Concrete Vault Cover (Traffic Type)

Note(s):
1. Solid lines indicate top bars. Dashed lines indicate bottom bars.
For Manhole Cover and Frame.
See Note 1.
Frame shown phantom in plan.

Drop through Cleanouts
Under Cover Bolts (Typ.)

L 1" x 1" x 1/8" All Sides
Mitered Corners (Typ.)

2-1/4" Ctr.
1-1/2" Ctr.
3/16 Typ.

Section A

Figure FC 660–1.2: Section A

Each Side of Opening

3 - #5
2 - #5
4 - #5
6 - #6

#3 x 0'-6" at 12
at 45°

1-1/2" Clear
Typ.

Section C

Figure FC 660–1.3: Sections B and C

Note(s):
1. See FC 621.
Table FC 660–1: Bill of Material — Rebar Schedule

<table>
<thead>
<tr>
<th>Qty</th>
<th>Size</th>
<th>Rebar Length for 2'-3' MH Opening</th>
<th>Rebar Length for 2'-6' MH Opening</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>#5</td>
<td>4'-2&quot;</td>
<td>4'-2&quot;</td>
</tr>
<tr>
<td>4</td>
<td>#5</td>
<td>5'-2&quot;</td>
<td>5'-2&quot;</td>
</tr>
<tr>
<td>12</td>
<td>#6</td>
<td>4'-2&quot;</td>
<td>4'-2&quot;</td>
</tr>
<tr>
<td>8</td>
<td>#6</td>
<td>5'-2&quot;</td>
<td>5'-2&quot;</td>
</tr>
<tr>
<td>2</td>
<td>#5 Bent</td>
<td>1'-3-1/2&quot;</td>
<td>1'-3-1/2&quot;</td>
</tr>
<tr>
<td>4</td>
<td>#5 Bent</td>
<td>1'-5-1/2&quot;</td>
<td>1'-4&quot;</td>
</tr>
<tr>
<td>2</td>
<td>#5 Bent</td>
<td>0'-9-1/2&quot;</td>
<td>0'-8&quot;</td>
</tr>
<tr>
<td>4</td>
<td>#5 Bent</td>
<td>0'-11-1/2&quot;</td>
<td>0'-10&quot;</td>
</tr>
<tr>
<td>1</td>
<td>#6 Tie</td>
<td>8'-10-1/2&quot;</td>
<td>9'-8&quot;</td>
</tr>
<tr>
<td>4</td>
<td>#6</td>
<td>3-5&quot;</td>
<td>3-5&quot;</td>
</tr>
<tr>
<td>4</td>
<td>#6</td>
<td>4'-0&quot;</td>
<td>4'-0&quot;</td>
</tr>
<tr>
<td>22</td>
<td>#3</td>
<td>0'-6&quot;</td>
<td>0'-6&quot;</td>
</tr>
</tbody>
</table>

= For Reference Only

Note(s):
1. Concrete minimum f’c = 3,000 psi (28 days).
2. All rebar to be Grade 60.
3. Welding of reinforcing bar will conform to AWS D1.4-79.
4. Cover will conform to Specification for Precast Reinforced Concrete Vaults and Manholes. (See GI 030.)
5. Concrete cover top will have a checker plate imprint for a nonskid surface.
6. 3/8" x 0'-8" expansion felt is required around perimeter of cover. Attach to neck and grease between felt and cover.
7. Covers constructed by the same manufacturer will be interchangeable in all necking designed for the same size cover.
8. Standard manhole cover/frame size is 30". The 27" cover/frame detail is shown “For Reference Only.” Manufacturer will furnish plastic sealing cap for cast iron cover/pick hole (1).
9. Bottom of cover will have a smooth float finish.
10. Ladder rung assembly will be fabricated from A-36 steel and hot-dipped galvanized after washers have been welded and stress has been relieved.
11. Manufacturers will indicate their company name with a 2" maximum letter, molded into the cover top surface, adjacent to a corner.
12. Approximate weight and concrete volume of covers:
   a. 27" opening weight = 2,087 lb/Vol. = .52 CY
   b. 30" opening weight = 1,994 lb/Vol. = .49 CY
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FC 661  4' x 5' Precast Concrete Vault Cover (Traffic Type) and Plug Frame

Scope FC 661.1  4' x 5' Precast Concrete Vault Cover (Traffic Type) and Plug Frame

Figure FC 661–1: 4' x 5' Precast Concrete Vault Cover (Traffic Type) and Plug Frame

VAULT PLUG PLAN VIEW

SECTION VIEW A–A

<table>
<thead>
<tr>
<th></th>
<th>APPROX. WEIGHT</th>
</tr>
</thead>
<tbody>
<tr>
<td>4' X 5' PRECAST CONCRETE VAULT COVER (PLUG)</td>
<td>2,000 LB</td>
</tr>
<tr>
<td>PLUG FRAME</td>
<td>1,850 LB</td>
</tr>
</tbody>
</table>

What's Changed? Figure FC 661-1, updated reference to FC 627 Sheet 3 for Swiveloc Cover.
4' x 5' Precast Concrete Vault Cover (Traffic Type) and Plug Frame

Note(s):
1. Meets HS-20 Loading Requirements.
2. Concrete minimum f'c = 3,000 psi (28 days).
3. All rebar to be Grade 60.
4. Welding of reinforcing bar will conform to AWS D1.4-11.
5. Cover will conform to Specification for Precast Reinforced Concrete Vaults and Manholes. (See GI 030.)
6. Concrete cover top will have a diamond plate imprint for a nonskid surface.
7. 3/8" x 0'-8" expansion felt is required around perimeter of cover. Attach to neck and grease between felt and cover.
8. Covers constructed by the same manufacturer will be interchangeable in all necking designed for the same size cover.
9. Standard manhole cover/frame size is 30". The 27" cover/frame detail is shown “For Reference Only.” Manufacturer will furnish rubber sealing plug for 1" diameter pickhole (1) on Swiveloc venting cover (See FC 627).
10. Bottom of 4'x5' plug will have a smooth float finish.
11. Ladder rung assembly will be fabricated from A-36 steel and hot-dipped galvanized after washers have been welded and stress has been relieved.
12. Manufacturers will indicate their company name with a 2" maximum letter, molded into the cover top surface, adjacent to a corner.
14. 7/8" Diameter galvanized pull irons are for restraining the cover resulting from a high pressure event. Pull irons shall be designed for a minimum of 15 psi pressure. In addition, the pull irons shall allow enough clearance from surface of concrete to allow a turnbuckle or shackle to be connected shown in FC 670.
FC 670   Existing Vault and Manhole – Frame and Cover Replacement and Restraint Installation

Scope FC 670.1   Existing Vault – Type 1 Installation

Figure FC 670–1: Existing Vault – Type 1 Installation

Note(s):
1. Existing Vault Type 1 installation used only when distance from surface to ceiling of vault is 30 inches or greater.
2. See Scope FC 670.20 for General notes and Table FC 670–1 for Key notes.
3. If an event (such as an electrical fault) occurs inside the structure, Structural Engineering shall be notified within 3 days in order to determine if the covers and restraints can be reused or will require replacement.
Table FC 670–1: Key Notes – Existing Vault Type 1 Restraint Assembly Kit

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>SAP</th>
<th>Qty. Required Per Installation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Swiveloc Round Manhole Cover (UGS FC 627)</td>
<td>10209895</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>4’ x 5’ Plug and Frame (per UGS FC 661)</td>
<td>—</td>
<td>1</td>
</tr>
<tr>
<td>1</td>
<td>WT 4 X 20 – 8.5” Length Galv. (See Sheet 49 for details.)</td>
<td>10209809</td>
<td>4</td>
</tr>
<tr>
<td>2</td>
<td>1/2” Ø Galv. Chain – Grade 30 (Field cut to length)</td>
<td>10209810</td>
<td>30 ft.</td>
</tr>
<tr>
<td>3</td>
<td>5/8” Ø Galv. Shackle with 3/4” Ø Pin w/ Cotter Pin (Min 3.5-ton WLL)</td>
<td>10209811</td>
<td>8</td>
</tr>
<tr>
<td>4</td>
<td>Stainless Steel Angle L 3 X 3 X 1/4–6” Length</td>
<td>10209812</td>
<td>4</td>
</tr>
<tr>
<td>5</td>
<td>3/4” Thread Size Galv. Clevis-to-Clevis (5/8” Ø Pins w/ Cotter Pin) Turnbuckle (Min 2.6-ton WLL) with 2 hex nuts</td>
<td>10209813</td>
<td>4</td>
</tr>
<tr>
<td>6</td>
<td>5/8” Ø x 6” Length Anchor Bolt (316 Stainless Steel)</td>
<td>Hilli HIT-HY 200-R HAS-R 316 SS</td>
<td>10214883</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Manufacturer</th>
<th>Vault Restaint Kit (Type 1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jensen Precast</td>
<td>K45-VN12-R1-11</td>
</tr>
<tr>
<td>Oldcastle Precast</td>
<td>Edison Vault Restraint System 1</td>
</tr>
<tr>
<td>SAP</td>
<td>10210063</td>
</tr>
</tbody>
</table>

What's Changed? Updated bracket size and type of anchor bolt.

Effective Date: 01-29-2021
Scope FC 670.2  Existing Vault – Type 2 Installation

Figure FC 670–2: Existing Vault – Type 2 Installation

Note(s):
1. Type 2 installation used only when distance from surface to ceiling of vault is 30 inches or less.
2. See Scope FC 670.20 for General notes and Table FC 670–2 for Key notes.
3. If an event (such as an electrical fault) occurs inside the structure, Structural Engineering shall be notified within 3 days in order to determine if the covers and restraints can be reused or will require replacement.
### Table FC 670–2: Key Notes – Existing Type 2 Restraint Assembly Kit

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>SAP</th>
<th>Qty. Required Per Installation</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Swiveloc Round Manhole Cover (UGS FC 627)</td>
<td>10209895</td>
<td>1</td>
</tr>
<tr>
<td>B</td>
<td>4' x 5' Plug and Frame (per UGS FC 661)</td>
<td>—</td>
<td>1</td>
</tr>
<tr>
<td>A</td>
<td>WT 4 X 20 – 8.5” Length Galv. (See Sheet 49 for details.)</td>
<td>10209809</td>
<td>4</td>
</tr>
<tr>
<td>B</td>
<td>1/2” Ø Galv. Chain – Grade 30 (Field cut to length)</td>
<td>10209810</td>
<td>30 ft.</td>
</tr>
<tr>
<td>C</td>
<td>5/8” Ø Galv. Shackle with 3/4” Ø Pin w/ Cotter Pin (Min 3.5-ton WLL)</td>
<td>10209811</td>
<td>8</td>
</tr>
<tr>
<td>D</td>
<td>Stainless Steel Angle L 3 X 3 X 1/4–6” Length</td>
<td>10209812</td>
<td>4</td>
</tr>
<tr>
<td>E</td>
<td>3/4” Thread Size Galv. Clevis-to-Clevis (5/8” Ø Pins w/ Cotter Pin) Tummbuckle (Min 2.6-ton WLL) with 2 hex nuts</td>
<td>10209813</td>
<td>4</td>
</tr>
<tr>
<td>F</td>
<td>5/8” Ø x 6” Length (316 Stainless Steel)</td>
<td>Hilti HIT-HY200-R HAS-R 316 SS 10214883 10214884</td>
<td>8</td>
</tr>
</tbody>
</table>

**Manufacturer**

- Jensen Precast: SAP 10210063
- Oldcastle Precast: SAP 10210063
- Edison Vault Restraint System 2: SAP 10210063

**What's Changed?** Updated bracket size and type of anchor bolt.

*Effective Date: 01-29-2021*
Scope FC 670.3  Existing Vault – Type 3 Installation

Figure FC 670–3.1: Existing Vault – Type 3 Installation

Note(s):
1. See Scope FC 670.20 for General notes and Table FC 670–3 for Key notes.
2. If an event (such as an electrical fault) occurs inside the structure, Structural Engineering shall be notified within 3 days in order to determine if the covers and restraints can be reused or will require replacement.
3. After hardware installation, fill and level gaps around bolt with Sika Concrete Sealer.
4. When removing cover plug, do not damage bolts.
Figure FC 670–3.2 Existing Vault - Type 3 Installation: Restraint Connection to Ceiling Installation Details

Note(s):
1. See Scope FC 670.20 for General Notes and Table FC 670–3 for Key Notes.
2. If an event (such as electrical fault) occurs inside the structure, Structural Engineering shall be notified within 3 days in order to determine if the cover(s) and restraints can be reused or will require replacement.
3. After hardware installation, fill and level gaps around bolt with Sikaflex.
4. When removing cover plug, do not damage bolts.
### Table FC 670–3: Key Notes – Existing Vault Type 3 Restraint Assembly Kit

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
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<th>Qty. Required Per Installation</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>WT 4 X 20 – 8.5&quot; Length Galv. (See Sheet 49 for details.)</td>
<td>10209809</td>
<td>10</td>
</tr>
<tr>
<td>B</td>
<td>1/2&quot; Ø Galv. Chain – Grade 30 (Field cut to length)</td>
<td>10209810</td>
<td>80 ft.</td>
</tr>
<tr>
<td>C</td>
<td>5/8&quot; Ø Galv. Shackle with 3/4&quot; Ø Pin w/ Cotter Pin (Min 3.5-ton WLL)</td>
<td>10209811</td>
<td>20</td>
</tr>
<tr>
<td>D</td>
<td>304 Stainless Steel Angle L 3 X 3 X 1/4 –6&quot; Length</td>
<td>10209812</td>
<td>10</td>
</tr>
<tr>
<td>E</td>
<td>3/4&quot; Thread Size Galv. Clevis-to-Clevis (5/8&quot; Ø Pins w/ Cotter Pin) Turnbuckle (Min 2.6-ton WLL) with 2 hex nuts</td>
<td>10209813</td>
<td>10</td>
</tr>
<tr>
<td>F</td>
<td>5/8&quot; Ø x 6&quot; Length (316 Stainless Steel) Hilli HIT-HY200-R HAS-R 316 SS</td>
<td>10214883 10214884</td>
<td>20</td>
</tr>
<tr>
<td>G</td>
<td>5/8&quot; Ø – 11 x 24&quot; Thread Length – Stainless Steel Hex Bolt (Field Cut)</td>
<td>10209997</td>
<td>20</td>
</tr>
<tr>
<td>H</td>
<td>5/8&quot; Flat Washer (Stainless Steel)</td>
<td>10209821</td>
<td>10</td>
</tr>
<tr>
<td>I</td>
<td>5/8&quot; – 11 Hex Nut (Stainless Steel)</td>
<td>10209822</td>
<td>20</td>
</tr>
<tr>
<td>J</td>
<td>Hairpin Cotter Pin (3/32&quot; Wire Diameter, Stainless Steel)</td>
<td>—</td>
<td>10</td>
</tr>
<tr>
<td>K</td>
<td>5/8&quot; Ø Eye Nut (Stainless Steel) McMaster # 3061T45</td>
<td>—</td>
<td>10</td>
</tr>
</tbody>
</table>

**Manufacturer**

- **Jensen Precast**: K-VN12-R3-11
- **Oldcastle Precast**: EDISON VAULT RESTRAINT SYTEM 3

**Vault Restraint Kit (Type 3)**

- SAP 10211579
Scope FC 670.4 Existing Vault – Type 4 Installation

Figure FC 670–4: Existing Vault – Type 4 Installation

Note(s):
1. See Scope FC 670.20 for General notes and Table FC 670–4 for Key notes.
2. If an event (such as an electrical fault) occurs inside the structure, Structural Engineering shall be notified within 3 days in order to determine if the covers and restraints can be reused or will require replacement.

What's Changed?
Table FC 670–4: Key Notes – Existing Vault Type 4 Restraint Assembly Kit

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>SAP</th>
<th>Qty. Required Per Installation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Swiveloc Round Manhole Cover (UGS FC 627)</td>
<td>10209895</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>61.5&quot; x 105&quot; Plug and Frame</td>
<td>—</td>
<td>1</td>
</tr>
<tr>
<td>A</td>
<td>WT 4 x 20 – 8.5&quot; Length Galv. (See Sheet 49 for details.)</td>
<td>10209809</td>
<td>10</td>
</tr>
<tr>
<td>B</td>
<td>1/2&quot; Ø Galv. Chain – Grade 30 (Field cut to length)</td>
<td>10209810</td>
<td>80 ft.</td>
</tr>
<tr>
<td>C</td>
<td>5/8&quot; Ø Galv. Shackle with 3/4&quot; Ø Pin w/ Cotter Pin</td>
<td>10209811</td>
<td>20</td>
</tr>
<tr>
<td>D</td>
<td>304 Stainless Steel Angle L 3 X 3 X 1/4–6&quot; Length</td>
<td>10209812</td>
<td>10</td>
</tr>
<tr>
<td>E</td>
<td>3/4&quot; Thread Size Galv. Clevis-to-Clevis</td>
<td>10209813</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>(5/8&quot; Ø Pins w/ Cotter Pin Turnbuckle (Min 2.6-ton WLL) with 2 hex nuts</td>
<td></td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>5/8&quot; Ø x 6&quot; Length</td>
<td>Hilti HIT-HY200-R</td>
<td>10214883</td>
</tr>
<tr>
<td></td>
<td>(316 Stainless Steel)</td>
<td>HAS-R 316 SS</td>
<td>10214884</td>
</tr>
</tbody>
</table>

Manufacturer

- **Jensen Precast**
  - SAP: 10211580
- **Oldcastle Precast**
  - SAP: 10211580

*What's Changed?* Updated bracket size and type of anchor bolt.
Scope FC 670.5  Existing Vault – Type 5 Installation

Figure FC 670–5: Existing Vault – Type 5 Installation

Note(s):
1. Existing Vault Type 5 Installation used only when distance from surface to vault ceiling is 30 inches or greater.
2. See Scope FC 670.20 for General notes and Table FC 670–5 for Key notes.
3. If an event (such as an electrical fault) occurs inside the structure, Structural Engineering shall be notified within 3 days in order to determine if the covers and restraints can be reused or will require replacement.
### Table FC 670–5: Key Notes – Existing Vault Type 5 Restraint Assembly Kit

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>SAP</th>
<th>Qty. Required Per Installation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Swiveloc Round Manhole Cover (UGS FC 627)</td>
<td>10209895</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>4’ x 5’ Plug and Frame</td>
<td>—</td>
<td>1</td>
</tr>
<tr>
<td>A</td>
<td>4’ X 20 – 8.5” Length Galv. (See Sheet 49 for details.)</td>
<td>10209809</td>
<td>4</td>
</tr>
<tr>
<td>B</td>
<td>1/2” Ø Galv. Chain – Grade 30 (Field cut to length)</td>
<td>10209810</td>
<td>30 ft.</td>
</tr>
<tr>
<td>C</td>
<td>5/8” Ø Galv. Shackle with 3/4” Ø Pin w/ Cotter Pin (Min 3.5-ton WLL)</td>
<td>10209811</td>
<td>8</td>
</tr>
<tr>
<td>D</td>
<td>304 Stainless Steel Angle L 3 X 3 X 1/4–6” Length</td>
<td>10209812</td>
<td>4</td>
</tr>
<tr>
<td>E</td>
<td>3/4” Thread Size Galv. Clevis-to-Clevis (5/8” Ø Pins w/ Cotter Pin) Turnbuckle (Min 2.6-ton WLL) with 2 hex nuts</td>
<td>10209813</td>
<td>4</td>
</tr>
<tr>
<td>F</td>
<td>5/8” Ø x 6” Length (316 Stainless Steel) Hilti HIT-HY200-R HAS-R 316 SS</td>
<td>10214883, 10214884</td>
<td>8</td>
</tr>
</tbody>
</table>

**Manufacturer**

<table>
<thead>
<tr>
<th>Manufacturer</th>
<th>Vault Restraint Kit (Type 5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jensen Precast</td>
<td>K44-VN12-R5-11</td>
</tr>
<tr>
<td>Oldcastle Precast</td>
<td>EDISON VAULT RESTRAINT SYSTEM 5</td>
</tr>
</tbody>
</table>

**What’s Changed?** Updated bracket size and type of anchor bolt.
Scope FC 670.6  Existing Vault – Type 6 Installation

Figure FC 670–6: Existing Vault – Type 6 Installation

Note(s):
1. Existing Vault Type 6 Installation used only when distance from surface to vault ceiling is 30 inches or less.
2. See Scope FC 670.20 for General notes and Table FC 670–6 for Key Notes.
3. If an event (such as an electrical fault) occurs inside the structure, Structural Engineering shall be notified within 3 days in order to determine if the covers and restraints can be reused or will require replacement.

What's Changed?

Effective Date: 01-29-2021
### Table FC 670–6: Key Notes – Existing Vault Type 6 Restraint Assembly Kit

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>SAP</th>
<th>Qty. Required Per Installation</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Swiveloc Round Manhole Cover (UGS FC 627)</td>
<td>10209895</td>
<td>1</td>
</tr>
<tr>
<td>B</td>
<td>4' x 4' Plug and Frame</td>
<td>—</td>
<td>1</td>
</tr>
<tr>
<td>C</td>
<td>WT 4 X 20 – 8.5&quot; Length Galv. (See Sheet 49 for details.)</td>
<td>10209809</td>
<td>4</td>
</tr>
<tr>
<td>D</td>
<td>1/2&quot; Ø Galv. Chain – Grade 30 (Field cut to length)</td>
<td>10209810</td>
<td>30 ft.</td>
</tr>
<tr>
<td>E</td>
<td>5/8&quot; Ø Galv. Shackle with 3/4&quot; Ø Pin w/ Cotter Pin (Min 3.5-ton WLL)</td>
<td>10209811</td>
<td>8</td>
</tr>
<tr>
<td>F</td>
<td>304 Stainless Steel Angle L 3 X 3 X 1/4–6&quot; Length</td>
<td>10209812</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>3/4&quot; Thread Size Galv. Clevis-to-Clevis (5/8&quot; Ø Pins w/ Cotter Pin) Turnbuckle (Min 2.6-ton WLL) with 2 hex nuts</td>
<td>10209813</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>5/8&quot; Ø x 6&quot; Length (316 Stainless Steel)</td>
<td>Hilti HIT-HY200-R HAS-R 316 SS</td>
<td>8</td>
</tr>
</tbody>
</table>

**Manufacturer**

<table>
<thead>
<tr>
<th>Manufacturer</th>
<th>Vault Restraint Kit (Type 6)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jensen Precast</td>
<td>K44-VN12-R5-11</td>
</tr>
<tr>
<td>Oldcastle Precast</td>
<td>EDISON VAULT RESTRAINT SYSTEM 6</td>
</tr>
<tr>
<td>SAP</td>
<td>10211581</td>
</tr>
</tbody>
</table>
Note(s):
1. Existing Vault Type 7 Installation used only when distance from surface to vault ceiling is 30" or greater.
2. See Scope FC 670.20 for General Notes and Table FC 670–7 for Key Notes.
3. If an event (such as an electrical fault) occurs inside the structure, Structural Engineering shall be notified within 3 days in order to determine if the covers and restraints can be reused or will require replacement.
Table FC 670–7: Key Notes – Existing Vault Type 7 Restraint Assembly Kit

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>SAP</th>
<th>Qty. Required Per Installation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Vault (Type 7)</td>
</tr>
<tr>
<td>A</td>
<td>Swiveloc Round Manhole Cover (UGS FC 627)</td>
<td>10209895</td>
<td>1</td>
</tr>
<tr>
<td>B</td>
<td>5' x 8' Plug and Frame</td>
<td>—</td>
<td>1</td>
</tr>
<tr>
<td>C</td>
<td>WT 4 X 20 – 8.5&quot; Length Galv. (See Sheet 49 for details.)</td>
<td>10209809</td>
<td>4</td>
</tr>
<tr>
<td>D</td>
<td>1/2&quot; Ø Galv. Chain – Grade 30 (Field cut to length)</td>
<td>10209810</td>
<td>60 ft.</td>
</tr>
<tr>
<td>E</td>
<td>5/8&quot; Ø Galv. Shackle with 3/4&quot; Ø Pin w/ Cotter Pin (Min 3.5-ton WLL)</td>
<td>10209811</td>
<td>16</td>
</tr>
<tr>
<td>F</td>
<td>Stainless Steel Angle L 3 X 3 X 1/4–6&quot; Length</td>
<td>10209812</td>
<td>8</td>
</tr>
<tr>
<td>G</td>
<td>3/4&quot; Thread Size Galv. Clevis-to-Clevis (5/8&quot; Ø Pins w/ Cotter Pin) Turnbuckle (Min 2.6-ton WLL) with 2 hex nuts</td>
<td>10209813</td>
<td>8</td>
</tr>
<tr>
<td>H</td>
<td>5/8&quot; Ø x 6&quot; Length (316 Stainless Steel)</td>
<td>Hilti HIT-HY200-R HAS-R 316 SS</td>
<td>16</td>
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Manufacturer

<table>
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<tr>
<th>Manufacturer</th>
<th>Vault Restraint Kit (Type 7)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jensen Precast</td>
<td>K58-VN12-R7-11</td>
</tr>
<tr>
<td>Oldcastle Precast</td>
<td>EDISON VAULT RESTRAINT SYSTEM 7</td>
</tr>
<tr>
<td>SAP</td>
<td>10211583</td>
</tr>
</tbody>
</table>
Scope FC 670.8  Existing Vault – Type 8 Installation

Figure FC 670–8: Existing Vault – Type 8 Installation

Note(s):
1. Existing Vault Type 8 Installation used only when distance from surface to vault ceiling is 30" or less.
2. See Scope FC 670.20 for General Notes and Table FC 670–9 (Sheet 22) for Key Notes.
3. If an event (such as an electrical fault) occurs inside the structure, Structural Engineering shall be notified within 3 days in order to determine if the covers and restraints can be reused or will require replacement.
### Table FC 670–8: Key Notes – Existing Vault Type 8 Restraint Assembly Kit

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>SAP</th>
<th>Qty. Required Per Installation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Vault</strong> (Type 8)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Swiveloc Round Manhole Cover (UGS FC 627)</td>
<td>10209895</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>5' x 8' Plug and Frame</td>
<td>—</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>WT 4 x 20 – 8.5&quot; Length Galv. (See Sheet 41 for details.)</td>
<td>10209809</td>
<td>4</td>
</tr>
<tr>
<td>4</td>
<td>1/2&quot; Ø Galv. Chain – Grade 30 (Field cut to length)</td>
<td>10209810</td>
<td>60 ft.</td>
</tr>
<tr>
<td>5</td>
<td>5/8&quot; Ø Galv. Shackle with 3/4&quot; Ø Pin w/ Cotter Pin (Min 3.5-ton WLL)</td>
<td>10209811</td>
<td>16</td>
</tr>
<tr>
<td>6</td>
<td>Stainless Steel Angle L 3 X 3 X 1/4–6&quot; Length</td>
<td>10209812</td>
<td>8</td>
</tr>
<tr>
<td>7</td>
<td>3/4&quot; Thread Size Galv. Clevis-to-Clevis (5/8&quot; Ø Pins w/ Cotter Pin) Tumbuckle (Min 2.6-ton WLL) with 2 hex nuts</td>
<td>10209813</td>
<td>8</td>
</tr>
<tr>
<td>8</td>
<td>5/8&quot; Ø x 6&quot; Length (316 Stainless Steel)</td>
<td>10214883</td>
<td>16</td>
</tr>
<tr>
<td></td>
<td>Hilti HIT-HY200-R HAS-R 316 SS</td>
<td>10214884</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Manufacturer</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Jensen Precast</td>
<td>K58-VN12-R8-11</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Oldcastle Precast</td>
<td>EDISON VAULT RESTRAINT SYSTEM 8</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>SAP</td>
<td>10211583</td>
<td></td>
</tr>
</tbody>
</table>

**What's Changed?** Updated bracket size and type of anchor bolt.
Scope FC 670.9  Existing Vault – Type 9 Installation

Figure FC 670–9.1: Existing Vault – Type 9 Installation

(38" x 38" Square Ductile Iron Retrofit Cover and Anchor Beam Assembly Details)

Note(s):
1. See Scope FC 670.20 for General Notes and Table FC 670–9 for Key Notes.
2. If an event (such as an electrical fault) occurs inside the structure, Structural Engineering shall be notified within 3 days in order to determine if the covers and restraints can be reused or will require replacement.
Figure FC 670–9.2: Existing Vault – Type 9 Installation
(42" x 42" through 53" x 53" Square Ductile Iron Retrofit Cover and Anchor Beam Assembly Details)

Note(s):
1. See Scope FC 670.20 for General Notes and Table FC 670–9 for Key Notes.
2. If an event (such as an electrical fault) occurs inside the structure, Structural Engineering shall be notified within 3 days in order to determine if the covers and restraints can be reused or will require replacement.
Figure FC 670–9.3: Existing Vault – Type 9 Installation
(Square Ductile Iron Retrofit Cover)

Note(s):
1. Dimensions range from 38” to 53-1/2” square. Existing Vault Frames shall be measured by material supplier for retrofits.
2. Weight ranges from 224 lb. to 679 lb.
3. Square Retrofit Cover will accept Edison 30” Round Cast Iron Manhole Cover (See FC 621).
4. This has been approved for system-wide use.
Figure FC 670–9.4: Existing Vault – Type 9 Installation (Retrofit Plate Anchor Beam)

Note(s):
2. This has been approved for installation in the following districts: Long Beach
3. See Scope FC 670.20 for General Notes and Table FC 670–9 for Key Notes.
4. If an event (such as an electrical fault) occurs inside the structure, Structural Engineering shall be notified within 3 days in order to determine if the covers and restraints can be reused or will require replacement.
Table FC 670–9: Key Notes – Existing Vault Type 9 Restraint Assembly Kit

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Qty. Required Per Installation</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Swiveloc Round Manhole Cover (UGS FC 627)</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>38” x 38” Square Cover, or 46” x 46” Square Cover, or 53” x 53” Square Cover</td>
<td>1</td>
</tr>
<tr>
<td>B</td>
<td>66-inch Long Anchor Beam – 49 lb/Ea.</td>
<td>2</td>
</tr>
<tr>
<td>C</td>
<td>7/8” – 9 Stainless Steel Bolt</td>
<td>2</td>
</tr>
<tr>
<td>D</td>
<td>Shaft Collar</td>
<td>2</td>
</tr>
<tr>
<td>E</td>
<td>Sleeve Washer</td>
<td>2</td>
</tr>
<tr>
<td>F</td>
<td>Belleville Disc Spring - Stainless Steel 0.88 in. I.D., 1.75 O.D., 0.057 in. Thick</td>
<td>8</td>
</tr>
<tr>
<td>G</td>
<td>Lock Washer – Stainless Steel</td>
<td>2</td>
</tr>
<tr>
<td>H</td>
<td>7/8” – 9 Stainless Steel Hex Nut</td>
<td>4</td>
</tr>
<tr>
<td>I</td>
<td>Hairpin Cotter Pin (3/32” Wire Diameter) - Stainless Steel</td>
<td>2</td>
</tr>
<tr>
<td>J</td>
<td>5/16” 18 - Stainless Steel (Shaft Collar Bolt)</td>
<td>4</td>
</tr>
<tr>
<td>K</td>
<td>1/2” Ø x 6” Lg. Stainless Steel Concrete Wedge Anchors (Install one per anchor beam as shown)</td>
<td>2</td>
</tr>
<tr>
<td>L</td>
<td>Neoprene Rubber Strip (2” x 36” x 1/2” Thick) – Field Cut to Fit</td>
<td>2</td>
</tr>
<tr>
<td>M</td>
<td>Vinyl Red Protective Cap</td>
<td>4</td>
</tr>
<tr>
<td>N</td>
<td>Adhesive</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Gasket</td>
<td>—</td>
</tr>
</tbody>
</table>

**Manufacturer**

Neenah Foundry | SAP

38” x 38” Square Cover | 10211489
38” x 38” Square Cover w/ Lip | 10211491
46” x 46” Square Cover | 10211492
46” x 46” Square Cover w/ Lip | 10211493
53” x 53” Square Cover | 10211494
53” x 53” Square Cover w/ Lip | 10211495

**What's Changed?**

Effective Date: 01-29-2021
Scope FC 670.10  Existing Vault – Type 10 Installation

Figure FC 670–10.1: Existing Vault - Type 10 Installation

Note(s):
1. See Scope FC 670.20 for General Notes and Table FC 670–10.7 for Key Notes.
2. If an event (such as an electrical fault) occurs inside the structure, Structural Engineering shall be notified within 3 days in order to determine if the covers and restraints can be reused or will require replacement.
Figure FC 670–10.2: Existing Vault – Type 10 – Cast-in-Place Plug Frame

Note(s):
1. A 1/8" tolerance shall be included in the fabrication of the steel frame.
2. Steel frame shall be ASTM A36. Edges shall be formed with a 1/4" fillet weld in accordance with AWS D1.1.
3. Steel frame including welded studs shall be hot dipped galvanized in accordance with ASTM A123.
4. Steel frame shall be installed flush with surrounding grade.
5. Concrete shall be placed with a form or barrier on all sides. The inside surfaces of forms shall be clean of dirt and foreign material. Forms shall be coated with form release agent prior to their use.
6. Bottom of excavation shall be clean of dirt and free of foreign material.
7. Reinforcing bars shall conform to ASRM A615 or A706 Grade 60.
8. Rebar shall be placed with a minimum cover of 1.5" on all sides.
9. Concrete shall be mixed, placed, consolidated and finished in accordance with the applicable ACI standards.
10. Finished surface shall receive a broom finish.
Note(s):
1. See Scope FC 670.20 for General Notes and Table FC 670–10.7 for Key Notes.
2. If an event (such as an electrical fault) occurs inside the structure, Structural Engineering shall be notified within 3 days in order to determine if the covers and restraints can be reused or will require replacement.
Figure FC 670–10.4: Existing Vault – Type 10 – Cast-in-Place Plug Frame

Note(s):
1. A 1/8" tolerance shall be included in the fabrication of the steel frame.
2. Steel frame shall be ASTM A36. Edges shall be formed with a 1/4" fillet weld in accordance with AWS D1.1.
3. Steel frame including welded studs shall be hot dipped galvanized in accordance with ASTM A123.
4. Steel frame shall be installed flush with surrounding grade.
5. Concrete shall be placed with a form or barrier on all sides. The inside surfaces of forms shall be clean of dirt and foreign material. Forms shall be coated with form release agent prior to their use.
6. Bottom of excavation shall be clean of dirt and free of foreign material.
7. Reinforcing bars shall conform to ASRM A615 or A706 Grade 60.
8. Rebar shall be placed with a minimum cover of 1.5" on all sides.
9. Concrete shall be mixed, placed, consolidated and finished in accordance with the applicable ACI standards.
10. Finished surface shall receive a broom finish.
Note(s):
1. See Scope FC 670.20 for General Notes and Table FC 670–10.8 for Key Notes.
2. If an event (such as an electrical fault) occurs inside the structure, Structural Engineering shall be notified within 3 days in order to determine if the covers and restraints can be reused or will require replacement.
Figure FC 670–10.6: Existing Vault – Type 10 – Cast-in-Place Plug Frame

Note(s):
1. A 1/8” tolerance shall be included in the fabrication of the steel frame.
2. Steel frame shall be ASTM A36. Edges shall be formed with a 1/4” fillet weld in accordance with AWS D1.1.
3. Steel frame including welded studs shall be hot dipped galvanized in accordance with ASTM A123.
4. Steel frame shall be installed flush with surrounding grade.
5. Concrete shall be placed with a form or barrier on all sides. The inside surfaces of forms shall be clean of dirt and foreign material. Forms shall be coated with form release agent prior to their use.
6. Bottom of excavation shall be clean of dirt and free of foreign material.
7. Reinforcing bars shall conform to ASRM A615 or A706 Grade 60.
8. Rebar shall be placed with a minimum cover of 1.5” on all sides.
9. Concrete shall be mixed, placed, consolidated and finished in accordance with the applicable ACI standards.
10. Finished surface shall receive a broom finish.
## Table FC 670-10.7: Key Notes – Existing Type 10 Restraint Assembly Kit

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>SAP</th>
<th>Qty. Required Per Installation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Swiveloc Round Manhole Cover (UGS FC 627)</td>
<td>10209895</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>4’ x 4’ Plug</td>
<td>—</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>4’ x 5’ Plug (per UGS FC 661)</td>
<td>—</td>
<td>1</td>
</tr>
<tr>
<td>A</td>
<td>WT 4 x 20 – 8.5” Length Galv. (See Sheet 49 for details.)</td>
<td>10209809</td>
<td>4</td>
</tr>
<tr>
<td>B</td>
<td>1/2” Ø Galv. Chain – Grade 30 (Field cut to length)</td>
<td>10209810</td>
<td>30 ft.</td>
</tr>
<tr>
<td>C</td>
<td>5/8” Ø Galv. Shackle with 3/4” Ø Pin w/ Cotter Pin (Min 3.5-ton WLL)</td>
<td>10209811</td>
<td>8</td>
</tr>
<tr>
<td>D</td>
<td>Stainless Steel Angle L 3 X 3 X 1/4–6” Length</td>
<td>10209812</td>
<td>4</td>
</tr>
<tr>
<td>E</td>
<td>3/4” Thread Size Galv. Clevis-to-Clevis (5/8” Ø Pins w/ Cotter Pin) Turnbuckle (Min 2.6-ton WLL) with 2 hex nuts</td>
<td>10209813</td>
<td>4</td>
</tr>
<tr>
<td>F</td>
<td>5/8” Ø x 6” Length (316 Stainless Steel)</td>
<td>Hilti HIT-HY200-R HAS-R 316 SS 10214883</td>
<td>8</td>
</tr>
</tbody>
</table>

### Manufacturer

- **Jensen Precast**
- **Oldcastle Precast**

### Vault Restraint Kit (Type 10)

- **EDISON VAULT RERAINT SYSTEM 10**
- **EDISON VAULT RERAINT SYSTEM 10**

---

**What's Changed?** Updated bracket size and type of anchor bolt.
<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>SAP</th>
<th>Qty. Required Per Installation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Swiveloc Round Manhole Cover (UGS FC 627)</td>
<td>10209895</td>
<td>1</td>
</tr>
<tr>
<td>A</td>
<td>5' x 8' Plug</td>
<td>—</td>
<td>1</td>
</tr>
<tr>
<td>B</td>
<td>WT 4 x 20 – 8.5” Length Galv. (See Sheet 49 for details.)</td>
<td>10209809</td>
<td>8</td>
</tr>
<tr>
<td>C</td>
<td>1/2” Ø Galv. Chain – Grade 30 (Field cut to length)</td>
<td>10209810</td>
<td>60 ft.</td>
</tr>
<tr>
<td>D</td>
<td>5/8” Ø Galv. Shackle with 3/4” Ø Pin w/ Cotter Pin (Min 3.5-ton WLL)</td>
<td>10209811</td>
<td>16</td>
</tr>
<tr>
<td>E</td>
<td>Stainless Steel Angle L 3 X 3 X 1/4–6” Length</td>
<td>10209812</td>
<td>8</td>
</tr>
<tr>
<td>F</td>
<td>3/4” Thread Size Galv. Clevis-to-Clevis (5/8” Ø Pins w/ Cotter Pin)</td>
<td>10209813</td>
<td>8</td>
</tr>
<tr>
<td>G</td>
<td>5/8” Ø x 6” Length (316 Stainless Steel)</td>
<td>Hilti HIT-HY200-R HAS-R 316 SS</td>
<td>16</td>
</tr>
</tbody>
</table>

**Manufacturer**

- **Jensen Precast**
  - EDISON VAULT RESTRAINT SYSTEM 10
- **Oldcastle Precast**
  - EDISON VAULT RESTRAINT SYSTEM 10

**SAP**

- —

**What's Changed?** Updated bracket size and type of anchor bolt.

**Effective Date:** 01-29-2021
Scope FC 670.11  Existing Vault – Type 11 Installation

What's Changed? Added new scope and figures for existing Type 11 installations.
Figure FC 670–11.2 Existing Vault – Type 11 Installation  
(Square Ductile Iron Retrofit Cover)

Note(s):
1. Dimensions range from 38" to 53-1/2" square. Existing Vault Frames shall be measured by material supplier for retrofits.
2. Weight ranges from 224 lb. to 679 lb.
3. Square Retrofit Cover will accept Edison 30" Round Cast Iron Manhole Cover (See FC 621).
4. This has been approved for system-wide use.

What's Changed? Added new scope and figures for existing Type 11 installations.

Effective Date: 01-29-2021
### Table FC 670–11: Key Notes – Existing Vault Type 11 Restraint Assembly Kit

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>SAP</th>
<th>Qty. Required Per Installation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Vault (Type 1)</td>
</tr>
<tr>
<td>A</td>
<td>Swiveloc Round Manhole Cover (UGS FC 627)</td>
<td>10209895</td>
<td>1</td>
</tr>
<tr>
<td>B</td>
<td>4’ x 5’ Plug and Frame (per UGS FC 661)</td>
<td>—</td>
<td>1</td>
</tr>
<tr>
<td>C</td>
<td>WT 4 X 20 – 8.5” Length Galv. (See Sheet 49 for details.)</td>
<td>10209809</td>
<td>4</td>
</tr>
<tr>
<td>D</td>
<td>1/2” Ø Galv. Chain – Grade 30 (Field cut to length)</td>
<td>10209810</td>
<td>30 ft.</td>
</tr>
<tr>
<td>E</td>
<td>5/8” Ø Galv. Shackle with 3/4” Ø Pin w/ Cotter Pin (Min 3.5-ton WLL)</td>
<td>10209811</td>
<td>8</td>
</tr>
<tr>
<td>F</td>
<td>Stainless Steel Angle L 3 X 3 X 1/4–6” Length</td>
<td>10209812</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>3/4” Thread Size Galv. Clevis-to-Clevis (5/8” Ø Pins w/ Cotter Pin) Turnbuckle (Min 2.6-ton WLL) with 2 hex nuts</td>
<td>10209813</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>5/8” Ø x 6” Length Anchor Bolt (316 Stainless Steel)</td>
<td>10214883</td>
<td>10214884</td>
</tr>
</tbody>
</table>

**Manufacturer**

- **Vault Restraint Kit (Type 1)**
  - Jensen Precast: K45-VN12-R1-11
  - Oldcastle Precast: Edison Vault Restraint System 1
  - SAP: 10210063

**What's Changed?** Added new scope and Key Notes for existing Type 11 installations.
Scope FC 670.12  Existing Manhole – Type 1 Installation

Figure FC 670–12: Existing Manhole – Type 1 Installation

Note(s):
1. Existing Manhole Type 1 Installation used only when distance from surface to manhole ceiling is 30 inches or greater.
2. See Scope FC 670.20 for General Notes and Table FC 670–12 for Key Notes.
3. Remove existing manhole cone and grade rings (as needed). Install 8 inch tall Neenah frame and grade ring (with inserts).
4. If an event (such as an electrical fault) occurs inside the structure, Structural Engineering shall be notified within 3 days in order to determine if the covers and restraints can be reused or will require replacement.
### Table FC 670–12: Key Notes – Existing Manhole Type 1 Restraint Assembly Kit

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>SAP</th>
<th>Qty. Required Per Installation</th>
<th>Manhole (Type 1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Swiveloc Round Manhole Cover (UGS FC 627)</td>
<td>10209895</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>8&quot; Tall Manhole Frame (Per UGS FC 627)</td>
<td>10209439</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>6&quot; Grade Ring (UGS MH 319, Table MH 319–2)</td>
<td>—</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>WT 4 x 20 – 8.5&quot; Length Galv. (See Sheet 49 for details.)</td>
<td>10209809</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>1/2&quot; Ø Galv. Chain – Grade 30 (Field cut to length)</td>
<td>10209810</td>
<td>15 ft.</td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>5/8&quot; Ø Galv. Shackle with 3/4&quot; Ø Pin w/ Cotter Pin (Min 3.5-ton WLL)</td>
<td>10209811</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>G</td>
<td>3/4&quot; Stainless Steel Angle L 3 X 3 X 1/4–6&quot; Length</td>
<td>10209812</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>H</td>
<td>3/4&quot; Thread Size Galv. Clevis-to-Clevis (5/8&quot; Ø Pins w/ Cotter Pin) Turnbuckle (Min 2.6-ton WLL) with 2 hex nuts</td>
<td>10209813</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>I</td>
<td>5/8&quot; Ø x 6&quot; Length (316 Stainless Steel)</td>
<td>Hilti HIT-HY200-R HAS-R 316 SS</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>J</td>
<td>1/2&quot; – 13 x 8&quot; Length – All Thread Rod (Grade 8 Steel)</td>
<td>10209815</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>K</td>
<td>1/2&quot; – 13 Hex Nut (Grade 8 Steel)</td>
<td>10209816</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>L</td>
<td>1/2&quot; Flat Washer (Grade 8 Steel)</td>
<td>10209817</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>Hilti HFX Hybrid Adhesive or Sikadur 31 Hi-Mod Gel</td>
<td>—</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

**Manufacturer**

- Jensen Precast: K36-MH1-11
- Oldcastle Precast: Edison Manhole Restraint System 1
- SAP: 10210064

**What’s Changed?** Updated bracket size and type of anchor bolt.
Scope FC 670.13  Existing Manhole – Type 2 Installation

Figure FC 670–13: Existing Manhole – Type 2 Installation

1. Existing Manhole Type 2 Installation used only when distance from surface to manhole ceiling is 30 inches or less.
2. See Scope FC 670.20 for General Notes and Table FC 670–13 for Key Notes.
3. If an event (such as an electrical fault) occurs inside the structure, Structural Engineering shall be notified within 3 days in order to determine if the covers and restraints can be reused or will require replacement.
Table FC 670–13: Key Notes – Existing Manhole Type 2 Restraint Assembly Kit

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>SAP</th>
<th>Qty. Required Per Installation</th>
<th>Manhole Restraint Kit (Type 2)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Manhole (Type 2)</td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>Swiveloc Round Manhole Cover (UGS FC 627)</td>
<td>10209895</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>8&quot; Tall Manhole Frame (Per UGS FC 627)</td>
<td>10209439</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>WT 4 x 20 – 8.5&quot; Length Galv. (See Sheet 49 for details.)</td>
<td>10209809</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>1/2&quot; Ø Galv. Chain – Grade 30 (Field cut to length)</td>
<td>10209810</td>
<td>15 ft.</td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>5/8&quot; Ø Galv. Shackle with 3/4&quot; Ø Pin w/ Cotter Pin (Min 3.5-ton WLL)</td>
<td>10209811</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>304 Stainless Steel Angle L 3 X 3 X 1/4–6&quot; Length</td>
<td>10209812</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>G</td>
<td>3/4&quot; Thread Size Galv. Clevis-to-Clevis (5/8&quot; Ø Pins w/ Cotter Pin) Turnbuckle (Min 2.6-ton WLL) with 2 hex nuts</td>
<td>10209813</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>H</td>
<td>5/8&quot; Ø x 6&quot; Length Hilti HIT-HY200-R HAS-R 316 SS</td>
<td>10214883</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>I</td>
<td>1/2&quot; Ø 13 x 7&quot; Length – Stainless Steel Expansion Anchor (For Leveling)</td>
<td>10209818</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>J</td>
<td>1/2&quot; – 13 Stainless Steel Hex Nut (For Leveling)</td>
<td>10209819</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>K</td>
<td>1/2&quot; Stainless Steel Flat Washer (For Leveling)</td>
<td>10209820</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>L</td>
<td>Hilti HFX Hybrid Adhesive or Sikadur 31 Hi-Mod Gel</td>
<td>—</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

Manufacturer

- Jensen Precast: K36-MH1-11
- Oldcastle Precast: Edison Manhole Restraint System 2

SAP 10210064

Approved by: RR

Effective Date: 01-29-2021

What's Changed? Updated bracket size and type of anchor bolt.
Scope FC 670.14  Existing Manhole Type 3 Installation

Figure FC 670–14: Existing Manhole – Type 3 Installation

Note(s):
1. Existing Manhole Type 3 Installation used only when distance from surface to ceiling is less than 8 inches.
2. Contractor performing work shall ensure notch dimensions allow cover to function freely.
3. Rebar exposed as a result of performing the work shall be patched with epoxy.
4. See Scope FC 670.20 for General Notes and Table FC 670–14 for Key Notes.
5. If an event (such as an electrical fault) occurs inside the structure, Structural Engineering shall be notified within 3 days in order to determine if the covers and restraints can be reused or will require replacement.

BOLTS PREFERRED LOCATIONS ARE AS SHOWN ON DIAGRAM; BUT PLACEMENT MAY BE ADJUSTED TO AVOID OBSTACLES (EXISTING REBAR, BAD CONCRETE, ETC.) IN ADDITION, ONLY WHEN NECESSARY, EACH BOLT MAY BE PLACED 1 POSITION (ON THE CAST IRON FRAMES) TO THE LEFT OR RIGHT OF THE DEFAULT 90 DEGREE SPACING. WHEN THIS IS NECESSARY, SYMMETRICAL POSITIONING IS PREFERRED.
Table FC 670–14: Key Notes – Existing Manhole Type 3 Restraint Assembly Kit

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>SAP</th>
<th>Qty. Required Per Installation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Swiveloc Round Manhole Cover (UGS FC 627)</td>
<td>10209895</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>2&quot; Tall Manhole Frame (Per UGS FC 627)</td>
<td>10209896</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>5/8&quot; Ø – 11 x 24&quot; Thread Length – Stainless Steel Hex Bolt (Field Cut)</td>
<td>10209997</td>
<td>4</td>
</tr>
<tr>
<td>4</td>
<td>5/8&quot; Flat Washer (Stainless Steel)</td>
<td>10209821</td>
<td>12</td>
</tr>
<tr>
<td>5</td>
<td>5/8&quot; – 11 Hex Nut (Stainless Steel)</td>
<td>10209822</td>
<td>16</td>
</tr>
<tr>
<td>6</td>
<td>4&quot; x 4&quot; x 3/8&quot; Galv. Plate Washer (for 5/8&quot; Ø Bolt)</td>
<td>10209823</td>
<td>4</td>
</tr>
<tr>
<td>7</td>
<td>5/8&quot; Lock Washer (Stainless Steel)</td>
<td>10209824</td>
<td>4</td>
</tr>
<tr>
<td>8</td>
<td>316 Stainless Steel Hairpin Cotter Pin (11/64&quot; Wire Gauge)</td>
<td>10209825</td>
<td>4</td>
</tr>
</tbody>
</table>

**Manufacturer**

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>SAP</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>Manhole Restraint Kit (Type 3)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Jensen Precast</td>
<td>K36-MH1-11</td>
</tr>
<tr>
<td>2</td>
<td>Oldcastle Precast</td>
<td>Edison Manhole Restraint System 3</td>
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</table>

**What's Changed?** Updated bracket size and type of anchor bolt.
Scope FC 670.15  Existing Manhole – Type 4 Installation

Figure FC 670–15: Existing Manhole – Type 4 Installation

Note(s):
1. Existing Manhole Type 3 Installation used only when clear access opening is less than 36 inches.
2. Contractor performing work shall ensure notch dimensions allow 30-1/8" clearance from face of chain to face of opposite chain. Field to cut angle to fit in notch.
3. Rebar exposed as a result of performing the work shall be patched with epoxy.
4. See Scope FC 670.20 for General Notes and Table FC 670–15 for Key Notes.
5. If an event (such as an electrical fault) occurs inside the structure, Structural Engineering shall be notified within 3 days in order to determine if the covers and restraints can be reused or will require replacement.

Effective Date: 01-29-2021
### Table FC 670–15: Key Notes – Existing Manhole Type 4 Restraint Assembly Kit

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<thead>
<tr>
<th>Item</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Manhole (Type 4)</td>
</tr>
<tr>
<td>A</td>
<td>Swiveloc Round Manhole Cover (UGS FC 627)</td>
<td>10209895</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>8&quot; Tall Manhole Frame (Per UGS FC 627)</td>
<td>10209439</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>6&quot; Grade Ring (UGS MH 319, Table MH 319–2)</td>
<td>—</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>WT 4 x 20 – 8.5&quot; Length Galv. (See Sheet 49 for details.)</td>
<td>10209809</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>1/2&quot; Ø Galv. Chain – Grade 30 (Field cut to length)</td>
<td>10209810</td>
<td>15 ft.</td>
</tr>
<tr>
<td></td>
<td>5/8&quot; Ø Galv. Shackle with 3/4&quot; Ø Pin w/ Cotter Pin (Min 3.5-ton WLL)</td>
<td>10209811</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>304 Stainless Steel Angle L 3 X 3 x 1/4–6&quot; Length</td>
<td>10209812</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>3/4&quot; Thread Size Galv. Clevis-to-Clevis (5/8&quot; Ø Pins w/ Cotter Pin) Turnbuckle (Min 2.6-ton WLL) with 2 hex nuts</td>
<td>10209813</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>5/8&quot; Ø x 6&quot; Length (316 Stainless Steel) Hilti HIT-HY200-R HAS-R 316 SS</td>
<td>10214883</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>1/2&quot; – 13 x 8&quot; Length – All Thread Rod (Grade 8 Steel)</td>
<td>10209815</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>1/2&quot; – 13 Hex Nut (Grade 8 Steel)</td>
<td>10209816</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>1/2&quot; Flat Washer (Grade 8 Steel)</td>
<td>10209817</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>Hilti HFX Hybrid Adhesive or Sikadur 31 Hi-Mod Gel</td>
<td>—</td>
<td>1</td>
</tr>
</tbody>
</table>

**Manufacturer**

- Jensen Precast
  - K36-MH1-11
- Oldcastle Precast
  - EDISON MANHOLE RERAINT SYSTEM 4

**What's Changed?** Updated bracket size and type of anchor bolt.
Scope FC 670.16   Existing Manhole – Type 5 Installation

Figure FC 670–16.1: Existing 30” x 30” Square Shaft Manhole – Type 5 Installation

**Note(s):**
1. This detail shall be used for 30” x 30” square manhole access opening.
2. Contractor performing work shall ensure dimensions allow cover to function freely.
3. Rebar exposed as a result of performing the work shall be patched with epoxy.
4. See Scope FC 670.20 for General Notes and Table FC 670–16 for Key Notes.
5. If an event (such as an electrical fault) occurs inside the structure, Structural Engineering shall be notified within 3 days in order to determine if the covers and restraints can be reused or will require replacement.
6. Rotate angle brackets to miss existing rebar.
7. Each 5/8” Ø threaded rod shall extend 1-1/16” into 5/8” Ø coupler nut.
Figure FC 670–16.2: Existing Vault and Manhole – Restraint Connection to Ceiling Installation Details

**Note(s):**
1. Slotted holes provided for anchor bolts and to avoid existing steel reinforcement in structure during installation.
2. It is recommended to scan and locate the steel reinforcement prior to drilling.
3. Preferred anchor locations at angle bracket end slots.
4. Each 5/8" Ø threaded rod shall extend 1-1/16" into 5/8"Ø coupler nut.
5. See Scope FC 670.20 for General Notes and Table FC 670–16 for Key Notes.
Table FC 670–16: Key Notes – Existing Manhole Type 5 Restraint Assembly Kit

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>SAP</th>
<th>Qty. Required Per Installation</th>
<th>Manhole (Type 5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>J</td>
<td>Swiveloc Round Manhole Cover (UGS FC 627)</td>
<td>10209895</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2&quot; Tall Manhole Frame (Per UGS FC 627)</td>
<td>10209896</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>K</td>
<td>1/2&quot; Ø – 13 x 7&quot; Length – Stainless Steel Expansion Anchor</td>
<td>10209818</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>L</td>
<td>1/2&quot; – 13 Hex Nut (Stainless Steel)</td>
<td>10209819</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>1/2&quot; Flat Washer (Stainless Steel)</td>
<td>10209820</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>5/8&quot; Ø – 11 x 24&quot; Thread Length – Stainless Steel Hex Bolt (Field Cut)</td>
<td>10209997</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>O</td>
<td>5/8&quot; Flat Washer (Stainless Steel)</td>
<td>10209821</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>P</td>
<td>5/8&quot; – 11 Hex Nut (Stainless Steel)</td>
<td>10209822</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>Q</td>
<td>5/8&quot; Lock Washer (Stainless Steel)</td>
<td>10209824</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>R</td>
<td>316 Stainless Steel Hairpin Cotter Pin (11/64&quot; Wire Gauge)</td>
<td>10209825</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>S</td>
<td>Flexible Vinyl High-Temp Push-On Round Caps for 5/8&quot; – 11/16&quot; O.D. Bolts</td>
<td>10209826</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>T</td>
<td>5/8&quot; Ø – 11 Coupler Nut (Stainless Steel)</td>
<td>90104A020</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>U</td>
<td>5/8&quot; Ø – 11 x 24&quot; Length, Threaded Rod (Stainless Steel)</td>
<td>98250A480</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>V</td>
<td>Angle 4&quot; x 4&quot; x 5/8&quot; x 16&quot; Long, Galv. (for 5/8&quot; Ø Bolt)</td>
<td></td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>W</td>
<td>1/2&quot; x 5 1/2&quot; Long concrete wedge anchors (316 Stainless Steel)</td>
<td></td>
<td>8</td>
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</tr>
</tbody>
</table>

Manufacturer

<table>
<thead>
<tr>
<th>Manufacturer</th>
<th>Manhole Restraint Kit (Type 5)</th>
</tr>
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<tbody>
<tr>
<td>Jensen Precast</td>
<td>K30-MH5-11</td>
</tr>
<tr>
<td>Oldcastle Precast</td>
<td>EDISON MANHOLE RESTRAINT SYSTEM 5</td>
</tr>
<tr>
<td>SAP</td>
<td>10211585</td>
</tr>
</tbody>
</table>
Scope FC 670.17 Existing Manhole – Type 6 Installation

Figure FC 670–17: Existing Manhole – Type 6 Installation

Note(s):
1. Existing Manhole Type 6 Installation used only when clear access opening is less than 36".
2. Contractor performing work shall ensure notch dimensions allow 30-1/8" clearance from face of chain to face of opposite chain. Field to cut angle to fit in notch.
3. Rebar exposed as a result of performing the work shall be patched with epoxy.
4. See Scope FC 670.20 for General Notes and Table FC 670–17 for Key Notes.
5. If an event (such as an electrical fault) occurs inside the structure, Structural Engineering shall be notified within 3 days in order to determine if the covers and restraints can be reused or will require replacement.

Effective Date: 01-29-2021

What's Changed?
**Table FC 670–17: Key Notes – Existing Manhole Type 6 Restraint Assembly Kit**

<table>
<thead>
<tr>
<th>Key Notes: Existing Manhole Type 6 Restraint Assembly Kit</th>
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<tr>
<td><strong>Item</strong></td>
<td><strong>Description</strong></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Swiveloc Round Manhole Cover (UGS FC 627)</td>
</tr>
<tr>
<td></td>
<td>8&quot; Tall Manhole Frame (Per UGS FC 627)</td>
</tr>
<tr>
<td></td>
<td>WT 4 x 20 – 8.5&quot; Length Galv. (See Sheet 41 for details.)</td>
</tr>
<tr>
<td></td>
<td>1/2&quot; Ø Galv. Chain – Grade 30 (Field cut to length)</td>
</tr>
<tr>
<td></td>
<td>5/8&quot; Ø Galv. Shackle with 3/4&quot; Ø Pin w/ Cotter Pin (Min 3.5-ton WLL)</td>
</tr>
<tr>
<td></td>
<td>304 Stainless Steel Angle L 3 X 3 X 1/4–6&quot; Length</td>
</tr>
<tr>
<td></td>
<td>3/4&quot; Thread Size Galv. Clevis-to-Clevis (5/8&quot; Ø Pins w/ Cotter Pin) Turnbuckle (Min 2.6-ton WLL) with 2 hex nuts</td>
</tr>
<tr>
<td></td>
<td>5/8&quot; Ø x 6&quot; Length (316 Stainless Steel)</td>
</tr>
<tr>
<td></td>
<td>1/2&quot; Ø – 13 x 8&quot; Length – All Thread Rod (Grade 8 Steel)</td>
</tr>
<tr>
<td></td>
<td>1/2&quot; – 13 Hex Nut (Grade 8 Steel)</td>
</tr>
<tr>
<td></td>
<td>1/2&quot; Flat Washer (Grade 8 Steel)</td>
</tr>
<tr>
<td></td>
<td>Hilti HFX Hybrid Adhesive or Sikadur 31 Hi-Mod Gel</td>
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**Manufacturer**

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<td>Jensen Precast</td>
<td>K36-MH6-11</td>
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<td>Oldcastle Precast</td>
<td>EDISON MANHOLE RESTRAINT SYSTEM 6</td>
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</table>
Scope FC 670.18  Existing Manhole – Type 7 Installation

Figure FC 670–18: Existing 30” x 30” Square Shaft Manhole – Type 7 Installation

Note(s):
1. This detail shall be used for manhole with access opening less than 30” x 30”.
2. The minimum ceiling thickness shall be 8” after saw cutting.
3. Contractor performing work shall ensure dimensions allow cover to function freely.
4. Rebar exposed as a result of performing the work shall be patched with epoxy.
5. See Scope FC 670.20 for General Notes and Table FC 670–18 for Key Notes.
6. If an event (such as an electrical fault) occurs inside the structure, Structural Engineering shall be notified within 3 days in order to determine if the covers and restraints can be reused or will require replacement.
### Table FC 670–18: Key Notes – Existing Manhole Type 7 Restraint Assembly Kit

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>SAP</th>
<th>Qty. Required Per Installation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Swiveloc Round Manhole Cover (UGS FC 627)</td>
<td>10209895</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>8&quot; Tall Manhole Frame (Per UGS FC 627)</td>
<td>10209439</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>WT 4 x 20 – 8.5&quot; Length Galv. (See Sheet 32 for details.)</td>
<td>10209809</td>
<td>2</td>
</tr>
<tr>
<td>4</td>
<td>1/2&quot; Ø Galv. Chain – Grade 30 (Field cut to length)</td>
<td>10209810</td>
<td>15 ft.</td>
</tr>
<tr>
<td>5</td>
<td>5/8&quot; Ø Galv. Shackle with 3/4&quot; Ø Pin w/ Cotter Pin (Min 3.5-ton WLL)</td>
<td>10209811</td>
<td>4</td>
</tr>
<tr>
<td>6</td>
<td>304 Stainless Steel Angle L 3 X 3 X 1/4–6&quot; Length</td>
<td>10209812</td>
<td>2</td>
</tr>
<tr>
<td>7</td>
<td>3/4&quot; Thread Size Galv. Clevis-to-Clevis (5/8&quot; Ø Pins w/ Cotter Pin) Turnbuckle (Min 2.6-ton WLL) with 2 hex nuts</td>
<td>10209813</td>
<td>2</td>
</tr>
<tr>
<td>8</td>
<td>5/8&quot; Ø x 6&quot; Length (316 Stainless Steel) Hilti HIT-HY200-R HAS-R 316 SS</td>
<td>10214883</td>
<td>4</td>
</tr>
<tr>
<td>9</td>
<td>1/2&quot; Ø – 13 x 8&quot; Length – All Thread Rod (Grade 8 Steel)</td>
<td>10209818</td>
<td>8</td>
</tr>
<tr>
<td>10</td>
<td>1/2&quot; – 13 Hex Nut (Grade 8 Steel)</td>
<td>10209819</td>
<td>8</td>
</tr>
<tr>
<td>11</td>
<td>1/2&quot; Flat Washer (Grade 8 Steel)</td>
<td>10209820</td>
<td>8</td>
</tr>
<tr>
<td>12</td>
<td>Hilti HFX Hybrid Adhesive or Sikadur 31 Hi-Mod Gel</td>
<td>—</td>
<td>1</td>
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#### Manufacturer

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<thead>
<tr>
<th>Manufacturer</th>
<th>Manhole Restraint Kit (Type 7)</th>
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<tbody>
<tr>
<td>Jensen Precast</td>
<td>K36-MH1-11</td>
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<tr>
<td>Oldcastle Precast</td>
<td>EDISON MANHOLE RESTRAINT SYSTEM 7</td>
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<td>SAP</td>
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</tbody>
</table>

**What's Changed?** Updated bracket size and type of anchor bolt.
Note(s):
1. Slotted holes provided for anchor bolts and to avoid existing steel reinforcement in structure during installation.
2. It is recommended to scan and locate the steel reinforcement prior to drilling.
Scope FC 670.20  General Notes

General Notes:

1. Anchor bolts installed on ceiling and walls shall be a minimum of 24 inches from edge of access opening and a minimum of 12 inches from joint.
2. Anchor bolts shall be installed in sound concrete.
3. Rebar scanning is required prior to drilling holes into existing concrete. Drilling rebar is prohibited. Drill bits intended to drill through rebar (e.g. diamond and core bits) are not allowed. Cover drilled holes with tape and fill the holes with adhesive by following manufacturer's recommendation or any other methods to minimize dripping. Insert anchor bolts and allow 90 minutes to cure if ambient temperature is at 51°F, 60 minutes if ambient temperature is at 69°F. Clean excess adhesives after the cure time.
4. All core drilled holes not used shall be clean of debris and filled with epoxy, flush with existing surface.
5. Anchor bolts shall be installed in-line with restraint attachment at opposite end.
6. All restraints shall be installed taut with no slack in any of the components (turnbuckle, shackle, chain, etc.).
7. Chains shall be in their normal position and not twisted while making restraints taut.
8. Installation of expansion anchors shall be in accordance with the Manufacturer's Published Installation Instructions (MPII). Anchors must be installed in holes drilled into concrete using carbide-tipped drill bits. For on-site training of expansion anchor installation, contact Simpson Strong-Tie (800-999-5099) or Hilti (800-879-8000).
9. SCE will perform periodic inspections to ensure compliance with standard.
10. Torque wrench shall be certified by an accredited testing laboratory and results are to be kept on file at contractor's facility and available upon request. Torque wrench shall be stored according to manufacturer's specifications.
11. Actual orientation of frame, cover and notches are to be field verified and located. Prior to notching, the concrete shall be scanned. Notching shall avoid damaging or cutting existing rebar. Exposed reinforcing steel shall be epoxy treated with Sikagard 62, in accordance with manufacturer's installation instructions. Cutting of rebar is prohibited, unless approved by Structural Engineering.

What's Changed? Updated General Note 1 and Note 3.
1.0 Modified Precast Concrete Vault Cover Requirements

1. Modified vault covers are utilized for replacement of deteriorated covers when existing vault necking is employed.

2. Covers will be furnished with grease applied to sides and cast in recesses.

3. Four 1/2-inch loop inserts will be located as shown in Plan View and Section B-B. To be furnished with four installed 1/2" x 2" hex head cap bolts.

4. For size and placement of cover lifting holes and ladder inserts, manhole covers and rings, see FC 621, FC 640, FC 641, and FC 642.

5. Bottom perimeter of covers will be provided with a cast-in recess to the dimensions shown in Table FC 680–1 (Sheet 2).
2.0 Replacement Vault Cover Installation Instructions

Figure FC 680–2: Replacement Vault Cover

2.1 Remove deteriorated cover from existing vault necking.

CAUTION Wire brush and remove all damaged concrete, dirt, oil, grease or any other bond-inhibiting materials from the inside ledge of cover necking. Replace any damaged 3/8-inch expansion felt as required. (Figure 1)

2.2 Level replacement cover to top of vault necking by adjusting the four 1/2" x 2" bolts, one at each corner of bottom cast-in recess. (Figure 2)

2.3 Mix the “SikaTop” No. 122 repair mortar kit (component A and B) per manufacturers’ instructions. Mortar must be mixed to a uniform consistency. Do not over mix (3 minute maximum).

SikaTop No. 122 is available from:

A. Edison (SAP Key 30)

B. The Burke Company — Address:
   1625 W. Washington Blvd.
   Montebello, CA 90640

2.4 Moisten inside ledge of vault necking with clean water, using a brush or fine spray. Surface should be damp with no glistening water. Place mixed mortar on inside ledge to dimensions shown (Figure 3).
Minimum ambient and structure surface temperature before applying mortar will be 50°F. For maximum adhesion of mortar to neck ledge, mortar should be applied no longer than 15 minutes after initial mixing. Remove mortar from neck area where the four cover adjusting bolts will rest.

2.5 Covers should be barricaded to prevent pedestrian/traffic contact for a minimum of 8 hours for nontraffic covers and 24 hours for traffic covers. At end of this time, adjust the 1/2-inch bolts upward to remove their contact with necking.

2.6 Modified replacement vault covers are available as shown in Table FC 680–2 (Sheet 3).

Table FC 680–2: Replacement Vault Cover Catalog Numbers

<table>
<thead>
<tr>
<th>Vault Cover Size</th>
<th>Manhole Cover 30&quot;</th>
<th>Jensen Precast</th>
<th>Oldcastle Infrastructure</th>
<th>SAP</th>
</tr>
</thead>
<tbody>
<tr>
<td>4' x 4'</td>
<td>K44-VN9-11T</td>
<td>44 Neck and Plug</td>
<td>10117548</td>
<td></td>
</tr>
<tr>
<td>4' x 5'</td>
<td>K45-VN12-11T</td>
<td>ED 45 Neck and Plug Traffic</td>
<td>10117549</td>
<td></td>
</tr>
<tr>
<td>5' x 8'</td>
<td>K58-VN12-11</td>
<td>–</td>
<td>10117573</td>
<td></td>
</tr>
</tbody>
</table>

CAUTION

Minimum ambient and structure surface temperature before applying mortar will be 50°F. For maximum adhesion of mortar to neck ledge, mortar should be applied no longer than 15 minutes after initial mixing. Remove mortar from neck area where the four cover adjusting bolts will rest.

For maximum adhesion of mortar to neck ledge, mortar should be applied no longer than 15 minutes after initial mixing. Remove mortar from neck area where the four cover adjusting bolts will rest.

What’s Changed? The approved manufacturer information has been updated. Utility Vault Co. replaced with Oldcastle Infrastructure. Utility Vault Co. parent company note removed.
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Vault and Manhole Lid Tethers

Figure FC 690P−1: Vault and Manhole Lid Tether

Remove existing pentahead bolt
Typ. 3 locations, do not install
bolt opposite side of lid from
the bracket installation.

Figure FC 690P−2: Structure Connection Detail

Note(s):
1. Use an approved method for the opening and closing of tethered structure lids.
1.0 Lid Tether Requirements

1.1 Tethers shall only be installed on lids of structures on the Long Beach Secondary network.

1.2 Round type lids shall have one tether installed (see Figure FC 690P-4). Square type lids shall have two tethers installed per half (see Figure FC 690P-4).

Figure FC 690P–3: Round Type Lid Typical Tether Location

Figure FC 690P–4: Square Type Lid Typical Tether Locations
Table FC 690P–1: Parts List for Lid Connection

<table>
<thead>
<tr>
<th>Quantity</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>3/4&quot; Dia. SS304 Stainless Steel Flat-Head Bolt (1-3/8&quot; Longer than Lid Thickness) 70ksi Min. Tensile Strength</td>
</tr>
<tr>
<td>1</td>
<td>1-3/4&quot; Dia. Washer</td>
</tr>
<tr>
<td>2</td>
<td>3/4&quot; Lock Washer</td>
</tr>
<tr>
<td>1</td>
<td>3/4&quot; Dia. Hex Nut</td>
</tr>
<tr>
<td>1</td>
<td>5/8&quot; Shackle</td>
</tr>
<tr>
<td>1</td>
<td>L4&quot; x 4&quot; x 3/8&quot; x 3-3/8&quot; Lg. Galvanized Angle Bracket</td>
</tr>
</tbody>
</table>

Table FC 690P–2: Parts List for Structure Connection

<table>
<thead>
<tr>
<th>Quantity</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>3/4&quot; Dia. Stainless Steel Threaded Rod (Cut to Fit)</td>
</tr>
<tr>
<td>1</td>
<td>3/4&quot; Lock Washer</td>
</tr>
<tr>
<td>1</td>
<td>3/4&quot; Dia. Hex Nut</td>
</tr>
<tr>
<td>1</td>
<td>5/8&quot; Shackle</td>
</tr>
<tr>
<td>1</td>
<td>L4&quot; x 4&quot; x 3/8&quot; x 6&quot; Lg. Galvanized Angle Bracket</td>
</tr>
<tr>
<td>1</td>
<td>Adhesive Epoxy</td>
</tr>
</tbody>
</table>

2.0 Lid Tether Installation Details

1. Remove structure lid and place bottom side up.
2. Remove inner pan and return it to service center upon completion of installation.
3. Place angle bracket on the bottom of the structure lid with the vertical leg towards the outside of the lid.
   - Install bracket opposite side of lid from "pick hole".
   - Ensure angle bracket with shackle does not interfere with the installation of the lid.
4. Mark location for angle bracket and drill pilot hole in structure lid using a hand drill with a 1/8 inch - 5/16 inch drill bit. Use cutting oil to aid drilling.
5. Flip structure lid (top-side up).
6. Drill a 3/4" inch hole through the lid at drill pilot location, using cutting oil as necessary.
7. Drill chamfer in top of structure lid in the 3/4" through hole.
8. Flip structure lid (bottom-side up).
9. Align hole on angle bracket with hole on structure lid.
10. Insert hole in angle bracket.
11. Insert flat washer then lock washer and then nut on bolt.
12. Make nut snug tight with wrench to compress washer.
   **Note:** Angle bracket hole can be located anywhere around the structure opening. It is best to locate for easy access and where no equipment or cable is below the drilling operation.
13. Orient structure lid to match quadrant in structure ceiling.
14. Set one end of the stainless steel rope 3 feet away from structure opening.
15. Drop remainder of stainless steel rope inside hole.
16. Pull end of stainless steel rope across ceiling and mark hole location for angle bracket attachment.
   - It is important to choose a location where the stainless steel rope will not hang down into energized equipment. Be sure the rope will not become entangled on any obstructions (ladders, etc.) that would prevent future removal of the lid.
   - Desired hole location must be a minimum of 2 feet from opening.
   - Stainless steel rope should allow the lid a maximum 3 foot travel outside of the structure.
17. Drill a 4.5 inch deep, 7/8 inch diameter hole in structure ceiling.
18. Apply adhesive epoxy into structure ceiling hole per manufacturer instructions.
19. Insert threaded rod into hole, twist rod while inserting to allow for air to escape.
20. Hold threaded rod in place by hand or mechanical means for a minimum of 5 minutes. Wait 30 minutes for epoxy to cure before placing any load on the threaded rod.
21. Place angle bracket on threaded rod in the proper orientation so that cable pulls shackle perpendicular to hinge keyed bolt, not in line with hinge keyed bolt.
22. Install flat washer then lock washer and then nut on threaded rod.
23. Make nut snug tight with wrench to compress washer.
24. Connect end of stainless steel rope to shackle and then to angle bracket.
25. Attach shackle to stainless steel rope.
26. Bolt shackle through angle bracket hole.
27. Replace lid, ensuring that lid is oriented so that angle bracket on lid and structure are as close to each other as possible.
28. Install nylon bolts to retain round lids in only 3 locations. The hole to be left empty shall be opposite the angle bracket tether connection. If nylon bolts or bolt holes are not available, DO NOT bolt the lid down. DO NOT re-install any steel bolts (if they are present). Square lids should use all nylon bolts for all bolt holes if present.
Scope FC 700P.1 Subsurface Equipment Enclosure – Retrofits Only

Figure FC 700P–1: 4’ x 7’ x 7’ Enclosure

What’s Changed? Initial issue of Subsurface Enclosure Pilot.

Effective Date: 01-29-2021
Figure FC 700P–2: 5' x 8'-6" x 7' Enclosure

- Partially vented cover (Type 2) to be used for replacement of partially vented cover. See Details on Sheet 6.
- Full solid cover (Type 1) to be used for replacement of full solid cover. See Details on Sheet 6.
- New restraint system assembly (3 each side wall). See Details on Sheet 6.
- Rapid set cement leveling grout.
- Existing concrete structure to remain and protect in place.

What's Changed? Initial issue.

Effective Date: 01-29-2021
Figure FC 700P–3: 5’ x 8’-6” x 5’ Enclosure

- Partially vented cover (Type 2) to be used for replacement of partially vented cover. See details on Sheet 6.
- Full solid cover (Type 1) to be used for replacement of full solid cover. See Details on Sheet 6.
- New restraint system (3 each side wall) See Details on Sheet 6.
- Rapid set cement leveling grout.
- Existing concrete structure to remain and protect in place.

What’s Changed?
Initial issue.

Effective Date: 01-29-2021
Figure FC 700P–5: 4’ x 7’ Cover Details

<table>
<thead>
<tr>
<th>Cover Type</th>
<th>Material</th>
<th>Traffic Rating</th>
<th>Weight (lbs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 (Full Solid)</td>
<td>Frame: Cold Roller Steel Cover: Ductile Iron Accessory: Ductile Iron</td>
<td>HS-20</td>
<td>280 lbs ea panel</td>
</tr>
<tr>
<td>2 (Partially vented)</td>
<td>Frame: Cold Roller Steel Cover: Ductile Iron Accessory: Ductile Iron</td>
<td>HS-20</td>
<td>280 lbs ea panel</td>
</tr>
</tbody>
</table>

1 3/4" Flat Faced Gothic (Typ)

Ductile Iron Cover (skid resistant)

5/8" Ø holes (typ)

1/2-13 Stainless Steel Hex Head Bolts with Stainless Steel Washers covered by a plastic cap to keep out debris

Type 1

Stainless Steel Mechanical Strut

Ductile Iron Arm EM3

SECTION B-B

SECTION A-A

SECTION B-B

DETAIL C

3/4" Ø thru holes for anchoring (16) places

Long Ductile EM3 Arm (2) places located on the two inner covers

What's Changed?

Initial issue.
What's Changed?
Initial issue.

Figure FC 700P-6: Restraint Connection Detail
### Table FC 700P–1: Key Notes – Subsurface Equipment Enclosure – Retrofits Only

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>SAP</th>
<th>Qty. Required Per Installation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Manhole (Type 1)</td>
</tr>
<tr>
<td>A</td>
<td>WT 4 X 20 – 8.5&quot; Length Galv. (See Page 6)</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>B</td>
<td>1/2&quot; Ø Galv. Chain – Grade 30 (Field cut to length)</td>
<td>10209810</td>
<td>15 ft.</td>
</tr>
<tr>
<td>C</td>
<td>5/8&quot; Ø Galv. Shackle with 3/4&quot; Ø Pin w/ Cotter Pin (Min 3.5-ton WLL)</td>
<td>10209811</td>
<td>4</td>
</tr>
<tr>
<td>D</td>
<td>304 Stainless Steel Angle L 3 X 3 X 1/4–6&quot; Length</td>
<td>10209812</td>
<td>2</td>
</tr>
<tr>
<td>E</td>
<td>3/4&quot; Thread Size Galv. Clevis-to-Clevis (5/8&quot; Ø Pins w/ Cotter Pin) Turnbuckle (Min 2.6-ton WLL) with 2 hex nuts</td>
<td>10209813</td>
<td>2</td>
</tr>
<tr>
<td>F</td>
<td>5/8&quot; Ø x 6&quot; Length (316 Stainless Steel)</td>
<td>10214883</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Hilti HIT-HY200-R HAS-R 316 SS</td>
<td>10214884</td>
<td>4</td>
</tr>
<tr>
<td>G</td>
<td>1/2&quot; Ø – 13 x 8&quot; Length – All Thread Rod (Grade 8 Steel)</td>
<td>10209815</td>
<td>4</td>
</tr>
<tr>
<td>H</td>
<td>1/2&quot; – 13 Hex Nut (Grade 8 Steel)</td>
<td>10209816</td>
<td>8</td>
</tr>
<tr>
<td>I</td>
<td>1/2&quot; Flat Washer (Grade 8 Steel)</td>
<td>10209817</td>
<td>8</td>
</tr>
</tbody>
</table>
General Note:
1. Anchors bolts installed on ceiling shall be a minimum of 24 inches from edge of access opening and a minimum of 12 inches from joint.
2. Anchor bolts shall be installed in sound concrete.
3. Rebar scanning is required prior to drilling holes into existing concrete. Drilling rebar is prohibited. Drill bits intended to drill through rebar (e.g. diamond and core bits) are not allowed.
4. All core drilled holes not used shall be clean of debris and filled with epoxy, flush with existing surface.
5. Anchor bolts shall be installed in-line with restraint attachment at opposite end.
6. All restraints shall be installed taut with no slack in any of the components (turnbuckle, shackle, chain, etc.).
7. Chains shall be in their normal position and not twisted while making restraints taut.
8. Installation of adhesive anchors shall be in accordance with the Manufacturer’s Published Installation Instructions (MPIII). Anchors must be installed in holes drilled into concrete using carbide-tipped drill bits. For on-site training of adhesive anchor installation, contact Hilti at (800) 879-8000.
9. SCE will perform periodic inspections to ensure compliance with standard.
10. Torque wrench shall be certified by an accredited testing laboratory and results are to be kept on file at contractor’s facility and available upon request. Torque wrench shall be stored according to manufacturer’s specifications.
11. Restraint system shall be installed plumb and can be skewed from vertical axis to a maximum of 30deg angle.
12. End wall installation is not permitted.
13. Actual orientation of frame and cover is to be field located and approved. Cover venting shall be directed away from structures and pedestrian walkway paths.