



# ENCLOSURES

## REFERENCE GUIDE



## Small Enclosure Installation

Hubbell enclosures sized smaller than 24" x 36" can be safely and securely installed by following these four simple steps.

### 1 Site Selection

Select an appropriate site or location that is suitable for an underground enclosure. Consider the following:

- Slope -- Level is ideal, but some grade is acceptable depending on soil conditions and expected drainage.
- Existing underground utilities -- Call 8-1-1 and avoid all existing lines
- Traffic -- Select the enclosure type and ANSI/TIER load rating based on application.

### 2 Excavation

- Excavate six inches to one foot larger than enclosure size.
- Excavate six to eight inches deeper than enclosure height.
- Cover bottom of hole with six-inches crushed rock.
- Level gravel prior to setting enclosure.

### 3 Placement

- Remove cover from box.
- Manually position box on leveled gravel in bottom of hole
- Adjust for level or to match grade.
- Trim/prepare any incoming conduit paths.

### 4 Backfill

- Begin backfilling around perimeter of box and manually tamp, every six- to eight-inches of backfill. Proper backfilling will minimize settling and potential frost heave of the enclosure.
- Where ribbing exists on exterior of enclosure, carefully work backfill into voids and tamp.
- Bring backfill to desired grade.



Attach nylon straps or chains to the lifting bolts.



Lift and position enclosure with backhoe.



Backfill in 6-inch intervals, manually tamping to ensure backfill gets into channels and ribbing in sidewall of enclosure.



## Large Enclosure Installation

Hubbell enclosures sized 24" x 36" and larger can be safely and securely installed by following these five simple steps.

### 1 Site Selection

Select an appropriate site or location that is suitable for an underground enclosure. Suitability evaluation of a particular site should include:

- Slope -- Ideal location is level, but some grade is acceptable depending on soil conditions and expected drainage.
- Existing underground utilities -- Make necessary preparations for avoiding all existing utility lines and equipment.
- Traffic -- Hubbell enclosures are load rated and designed for non-deliberate traffic. See further information under the ANSI/TIER section of this reference guide.

### 2 Excavation

After line trenches are complete, excavate an area approximately 1- to 2-feet larger than the width and length dimensions of the box, and 6- to 8-inches deeper than the overall height of the box.

- Add rodent barrier if necessary.
- Cover bottom of hole with 6-inches of gravel or crushed rock and level.

### 3 Lifting & Placement

- Remove cover from box (See lift instructions section of this reference guide).
- Attached lift straps to lift positions on box (See lift instructions of this reference guide).
- Position box on leveled gravel in bottom of hole. Adjust for level or to match grade.
- Prepare incoming conduit paths into the box. Any necessary box modifications (i.e. knockout holes) should be added.
- Stub conduit into box.

### 4 Bracing

- Add bracing inside enclosure as described in the Internal Bracing section of this reference guide.
- Using proper lifting techniques, replace cover onto box and bolt down.

### 5 Backfill

- Wrap box with rodent barrier if necessary.
- Begin backfilling around perimeter of box and manually tamp, every 6- to 8-inches of backfill. Proper backfilling will minimize settling and potential frost heave of the enclosure.
- Where ribbing exists on exterior of enclosure, carefully work backfill into voids and tamp.
- Bring backfill to desired grade. Finish with grass seeding and/or additional erosion control.



Attach nylon straps or chains to the lifting bolts.



Lift and position enclosure with backhoe.



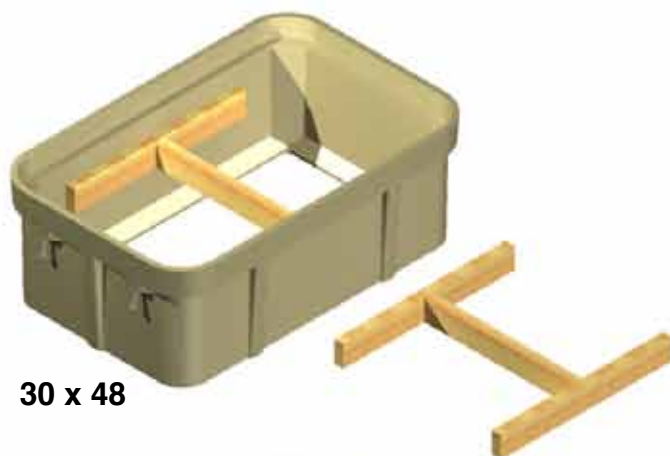
Backfill in 6-inch intervals, manually tamping to ensure backfill gets into channels and ribbing in sidewall of enclosure.

### Install and Protect

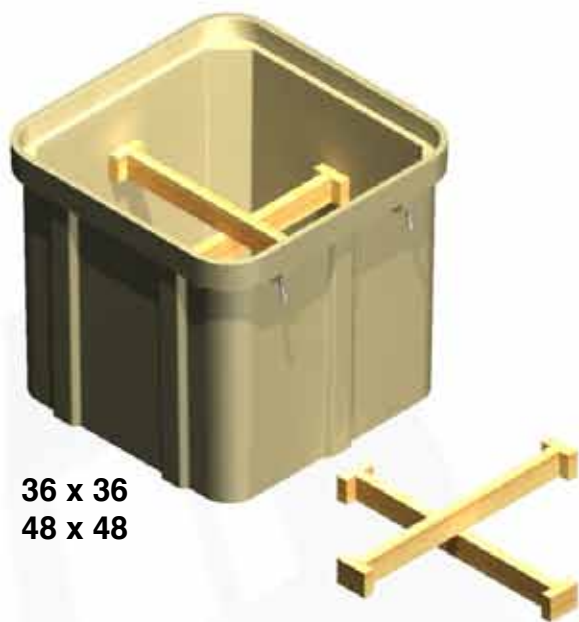
Always consider environmental factors when installing enclosures of any size. Local conditions could require additions, such as concrete collars or internal bracing. Information can be found on those additions inside this reference guide.

# Internal Bracing: Polymer Concrete

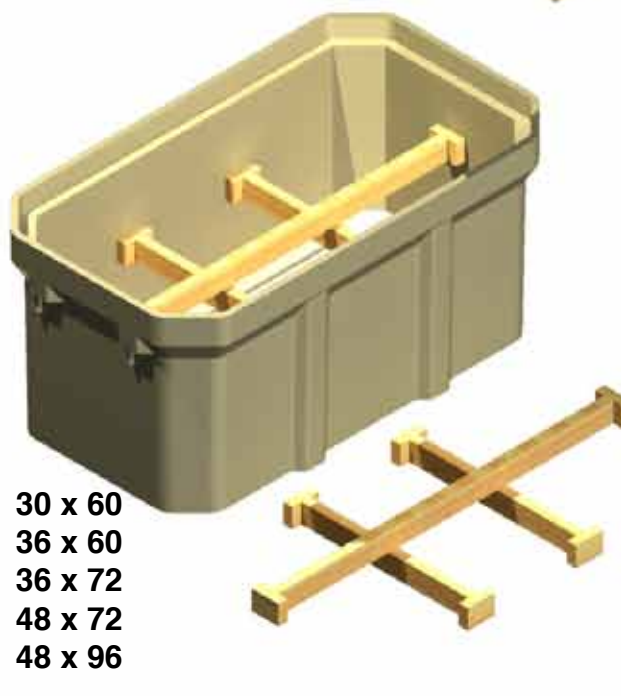
Internal bracing may be warranted for any manufacturer's underground enclosure. If 95% compaction is required, or if heavy vehicles will be present during construction and/or throughout the life of the enclosure, internal bracing during backfilling operations will ensure minimal box sidewall deflections. This applies to enclosures made from any material to maintain the original sidewall geometry. Supports should be 2 x 4s or similar material sized to hold at mid-depth.



30 x 48



36 x 36  
48 x 48



30 x 60  
36 x 60  
36 x 72  
48 x 72  
48 x 96

## Pencil Bracing

Before backfill operations, ensure the "U-Channel" Beam in the top-center of the box is in place, and ensure the two one-inch square, aluminum splice racks at the bottom of the box are also in place. No additional bracing is required.



## Rigging and Strap Lengths

When using lifting equipment to move medium to large size Hubbell enclosures, always use proper lifting and rigging techniques and refer to the requirements outlined below.

### For installation on job site:

1. Always remove the covers from the enclosures before lifting into position. Never lift an enclosure by the cover. Covers should be removed by attaching appropriate size and strength rigging designed for a minimum of 1,000-pound load (consider safety factor of rigging device of 3-4X), or remove the cover by hand.

2. When using lift straps for removing the cover, ensure each arm of the strap has a length that is no less than the distance between the lift pins on the cover. (See Cover Lifting Procedures on the following page.)

3. To lift enclosure, attach appropriate size and strength rigging designed for a minimum of 2,500-pound load (consider safety factor of rigging device of 3-4X). Attach to enclosure at designated lift points:

- PG24x36 and larger: Use four lift pins found on outside end-walls (two per end). Refer to Diagram 1 following page.
- DT24x36 and larger: Use two lift holes (one per end located at seam). Refer to photos on following page and Diagram 2 on following page.



It is often necessary to move enclosures at loading/offloading docks and in storage warehouses. Always use proper lifting and rigging techniques and refer to the requirements outlined below.

### For loading or offloading trucks, or for moving enclosures within storage warehouses:

1. It is not necessary to remove covers from the enclosures before moving assemblies for short distances (less than 50 feet). However, never lift any enclosure by the cover.

2. To lift enclosure, attach appropriate size and strength rigging designed for a minimum of 2,500-pound load (consider safety factor of rigging device of 3-4X). Attach to enclosure at designated lift points:

- PG24x36 and larger: Use four lift pins found on outside end-walls (two per end). Refer to Diagram 1 below.
- DT24x36 and larger: Use two lift holes (one per end located at seam). Refer to photos at bottom of preceding page for more information.

ENCLOSURE	MIN. STRAP LENGTH
PG2436	36"
PG3048	52"
PG3636	44"
PG3660	60"
PG4848	66"
PG4872	86"
PG4896	110"

Suggested Lifting Procedure

- Attach nylon straps to the lifting bolts as shown.
- Straps should be long enough to ensure no more than a 30-degree angle with the vertical axis.

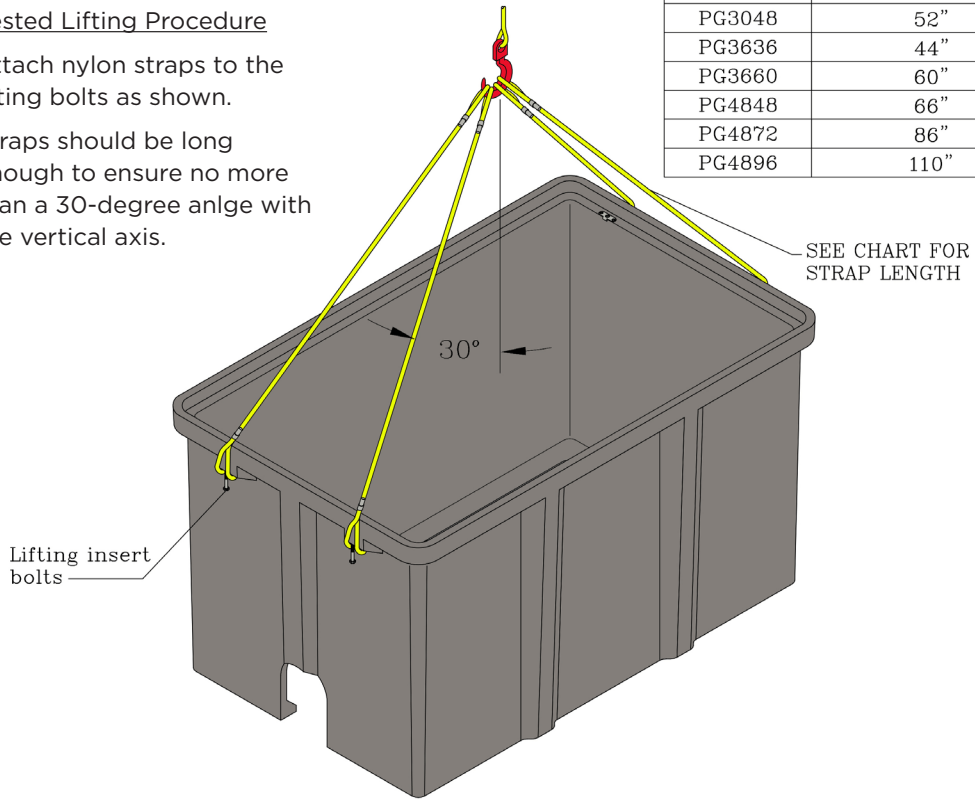


Diagram 1. PG lift procedure.

DT97273

Suggested Lifting Procedure

- Attach nylon straps through the 1 1/4" hole as shown.
- Straps should be long enough to ensure no more than a 30-degree angle with the vertical axis.

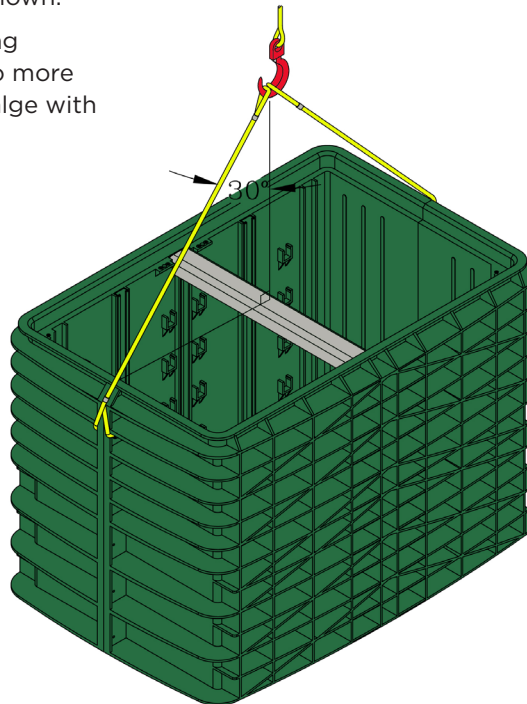


Diagram 2. DT lift procedure.

DT15081



## Rigging and Strap Lengths, continued

### Lift holes for DT enclosures:

1. Some early models of DT enclosures were manufactured without lift holes. Those enclosures (24x36 and larger) can be modified to add these lift holes.
2. Along the end walls of the DT box, you will find the seam where the two halves of the enclosure are bolted together. The sidewalls of the DT boxes include “ribs” for added strength. Starting from the top, count down three openings between those ribs.
3. At the center of this opening, drill a 1 1/4” hole through this seam wall. Your hole should be parallel to the end wall of the enclosure, not directly into the enclosure.
4. Repeat this process on the opposite side of the enclosure.
5. Using six-foot lift straps, 1” wide, feed the strap ends through this new hole and add a slip knot. Attach the other ends to your lifting device.

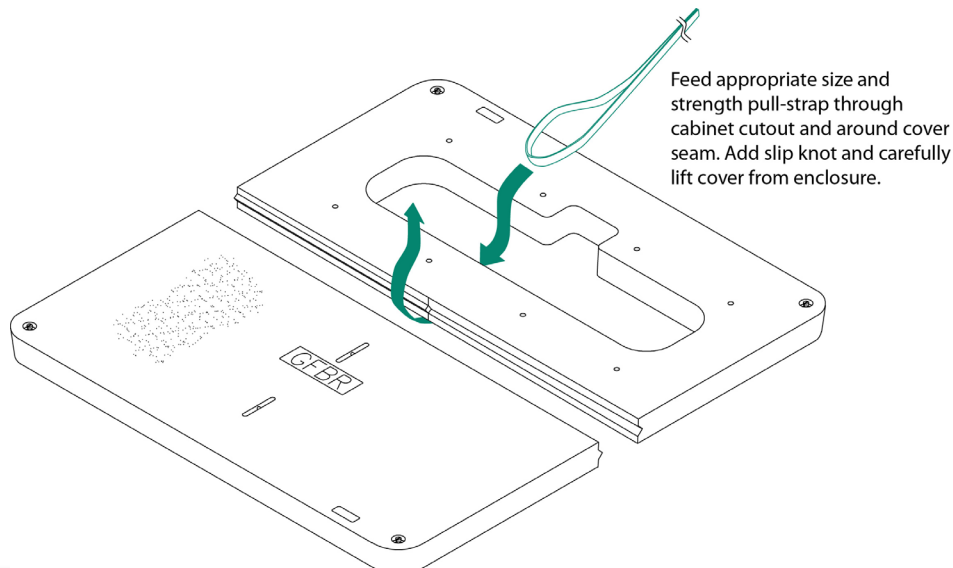


Early DT boxes require a 1 1/4” lift hole be added to the third rib channel. 2016 and later DT boxes include this hole.

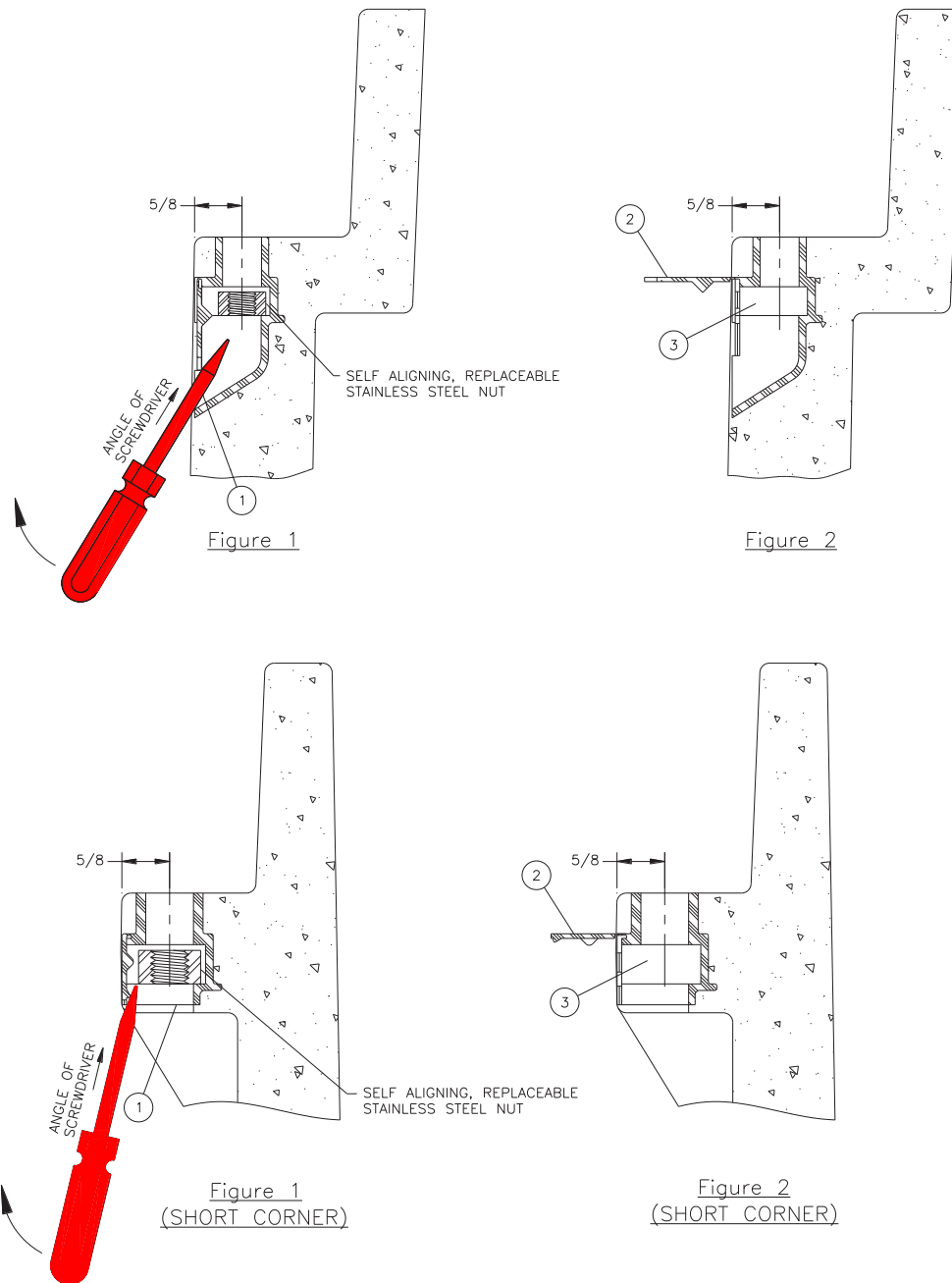
### Cover lifting procedures:

Always remove the cover before lifting an enclosure.

- Solid and split covers should be lifted with an appropriate size and strength pull strap. The minimum length strap should match the distance between the lift pins on the cover.
- Covers with cabinet cutouts that do not also include pull slots can be lifted in one of two ways:
  1. Add two eye bolts to existing lug holes that surround the cabinet cutout opening. Attach lift straps to these eye bolts. Eye bolts should be situated in two opposing locations spanning the width of the cover as much as possible.
  2. Alternatively, wrap a lift strap through the cabinet cutout opening and around the cover seam edge of the cover itself as shown below. Use a slip knot to secure and slowly lift the cover away from the enclosure.



## EZ-Nut replacement procedure



1. Locate the drainage opening in the area containing the insert. Insert a screwdriver into the opening at approximately the angle shown in Figure 1.
2. After inserting the screwdriver into the drainage opening, pull upward on the handle of the screwdriver in order to pry open the door of the insert as shown in Figure 2.
3. If necessary, remove any remaining debris from the opening. After the opening is clear, remove existing nut and replace with a nut of the required size.



## Hole Cutting Instructions



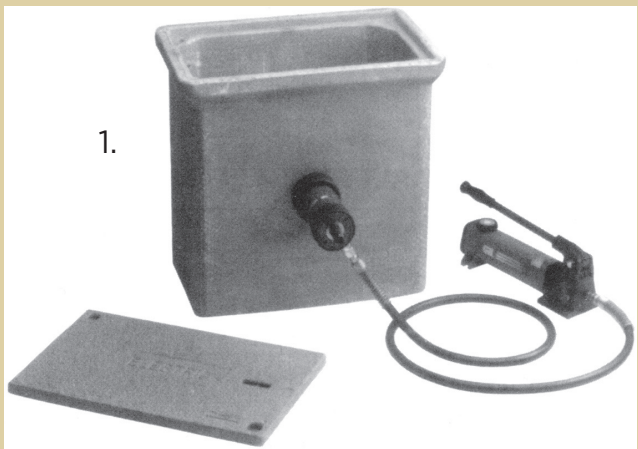
### Hole Saw

1. Drill a 7/8" pilot hole with a carbide tipped masonry drill.
2. Drill hole using a diamond tipped masonry hole saw.
  - This is the preferred method from engineering.
  - Estimated drilling time is 1 - 1.5 minutes.
3. Wood cutting hole saw may be used on Quazite FRP and PenCell HDPE enclosures (15 - 20 seconds).
4. Depending on the box, cutting these holes from the inside or outside may work better. Cutting on a smooth flat area of the wall vs. a ribbed uneven area works best.



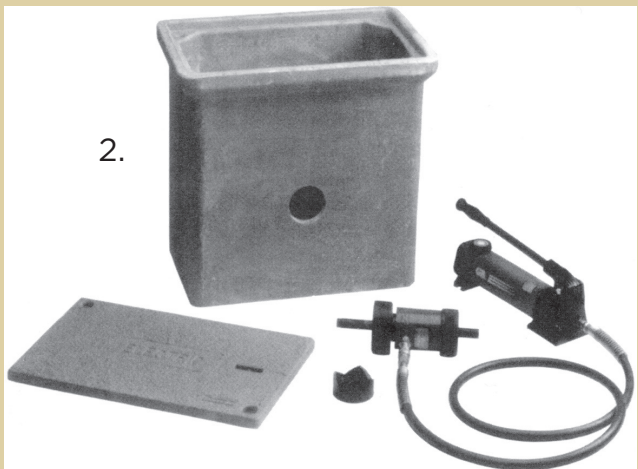
### Knockout Punch Driver

1. Set up the punch
  - 1.01 Slide the die over the pull rod.
  - 1.02 Insert pull rod into pilot hole.
  - 1.03 Thread the punch onto the pull rod.
2. Punch hole and remove
  - 2.01 Operate hand pump until the punch penetrates the surface.
  - 2.02 Open pump release valve.
  - 2.03 Remove the slug.



#### NOTES:

- 1) Quazite UL Listed enclosures with holes drilled in the field may qualify for UL Listing as long as the holes do not exceed more than 25% of the area of each sidewall and as long as the holes do not cut into a structural reinforcing rib, corner, or box lip.
- 2) Quazite FRP enclosures, follow the same guideline as #1 above.
- 3) PenCell HDPE enclosures, we recommend never removing more than 20% of the total area of any wall.



Contact your representative if there are any questions.

## Hole Cutting Limitations

The amount of material that can be safely removed from the sidewall of an enclosure is limited. That limitation is defined first by the type of enclosure: Quazite or Pencell.

### Quazite

No more than 25 percent of the area of any wall of the enclosure should be removed. In addition, no hole or material removal should occur at a corner radius or sidewall rib.

### Pencell

No more than 20 percent of the area of any wall of the enclosure should be removed. In addition, no hole or material removal should occur at a corner radius, sidewall rib, or the seam where the two halves of the box are bolted together.

### Example:

If a DT 24" x 36" x 36" deep box needed holes cut in one of the 24" end walls. You could put up to (8) 4" diameter holes in the wall before any loss of strength occurred. Again, the double rib that is formed where the two walls bolt together should not be drilled. All holes should be on either side of that rib. This material removal applies to all four sides of the box.



### Hole Saw

Cutting holes in a PenCell style box is similar to the Quazite instructions. However, a standard wood or metal drill bit should be used. The hole saw should be designed for wood applications.

Estimated drill time, 15-20 seconds.





Hubbell is committed to providing high quality enclosures that meet or exceed all applicable requirements and provide the customer with outstanding performance and reliability. Our enclosure products are engineered and manufactured to the highest standards.

While we strive to ensure our enclosures arrive to our customer locations in the best possible condition, some minor cosmetic blemishes (scuffs, scratches) may occur during packaging, shipping, and delivery. We consider these blemishes to be normal, and not detrimental to the performance of the product.

Similarly, some enclosures could arrive to our customers in a structurally damaged condition. This could result from damage during shipping or a manufacturing defect. It is important that our customers understand the difference between a cosmetic blemish (Acceptable) and a structural defect (Unacceptable).

The below photographs demonstrate a variety of quality concerns, both the typical variety and the excessive variety. Please use this guide to help you in establishing the level of quality concern you may encounter.

### Scratches

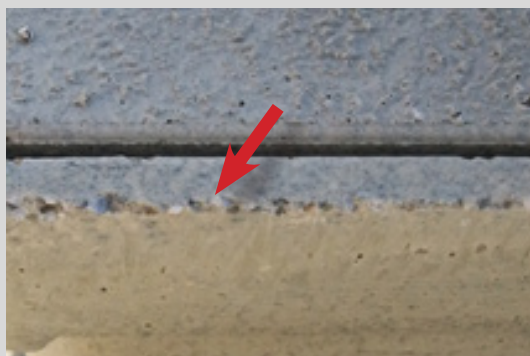


#### Acceptable

White scuffing on the sides of the box are part of the casting process. Excess material from the casting process is removed with an abrasive stone to prevent sharp edges. That procedure often results in white scuffing as shown in the picture. Hubbell considers this scuffing "typical" and not a product failure.

Scratches and scuffs are usually caused by scrapes from fork lifts, from the enclosures rubbing against one another during transit, or from being knicked by hand tools.

### Chips



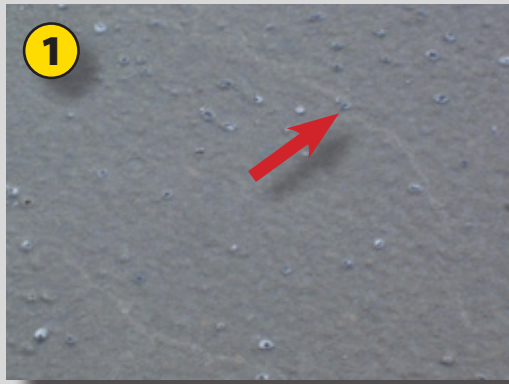
#### Acceptable

Molds that have the parting line at the top lip of the box will produce a product that has a slightly rough edge (left). Chips that are less than the size of a dime are considered typical. Larger chips, as shown on the right, will be patched prior to shipment. Chips are frequently caused by rough handling: backhoe operations, backfill procedures, or lifting procedures.



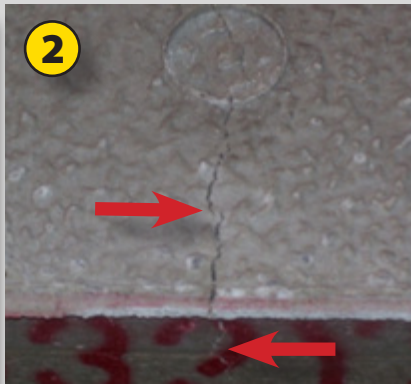
#### Unacceptable

## Cracks



1

**Acceptable**



2

**Unacceptable**



3

**Unacceptable**

1. "Whiteline" cracks in covers are common
2. Open cracks in covers on two planes are considered a structural defect.
3. Open cracks in boxes on two planes are considered a structural defect.

Cracks can be caused by improper lifting, dropping a cover or enclosure, or other hard impacts. Cracks can also result from a manufacturing defect.

## Ejector Pin Cracks



**Acceptable**



**Acceptable**



**Unacceptable**

Pull pins cracks are typical to the casting process and are usually not a structural defect. These are found in the corner radius of larger polymer concrete boxes adjacent to approximately 1/2-inch diameter holes. The Ejector Pin is a necessary part of the mold process, and small cracking around this hole is typical.

## Surface Voids



**Acceptable**



**Acceptable**

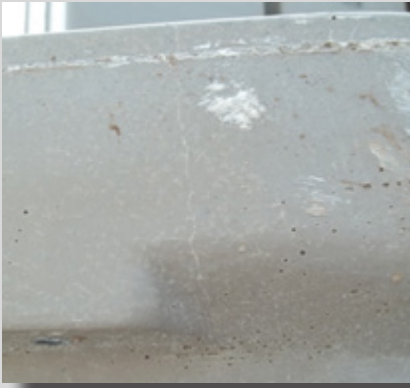


**Unacceptable**

Surface voids are small air pockets that appear on the surface of polymer concrete material. When smaller than a pea, they are considered acceptable. Larger and irregular shaped air pockets with fiberglass showing should be considered unacceptable.



## Broken Lip



**Acceptable**



**Unacceptable**

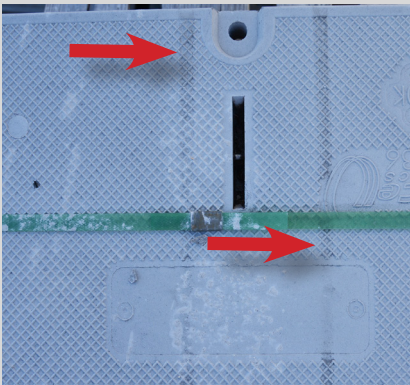


**Unacceptable**

Hairline cracks in the lip area do not typically affect the structural integrity of the box. These sections can be repaired with patching compound (left). However, open cracks should be considered excessive.

These types of cracks are frequently caused by rough handling during backfill operations: getting too close with hand tamping tools, a "jumping jack," a backhoe bucket, or with a skid-steer, for example.

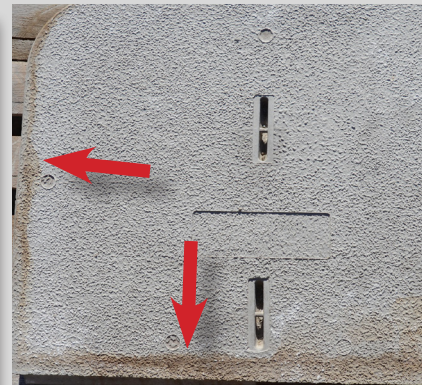
## Discoloration



**Acceptable**



**Acceptable**



**Acceptable**

Discoloration from rain, banding or pallet stains are typical and will disappear after some time in the sun.

## Lock Mechanisms



**Unacceptable**



**Unacceptable**

The plastic ledge that holds the bolting backplate can be damaged. This is most often caused when installer or field technician attempts to lift the enclosure by the cover, or when box/cover assembly is roughly handled. Extreme force is then transferred to the bolting mechanism and these plastic ledges can easily break.



## Broken Ribs or Fins



**Acceptable**



**Acceptable**



**Unacceptable**

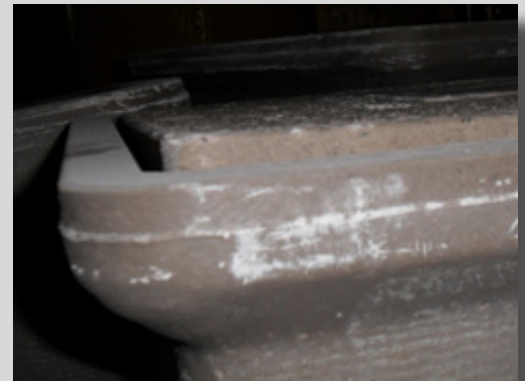
Broken plastic ribs, or fins, on the sidewall of plastic enclosures are normally not a structural problem, especially if the broken ribs are limited to one or two locations on a single box. Multiple broken ribs should be considered excessive, and the box should not be installed without consulting Hubbell for review of the enclosure. Ordinarily, broken ribs are a cosmetic concern as opposed to a structural concern. These damages should be noted immediately upon delivery of material from Hubbell.

This type of damage is frequently caused by excessive tamping, by rough handling before installation, or by hasty removal from installation.

## Warping



**Acceptable**



**Unacceptable**

Covers should align with the lip of the enclosure evenly all the way around the perimeter. The cover may extend slightly higher than the lip of the enclosure, but the difference should remain constant. Slight variations are acceptable. However, if the alignment varies by more than 1/4" (the width of three nickels stacked together), or if the cover rocks on its base, the cover should be considered warped. Warping could be the result of a manufacturing defect, and should be replaced.

### POLYMER CONCRETE PATCHING PROCEDURE

- Step 1: Surface(s) to be patched must be cleaned and free from dirt, oils, grease, water, etc.
- Step 2: If a large area is to be patched, the area must be formed with some type of material such as wood, plastic or duct tape. It may be necessary to incorporate fiberglass cloth (provided in kit) into the patch area for additional strength and reinforcement.
- Step 3: Fill one of the provided patching cups  $\frac{3}{4}$  full with patching material. Add 10 ml or 30 drops of hardener to the patch mix and blend well.
- Step 4: This material can then be troweled, squeegeed, poured or brushed onto the area that requires patching.
- Step 5: After the patch hardens it can be ground or sanded to a desired appearance.
- Step 6: The patch material can be cleaned up with acetone or a similar solvent.
- Note: The amount of hardener can be varied to speed up or slow down the set time of the patch material.

If there are any problems or questions, please call your Hubbell representative.

For repair only. Not for the development or manufacture of products.

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