

Installation Guide and Detail for CAP Composite Cover and Frames

Note: The information that follows is intended for general informational purposes only and does not necessarily represent appropriate advice for your specific application as each individual application has its own variables: e.g. climate, temperature, soil, chemical exposures, grade. Consult with your contractor, engineer, and other required professionals for your application.

1) Avoid transporting products across bumpy terrain at a speed that causes the product to bounce in or discharge from the vehicle. Excessive travel bouncing of the product can cause damage. Impacts from cover and frame assemblies falling out of vehicles, backhoe strikes, or blows from other heavy machinery before installation can damage the cover and frame. Avoid insecure logistics and storage (e.g. unbanded product in transport, stacking two pallets high) – to prevent assemblies from dropping to the ground, truck walls, or into one another, with force and velocity. Improper handling voids warranties. (see photos below of examples of poor storage practices)



2) Measure the diameter of the clear opening of the access hole to ensure that the diameter of the hole is not larger than the interior diameter of the access hole frame. Do not have frame bottom without ground underneath it (i.e. the frame ledge is suspended over air). The frame must fully rest on the ground or riser rings for proper support. Select the proper diameter frame and cover for the diameter of the access hole.



3) You may need to cut into the concrete or asphalt with a jackhammer, pick, or saw. Remove the current cover and frame. The old cover and frame may be very heavy depending on the size. You may need some help or tools to move it safely. Always bend knees when lifting.



4) Inspect the access hole opening and remove any dirt, grease or other debris from the access hole opening and support.

5) Measure the depth of the hole top to the ground level. The depth should be deeper than the height of the frame and cover.

6) Lay a layer of sealing product on the top of the access hole. Some use a butyl mastic tape, M1 adhesive, or RAM NEK between cover and supporting surface.



7) If riser rings are used, CAP's will work with concrete, brick and polymer types (e.g. Ladtech, Cretex). CAP does not endorse a specific riser types and this is the utility's preference. The same adhesive sealants can be used between riser rings (M1 Adhesive, RAM NEK, Butyl mastic tape). With brick or other rough/uneven surfaces, a thin layer of mortar/concrete should be applied to smooth the top surface of the riser material before attaching the seal. Follow riser ring manufacturer's instruction for using preferred adhesive sealant between riser rings.

8) Use riser rings in contact with the frame that have a clear opening equal or less than the clear opening of the frame for complete support. Avoid installing covers with clear openings less than the supporting surface as loads from traffic will not be fully supported.

Avoid Using Riser Rings with Larger Clear Opening than Frame Clear Opening – Frame and Cover Will Not Be Completely Supported. Unsupported Frames May Not Resist Traffic Loads



Photo Shows a Riser Ring with a Larger Clear Opening than the Frame Clear Opening

9) Make sure each additional riser section is plumb as installed before installing the next riser, cone or cap.



10) If using concrete, mix cement and water per instructions on the bag.

11) Make sure the frame is level with the slope of your surrounding concrete or asphalt (concrete is preferred for in-road). **WARNING: DO NOT USE SMALL PIECES OF WOOD, ROCK, CONCRETE, BRICK OR OTHER MATERIAL TO “SHIM” UNDER A SECTION OF THE FRAME OR POLYMER RISER RINGS TO ACHIEVE A DESIRED SLOPE. USE ANGLED ADJUSTMENT RINGS TO EVEN COVERS WITH THE ROAD GRADE. POINT FORCES FROM SMALL SHIMS MAY DAMAGE PRODUCT.**

12) If riser rings are not used, lay a bed of concrete around the hole. The ring should be wide enough to fit under the flange bottom of the frame. Place the flange directly on the wet concrete ring. You can push the flange down by hand to set it into the concrete. If you use a tool to set the flange into the concrete, use a rubber mallet or blunt end, NOT a sharp metal hammer like the operator in the right of the photo below. Do not use heavy equipment (e.g. backhoe) to press or hit the cover into the concrete.



13) Holes in the frame flange can be used to anchor with bolts into the riser rings or concrete below. This is not mandatory, but the holes in the frames allow for this option. (See end of instructions)

14) Fill in around the frame with more wet concrete until the concrete is level to the top of the frame. **IMPORTANT:** Make sure to wipe all wet concrete off the inside of the frame walls and seat. If concrete cures with the cover on, it will be difficult to remove the cover, and the cover also will not sit flat. **WARNING: A COVER PROPPED UP BY CONCRETE OR OTHER DEBRIS GIVES A POTENTIAL CATCH POINT THAT COULD LEAD TO COVER EJECTION AND ALSO MAY NOT BE PROPERLY FASTENED TO THE FRAME.** Concrete may not be necessary for off road installations and a simple backfill may suffice (see next page for “Off-Road Examples.”)



Clean Frame Underside Notch



15) **IMPORTANT:** It is critical to clean the notches on the frame inside bottom from any curing concrete, debris, or other obstruction. If these frame notches are filled in with concrete or other materials, the latch for the cover lock will not be able to engage into the frame notch to lock to the frame. **WARNING: DISGENAGED PADDLE LOCKS OR UNBOLTED COVERS WITH DEBRIS, CONCRETE, OR OTHER MATTER IN BETWEEN THE FRAME LEDGE AND COVER PROPPING THE COVER EDGE ABOVE THE FRAME INCREASES RISK OF COVER EJECTION FROM THE FRAME IN TRAFFIC.**

Note: Some installers prefer a square of concrete around the frame and some a circle (the theory is that the corners of the concrete bed in a square create a “stress point” where a circle does not). Some also use rebar, create expansion joints or other techniques. Some recommend 5000 psi concrete a minimum of 12 inches from the frame edge, at least 6 inches deep, using #4 rebar 12 inches on center. Allow 24 hours for concrete to cure before allowing traffic contact (refer to concrete mix instructions).

(Instructions continue next page)

In-Road Examples

Square Concrete Support



Circle Concrete Support



Circle with Expansion Joints



Note: Off-road some will simply backfill with dirt, raise with concrete to avoid lawnmower impact, or raise several feet to prevent water inflow. However, assemblies should be anchored and or secured with concrete in roadway installations.

Off-Road Examples

Raised- Garden



Dirt Backfill



Paver Façade



Elevated to Avoid High Water Inflow



Secure Base Around Manhole for Off-Road Tripod Use



Note: If tripod use is planned for entering and exiting the manhole, it is advisable to have a solid supporting surface large enough for the tripod base. Tripods may not be secure on dirt or soft ground. Some municipalities specify 6 feet by 6 feet of concrete around manholes.

NOT PROPER INSTALL



Note: Improper install can reduce product life and voids warranty. Municipalities are responsible for training contractors on correct installation procedures. Applying the surrounding concrete too shallow could cause cracks and expose the frame edges to side impact. Frame edges should be flush or slightly below grade – Areas with freezing will need to determine the depth below grade to allow for ice heaving.

16) If the cover has bolt down or locking features, visually locate the receiving bolt holes on the frame ledge. Align bolt holes on the cover with the receiving hole locations. Place the cover on the frame properly aligned.

17) Be careful with fingers when inserting covers into frames. When possible, place the cover into the frame so that one edge rests on the frame top and push the cover in the remaining amount with a tool (or the base of your steel-toed footwear). Fingers and hands need to be kept clear of the cover when it falls into the frame seat to avoid injury.



You may need to rotate the cover if the holes and hardware do not line up. The frame has shapes (triangles, stars) that indicate where the bolt holes should be aligned to have the cover and frame holes centered on each other. The frame also has indicators for paddle lock notches.



18) Once in the hole, tighten all the bolts or paddle locks. **WARNING: DO NOT HAMMER THREADED BOLTS INTO THE BOLT HOLES. HAMMERING THE BOLTS INTO THE HOLES INSTEAD OF SCREWING COULD DISLODGE THE RECEIVING NUT IN THE FRAME AND DAMAGE THE THREADS.** Paddle locks may need to be pressed down and then rotated to engage the frame. A mark on the head of the paddle will point away from the cover center and toward the frame wall when the latch is locked. This mark is in the same direction as the paddle underneath to cover.



Hand-tighten bolts.
Less than 12 ft-lb
recommended

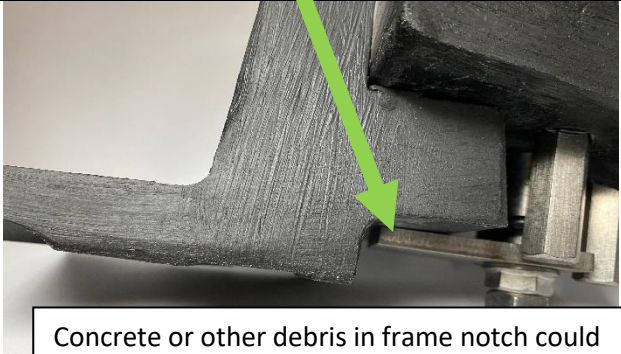
Avoid high torque or impact
316 SS hardware may strip with
torque higher than 25 ft-lb.



Push down and turn to lock and unlock.

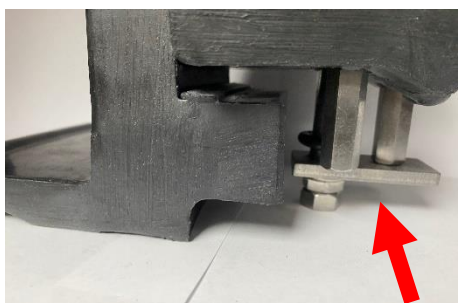


Frame/Cover Cross Section – Paddle Lock Latch Engaged



Concrete or other debris in frame notch could
block and prevent proper latch engagement

PADDLE LOCK **NOT** ENGAGED TO FRAME - UNLOCKED



19) The mark on the paddle lock head will point away from the center when engaged. This photo shows a **disengaged** paddle lock as the notch is not pointing toward the outside of the cover. Push down and turn until the notch is closest to the outside of the cover. **WARNING: A DISGENAGED PADDLE LOCK(S) OR UNBOLTED COVERS WITH DEBRIS, CONCRETE, OR OTHER MATTER ON THE FRAME EDGE UNDER THE COVER PROPPING THE COVER EDGE ABOVE THE FRAME CAN LEAD TO POTENTIAL EJECTION OF COVER FROM FRAME IN THE STREET.**

20) **DO NOT OVERTIGHTEN STAINLESS STEEL BOLTS FOR THE THREADED BOLT OPTION. OVERTIGHTENING WILL STRIP THREADS. MAXIMUM TORQUE APPLIED SHOULD BE NO MORE THAN 20 FT.LB. HAND TIGHTEN OR USE TORQUE LIMITED TOOL. OVERTIGHTENING BOLTS VOIDS WARRANTY.**



21) After fastening the cover to the frame with either the paddle lock or bolts, insert the rubber dirt shield over the hardware into the hardware hole. Push in the center of the rubber cover so that it forms a tight seal and does not drop out.



22) Allow the concrete to cure for at least 24 hours before driving a vehicle over it. Follow instructions and warnings on your concrete product packaging. Wipe off excess concrete or asphalt from cover surface for maximum tread efficiency and to avoid sticking the cover shut.



Clean Surfaces of Concrete/Asphalt (photo shows what **NOT** to do)

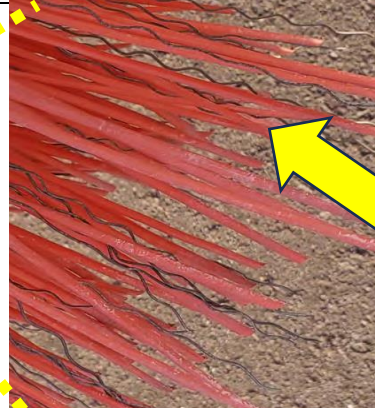
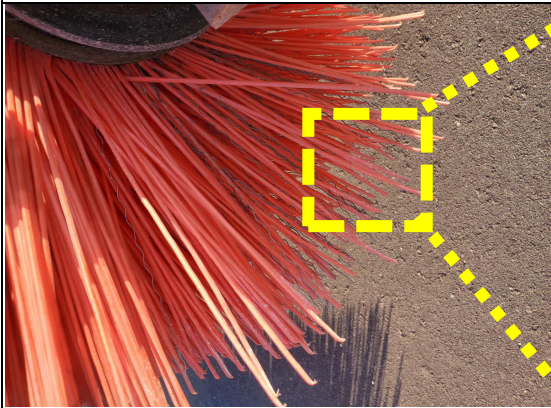


Note: Many other products and methods that can be used to reduce infiltration and provide other benefits. This guideline is intended to represent the optimum method for installing utility access covers. The life and performance of any access cover depends on proper installation.

23) For attaching sensors or other technology to the underside of the cover, CAP covers have attachment points molded into the cover bottom. It is recommended to request anchors in the PO so that the manufacture attaches the 316 stainless threaded anchors designed to securely hold objects up to 50 lbs per point. These anchors also can be ordered separately and attached at the job site. It is recommended to bolt technology to at least one hole and tether with a wire cable to a second hole for a safety connection.



24) If a street sweeper or similar cleaning equipment is used to clean off excess asphalt after the covers are installed in the road, avoid the use of steel bristles or even a combination of steel and polymer brush bristles. Sharp metal may scratch the cover surface causing a mostly a cosmetic issue. Any machining, drilling, milling, abrading that exposes fiber filaments is to be avoided for optimal aesthetics and total product life. Surface damage will usually not affect the overall load capacity of the covers.



Avoid Using any Steel Bristles or Combination of Polymer and Steel (like in photo) on Street Sweepers or other Equipment

Anchoring Cover and Frame to Prevent Surcharge

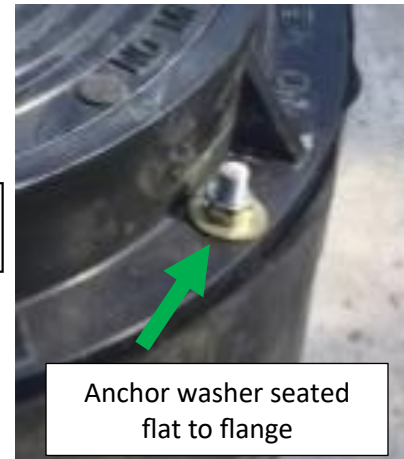
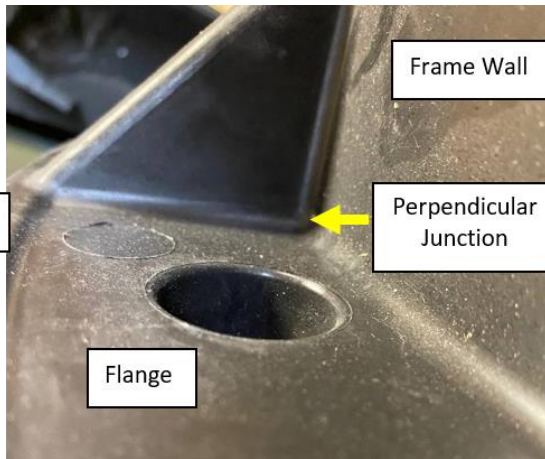
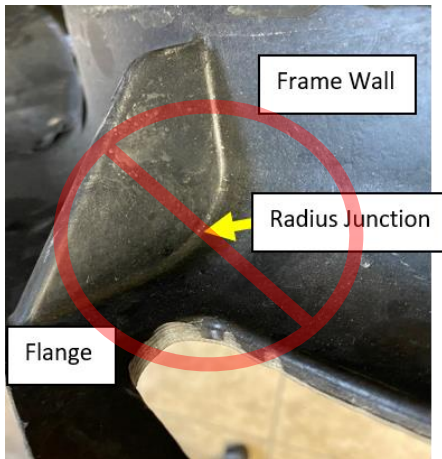


1. Mark holes in the ground using the frame anchor holes as the template. Insert anchors (e.g. Redhead) at the anchor hole locations. Attach threaded rods.

2. Drill holes in grade/riser rings and insert rings on rods. Use butyl mastic tape between each ring per manufacturer recommendation.

3. Mount the frame on the rods. Use same butyl mastic to seal the frame bottom to the grade/riser rings.

4. Cut rods to eliminate extra rod and tighten with nuts.



CAP frame flanges are perpendicular to the vertical frame wall. This allows for a washer to sit flat under the nut on the threaded rod used for anchoring the assembly. Non-perpendicular (radiused) flange-wall junctions can tilt the washer with one side propped up on the vertical wall joint.