

Water T&D Construction Standard

SERVICE LINE REPLACEMENT TRENCHLESS - CABLE PULLING METHOD

Application: Replacement of existing service lines with a new copper tube service line using a trenchless construction technique which replaces the old service using the existing route.

Service line replacement is performed with the expectation that the existing service line will be removed. This Standard references construction techniques that replace the service line using the existing route. A cone shaped tool sometimes called a "pulling block", locks onto the trailing end of the service pipe. The cone plus the pipe is pulled from the ground by a cable passing through the pipe and attached to the cone. The replacement pipe is simultaneously pulled in behind the cone. This technique cannot be used if the service pipe is;

- 1) Looped
- 2) Badly clogged so that the cable cannot pass through
- 3) Service is encased in concrete (excluding basement wall)
- 4) Existing utilities interfere with a straight line pull
- 5) If the ground is extremely hard and dry.

Generally, service section lengths greater than 60' cannot be replaced using this technique.

GENERAL INSTALLATION NOTES:

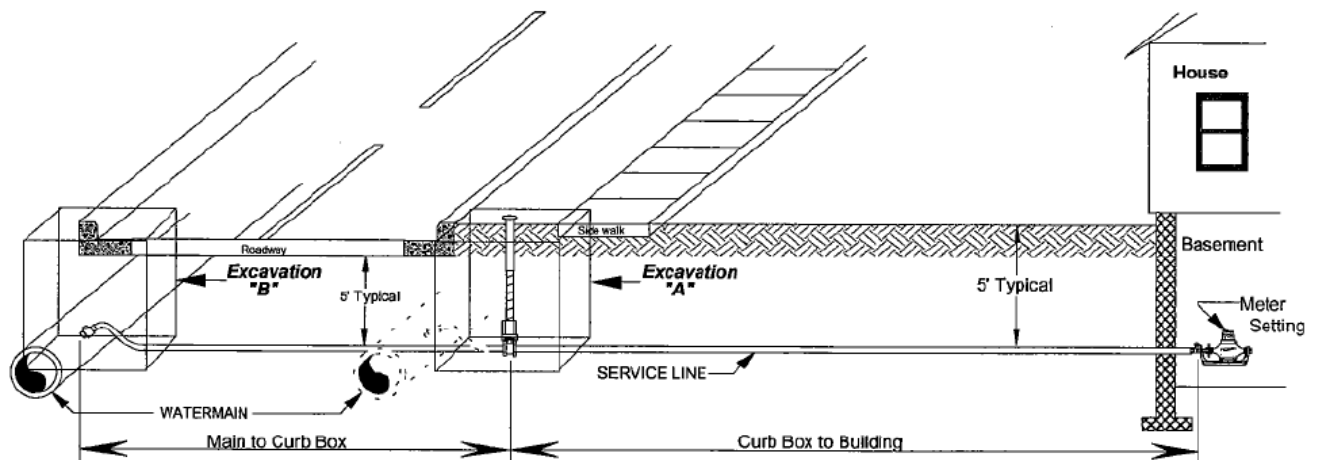
- Complete all staking requirements prior to installation.
- Make appropriate customer notifications and close curb stop prior to any excavation.
- Replace all 5/8" & 3/4" galvanized iron or lead services with a 3/4" copper tube service.
- Replace all 1" galvanized iron or lead services with 1" copper tube service.
- Meter set and meter installation shall be performed by Utility personnel only.

Excavation "A":

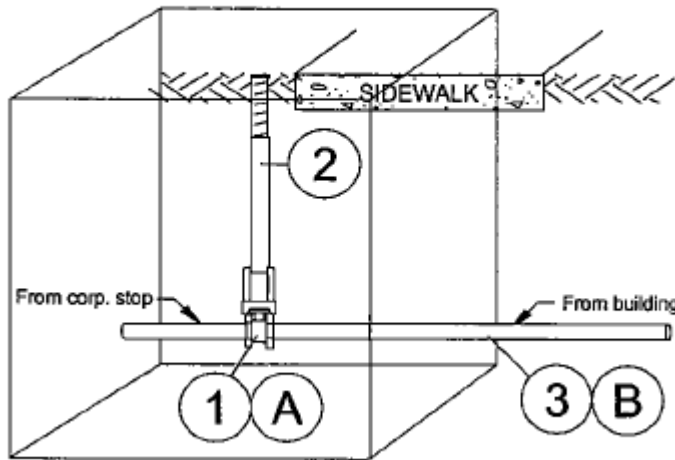
Required for complete service replacement. Excavate at "A" to unearth the curb stop. Expose the curb stop and a minimum of 2' of service line in each direction, unless otherwise directed by the Utility Engineer. It is imperative that the material type of the existing service sections be identified. If either of the service line sections (main to curb box / curb box to bldg.) are of non-standard material or construction, they shall be replaced. Control of excavations is required to keep any water or other materials from entering the main tap or the newly installed copper service lead. Follow all trenching or excavation safety precautions.

Excavation "B":

Required for long side service replacement. May not be required when the water main is exposed by excavation "A" (short side).



Excavation "A"



INSTALLATION NOTES:

Excavation "A"

A New curb stop & curb box may be required if existing curb stop is *non-standard or damaged

B Existing service material is to be removed during the service installation. If existing service cannot be removed follow water service abandonment procedure.

INSTALLATION NOTES:

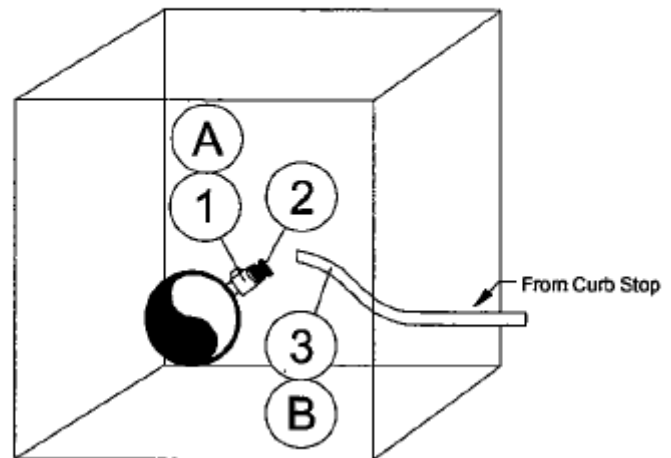
Excavation "B"

If a new 3/4" or 1" tap is required install new tap as per standard AWWA C600 procedures. If a new tap larger than 1" is required install new tap with service saddle.

A – The existing service corporation can be used if it is the correct size for the service being installed. Allowable transitions are 5/8" to 3/4", 3/4" to 1", 1" to 3/4". 1/2" corporation stops shall not be re-used. If new corporation is being installed, abandon the existing corporation stop in the OFF position and cap. Verify that capped tap is not leaking.

B – Existing service material is to be removed during the service installation.

Excavation "B"



MATERIALS FOR 3/4" SERVICE			
REF	ITEM	QTY	DESCRIPTION
①	30-05680	1	Curb Stop, 3/4" CTS Comp. Both ends
②	30-00320	1	Curb Box Complete
③	30-45329	As Req'd	Tube, Copper, Type K, 3/4" x 60'
MATERIALS FOR 1" SERVICE			
①	30-06166	1	Curb Stop, 1" CTS Comp both ends
②	30-00320	1	Curb Box Complete
③	30-45345	1	Tube, Copper, Type K, 1" x 60'

Excavation "A"

MATERIALS FOR 3/4" SERVICE			
REF	ITEM	QTY	DESCRIPTION
①	30-03123	If Req'd	Corp. Stop, 3/4" CC x 3/4" CTS comp
②	30-00193	If Req'd	Coupling, Corp adapter, 5/8" XS x 3/4" CTS comp
	30-00221		Coupling, Corp adapter, 3/4" XS x 3/4" CTS comp
	30-00263		Coupling, Corp adapter 3/4" XS x 1" CTS comp
③	30-45329	As Req'd	Tube, Copper, Type K, 3/4" x 60'
MATERIALS FOR 1" SERVICE			
①	30-03446	If Req'd	Corp. Stop, 1" CC x 1" CTS comp
②	30-00250	If Req'd	Coupling, Corp adapter, 1" XS x 1" CTS comp
③	30-45345	As Req'd	Tube, Copper, Type K, 1" x 60'

Excavation "B"

INSTALLATION NOTES:

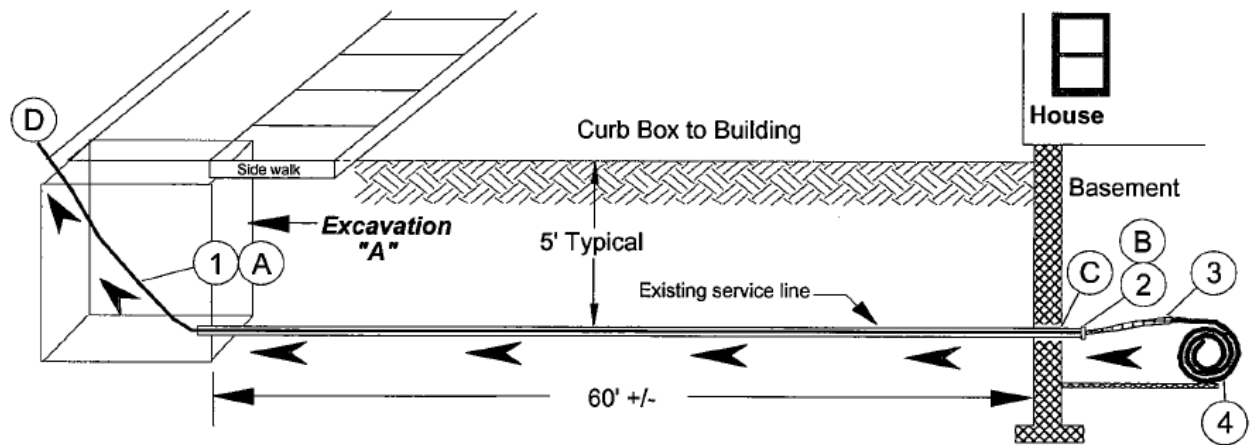
Curb Box to Building

A - Insert the 3/8" wire rope into the existing service pipe pushing it through till it reaches the other pipe end inside the basement. In some instances a smaller fish tape may be used first and the 3/8" rope wire pulled back through attached to the fish tape.

B - Attach cone or "Push Block" to cable and attach the pulling sock behind that. Secure new copper tubing in pulling sock. Be sure to tape off the new copper service prior to insertion into the pulling sock and make sure that taped off end of the copper service is tight against the rubber ball in the pulling sock. Completely tape off pulling sock to prevent any loose material from entering the new copper service.

C - Chip out basement or foundation wall around the existing service line to loosen the contact and allow new copper to pull in smoothly.

D - Pulling equipment may vary. Equipment and procedure shall be approved by the Utility Engineer. The new copper tube service will be pulled in as the old service line is pulled out.



MATERIALS FOR SERVICE REPLACEMENT			
REF	ITEM	QTY	DESCRIPTION
(1)	Non-stock	75'	Wire rope, 3/8", 18,000 lbs.
(2)	Non-stock	1	Block, cable pulling for "Push" pulls
(3)	Non-stock	1	Grip, pulling (pulling sock)
(4)	30-45329 or 30-45345	As Req'd	Tube, Copper, Type K, 3/4" x 60' or Tube, Copper, Type K, 1" x 60'
Curb Box To Building & Main To Curb Box			

INSTALLATION NOTES:

Main to Curb Box

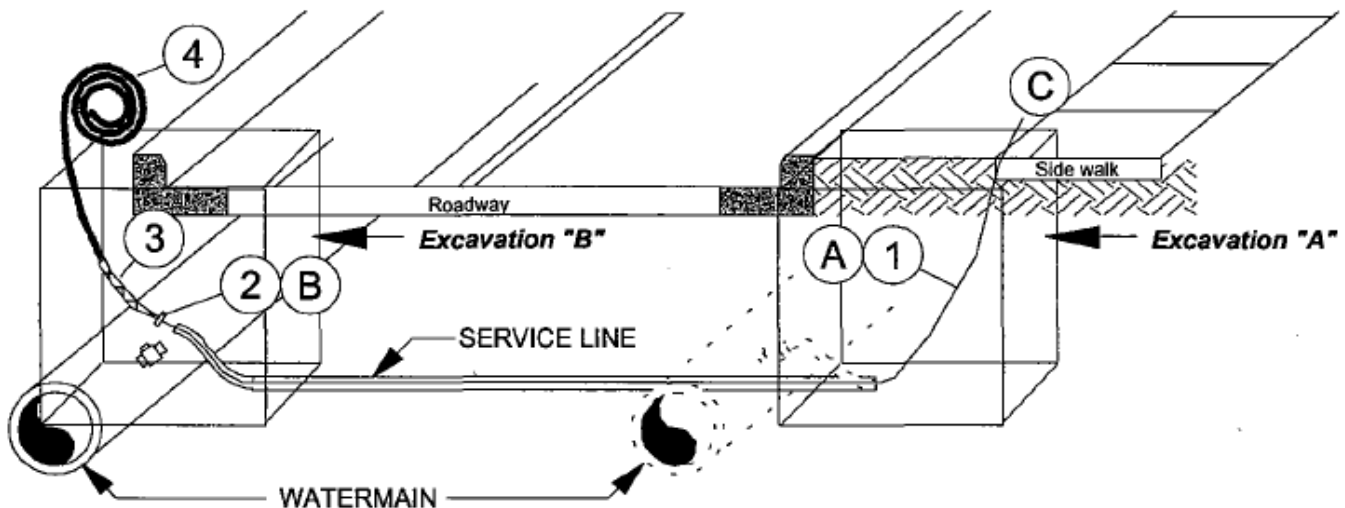
If the water main can be accessed by enlarging Excavation "A", Excavation "B" will not be necessary and the short side service can be removed from the single excavation.

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B - Attach cone or "Push Block" to cable and attach the pulling sock behind that. Secure new copper tubing in pulling sock. Be sure to tape off the new copper service prior to insertion into the pulling sock and make sure that taped off end of the copper service is tight against the rubber ball in the pulling sock. Completely tape off pulling sock to prevent any loose material from entering the new copper service.

C - Pulling equipment may vary. Equipment and procedure shall be approved by the Utility Engineer. The new copper tube service will be pulled in as the old service line is pulled out.

In most instances the portion from the curb box to the main may be pulled without redoing the pulling block assembly by simply removing the old service line that was pulled in the first step from the 3/8" wire rope and rethreading the wire rope through the curb box to main section.



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Curb Box To Building & Main To Curb Box			

FINALIZATION

- Complete connections at main tap and curb stop to new copper service.
- Complete internal connections including installation of new meter assembly as per meter set standards.
- Open new curb stop valve and check for any leaks. Make repairs as necessary.
- Flush new service for 5-7 minutes and provide customer with internal plumbing flushing notice.

"Reference Only"

Prior to beginning the actual replacement of the lead service there is a substantial amount of work that must be done in advance. Scheduling of the replacement with the customer can take many iterations before an acceptable timetable can be reached. Then the utility must coordinate with local Miss-Dig to locate other utilities in the excavation areas.



"Reference Only"

The process begins by shutting off the curb stop to prevent any water in the system from entering the customer's premises. This is especially important to minimize the transfer of any lead particulate into the service or the customer's household piping during the excavation of the corporation at the main.



“Reference Only”

Once the curb stop has been closed the work can then be divided into two different work groups. The first work group can then enter the premises and disconnect the service from the meter assembly. The second work group can then begin the excavation process at the main to expose the corporation fitting. Excavation can be accomplished with either a backhoe or by using a vacuum excavator. The advantage of the excavator is that it can minimize the potential risk to other utilities that can be difficult to locate or may have been miss-marked.



“Reference Only”

Of course there is always a lot of hand digging that must be done as well. Once the corporation is exposed the water is shut off at that location as well. It is important that the excavation of the main and the corporation be controlled to prevent water or soils from entering the corporation or the new service once it is installed.



“Reference Only”

Meanwhile inside.....

While the excavation continues outside the employee inside the residence begins the disconnection of the lead service and preparing the new copper for installation. We are also replacing the water meter at the same time since we already have access to the property.



“Reference Only”

One of the most important steps in getting the new copper line ready for installation is the sealing of the new service before it is pulled. The end of the copper pipe is covered with electrical tape. The pulling sock is then placed over the end of the copper pipe. Within the pulling sock is a small rubber ball that is pressed against the taped end of the pipe to further prevent any potential particulate from entering the new copper service during installation.



“Reference Only”

Once the corporation is exposed, the excavation then moves to the curb stop. The curb stop is removed by cutting the lead line on both sides of the curb stop. Then a line is fished through the lead line from the curb stop to the inside and a 3/8" steel cable is pulled back through the service.



“Reference Only”

The copper pipe is then connected to the pulling harness and the harness is connected to the steel cable. Using the backhoe, the lead service is pulled out of the ground from the basement to the curb stop.



"Reference Only"

Once the copper pipe is visible in the curb stop excavation, the process stops to allow the cable to be removed from the backhoe and it is then rethreaded through the portion of the lead service line between the curb stop and the corporation. The backhoe then pulls the copper line through to the corporation excavation. From there the new copper service is attached to the corporation.



“Reference Only”

Once the copper is attached to the corporation then the copper line is cut in the curb stop excavation and a new curb stop is installed.

