

## Watermain Saddle Tapping Procedure

### 1. IDENTIFY MAPS NEEDED

- a. For the location of the affected area or areas
- b. The location of the valve or valves, watermain and services which will be used in a specific order to be able to isolate and get control of the affected area
- c. Locate and mark water lines

### 2. BEFORE COMMENCING ANY WORK

- a. Secure the work area with proper cones, barricades, and traffic signs to protect the general public as well as the workers within the work area
- b. Follow all current legislation and complete all applicable forms "Ministry of Transportation Ontario Traffic Control Manual Book 7"

### 3. SADDLE TAPPING TOOL CHECK LIST

- a. Tapping Machine - There are a number of acceptable tapping machines available. Most taps are made with Footage Tools Main Line tap machine, Modified Mueller B, Mueller B100, or Hays B1. Whichever machine is used, it must have a standard ratchet handle on the boring bar and yoke or feed nut.
- b. The machine must also conform to the outside diameter of the pipe. Thoroughly inspect the machine before use to ensure that the boring bar is secure and does not wobble
- c. The cutter must be specifically designed to cut PVC so that the coupon is retained or have a bit designed to drill through metal.
- d. The cutter should provide a milling action as it is the coolest method of cutting and minimizes loss of shavings into the pipe
- e. The cutter must be in good condition and sharp.
- f. Do not use a twist drill or auger bit for PCV taps
- g. Main Stop - AWWA threads are recommended. Threads must conform to the saddle
- h. Only use saddles that fully support the circumference of the pipe and have a width of at least 2" (50 mm) along the axis of the pipe. Do not use saddles with U-bolt type straps or bolts/nuts that dig into the pipe when tightened
- i. Cutter Lubricant - Special lubricant should be available from the tapping tool manufacturer. The lubricant reduces the amount of heat generated and extends the life of the cutter and tapping tool
- j. Thread sealant should be applied to the main stop before insertion into the saddle

#### 4. CHOOSING A SADDLE TAP LOCATION

- a. Brittleness in PVC pipe does increase with reduced temperature and contractors are advised to use extra precautions when handling or installing PVC pipe in colder temperatures.
- b. Do not tap closer than 2' (600 mm) from the end of the pipe or 2' (600 mm) behind the bell
- c. Do not tap into a discolored surface or next to any deep scratches, gashes or other abnormalities on the pipe
- d. Do not install two taps within 20" (500 mm) of each other on the same length of pipe
- e. Do not place two taps in a straight line on the same length of pipe. They should be staggered, with respect to each other, around the pipe radially
- f. Tapping a curved pipe is not recommended. If unavoidable, only tap a curved pipe that has a bend radius of less than 300 times the pipe diameter
- g. Saddle taps may be located at 90° and 45° from the crown of the pipe.
- h. Stay as close to the horizontal as possible

#### 5. PERFORMING A SADDLE TAP

- a. Attach the saddle to the main. Tighten each side alternately until both are tightened with the same amount of torque. Be careful not to distort the diameter of the pipe by overtightening the saddle
- b. Insert the main stop. Apply sealant and thread the inlet side of the main stop securely into the saddle boss. Do not overtighten
- c. Open the main stop. Remove the tube nut from the main stop. If the outlet has a compression connection, remove the compression nut and gasket, making sure to keep the gasket in the nut facing the same direction as assembled by the factory. Make certain the main stop is in its fully opened position
- d. Attach the proper machine adaptor and gasket to the drilling machine. The size and type depends on the size and type of outlet connection.
- e. Attach the correct size of tapping cutter to the drilling machine
- f. Lightly lubricate the outside of the cutter with pipe lubricant
- g. Attach the tapping machine with cutter, adaptor and gasket to the main stop
- h. Check again to ensure that the main stop is in the fully open position.
- i. Advance the boring bar until the cutter contacts the pipe.
- j. Rotate the boring bar clockwise by steady continuous motion and drill the pipe. Do not use a ratchet-type motion
- k. When the main is drilled, retract the cutter from the pipe.
- l. Close the main stop.
- m. Remove the tapping machine and adaptor from the main stop
- n. Remove the coupon and chips from the cutter after each cut with a punch, nail or screwdriver. Examine the PVC coupon after it comes out of the cutter. A clean, smooth edge means that a good cut was made.
- o. A raised, rough crown means that the cut was poor. If the cut was poor, check the cutter condition and replace if necessary before the next tap

## 6. PERFORMING A DRY TAP

- a. Follow the same instructions as for wet tapping except;
- b. Remove the tapping machine after the hole has been cut and tapped
- c. Remove any shavings from the hole
- d. Prepare the stop as previously described and insert it by hand, being careful not to cross-thread the threads
- e. Tighten the stop using a torque wrench to 27 ft-lb (37 J) with one to three threads showing

## 7. CONNECTING SERVICES

- a. For either tapping method, the service taps should be made between 90° and 45° from the pipe crown. The closer the service tap is to the horizontal, the less likely the service line will extend into the frost zone
- b. All copper and composite pipe service lines should be bent into a "gooseneck" if possible. This practice allows for flexibility and acts as a buffer for the main stop
- c. When using polyethylene service line pipe the service connection should be made on the horizontal and the gooseneck also bent on the horizontal