AM-LINER II® INSTALLATION PROCEDURE
PATENTED

Arrive on Site

Position reel trailer, power unit, and cable winch.

Set up traffic control.

Establish flow diversion.

Begin heating the coil of flat AM-LINER II in the trailer until it is flexible enough to uncoil, pull into the manhole and pass through the shaping device.

Note: Coordinate all activities at the upstream and downstream manholes using two way radios.

UPSTREAM MANHOLE

Position television truck and prepare camera.

Attach camera to high pressure cleaning head.

Televise line, and mark cable to reference laterals.

Note: In some cases it may not be possible or desirable to use the shaping device. To use or not use the shaping device shall be at the discretion of the installer.

DOWNSTREAM MANHOLE

Position high-pressure jet cleaning truck, and jet clean sewer line.

Pull camera back with the high pressure cleaning head.

Remove the camera.

Position the winch for pulling the liner into the sewer over the downstream manhole. Attach the cable from the TV camera to the cable on the liner pulling winch.
UPSTREAM MANHOLE

Install the shaping device at the bottom of the manhole against the entrance to the host pipe. Alternatively the shaping device may be located on the back of the heating trailer or outside of the manhole.

Connect the high-pressure water hose from the cleaning truck to the water spray nozzle assembly on the shaping device.

Pull the cable from the downstream power winch through the host pipe to the upstream manhole using the TV winch. Thread the cable from the downstream winch through the shaping device such that it will pull the liner through the shaping device and into the host pipe when the downstream winch is operated.

Shut off the steam to the coil of AM-LINER II.

Pull the free end of the flat liner from the reel. Prepare the nosepiece by folding approximately three feet of liner in half along the longitudinal axis. Tape the folded liner. Drill holes through the folded liner, then thread a cable or chain through the holes in such a way that it may be quickly attached to the cable from the pulling winch.

Attach the cable from the pulling winch to the cable or chain of the nosepiece.

UPSTREAM MANHOLE

Guide the flat AM-LINER II from the trailer.

DOWNSTREAM MANHOLE

Install the shaping device at the bottom of the manhole against the entrance to the host pipe. Alternatively the shaping device may be located on the back of the heating trailer or outside of the manhole.

Connect the high-pressure water hose from the cleaning truck to the water spray nozzle assembly on the shaping device.

Pull the cable from the downstream power winch through the host pipe to the upstream manhole using the TV winch. Thread the cable from the downstream winch through the shaping device such that it will pull the liner through the shaping device and into the host pipe when the downstream winch is operated.

Shut off the steam to the coil of AM-LINER II.

Pull the free end of the flat liner from the reel. Prepare the nosepiece by folding approximately three feet of liner in half along the longitudinal axis. Tape the folded liner. Drill holes through the folded liner, then thread a cable or chain through the holes in such a way that it may be quickly attached to the cable from the pulling winch.

Attach the cable from the pulling winch to the cable or chain of the nosepiece.

Begin pulling the liner to the downstream manhole using the power winch. The operation must be coordinated with the people at the upstream manhole using two-way radio.
through the manhole and into the shaping device. Position the liner so that the nosepiece is properly oriented in the lower unit of the shaping device.

Start the flow of water to the spray nozzles, then lock the lower shaping disc into contact with the liner and close the upper guide rollers.

Care must be taken not to kink or snag the liner as it is guided from the trailer through the manhole and into the shaping device or through the shaping device and into the manhole.

Note: If the shaping device is not used guide the nosepiece through the manhole and directly into the host pipe. A piece of carpet attached to a rope and soaked with a lubricant should be placed between the liner and the crown of the host pipe at the point of entry. The rope from the lubricate carpet must be secured to the manhole so that the carpet will not be pulled into the pipe. Additionally it is advisable to pour or spray a lubricant such as vegetable oil or oil soap onto the liner as it is pulled through the host pipe.

Cut the liner at street level leaving several feet of extra liner to allow for stress relief. Remove the shaping device.

Continue the pulling operation until the liner arrives at the downstream manhole and the end is pulled around the downstream roller and brought to street level.

Release tension on the downstream winch. Cut and remove the tape around the liner so that it does not obstruct the holes in the nosepiece.

UPSTREAM MANHOLE

Apply steam to the free end of the liner, to make it pliable.

DOWNSTREAM MANHOLE

Lock the reel of the winch.
Insert an inflatable steam rated flow through plug into the end of the liner. Inflate the plug until it causes the liner to bulge. Connect the plug to the steam source.

Apply steam to the liner through the upstream inflatable plug assembly. This starts the stress relief process.

Observe the movement of the liner in the manhole. Continue steaming until no movement of the liner is observed.

Shut off steam flow.

Cut off the excess liner, leaving approximately one foot of liner extending from the host pipe.

Install the inflatable plug and flow through steam assembly inside of the liner. Insert the end of the plug so that when it is expanded it will press the liner tightly against the inside of the host pipe.

Inflate the plug and connect the steam hose.

Block the plug against both horizontal and vertical movement.

Release the reel of the winch and allow slack in the liner. Remove the roller in the manhole.

Observe the movement of the liner in the manhole. Continue steaming until no movement of the liner is observed. This completes the stress removal procedure.
UPSTREAM MANHOLE

Shut off the steam.

Apply steam to the liner.

Increase steam flow until the downstream operator reports that the gauge at his station indicates the target pressure.

Begin timing the process when the temperature at the downstream station reaches 200°F. Maintain steam pressure at the target pressure for the predetermined length of time.

Begin the cooling process. Switch from steam to compressed air. When the change is complete, the operator will immediately communicate with the downstream operator using the words “all air”.

DOWNSTREAM MANHOLE

Cut off the liner in the manhole. Leave sufficient liner extending into the manhole to install the inflatable plug into the liner without having it extend into the host pipe. Inflate the plug until it fits tightly in the liner. Block the inflatable plug against the manhole to prevent movement once the liner is pressurized.

Connect the steam hose from the downstream control manifold assembly to the connection on the inflatable plug assembly in the manhole.

The valve controlling the steam exhaust must be in the fully open position.

Monitor steam pressure and temperature on the control manifold. Report times and temperatures to the upstream operator.

Maintain the target pressure by telling the upstream operator to either increase or decrease steam flow.

When the operator hears the words “all air” he will take control of the cooling process, and maintain the targeted cooling pressure from his control station.

Monitor the air temperature at the downstream station until the gauge indicates a temperature of 80°F. Continue to cool the liner for approximately 30 minutes after reaching that temperature.
UPSTREAM MANHOLE

Shut off the compressed air.

Depressurize the expandable plug from street level before going into the manhole to remove the blocking and the plug.

DOWNSTREAM MANHOLE

Open the downstream valve to release the pressure in the liner.

Depressurize the expandable plug from street level before going into the manhole to remove the blocking and the plug.

Inspect the liner using closed circuit television.

Reinstate the service connections using a robotic cutter.

Trim the ends of the liner.

Note: The above procedures may vary according to conditions and equipment.

1 Self-propelled cameras would also be acceptable to accomplish this task.
2 The methods shown herein to bring the pulling cable from the downstream manhole to the upstream manhole are provided for informational purposes only. Any method which accomplishes this purpose efficiently without damage to the host pipe should also be considered acceptable.
3 The recommended shaping device is manufactured by Express Industries of Plain City, OH.

10/05