OFFICIAL PROCEEDINGS

OF THE

TWENTIETH ANNUAL CONVENTION

OF

The National District Heating Association

HELD AT

STATLER HOTEL, DETROIT, MICH.

June 11, 12, 13, 14, 1929

PUBLISHED BY THE ASSOCIATION

D. L. GASKILL, *Secretary.*

replacement of a bend or fitting would be less expensive than the carrying charges on a larger main at lower velocities."

St. Louis, Mo.—

"With lines as now constructed for mains of extra heavy pipe, all welded, and no flanges, there is no limit on velocity which can be used, but beyond 20,000 or 25,000 feet the pressure drop makes it impractical to reach higher velocities, except on long high-pressure feeders to low-pressure lines. Lines with cast-iron fittings are not safe at high pressure or velocities."

STEAM MAIN CONSTRUCTION IN AKRON, OHIO

During the season of 1928 additional mains were laid to the already existing heating system in Akron and there was considerable discussion as to the type of construction to use both for insulation and the conduit around the pipe. After thoroughly investigating the merits of two different types of construction it was decided to use Ric-wiL split tile with the usual tile-base drain. Inasmuch as a return line system is now in use in this city, the problem of taking care of this return line efficiently and without undue width in the trench was given considerable consideration. It was finally decided to use the type of construction shown on the accompanying blueprint.

The concrete base or, in other words, gutter in which the return is placed was built up of a mixture of concrete, using a 1-2-4 mix with enough calcium in the mixture to aid in setting up the concrete quickly. Pea gravel was used and the whole mixture is poured into the form exceptionally thin. Steel forms were used for this construction and it was the general practice to lay about 250 feet of form at one stretch, and this 250 feet could be easily poured in about two hours' time. Concrete was allowed to set at least ten hours, at which time the forms were easily removed.

The next operation in the construction was the placing and welding of the return line, return being supported by cast-iron saddles and rollers. After the return line was welded the regular Ric-wiL base drain was placed on the concrete base and the next operation was laying the bottom half of the Ric-wiL tile. After the bottom half of the Ric-wiL tile was laid and cemented course gravel was then poured around the tile, up to within about one inch of the Loc-liP joint. It was found that after some

experimenting that it was not advisable to lay the steam main until this crushed rock had been placed around the tile.

The steam main was supported on cast-iron supports and rollers furnished by the Ric-wiL Company, and these supports are placed about fifteen feet apart. No alignment guides were used. Laying the steam main was the next operation and as soon as it was welded the insulation was placed in the bottom half of the tile. The next crew came along with the top half of the tile and the filler was then packed in and the joints cemented. Particular care was used to see that the bottom half of the tile and the top half matched exactly. When the tile were split, each section was numbered and the writer believes that this is half the secret of Ric-wiL type construction—to see to it that the tile matches exactly.

The type of filler used for insulation is what is known as Long Fiber African Asbestos, water-proofed by a patented process of the Ric-wiL Company. Great care was used and rigid inspection made to see that the proper amount of filler was used for a certain size pipe and section of main. The inspector also insisted and saw to it that the filler was not rammed in the tile too tight, as the writer believes that the effectiveness of loose-filler-type insulation is greatly retarded if the same is packed in too tight. After the filler is placed, the bell ends of the tile and the Loc-liP side are cemented and allowed to set for at least five hours, after which the ditch is filled.

All expansion joints on this year's construction were hung from I-beams in the manhole, and these beams were built in with the manhole construction, all manholes being built of brick laid in cement mortar. Expansion joints are bolted to the I-beam and quite naturally hang upside down. So far we have experienced no trouble whatsoever with this type of construction and we have mentioned a few features in favor of this construction as follows:

In nearly every manhole that we have we have room enough for the ordinary man to stand up in the hole and pack an expansion joint.

Gives ample access all around the joint to make a thorough inspection.

One weakness that might be pointed out is the fact of the possibility of the I-beam rusting off flush with the brick wall of the manhole, but

the writer believes that this can be taken care of by a rigid inspection and proper application of water-proof paint.

Expansion joints on the return line are hung directly beneath the steam-main expansion joints, and this cuts down considerably the expense of welding, as there is no necessity of making offsets in the return line to get around a steam-expansion joint.

Whenever possible, services are taken from the service connection provided for on the expansion joints and a valve placed in the manhole so as to control that particular service from one location. We have been very careful to take services across the street large enough so as to be able to supply the maximum amount of radiation from one service which, quite naturally, cuts down the number of street cuts. For instance, one 4″ service laid across one of the principal streets in Akron takes care of seven customers with a total of approximately 40,000 sq. ft. of radiation, branch lines being extended through the various building basements taking care of the different customers. All services wherever possible are laid in Ric-wiL, using the same type of construction as the steam main, with the exception that the steam and return are both laid in the same tile. No services less than 3″ in size or over 5″ are taken into any one building, and we have found out that the 3″ service, with a 2″ return, gives ample supply and steam pressure for any ordinary heating system.

Wherever necessary, steam mains are dripped with Armstrong traps and the traps discharge into the return line. The same method of dripping is used on the steam services and a blueprint is attached showing the standard steam-service connection.

The writer has found that it is decidedly an advantage, both from the maintenance point of view, and from appearance, to use wherever possible all welded fittings. In other words, no cast-iron tees or crosses are used, and these same fittings are made up in the field as the welder lays out his work. To anyone who has not used the cast-iron fittings for steam-service connections it is certainly a revelation and a surprise to see what a neat and mechanical appearance can be made of a steam-service connection by using this method of construction. As far as the writer is individually concerned, no flanged fittings of any kind will be used in future construction for steam-service connections—in fact, we do not have a cast-iron cross or tee or elbow on any of the steam-main construction that was laid during 1928. So far, with over three miles of piping varying from 15″ down to 6″ on our mains, we have the first bad weld to make its appearance. All welding is electric.

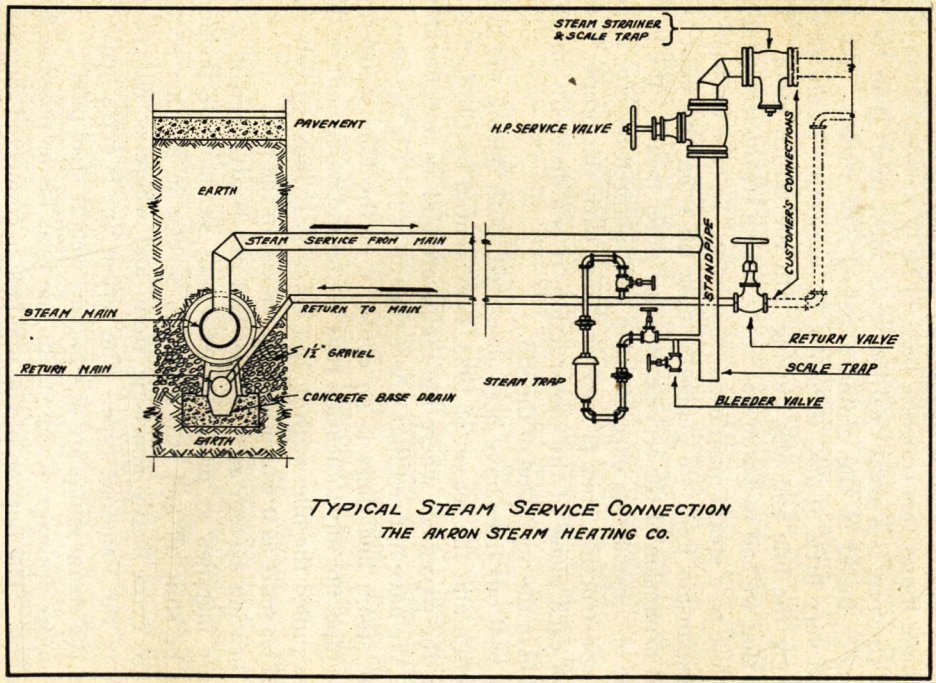
Steam pressure available at the service valve at the present time is not to exceed 100 lbs.

No doubt some of the readers of this article will wonder how our concrete base is standing up since its construction. We have had numerous occasions to cut into the main steam line for service connections, and we have found this concrete base to be in wonderful condition—in fact, the concrete is a great deal harder in most cases than the concrete base usually found in the ordinary paved city streets. We have experienced very little, if any, difficulty in connecting steam services any place along the line and also getting into the return main. The only problem that we had to watch was not to take a steam-service connection off too close to a steam-main expansion joint. In case we were too close to the expansion joint we generally took off from the joint itself and provided expansion of the service by some other means. We have found this type of construction exceptionally well adapted for city streets, and when a construction crew is once working, with the proper foreman in charge of each phase of the construction, it is a decidedly machine-like procession in the operation of the job.

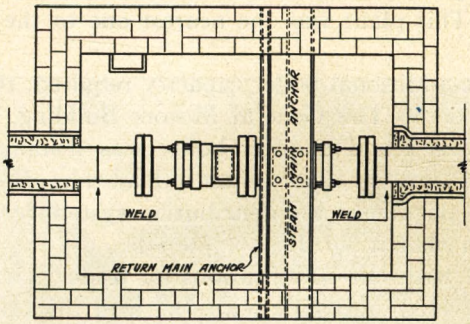
How well our lines have been insulated, both during the first year's construction and the season of 1928, is evidenced by the fact that snow stays on the pavement where the mains are laid an unbelievable length of time. We have noticed that where the top of the tile has been removed from the steam line there is no evidence of the filler shattering away from the pipe, nor any indication that the lateral movement of the steam main has pulled the filler with it, but apparently moves freely inside the filler and leaves it as it was originally packed in the tile.

The heating system as it is now laid out is arranged in a loop and valves are installed at proper intersections so that one portion of the line can be shut off and still maintain service in another section. All valves are extra heavy nonrising stem, and wherever flanges are used they are of the Vanstone type. The return line is extra heavy wrought iron and the steam mains are of standard weight steel pipe.

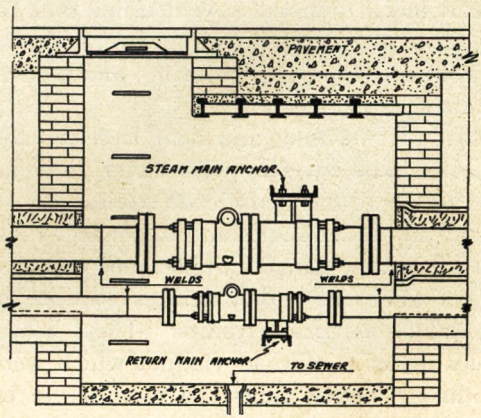
The under-drainage of the steam line is as far as possible drained to the manhole. The bottom of the manhole is connected directly through a Pea trap to the sewer. So far we have experienced no difficulty whatever with this type of drainage working satisfactorily:



TYPICAL STEAM SERVICE CONNECTION
THE AKRON STEAM HEATING CO.



PLAN OF MANHOLE ARRANGEMENT



SECTIONAL ELEVATION OF MANHOLE