

PAVEMENT RECONSTRUCTION AND REPAIRS  
INCURRED BY WATER SERVICE CONNECTIONS  
AND OTHER UTILITIES

Clyde E. Williams, City Engineer,  
South Bend, Indiana

The preparation of this report has been stimulated not only by the desire to be of service to the waterworks field in general, but also by the desire to correct an undesirable condition that exists in a municipality with which the writer is directly interested.

It was first intended to make a thorough study of the methods and materials used in repairing pavements after cuts were made for water service connections. A brief review, however, revealed that any number of agencies might be doing the repair work, and that recommendations in all probability would fall by the wayside unheeded, unless the responsibility was confined to a few agencies with sufficient experience to do the work. A study of the procedure followed in making service connections was felt to be more advantageous at this time, followed later, possibly, by recommendations as to the method of repairing pavement cuts.

To determine the general picture of the various water works throughout the state, a questionnaire was prepared asking the procedure, its satisfaction, and recommended changes.

The questionnaire was sent to every known water supply in Indiana and required 309 communications. The writer appreciates the splendid co-operation of the water works men in their immediate response. One hundred and thirty-nine replies were received, and all questions were answered except in one case, and that was because the water works was not completed.

**Question No. 1.** Who is permitted to make service connections to a water main?

Of the 101 municipal water supplies responding, 21 permit plumbers to make the service connections. In 79, the connections are made by the water department, city employed plumbers, or some department of the city, and one supply under construction did not answer the question.

Of the 38 private water supplies reporting, 5 permit plumbers to make the service connections. In 30, the connections are made by the company, in two by the street department, and in one anybody is permitted to make the connection.

**Question No. 2.** Is a bond protecting the city against liability required?

Of the 21 municipal supplies permitting private plumbers to make service connections, only six require a bond. This seems unusual in that the city is not protected from liability

in case of accident due to an opening in the street; nor is the water works assured of satisfactory workmanship. For the municipal supplies doing their own construction work, a bond is not essential because the city, as a civil city, or as a water works, is liable in either case.

Of the 38 privately owned supplies, 15 require bond, 20 do not, and three did not report on this question. Undoubtedly the private supplies doing their own work, yet not bonded, provide some other means of protecting the city against liability, probably by franchise or contract; however, in only one of the five permitting plumbers to do work in the street, are bonds required. Neither is the city or the water supply protected against improper workmanship or liability.

**Question No. 3.** Is a permit for cutting into the street required?

In analyzing this question no effort was made to distinguish between private and municipal supplies, since the permit, if issued, is for the purpose of controlling the pavement repair and not the service installation. Eighty supplies require permits, 55 do not, and four did not report. Those reporting the issuance of permits only on state highways were classed as not issuing permits, because the State Highway Commission requires permits on all its routes regardless of cities and towns.

**Question No. 4.** Who issues the permit?

Permits are obtained to some extent from practically every department of town and city government. In the majority of the towns and 5th-class cities, they are obtained from the clerk. Some are obtained from the board of trustees, some from the water department, and one from the town marshal.

In the larger cities, all permits are obtained from the engineering department, the water department, the street department, the board of works, or the plumbing inspector. This is to be expected, in that all of these departments are under the jurisdiction of the board of works.

**Question No. 5.** Who makes the pavement repair?

Excluding state highways, which are repaired by the State Highway Department, a majority of the pavement repair work is done by the street department. Thirty-five municipal supplies and 20 private supplies do their own repair work, and in three instances plumbers are allowed to do the repair work.

**Question No. 6.** What charge is made for pavement repair?

In 62 cities and towns no charge is made for repairing the pavement. A strict analysis of these cases against the cost of the water service was not made, but in all probability some of them at least have absorbed part of the cost in the charge for service connections.

In a majority of these cases when charges are made, they are for actual material and labor costs. In a few instances charges are made of from 19c per square foot to \$6.00 per square yard, with \$3.00 per square yard being about standard. In a very few cases a flat charge is made per opening, with \$3.00 being about average.

Very little reference was made to types of pavement, and it would appear that, when charges are made by the square yard or square foot, the cost would be the same for all types. Of course, those charging material cost would have a variable total cost.

**Question No. 7.** Is charge made to plumber or direct to property owner?

In 38 cities and towns the cost of the pavement repair is charged directly to the property owner. In 10 cases the charge is made to the plumber, who in turn adds it to his bill. All others either make no charge or have it incorporated in the service charge.

**Question No. 8.** Is the procedure practiced in your city satisfactory?

This question was added to the questionnaire to determine whether or not the superintendent was satisfied with the practice in his community and to encourage a statement from him.

**Question No. 9.** What changes would you recommend, if any?

This question was asked to secure recommendations. In only two cases was this question answered "none" and a statement was not given.

### CONCLUSIONS

It is quite evident from the information submitted in the questionnaires that only those directly connected with the water works or company should be permitted to make service connections. This is borne out by general practice and the recommendations of the superintendents.

In the writer's own case, as an illustration, the local plumbers make all service connections unless they have been installed by a contractor prior to paving construction. They are required to obtain a permit for the excavation from the engineering department. In many instances, they start the excavation before obtaining the permit and before they have located the main from the records. As a result, more cuts are made than necessary and the street department is not informed, all of which put added expense and liability on the city. It is desirable to keep all service departments, such as the police and fire departments, informed of obstructions in the streets; but unless permits are obtained this cannot be done.

In some cases it is more desirable and economical to make service connections for corner lots to the side street. If the plumber does not obtain his permit in advance, he cannot be advised of this.

Plumbers are not permitted to tunnel under the pavement; but it is done at times and he charges the property owner for pavement repair the full width of trench from the main to the curb. Open trenches are not backfilled properly, and it is difficult to replace the pavement in a reasonable time. Of course, the pavement is sure to settle over the tunnel section, thus increasing the maintenance.

The questionnaire reveals that a majority of cities and towns do the pavement repair work for both municipal and private water supplies. This seems logical, since all cities and towns must provide some means of repairing and maintaining their paved and unpaved streets. It is recommended that the city or town, through its street department or authorized agent, do the repair work for both municipal and private water supplies.

A permit should be issued at the time the contract is written, or at the time the order is written or given to the construction department. One copy of the permit should be given to the billing department or agency, and one copy to the department or agency making the repair. Either of these agencies should be held responsible for notification of other service departments.

Any changes in the cost of pavement repair should be referred to the water works or company, so that a corresponding change can be made in the contract with the property owner.

The ideal condition would be for the water works or company to construct, maintain, and repair all service lines to the property line. It was found from the questionnaires that this is done in some instances. However, for all cities and towns to adopt this method would be practically impossible. Many cities and towns have ordinances in effect establishing a plumbing code with regulatory measures to the curb line and under the jurisdiction of a plumbing inspector. To endeavor to change or modify this ordinance would create an endless amount of opposition by the plumbers. Although not perfect, better control of the work done in the roadway under expensive pavements would solve a major portion of the problems.

A model ordinance with rules and regulations covering this work is submitted for your consideration.

#### MODEL ORDINANCE

An ordinance to regulate and govern the excavation, backfill, and pavement repair of streets, alleys, and public thoroughfares of the

City of \_\_\_\_\_, Indiana, for the purpose of making service connections to water mains, to limit the work to water company employees, and to establish rules and regulations for the execution of such work and provide a penalty for violation thereof.

Section 1. Be it ordained by the Common Council of the City of \_\_\_\_\_, Indiana, that it shall be unlawful for any person, persons, firm or corporation to excavate between curb lines (property lines) of any street, alley, or public thoroughfare in the City of \_\_\_\_\_, Indiana, for the purpose of making service connections to water mains between curb lines (property lines) of said street, alley, or public thoroughfare, except duly authorized employees of the water works company owning said water mains.

Section 2. The Board of Public Works and Safety is hereby authorized to adopt reasonable rules and regulations, not in conflict herewith, governing the excavation work, backfill, and pavement repair necessary in making service connections to the water mains in the streets, alleys, and public thoroughfares of the City of \_\_\_\_\_, Indiana.

Section 3. Any person, persons, firm or corporation violating any provision of this ordinance shall be deemed guilty of misdemeanor, and upon conviction thereof shall be punished by a fine of not less than \$25.00 nor more than \$100.00, and each violation shall constitute a separate offense.

Section 4. If any section or provision of any section of this ordinance shall be held to be void, ineffective, or unconstitutional, the holding of such section or provision of any such section to be void, ineffective, or unconstitutional for any cause whatsoever, shall not affect the validity of the remaining sections and provisions of this ordinance.

Section 5. All ordinances or parts of ordinances in conflict herewith shall be and are hereby repealed.

Section 6. This ordinance shall be in full force and effect from and after its passage by the Common Council and its approval by the Mayor.

MEMBER OF COMMON COUNCIL OF THE CITY OF \_\_\_\_\_, INDIANA.

**RULES AND REGULATIONS**

**Governing Excavations, Backfill, and Pavement Repair Necessary in making Service Connections to Water Mains  
Adopted by the Board of Public Works and Safety**

1. **Permit.** A permit shall be required and issued by the Board of Public Works and Safety or its duly authorized agent for excavation between curb lines (property lines) of any street, alley, or public thoroughfare for the purpose of repairing or installing water mains and/or service lines.

Permits shall be numbered and in triplicate, the original for the Water Works Company, the first copy for the Street Department, and the second copy for billing and filing by the Board of Public Works and Safety.

The permit shall indicate the date and certify that the Water Company having filed a petition therefor is granted a permit to

NOTE: This ordinance is applicable to cities or towns with a municipal or privately owned water supply by changing the names for the particular case. It has been written in this form for simplicity only.

open (street name) Street, in front of (street number) owned by (owner's name), for the purpose of construction (repairing) main (service connection). Said work to be done under provisions of ordinance number . . . . ., and rules and regulations in force relating to such work. The permit shall also indicate the kind of pavement, size of cut, square yards to be removed, and the cost per square yard.

A charge of 25 cents shall be made at the time of issuance of each permit to cover cost of billing.

The original of the permit shall at all times be in the possession of a competent representative of the Water Works Company on the site and shall be shown to any police or authorized agent or employee of the Board of Public Works and Safety upon request.

**2. Performance Bond.** The Water Works Company shall post a performance bond with surety approved by the Board of Public Works and Safety in the penal sum of \$ . . . . . guaranteeing satisfactory completion of the work being done by the Water Works Company in accordance with all ordinances, rules and regulations governing same. Said bond shall be for one year and a new bond shall be written each year thereafter.

**3. Public Liability and Property Damage.** The Water Works Company shall post a bond with surety approved by the Board of Public Works and Safety in the penal sum of \$ . . . . . or obtain public liability insurance in the same amount, holding the City free and harmless from all claims for damages on account of the negligence or misfeasance of the Water Works Company and from all cost and expense growing out of the defense of such claims. Said bond or insurance policy shall be for one year and a new bond or insurance policy shall be written each year thereafter.

**4. Inspection.** All work shall be inspected by the Board of Public Works and Safety or its duly authorized agent, and the Water Works Company shall be billed for such inspection service upon completion of the work at the rate of \$ . . . . . per hour while the inspector is on the work.

**5. Improper Construction.** The Water Works Company shall agree that the Board of Public Works and Safety or its duly authorized agent shall at all times have the right and authority to correct any and all omissions in the conduct of the work and to have the power to take possession of and to do all of the work and charge the expense thereof to the Water Works Company. Upon failure of the Water Works Company to pay promptly for said service, the Board of Public Works and Safety shall file its claim therefor with the bonding company.

**6. Compliance with Permit.** In no case shall the Water Works Company open or remove a greater area of surface or any location other than that specified in the original application without first obtaining a supplementary permit.

**7. Protection.** The Water Works Company during the progress of the work shall provide and maintain such barricades, signs, lights, and watchmen as may be necessary to prevent avoidable accidents to the public and adjoining tenants. Temporary approaches to abutting property and crossings of intersecting streets shall be provided for the convenience of the public and kept in good condition where practicable. The sidewalks or portions of the street adjoining the work or its vicinity shall not be littered or obstructed more than necessary and the drainage to storm sewers and ditches shall at all times be kept clean and unobstructed.

**8. Excavation.** Excavation shall be open cut from the surface and no tunneling and drifting will be permitted except by permission or when so noted on the permit. The amount of trench opened at one

time and also the amount unfilled shall be subject to the decision of the Board of Public Works and Safety or its duly authorized agent. No trench or excavation shall be undercut or have a greater width at the bottom than at the top. When necessary or required by the Board of Public Works and Safety or its duly authorized agent, the sides of the trench shall be sheathed and braced and rendered secure until the construction has been laid therein and the trench refilled. In rock excavation all drilling and blasting shall be conducted with the greatest possible care and all possible precautions taken to guard against accidents.

**9. Other Subsurface Structures.** Care shall be taken not to move or disturb other subsurface structures; and in crossing these or running parallel with or near them, they shall be securely hung, braced, and supported in place until the work is completed. The Water Works Company shall maintain their respective services and shall repair all damage done to any of said structure.

**10. Backfill.** All excavations shall be carefully refilled promptly after the completion of the structures with such of the excavation materials as may be suitable. All materials used for backfill shall be in proper condition; all frozen, wet, or soggy earth must be removed and replaced with material of proper consistency. Coarse or lumpy earth must be pulverized before it is returned to the trench. No rock fragments larger than eight inches in any dimensions shall be placed in the trench. The spaces between the pieces of rock shall be filled with earth and tamped. Earth fill shall be placed in layers not exceeding six inches and thoroughly tamped with iron rammers not over 36-square inches face and not less than twenty pounds weight, or with an approved mechanical tamper. All backfill shall be done in the ratio of one man shoveling to two men tamping or ramming. Puddling or jetting may be done only by special permission or by the direction of the Board of Public Works and Safety or its duly authorized agent. In the case of any deficiency of proper material for backfilling, the same shall be supplied by the Water Works Company. All pavement materials that can be reused shall be laid aside for future use. The Water Works Company shall be held responsible for the preservation of such materials. On all unimproved streets the surface of the trenches after being filled and settled shall be finished in a workmanlike manner without needless delay, and shall in every respect be equal in quality and character of materials to the street surface existing previous to the making of the excavation.

**11. Replacing Pavement.** From a point six inches below the base of the pavement the trench shall be widened to nine inches beyond the outside of the original excavation at the bottom of the pavement base. The pavement shall not be disturbed for a width greater than the width of the trench below the enlarged section. Into this enlarged section of trench shall be placed concrete composed of one part cement, two parts sand, and four parts coarse aggregate. The surface of this concrete shall be such as to conform with the original pavement.

**12. Excavation in New Pavement.** When a permit is issued for excavation on a street upon which the contractor's maintenance bond has not been released, the Water Works Company shall be required to secure the consent or permission of the contractor to make said excavation. This agreement shall be in writing and so indicated on the permit.

**13. Supervision.** No replacing of backfill or resurfacing will be permitted during the absence of the duly authorized agent of the Board of Public Works and Safety.

**14. Compliance with Specifications.** All work not herein specified shall be in conformity with the specifications previously adopted by the Board of Public Works and Safety.