

MEMO

To Mr. Waring Hou Location LC
(Office)
Subject Geo Schaumburg Bmt Texas Date 1-12-57
(Write a separate letter on each subject)

Here is some propaganda being
used to keep Granite out of Bmt
specs. It will however be included

Signed Lee Bang

Why there is no substitute for
CAST IRON PIPE



CAST IRON PIPE RESEARCH ASSOCIATION
122 SOUTH MICHIGAN AVENUE
CHICAGO 3, ILLINOIS

Why there is no substitute for **CAST IRON PIPE**

The experience of thousands of water utilities—many have bought and laid cast iron pipe for a century or more—proves that there are certain requirements that pipe must meet if it is to render dependable, economical, long-lived service. Their experience further proves that cast iron pipe meets these requirements—not some of them but all of them. The question the pipe buyer must face, when considering the use of a so-called substitute pipe, is this: Does this pipe meet all of these requirements and has it been proved over a period of years?

These requirements are set forth in the next two pages. Impartial organizations have devised scientific tests to qualify materials for practically all of these points. Test results are specific evidence of suitability of the material.

* * *

Experience is a great teacher. When teamed-up with modern scientific research and development it is unbeatable as a

guide and mentor to the producer as well as to the buyer of his product.

For years, the Cast Iron Pipe Research Association has conducted laboratory and field performance tests of cast iron pipe. It has sponsored numerous research and test projects through leading universities, research organizations and other scientific bodies. Some of these projects were undertaken to determine the strength characteristics of cast iron pipe compared with those of substitute pipe. For example, recent impartial tests of the comparative strengths of cast iron and asbestos-cement pipe, made by an independent research laboratory of national reputation (name on request), will be found in the eight charts shown in this brochure. Specimens of both kinds of pipe were bought in the open market. Cast iron pipe is 6.8 times stronger than asbestos-cement pipe for beam loads encountered under city streets and 4 times stronger for resisting internal pumping pressure and water hammer.

Check PIPE AGAINST

THESE 10 REQUIREMENTS

Before experimenting with any
substitutes for cast iron underground mains...

Check them against these

TEN QUALITY POINTS OF PROTECTION

1. ASSURED, PROVEN LONG LIFE
2. STRENGTH TO WITHSTAND BURSTING PRESSURE
3. ADEQUATE TENSILE STRENGTH
4. RUGGED INHERENT TOUGHNESS
5. ABILITY TO RESIST HEAVY BEAM LOADS
6. RESISTANCE TO EXTERNAL CRUSHING LOADS
7. IMPERVIOUSNESS—FREEDOM FROM WATER ABSORPTION
8. STRONG, PERMANENT TIGHT JOINTS
9. STRENGTH AND STRUCTURAL QUALITIES FOR TAPPING
10. ASSURED HIGH FLOW CAPACITY

ALSO

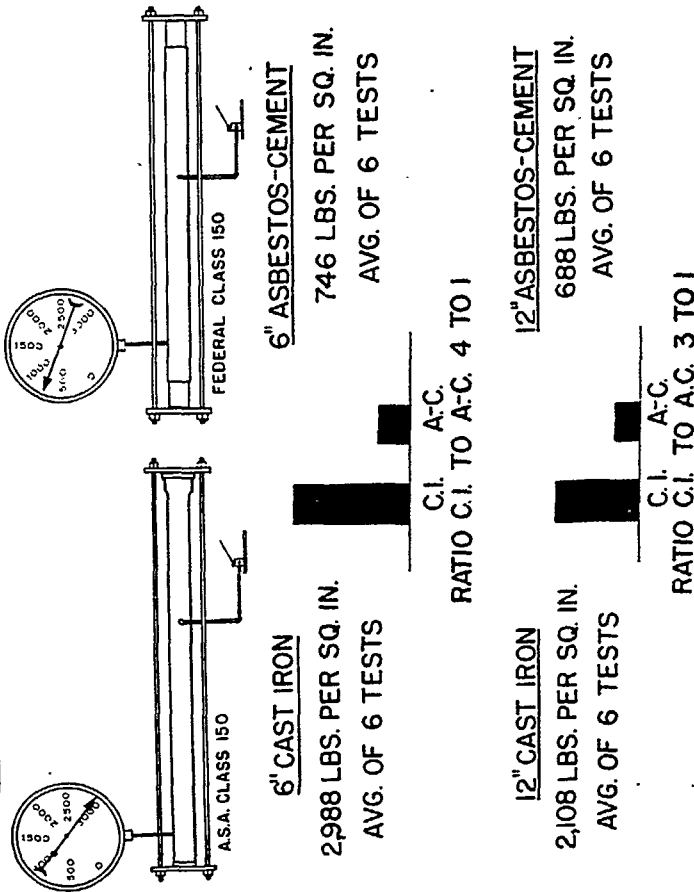
Check THESE ADDITIONAL 10 POINTS

Before experimenting with any
substitutes for cast iron underground mains.

11. SPECIFICATIONS CONTROLLING MANUFACTURE
12. HANDLING AND LAYING
13. ADAPTABILITY WITH STANDARD FITTINGS
14. LOW MAINTENANCE
15. SALVAGE VALUE
16. LOW COST
17. FACTORS OF SAFETY
18. EXPERIENCE
19. FREEDOM FROM WORRY
20. ABILITY TO THAW WHEN FROZEN

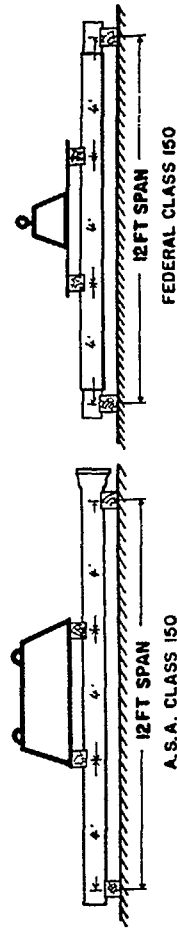
BURSTING: ALL WATER PIPE IS SUBJECTED TO INTERNAL PRESSURE. WHILE THIS PRESSURE IS USUALLY MUCH LESS THAN THE ULTIMATE STRENGTH OF THE PIPE, IT SHOULD BE BORNE IN MIND THAT WHILE PIPES SELDOM FAIL DUE TO INTERNAL PRESSURE ALONE, THEY DO FAIL BECAUSE OF THE COMBINED INTERNAL PRESSURE PLUS WATER HAMMER AND EXTERNAL STRESSES. A PIPE WITH HIGH BURSTING STRENGTH HAS RESERVE TO RESIST OTHER STRESSES—TRAFFIC LOAD—EARTH LOAD.

INTERNAL PRESSURE REQUIRED TO BURST PIPE



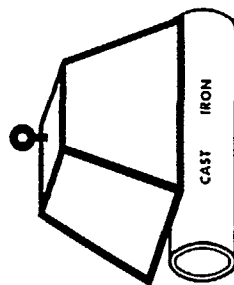
EXTERNAL LOAD REQUIRED TO CAUSE FAILURE AS A BEAM

THIS TEST REPRESENTS CONDITIONS WHERE PIPE IS UNEVENLY SUPPORTED OR WHERE BEDDING HAS BEEN DISTURBED BY SUBSEQUENT UNDERGROUND CONSTRUCTION. DEFLECTION IS IMPORTANT—BENDABILITY OF PIPE IS DESIRABLE.

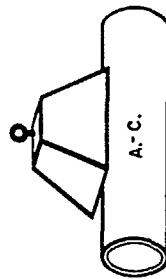


EXTERNAL LOAD NECESSARY TO CRUSH PIPE AS A RING

RINGS 12 INCHES LONG ARE LOADED TO DESTRUCTION. THE LOADING IN THIS TEST CORRESPONDS TO LOADING THAT CAN OCCUR WHEN PIPE REST ON UNYIELDING SUPPORT SUCH AS ROCK-BLOCKING-VAULT WALL.



A.S.A. CLASS 150



FEDERAL CLASS 150

6" CAST IRON

17,900 LBS.

AVG. OF 12 TESTS



C.I. A-C.

RATIO C.I. TO A-C. 28 TO 1

12" CAST IRON

13,380 LBS.

AVG. OF 6 TESTS



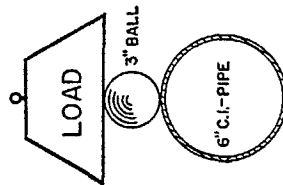
C.I. A-C.

RATIO C.I. TO A-C. 1.7 TO 1

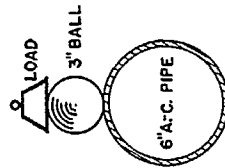
CONCENTRATED LOAD NECESSARY TO CAUSE LEAK

THIS CONDITION CAN OCCUR WHEN PIPE RESTS ON SHARP ROCK, BOULDER OR ON OTHER PIPE.

LOAD APPLIED TO PIPE THROUGH 3" STEEL BALL



A.S.A. CLASS 150



FEDERAL CLASS 150

6" CAST IRON

15,060 LBS.

AVG. OF 6 TESTS



C.I. A-C.

RATIO C.I. TO A-C. 2.9 TO 1

6" ASBESTOS-CEMENT

5,166 LBS.

AVG. OF 6 TESTS

PRESSURE NECESSARY TO CAUSE FAILURE IN PIPE OR JOINT WHEN JOINTS ARE RESTRAINED. THE TEST RESEMBLES CONDITIONS IN THE ORDINARY WORKING LINE.



A.S.A. CLASS 150

6" CAST IRON

BELL & SPIGOT

3,008 LBS. PER SQ. IN.

FAILURE - 4 BURST PIPE

FAILURE - 2 JOINT LEAKS

AVG. OF 6 TESTS

MECH. JOINT

2,871 LBS. PER SQ. IN.

FAILURE - 6 BURST PIPE

AVG. OF 6 TESTS

BELL & SPIGOT MECH. JOINT

C.I.

C.I.

A-C.

12" CAST IRON

BELL & SPIGOT

806 LBS. PER SQ. IN.

FAILURE - 4 JOINT LEAKS

AVG. OF 4 TESTS

MECH. JOINT

1,850 LBS. PER SQ. IN.

FAILURE - 4 BURST PIPE

AVG. OF 4 TESTS

BELL & SPIGOT MECH. JOINT

C.I.

C.I.

A-C.

FEDERAL CLASS 150

6" ASBESTOS-CEMENT

520 LBS. PER SQ. IN.

FAILURE - 4 BURST PIPE

FAILURE - 2 BURST SLEEVES

AVG. OF 6 TESTS

RATIO B&S TO A.C. 5.8 TO 1

M. J. TO A.C. 5.5 TO 1

BELL & SPIGOT MECH. JOINT

C.I.

C.I.

A-C.

12" ASBESTOS-CEMENT

440 LBS. PER SQ. IN.

FAILURE - 1 BURST PIPE

FAILURE - 3 BURST SLEEVES

AVG. OF 4 TESTS

RATIO B&S TO A.C. 1.8 TO 1

M. J. TO A.C. 4.2 TO 1

BELL & SPIGOT MECH. JOINT

C.I.

C.I.

A-C.

PRESSURE NECESSARY TO SEPARATE PIPE OR CAUSE LEAKS WHEN JOINTS ARE UNRESTRAINED THIS CONDITION CAN EXIST AT DEAD ENDS AND HYDRANT LEADS.



A.S.A. CLASS 150

6" CAST IRON

BELL & SPIGOT

466 LBS. PER SQ. IN.

AVG. OF 6 TESTS

MECH. JOINT

223 LBS. PER SQ. IN.

AVG. OF 6 TESTS

BELL & SPIGOT MECH. JOINT

C.I.

C.I.

A-C.

12" CAST IRON

BELL & SPIGOT

222 LBS. PER SQ. IN.

AVG. OF 4 TESTS

MECH. JOINT

124 LBS. PER SQ. IN.

BELL & SPIGOT MECH. JOINT

C.I.

C.I.

A-C.

FEDERAL CLASS 150

6" ASBESTOS-CEMENT

22.6 LBS. PER SQ. IN.

AVG. OF 6 TESTS

RATIO B&S TO A.C. 20 TO 1

M. J. TO A.C. 10 TO 1

BELL & SPIGOT MECH. JOINT

C.I.

C.I.

A-C.

12" ASBESTOS-CEMENT

6.6 LBS. PER SQ. IN.

AVG. OF 4 TESTS

RATIO B&S TO A.C. 33 TO 1

M. J. TO A.C. 19 TO 1

BELL & SPIGOT MECH. JOINT

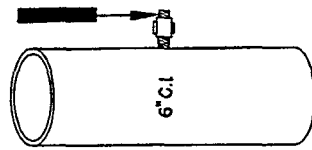
C.I.

C.I.

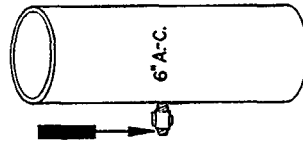
A-C.

TAPPING STRENGTH

LOAD NECESSARY TO FORCE CORPORATION STOP OUT OF PIPE, - LOAD APPLIED PARALLEL TO PIPE. THIS STRESS CAN HAPPEN WHEN SHIFTING OF PIPE OR SERVICE OCCURS.



A.S.A. CLASS 150



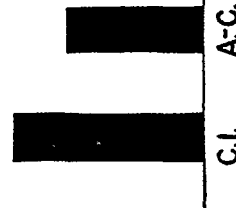
FEDERAL CLASS 150

6" CAST IRON

1,488 LBS. [⊗]
AVG. OF 6 TESTS

6" ASBESTOS-CEMENT

1,097 LBS. [⊗]
AVG. OF 6 TESTS



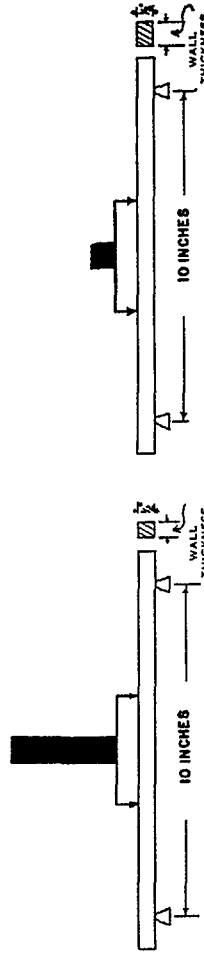
C.I. A.C.

RATIO C.I. TO A-C. 1.4 TO 1

⊗ CORPORATION STOP FAILED NOT THE PIPE

⊗ IN EACH CASE CORPORATION STOP TORE OUT OF PIPE

STRIP TEST: THE TEST OF A STRIP CUT FROM THE PIPE IS A MEASURE OF THE STRENGTH OF THE MATERIAL OF WHICH THE PIPE IS MADE. THIS TEST KNOWN AS THE TALBOT STRIP TEST IS ONE OF THOSE REQUIRED BY STANDARD CAST IRON SPECIFICATIONS. THE STRIP TESTED HAS A WIDTH EQUAL TO THE WALL THICKNESS AND A DEPTH OF $\frac{1}{2}$ ". IT IS TESTED AS A BEAM ON A 10" SPAN AND LOADED $3\frac{1}{3}$ " FROM EACH SUPPORT.



A.S.A. CLASS 150

FEDERAL CLASS 150

6" CAST IRON

494 LBS.
AVG. OF 24 TESTS

6" ASBESTOS-CEMENT

72 LBS.
AVG. OF 24 TESTS



C.I. A.C.

RATIO C.I. TO A-C. 6.9 TO 1

12" CAST IRON

643 LBS.
AVG. OF 18 TESTS

12" ASBESTOS-CEMENT

154 LBS.
AVG. OF 18 TESTS



C.I. A.C.

RATIO C.I. TO A-C. 4.2 TO 1

Summary

The cheapest thing you can buy will usually represent an extravagance in the end—and the end may be sooner than you think. This is unquestionably true when the purchase is pressure pipe for underground water mains. The risk of early replacement of pipe that does not have an adequate history of reliable, long-lived service is a risk most experienced water works operators hesitate to take. Make sure that the pipe you lay will outlast the bond issue by specifying cast iron pipe.

* * *

When you install cast iron pipe, your first installation cost is your last cost. Properly installed, maintenance costs are negligible—little or nothing. Remember that 67 water and gas utilities from the Pacific to the Atlantic, from Canada to the Gulf of Mexico, have cast iron underground mains in service that were laid 100 or more years ago.

[illegible]