

244

HOBOKEN,
N. J.

March, 1933

Report No. 244

NATIONAL BOARD OF FIRE UNDERWRITERS
COMMITTEE ON
FIRE PREVENTION AND ENGINEERING STANDARDS

REPORT
ON THE
CITY OF HOBOKEN, N. J.

(Superseding that of 1923)

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The investigation of conditions in Hoboken, N. J., was made during October and November, 1932, by Engineers Edward L. Zeltner, S. Q. Stoneiseifer and Geo. J. Lyon.

Acknowledgment is made of the valuable assistance rendered by the Hon. Bernard N. McFeely, Mayor; the officials of the various city departments concerned; the Jersey City Water Department, and others.

Office Engineers

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March 11, 1933

HOBOKEN, N. J.

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(Superseding that of 1923)

CITY IN GENERAL

The commissioners of the commission government are Hon. Bernard N. McFeely, Mayor and Commissioner of Public Affairs; Joseph A. Clark, Commissioner of Public Safety; William Geipert, Commissioner of Finance; Michael Kearns, Commissioner of Streets and Public Improvements, and Adolph Carsten, Commissioner of Parks and Public Property.

Population estimated to be 59,000; the 1930 U. S. Census showed 59,261. The city is important as a center of shipping and transportation, several trans-Atlantic and coastwise steamship lines and two railroads using the city as a terminal. Other important industries are ship repairing and allied industries, woodworking and the manufacture of machinery, scientific instruments, lead pencils, varnish and metal goods.

The city covers an area of about $1\frac{1}{4}$ square miles, about 9/10 of which is built upon. The surface is generally flat. Elevations range from mean high water to 100 at the top of Stevens Point Terrace in the eastern part of the city. The grades generally average about one per cent, but some streets, notably 4th and 8th streets in the vicinity of Washington street, have grades around five per cent. Washington and Hudson streets are respectively 100 feet and 80 feet in width; other north and south streets are 65 feet and those running east and west are mostly 50 feet wide.

There are 27.6 miles of streets, of which 25.4 miles are paved, and mostly in good condition.

Overhead wires would form obstructions to fire department operations in many places. Bituminous coal and anthracite screenings are used for manufacturing purposes, and anthracite coal and manufactured gas for domestic purposes.

Records of the U. S. Weather Bureau Station at New York, on the opposite side of the Hudson river, show that high winds are frequent, with the prevailing direction from the northwest; as Hoboken is situated in a hollow adjacent to the high ridge forming Jersey City Heights, its wind velocities are probably somewhat lower than at New York. The average snowfall is such as to cause little interruption to traffic. There is practically no continuous severe cold weather; periods of hot, dry weather are infrequent.

The gross fire loss for the five years ending December 31, 1931, as given in the fire department records, which do not include many small losses or those incurred by fires on ships, was \$1,543,472. The annual loss varied from \$121,296 in 1928 to \$809,330 in 1930; the latter included a serious pier fire aggregating a loss of \$565,000. The average annual number of fires was 233, varying from 243 in 1930 to 217 in 1931, with an average loss per fire of \$1,324, a very high figure. Based on an estimated average population of 57,000, the average annual number of fires per 1,000 population was 4.1, a moderate number, and the average loss per capita was \$5.41, a high figure.

FIRE-FIGHTING FACILITIES

WATER SUPPLY

OWNERSHIP.—The municipality operates the distributing system the major portion of which it owns; a small amount of pipe, mostly along the waterfront, is still in private ownership. Supply is purchased from Jersey City which owns and operates the supply works and all mains up to the city limits.

ORGANIZATION.—The municipal control is vested in the Commissioner of Revenue and Finance who appoints the subordinate officials, with the confirmation of the City Commissioners. William H. Gilfert, Commissioner of Revenue and Finance, is water registrar, John P. Field assistant water registrar, George Bach, chief clerk. Thomas Haggerty, superintendent, is in charge

of maintenance and construction. There are 19 permanent employees. No civil service regulations prevail.

An agreement between Hoboken and Jersey City, which expires November 1, 1933, specifies that water shall be delivered at the city line under a static pressure, at elevation 20, Hoboken datum, of not less than 60 nor more than 65 pounds and that the supply line shall be capable of delivering at the rate of 20,000,000 gallons a day at a pressure of 45 pounds at elevation 20. There are no provisions for renewal, future increase or continuous service.

Records.—Records include an incomplete map of the distributing system showing location of pipes, valves and hydrants, and a notebook kept by the superintendent showing detailed location of gate valves.

Quarters.—Office is in city hall, corner of Washington and Newark streets; shop is on Bloomfield street between Second and Third streets; pipe storage is at Twelfth and Madison streets. Telephones connect all quarters; responsible employees have telephones.

Fire Service and Emergency Operations.—Fire alarms sound on a tapper in the water office. The superintendent answers all alarms, day or night. An emergency repair crew can be assembled quickly.

GENERAL OUTLINE OF SYSTEM.—Supply is received and metered at Newark and Marshall streets, Hoboken, where it is delivered through a 36-inch line that connects on Summit avenue at Jersey City reservoir No. 3, with a 60-inch branch from the two conduits from Bonton, and extends about 4,000 feet along Jefferson and Bloomfield avenues, Jersey City, to the point of delivery. A 26-inch reducing to 20-inch main of the Jersey City distributing system from Reservoir 2, connected to the 36-inch main through a pressure regulating valve at a point midway, also extends to the city line. There are also two 12-inch connections with the Jersey City distributing system near Madison street and Newark avenue. Distribution is in a single service.

Elevations in this report are in feet above Hoboken datum, which is mean high tide. The Hoboken datum is 1.2 feet above the United States Coast Survey datum.

SUPPLY WORKS.—See National Board Report No. 234A, August, 1932.

CONSUMPTION.—For 1932 the average daily consumption was 7,300,000 gallons, which,

for a population of 59,000 is 124 gallons per capita. Statistics of consumption are based on daily readings of two 10-inch Protectus meters at the city line. There are 4,932 services, all metered. Large size connections include 45 for fire use only, of which 19 are three-inch, 18 four-, 5 six- and 3 eight-inch; and 51 for commercial use of which 16 are three-inch, 14 four-, 14 six- and 7 eight-inch; also two 6-inch and one 8-inch for combined commercial and fire use. Controlling valves on large services are usually near the street main.

Maximum days occurred on July 22, 1930, with 11,000,000 gallons; on July 29, 1931 with 9,000,000, and on August 30, 1932 with 8,600,000 gallons.

PRESSURES.—Recording gages are maintained at the water office where charts at elevation 32 showed during November, 1932, day pressures averaging 41 pounds and night pressures 4 pounds higher; and at fire headquarters where charts at elevation 25 show day pressures 44 and night pressures 4 pounds higher. The recording gage at the city line, elevation 9, showed pressures on the high side of the regulating valves of 74 to 88 pounds and on the low side from 57 to 62 pounds; occasional irregularity in the operation of the pressure regulators at the city line cause temporary pressure increases, but the regulators are readjusted on such occasions.

In October, 1932, pressures throughout the city showed an average of 46, a maximum of 58 and a minimum of 16 pounds; the average pressure in the principal mercantile district was 47 pounds. Pressures are about 5 pounds less now than in 1924.

DISTRIBUTING SYSTEM.—See accompanying plan. At the southwestern city line the 36-inch main supplies a battery of three meters, one of which is held in reserve, through a manifold the outlet of which connects with a second three-way, 24-inch manifold two legs of which each contain a 24-inch pressure regulating valve and the third a normally closed gate valve. This manifold discharges into a header from which a 24-, a 16- and a 12-inch line supply the distribution. The 16-inch continues back beyond a closed gate to a 20-inch Jersey City line; it also receives a closed connection from the Jersey City. Low service distribution on Henderson street. The 12-inch receives a closed connection from the Jersey City Low service on Grove Street. Closed connections exist with one 30- and one 24-inch supply lines of the Hackensack Water Company, at the northern city limits. An

outstanding feature of the distribution is the lack of cross-connections between the principal arteries, which are of adequate capacity and well arranged, and the minor distributors, which reduces in many localities the quantities otherwise available for protection.

Minor distributors are mainly 6-inch with a small proportion of 8-inch. Gridiron is close; the average length of 6-inch pipe on the long side of blocks between cross-connections is about 450 feet. About 0.4 miles of 6-inch pipe is in dead ends which supply public hydrants.

The total length of mains in the principal mercantile district is 17,900 feet of which 59 per cent. is 6-inch, 24 per cent. 10-inch, 3 per cent. 16-inch, and 14 per cent. 24-inch.

PIPES.—Length and Age.—See Table 1, which includes a small amount of 4- to 20-inch pipe still in private ownership. Most of the mileage was installed subsequent to 1895; about 4 miles of 16-, 24-, and 30-inch mains were laid in 1908 and 1910.

Condition and Cover.—All pipe is tar coated cast-iron. There appears to be only a slight amount of incrustation and tuberculation. Hydrants are not flushed frequently; discharges from hydrants during the flow tests showed considerable sediment. Breaks are infrequent and are usually on small mains.

The usual cover over mains is 4 feet. In the southwestern part of the city, the surface of filled in marsh land continues to subside slowly and necessitates regrading. As a result the mains are as much as 9 feet deep in this region; the older mains on Ferry street are at that depth. Frost penetration rarely exceeds 2 feet; no trouble is reported from frozen mains.

Specifications.—Pipe is purchased as required; a small amount of various sizes is kept on hand for emergencies. Weights correspond with Class B, American Water Works Association specifications.

TABLE 1.—PIPES IN THE DISTRIBUTING SYSTEM, OCTOBER 31, 1932

Diameter Inches	Length, Miles	Per Cent. of Total
3.....	0.23	0.6
4.....	0.23	0.6
6.....	19.21	51.8
8.....	1.88	5.1
12.....	9.80	25.9
16.....	3.72	10.0
24.....	0.98	2.6
30.....	1.25	3.4
Totals.....	37.13	100.0

tions. Pipes are hammer tested at the trench and pressure is generally applied before joints are covered.

Electrolysis.—See page 16.

GATE VALVES.—Number and Type.—There are approximately 313 gates on mains and 375 on hydrant branches. They are set usually with wooden or brick vaults; some are operated through cast-iron extension boxes. The direction of opening is clockwise with some exceptions. The 30-inch valves are set horizontally and geared.

Location and Spacing.—Valves are located generally at street intersections near the property line; some are near the connecting main. In the principal mercantile district the average length of main that would be shut off in case of a break is 810 feet with a maximum of 2,890 feet. Elsewhere throughout the city the average valve spacing is 610 feet, with a maximum of 4,640 feet. Average spacing on the 30-inch line is 910 feet and on the 24-inch 1,250 feet.

Inspection and Condition.—Valves are inspected spring and fall, but no formal records of inspection have been kept. An inspection of 40 valves, 6 to 30 inches in diameter, well distributed throughout the city, indicated generally good maintenance; several needed packing. One 16-inch valve near the source of supply was found to have a broken disc, which was removed with a resulting betterment to the quantities available to the system.

Closing of Valves.—The fire department is notified by telephone when valves shutting off supply to hydrants are operated.

HYDRANTS.—Number and Type.—On October 31, 1932, there were 401 public and 52 private hydrants. Public hydrants are of the post type and all open clockwise; 238 Smith, 103 Darling, 16 Corey and 14 Iowa hydrants have one 4½- and two 2½-inch outlets, and 6-inch gated branch connections with the main. One Darling hydrant has double the above number of outlets. On 4-inch branch connections, 12 not gated, are 28, single 2½-inch outlet McLean hydrants; there are 5 Glamorgan hydrants with one 2½-inch outlet, 3 on 4-inch and 2 on 6-inch ungated branch connections.

How Located.—One hydrant is installed usually at or near each street intersection and an intermediate hydrant in long blocks. Locations are determined by the water registrar and the fire chief.

Drainage.—Hydrants have automatic drip-valves and drain into brick chambers with pock-

ets of loose stone beneath; drainage is generally satisfactory.

Inspection and Condition.—Hydrants are inspected semi-annually when each is flushed and the caps greased. During extremely cold weather, 7 men are employed and each hydrant is inspected daily. Those found frozen are thawed and treated with salt and wood alcohol. The hydrants operated during the National Board inspection were in generally good condition; a few have odd sized nuts.

Distribution.—In the principal mercantile district the average area served by each hydrant is 54,500 square feet. Throughout the city the average area served is 66,600 square feet. Of the 17 hydrants within and the 27 adjacent to the principal mercantile district, all except 3 have one 4½- and two 2½-inch outlets and are on 6-inch gated branch connections with the mains. The 3 have single 2½-inch outlets.

Use by Street Department and Others.—Hydrants are used by the street and sewer departments for flushing. Contractors desiring to use hydrants are required to obtain a permit. Little damage is reported in consequence of these uses.

FIRE FLOW TESTS.—See Table 2. Tests were first made on November 3, 1932, after which a nearly closed valve on the 16-inch Newark

street line was found and tests were repeated on Tuesday, November 29, 1932, under normal operating conditions, the domestic consumption being at the rate of 10,000,000 gallons a day. Except in Test 1 one to all hydrants in a group failed to deliver 600 gallons a minute when wide open; this condition is particularly serious in several high value sections. On November 3, tests were also made on the Low service lines of the Jersey City distribution from which a good emergency supply is available.

CONCLUSIONS.—Supply Works.—The supply available from Jersey City is normally ample for the needs of Hoboken; reliability is further assured by direct connections with the works of the Hackensack Water Company which could be used in emergency.

Pressures.—Pressures are well maintained under normal draft and are adequate for sprinkler protection in buildings of moderate height except in the higher elevation adjacent to Castle Point where pressures are poor. The fire flow tests indicate that at times the operation of the pressure regulator is not sufficiently positive to maintain pressures during heavy fire draft.

Protection.—Fire flow tests indicate that in the principal mercantile district adequate quantities are maintained in one section, but in other

parts of the district they are from good to very poor. In other sections they are mainly poor, none of the tests showing fully adequate quantities. The results of the tests show the effect, in what would otherwise be a strong distribution system, having adequate and well arranged main arteries and secondary feeders, of the lack of connections in many places between these large mains and the minor distributors, and between main arteries and secondary feeders. The large number of hydrants not capable of furnishing supply for a pumper is an item of serious inadequacy.

A considerable portion of the distributing system is installed in filled-in marsh land, where pipes are subject to settlement and repairs are difficult and apt to be delayed. The interior condition of mains is probably fairly good.

Gate Valves.—Valve spacing is fair to wide. Systematic inspections are made and the condition of the valves is fair, but the absence of written records of the inspections diminishes their value.

Hydrants.—Spacing of hydrants is generally satisfactory. The inability of a considerable number of hydrants to deliver sufficient supply for an engine and the presence of several small hydrants are unsatisfactory features. Hydrants are inspected and are maintained in generally good condition.

FIRE DEPARTMENT

ORGANIZATION.—Basis.—Full paid since 1891; on 2-plateau system since 1919.

Supervision.—Under the supervision of the Director of Public Safety Joseph A. Clark; he is elected for a 4-year term.

Districts.—For fire department purposes, the city is divided into two approximately equal districts by Fifth street.

Officers.—Chief John J. Gilday, age 70, was appointed in 1918 and is the executive head of the department, with full control at fires, and is responsible for the general conduct and efficiency of the department. The assistant chiefs, Andrew U. Keller and John J. Reilly, age 57 and 53, were appointed in 1918 and 1932, respectively, and assume command in the absence of the chief. The chief is on continuous duty.

Membership.—Total membership, 172; fire force, 149.

MEMBERSHIP TABLE

Chief.....	1
Assistant Chief.....	1
Acting Ass't Chief.....	18
Captains.....	124
Firemen.....	4
Chief's drivers.....	4
Total Fire Force.....	149
Battalion Chief, charge of repairs.....	1
Repair shop.....	6
Clerk.....	2
Inspectors.....	2
Firemen assigned to fire alarm.....	3
Firemen assigned to city ambulance.....	2
Phalanx.....	4
Watchmen.....	1
Director's chauffeur.....	1
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Expenses.—The expenses of the fire department, including the fire alarm system, for the past 5 years, averaged \$433,949.

The per capita expense for maintenance for 1931 was \$7.25, based on an estimated population of 60,000. Additional expenditures for new apparatus, during 1928 and 1932, were \$22,250 and \$44,320, respectively.

Appointments and Promotions.—In general, applicants for appointment to the fire department must be between the ages of 21 and 35, not less than 130 pounds in weight, and not less than 5 feet 6 inches in height. Other than to show ability to read, write and make out reports, no mental examinations are held for appointment or promotion; applicants must have recommendations from 3 to 5 citizens and be passed by the city physician. Promotions are usually based upon merit, with particular consideration given to seniority, but there are evidences of outside influence having been used to secure promotion.

Retirement and Pensions.—A fire and police pension fund, established by State law, is maintained by 2 per cent. assessment of the salaries of members and appropriations by the city, fines, donations, etc. Members may, on application, be retired on half pay for disability, or after 20 years' service, if 50 years old; retirement is mandatory at 65, if 20 years' service has been performed. Pensions are paid to dependent relatives of members killed in service. Salaries are continued in case of sickness or injury incurred in duty. A Firemen's Mutual Benevolent Association, supported by assessments on members, and a State Firemen's Relief Association, supported by a tax of 2 per cent. of premiums of foreign fire insurance companies, pay death benefits. Two members of the department are over 65 years of age, 5 between 60 and 65, and 20 between 55 and 60.

TABLE 2.—FIRE FLOW TESTS

District	Number and Location of Group*	Discharge, Gallons Per Minute.				Pressure, Pounds Per Sq. In.		Quantity	
		Individual Hydrants				Total of Group	Hydrants Closed	Re-quired for Engine Supply	Available
Principal Mercantile..	1. Bloomfield and Ferry Sts.....	900	1070	1080	1590	4640	57	45	8000
	2. Bloomfield and Fourth Sts.....	5402	920	900	1230	1550	54	38	8000
	3. Washington and Newark Sts.....	3801	640	660	1040	1360	54	37	8000
	4. Hudson and Second Sts.....	3202	3550	400		1070	50	13	8000
Minor Mercantile.....	5. Adams and First Sts.....	410	480	770	870	2530	58	46	5000
	6. Harrison and First Sts.....	751	5001	5901	820	1990	59	30	2300
	7. Washington and Fourteenth Sts.....	4401	5901	730		1760	51	35	4000
Manufacturing.....	8. Jefferson and Fourteenth Sts.....	3201	780	1030	1060	3190	54	23	4000
	9. Adams and Eleventh Sts.....	4001	690	710	770	2570	51	33	5000
	10. Adams and Eighth Sts.....	3801	640	660		1460	54	12	4000
Residential.....	11. Jefferson and Fifth Sts.....	4701	5101	690	1000	2750	54	24	4000
	12. Fifth and Grand Sts.....	3201	380	740	890	2290	53	26	5000
	13. Willow Ave. and Sixth St.....	1401	3001	3801		820	51	44	4000
	14. Garden and Ninth Sts.....	4101	4601	4801	5101	1860	47	21	4000
	15. Castle Point Terrace bet. Ninth and Tenth Sts.....	1201	2201	4401		780	39	18	2500

*Location of groups shown on accompanying plan by corresponding numbers.

†Hydrants unable to deliver 600 gallons a minute when wide open.

FIRE DEPARTMENT

TABLE 3.—FIRE COMPANIES—LOCATION AND EQUIPMENT

ENGINE AND HOSE COMPANIES

COMPANY	LOCATION	Members Each Platoon	APPARATUS			Hose Carried, Feet	Spare Hose, Feet	Ladders Carried	Extinguishers and Tanks, Gallons
			Type	Motor H.P.	Put in Service				
Engine 1 st	(Headquarters: Hudson St., near 2nd St.)	8	1000-gallon Engine.	83	1917	400-3" (500-24")	1500-2½"	1-24" 1-12" 1-24"	2-2½"
			Hose Wagon. a†	48	1917	1000-2½" (200-¾")	800-3"	2-10" 1-12" 1-24"	2-2½"
Engine 2 nd	13th and Washington Sts.	8	1000-gallon Engine.	83	1916	400-3" (500-24")	1500-2½"	1-24" 1-12" 1-24"	2-2½"
			Hose Wagon.	73	1932	1000-2½" (200-¾")	800-3"	1-24" 2-12" 1-6"	2-2½"
Engine 3 rd	2nd and Jefferson Sts.	8	750-gallon Engine.	73	1917	1000-2½"	1850-2½"	1-8" 1-20" 3-12"	2-2½"
			Hose Wagon. a	48	1916	1000-2½" (200-¾")	1000-2½"	1-20" 1-14½"	2-2½"
Hose 4 th	Park Ave., near 2nd St.	6	Hose Wagon.	48	1914	1000-2½" (200-¾")	1000-2½"	1-20" 1-14½"	2-2½"
Engine 5 th	Grand St., near 4th St.	8	1000-gallon Engine.	73	1928	500-24"	500-2½"	(1-20½) 1-20" 1-14½"	2-2½"
			Hose Wagon.	73	1928	1000-2½" (200-¾")		1-12" 1-14½"	2-2½"
Engine 6 th	Clinton and 8th Sts.	8	750-gallon Engine.	73	1916	500-24"	1500-2½"	1-12" 1-24" 2-16"	2-2½"
			Hose Wagon.†	73	1932	1000-2½" (200-¾")		1-12" 1-24"	2-2½"

† Equipped with Turret Pipe.

a. Company located in High Value District.

a. With Booster Pumps.

b. Also one 10-foot ladder.

LADDER COMPANIES

COMPANY	LOCATION	Members Each Platoon	LADDER TRUCK			LADDERS CARRIED		Extinguishers and Tanks, Gallons
			Type	Motor H.P.	Put in Service	Number	Total Length, Feet	
1..... th	With Engine 2.....	8	75'-Quick-raising Aerial.	73	1922	12	329	4-2½"
2..... th	Ferry and Madison Sts.	8	75'-Quick-raising Aerial.	73	1928	12	333	4-2½"
3..... th	With Engine 6.....	9	85'-Quick-raising Aerial.	83	1932	12	350	2-2½"

a. Company located in or near High Value District.

FIRE DEPARTMENT

HOBOKEN, N. J.

Companies.—Organization.—See Table 3. Five engine, a hose and 3 ladder companies are in service in 7 stations. Each company has a captain on each shift, and sufficient operators to insure one being on duty with each piece of apparatus at all times.

Maintenance.—Platoons are approximately equal in strength and work 10 and 14 hours, alternating every 3 days. The assistant chief works on a 24-hour shift. Annual vacations of 16 to 30 days, according to rank, are allowed, with one man per shift per company off at a time. Continuous watch is maintained at each station. Members may leave the city only upon permission, and are required to respond to second or greater alarms of fire; no means of notification are provided.

Distribution.—A 2-piece engine company is located within the principal mercantile district and dock districts; another engine and a ladder company is in the factory and dock districts in the northern end of the city. Ladder trucks are located at either end, and in the middle, of the city. An engine company is within and 2 additional engines and a ladder company are on the edge of the frame district in the southwestern section of the city. The entire department is within 1 mile of all thickly-built districts. Chemical service is adequate in all sections.

EQUIPMENT.—Fire Engines.—See Table 3. There are 5 engines in service; 3 have rotary gear pumps, and the remaining two have piston type pumps. Each engine is equipped with 2 lengths of hard and one length of soft suction, also one 12-foot length of 3-inch hose for suction if hydrants are obstructed. All carry necessary reducers and each has divided hose body. A reserve engine, stationed at Engine 5, has a rotary pump; it is loaded with 1,000 feet of 2½-inch hose.

Engine Tests.—All engines were tested at draft in October and November, 1932, to determine their condition and the ability of the operators. Engines in service delivered from 98 to 101 per cent., and the reserve engine 96 per cent., of their rated capacities. Pump trouble was encountered with Engine 3 and required 3 trials before satisfactorily passing the test. Engine 5 developed trouble due to poor exhaust gaskets, which were replaced and the test completed on second running. Operators of the engines showed the need of more extensive training and instructions under draft conditions. A few operators are unqualified for such duty.

Ladder Trucks.—See Table 3. Two ladder trucks in service and one truck in reserve are

American-LaFrance 75-foot quick-raising aerials; one other truck in service is an Ahrens-Fox 85-foot aerial. All have 4-wheel tractors. Each truck in service is provided with a ladder pipe, attached, and carries a 50-foot ground extension, a roof and pompiers ladders. The reserve ladder truck carries 9 additional ladders, including a 45-foot extension; it is stationed at Ladder 2. A foam generator with 200 feet of 1½-inch hose is provided on Ladder 3; extra cases of foam are kept at each fire station.

Hose Wagons.—Six combination hose wagons are in service; 2 of these are equipped with water tanks and booster pumps and the rest have chemical tanks. All but 2 hose wagons have divided hose bodies and 2 are each equipped with a turret pipe.

Chiefs' Cars.—Miscellaneous Vehicles.—Two sedan automobiles and one touring car are provided for the use of the chief officers. An automobile repair wagon is provided for inspection and repair work; it is equipped with a 250-gallon pump, which is used for pumping out cellars, and there is also a wrecking wagon equipped with a 7½-ton hoist and two 10-ton jacks.

Hose.—All 2½- and 3-inch hose is double-jacketed cotton, rubber-lined, purchased under the usual trade guarantees. It is tested upon purchase to 250 pounds and annually to 200 pounds. Engine Companies 1 and 2 each has 1,200 feet of 3-inch hose; 300 feet is in reserve. The amount of 2½-inch hose allows 1,500 to 3,850 feet per company. Hose is well coiled and stored until needed; hose is replaced on wagons monthly if not used at fires. Chemical hose is mainly ¾-inch rubber and of good quality.

Couplings.—Hose couplings of this and nearby cities are of the usual screw type. Those of Hoboken, Jersey City, Newark and Union are 3-inch outside diameter of male threads and 8 threads to the inch. Others are of National Standard dimensions and will attach to Hoboken hydrants without alteration. Adapters are kept for Weehawken suction connections.

Minor Equipment.—Equipment carried on fire engines, hose wagons and ladder trucks is uniform and generally complete, the latter, however, carrying such additional equipment as is required for this type of apparatus. Principal items lacking include bale hooks, brooms, electric hand-lights, hose shut-offs and saws.

The equipment for handling heavy or special streams consist of 4 ladder pipes, 4 deluge sets, 5 cellar pipes and 8 distributing nozzles.

SUMMARY OF APPARATUS

	1932	
	In Service	In Reserve
Fire Engines:		
1000-gallons.....	3	0
750-gallons.....	2	1
Hose Wagon:		
Automobile combination.....	6	0
Ladder Trucks:		
Aerial, automobile.....	3	1
Chief's automobiles.....	3	0
Bureau of Repair automobile.....	1	0
Wrecking Wagon.....	1	0
Fire alarm automobile.....	1	0
Hose, 2½-inch.....	16,850'	1,000'
Hose 3-inch.....	2,400'	300'
Hose, ½-inch for chemical.....	1,200'	200'
Ladders, total length.....	1,480'	318'
Ladders, short, on hose wagons, etc.....	31	2
Portable Extinguishers.....	32	6
Deluge sets.....	3	1
Slamming connections.....	9	0
Turret nozzles.....	3	0
Ladder pipes.....	3	1
Cellar pipes.....	5	0
Distributing nozzles.....	8	0
Special coupling (for engines from other cities).....	1	0

Fire Stations.—Fuel.—Stations are 2 or 3 stories in height and of ordinary construction. Stations 2 and 6, housing an engine and a ladder company, each have but one door. Each station is heated by steam or hot water and lighted by electricity; doors are of the sliding type, hand opened. All, except Station 4, which is old and unsuited for fire station use, have a hose tower and concrete apparatus floor. Each station, except Station 4, has an underground gasoline storage tank, and a pump, which is usually located on the apparatus floor. At least one or more large metal cans of poor type, to be filled with gasoline, are kept at each fire station, and would be taken to large fires on the repair wagon.

Repair Shop.—Battalion Chief Frank Drewes is Superintendent of Repairs in charge of the department repair shop, which is located in the rear of Station 3; he is assisted by 6 men. The shop is equipped with lathes, shaper, grinder, drill press, forges, acetylene welding and cutting tools, two ½-ton hoists and a good supply of bench tools. Few spare parts are kept on hand.

OPERATION.—Discipline.—A printed book of rules and regulations, made by the director of public safety and the chief of the department in 1924, are in force. The chief has power to transfer and suspend members temporarily. Charges are made through the superior officers to the chief, who refers them to the director for trial; the lat-

ter grants a hearing and renders a decision which is final. The accused is given the right of representation by counsel. Within the past two years 12 members have been brought to trial for some infraction of the rules. Discipline appears good.

Drills and Training.—Training and instruction of the department is under the charge of Acting Assistant Chief John F. Reilly. Drill school is held at a 5-story hose tower at Station 3. All members undergo training for a period of 3 months yearly, and drills by companies in units are held by the instructor upon completion of the regular school course.

Demonstration drills by several companies in units were held during this inspection. The performance showed the need of more regular individual instruction and of company drills being held more frequently throughout the year. Some company officers do not appear to have the qualifications needed for such office.

Response to Alarms.—The usual response to box alarms in the principal mercantile district and the dock and factory sections consists of 3 engine and 2 ladder companies or a total of 8 pieces of apparatus; a second alarm calls one or two additional engine and a ladder companies. In other districts, the usual response is 2 or 3 engine and 2 ladder companies, and a second alarm calls 2 more engine and a ladder companies. On all first alarms to hospital boxes, response consists of 5 engine and 3 ladder companies.

The chief responds on first alarms to all waterfront boxes, to locations of particular hazard, and to all second alarms. The assistant chief on duty responds to all alarms. Later Company 3 responds to all box alarms. To telephone and A.D.T. alarms, an engine and a ladder company are usually sent; if nature of the fire is known to be serious, full box response is dispatched.

Fire Methods.—Fire department records do not show, in every case, how fires were extinguished, but it is estimated by chief officers that approximately 80 per cent. or more of the fires requiring apparatus are extinguished by chemical or small water lines. Lines of large hose are laid to back up chemical streams. A 2½-inch hose line is connected to the chemical tank and water used through the chemical hose when needed. Engines connect to hydrants if signs of fire are seen. Shut-off nozzles with 1½-inch tips are used; heavy stream appliances are frequently used at large fires. Hose lines are carried up stairs or ladders or hoisted to roofs by ropes. Ladder companies ventilate buildings on arrival and assist with hose lines when necessary. Standpipes would be used when available and required; the second company due at a fire is instructed to connect to standpipe or sprinkler connection on

arrival. Salvage covers are carried on ladder trucks and these are used whenever possible. Buildings are freed of excess water, and watch is left after serious fires, for rekindling.

Building Inspections.—Two inspectors devote their entire time to inspection work. Company officers are required to make periodical inspections of buildings in their respective districts and must notify headquarters when they leave quarters. A review of some of the company journals showed no record of such inspections having been made for some time. For complete data on inspections, see Explosives and Inflammables, page 15.

Reports and Records.—Records are kept at each fire station of all events and a daily report is sent to the chief covering fire duty of the company, company strength, supplies received and details affecting the company. The chief makes a monthly report to the director of fires and department conditions, and an annual report which is fairly complete and contains recommendations for betterment of the service; these reports are not printed or published. Records of fires are somewhat deficient; of apparatus and personnel generally complete and accessible.

IMPROVEMENTS.—Since the last report of the National Board of Fire Underwriters, the personnel of department has been increased by 21 men. One engine, 3 hose wagons, two aerial ladder trucks and a 4-wheel tractor have been added to the department, replacing older apparatus.

CONCLUSIONS.—Generally good fire protection is provided by the fire department, which is well equipped, adequately manned and in command of competent chief officers. Drills are too infrequent and operators of pumping engines are in need of additional training; it is important that these positions be filled by members properly qualified, and that appointment of company officers be made on the basis of experience, ability to command and instruct and knowledge of fire-fighting methods, which, heretofore, have not been given much consideration. Response to telephone and A.D.T. alarms is inadequate. Building inspections by company officers are infrequent and records of inspections are incomplete. Other department records are fairly complete and accessible.

FIRE ALARM SYSTEM

ORGANIZATION.—The fire alarm system is a part of the fire department and under the supervision of Director of Public Safety, Joseph A.

Clark. City Electrician George W. Baumann, appointed to this position in 1931, maintains the police signaling system and in January 1, 1932 was also charged with maintenance of the fire alarm system. The incumbent has had 12 years' experience in the electrical field; he is assisted by 3 linemen who are members of the fire department detailed to this work. The latter are subject to call at all times; each has a telephone at his home. An automobile truck is provided; it is equipped with a 30-foot extension ladder and necessary tools.

HEADQUARTERS.—On the third story of fire department headquarters, an old building of ordinary construction, seriously exposed on the rear and containing the usual hazards of the fire station; electric wiring in parts of the building is in poor condition. No chemical extinguishers are provided in the apparatus room.

EQUIPMENT.—Apparatus at Headquarters.—An automatic system of Gamewell make, the greater part installed in 1913, consists of a 6-circuit switchboard, with the usual devices for testing circuits; the charging devices on the board are disconnected and replaced by a separate battery board equipped with oxide film rectifiers, rheostats, control switches and meters; and a 4-circuit non-interfering repeater with contacts for 2 closed alarm circuits on the drum and 1 open circuit on the repeater shaft.

Alarm circuits enter the building overhead and are carried in lead cable through an unused chimney to a slate protector board on wall of operating room, thence in bunched wires in conduit under the floor to battery board and repeater. Wires between switchboard and battery rack are No. 12 triple-braid rubber-covered copper wire in conduit under the floor. Circuits are protected by inert gas lightning arresters and 3-ampere fuses on the protector board, ½-ampere fuses and grounded plate lightning arresters on the switchboard, 1½-ampere glass enclosed fuses on the battery charging board and by 3-ampere link fuses on the battery racks.

Apparatus at Fire Stations.—Each fire station has a punch register, a large gong and an automatic lighting switch with clock-work to extinguish lights, directly on a box circuit, with a key for sounding the gong on still alarms. A relay, operating an electro-mechanical gong and punch register is provided in Headquarters on the A.D.T. system.

Batteries.—Current for operating the system is supplied by rectifiers, with 82 twelve-ampere-hour enclosed type storage batteries in series on the line. Batteries are mounted on glass rails on porcelain knobs, on a metal rack, in the room

with the switchboard and repeater. A duplicate set of 96 batteries are similarly mounted on a wooden rack; there are 60 extra cells on hand. A separate 110-volt a.c. circuit enters the building on the top floor rear, and is mostly in conduit to the charging board; proper service and branch circuit fuses and switches are installed. Batteries are given an overcharge every two weeks.

Boxes.—Description.—Total number, 95, of which 82 are accessible to the public; 13 boxes are auxiliary. All boxes are of the succession type; 92 are of Gamewell and 3 of Horni make. Three boxes have quick action doors and the remainder have keys attached; except for boxes mounted on metal poles or pedestals, neither outer cases nor lightning arresters are grounded. Eight boxes are located inside of buildings, 13 are mounted on buildings and 5 on pedestals, and the rest on any available poles. No lights are provided to indicate box locations at night; only a few poles supporting boxes have red bands with white borders. Boxes were painted during the summer of 1932 but are inconspicuous. Boxes tested and examined by an engineer of the National Board of Fire Underwriters during this inspection were found to be in good operable condition.

Distribution.—Generally good box distribution is provided throughout most of the city. It is estimated that about 15 additional boxes are needed. The more important steamship docks and factories are provided with private boxes and alarm systems.

Circuits.—Four all-metallic, normally-closed box circuits are in use; two circuits, both overloaded, are each divided into 2 loops. Circuits are mostly overhead; aerial construction is No. 10 copper wire with triple-braid weatherproof insulation run on lowest cross-arm on any available pole; many poles also support high tension circuits and transformers. Underground construction is No. 14 rubber-covered copper wire, in lead sheath, in telephone ducts. Most box leads are installed in iron conduit from cross-arm to box and are of No. 14 copper wire. All aerial circuits have been recently overhauled or rebuilt and are in good condition; 5-ampere fuses and inert gas lightning arresters in terminal boxes are installed at the junction of overhead and underground construction. Circuits entering fire stations are not protected. A total of about 20 miles of circuits, of which about 26 per cent. is underground, carries all boxes, alarm instruments in fire stations, and in addition, 10 gongs and one punch register at residences of fire department members, 2 police stations and the water and newspaper offices.

TELEPHONE SYSTEM.—A 10-circuit telephone switchboard, owned and maintained by the telephone company, is located in the chief's office, and another is on the apparatus floor of headquarters; either switchboard may, by means of double-throw switches, be connected to the system. Each fire station has an instrument on an individual line connecting to these switchboards; and a line from the public exchange connects with a telephone at the watch desk in headquarters and in the chief's office. An operator is on duty at all times.

OPERATION.—Routine and Maintenance.—The city electrician and linemen are at headquarters during the day when not engaged on outside work or at fires. A lineman responds to all second or greater alarms of fire. Circuits are tested once daily for current, voltage and grounds; test taps are sent over the system once daily. Boxes are tested by pulling one each day, unless boxes have been operated for fire recently. Circuits are inspected monthly and after severe storms. Practically no records are being kept at this time; a map of box locations is provided and a map of circuit routes was prepared during this inspection. Note is made in house journals each day of receipt of test taps.

Alarm Transmission.—Four rounds of box alarms are automatically transmitted over the system. Telephone and A.D.T. alarms are received at headquarters, the nearest engine and ladder company are dispatched by telephone and other companies notified. On verbal alarms, the company notified responds after communicating with fire headquarters; if assistance is needed a box is pulled.

During 1931, 467 alarms were received, of which 257 were box and 210 were telephone; 70 alarms were false.

CONCLUSIONS.—The fire alarm system was recently placed under the supervision of the city electrician who is experienced and provided with a capable maintenance force. The present system is inadequate and apparatus is insecurely housed in an old building of ordinary construction and unprotected window openings; exposures and internal hazards are severe. Current supply is generally adequate; batteries are in good condition, but poorly located, being in the same room with other equipment. Box circuits have just been completely rebuilt and are in good condition. The lack of duplicate alarm circuits introduces a feature of unreliability; 2 box circuits at present are overloaded. Boxes are of good type but are generally inconspicuous. Telephone service is good, except for lack of reserved line. Telephone alarms are not properly handled. Tests are inadequate and records are poor.

FIRE DEPARTMENT AUXILIARIES

FIRE MARSHAL.—No State fire marshal. The chief of the fire department, with the assistance of the police department, investigates the causes of fires; if sufficient evidence of incendiarism is obtained, arrests are made and referred to the grand jury. During the past 2 years there were two suspicious fires; in one case, 5 arrests were made, 2 convicted and 2 have trials pending; in the other, one arrest was made with trial pending.

POLICE DEPARTMENT.—Chief, Edward J. McFesty. Total active membership, 196. The city is divided into 2 precincts.

Equipment.—Two automobile patrol wagons, 9 motorcycles with side cars and 10 horses are in regular service. Rope is carried by the fire department for use in fire lines. A police signaling system consists of a telephone signal board having 16 horn and 3 telephone circuits; 24 police boxes, with telephone installed, 6 traffic booths each having a telephone and 15 police horns, 8 of which have flashlights above, are in use. Patrolmen report hourly.

Fire alarms are received at precinct stations on a gong connected to a fire alarm circuit. Patrolmen on adjoining beats respond to all alarms to form fire lines; 8 patrolmen should be on hand within a reasonable time. Headquarters is notified of the nature of the fire and if serious, the patrol wagon would respond with additional men. On time off, police are required to respond to serious fires and may not leave the city without permission. Watch is provided at premises seriously damaged by fire until owners can make other arrangements. Patrolmen are required to see permits for building construction on their beats.

PUBLIC SERVICE CORPORATIONS.—The Public Service Corporation of New Jersey distributes both gas and electricity in the city. No connection with the city fire alarm system is maintained in corporation trouble stations; and response is made with a trouble wagon to fires only on telephone request from the fire department.

CENTRAL STATION WATCH, SPRINKLER SUPERVISORY AND AUTOMATIC ALARM SERVICES.—The American District Telegraph Company maintains central station watch, sprinkler supervisory, automatic fire alarm, and burglar alarm services, with office on the second floor of a fireproof office building in Jersey City, about two miles from the nearest

part of Hoboken; service is furnished from this office in several other cities.

The central station board is of slate, mounted on metal frame; and has provision for 31 night watch, fire alarm and sprinkler supervisory circuits, eight of which serve Hoboken, two for sprinkler supervisory and the remainder for night watch and fire alarm; they are all metallic McCullough circuits. Signals are received on double pen registers. Fire alarms are transmitted to Hoboken fire headquarters by manual transmitter and confirmed over the telephone. Current for operating is supplied by storage batteries and floating on the line with emergency reserve capacity for operating the system for 72 hours. During the day, three men, including the manager, are on duty in the central office; at night six are on each of two shifts, with a roundsman, provided with automobile, who covers Weehawken and Hoboken. Watchmen report at least hourly, and are allowed 15 minutes grace.

In Hoboken, the central station watch service includes 221 boxes of approved combined watch and fire alarm type in premises of 29 subscribers, 7 of which are equipped with local fire alarm gongs only. Maximum number of boxes on a circuit, 55. Two subscribers are furnished fire alarm service only with a total of 11 boxes. There are 8 subscribers to the sprinkler supervisory service with water flow, closed valve, high and low water, and air pressure alarms. Aero automatic fire alarm service is also supplied on a dock and in a warehouse.

Circuits between the central office and the Hoboken telephone exchange are in cable in telephone underground ducts, from which much of the local distribution is in leased wires in telephone cables. The open overhead lines are No. 14 double-braided, rubber-covered copper or iron wire; 80 per cent. of the subscribers' installations are in all conduit.

Periodical systematic tests are made of the various services. The A.D.T. gong and punch register at fire headquarters is tested 3 times daily. During 1931, the A.D.T. system transmitted 7 fire alarms; 6 were for fires.

AUXILIARY FIRE ALARM SYSTEMS.—The New Jersey Fire Alarm Company has provided 11 establishments with Gamewell auxiliary equipments with 3 to 57 stations each, with a total of 162, connected to auxiliaryized fire alarm boxes on the city circuits; in addition, 5 establishments also have provisions for fire drill through connections with the auxiliary box circuits actuating gongs without tripping the master box. This company owns and maintains the local alarm system at the U. S. government piers, consisting of control board, storage batteries, 55 boxes and 17 vibrating code ringing bells, the

latter on open circuits; two boxes on a city fire alarm circuit are located in the government fire station for transmission to the city of alarms received over the local alarm system. All the auxiliary boxes are private and located in the subscribers' premises. Boxes and equipments are inspected at least monthly, and after all fire alarms; on inspection the box is cut out and an auxiliary box pulled. Each installation has a trouble bell which indicates open circuits or crossed wires, and a vibrating gong which indicates that an auxiliary box has been pulled. Local circuits are Nos. 10 and 18 duplex, single-braided, rubber-covered wire. Risers and horizontal runs are installed in conduit, except at the government piers, where No. 14 wire is used and supported on bridge rings. Current supply is maintained through dry and storage batteries and 110 volts a.c. reduced by transformers. The city electrician resets auxiliary boxes after they are pulled.

TELEPHONE SERVICE.—The New Jersey Bell Telephone Company serves about 5,000 subscribers with 8,000 stations on single, 2- and 4-party lines, through an exchange in a fireproof building, used exclusively for telephone purposes, with exposed openings protected. Internal protection consists of chemical extinguishers, water and sand pails, and standpipes and hose, with waterproof covers for the operating board. About 50 per cent. of the lines are underground. The exchange is connected to fire headquarters by a

single line, not reserved for fire alarms. Calls known to be for fire are properly supervised; and for such calls, the operator would cut-in, if the line to fire headquarters was busy. About forty-five per cent. of the fire alarms during 1931 were received by telephone.

PRIVATE FIRE APPARATUS.—The Delaware, Lackawanna & Western Railroad terminal, which is partly in Hoboken and partly in Jersey City, the Pennsylvania Railroad marine repair shops, the D., L. & W. R. R. ferry house, the United States government piers and a number of other privately owned piers have extensive private fire protection facilities installed. This protection consists of private fire alarm systems, yard hydrants and hose, fire pumps, standpipes with hose, water casks and pails, and chemical extinguishers. Tug-boats connected with the railroads are equipped with fire pumps and would assist the city department along the water front.

OUTSIDE AID.—Powerful outside aid could be obtained in a very short time from Jersey City, West Hoboken and Weehawken which are adjoining, and West New York, Newark and New York City, the latter being across the bay. Most hose couplings are the same; adapters are provided for use of Weehawken suction connections. At least 2 or 3 of New York's fire boats would render assistance if summoned.

STRUCTURAL CONDITIONS AND HAZARDS

BUILDING DEPARTMENT

ORGANIZATION.—Supervision.—The Inspector of Buildings, who is required to be an architect, civil engineer or other mechanic, is appointed by the Board of Commissioners for an indefinite term. Duties include the supervision and control of building operations and the enforcement of the building laws.

The State laws bearing on fire protection and fire escapes in factories and workshops are enforced by the State Department of Labor; those governing tenement house construction are enforced by the State Board of Tenement House Supervision.

Personnel.—Joseph H. Cummins, formerly a civil engineer and contractor, has been inspector of buildings since January, 1909; he has one assistant.

Permits and Records.—An application must be made and a permit obtained before any building operations may be started. Applications are accepted by plans and specifications, except in

the case of repairs or slight alterations. Before erecting or altering any factory or tenement, or building on a lot with a tenement, plans and an application must be submitted to the State department concerned. Applications, plans and specifications, stubs of permits and copies of notices to correct violations are filed and well indexed in the office of the building department in the city hall.

Inspections.—All buildings for which permits have been issued are inspected as often as considered necessary. State inspections are made of factories and tenement houses.

BUILDING LAWS.—State Laws.—A law of 1911 provides that every factory, workshop or mill shall be provided with proper means of egress or escape, and be protected against fire as far as practicable.

The Tenement House Act, with amendments to 1930, limits the height of buildings to two times the width of the widest adjacent street and provides setback requirements. Frame buildings

outside the fire limits may be 3 stories in height. Tenements 6 stories and over must be fireproof. Non-fireproof buildings having over 12 apartments must have stair halls enclosed by 8-inch walls; except the top 2 stories which may have 6-inch walls, and in those of over 36 apartments, floors of stair halls and doors leading thereto must be fireproof; cellar ceilings must be of metal lath or plaster boards with plaster. Furred walls must be fire stopped at the floor line. Two-foot parapets are required on party and division walls. New roofs must have approved roofing, but repairs may be made to existing roofs. Private garages may be built 5 feet from a rear line of a tenement if required yard space is provided and on corner lots may adjoin if the separating wall is fireproof. The basement of a tenement may be occupied as a garage if the ceiling is of 6-inch concrete and the walls enclosing the garage are of 8-inch brick and may extend to the rear if the roof is of 6-inch concrete; windows must be of wired glass and the area sprinklered when exceeding 1,000 square feet.

Only 4 inches of masonry are required between the ends of beams entering a wall from opposite sides. Heating stoves may be placed 2 feet from a partition.

Municipal Laws.—The municipal building code of 1910 has had few amendments. Buildings are divided according to construction into seven classes. Buildings over 3 stories erected or altered to be used as a theatre, lodging house, school, jail, public station, hospital or asylum, and hotels and apartments exceeding four stories, and all other buildings over five stories in height, and garages must be of fireproof construction. Buildings used above the ground floor as factories, warehouses or for mercantile purposes are limited to 100 feet in height, and no building may exceed $2\frac{1}{2}$ times the width of widest adjacent street; frame warehouses must not exceed 2 stories or 35 feet. The requirements for concrete construction and fireproofing of steel members are good. Mill construction is incompletely defined, and not otherwise mentioned. Floor area restrictions are brief and incomplete.

All exterior openings above the first story, when exposure is within 35 feet, except in tenements, dwellings, hotels, and churches, must be protected by fireproof swinging shutters or wired glass windows in metal frames. Requirements for floor opening protection are below standard. Openings in interior walls must be provided with automatic fireproof doors where deemed necessary by the inspector; party wall openings are also required to be properly protected.

Frame construction within the fire limits is restricted to temporary 1-story buildings in connection with building operations, sheds not over

15 feet high, additions to existing buildings when used as toilet rooms exclusively, grain elevators, coal elevators and pockets, ice houses and exhibition buildings. Combustible roof coverings are prohibited throughout the city; existing single roofs may be repaired but not renewed.

The required thickness of walls is only fairly satisfactory; 12-inch walls throughout are permitted in 3-story buildings of the warehouse class, and in the dwelling house class walls may be 12 inches thick throughout for 5 stories. Specifications for chimneys and heating apparatus are generally good. Suitable fire stops are required around chimneys and for wooden studded partitions, and furred walls. Parapets in most cases must be not less than 8 inches in thickness and 2 feet high; parapet requirements for warehouses, factories and commercial buildings are good. Good requirements are specified for quality and strength of materials, and for fire escapes. Requirements for theatres and their private fire protection and means of egress are mainly good. Four-inch standpipes and hose are required in existing buildings and those to be erected, excepting dwellings, over 65 feet and less than 100 feet in height; 6-inch standpipes are required for buildings exceeding 100 feet.

The zoning ordinance of 1925 divides the city into six use districts, and limits the heights and areas of buildings, and percentage of lot built upon.

Fire Limits.—As shown on the accompanying map, the fire limits are extensive, including half of the city, the congested business and the pier and dock districts.

Enforcement.—Provisions of the building code appear to be fairly well enforced on all new construction; but the retroactive features are not enforced.

LOCAL CONDITIONS.—The principal mercantile district consists of 17 blocks and contains 11 buildings of fireproof, 334 of ordinary and 69 of frame construction; these buildings, 224 are 3 or 4 stories high, and 81 range up to 7 stories in height; and, the areas in 18 buildings and 16 groups of buildings, which cover about one-third of the built-on area, are large or excessive.

Buildings of fireproof construction cover about 11 per cent. of the built-on area; none exceeds 7 stories in height. Some exposed steel was noted in several of these buildings. The largest areas are a partly sprinklered theatre of 25,500 square feet, and the 2-story Post Office of 14,000 square feet. A 2-story garage of 9,500 square feet communicates with a group of 2- and 3-story ordinary constructed buildings, through partly protected openings, to form a combined fire area of 16,500 square feet. Only about half of these

buildings have proper protection to floor and window openings.

Frame construction, covering 10 per cent. of the built-on area, consist principally of old dwellings, grade floor mercantiles and additions. Areas are small to moderate, except where grouped; in 3 instances large areas are subject to one fire. Eleven structures are 4 stories in height.

Buildings of ordinary construction cover 79 per cent. of the built-on area; over half of the buildings are 4 stories or over in height, 70 being 5 or 6 stories high. Thirteen buildings and thirteen groups of buildings, covering 30 per cent. of the built-on area of this type of construction, have large or excessive fire areas. The largest individual buildings are the city hall of 13,700 square feet, and two 5-story, tenement houses of 12,900 and 11,000 square feet, respectively; there are many light wells in the tenement houses.

Including all classes of construction, there is a considerable number of fire or party walls, but many of them are 8 inches deficient in thickness; 12-inch walls, throughout for 4 and 5 stories, are common. Adequate protection to window, floor and communicating openings is, for the most part, very infrequent. Many buildings are old and there are numerous cracked walls, mostly in the buildings on the made land located on the river side that has settled. Parapets, though rarely lacking, are usually low. Communicating openings were found in 79 party walls, of which only 11 were fully or partially protected. The several buildings which are provided with automatic sprinklers cover only 3 per cent. of the built-on area, and standpipes and hose were found in only a small percentage of the buildings. Fire escapes were noted in practically all the buildings requiring them, and hand chemical extinguishers were found in a small amount.

Along either side of Washington street from Fourth to Fourteenth, and on First street from Bloomfield to Marshall streets, are important minor mercantile districts. Construction of the buildings along Washington street is similar to that in the principal mercantile district, and is, for the most part, occupied by tenements above first floor; areas are mainly small to moderate, but many of the buildings exceed 3 stories in height, and floor, window and communicating openings are usually improperly protected. The buildings along First street are usually of grade floor occupancies and mostly of frame construction, many of these buildings are old and poorly maintained, and include numerous large and congested frame tenement houses of excessive heights.

All the pier sheds and docks, except one and the main portion of one of the larger pier sheds, are of corrugated iron on wood frame or other non-fireproof construction supported by wood

piles and substructures. The excepted one has concrete floor and main steel columns are supported by concrete piles, but substructure and numerous other piles are wooden; this pier shed and another smaller one are provided with baffle walls. Most of the larger pier sheds are subdivided by corrugated iron or steel plate partitions with doors. None are sprinklered, but most of them have fireboat and fire department connections, and all have inside standpipes and hose lines, fire extinguishers, day and night watchmen and A.D.T. boxes. The largest group, comprising four wing pier sheds terminating in a common headhouse, is provided with a private fire alarm system and a 1,500-gallon fire pump, located inside the southern end of the headhouse.

Factory buildings are mostly of good brick construction, interspersed by numerous fireproof and frame constructed buildings; heights are usually low but areas are mostly large or excessive, and most of the larger buildings are provided with sprinklers.

The residential sections of the city consist mainly of 3- and 4-story tenement houses, and some intermingling dwellings, many of which are old of frame and brick construction, but some of the tenement houses range up to 6 stories in height. Block frontages are compactly built on, and in many instances both the frame and ordinary constructed buildings are grouped, have adjoining light wells and rear frame additions; floor and window openings are unprotected.

CONCLUSIONS.—The building laws are generally good, but inadequate in several important features and are fairly well enforced. The fire limits are extensive and protect the business districts. Little change has occurred in structural conditions in recent years which are still weak from a fire prevention standpoint.

EXPLOSIVES AND INFLAMMABLES

ORGANIZATION.—Supervision.—By State law, the municipal supervision and control of explosives and inflammables is vested in the Department of Public Safety. The State Department of Labor is responsible for the enforcement of the State laws covering the manufacture, storage and handling of explosives. The State Board of Utility Commissioners is empowered to formulate regulations governing the intrastate transportation of explosives. Municipal ordinances place the supervision and control in the hands of the Bureau of Fire Prevention.

Personnel.—John J. Gilday is Chief of the Fire Department and in charge of the Bureau of Fire Prevention.

Permits and Inspections.—Permits are issued by the bureau of fire prevention to manufacturers, store and handle explosives and inflammable. Two members of the fire department, detailed as fire inspectors, devote full time to inspections of buildings and premises for hazardous conditions. Fire department officers are required to make inspections of buildings, 3 to 4 times a year, but records indicate that these have not been made. Occupants are notified of unsatisfactory conditions by the fire inspectors; time allowed for remedying conditions is determined by the hazard; if notice is not complied with, legal action is started. Records of each inspection made by the fire inspectors are kept in a permanent record book; the chief of the fire department receives a list of the daily inspections made.

LAWES AND REGULATIONS.—State Laws.—The municipal authorities are empowered to regulate the storage, sale, manufacture and handling of explosive and inflammable substances. The State tenement house act provides that no part of a tenement may be used for the keeping or handling of combustible articles, except as permitted by local ordinances, but permits garage occupancy in the basement if the floor above is of reinforced concrete construction, windows protected and automatic sprinklers provided if the area exceeds 1,000 square feet.

State laws adequately cover storage and shipment of explosives. A law of 1912 provides that motion picture booths must be of fireproof materials; specifications for construction are good. Plans and specifications must be approved by the proper municipal official; and no booth may be used until inspected and approved. This act, with supplements, properly controls the hazard incident to the display of motion pictures, except in schools; an amendment of 1922 permits the use of inflammable film in school rooms without a booth.

The fireworks law of 1930 prohibits the manufacture, sale or transportation of dangerous fireworks and specifies those permitted for retail sale between June 20th and July 5th.

Municipal Ordinances.—An ordinance of May 17, 1921 controlling the hazards due to the manufacture, storage, sale, handling and transportation of explosives, pyrotechnics, pyroxylin plastics, motion picture film, matches, calcium carbide, paints, varnishes and lacquers and hardening chemicals are generally satisfactory. The requirements also properly cover the operation of dry cleaning establishments, automobile garages, repair shops and oil burning equipments, storage of fuel oil, disposal of ashes and combustible rubbish. The requirements relating to gasoline, benzene, naphtha and kerosene are good, except-

ing that quantities up to 5 gallons of either may be kept in an ordinary car. There are good requirements regulating the emission of smoke and other solids, gases or fumes from any chimney, smoke stack or other source within the city.

LOCAL CONDITIONS.—No dynamite or other high explosive was found in the city. There are several paint, varnish and floor wax plants in the city. One large paint plant occupies about two-thirds of a rather old 4-story sprinklered ordinary constructed building having numerous fire walls; the remainder of the building is occupied by a children's play-stuff factory; a large stock of these suits and cotton goods are in storage. Bulk paints and thinners are distributed throughout the building in numerous small aboveground tanks. The sprinkler equipments and other private protection facilities, along with the many fire walls, are mitigating features in preventing any fire spreading from one portion of this building to another. Another smaller varnish plant is located in an unsprinklered 2-story ordinary constructed building having many fire walls; bulk stocks of varnish and thinners are distributed throughout the plant, in well constructed aboveground tanks of small capacities, and the boil-room is in a small fireproof addition, cut-off from main plant; very little private protection is provided in this plant. The floor wax plant is made up of a group of up to 3-story unsprinklered ordinary constructed buildings; the inflammable oils used in connection are stored in outside underground tanks, and transferred to the several mixing tanks located on all the floors of the main building; a 40-gallon portable foam tank, numerous hand fire extinguishers and sand pails are provided. Small amounts of flammable oils were safely stored at the other plants in the city.

Retail hardware and paint stores carry small stocks of mixed paints in sealed cans, and up to 18 barrels of turpentine, alcohol and various oils, usually in pump tanks. Retail grocery stores carry as much as one barrel of kerosene in metal tanks with hand pumps. Wholesale grocers carry up to 1 carload of matches, stored under satisfactory conditions. There are no wholesale hardware, paint or oil storage establishments in the city.

There are many garages, repair shops and filling stations in the city. Garages, recently constructed, are of a good type, but many of the older ones are of inferior construction unsuited for such occupancy, and some of these have dwellings on upper stories. Gasoline is usually stored in well arranged underground tanks, with approved type of pumps. In several garages and automobile repair shops, acetylene welding and spray painting of automobile bodies and parts are done without special precaution.

Motion picture booths are of fire-resistive construction, fairly well vented and maintained. In one booth, a look-out shutter was not fused. Rewinding is done on open reels in all booths, but at one location a separate rewind room is also provided; in several, electrical defects were noted. Most exit doors of booths were propped open, and in one booth there is considerable combustible material. There is no dry cleaning establishment in the city.

Block interiors in the principal mercantile district were found to be mainly clear of hazardous accumulations of combustible materials; but some small accumulations were noted.

CONCLUSIONS.—State laws and municipal laws include most of the special hazards. Control is with the bureau of fire prevention, under supervision of the chief of the fire department. Systematic inspections are made by two permanent fire inspectors; records indicate inspections by fire department officers have not been made. Local conditions as a whole are fairly good, but some undesirable conditions exist.

ELECTRICITY

ORGANIZATION AND CONTROL.—General.—The Public Service Corporation of New Jersey requires the inspection and a certificate of approval of all new work by the Fire Insurance Society of Newark before current is supplied. Old work receives very little attention. Regulations of the National Electrical Code are used as the standard.

INSIDE WORK.—During November, 1932, a number of representative installations were inspected to ascertain the general conditions of inside wiring. In the new work, the few defects found were mainly due to the misuse of flexible cords; but the average number of varied defects found in the old work indicated the need of systematic reinspections and subsequent overhauling of many installations; in numerous instances, defects are repeated in the same installation.

OUTSIDE WORK.—Wiring is overhead, except the main lines of the telephone company and those of the lighting company along several of the important streets of the congested business district. High and low tension wires are in some instances on the same pole. The Public Service Electric and Gas Company operates the street railway and supplies current for commercial light and power. Alternating current at 13,000 volts is generated outside the city and transmitted to a substation, located in the extreme northern part of the city, where it is stepped down to 2,200

volts for primary distribution to transformers, usually on poles, having 110-220-400-volt secondaries. This substation also supplies 500-volt direct current for operating the street railway system. Street lighting is by series incandescent, with maximum line voltage of about 3,000 alternating current.

ELECTROLYSIS.—No recent trouble is reported from electrolysis. The telephone and lighting companies make electrolytic tests.

CONCLUSIONS.—The city exercises no supervision over electrical wiring. New work is well controlled by the Public Service Company and underwriters. Old work receives very little attention, is in poor condition, and reinspections are not made. The main lines of the telephone company and several lighting and power lines in the business district are underground; elsewhere they are overhead. No trouble is reported from electrolysis; regular tests are made.

CONFLAGRATION HAZARD

PRINCIPAL MERCANTILE DISTRICT.—Limits.—Commencing at Bloomfield and Fourth streets, Fourth, Hudson, Third, River, First, Post Office Plaza, Ferry Plaza, Hudson place, Hudson, Ferry, Bloomfield, to place of beginning.

The district is located in the southeastern part of the city, adjacent to the Hudson river. It is practically level, includes 17 blocks and covers 38 acres, of which 43 per cent. is in streets and open spaces; 79 per cent. of the block area is built upon. Streets are well paved. Washington and Hudson streets, which extend from north to south through the district, are 100 and 80 feet in widths, respectively; cross streets are mainly 50 feet in width. Blocks are small to moderate in area, and several are divided by alleys; block frontages are solidly built on, and accessibility is poor in 8 blocks. Values are mainly moderate to low, with a number of higher values in theatre, office, bank and grade floor tenement house buildings along Washington street. Exposures to the district are severe on the north and west, moderate on the south, and mild on the east.

Of the 414 buildings in the district, 75 are more than 4 stories high, and the fire areas in 18 buildings and 16 groups of buildings, covering about one-third of the built-on area, are large or excessive. The fireproof is small in amount. Frame constructed buildings, covering 10 per cent. of the built-on area, are grouped at some points. The remaining buildings, covering 79 per cent. of the built-on area, are of ordinary construction, mainly having thin fire and party walls, low para-

pets and unprotected floor, communicating and window openings; in addition, many of these buildings are old; about one-third of their fire areas are large or excessive, and more than half of them exceed 3 stories in height. These fire-resistively weak features, particularly in the predominating ordinary construction, are conducive to the spread of fire, and the potential hazard is high in all the blocks of the district.

Private protection is small in amount, only 4 buildings in the district being equipped with automatic sprinklers. The fire department is fairly effective; and powerful outside aid is available. The water supply is fairly reliable, but the quantities available to fight serious fires are only fair to poor. The high potential hazard combines with high winds and deficiencies of the water supply to make serious fires probable; such fires might readily spread and involve a large group of buildings. The blocks in which the conflagration hazard is especially marked are as follows:

Block bounded by First, River, Newark and Hudson (Sanborn, page 15, block 228). A small block with practically no vacant space. Buildings are of small or moderate area, but a 1-story frame building adjoins and communicates through frame rear additions with six buildings, forming a combined fire area of about 15,500 square feet. The buildings are mostly 4 stories in height and of ordinary construction and without protection to vertical openings. There is no protection to window and communicating openings, walls are light and parapets low. Owing to weak construction, lack of private protection and serious rear exposures from the frame construction, the block is subject to one fire, which would threaten the block to the north.

Block bounded by Second, Hudson, First and Washington (Sanborn, page 16, block 212), a compactly built, moderately sized block subdivided by a 20-foot alley. Buildings are 2 to 6 stories high and mostly of moderate areas. A group of up to 4-story old frame buildings, covering 5,500 square feet area, occupies the southeastern corner, a 2-story fireproof building of 6,000 square feet is in the southwestern corner, and the remaining construction is of rather old, up to 6-story, ordinary constructed buildings. Only four buildings have windows protected and floor and communicating openings are unprotected. There are many light wells, and frame constructed rears, cornices, and roof structures, severe mutual exposures and weak internal construction, making serious fires probable.

OUTSIDE THE PRINCIPAL MERCANTILE DISTRICT.—Minor Mercantile Districts.—Along Washington street from Fourth to Fourteenth, around Fourteenth and Washington streets and on First between Hudson and Mar-

shall streets are important minor mercantile sections. With few exceptions buildings are of tenement occupancy above the first floor. Areas are generally small and construction is similar to that of the principal mercantile district, except along First street where there is a considerable number of frame buildings. These districts are subject to serious fires which, along First street, may spread to the large frame tenement district adjoining on the north.

Wharf District.—This district comprises groups of piers, with considerable separation, along the river front for the entire length of the city. The types of construction of the pier sheds, inflammability of contents, excessive areas, absence of baffle walls, inaccessibility of substructures and supports of wooden piles create a high potential hazard and serious fires are probable.

One large ferry house and train shed, and the bulkheads of several pier sheds are fireproof. At the foot of Sixth street, between the pier sheds and the Shore railroad is a large frame constructed freight house and five 6-story brick constructed general storage warehouses, the latter having all exposing windows protected. Between Tenth and Twelfth streets are several large 1-story frame warehouses, and at the foot of Fourteenth street is a frame ferry house, and groups of up to 3-story frame and ordinary constructed buildings of warehouse, machine shop and marine repair occupancies, but most of these buildings are provided with automatic sprinklers. At the extreme northern part are large frame constructed dry docks and yacht pier sheds.

The potential hazard in this district is high, and the danger of serious fires is imminent, but on account of the improved construction in the northern section, the generally low heights, ready accessibility to both land and water fire fighting apparatus, the private fire protection, the absence of serious mutual exposures, and the fact that the prevailing direction of the winds tends to carry a fire toward the river, the probability of a general conflagration in this district is small.

Manufacturing Districts.—Most manufacturing plants are located in the northern part of the city west of Willow street and north of Seventh street; there are several factory groups elsewhere, but they are mostly sprinklered or of fireproof construction. The blocks, approximately bounded by Fourteenth, Willow, Tenth and Grand streets, are almost solidly built-on wire factories, a large portion of which are frame; streets are narrow, the water supply is deficient, there are many severe mutual exposures and structural conditions are fire-resistively weak, making severe group fires probable, which might readily spread across the narrow streets and involve a large portion of the district. There are

several groups of factories in the residential districts, but these are provided with automatic sprinklers and other private protection, so that a fire should be confined to the building of origin.

Residential Districts.—The remainder of the city is mainly 3- to 4-story tenement houses. Frame construction is largely grouped in the western part of the city and is generally of light mercantile and principally foreign tenement occupancy; many buildings are old, and in numerous instances, old frame tenement houses are 5 or 6 stories in height. The high potential hazard due to the large amount of combustible materials in conjunction with the frequent high winds, inadequate water supply and the absence of fire

stops, results in a very high conflagration hazard, and sweeping fires are probable.

CONCLUSIONS.—In the principal mercantile district, ordinary construction predominates, and the many large or excessive fire areas, few of which have sprinkler or other private protection, along with mutual exposures resulting from unprotected window and communicating openings, make severe group fires probable. In the minor mercantile districts, severe group fires are probable which, in the district along First street, may spread to the adjoining tenement section. Severe fires are probable in the wharf district. Group fires are probable in the manufacturing plants. Residential districts, in the western part of the city, are subject to sweeping fires.

RECOMMENDATIONS

Recommendations marked with a star (★) are deemed of most importance and their early adoption is urged.

WATER SUPPLY

Organization

1. That all department employees be placed under civil service regulations, requiring proper qualifications before appointment and with removal only for cause.

Records

2. That records be improved by the preparation of a set of street intersection plans showing correctly the detailed locations of pipes, valves and hydrants, that prints of the detailed plans suitable for field use be made, and that all original maps and records be filed in the vault of the department.

Pressures

★3. That arrangements be made so that in case of serious fires the supply available at the city line may be increased by operating both pressure regulating valves.

Mains

4. That the distributing system be strengthened by the construction of a 12-inch main along Hudson from Newark to Fourth streets, and by the construction of 8-inch mains as shown in red on the accompanying plan.

★5. That a complete underground survey of the distributing system be made to determine the actual size and condition of the mains, the places and manner in which they are now cross-connected and the size and arrangement of hydrant connections with the mains.

★6. That following the completion of the survey such improvements be made as are necessary to insure a flow of at least 600 gallons a minute from each hydrant if tested in groups corresponding to the number of hydrants required for a serious fire.

★7. That in addition to providing hydrant branch connections of proper size the larger mains shown to lack cross-connections be connected in the following localities:

CONNECTIONS RECOMMENDED.

LOCATIONS	MAINS	
Ferry and Washington Sts.	16-	6-inch
Newark and Bloomfield Sts.	24-	12-inch
2nd St. and Park Ave.	16-	6-inch
2nd St. and Willow Ave.	10-	12-inch
2nd and Grand Sts.	16-	6-inch
2nd and Adams Sts.	16-	6-inch
5th and Bloomfield Sts.	10-	6-inch
5th St. and Park Ave.	10-	6-inch
5th St. and Willow Ave.	16-	12-inch
5th St. and Willow Ave.	10-	6-inch
5th and Clinton Sts.	12-	6-inch
9th and Hudson Sts.	8-	6-inch
4th and Madison Sts.	6-	6-inch
8th and Madison Sts.	6-	6-inch
9th and Madison Sts.	16-	8-inch
10th and Bloomfield Sts.	12-	6-inch
11th and Garden Sts.	30-	16-inch
11th and Bloomfield Sts.	16-	6-inch
13th and Bloomfield Sts.	30-	6-inch
13th St. and Park Ave.	30-	12-inch
13th St. and Willow Ave.	30-	16-inch
13th St. and Willow Ave.	30-	12-inch
13th St. and Willow Ave.	30-	6-inch

Gate Valves

8. That the distribution system be equipped with a sufficient number of gate valves, so located that no single break will necessitate shutting from service a length of main greater than the side of a single block, or a maximum of 500 feet, in high value districts, or a length greater than the sides of two blocks, or a maximum of about 800 feet, in other districts.

Hydrants

9. That hydrants of unsatisfactory size be replaced by hydrants having one 4½- and two 2½-inch outlets and with 6-inch gated branch connections to the main.

FIRE DEPARTMENT

Organization

10. That the department be placed under civil service regulations, and appointments and promotions of members be made from qualified civil service lists.

Companies and Equipment

11. That Hose Company 4 be changed to an engine company equipped with an engine of at least 750 gallons capacity, and a separate hose wagon carrying a chemical tank.

12. That each hose carrying vehicle carry at least 200 feet of 3-inch hose, with a total of at least 1,000 feet of 2½- and 3-inch hose.

Operation

13. That individual and company drills be held more frequently, and operators of engines be given additional instructions and training and only those members who are thoroughly qualified to operate engines be so appointed.

14. That an officers' fire college be established for the instruction of all officers and candidates for promotion to officers, in standard methods and uniform practices in fire-fighting, and in regulations pertaining to the department, buildings and fire protection and prevention.

★15. That engines be tested annually and after any extensive repairs are made, following the methods published by the National Board of Fire Underwriters and complete records kept.

16. That the same response be made to telephone, and A.D.T. alarms for fires in buildings as to box alarms from the same locality.

FIRE ALARM SYSTEM

Headquarters

★17. That fire alarm headquarters be removed to a building of fireproof construction, especially

constructed to reduce as far as possible, all liability to interruption of service; in the new location all apparatus to be placed on incombustible mountings and no unnecessary combustibles permitted in the building.

Apparatus

★18. That additional switchboard and charging facilities be installed to provide for the necessary box and alarm circuits; and that a manual transmitter and time stamp and a non-interfering repeater of adequate capacity for the necessary circuits be installed.

19. That apparatus at fire stations include a taper and punch register on a box circuit and a gong on a separate alarm circuit; provisions to be made to transfer the register to the alarm circuit in case of emergency.

Boxes

20. That additional boxes be installed so that a box will be visible from and within 500 feet of every building in important districts and elsewhere within 800 feet of every building in the closely-built sections; boxes in important districts to be indicated by lights at night and all boxes and a band on supporting poles to be painted red annually.

Circuits

21. That conditions be improved by:

a. Connecting not more than 20 boxes on one circuit.

b. Installing closed alarm circuits, separate from box circuits, to connect to gongs at fire stations and instruments elsewhere.

c. Installing lightning arresters of approved type in entering aerial conductors at fire stations.

d. Continuing to place circuits underground wherever ducts in low tension systems are available.

Operation

22. That the telephone operator be on duty at all times in the fire alarm operating room.

23. That more frequent tests be made of circuits and batteries, and records of all tests, inspections and trouble be kept and maps of box locations and circuits be kept up-to-date.

24. That telephone and A.D.T. alarms for fires in buildings be transmitted as box alarms, the number of the nearest box being manually transmitted over the circuits after notifying the nearest company by telephone.

BUILDING DEPARTMENT

25. That the building laws be revised to conform more closely to modern requirements for

construction and fire prevention as given in the National Board Building Code, particularly as to limitation of heights and areas, protection to floor and exposed openings and required wall thicknesses.

ELECTRICITY

26. That the National Electrical Code be adopted by ordinance as the standard for all electrical work.

27. That authority be granted for the complete inspection of old wiring and correction of defects, and that all wiring be subsequently reinspected at suitable intervals.

28. That a definite plan be adopted for the

removal of overhead wires in closely built sections so that eventually all obstructions to fire department operations will be eliminated.

CONFLAGRATION HAZARD

★29. That owners of existing defectively constructed buildings, which are so located as to form conflagration areas, be required to suitably protect floor, window and party wall openings.

★30. That automatic sprinkler equipments with outside siamese hose connections and controlling valve near main in street, be required in all buildings, which by reason of their size, construction or occupancy, singly or combined, might act as conflagration breeders.

GENERAL SUMMARY

CITY IN GENERAL

Population estimated 59,000. Important shipping and transportation center. The surface is generally flat, but some grades average about one per cent. Streets mostly paved and in good condition. High winds frequent; continuous cold or hot dry weather infrequent. Number of fires moderate; loss per fire very high and loss per capita high, with incomplete record of losses.

FIRE-FIGHTING FACILITIES

Water Supply.—Supply from a normally adequate and reliable source purchased from Jersey City and delivered at southwest city line; emergency connections at north city line with private company. Records incomplete. Consumption moderate. Pressure fair to low. Arterial system of adequate capacity and well arranged; distributing system very weak because of lack of connections between large and small mains. Valve spacing fair to wide. Hydrant distribution good; many small or poorly supplied hydrants limit engine supply.

Fire Department.—Full paid; on 2-platoon basis; under command of competent chief officers. Methods of appointment and promotion unsatisfactory. Department well equipped; adequately manned, and companies well distributed. Some 3-inch hose in use. One fire station unsuitable, others good. Drills installed, but insufficiently frequent to be fully effective. Response to telephone alarms inadequate. Fire methods generally good. Inspections by company officers infrequent. Records fairly complete.

Fire Alarm System.—Recently placed under good supervision. Of automatic type; headquarters equipment incomplete and hazardedly housed. Aerial circuits in good condition. No separate alarm circuits provided. All boxes of good type, but are generally inconspicuous. Tests infrequent and inadequate. Records poor.

Fire Department Auxiliaries.—No State fire marshal. Fire and police departments cooperate in the investigation of suspicious fires; some arrests and convictions obtained in recent years. Police cooperate with the fire department at fires. Public service corporations render aid only on request. Telephone service good; much used for notification of alarms. Most waterfront properties provided with private protection; powerful outside aid quickly available.

Summary.—Water supply from a normally adequate and reliable source; distribution weak; available quantities poor in many parts of the city. Fire department fairly efficient and effective. Fire alarm system contains many features of unreliability.

STRUCTURAL CONDITIONS AND HAZARDS

Building Department.—Building laws slightly deficient, but fairly well enforced. Fire limits extensive. Structural conditions weak.

Explosives and Inflammables.—State and municipal laws control most of the special hazards. Control is with fire prevention bureau. Local conditions, as a whole, fairly good, but some undesirable conditions exist.

Electricity.—No municipal supervision. Underwriters and public service company exercise good control over new work; very little attention given old work and much in need of overhauling. Main lines of telephone and power companies underground in part of the business district. No electrolytic trouble reported; tests made.

Conflagration Hazard.—In the principal mercantile district, fire-resistively weak ordinary construction, large fire areas, lack of protection to exposed and vertical openings make severe group fires probable. Group fires are probable in the minor mercantile districts which may become sweeping fires in the contiguous frame mercantile district along First street and tenement district to the west. Severe group fires are probable in the wharf district. Group fires are probable in the manufacturing districts, but the hazard is somewhat mitigated in the larger buildings, which are usually sprinklered.

March, 1933.

National Board of Fire Underwriters

COMMITTEE ON FIRE PREVENTION AND
ENGINEERING STANDARDS,

HOBOKEN, N.J.

MARCH, 1933

KEY

Principal Mercantile District
Blocks in which conflagration hazard is marked
Fire limits

WATER SUPPLY

Mains 8 inches and larger in diameter
Mains 6 inches in diameter
Mains 4 inches in diameter
Mains recommended by the National Board
Connections recommended by the National Board
Fire flow tests designated by numbers

FIRE DEPARTMENT

Present companies shown in black
Recommended company shown in red
Companies designated by symbols
Ⓜ Engine with separate hose Ⓛ Ladder
Ⓜ Hose Ⓞ Chemical or water tank on above
Scale of Feet

