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# Report on the City of Tampa, Florida

National Board of Fire Underwriters Committee on Fire Prevention and Engineering Standards

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38

TAMPA,  
FLA.

MAY, 1927

Report No. 38

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

REPORT  
ON THE  
CITY OF TAMPA, FLA.  
(SUPERSEDING THAT OF 1923)

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The investigation of conditions in Tampa, Florida, was made during January, 1927 by Engineers Robert C. Dennett, J. H. Howland and George F. Grimshaw.

Acknowledgement is made of valuable assistance rendered by Hon. Perry G. Wall, Mayor; W. Lesley Brown, City Manager; the officials of the several city departments concerned, and others.

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Office Engineers

ROBERT C. DENNETT

CLINTON T. BISSELL

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MAY 26, 1927

# TAMPA, FLA.

REPORT NO. 38

(Superseding that of 1923)

## CITY IN GENERAL

The commissioners of the commission-manager form of government are: Hon. Perry G. Wall, Mayor; W. J. Barritt; W. A. Adams, S. L. Lowry, Sr., and James McCants. W. Lesley Brown is City Manager.

Resident population estimated to be 125,000; the State census of 1925 gave 95,000 and the 1920 United States census showed 51,608. During the winter months there is a considerable increase due to transient population. The city is an important distributing center. Coastwise and deep-sea shipping and two trunk line railroads afford excellent transportation facilities. The principal industries are the manufacture of cigars and the shipping of phosphate; large cement and fertilizer plants have recently been established.

The present city area is 24.1 square miles, of which 17.5 square miles is land area; about 65 per cent. of the latter is built upon and is practically level. The principal streets are 80 feet wide; in Ybor City, 50 and 60 feet and in outlying districts 30 to 80 feet, with an average of close to 60 feet. The Hillsborough river, intersecting and bordering the city, is spanned by six bridges. Railroad crossings are

numerous, with the liability of serious delays in fire department response. There are 433 miles of dedicated streets of which 189 miles are paved, largely with brick or asphalt block and in good condition; the remainder are generally deep in sand. Fuel is crude oil, bituminous coal and wood; gas is generally used for domestic purposes.

Records of the local United States Weather Bureau station show that winds of 25 miles per hour and over occur on an average of 21 times a year; hurricanes occasionally occur. Winter temperatures are mild, seldom reaching freezing. Extended periods of hot, dry weather are considerable in number.

The gross fire loss for the past 5 years as compiled from fire department records was \$2,013,561, the annual losses varying from \$235,073 in 1924 to \$611,936 in 1926. The average annual number of actual fires was 444, with an average loss per fire of \$907, a high figure. The average annual number of fires per 1000 population, based on an average population of 86,600 was 5.1, and the average loss per capita was \$4.65, both high figures.

## FIRE-FIGHTING FACILITIES

### WATER SUPPLY

**OWNERSHIP.**—Works, started in 1889, were purchased by the city from the Tampa Water Works Company on July 1, 1923. Since this date new supply works have been constructed and extensive improvements made in the distribution system.

**ORGANIZATION.**—The city manager, W. Lesley Brown, has general supervision over the water department. The superintendent, A. W. Squires, was with the water company for 17 years prior to its acquisition by the city, two years as acting superintendent; he is appointed for an indefinite term by the commission, on the recommendation of the city manager. H. F. Brown is chief engineer, in charge of pumping

stations. There are 138 permanent employees, under civil service.

**Records.**—Two sets of maps show mains, gates and hydrants and an atlas shows these features in more detail. Card index shows detail location of gate valves. There are complete plans of the new supply works and records of operation of pumping stations. Recording gage charts show pressures and height of water in the reservoir and tanks, and Venturi meter charts give consumption data.

**Quarters.**—The office is in the City Hall. Pipe yard and meter shop are at Henderson avenue and Jefferson street.

**Fire Service and Emergency Operations.**—Fire alarms sound on a gong at the old pumping station, where constant watch is maintained

## WATER SUPPLY

and one of the fire pumps is started on every alarm. No regular response is made to alarms, but the superintendent and generally some other employees, attends large fires. Adequate telephone connections are provided and several trucks are available and a repair gang can be readily assembled.

**GENERAL OUTLINE OF SYSTEM.**—Supply taken from the Hillsboro river, about six miles north of the congested value district, is filtered and pumped to the city in one service with three elevated tanks as equalizers. The former well supply is maintained for emergency use. The supply for fires is augmented by pumpage from a suction reservoir at the old main pumping station, about  $\frac{3}{4}$  mile north of the principal mercantile district.

Elevations in this report are in feet above mean sea level.

**HILLSBORO RIVER SUPPLY.**—**General.**—The works, put in service in March, 1926, include intake, pumping station with low- and high-lift pumps, and treatment plant comprising mixing tanks and sedimentation basins, chemical house, gravity mechanical filters and a filtered water reservoir. The treatment plant has a nominal rated capacity of 15,000,000 gallons a day, but can be operated at an 18,000,000-gallon rate, and was so designed that it may be readily enlarged to a capacity of 36,000,000 gallons a day.

The Hillsboro river, with a drainage area above the intake of 535 square miles, has a minimum estimated flow in excess of 50,000,000 gallons a day. About  $\frac{1}{2}$  mile below the intake a concrete dam of the Tampa Electric Company forms a narrow lake some 12 miles long, impounding about 6,500,000,000 gallons below the top of the flash boards, elevation 23.

**Intake.**—A concrete intake chamber, in the center of the river channel, in about 25 feet of water has 3 openings, controlled by 48-inch sluice gates and protected by bar screens. The lowest opening is at elevation 5, below the bottom of the dam. From the intake a 36-inch cast-iron pipe extends about 250 feet to a concrete screen and suction well adjacent to the pumping station. Connections have been provided so that, in case of any unusual lowering of the water in the river, a low-lift pump may be made to take suction direct from the intake.

**Purification Plant.**—Low-lift pumps include three De Laval, steam turbine driven single stage centrifugals, one of 6,500,000 and two of 12,500,000 gallons a day capacity, against 35-foot head. They take suction, normally with slight lift, through independent lines from the well and discharge against about 20 feet head

through a single 30-inch line about 450 feet long to the purification plant. There are 8 mixing tanks, 2 settling basins each of 1,000,000 gallons capacity and 2 decolorizing basins, each of 750,000 gallons capacity; all are of substantial concrete construction; elevation 48. Eight concrete filters, nominal capacity 1,875,000 gallons a day each, are housed in a hollow-tile and stucco building. From the filters a 48-inch concrete conduit extends to a 500,000-gallon covered concrete, filtered water reservoir, adjacent to the pumping station.

**Pumping Station.**—**General.**—The station is on the bank of the river, about 500 feet south of the filter house. Operation is in 3 shifts, two of 2 men each, and one of five. Fuel oil is stored in two 25,000-gallon tanks, about 75 feet from the station; they are supplied by gravity through an 8-inch pipe from tank cars on a siding at the filter house; two pumps serve the boilers, with single suction and discharge lines. The tanks are enclosed by a concrete retaining wall and equipped with steam heating and smothering lines. Operation is continuous, with one or two high and low-lift pumps.

**Equipment.**—In addition to the low-lift pumps there are two 10,000,000-gallon and one 5,000,000-gallon 240-foot-head De Laval, two-stage centrifugal pumps, each driven by a De Laval steam turbine. Suction is through independent lines from a suction well connected to the clear water basin, which may be by-passed; lift about 6 feet, and discharge at 75 to 85 pounds pressure is to a 30-inch line to the distribution system, equipped with a Venturi meter. Two 50-K. W. generators furnish current for lighting and motor driven equipment in the filter plant. Three 200-h. p., Babcock and Wilcox water tube boilers supply steam at 185 pounds pressure; two are kept under steam. Steam piping is in a loop, with branches to each unit well installed and gated, except that the repair of one valve would necessitate the shutting down of all units. Two boiler feed pumps and injector are provided. The plant is provided with all meters, registering devices, gages and equipment for convenient and efficient operation.

**Construction.**—The station is a large-area building of hollow tile, stucco construction with tile covered wooden roof on steel trusses. Tile wall separates boiler and pump room, with one unprotected opening. Floors are of concrete or tile. Pump room is in two levels, with pipe gallery under high-lift pump floor.

**Hazards.**—No exposures. Oils stored in small outside building. Oil feed to pumps from tanks on steel platform near roof. Wiring in conduit.

**Protection.**—Several fire hydrants about plant; 200 feet of 2½-inch hose and nozzle. A stand-pipe and hose is to be installed in the pump room.

**RESERVE SUPPLY.—Wells.**—At the old main station, at Highland and Henderson avenues, ¼ mile north of the congested value district, are 17 available, 10-inch wells, about 200 feet deep. The flowing supply is about 5,000,000 gallons a day which can be increased by air lift to about 8,000,000 gallons. Supply flows through cast-iron pipe lines to a 33,000-gallon receiving well from which a concrete conduit, 70 feet long, extends to a 54,000-gallon suction well. The receiving well also receives the flow from a spring which yields about 1,000,000 gallons a day.

Five segregated wells, the locations of which are shown on the accompanying plan, are electrically operated, kept in good condition, and can be started at any time by a man sent from the old station or the supply yard. Four have deep well pumps and one a centrifugal pump; each discharge is equipped with Venturi meter. Capacities range from 500,000 to 1,600,000 gallons a day, with a total of 6,000,000 gallons a day.

**Main Pumping Station.**—At this station are two 5,000,000-gallon and one 3,000,000-gallon horizontal, triple-expansion, duplex, double-acting pumps, one air compressor, and four 150-hp. fire tube boilers. Equipment is maintained in good condition; about once a month boilers are fired and equipment operated. Two men are on duty during the day and one at night; others live on ground.

Station is a high, 1-story, large-area brick building, consisting of pump and boiler rooms with unprotected communication. Roof is slate on wood sheathing on wood trusses; floors cement and tile on concrete. End of boiler room is of corrugated iron on wooden studs. No exposures. Lighting by electricity; wiring in fair condition. Fuel oil pumped to boilers; other oils in small frame building 100 feet distant. Only protection is 100 feet of 1½-inch hose for cleaning purposes; several hydrants available.

**FIRE PUMPS.**—In the old Main pumping station are two De Laval single stage, centrifugal pumps, each driven by a General Electric 200-h.p., 440-volt induction motor; capacity 5,000,000 gallons each at 70 pounds pressure. Pumps discharge through a single 20-inch line to a 20-inch line in the street which would also receive the supply of the domestic pumps in the station when operating. Suction under slight head is taken through a 20-inch line about 100 feet long from a concrete suction

reservoir, capacity 3,500,000 gallons. The reservoir is kept filled for fire supply from the mains of the distribution system. One pump is started for all alarms of fire and if pressure drops materially the second pump would be started. Current is supplied over a single overhead line about 300 feet long from a circuit of the Tampa Electric Company; transformers on poles outside.

**EQUALIZING TANKS.**—Three elevated steel tanks are connected to the distribution system. Each is 52 feet high with spherical bottom, on a steel tower, top 123 feet from the ground, capacity 500,000 gallons; overflow is prevented by a regulating valve on each. One is at 21st Avenue and 13th street about 1½ miles north-east of the congested value district; connected to a 24-inch main of the distribution system by a 16-inch pipe; this tank is maintained full or nearly full; elevation top 170. One tank is at Henderson and Jefferson streets, about ¼ miles north of the congested value district, connected through a 10-inch to a 20-inch main; this tank is filled at night but its content is largely reduced during hours of heavy consumption in the afternoon; elevation of top 170. The third tank is near Howard avenue and Cass street in West Tampa, some two miles west of the Henderson street tank and connected to a long loop of 12-inch pipe; this tank is filled at night but is normally empty for a short period each afternoon due to inadequate pipe capacity to it; elevation of top 150.

**FORCE MAINS.**—A single 30-inch cast-iron main extends 10,000 feet west and south from the new pumping station; this main supplies two lines extending into the distribution system as shown on the accompanying plan, one a 20-inch and the other a 30-inch reducing successively to 24-inch and to 20-inch.

**CONSUMPTION.**—The average daily consumption, based upon pump plunger displacement at the old Main pumping station and Venturi meters at the deep well stations, was 8,087,000 gallons in 1924 and 11,306,000 gallons in 1925. Since the new plant went into full operation in May, 1926, the average daily consumption, as measured by Venturi meter, has been 11,820,000 gallons a day; with an estimated population supplied of 95,000 the per capita is 124 gallons a day.

**Maximum.**—The greatest consumption occurs in May or September and has reached a maximum of 14,000,000 gallons a day since the new plant has been in operation.

**Meters and Service Connections.**—On December 1, 1926, there were 17,990 service connections

## WATER SUPPLY

of which 6,500 were metered. There are 14 six-inch and 84 four-inch connections for fire protection, unmetered. Systematic house to house inspections for the detection of leakage and waste are made annually with good, but only temporary, results. The department plans to meter all services and if funds are made available will complete this work within three years.

**PRESSURES.**—Recording pressure gages are maintained at eight locations on the distribution system and charts are on file. These indicate as follows: In the congested value district pressure averages about 50 pounds during the day reaching a maximum of 70 pounds during the night; at the old Main pumping station pressure is normally 50 to 55 pounds during the day with a maximum of 65 at night; in the Ybor City section, day pressure is about 55 pounds and 70 to 75 at night; in Seminole heights pressure is 55 to 70 pounds; in West Tampa and Hyde Park pressure averages 35 pounds during the day with a minimum of 20 pounds and reaches a maximum of 55 at night. With one fire pump operating pressure is increased 15 pounds at the old Main station and from 5 to 15 pounds throughout the system, increasing 10 pounds in the congested value district and 5 to 10 pounds in Hyde Park and West Tampa.

During the fire flow tests, made at 15 locations throughout the city, with one fire pump operating, pressures averaged 53 pounds with a maximum of 65 pounds and a minimum of 45 pounds.

**DISTRIBUTION SYSTEM.**—As shown on the accompanying plan the 30-inch force main from the new plant supplies a 20-inch and a 24-inch which extend to Michigan avenue, the former supplying three 12-inch lines and the latter continuing as a 20-inch to the Henderson street tank and extending on to the old Main pumping station. From the 20-inch line several 10- to 16-inch lines extend to the congested value district and the other sections east of the Hillsboro river, including Ybor City. The Hyde Park and West Tampa sections, west of the river, are supplied by a 20-inch, a 16-inch and two 12-inch lines which are of good capacity in themselves but which extend for only a short distance beyond the river, supply for most of the territory being largely dependent on a long 12-inch loop of insufficient capacity. Minor distributors are largely 6-inch with a good proportion of 8-inch and a small amount of 4-inch. In the principal mercantile district, of 25,000 feet of pipe 2.4 cent. is 4-inch, 47.6 per cent. 6-inch, 10.4 per cent. 8-inch, 13.6 per cent. 10-inch, 18.4 per cent. 12-inch, 6.4 per cent. 16-inch and 1.2 per cent. 20-

inch. The average length of 6-inch pipe between cross connections in the gridiron on the long side of the blocks is about 800 feet. There are 5.4 miles of 4- and 6-inch dead ends, largely the latter, supplying hydrants, or 4.5 per cent. of the total.

**PIPES.—Length and Age.**— See Table 1. Very few hydrants are supplied directly from 4-inch mains. Pipe is tar-coated, cast-iron. The first mains were laid in 1889. Since the city acquired the plant in 1923, about 20 miles of pipe, 6 to 30 inches in diameter, has been laid.

TABLE 1.—PIPES IN DISTRIBUTION SYSTEM,  
JANUARY 1, 1927.

Diameter, Inches	Length, Miles	Per Cent. of Total
4	5.71	4.7
6	48.83	40.3
8	24.40	20.1
10	10.27	8.5
12	19.08	15.8
16	0.98	0.8
20	6.51	5.4
24	2.14	1.8
30	3.14	2.6
Totals.....	121.06	100.0

**Condition and Cover.**—The present water does not cause tuberculation of the mains and some of the previous incrustation has been removed. Discharges during fire flow tests showed considerable turbidity. Mains are covered 2½ feet. Frost penetration is negligible. One of the 12-inch mains crossing the river is laid upon the bed of the stream, the other 12-inch and the 16-inch and 20-inch are in trenches with rock fill above the latter two.

**Specifications.**—Pipe is purchased under specifications of the American Water Works Association, Class B. It is inspected at the foundry, upon receipt and at the trench before laying.

**Electrolysis.**—See Electricity, page 15.

**GATE VALVES.—Number and Type.**— On January 1, 1927, there were 939 gate valves in the distribution system. All open clockwise. All valves 20-inch and larger are geared and in concrete vaults; others are direct acting, in iron boxes.

**Location and Spacing.**—Valves are on the property lines at street intersections. The average length of main which would be shut off in consequence of a single break in the congested value district is 1,100 feet, with a maximum of 2,100 feet. In a representative residential

section the average was found to be 1,420 feet.

**Inspection and Condition.**—Valves are inspected annually when each is opened and closed and any repairs found necessary are made. Inspections made during this report indicate that valves are in good condition.

**Closing of Valves.**—The fire department is notified by telephone when valves affecting hydrant supply are to be operated.

**HYDRANTS.—Number and Type.**—On January 18, 1927, there were 1224 hydrants in service, all R. D. Wood post type, opening counter clockwise. Nine hundred ten have two 2½-inch outlets and 4½-inch foot valve, 680 with 6-inch connections to main and 230, mainly in West Tampa, with 4-inch connections; 314 have one 4½-inch and two 2½-inch outlets, with 6-inch branch. A few, supplied directly from large mains, have gated branch.

**How Located.**—Locations are determined by the superintendent and fire chief. The typical arrangement is one hydrant at each street intersection, with an additional hydrant in blocks of excessive length.

**Drainage.**—All hydrants have automatic drip valve and the sandy soil provides quick drainage.

**Inspection and Condition.**—Hydrants are inspected annually by the water department when each is flushed and caps are greased. Report

is made by the fire department of any hydrants found in need of repairs. Hydrants operated during the field work of the National Board inspection were in generally good condition.

**Distribution.**—In the congested value district there is one hydrant at each street intersection and four intersections have two hydrants, and the average area served by each is 64,000 square feet. In a representative residential district the average area served by each hydrant is 144,000 square feet. There are some fairly well built-up sections of considerable area in the northerly part of the city that are without hydrant protection into which the department is planning to extend mains as rapidly as possible; considering all areas needing protection the average area served by each hydrant is about 250,000 square feet.

Of the 60 hydrants in and bordering on the congested value district 11 have two 2½-inch outlets and 49 have a third outlet 4½-inches in diameter.

**Use by Street Department and Others.**—The general use of hydrants is not permitted. When their use is required for street work, the contractor must obtain a permit signed by the water department and the fire chief and hydrant is operated by an employe of the water department.

**FIRE FLOW TESTS.**—See Table 2. Tests were made on January 21, 1927, between 8:30 A. M. and 3:00 P. M. One fire pump was operating,

TABLE 2.—FIRE FLOW TESTS.

District	Number and Location of Group*	DISCHARGE, GALLONS PER MINUTE				PRESSURE, POUNDS PER SQUARE INCH		QUANTITY		
		Individual Hydrants		Total of Group		Hydrants Closed	Hydrants Open	Required	Available for Engine Supply	
Congested Value.....	1. Franklin and Cass Sts.....	420	750	900	1100	3170	63	58	10000	9000
	2. Franklin and Washington Sts.....	840	860	1000	1110	3810	58	40	10000	5700
Warehouse.....	3. Franklin St. and Carew Ave.....	750	810	960	.....	2520	63	24	4000	2700
	4. 13th and Washington Sts.....	780	860	980	.....	2620	63	22	3000	2700
	5. Twigg St. and Nebraska Ave.....	560	920	1120	.....	2600	59	46	4000	4700
	6. 7th Ave. and 14th St.†.....	610	650	700	810	2770	60	45	4000	4700
Minor Mercantile....	7. Garcia Ave. and Greene St.....	700	1000	1360	1560	4620	65	53	2500	9000
	8. Albany Ave. and Union St.....	740	900	1140	.....	2780	46	23	2500	2900
	8a. See Note below.....	560	640	840	.....	2040	46	17	.....	1900
	9. Grand Central and Oregon Aves.....	780	810	1080	.....	2670	47	22	2500	2800
	10. Grand Central Ave. and Boulevard.....	570	650	780	1060	3060	54	28	3000	3500
	11. Morrison and Rome Aves.....	610	920	1000	.....	2530	45	18	2000	2400
	12. Bay St and Magnolia Ave.....	340	500	1060	.....	1900	56	15	2000	1800
	13. Highland and Amelia Aves.....	560	560	600	860	2580	56	33	2000	3300
Residential.....	14. Ross Ave. and Taliaferro St.....	580	600	810	900	2890	58	38	2000	4100
	15. 19th St. and 13th Ave.....	610	720	960	1080	3370	54	22	3000	3500
	16. Scott and Governor Sts.....	700	840	920	1160	3620	61	28	2500	4000

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

†Test made in 1923; larger quantity available now.

NOTE:—Test 8 repeated with Howard Avenue standpipe shut off.



## FIRE DEPARTMENT

the Henderson street tank was about  $\frac{3}{4}$  full and the West Tampa tank about  $\frac{1}{3}$  full. The total consumption on the day of the tests was about 12,000,000 gallons with a maximum rate of 16,000,000 gallons a day.

**IMPROVEMENTS.**— Since the report of 1923, the city has constructed new supply works, holding the well supply in reserve, and materially strengthened the distribution system. Further strengthening is contemplated and the reduction of the excessive consumption by complete metering.

**CONCLUSIONS.—Supply Works.**—The new supply works are well designed, constructed and operated and may be readily enlarged to meet future demands. The former well supply, held in reserve, and the suction storage for the fire pumps at the old station offsets to a great extent the unreliability inherent in a single force main and the possibility of interruption to the supply from any cause at the new plant. Although the plant itself is of adequate capacity for present needs the mains to the city are severely taxed by the needlessly heavy consumption, especially at time of peak load, and unless the use of water is kept within reasonable limits it will soon be necessary to increase the capacity of these lines and within a comparatively short time to enlarge the plant itself. The elevated tanks are a valuable feature, but during the hours of heavy consumption the storage in two of them is greatly reduced, particularly the one in West Tampa.

**Consumption.**—The consumption is high. It could undoubtedly be materially reduced by the general installation of meters. This would be of distinct financial advantage in saving in cost of purification and pumpage, would postpone the need of enlarging the purification and pumping plant, would make it possible by reducing the peak load to keep more water in the tanks and would leave a greater reserve in the mains for fire protection.

**Pressures.**—Pressures are fair to good except in West Tampa and Hyde Park where they are seriously reduced during hours of heavy consumption when the tank is empty or nearly so, a condition which can be remedied by additional main capacity to this section as recommended. Pressures are not suitable for direct hydrant streams, particularly in West Tampa and Hyde Park.

**Protection.**—Protection in the congested value district is largely dependent on the fire pumps in the old pumping station which are a valuable feature, located as they are near the district. Fire flow tests indicate that good quantities are available in the northern part of the

congested value district but are deficient in the southern portion. In the warehouse sections, at tests 3 and 4, supply was inadequate. In minor mercantile sections where tests were made quantities obtained were adequate, as they were in general in residential sections. In the West Tampa and Hyde Park sections, although pressures are lower than desirable at certain hours of the day the tests indicate that fair to good quantities for engine supply are generally available.

**Mains.**—The arterial system in the section east of the river is fairly adequate, but additional strengthening is needed to the southern section and greater capacity to the Henderson Street tank. The mains across the river are of good capacity, but the arterial system in West Tampa and Hyde Park is insufficient and should be strengthened so that better water level can be maintained in the tank and the wide range between day and night pressures reduced. Minor distributors are of good size and gridironing is fairly good. Because of the rapid growth of the city some fairly well built-up sections are without protection, a condition which is being remedied as funds are available.

**Gate Valves.**—Valve spacing is generally wide. Valves are regularly inspected and are in good condition.

**Hydrants.**—In the congested value district a few additional hydrants are needed, and in residential sections the area served per hydrant is slightly in excess of the desirable. A small proportion have too small branch connection and about  $\frac{3}{4}$  are without steamer outlet, but no more of this type are being installed and they are being replaced in important districts.

## FIRE DEPARTMENT

**ORGANIZATION.—Basis.**— Full paid since 1895; on two-platoon system since 1919.

**Supervision.**—Under the supervision of the City Manager and Board of Commissioners, and under the control of the chief as executive head.

**Officers.**—Chief J. B. Holton, 49 years of age, has been in the service 28 years and was first appointed to his present position in 1921; he is appointed by the city manager for an indefinite term, with removal only for cause. First Assistant Chief Ben Torres and Second Assistant J. D. Ross, with 27 and 24 years of service, respectively, were also appointed to their present rank in 1921. The chief is on continuous duty and the assistants work on opposite platoons.

**Membership.**—The total membership, includ-

ing the fire alarm superintendent and an inspector, is 99; active fire force, 97.

**Expenses.**—The total fire department budget, including the fire alarm system, for the fiscal year ending May 31, 1927, is \$244,921. This is a per capita expense for maintenance of \$1.96, based on an estimated population of 125,000.

**Enlistment and Promotion.**—Appointments and promotions are made by the chief from certified civil service lists, prepared after competitive mental and physical examinations, with standard age, height and weight limits. Appointees are on probation for 6 months. For promotion, length of service, merit and efficiency are the chief considerations.

**Retirement and Pension.**—A pension fund established by State law is supported by a city tax levy and an assessment on salaries of firemen. Members may retire on three-quarters pay after 20 years continuous service or for permanent disability. The age limit for compulsory retirement is placed at 65. No member is over 55 years of age.

**Companies.—Organization.**—Eight engine, 2 hose and 1 ladder companies are in service in nine stations. Each engine company and one hose company has an officer for each shift; Hose Company 6 has only one officer and the ladder company has none. There are at least two trained operators for each piece of apparatus.

**Maintenance.**—Platoons work on 10- and 14-hour shifts, changing every week. No time off is allowed for meals. Members receive 10 days annual vacation; no substitutes are provided. From 1 to 4 men off-shift bunk at quarters of seven of the 9 companies and respond to fires at night. Men on the off-shift are required to respond on telephone call to all second alarm fires; only 7 men are allowed to leave the city at a time. Continuous watch is maintained at all stations.

**Distribution.**—No company is stationed within the congested value district; but headquarters, containing an engine, a hose and a ladder company, is located 3 blocks to one side, and 2 additional engine companies are one mile distant. Within the mercantile district of Ybor City is an engine company and within a mile on either side is another engine and a hose company. No well-built portions of the city are over 1½ miles from a fire station. The only long ladders carried are on the aerial truck at headquarters, resulting in very inadequate ladder distribution and protection. Chemical equipment and short ladders carried on pumpers and hose wagons are well distributed.

SUMMARY OF APPARATUS.

	In Service	In Reserve
<b>Fire Engines:</b>		
<b>Pumpers—</b>		
1,000 gallons.....	1	0
900 gallons.....	0	1
750 gallons.....	7	1
<b>Total Fire Engines.....</b>	<b>8</b>	<b>2</b>
<b>Hose Wagons:</b>		
<b>Automobile Combination.....</b>	<b>2</b>	<b>1</b>
<b>Ladder Truck:</b>		
<b>Aerial, Automobile.....</b>	<b>1</b>	<b>0</b>
Chiefs' Automobiles.....	3	0
Fire Alarm Automobile.....	1	0
Hose, 2½-inch.....	17,750'	1,800'
Hose, 1- and ¾-inch for chemical.....	2,000'	600'
Ladders, total length.....	706'	128'
Ladders, short, on hose wagons, etc.....	20	6
Portable Extinguishers.....	24	6
Deluge Sets.....	2	0
Siamese Connections.....	2	0
Turret Nozzle.....	0	1
Ladder Pipe.....	1	0

**EQUIPMENT.—Engines.**—See Table 3. All engines are automobile pumpers carrying standard equipment including hard and, in most cases, soft suction; 5 of those in service are of American La France make, with rotary pumps and 3 are of Seagrave make, with centrifugal pumps; in addition, two with rotary pumps are in reserve.

**Engine Tests.**—Four American La France pumpers, 2 in service and 2 in reserve, including the three oldest in the department, were tested at draft in January, 1927. Engines 1 and 9 were found in excellent condition and easily delivered their rated capacity; reserve engine 1 exceeded its rated capacity but the motor showed the need of minor repairs; reserve engine 4 did not run smoothly and failed to deliver rated capacity, indicating the need of a general overhauling, which it has since received. Two of the operators were good and 2 showed the lack of regular experience.

**Ladder Truck.**—See Table 3. The truck is an American La France, carrying in addition to the aerial ladder, a 45-foot extension and 8 other ladders, including 2 pompiers and 2 with roof hooks; a ladder pipe and a life net are part of the equipment.

**Hose Wagons.**—See Table 3. In addition to the pumpers carrying hose, two motor hose wagons, a Reo and a Brockway, are in service; and one in reserve is loaded with 800 feet of 2½-inch hose.

**Chief's Automobiles.**—Three touring cars,

## FIRE DEPARTMENT

TABLE 3.—FIRE COMPANIES.—LOCATION AND EQUIPMENT.

Company	Location	MEMBERS			APPARATUS			Hose Carried, Feet	2½" Spare Hose, Feet	Ladders Carried	Extinguishers and Tanks, Gallons
		Total	LEAST NO. ON DUTY		Type	Motor h.p.	Put in Service				
			Day	Night							
Engine 1 <i>hv</i>	{ Headquarters: Zack and Jefferson Sts. .... }	8	3	6	{ 1000 Gallon Pumper }	73	1925	{ 1000-2½" 200-¾"	500	{ 1-30' 1-14'	{ 1-35 2-3
Engine 2	12th St. and Michigan Ave..	10	4	5	{ 750 Gallon Pumper }	73	1925	{ 1000-2½" 200-¾"	1000	{ 1-30' 1-14'	{ 1-40 2-2½
Engine 3 <i>hv</i>	Magnolia Ave. and Platt St.	10	5	6	{ 750 Gallon Pumper }	73	1919	{ 1000-2½" 200-¾"	1000	{ 1-30' 1-14'	{ 1-35 2-2½
Engine 4	9th Ave. and 18th St. ....	10	4	5	{ 750 Gallon Pumper }	79	1926	{ 1000-2½" 200-¾"	700	{ 1-30' 1-14'	{ 1-80 2-2½ 1-1qt
Engine 5 <i>hv</i>	Florida and Ross Aves. ....	11†	5	5	{ 750 Gallon Pumper }	79	1925	{ 1000-2½" 200-¾"	1000	{ 1-30' 1-14'	{ 1-80 2-2½
Engine 7	{ Taliaferro Ave., bet. Gid- dens & Hillsborough Aves. }	8	4	5	{ 750 Gallon Pumper }	73	1926	{ 1200-2½" 200-¾"	800	{ 1-30' 1-14'	{ 1-35 2-2½
Engine 8	Albany Ave. and Azelee St.	8	3	4	{ 750 Gallon Pumper }	79	1926	{ 1200-2½" 200-¾"	800	{ 1-30' 1-14'	{ 1-80 2-2½
Engine 9	Albany Ave. and Main St. ...	8	3	4	{ 750 Gallon Pumper }	73	1916	{ 1200-2½" 200-¾"	800	{ 1-22' 1-12'	{ 1-35 2-2½
Hose 1 <i>hv</i>	Headquarters. ....	10φ	5	6	Hose Wagon	27	1920	{ 600-2½" 200-¾"	450	{ 1-30' 1-14'	{ 1-35 2-2½
Hose 6	22nd and Linsey Sts. ....	6	3	3	Hose Wagon	32	1921	{ 1400-2½" 200-¾"	100	{ 1-18' 1-14'	{ 1-35 2-2½
Ladder 1 <i>hv</i>	Headquarters. ....	4	2	2	{ 75' Spring- Balanced Aerial }	73	1921	50-2½"	10 Ladders; total length, 288'		{ 2-2½

†Includes Master Mechanic.

*hv*—Company located in or near High Value District.

φIncludes 2 Chief's drivers.

εIncludes off-shift men bunking at stations.

carrying some minor equipment including gas masks, are provided for the chief officers.

**Hose.**—All large hose is double- or triple-jacketted, cotton, rubber-lined, purchased under the usual service guarantees; tested semi-annually to 200 pounds pressure. It is dried on racks and occasionally shifted on wagons. The total amount on hand allows about 1800 feet for each hose-carrying vehicle in service besides 1800 feet for the reserve apparatus.

**Couplings.**—Hose couplings are 2½-inch nominal size, 3-inch outside diameter and 8 threads per inch, which are not interchangeable with those of neighboring municipalities rendering the principal outside aid.

**Minor Equipment.**—All apparatus is well equipped with axes, chemical extinguishers, crow bars, hose straps, combination spanners and hydrant wrenches, lanterns, shut-off nozzles with 1½-inch tips, plaster hooks, ropes and small tools. Two pieces carry bale hooks, buckets, door openers, deluge sets, nozzle holders and wire cutters. Three pumpers carry double male and female connections, and four have open nozzles with 1½- to 1½-inch tips. Essential equipment not provided includes augers, brooms, burst-hose jackets, cellar pipes, gas keys, hose rollers, hydrant hose gates, dis-

tributing nozzles, sledges, shovels, squeegees and waterproof covers.

The only large stream appliances consist of ladder pipe on the aerial truck, 2 deluge sets and 2 siamese connections.

**Repairs.**—Repair work and conditioning of apparatus is done by the master mechanic, Charles Weber, assisted by detailed firemen. A small repair shop in the rear of Station 5 has only portable machines and small tools; a fair supply of minor repair parts are kept on hand. For more adequate facilities dependence is upon local garages and shops.

**Fire Stations.**—The stations are all of 2-story joisted brick construction, mainly well arranged, of adequate size and in good repair. All have electric lights and automatic lighting switches, with fair to good plumbing. Apparatus floors are cement; doors are sliding hand opened. Hose drying racks are provided in all but one station.

**OPERATION.—Discipline.**—There are no printed rules and regulations governing the members, such matters being covered by special orders and bulletins. The chief is responsible for discipline and has full power to reprimand, transfer or discharge members.

**Drills and Training.**—The hose tower at Station 5 is used for drilling purposes, but the department has no drill master or prescribed regulations governing drills and training. New men devote 2 to 3 weeks of their probationary period to drill tower work and regular members average 3 to 4 drills a year.

**Response to Alarms.**—The response to alarms is by districts, with provisions for subsequent alarms and for moving in. The prescribed response to first alarms is 2 engines, 1 hose wagon and the ladder truck in the congested value, pier, warehouse and wholesale districts; 2 engines and the ladder to the Ybor City mercantile district; and 1 hose wagon, with 1 or 2 engines to residential districts. The chief or an assistant chief respond to all alarms. Box, telephone and verbal alarms receive the same response, except that when the fire is reported as small less than full response is made to the two last. Conditions adversely affecting response include, railroad grade crossings which are numerous, congested street traffic, and many unimproved streets.

**Fire Methods.**—Records indicate that fires are extinguished in most cases with chemicals and a large portion of the remainder with direct hydrant streams using shut-off nozzles with 1½-inch tips. For fires of any magnitude, it should be the invariable practice for second and subsequent companies in to lay from the fire to hydrant and use streams from pumpers; the companies on the west side of the river where pressures are low, now connect pumpers direct to hydrants at all fires where water is needed. Standpipe and sprinkler connections are seldom used. Hose is usually carried up stairways to upper stories. Overhead wire obstructions would interfere with operations. Little or no salvage work is done.

**Building Inspections.**—A captain devotes his entire time to inspections and, together with irregular inspections made by the 3 chief officers, much of the business district is gone over every 3 to 4 weeks. No records are kept and from conditions noted in and around the congested district, the inspections are largely ineffective.

**Reports and Records.**—Company officers make daily fire reports to the chief, who submits a summary of fire department operations to the city manager. The chief also submits an annual report and budget, including summaries of apparatus and equipment, fire service, losses, expenses and recommendations.

**IMPROVEMENTS.**—Since the National Board report of 1923, four new stations have been built, two of which were replacements,

and one old city hall converted into a fire station; 4 engine companies added, one of which replaced a hose company; 6 motor pumpers purchased; the fire force increased by 29 men, and a department drill tower and small repair shop provided.

The chief recommends more men, additional engine companies in the vicinity of Buffalo and Central avenues and Michigan avenue and Habana street, ladder companies established with Engine Companies 3 and 4, and a fire boat.

**CONCLUSIONS.**—The department is well organized and under the command of experienced and capable officers, with a force of young men of good personnel; but it is seriously deficient in ladder service, large stream appliances, waterfront protection, and in man power; the response of the off-shift to extra alarm fires only slightly offsets the last deficiency. The rapid growth of the city in population and expansion in area have brought with them corresponding increases in fire losses and number of fires, the average annual fire loss for the calendar years 1923 and 1924 being about \$240,000 with an average annual number of fires of 340, while the fire loss in 1926 was \$612,000, with 660 actual fires; and expansion in effective fire department facilities is essential to provide the city with proper protection.

The existing companies are well located for the present area within the city limits, but additional engine companies will be needed when the plan of development through probable annexations is more definitely established. Stations and apparatus are in mainly good condition and chemical service is adequate. Three-inch hose could be used to advantage, but none is provided; 2½-inch hose is regularly tested and practically adequate in amount. Drills and training and inspection work need to be conducted along more intensive lines, and modern salvage methods employed. Repair shop facilities should be extended to provide for proper care of apparatus. Records are mainly complete and well kept.

## FIRE ALARM SYSTEM

**ORGANIZATION.**—The fire alarm system is a part of the fire department; and is efficiently maintained by Superintendent of Fire Alarm and Police Signalling Systems A. E. Fraser, assisted by linemen, assigned as needed.

**HEADQUARTERS.**—On the ground floor of fireproof city hall, remodeled in 1925, with plain glass, wood frame windows on one exposed side. Internal hazards are slight; no inside fire protection.

## FIRE ALARM SYSTEM

### **EQUIPMENT.—Apparatus at Headquarters.**

—Apparatus installed in 1925 and mounted on metal cabinets, is of automatic type and Gamewell make; it consists of a 50-circuit slate terminal board, two 12-circuit marble switchboards, a 24-circuit protector board, two 8-circuit repeaters each with 6 alarm contacts, an electro-mechanical gong, and punch register with inoperative time stamp. Circuits of No. 14 rubber covered copper wire enter underground and extend to apparatus in rigid conduit; Argus lightning arresters and glass enclosed fuses are provided on protector board. Fuse protection is also provided on switchboards and battery racks.

**Batteries.**—Current is supplied by 500 storage battery cells in duplicate sets mounted on glass and porcelain supports on iron pipe racks in a separate, well ventilated room. Batteries are in good condition; they are charged from duplicate motor generator sets with automatic controlling panel, serviced from a 220-volt lighting circuit; an auxiliary charging current could be readily obtained from nearby gas engine generator.

**Apparatus at Fire Stations.**—Each station has a combination gong and visual indicator and automatic lighting switch on an alarm circuit, and a call bell on an open local circuit. In addition, a key transmitter is located in the telephone booth at fire headquarters. A belt line telephone fire circuit connects stations and the public exchange; and there is an additional telephone on a direct line to the exchange for general use. In the dormitory at headquarters and at Station 5, is also a small gong on a box circuit.

**Boxes.—Description.**—There are 69 boxes in service; all are of Gamewell make and accessible to the public; 43 are succession and the remainder are of Gardiner type, non-interfering, with brush breaks. Each box has shunt, test switch, Morse key, tapper and lightning arrester; box cases are not grounded. Twelve boxes are on telephone poles, connected to overhead lines; the others are directly connected to underground circuits and mounted on iron pedestals of good design. Most boxes have keys attached under glass guard; a few have keyless, self-acting doors and 3 have detached keys. No red lights or red bands are provided; boxes and pedestals were painted last year, but in many cases the color has badly faded.

An inspection of 16 boxes, by alternating silent and through tests, of 2 on each circuit showed the boxes and circuits to be well maintained and in good operative condition. Boxes are timed to send in blows at approximately 1½-second intervals.

**Distribution.**—In the congested value, Ybor City and East Hyde Park districts box distribu-

tion is only fair; a large portion of the city is without fire alarm protection. Much of the thickly built territory north, east and south of the congested value district, along the waterfront and in West Tampa is without boxes; about 140 additional boxes are needed.

**Circuits.**—Eight all-metallic, normally closed box and 5 alarm circuits are in use; the maximum number of instruments on any one circuit is 13 boxes; the small gongs at fire headquarters and Station 5 are on a box circuit; other alarm instruments are on alarm circuits; no circuit is overloaded. The total length of circuits approximates 79 miles, of which all but 9.4 miles of one box circuit is in underground cable; the aerial construction is of No. 12 copper-clad weatherproof wire, carried on brackets on top of telephone poles; the underground is No. 14 rubber covered copper wire, in 4- to 60-conductor, lead sheathed cable mostly of the armored parkway type. Leads down poles are No. 14 rubber covered weatherproof copper in rigid conduit. Lightning arresters and fuses are provided at the junction of overhead and underground construction. Circuits are well maintained and were found in good condition. Wiring in fire stations is No. 14 braided, rubber-covered copper wire, all in conduit.

**OPERATION.—Routine and Maintenance.**—The superintendent divides his time between the maintenance of the fire alarm and police signalling systems. He is in the headquarters operating room at least 3 times a day and makes tests for voltage, current and grounds; tests taps are sent in from boxes twice daily; tests of batteries and insulation are made weekly; all boxes are given a silent test every 2 months. Line troubles are very infrequent. An automobile runabout is provided for maintenance, inspection and repair work. Maps and records are poor, as tests, inspections and troubles experienced are not recorded and the only map on file is that of the underground cable construction.

**Alarm Transmission.**—Four rounds of box alarms are automatically transmitted over the system. Telephone alarms are received over the belt line telephone fire circuit; the man on watch at fire headquarters takes the call, sends in 3 taps over the fire alarm circuit to supplement the operation of the telephones and the other stations listen in for the location of the fire; they are not confirmed over the fire alarm telegraph system.

**IMPROVEMENTS.**—Since the National Board report of 1923, the headquarters has been remodeled with much additional and mainly adequate standard apparatus installed, 13 additional succession boxes have been put in, but

with an increase of only 9 in the total number, the number of box circuits has been increased and alarm circuits have been installed, and much of the aerial construction has been replaced with underground.

**CONCLUSIONS.**—The fire alarm system is under good supervision and is well maintained. Headquarters apparatus is properly located in a fireproof building, but the latter is seriously exposed on one side, and no interior fire protection is provided. The central office equipment is of ample capacity to take care of the additional circuits, boxes and instruments needed to give the city adequate protection, but the number of alarms received in recent years is such that dependence should not be placed solely on automatic operation, and box circuits should not be used as alarm circuits; the constant attendance of an operator is necessary for proper operation. The lack of duplicate alarm circuits into all but two fire stations and the use of visual indicators are unreliable features. The boxes in service are mainly of good type and well maintained but distribution of them covers only about one-fourth of the city. Too much dependence is placed upon the telephone for reporting fire alarms; this method of transmission delays response of fire apparatus and has other features of unreliability. Tests and inspections are satisfactory, but records are incomplete.

## FIRE DEPARTMENT AUXILIARIES

**FIRE MARSHAL.**—None. Suspicious fires are investigated by the fire and police departments and available evidence submitted to the proper prosecuting officials; several arrests have been recently made but no convictions secured.

**POLICE DEPARTMENT.**—Chief, D. B. York; total active force, 196.

**Equipment.**—Two automobile patrol wagons are stationed at city hall headquarters; 14 motorcycles and 20 automobiles are provided for department use. A signalling system maintained by the fire alarm superintendent, consists of 36 boxes of the 4-call and telephone type on 3 metallic circuits with old type operating board at headquarters. Patrolmen report hourly, signals being received on punch registers;

18 boxes are equipped with flash lights and gongs.

**Fire Service.**—Fire alarms are received at headquarters on a gong and visual indicator and a telephone on the special fire department circuit. A motorcycle officer with 2 to 3 others on nearby beats usually respond to all fires; to second alarm fires 5 to 6 officers ordinarily respond. Cooperation with the fire department is good.

**TELEPHONE SERVICE.**—The Peninsular Telephone Company serves nearly 20,000 subscribers, through a main exchange in a 4- to 12-story fireproof building on the edge of the congested value district and 3 city sub-stations, all operated automatically; about 25 per cent. of the subscribers are on single party and 67 per cent. on 4-party lines. Distribution is 95 per cent. underground in the business center and about two-thirds underground elsewhere. All fire stations are connected by a special fire call circuit, the number for which appears on the front of telephone directories and by direct lines for general use.

**PRIVATE FIRE PROTECTION.**—There are about 120 plants and buildings protected with automatic sprinkler equipments but there are no sprinkler supervisory or similar services in the city. The Seaboard Air Line Railway maintains a 750-gallon fire pump and yard hydrants in well equipped hydrant hose houses for the protection of its Green Island terminal.

**PUBLIC UTILITIES.**—The Tampa Electric Company receives alarms on a tapper connected to a fire alarm circuit, and sends a trouble man on motorcycle to all alarms.

The Tampa Gas Company sends an employee to all serious fires to look after the company's interest and assist the fire department.

**OUTSIDE AID.**—St. Petersburg, 19 miles distant, could render considerable aid in 30 minutes. A motor pumper, manned by volunteers is at Sulphur Springs, just outside the northern city limits and at Plant City, 20 miles away. Tarpin Springs, Clearwater and Lakeland, from 27 to 32 miles distant, have paid departments and motor apparatus, which is available within an hour. The threads on hose couplings in most of these municipalities are not interchangeable with those of Tampa.

# STRUCTURAL CONDITIONS AND HAZARDS

## BUILDING DEPARTMENT

**ORGANIZATION.—Supervision.**—The Building Department was established in 1913, and is under the control of the city manager. The Building Inspector is required to be a competent architect, engineer, or builder of at least 10 year's experience, and is recommended by the city manager and appointed by the mayor and city commissioners. Provisions are made for the appointment of assistant inspectors by recommendation of the building inspector.

**Personnel.**—Asher Bassford, an experienced builder, was appointed building inspector September 1, 1916, and served until April 7, 1921; he was reappointed October 1, 1922. He has one assistant and two clerks.

**Permits.**—A permit must be secured before building operations may be started. Plans and specifications in duplicate for all proposed work must be filed; one set, with the permit are kept on the work until operations have been completed. All permits are issued in triplicate, one of which remains in the book as a record.

**Inspections and Records.**—Inspections of all structures under construction are said to be made when foundations are completed and as often thereafter as time will permit. The inspector spends most of his time in the office. Due to lack of assistant inspectors, it is evident that many structures are not inspected. Inspection records are not kept. A card index, triplicate of permit, a book record of all building operations, and plans of construction are kept in the inspectors office.

**BUILDING LAWS.—State Laws.**—A law of January 1, 1924, with amendments adopted September 16, 1925, provides that every hotel, apartment house, rooming house or restaurant more than 2 stories high, having accommodations for 15 persons on any floor, must be equipped with a complete fire escape. All interior shafts, exceeding an area of 6 square feet must be continuously enclosed by suitable fireproof walls. Good provisions are made for protection to openings in shaft enclosing walls. Fire stop requirements are good, as are also those relating to chimneys, heating apparatus and provisions for fire extinguishers.

**Municipal Laws.**—The municipal building code of January, 1926 follows the National Board Building Code verbatim, with a few exceptions. Buildings are divided into 4 classes, according to construction and sub-divided into 6 classes according to occupancy. Top story

walls of dwellings and walls of 1-story dwellings and outbuildings may be 8 inches thick if built of brick; parapet walls are required to be only 18 inches above the roof at the lowest point. A frame garage or residence of 2 stories may be built on a vacant lot in the fire limits, providing 90 per cent. of the existing buildings in the block are of frame construction. The use of wood shingles for roofing is prohibited throughout the city.

**Fire Limits.**—These are shown on the accompanying map; as last amended they are extensive, protecting the congested value and Ybor City districts.

**Enforcement.**—Inspections disclose that the building laws have not been properly enforced; this is particularly true of requirements relating to protection of vertical and horizontal openings, and openings in fire walls, installation of fire protection equipment and limitation of areas in warehouses; also of submitting plans and specifications for all proposed work. This apparent laxity is due to insufficient inspection force.

**LOCAL CONDITIONS.**—The 38 blocks or part blocks comprising the congested value district contain 308 buildings. Twenty-four buildings covering 16.2 per cent. of the area built upon are of fireproof construction; of these 15 are reinforced concrete; the others are of protected or partially protected steel frame construction; 7 are of wholesale or retail occupancy; 6 are office buildings usually with grade floor mercantiles, 3 are theatres and 5 are hotels; the remainder are of diversified occupancy. The highest are an 18-story hotel, and 2 office buildings of 13 stories. Two hotels are 10 stories, one is 9 and one is 12 stories; the latter two cover 21,000 and 13,700 square feet, respectively. Seven buildings of diversified occupancy are of excessive area. Exposed windows are protected in 11 buildings and partly protected in a few others. Floor openings are protected in 10 buildings. Four buildings are equipped with automatic sprinklers.

Two hundred and six buildings of the joisted brick class cover 74.5 per cent. of the area built upon. One garage of 22,100 square feet, 1 to 2 stories in height is sprinklered. Nine garages are 1 to 2 stories in height; six are excessive areas and the others are of large area. Two arcade buildings of 22,000 and 22,200 square feet area respectively, are 2 stories in height and sprinklered. Two hardware and mill supply buildings, 2 and 3 stories high, with partly protected communications in one build-

## EXPLOSIVES AND INFLAMMABLES

ing are sprinklered, as are also two department stores; areas of these four buildings range from 15,500 to 21,000 square feet. Of this class of construction 151 buildings are 2 and 3 stories and 13 are 3 to 6 stories in height. Fourteen buildings are of excessive area and 49 are of large area. Floor openings and exposed windows generally lack protection.

The 78 buildings and 25 sheds and additions of frame construction cover 9.3 per cent. of the area built upon. The largest is a 1-story garage of 9,000 square feet; 2 others are of large area. None exceed 2 stories in height.

Of buildings of all classes a large number have party or fire walls, of which about one-third are 4 inches and a few, more than 4 inches too light in whole or in part. Parapets are usually low and sometimes lacking. Communicating openings were found in 53 party walls, 4 of which were protected and 19 partly protected. Fire escapes, were noted on most of the buildings requiring them. Hand chemical extinguishers and standpipes and hose were found in a small percentage of the buildings; outside standpipes were found on 15 buildings of all classes. Thirty-one buildings covering 20 per cent. of the built-on area, are equipped with automatic sprinklers. Supply is from city mains; 3 equipments have gravity tank supply in addition. Six buildings have non-fire-resistive roof covering.

**CONCLUSIONS.**—The building laws are comprehensive and generally in accord with the National Board Building Code requirements. Their value, however, is materially reduced by laxity in enforcement, which apparently is due to inadequate inspection force. The fire limits as last amended are of sufficient extent, but the permission of frame construction therein is a weakening feature. Conditions have been somewhat improved by the increase in fireproof and sprinklered construction, but the prevailing construction is mainly lacking in fire resistive features, so that structural conditions as a whole are generally weak.

## EXPLOSIVES AND INFLAMMABLES

**ORGANIZATION.**—**Supervision.**—Ordinances place the control of explosives and inflammables in the hands of the Commission and the Chief of the Fire Department.

**Permits.**—Permits for the storage of carbon bisulphide, calcium carbide, inflammable liquids, dry cleaning and burning of combustible ma-

terials are issued by the chief of the fire department.

**Inspections.**—Irregular inspections are made by the chief of the fire department; a captain has been detailed to inspection duty in the congested value district. Thorough inspections are made upon complaint. The only records kept are those of obstinate cases.

**LAWS AND ORDINANCES.**—Five pounds of gunpowder may be stored in a metal canister or stone jar; retailers may keep 30 pounds stored in the same manner. Dynamite, nitroglycerin or gun cotton may be kept in amounts up to 10 pounds; provisions relating to transportation, sale during certain hours and storage in certain places are good, but incomplete. Generally good requirements are specified for the capacity and type of storage tanks or receptacles for petroleum, gasoline, benzine or naphtha; quantities up to 5 gallons may be stored outside buildings after obtaining permit, and kept in cans with screw top; one gallon may be kept in buildings if in screw top can. Regulations governing the storage of calcium carbide are good. Plans for dry cleaning establishments must be approved, buildings be of fireproof type and located 15 feet distant from other buildings, but this is not enforced. Weeds and rubbish are not permitted within the city limits. Bonfires or burning of combustible materials are prohibited except by permit of the fire department. Motion picture booths must be of fireproof materials, and operators licensed; inspection of booths is provided for, but not made.

**LOCAL CONDITIONS.**—No high explosives were found in the congested value district and none in Ybor City mercantile district. A hardware firm at times has moderate amounts of dynamite for immediate delivery, and sporting goods dealers sometimes have small quantities of gunpowder in metal cans. Some of the hardware and sporting goods firms carry moderate to large stocks of alcohol, oils and other hazardous compounds, mainly in vaults of sprinklered fireproof buildings. Retail drug stores carry small stocks of the usual hazardous compounds. Paint and hardware stores carry paints and oils in barrels or drums on tap; some have suitable tanks with pumps.

Gasoline at garages and filling stations is stored in underground tanks; small quantities are used in tailor and print shops from non-standard containers. There are about 8 dry cleaning establishments in the city, all outside the congested value district, a few have fireproof cleaning rooms, but prevailing construction is joisted brick and several are frame or metal clad. Some have underground storage tanks. Excessive quantities of gasoline were



noted in tubs and cans in two establishments, both located in 1-story frame buildings; household portable washers are used for cleaning; at another place cleaning is done in open tubs.

Conditions at motion picture theatres are generally good; booths are metal lined in some of the older theatres; and fireproof in the newer theatres.

Fuel oil burning equipments are being installed in the congested value district; some of these are well installed, but others use unapproved devices with gravity feed. Buildings in the congested value district and block interiors contain much rubbish, and several hazardous conditions exist. There are 7 wholesale oil stations in the city; tanks are generally well constructed and supported. Four are located on the bank of the river, about one-fifth of a mile from the congested value district, and 3 are located in the northern section of the city, about 1 mile from the district. Several of the plants are well isolated, but others form mutual exposures with adjacent property.

**CONCLUSIONS.**—The laws, except for some on inflammable liquids, are incomplete. The fire department lacks the personnel for adequate inspection and enforcement. Permits are required for various hazardous substances. Generally good conditions exist at motion picture theatres, but hazardous conditions exist at dry cleaning establishments, and many hazardous accumulations of rubbish were noted. Local conditions are only fair.

## ELECTRICITY

**ORGANIZATION AND CONTROL.**—An ordinance of 1922 recreates the electrical department as a subdivision of the Department of Public Works, working under the direction of the electrical inspector and electrical examining board. The electrical inspector must have technical and practical knowledge of electrical wiring; he is appointed by the city manager with the consent of the city commission. He has control and management of all electrical devices installed by the city, except police and fire alarm systems, and regulates light and power wires in and on buildings. Provision is made for the appointment of assistants to qualify by an examination before the electrical examining board.

**Personnel.**—Robert Peyinghaus was appointed electrical inspector August 15, 1922; he has two assistants. Motor transportation is provided.

**Inspections.**—New inside work is inspected when roughing-in is completed and again when

fixtures are installed; additional inspections are made of large installations or when defects are noted. An approval must be obtained before service connection can be made. Old inside work is inspected only when additions are made or serious defects are apparent.

**Permits and Records.**—An application must be made and permit obtained before the installation of new work or the alteration of old work may be started. A book record of all installations is kept; copies of permits and applications are filed by number.

**LAWS AND REGULATIONS.**—The National Electrical Code is adopted as the standard for all electrical work. Electrical work must be done under the direct supervision of a licensed electrician. Underground feed wires must have weatherproof fuse boxes and fuses at the pole terminus of the conduit. Overhead feed wires entering buildings over 15 feet from switch must be run in conduit. Conduit work is required in all buildings in the fire limits and in all brick buildings of the city; service wires must be underground.

**INSIDE WORK.**—In January, 1927, 21 new and 32 old representative equipments were inspected to ascertain the quality of the supervision maintained and the general condition of inside wiring. In the new work inspected, consisting of equipments under installation and those recently approved, an average of 6 defects per equipment were found. These were due mainly to the misuse of flexible cord; other defects were due to faulty maintenance.

In the old work a total of 451 defects were found, an average of 14 defects per equipment. The defects were due to the misuse of flexible cord, to alterations and extensions by incompetent workmen, overfusing and the use of unapproved apparatus, indicating the need of regular and systematic reinspections.

**OUTSIDE WORK.**—The main cables of the telephone company are underground in mercantile and the more congested sections of the city; distribution is from poles in block interiors. Wiring for street lighting on the principal thoroughfares is underground; otherwise all lighting and power lines are overhead. In practically all streets, alleys and block interiors such wires form serious obstructions to fire department operations. High- and low tension wires are frequently on the same poles. Low-tension signalling wires are well protected. Neutrals of secondaries are grounded.

The Tampa Electric Company supplies current for commercial lighting and power. Al-

ternating current is transmitted at 13,000 volts from a power house outside the city limits, to a substation within the city, where it is stepped down to 2,300 volts, and also generated at this voltage. It is transformed to 110-220 volts for lighting and 220 volts for power. Street lighting, except for the multiple system, is on alternating current circuits with voltages up to 5,000.

**ELECTROLYSIS.**—The water company reports the destruction of a few service connections, but no trouble to mains has been noted. Cable sheaths of the telephone company and fire alarm system are bonded together and to the return feeder of the trolley system. Rails of the trolley system are bonded and cross bonded and a negative return feeder has been installed. Periodic tests are made of rail bonding by the electric company and for current by the telephone company.

**CONCLUSIONS.**— Good municipal control and supervision of electric wiring is provided. The National Electrical Code is adopted as the standard. New work is in fair condition, but the old equipments indicate the need of systematic reinspections. Overhead wire obstructions are serious in practically all parts of the city. Electrolytic action still present but damage only slight; periodic tests are made.

## CONFLAGRATION HAZARD

**CONGESTED VALUE DISTRICT.—Limits.**—Beginning at Water and Washington streets; Washington, Tampa, Whiting, Florida, Washington, Marion, Tyler, Florida, S. Royal, Tampa, Tyler, Ashley and Water to point of beginning.

**General.**—The district extends along Water, Ashley and Franklin streets for 11 blocks and is 2 to 4 blocks wide; it contains 38 blocks and covers 72.8 acres. It is practically level; streets are paved. Occupancies are mainly grade floor mercantiles, with offices, rooms or hotels above, interspersed with an occasional department store, or office building. Values vary from low to moderately high, the higher values being along Franklin street. The district is exposed on the south and west by the warehouse and wharf district and on the other sides by minor mercantiles and frame residential sections. The blocks are small, mainly about 210 feet square; several are intersected by narrow alleys and there is some open space in block interiors, but frontages are solidly built. Streets are mostly 80 feet wide, but their effective

width is much reduced by numerous wooden awnings. Of the total area 48 per cent. is occupied by streets; of the block area 81 per cent. is covered by buildings. There are many obstructions from overhead wires and the numerous permanent awnings would interfere with the use of ladders. A small square in front of the court house forms a fair fire break in the southern part of the district.

Fireproof construction is found in 20 of the blocks and in some cases forms local fire breaks. Frame construction covers 9 per cent. of the area built upon, but is well scattered. In the joisted brick construction, little attention has been paid to fire prevention and practically every block in the district has 1 to 3 buildings or groups of large or excessive area, several with highly combustible contents. There is much defective electrical wiring. Vertical, exposed horizontal, and communicating openings are largely unprotected. Party walls are often light, especially in upper stories, and parapets are often low or lacking. Considerable rubbish was found in block interiors. These weak features, in connection with the fact that the fire department is undermanned and deficient in ladders and heavy stream appliances, make probable serious individual or group fires in almost every block of the district. On the other hand, owing to the mainly adequate water supply, fair amount of fireproof and sprinklered construction, small blocks, low heights, streets of good width, and infrequent high winds, the probability of sweeping fires, such as might spread beyond the block of origin, is moderate.

In the blocks mentioned in the report of 1923, conditions remain as follows:—

Block bounded by Twiggs, Franklin, Madison and Tampa, (Sanborn, page 11, block 58). Two- and 3-story structurally weak joisted brick buildings with iron-clad additions at the rears cover practically all of the block area; communications and exposed windows are unprotected and occupancies hazardous. The block interior is inaccessible, and a fire originating in almost any of the seriously exposed buildings could readily involve a considerable portion of the block, but should be prevented from crossing the street.

Block bounded by Tyler, Franklin, Cass and Florida (Sanborn, page 16, block 17.) An excessive area of 2-story brick department store with iron clad and stuccoed second story occupied as offices and dwellings covers half of the block area; although other buildings have exposed windows generally protected, a fire originating here could readily involve the entire block.

**OTHER DISTRICTS.— Warehouse and Wharf District.**—Bounded roughly by the Hillsborough river, Cass, Ashley, Whiting, Morgan, Bell, Garrison, Franklin, and Krause streets. The district adjoins the principal mercantile district on the west and extends along the river front. Occupancies are mainly wholesales and warehouses, with some manufacturing and lumber. The buildings between the A. C. L. Railroad and Ashley street and between the S. A. L. Railroad and Whiting street are nearly all joisted brick of generally good construction. Along the water front, a few of the frame and iron-clad buildings have been removed. Along Ashley street, buildings are mainly 1 and 2 stories high; areas are generally large to excessive. Construction in this section has been somewhat improved by the removal of frame construction, but at several locations, a fire might readily get beyond control and spread to the congested value district.

**Ybor City Mercantile District.**— This lies along Seventh avenue from Thirteenth to Twenty-third streets, along Fourteenth street from Sixth to Tenth avenues and along Fifteenth street from Sixth to Ninth avenues. It is closely built from Thirteenth to Eighteenth streets, with some vacant spaces between Nineteenth and Twenty-first streets. Construction is about one-fourth frame; the newer and larger buildings are brick. Buildings are mainly 2 and 3 stories, of moderate size; there are good fire walls or open spaces in nearly every block, and accessibility is good. Streets are 50 to 60 feet wide, decreased to 32 to 40 by many wooden galleries or permanent awnings. The district is exposed by a sprinklered wood-working plant on the south and a sprinklered cigar factory on the north, and is completely surrounded by frame dwellings. The blocks containing principally frame buildings create considerable hazard. Any fire originating in the district should be confined to one or two blocks, but flying brands might cause extensive fires in surrounding frame dwelling districts. The probability of such occurrences is increased by the aforesaid deficiencies of the fire department.

**Minor Mercantile Districts.**—Extending along Franklin street from the congested value district to Henderson street and along Fortune street from Franklin to Ashley streets and on Central avenue from Cass to Emery streets are districts of 1- and 2-story buildings, occupied by small mercantiles with hotels and apartments above. Construction is chiefly frame

between Henderson and Constant streets and brick elsewhere. Franklin street is 64 feet wide, with effective width reduced to 40 feet by frame galleries or awnings; Fortune street is only 40 feet, with an effective width of 22 to 28 feet. There are some good dividing walls in the brick buildings, but cross exposures are severe. A fire gaining headway could readily involve parts of two blocks, but should not develop into a conflagration.

**Residential Districts.**— The residential districts consist largely of closely-built frame dwellings, mainly with shingle roofs, subject to flying brand fires. Conditions are specially hazardous in the congested district bounded by Polk, Pierce, Scott, Nebraska, Third avenue, Maryland, Scott, Nebraska and Newcomb streets. This district is closely built, nearly all frame with shingle roofs, and there are some frame rows. Streets are narrow and sandy. During high winds, extensive fires, such as would endanger the congested value district, are probable.

The residential section of West Hyde Park is located beyond the city limits. It is fairly well built up and mainly consists of shingle roof frame dwellings. No public fire protection is provided, and as the Tampa fire department does not respond to fires in this territory, the probability of extensive fires is high. Under adverse wind conditions, such fires would probably involve adjacent frame dwelling sections within the city of Tampa.

**CONCLUSIONS.**— In the congested value district, weak construction and serious fire department deficiencies make severe individual or group fires probable in nearly every block. The probability of such fires spreading beyond the block of origin is moderate, however, as the water supply is fairly adequate, there is a fair amount of fireproof and sprinklered construction, blocks are small, heights low, streets are of good width, and high winds infrequent. At several points in the warehouse and wharf district fires might spread beyond control and endanger the congested value district. In minor mercantile districts, while group fires are probable, none should involve more than parts of two blocks. The residential districts consist mainly of closely-built frame dwellings with shingle roofs, highly congested in some sections; these conditions make probable extensive fires, in some cases exposing the congested value district. Such fires are most likely to occur in the West Hyde Park residential sections beyond the city limits, owing to the absence of public protection.

# RECOMMENDATIONS

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

## WATER SUPPLY

### Consumption.

★1. That consumption be reduced by the installation of meters on all services not so equipped.

### Mains.

2. That the distribution system be strengthened by the mains listed in the table below, and shown in red on the accompanying plan, and that the following be adopted as the standard minimum sizes of mains used for hydrant supply for all future construction.

a. In residential districts, 8-inch; 6-inch to be used only where they complete a good gridiron and in no case in blocks over 600 feet in length.

b. In mercantile and manufacturing districts, 8- and 12-inch; the former to be used only in localities where they complete a good gridiron and the latter for long lines not cross-connected.

Sections without hydrants to be supplied according to the above, dead ends eliminated wherever possible, 4-inch pipe supplying hydrants to be replaced, and long, unsupported lines of pipe cross-connected, so that not more than one hydrant will be on a 6-inch main between intersecting lines and not more than two on an 8-inch main.

### ★RECOMMENDED MAINS.

Diameter, Inches	Along	From	To
*36	Sligh, Florida, Highland and Ola Aves.....	Filter Plant....	Emma St.
36	Ola Ave.....	Emma St.....	Michigan Ave.
†24	Emma Ave.....	Nebraska Ave..	Ola Ave.
24	Michigan and Rome Aves.....	Ola Ave.....	Horatio St.
24	7th and Ola Aves...	Highland Ave..	Michigan Ave.
16	Morgan St.....	7th Ave.....	Whiting St.
16	13th St.....	7th Ave.....	Harbor St.
16	Platt St.....	Rome Ave.....	North Blvd.
12	Whiting St.....	Franklin St....	Jefferson St.

\*Not necessary at present if consumption is reduced.  
 †Not necessary if 36-inch force main is laid.

### Gate Valves.

3. That additional gate valves be installed so 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 side of two blocks, or a maximum of about 800 feet in other districts.

### Hydrants.

4. That additional hydrants be installed where necessary so that the area served by each shall not exceed 48,000 square feet in high value districts and 110,000 square feet in residential districts.

## FIRE DEPARTMENT

### Organization.

★5. That sufficient men be permanently assigned to companies so that the least number on duty at all times will be as shown in the following table:

	Day	Night
Engine Companies, 1, 3 and 5, Ladder Company 1, recommended engine company to replace Hose Company 1 and new ladder company with Engine 3 .....	6	8
Recommended ladder companies with Engine Companies 4 and 9 .....	5	7
Engine Companies 2, 4, 7, 8 and 9 .....	4	6
Hose Company 6 .....	3	5

### Companies and Apparatus.

6. That changes and additions be made as follows:

a. Convert Nos. 1 and 3 into two-piece engine companies by assigning Hose 1 and the reserve hose wagon as tenders, each equipped with a turret pipe.

b. Change Hose Company 1 to an engine Company stationed at headquarters, provided with the pumper now in reserve with Engine 1.

★c. Establish ladder companies with Engines 3, 4 and 9, the first equipped with a 65-foot aerial and the other two with city service trucks.

d. Provide a fire boat of at least 5,000 gallons a minute capacity when delivering water at 150 pounds pressure; to be berthed in the main ship channel; boat to be able to make a speed of 12 knots per hour and be provided with a minimum crew at all times of 5 men.

## RECOMMENDATIONS

### *Hose.*

7. That all hose-carrying vehicles be provided with at least 200 feet of 3-inch hose, with a total of at least 1,000 feet of 2½- and 3-inch hose with an equal spare shift; also that a reserve wagon be loaded with 1,000 feet of 3-inch hose; all hose to be fitted with 2½-inch couplings properly beveled and of National Standard dimensions.

### *Equipment.*

8. That the following equipment be furnished where not already provided:

a. To each hose-carrying vehicle: Hydrant hose gate, burst-hose jacket, open nozzle with 1⅝- to 1½-inch tips, hose clamp, door opener, siamese connection, nozzle holder, smoke mask and 2 waterproof covers.

b. To each ladder truck: A hose hoist, gas mask, hose clamp, 4 life belts, ladder straps, portable search light and 4 waterproof covers.

c. To each aerial ladder truck: A ladder pipe and rope gun.

### *Operation.*

★9. That the drill tower be fully equipped and a regular school be held under the direction of a competent officer who shall have graduated from a modern drill school, so that all members will be regularly drilled in the use of appliances, quick handling of hose and apparatus, ventilation, life saving and salvage work.

10. That members make regular and systematic inspections of all premises and buildings in their districts, except dwellings, and that records of such inspections be regularly filed.

## FIRE ALARM SYSTEM.

### *At Headquarters.*

11. That chemical extinguishers and sand pails be provided in the apparatus and battery rooms, a standard fire door be installed on communicating opening into main hall, and windows on exposed south side opening be replaced with wired glass in metal frame.

★12. That a register be installed on each box and alarm circuit and the repeater be changed to eliminate repeating alarms back over the box circuits.

★13. That a department telephone switchboard be installed with a sufficient number of trunk lines to the exchange and direct connection to each fire station.

14. That one or more operators capable of operating the fire alarm system be on duty at all times.

### *At Fire Stations.*

15. That each station be provided with a gong on a normally closed alarm circuit and

a punch register and tapper on a separate alarm circuit.

### *Boxes.*

★16. That additional succession boxes be installed so that a box shall be visible within 500 feet of every building in mercantile, warehouse and manufacturing districts and elsewhere within 800 feet of every important group of buildings.

17. That boxes in important districts have red lights to indicate location at night, and all boxes, pedestals and bands on supporting poles be painted annually.

### *Operation.*

18. That telephone alarms for fires in buildings be sent out manually over the telegraph system after first notifying the nearest company over the telephone.

## BUILDING DEPARTMENT.

★19. That the building inspector be furnished sufficient assistance to adequately carry on the work of the office and rigidly enforce the laws.

20. That frame construction within the fire limits be restricted in accordance with the provisions of the National Board Building Code.

## EXPLOSIVES AND INFLAMMABLES.

21. That a complete code of regulations covering the manufacture, sale, storage and transportation of explosives and inflammables be adopted by ordinance, the chief of the fire department to be held solely responsible for enforcement and the keeping of records.

## ELECTRICITY.

22. That an inspection of old wiring be made, defects corrected, and that all wiring be subsequently reinspected at regular intervals.

23. That all overhead wires, except trolley wires, in the streets and block interiors of the closely-built sections, be placed underground.

## CONFLAGRATION HAZARD.

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

★25. 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 about 125,000. An important manufacturing and distributing center; excellent transportation facilities. Surface practically level. Streets of fair width, nearly one half paved. Railroad grade crossings numerous. High winds normally infrequent; occasional hurricanes; winter temperatures mild. Loss per fire, loss per capita, and number of fires, all high.

## FIRE FIGHTING FACILITIES

**Water Supply.**—Municipal ownership; management good. Supply, pumped from Hillsboro river with former well supply in reserve, adequate and reliable in equipment and operation. Force mains heavily taxed at time of peak load. Consumption high; small proportion of services metered. Pressures low to good. Arterial system generally of fair strength but weak west of river; minor distributors of good size. Gate valve spacing rather wide. Hydrants fairly well spaced. Strengthening of arterial system and reduction of consumption by metering contemplated.

**Fire Department.**—Full paid; two-platoon basis. Engine companies well distributed but insufficient in number. Ladder protection is seriously inadequate. Companies considerably undermanned. Chemical service adequate. Hose and apparatus in good condition; no 3-inch hose. Large stream appliances inadequate; much minor equipment lacking. Drills and training, inspection service and salvage work, unsatisfactory. Records good.

**Fire Alarm System.**—Automatic system; under competent supervision; well maintained. Headquarters equipment mainly adequate; lacks transmitter. Duplicate alarm circuits and instruments at fire stations deficient. Boxes in good condition, largely of satisfactory type, but very deficient in number. Circuits very largely underground and in excellent condition. Telephone alarm transmission unsatisfactory. Tests good. Records incomplete.

**Fire Department Auxiliaries.**—No State fire marshal; fire and police departments investigate suspicious fires. Police and public utility corporations render good service at fires. Telephone service automatic and extensively used for fire alarm transmission. Some outside aid available in 30 minutes to 1 hour.

**Summary.**—Supply works adequate and reliable; fair to good quantities generally available for engine supply. Fire department considerably undermanned and weak in ladder service. Fire alarm system well maintained; box distribution weak.

## STRUCTURAL CONDITIONS AND HAZARDS

**Building Department.**—Laws adequate; enforcement lax. Fire limits of sufficient extent, but frame construction therein not properly restricted; incombustible roof coverings required throughout the city. Structural conditions generally weak.

**Explosives and Inflammables.**—Laws inadequate; numerous hazardous materials not regulated. Control mainly with the fire department; inspections not thorough or systematic. Local conditions only fair; hazardous conditions exist at dry cleaning plants; much combustible rubbish noted.

**Electricity.**—Under municipal control. National Electrical Code adopted. Enforcement for new work good; old work needs complete inspection. Overhead wire obstructions serious. Electrolytic action present; periodic tests made.

**Conflagration Hazard.**—In the congested value district, weak construction makes severe individual or group fires probable in most blocks. Probability of fires spreading beyond block of origin only moderate owing to mainly adequate water supply, fireproof and sprinklered construction, small blocks and low heights, good street widths, and infrequency of high winds. Spreading fires endangering the congested value district might occur at several points in warehouse and wharf district. Group fires probable in minor mercantile district. Spreading fires, in some cases, threatening the congested value district, probable in congested, shingle-roof frame dwelling sections. Considerable shingle-roof frame construction and absence of public protection in West Hyde Park residential sections beyond city limits creates severe exposure to adjacent frame dwelling sections within the city limits.









NEW PUMP STA. AND FILTER PLANT

National Board of Fire Underwriters  
COMMITTEE ON FIRE PREVENTION AND  
ENGINEERING STANDARDS.  
**TAMPA - FLA.**  
MAY - 1927

**KEY**

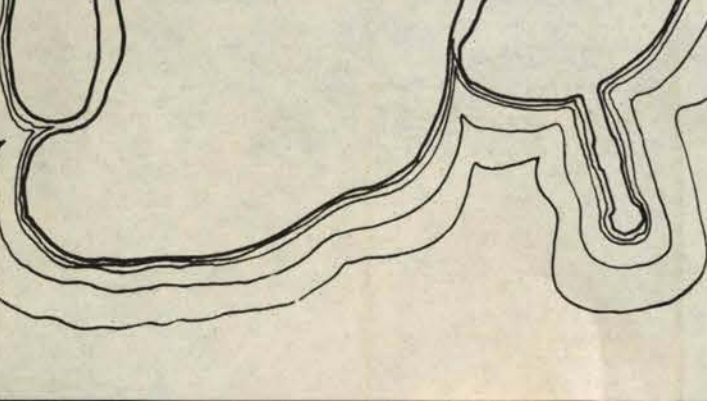
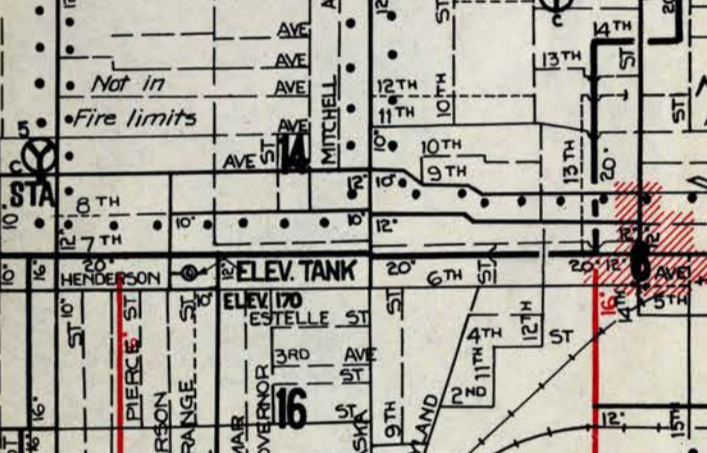
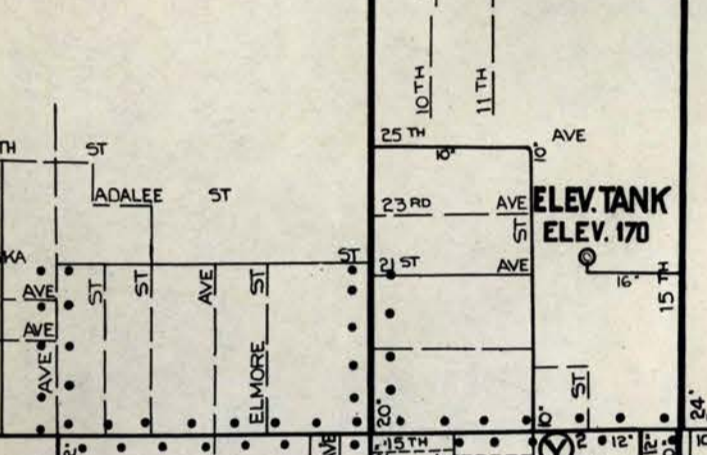
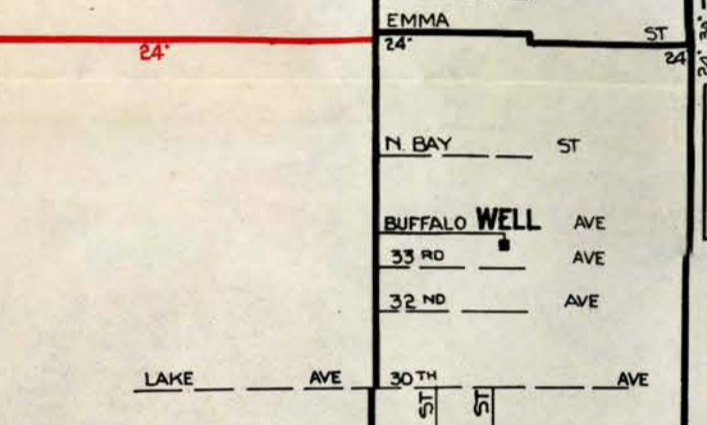
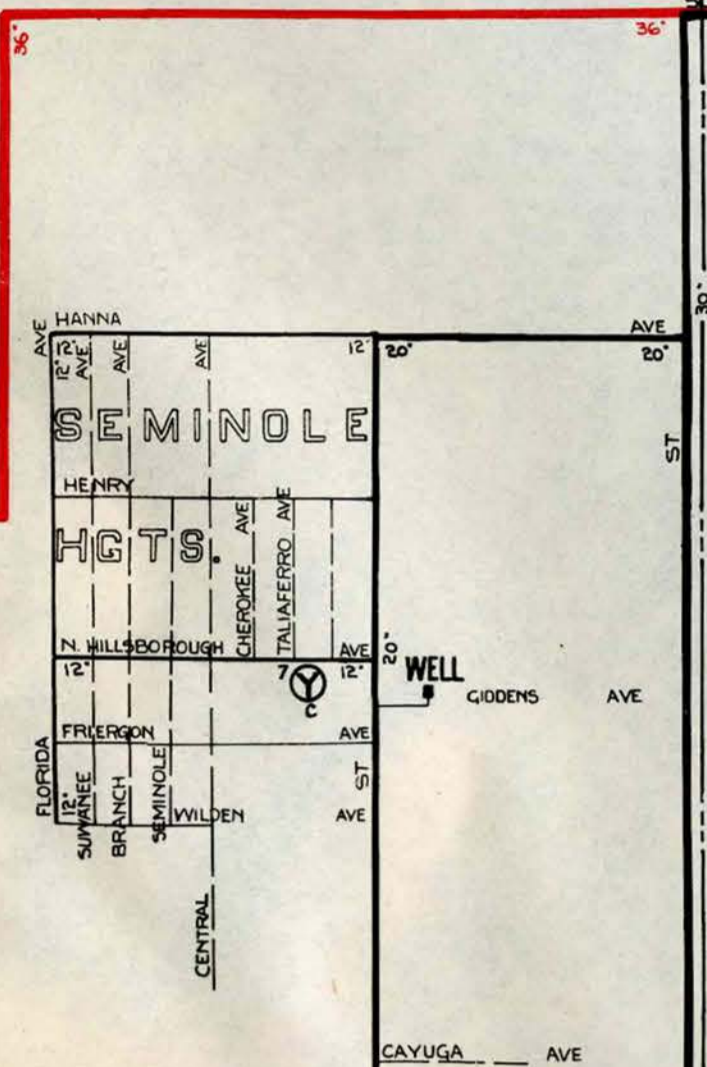
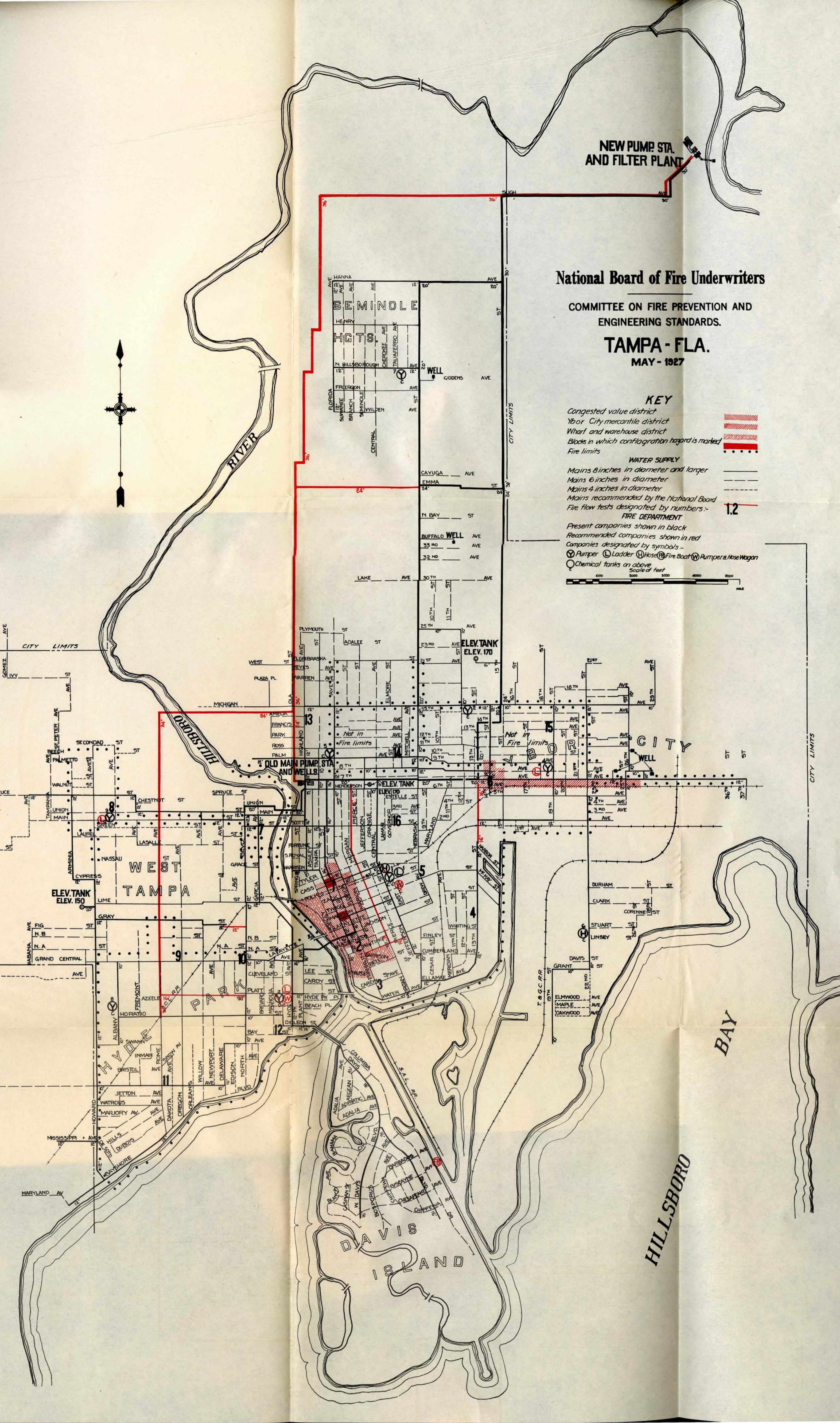
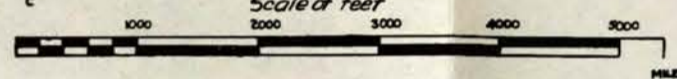
Congested value district  
 Wharf City mercantile district  
 Blocks in which conflagration hazard is marked  
 Fire limits

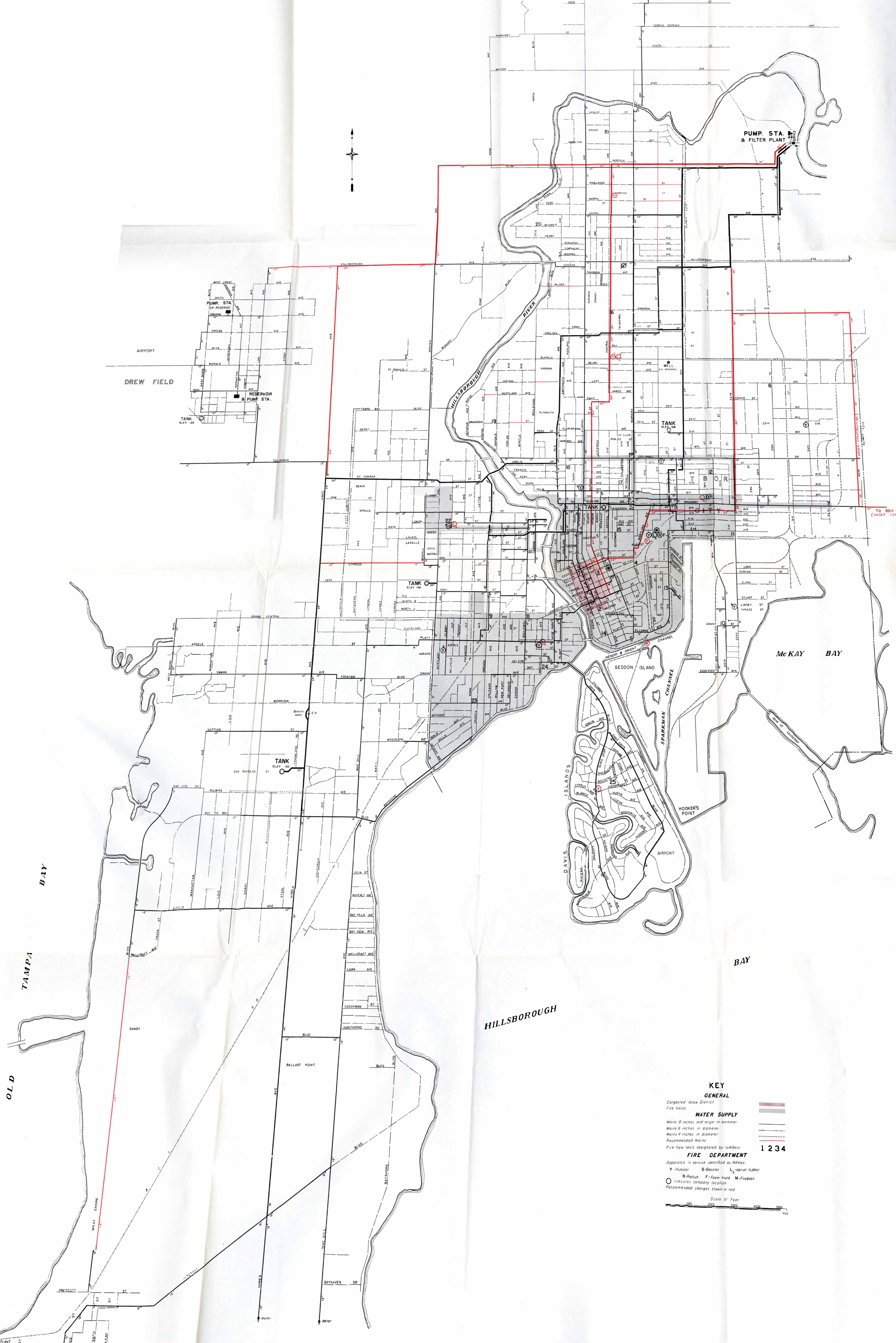
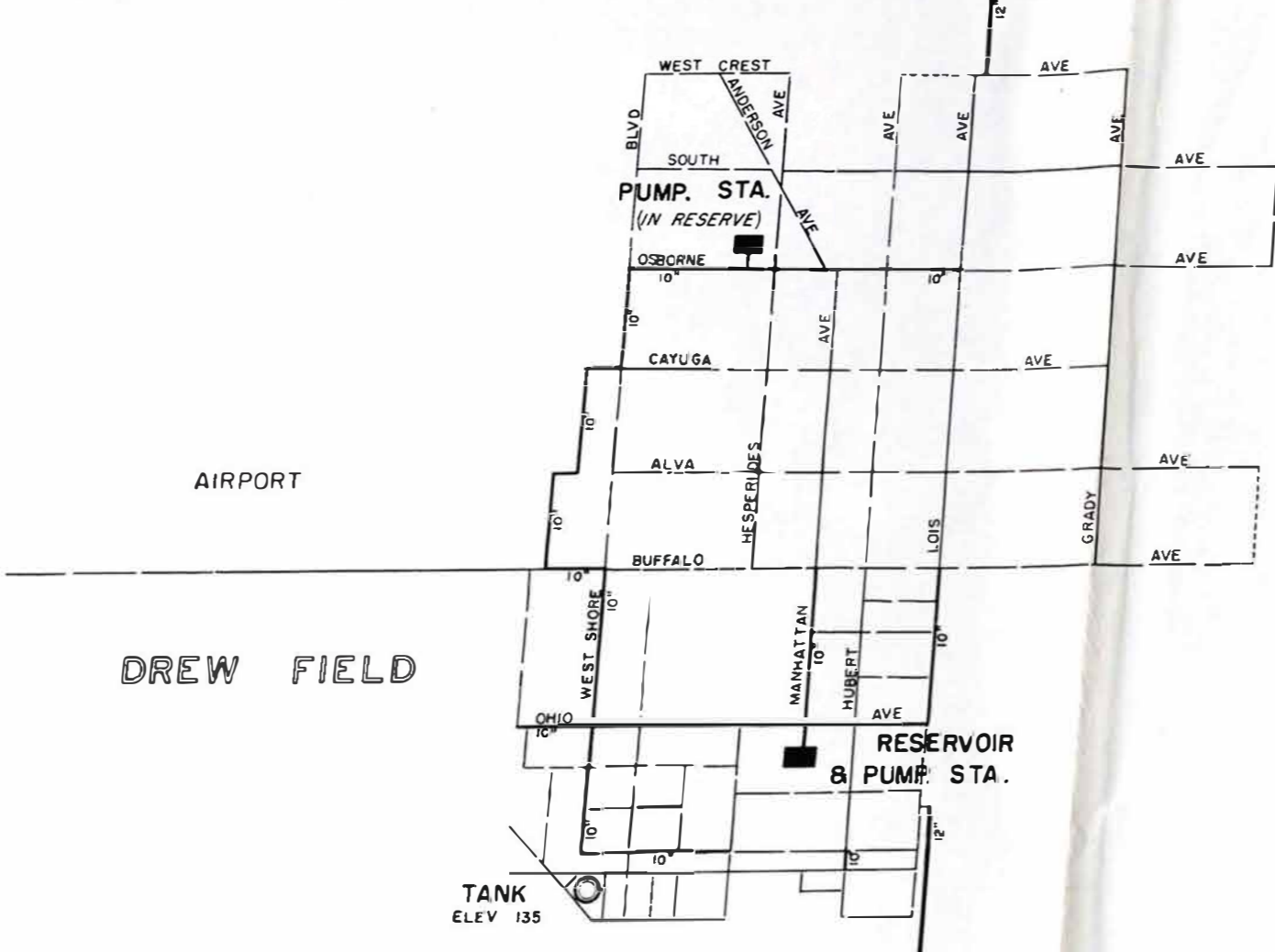
**WATER SUPPLY**

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

**FIRE DEPARTMENT**

Present companies shown in black  
 Recommended companies shown in red  
 Companies designated by symbols:-  
 Pumper Ladder Hose Fire Boat Pumper & Hose Wagon  
 Chemical tanks on above  
 Scale of feet





**KEY**

**GENERAL**

Congested Value District  
 Fire Lines

**WATER SUPPLY**

Mains 8 inches and larger in diameter  
 Mains 6 inches in diameter  
 Mains 4 inches in diameter  
 Recommended mains  
 Fire flow tests designated by numbers 1 2 3 4

**FIRE DEPARTMENT**

Apparatus in service identified as follows:  
 P - Pump    B - Booster    A - Aerial Ladder  
 R - Rescue    T - Team Truck    M - Motor  
 O - Indicates company location  
 Recommended changes shown in red

Scale of Feet  
 0 1000 2000 3000 4000 5000