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WINSTON-SALEM,  
N. C.

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

REPORT  
ON THE  
CITY OF WINSTON-SALEM, N. C.

(Superseding Report of 1934)

*W.S. Fire protection  
division of city of W.S.*

## FIRE DEPARTMENT

**ORGANIZATION.—General.** — The department is full paid and operates on a 72 hour-a-week basis under the supervision of a Fire Committee consisting of three members of the Board of Aldermen elected biennially. F. D. Pepper is Chairman; C. F. Bauserman and Fred C. Denny are the other members.

M. G. Brown, age 59, has been Chief since 1938. E. M. Dixon and B. H. Peoples, both age 56, are Assistant Chiefs, appointed in 1938 and 1947 respectively. All officers have advanced through the various grades and their service has been continuous.

Total membership is 101 and includes 3 chief officers, 7 captains, 7 lieutenants, 1 master mechanic, 1 secretary, an acting superintendent of fire alarm, 3 fire alarm operators and 78 firemen.

The average annual maintenance expense of the fire department for the past 5 years was \$203,944. During this period, the amount set aside for a new station and the purchase of apparatus was \$70,226. The expenditure for salaries and general maintenance in 1948 amounted to \$287,834 or a per capita cost, based on a population of 85,000, of \$3.39.

The chief is appointed annually by the Board of Aldermen. All other appointments and promotions are made by the fire committee with the approval of the chief. Applicants must pass a physical examination, which includes suitable height and weight requirements and be between 21 and 30 years of age. No mental examinations are required, there is no probationary period, and tenure of office is not secure.

There are two pension plans in force. One, a city plan, pays 1½ per cent monthly of a members annual salary at a voluntary retirement age of 55 or a compulsory age of 65, or for disability after 10 years of service. The compulsory limit of 65 may, upon application, be extended to 70. This plan is supported by a 4 per cent assessment of a member's salary, matched by an equal amount from the city. Under a second plan, The Winston-Salem Fireman's Retirement Fund Association created by State law, pays 2 dollars per month times the number of years of service after 30 years of service, or for disability after 5 years, with a maximum of 50 dollars. This plan is supported by a percentage of insurance business done within Winston-Salem plus a small monthly assessment of each member. There are two members on retirement at this time.

**Companies.**—Six pumper companies and one ladder company are in service in six stations. All stations are 1 or 2 stories in height and of ordinary construction; three of these are in only fair condition, two of which are poorly located with respect to traffic conditions.

The chief is on continuous duty responding from headquarters or his residence. An assistant chief is in charge of each platoon. A captain and a lieutenant are assigned to each company. Members are divided into two platoons and work 10- or 14-hour shifts, alternating weekly, with an extra day off each week. Members are allowed 16 days annual vacation, with no more than 2 men away from each company at a time. Vacancies caused by vacations are filled by details; no substitutes are provided. Off duty members are required to respond to second alarms being notified by telephone. No specified watch is maintained at any of the stations, except at fire headquarters, where a fire alarm operator is on duty on each shift. The night man is permitted to retire; an extension of the fire phone is located near his bed in the dormitory.

Two pumper companies and 1 ladder company are located within ½ mile of the congested value district. Most other built-up areas of the city are within 1½ miles of a pumper company, but some areas, particularly in the northwest section of the city, are from 2 to 3 miles from a pumper company. The ladder company response is limited to the congested value district and to some manufacturing districts, to apartment houses, hospitals and schools outside the congested value district; several schools are as much as 3 to 4 miles from the ladder company.

**APPARATUS AND EQUIPMENT.—Pumpers.**—See Table 3. All pumpers in service are of 1000 gallon capacity and are equipped with centrifugal pumps. One is a 1948 Mack, two are American-LaFrance placed in service in 1948 and 1947, and the remainder are of Pirsch make purchased in 1939, 1938 and 1937 respectively. All pumpers are equipped with water tanks, 250 feet of ¾-inch hose, a 5-inch hard suction and a 5-inch soft suction equipped with reducers to 4½ inches for hydrant connections. There are 3 pumpers in reserve, two of which are loaded with 2½-inch hose and ready for service. Reserve pumpers are of American-LaFrance make and were purchased in 1931, 1923 and 1922; one is of 1000-gallon capacity and two are of 750-gallon capacity; all are equipped with rotary gear pumps.

All pumpers, with the exception of the two purchased in 1948, were tested at draft during this survey. Those in service and the 1931 and 1923 reserve pumpers delivered their rated capacities at reasonable speeds. The 1922 reserve pumper was not able to maintain the required 250 pounds during the pressure test due to excessive missing in the engine. Operators were fair but showed a need for more frequent practice in pumper operation.

**Ladder Truck.** — See Table 3. An 85-foot Pirsch aerial, placed in service in 1937, is the

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only ladder truck in service. It carries 10 ladders in addition to the hydraulically operated aerial including a 50- and a 35-foot extension ladder. A 1918 American-LaFrance service ladder truck is in reserve. The ladders on the reserve truck are in only fair condition, and very little minor equipment is carried.

**Chiefs' Cars.—Other Vehicles.—Fuel.**—A 1941 and 1937 Buick sedan are provided for the chief and assistant chief respectively. Both cars carry a large variety of minor equipment and are equipped with 2-way radio.

A floodlight wagon assembled on a 1941 Dodge chassis is located at headquarters. It carries 7 portable flood or spotlights, adequate cable and a 10 kva generator driven by a 4 cylinder Waukesha engine. This wagon is manned upon special call by the master mechanic or a detailed fireman.

Gasoline is stored at each station in an underground tank of 500 to 1000-gallon capacity. Ordinary cans are used for delivery of gasoline at large fires; any available fire department vehicle is used.

TABLE 3.—FIRE COMPANIES—LOCATION AND EQUIPMENT.

Company	Location	Members on Duty	Apparatus Type
Pump. 1 <sub>hv</sub>	{ 8th St., near } { Trade St. .... }	6	1000-gal. Pumper
Pump. 2 <sub>hv</sub>	{ Headquarters: } { Liberty & Ceme- } { tery Sts. .... }	7	1000-gal. Pumper
Pump. 3 <sub>hv</sub>	{ Liberty St., near } { 15th St. .... }	5	1000-gal. Pumper
Pump. 4	{ Dunleith Avenue, } { near 3rd St. .... }	5	1000-gal. Pumper
Pump. 5	{ Devonshire and } { Glendale Sts. .... }	5	1000-gal. Pumper
Pump. 6	{ Academy St. and } { Gales Ave. .... }	5	1000-gal. Pumper
Lad. 1 <sub>hv</sub>	With Pumper 1 .....	5	85-ft. Aerial *

\* Equipped with Turret Pipe.

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

**Hose.**—The 2½-inch hose is double-jacketed cotton, rubber-lined, delivered under the usual trade agreements and tested to 400 pounds upon receipt. It is tested annually to 200-pounds pressure, and defective lengths are discarded. Each pumper company carries 1200 feet of 2½-inch hose and 250 to 300 feet of ¾-inch hose; there is no 1½- or 3-inch hose available. A complete spare shift of 2½-inch hose is available at each station. Hose is washed after use and dried on

sloping racks suspended from the ceiling over the apparatus floor. The average amount of hose assigned to each company, including the spare shift, is 2500 feet. Approximately 70 per cent of all hose is 7 years old or more, the remainder being 5 years old or less.

Hose couplings are of the usual screw type and the following dimensions: 2 59/64 inches outside diameter of male threads, 7½ threads to the inch. The cities of Greensboro, High Point and Durham use National Standard dimensions of 3 1/16 inches outside diameter of male threads with 7½ threads per inch. Adapters for these cities are kept at headquarters.

**Appliances.**—Minor equipment carried is generally uniform and mainly complete; equipment needed is listed under Recommendations. Appliances for handling special and heavy streams are fairly good and include a ladder pipe, 2 portable turrets, 3 cellar pipes, 7 distributing nozzles and 12 spray nozzles. Forcible entry tools are good but sufficient gas masks, self contained breathing apparatus and other emergency equipment is lacking. Salvage equipment is fairly good consisting of salvage covers, mops, brooms, shovels and sponges.

**Repairs.**—All repairs are made by Master Mechanic H. R. Burton, Jr. who is well qualified and experienced. A small department repair shop is located in a 1-story addition to fire headquarters. There are no power tools available, but there is a good assortment of hand tools. Most major repairs could be made by local garages or the city shops. A fair amount of small parts is available.

**OPERATION.—Discipline.**—A printed sheet of rules and regulations has been issued to each member and covers essential matters of discipline. Members may be suspended or dismissed by the chief, with the approval of the fire committee. There have been no cases of disciplinary action in the past five years. Discipline in general appears to be good.

**Training and Instruction.**—On January 1, 1949 a training program, which had been discontinued for a few years, was reactivated. There is no appointed drillmaster. Drills are held once a week by each company, usually at Station 5 where a 3 story section of the station is available for ladders and dry hose evolutions only. These drills are under the supervision of the respective company officers. There is no specified training for pump operators. Exhibition drills were held during this survey and indicated a willingness among members to learn, and that the men have received some benefits from the limited training provided. Evolutions, in general, were only fairly well executed.

**Fire Response and Methods.**—Running cards are provided in each company for box alarms. All assignments for second alarms or relocations are left to the judgment of the fire alarm operator. The assistant chief, two pumpers and the ladder company respond to all box alarms in the congested value, to some manufacturing districts, and to apartment houses, hospitals and schools. Response elsewhere to boxes, consists of the assistant chief and two pumper companies. Response to telephone alarms if known to be for a building fire generally follows the box alarm assignment to the same district. The chief responds to first alarms when the progress report made by the officer in charge, via 2-way radio, indicates that his presence is required. He responds to all second alarms. The light wagon, manned by the master mechanic or an off duty fireman, responds on special call.

Fifty-four per cent of the streets are paved, the remainder being in only fair condition. Some delay might be experienced on the unpaved streets during wet weather and also at railroad grade crossings on industrial sidings. Grades are slight to moderate. The department is notified of streets closed for repairs or hydrants out of service.

Records of the methods of extinguishment are lacking, but it is reported that the majority of fires are extinguished by booster lines. The first due company leads in with a booster line which,

if necessary, is backed up by a 2½-inch line laid by the second company. Shut off nozzles with 1, 1½, and 1¼-inch tips are used on fires of ordinary proportions. At larger fires heavy stream appliances consisting of portable turrets and the ladder pipe would be used. Connections are made to sprinkler and standpipe systems in sprinklered buildings. Ventilation, ladder work, salvage and cleanup work are done by the ladder company; some salvage work is also done by pumper companies. Quarterly inspections are made within the fire limits by off duty members of the department. Follow up inspections and complaints are handled by the assistant chiefs.

Company officers keep a house journal of runs made and make fire reports that are sent to the chief. These reports are entered into a fire record book. All other records including those for personnel, disciplinary action, apparatus and hose are fair to poor. However, during this survey a clerk was assigned to the chief's office and a complete reorganization of records was being instituted.

**CONCLUSIONS.**—The department is under experienced chief officers. Appointments and promotions are not under civil service. Manning is slightly to moderately deficient the latter being the condition during vacation periods. The number of pumper companies is insufficient, but the total pumping capacity is adequate and the distribution of available companies is generally good except with respect to the northwest section of the city. Ladder service is deficient, with dependence upon a single company; there is no ladder company response except in the congested value district and to occupancies involving considerable life hazard elsewhere. Hose is in good condition but a large percentage is over seven years old; no 1½ nor 3-inch hose is provided. Minor equipment is mainly complete, and special and powerful stream appliances are fairly good. The absence of a comprehensive training program and the lack of a proper training building seriously hinder the efficiency of fire department operations and the adoption and use of progressive fire fighting methods. Discipline is good. Records have been poor but are being improved.

SUMMARY OF APPARATUS

	In Service	In Reserve
<b>Pumpers:</b>		
1000-gallon .....	6	1
750-gallon .....	0	2
<b>Ladder Trucks:</b>		
Aerial .....	1	0
Service .....	0	1
Light Wagon .....	1	0
Chief's Automobile .....	2	0
Fire Alarm Truck .....	1	0
Hose, 2½-inch .....	15,800'	2000'
Hose, ¾-inch .....	1550'	900'
Ladders, Total Length .....	577'	322'
Ladders, Short, on Pumpers, Etc. ....	13	6
Portable Extinguishers .....	23	5
Chemical Tanks .....	0	1
Water Tanks .....	6	3
Gas Masks .....	11	0
Oxygen Masks, Self contained .....	2	0
Salvage Covers .....	32	0
Portable Turrets .....	2	0
Siamese Connections .....	6	0
Ladder Pipes .....	1	0
Cellar Pipes .....	3	0
Distributing Nozzles .....	7	0
Special Coupling (For Pumpers from Other Cities) ....	0	6

FIRE ALARM SYSTEM

**ORGANIZATION.**—The fire alarm system is a part of the fire department under the supervision of the Fire Committee and the Chief. It is maintained by Acting Superintendent W. V. Sprinkle, whose past experience has been as a lineman in the fire alarm service. He is assisted, when necessary, by a fireman detailed from Pumper 2.

Fire alarm headquarters is located on the first floor of fire headquarters, which is of ordinary

## FIRE ALARM SYSTEM

construction, in a room separated from the apparatus floor by an unpierced brick wall and iron vault doors. The room is exposed across a 40-foot street by a 3-story building of ordinary construction. Windows facing the street are of plain glass and internal protection consists of one 2½-gallon soda and acid extinguisher of doubtful value.

**EQUIPMENT.—At Headquarters.** — Apparatus is of automatic type, installed by Gamewell, and includes a 6-circuit operating board, with the usual testing facilities, and a 6-circuit automatic repeater with contacts for 4 closed alarm circuits. A break-wheel transmitter is located on the fire apparatus floor, near the telephones.

All but one side of one circuit enter headquarters underground to a metal terminal box mounted on the wall of the operating room. Circuits are protected by knife switches for each side of each circuit, a choke coil arrester for circuits 1 and 2 and ½ ampere fuses on the operating panel. No. 14 copper rubber covered single braided wire in conduit is used from the terminal box to the operating panel.

Current for operating the system is supplied by individual circuit rectifiers with batteries floating. Rectifiers are mounted below the operating panel; current for them is supplied by a separate 110-volt circuit. A total of 101 six-ampere-hour storage battery cells are mounted on wooden racks in a room adjoining the operating room. Ventilation is by 3 windows in each room. Each bank of batteries is protected by a 10-ampere, 250-volt fuse mounted on the rack. Batteries appear to be in good condition, but there are no spare parts on hand. A duplicate motor-generator set, supplied by a separate 220-volt circuit, is available for high-rate charging.

**At Fire Stations and Elsewhere.**—Each station has a gong and punch register on a box circuit, with the exception of the gong and register in fire headquarters which are on a local closed alarm circuit. Gongs are also provided in the Salem pumping station and in the home of the superintendent of fire alarm.

A total of 111 boxes are in service, all of Gamewell make and succession type. Two are private of which one is inaccessible to the public. All boxes, with the exception of the private boxes, are mounted on available poles. No insulating joints are provided above the boxes. None of the boxes have indicating lights over them, but all boxes are painted and supporting poles banded yearly. Distribution is only fair in the congested value district; it is estimated that 14 more boxes are needed in this district and approximately 250 elsewhere for proper distribution. Fifteen boxes were inspected and tested during this survey and were found to be in good

condition. They are timed to transmit signals at a rate of 1 blow a second.

**Circuits.** — There are five box and one local alarm, all metallic, normally closed circuits. Total length of circuits is approximately 59 miles, of which 85 per cent is overhead of No. 10 hard drawn rubber covered copper wire with triple braided insulation, and the balance is underground of No. 14 rubber covered copper wire in lead sheathed cable installed in ducts belonging to the telephone company. A large amount of the aerial circuits are in poor condition because of worn or badly frayed insulation. No lightning arresters are provided at junctions between aerial and underground circuits, but part of such junctions are protected by 3-ampere fuses in small terminal boxes. Circuits are protected at entry into fire stations by 3-ampere fuses mounted on the instrument panel.

**Telephone System.** — Five circuits are provided from the public exchange, three of which have progressive numbers and are reserved for fire calls only, the others being used for business calls. A series-magneto type phone, maintained by the telephone company, is used for inter-station communications. Each station also has a listed private phone for the members personal use.

**Radio System.** — A 2-way FM radio system was installed by the fire department in 1948. Equipment consists of a transmitter and receiver at the fire alarm operator's desk in fire headquarters and on each pumper in service, the two chiefs' cars, the fire alarm truck and one reserve pumper. A receiving set is located on the apparatus floor of each fire station.

**OPERATION.** — Three firemen are assigned as operators at the watch desk in fire headquarters, where all telephone alarms are received; they work 10- and 14-hour shifts with one man on each shift, but the man on duty at night is allowed to retire to the dormitory where an extension of the fire phone is provided. These operators handle the telephone calls, radio transmission and dispatching. All ground and voltage tests and supervision of the fire alarm boards are done by the officers assigned to Pumper 2. Test blows are sent over the system twice daily, ground tests are made once a day and boxes are tested about every six months. No other tests are made of the system unless trouble should develop. The only records kept are of the daily ground tests. A program has been instituted to improve the records but is progressing slowly.

Four rounds of box alarms are automatically transmitted over the system. Telephone alarms are seldom confirmed over the fire alarm telegraph, all companies being dispatched by tele-

phone. Companies remaining in service are not notified of companies dispatched by telephone.

During 1947 there were 806 alarms, of which 114 were box, 687 telephone and 5 were verbal. Of the total number of box alarms received, 40 were false.

**CONCLUSIONS.**—The fire alarm system is of proper type but is inadequate in extent and only fairly well maintained. Except for the replacement of inferior type boxes, there has been little extension or improvement of the system since the last report of the National Board of Fire Underwriters. The acting superintendent of fire alarm has had only limited experience in fire alarm work. Most of the headquarters equipment is unsatisfactorily located in a partly cut off room on the first floor of fire headquarters. Four out of five circuits in use cover an excessive area and the insulation on the aerial wire serving most of these circuits is in generally poor condition, frequently resulting in heavy grounds on the system. Boxes are of a good type and in good operating condition, but distribution is only fair. Tests and records have been very incomplete but an improvement program has been instituted.

## FIRE DEPARTMENT AUXILIARIES

**FIRE MARSHAL.**—By State law the chief of the fire department must investigate all fires within 3 days of their occurrence and furnish the State Insurance Commissioner, within one week, a written statement concerning the fire. The State Insurance Commissioner is William P. Hodges, with headquarters in Raleigh. The State Fire Marshal is Sherwood Brockwell. The insurance commissioner or his deputy has all the powers of an examining court and upon finding evidence of arson or other willful burning, power to cause the arrest of the suspected person.

During 1948 there were 3 suspicious fires, with 1 arrest and 1 conviction.

**POLICE DEPARTMENT.**—John M. Gold is chief; the total force is 159, of whom 21 are civilians.

Sixteen patrol cars, 4 sedans for the chief and the detective division, 8 motorcycles and 3 trucks are in service. All but 1 sedan and 2 motorcycles are equipped with 2-way FM radio. The police telegraph signaling system has been discontinued but 12 telephones have been installed for foot patrolmen in the congested value district.

There is no regular response of police cars to alarms of fire. The gong and visual indicator in police headquarters has been removed. Response

to fires is made upon request by the fire department unless a patrol car or patrolman happens to be in the immediate vicinity. They do not report any unauthorized building construction.

**TELEPHONE SERVICE.**—The Southern Bell Telephone Company serves about 20,750 subscribers. Service is through one machine switching exchange and is over one-, two- and four-party lines, with about 50 per cent 4-party lines. The exchange is located in a fireproof building adjoining the congested value district. It is moderately exposed by frame dwellings but is adequately protected by wire glass windows in steel frames. Internal protection consists of a local fire alarm system, portable extinguishers and tarpaulins. There are five lines to fire headquarters, three of which are reserved for fire only. Emergency calls to the operator are logged and passed on to the fire alarm operator. No trouble from electrolysis has been experienced in the past few years.

**SPRINKLER SUPERVISORY AND CENTRAL STATION WATCH SERVICE.**—The American District Telegraph Company, with headquarters on the first floor of a fireproof building in the congested value district, provides service to 15 subscribers. Nine of these subscribers have sprinkler supervisory, 6 have combined night watch and manual fire alarm and 8 have aero automatic fire alarm. The sprinkler supervisory services are on 10 circuits and manual fire alarm, night watch and aero systems are on 9 circuits. These circuits are energized by rectifiers with batteries floating. Current to these rectifiers is supplied from a public and a private source. Lines are leased from the telephone company and No. 16 rubber covered wires are used on customers' premises. Installations are inspected at least monthly.

All fire alarms are received at the central station on double pen registers. Six of these circuits also enter fire headquarters direct, where they are received on multiple circuit registers. All alarms, except those received on these 6 circuits, are transmitted to fire headquarters over a special circuit by means of a manual transmitter and are confirmed over a direct telephone line from the central office. There are two runners, with one car, on duty at all times.

**PUBLIC UTILITIES.**—The gong and indicator located at the Duke Power Company have been removed. Response is made to fires generally at the request of the fire department.

**OUTSIDE AID.**—Arrangements have been made for outside aid from Greensboro, 29 miles distant and High Point, 18 miles distant.