

# Fire Sprinkler

## Study Guide

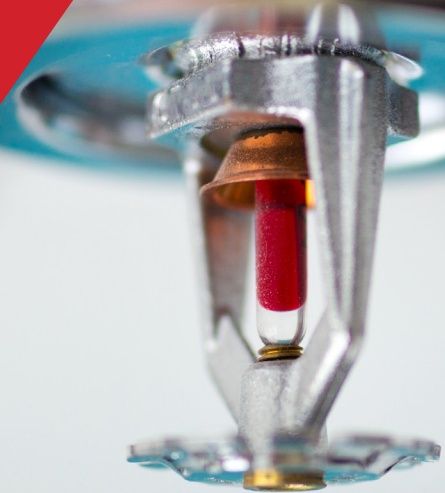
### Assessments:

4016 Fire Sprinkler Technician

4018 Fire Sprinkler Inspector

4017 Manager

4026 Residential Fire  
Sprinkler Technician



OKLAHOMA  
CareerTech

CTTC

CareerTech Testing Center  
Health and Professional Certifications Project

## Overview

This study guide is designed to help candidates prepare for licensure through the Oklahoma Department of Labor. It includes information about each of the examinations, and the skills standards upon which the examinations are based, resources that can be used to prepare for the examinations, and test taking strategies.

Each of the sections in this guide provides useful information for candidates preparing for the examinations.

- Fire Sprinkler Licensure Examinations
  - ▶ Assessment Information
  - ▶ Standards and Test Content
  - ▶ Sample Questions
  - ▶ Abbreviations, Symbols and Acronyms
  - ▶ Test Writing Resources
- Strategies for Test Taking Success
- Notes

These assessments were developed in partnership with the Oklahoma Department of Labor, which regulates the fire sprinkler industry in Oklahoma and licensing individuals and companies who install, maintain, and inspect fire sprinkler system equipment. Each examination measures the candidate's mastery of knowledge and skills expected of workers in the area of licensure.

### Disclaimer

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## **CareerTech and Licensure Exams**

Career and technology education uses industry professionals and certification standards to identify the knowledge and skills needed to master an occupation. This input provides the foundation for development of curriculum, assessments and other instructional materials needed to prepare candidates for wealth-generating occupations and produce comprehensively trained, highly skilled employees demanded by the work force.

### **Measuring Success**

Written competency assessments provide a means of evaluating the candidate mastery of knowledge and skills. Coaching reports communicate competency assessment scores to candidates and provide a breakdown of assessment results by standard area. The coaching report also shows how well the candidate has mastered skills needed to perform major job functions and identifies areas of job responsibility that may require additional instruction and/or training.

## Assessment Information

### How are the assessments developed?

The assessments are developed by the CareerTech Testing Center in partnership with the Oklahoma Department of Labor. Items for the exams were developed and reviewed by committees of subject matter experts. All subject matter experts are fire sprinkler professionals who have many years of experience in the industry.

### How do I register for an exam?

Candidates for licensure in the alarm, locksmith, or fire sprinkler industry can take an exam in-person or online. A list of testing centers and online testing information can be found at [www.okhcp.com](http://www.okhcp.com) under the Alarm/Locksmith tab. Candidates will be required to show one of the following forms of photo identification:

1. valid, current driver's license issued by any state in the United States, or
2. valid, current state of Oklahoma identification card

Identification cards issued by other states or entities **will not** be accepted.

### What do the examinations cover?

Each examination is aligned to the skills standards for that licensure area. The standards for each licensure area are contained in this study guide.

### What is required to pass the exam?

Candidates who score 70% or higher on the written examination and meet all licensure requirements will be issued a license by the Oklahoma Department of Labor.

### Are the exams timed?

Yes. The test plan for each licensure area specifies the time allowed to complete the written examination. If the time allowed expires before the candidate is finished with the examination, the examination will automatically be submitted for scoring and all unanswered questions will be marked incorrect.

### Can candidates use a calculator on the exam?

Yes, calculators may be used on these exams. If a calculator is needed, it will be provided by the testing center or through the assessment navigator within the exam.

### What is the testing fee for written examinations?

Candidates must pay all testing fees to the test site upon registration. The current testing fees for the exams are located on the website at [www.okhcp.com](http://www.okhcp.com) under the Alarm/Locksmith and Fire Sprinkler tab.

## Can candidates use code books or other resources during the examination?

All candidates may use a copy of the Oklahoma Alarm, Locksmith, and Fire Sprinkler Industry Act.

Candidates may bring and use publisher-bound code as indicated in the charts below. **NOTE: Only publisher-bound books are allowed.** Candidates may not use photocopies that have been spiral bound, placed in a binder, etc. No loose pages of notes or codes are allowed. In addition, all references will be checked for handwritten notes specifically related to test questions. References that contain test-related notations will not be allowed.

Licensure Area – Fire Sprinkler	Allowed Code Books												IRC
	I3	I3D	I3R	I4	I9	I20	I22	I24	I25	I70	I72	I73I	
Fire Sprinkler Technician	√	√	√	√		√		√					
Fire Sprinkler Inspector	√	√	√	√	√	√	√		√		√		
Manager										√	√	√	
Residential Fire Sprinkler Technician													√

## When will I receive my results?

Candidates will receive their results immediately upon completion of the testing. These results must be included with the candidate's licensure application and sent to the Oklahoma Department of Labor.

## Can candidates retake an exam?

Candidates who do not pass the written examination may retest. Although there is no formal waiting period for retesting, the ability to offer candidates an opportunity for same day retesting varies.

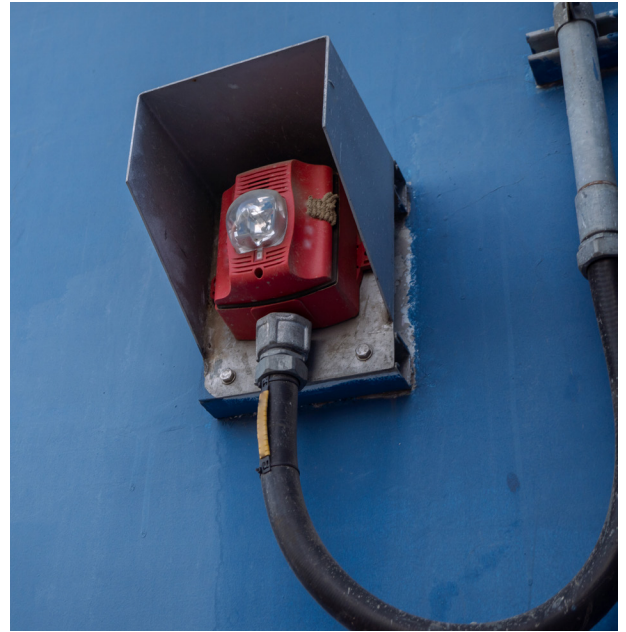


## Standards and Test Content

### 4016 Fire Sprinkler Technician 85 Questions — Two hour time limit

#### A. Demonstrate Understanding of Codes, Standards, and Regulations — 14% (12 questions)

1. List and explain standards related to fire sprinkler systems
  - NFPA 13, 13R, 13D, 14 and 20
  - IBC/IFC
2. Explain the consequences of failing to comply with state and federal codes and standards related to the fire sprinkler industry
3. Explain Occupational Health and Safety Administration regulations related to the installation and servicing of fire sprinkler equipment
4. Demonstrate an understanding of rules promulgated by the Oklahoma Department of Labor to enforce the Oklahoma Alarm, Locksmith, and Fire Sprinkler Industry Act
5. Demonstrate basic knowledge of contract law
6. Describe the fines and other penalties associated with failing to obtain/maintain required licenses and/or permits



#### B. Demonstrate Knowledge of Fire Sprinkler System Components and Configurations — 14% (12 questions)

1. Distinguish between the basic types of sprinkler systems
  - Wet
  - Dry
  - Preaction
  - Deluge
  - Foam
  - Anti-freeze loop
2. Identify a standpipe system and its components
3. Identify a fire pump system and its components
4. Identify the features and devices of different types of water supplies



5. Identify and describe the purpose of sprinkler system devices and components

- Post indicator valves
- Control valves
- Pumps
- Risers
- Switches
- Hangers/fasteners
- Sprinkler heads
- Mains
- Branch lines
- Backflow assemblies
- Quick open devices
- Drains
- Air venting

6. Describe the principles of operation of common fire sprinkler systems

7. Recognize typical occupancies for each hazard classification

### **C. Layout Basic Sprinkler System — 8% (7 questions)**

1. Identify and layout basic sprinkler system devices and components

2. Identify and layout basic piping configurations

3. Properly space sprinklers in a simple layout

4. Incorporate basic inspection, testing, and maintenance device requirements in a simple system layout

5. Complete a basic material list

### **D. Practice Job Site Safety — 31% (26 questions)**

1. Survey job site for unsafe work conditions and report appropriately

2. Identify and demonstrate the appropriate use of hand and power tools used to install, test, and service alarm systems

3. Identify and demonstrate the appropriate use of job site equipment

4. Practice safe ladder usage

5. Use proper fall techniques and practices

6. Use head, ear, eye, and foot protection properly

7. Read and interpret Safety Data Sheets

8. Recognize injuries and health conditions commonly encountered at job sites

10. Identify precautions that should be taken when working in confined spaces and other potential hazardous environments

11. Identify and respond properly to locked-out/tagged-out devices

## **F. Conduct Site Survey — 5% (4 questions)**

1. Make simple measurements
2. Confirm/note changes in building layout and existing fire sprinkler system components
3. Transfer information from notes to drawings
4. Identify basic building features
5. Identify building construction components
6. Recognize combustible and noncombustible materials

## **G. Install Fire Sprinkler Systems Properly — 24% (20 questions)**

1. Use project plans and specifications to determine dimensions and installation requirements (i.e. types of materials, elevation, and location of system components)
2. Demonstrate use of blue prints and adherence to specifications
3. Install fire sprinkler system components properly
4. Connect water source
5. Assist with acceptance testing
6. Provide customer training



## **H. Maintain and Service Fire Sprinkler Systems — 5% (4 questions)**

1. Read, interpret, and follow manufacturers' published instructions for sprinkler systems
2. Identify and locate all schematic components, connections, and test points
3. Use test equipment to verify proper function of various sprinkler systems and their components
4. Document all maintenance and repairs correctly

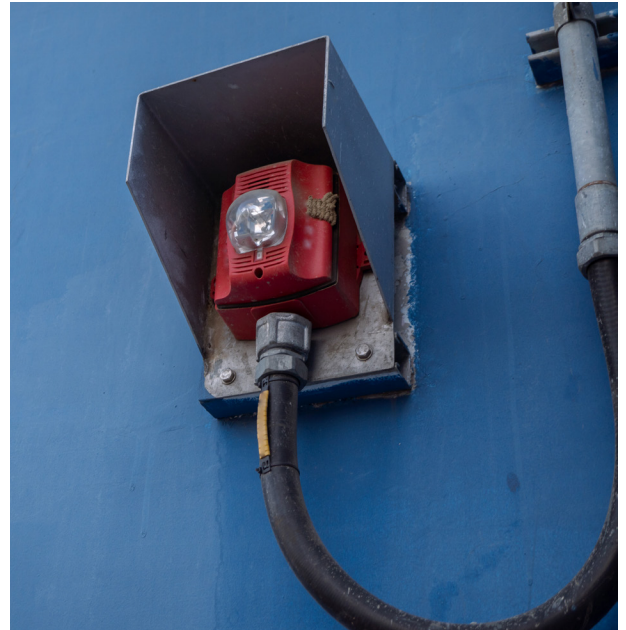


## Standards and Test Content

### 4026 Residential Fire Sprinkler Technician 85 Questions — Two hour time limit

#### A. Demonstrate Understanding of Codes, Standards, and Regulations — 14% (12 questions)

1. List and explain standards related to fire sprinkler systems
  - NFPA 13D
  - IRC
2. Explain the consequences of failing to comply with state and federal codes and standards related to the multi-purpose residential fire sprinkler industry
3. Explain Occupational Health and Safety Administration regulations related to the installation and servicing of fire sprinkler equipment
4. Demonstrate an understanding of rules promulgated by the Oklahoma Department of Labor to enforce the Oklahoma Alarm, Locksmith, and Fire Sprinkler Industry Act
5. Demonstrate basic knowledge of contract law
6. Describe the fines and other penalties associated with failing to obtain/maintain required licenses and/or permits



#### B. Demonstrate Knowledge of Residential Fire Sprinkler System Components and Configurations — 14% (12 questions)

1. Demonstrate an understanding of multi-purpose residential sprinkler systems
  - Wet
2. Identify the features and devices of different types of water supplies
3. Identify and describe the purpose of multi-purpose residential sprinkler system devices and components
  - Sprinkler heads      • Mains
  - Branch lines        • Drains
  - Hangers/fasteners
4. Describe the principles of operation of common multi-purpose residential fire sprinkler systems

## **C. Layout Basic Multi-purpose Residential Sprinkler System —10% (9 questions)**

1. Identify and layout basic sprinkler system devices and components
2. Identify and layout basic piping configurations
3. Properly space sprinklers in a simple layout
4. Incorporate basic inspection, testing, and maintenance device requirements in a simple system layout
5. Complete a basic material list

## **D. Practice Job Site Safety — 31% (26 questions)**

1. Survey job site for unsafe work conditions and report appropriately
2. Identify and demonstrate the appropriate use of hand and power tools used to install, test, and service alarm systems
3. Identify and demonstrate the appropriate use of job site equipment
4. Practice safe ladder usage
5. Use proper fall techniques and practices
6. Use head, ear, eye, and foot protection properly
7. Read and interpret Safety Data Sheets
8. Recognize injuries and health conditions commonly encountered at job sites
10. Identify precautions that should be taken when working in confined spaces and other potential hazardous environments
11. Identify and respond properly to locked-out/tagged-out devices

## **F. Conduct Site Survey — 5% (4 questions)**

1. Make simple measurements
2. Confirm/note changes in building layout and existing fire sprinkler system components
3. Transfer information from notes to drawings
4. Identify basic building features
5. Identify building construction components
6. Recognize combustible and noncombustible materials



## **G. Install Multi-purpose Residential Fire Sprinkler Systems Properly — 24% (20 questions)**

1. Use project plans and specifications to determine dimensions and installation requirements (i.e. types of materials, elevation, and location of system components)
2. Demonstrate use of blue prints and adherence to specifications
3. Install fire sprinkler system components properly
4. Connect water source
5. Assist with acceptance testing
6. Provide customer training

## **H. Maintain and Service Multi-purpose residential Fire Sprinkler Systems — 2% (2 questions)**

1. Read, interpret, and follow manufacturers' published instructions for sprinkler systems
2. Identify and locate all schematic components, connections, and test points
3. Use test equipment to verify proper function of various sprinkler systems and their components
4. Document all maintenance and repairs correctly

**Standards and Test Content**  
**4018 Fire Sprinkler Inspector**  
**115 Questions — 2.5 hour time limit**

**A. Demonstrate Understanding of Codes, Standards, and Regulations with AHJ — 2% (2 questions)**

1. Identify the responsibilities of the inspector, tester, contractor, owner, and AHJ

**B. Demonstrate Understanding of Codes, Standards, and Regulations — 9% (12 questions)**

1. List and explain standards related to fire sprinkler systems
  - NFPA 13, 13R, 13D, 14, 20, 22, 25 and 72
2. Explain the consequences of failing to comply with state and federal codes and standards related to the fire sprinkler industry
3. Explain Occupational Health and Safety Administration regulations related to the installation and servicing of fire sprinkler equipment
4. Demonstrate an understanding of rules promulgated by the Oklahoma Department of Labor to enforce the Oklahoma Alarm, Locksmith, and Fire Sprinkler Industry Act
5. Demonstrate basic knowledge of contract law
6. Describe the fines and other penalties associated with failing to obtain/maintain required licenses and/or permits

**C. Demonstrate Knowledge of Fire Sprinkler System Components and Configurations — 4% (5 questions)**

1. Distinguish between the basic types of sprinkler systems
  - Wet                      • Deluge
  - Dry                      • Foam
  - Preaction              • Anti-freeze loop
2. Identify a standpipe system and its components
3. Identify a fire pump system and its components
4. Identify the features and devices of different types of water supplies

5. Identify and describe the purpose of sprinkler system devices and components

- Post indicator valves • Sprinkler heads
- Control valves • Mains
- Pumps • Branch lines
- Risers • Backflow assemblies
- Switches • Quick open devices
- Hangers/fasteners • Drains

6. Describe the principles of operation of common fire sprinkler systems

7. Recognize typical occupancies for each hazard classification

## **D. Practice Job Site Safety — 16% (18 questions)**

1. Survey job site for unsafe work conditions and report appropriately

2. Identify and demonstrate the appropriate use of hand and power tools used to install, test, and service alarm systems

3. Identify and demonstrate the appropriate use of job site equipment

4. Practice safe ladder usage

5. Use proper fall techniques and practices

6. Use head, ear, eye, and foot protection properly

7. Read and interpret Safety Data Sheets

8. Recognize injuries and health conditions commonly encountered at job sites

10. Identify precautions that should be taken when working in confined spaces and other potential hazardous environments

11. Identify and respond properly to locked-out/tagged-out devices



## **E. Inspect Fire Sprinkler Systems — 63% (73 questions)**

1. Use NFPA standards to determine inspection frequencies

2. Read pressure gauges on risers and note whether readings are within acceptable ranges

3. Visually inspect fire sprinkler system devices and components for damage or deficiencies

4. Visually inspect fire department connections for damage or deficiencies

5. Verify that alarm devices are connected

6. Confirm the control valve is in the correct position
7. Verify that parts needed to operate control valves are present and functional
8. Verify appropriate supervision of control valves is in place
9. Verify access to control valves is clear
10. Verify required signage is legible and properly attached

## **F. Document Fire Sprinkler System Inspections — 4% (5 questions)**

1. Record the type and count of each fire sprinkler system component used in an existing sprinkler system
2. Record any deficiencies or impairments
3. Record sizes, makes, and models of deficient or impaired components
4. Document inspection findings on appropriate NFPA 25-based forms
5. Use oral and written communications to clearly communicate and document conditions and problems





## **Standards and Test Content**

### **4017 Manager**

### **55 Questions — 90 minute time limit**

The Manager exam for the fire sprinkler industry tests candidates over knowledge in the following areas:

**Duty A: Demonstrate an Understanding of Codes, Standards, and Regulations — 47% (26 questions)**

**Duty B: Understand Human Resources Issues Related to Managing Employees — 2% (1 question)**

**Duty C: Understand Insurance Issues Facing Managers — 4% (2 questions)**

**Duty D: Demonstrate Knowledge of Workplace Safety Requirements — 47% (26 questions)**

Although some knowledge areas overlap with those found on the Technician exam, questions on the Manager assessment are directed toward the level of knowledge or understanding expected of those holding management positions in alarm, locksmith, and fire sprinkler companies.

## Sample Questions

1. With regard to the written exam required for licensure, which of the following statements is true?
  - a. Candidates must reapply with the Oklahoma Department of Labor before retesting.
  - b. Candidates may retest immediately.\*
  - c. Candidates must wait at least 30 days before retesting.
  - d. Candidates are not allowed to retest.
2. Which of the following factors increases the chance of shock or electrocution?
  - a. high outdoor temperatures
  - b. high humidity\*
  - c. insulated head protection
  - d. dry cotton clothing
3. A technician fell off a ladder and injured his wrist. His wrist is swollen and turning purple, and the technician has limited ability to move his hand at the joint. What type of injury did the technician likely sustain?
  - a. strain
  - b. sprain\*
  - c. closed fracture
  - d. greenstick fracture
4. What is the recommended treatment for a burn where the victim's skin is red and/or blistered?
  - a. Apply a lotion or ointment to protect the damaged tissue and relieve pain.
  - b. Wrap a sterile, gauze bandage loosely around the burn to protect against further injury.
  - c. Rinse or submerge the affected area in cool water to stop the burn process.\*
  - d. Apply an ice pack to the affected area to reduce swelling and discomfort.
5. How frequently shall hangers and seismic bracing be inspected?
  - a. weekly
  - b. quarterly
  - c. semiannually
  - d. annually
6. The distance from the wall to the sprinkler shall be measured \_\_\_\_\_ to the wall.
  - a. across the ceiling
  - b. vertically
  - c. horizontally
  - d. perpendicular



## Abbreviations, Symbols and Acronyms on Fire Sprinkler Industry Exams

When abbreviations, symbols or acronyms are more commonly used in written and verbal communication within the fire sprinkler industry than the words they represent, they will also be used on the written examination required for certification. The following is a list of the abbreviations, symbols, and acronyms used on the fire sprinkler examinations.

<b>o</b>	Degree
<b>°F</b>	Degrees Fahrenheit
<b>'</b>	Foot/feet
<b>”</b>	Inch/inches
<b>ft</b>	foot/feet
<b>ft3</b>	Cubic feet
<b>A/E</b>	architect/engineer
<b>AHJ</b>	Authority Having Jurisdiction
<b>ASTM</b>	American Society for Testing and Materials
<b>BOCA</b>	Building Officials and Code Administrators International, Inc.
<b>CPVC</b>	Chlorinated Polyvinyl Chloride
<b>ESFR</b>	Early Suppression Fast Response
<b>FPE</b>	Fire Protection Response
<b>gpm</b>	gallons per minute
<b>IBC</b>	International Building Code
<b>lbs</b>	pounds
<b>IFC</b>	International Fire Code
<b>NFPA</b>	National Fire Protection Association
<b>OSFM</b>	Oklahoma State Fire Marshal
<b>psi</b>	Pound per square inch or pound-force per square inch
<b>NEC</b>	National Electric Code
<b>NFPA</b>	National Fire Protection Association
<b>OS &amp; Y</b>	Outside Screw & Yolk
<b>RFI</b>	Request for Information
<b>SDS</b>	Safety Data Sheets
<b>UL</b>	Underwriters Laborator

## Testing Policies

### Handling of Examination Materials

All examination materials are copyrighted property. Distribution of examination content or materials through any form of unauthorized reproduction or through oral or written communication is strictly prohibited. Individuals/ entities that compromise the security of testing materials will be held responsible for the expense of developing replacement materials.

### Security/Cheating

If a candidate is caught cheating during the examination, testing will stop immediately. The candidate will receive a failing result and the incident will be reported to the Oklahoma Department of Labor for review. Testing fees will not be refunded and the candidate will not be able to test without a letter of approval from the ODOL. Each HPCP Test Center reserves the right to monitor and record all testing using audio, visual, and electronic devices.

### Testing Accommodations

Requests to accommodate special needs during testing (i.e. oral test administration, special seating arrangements) must be made at the time of registration by completing the HPCP Form, Request for Testing Accommodations. Acceptable accommodations for Alarm, Locksmith, and Fire Sprinkler exams are determined by the ODOL.

### Electronic Devices

Cellular phones or other electronic devices are not permitted and must be turned off during testing. Use of electronic devices during testing will be considered cheating and will be handled accordingly.

### Study Aides

Only allowed resources listed in this study guide are permitted. Personal belongings brought into the testing area will be collected by testing personnel and returned when the examination has been completed. The HPCP test center is not responsible for lost or misplaced items.

### Translation

All examinations will be administered in English. Translators, translation devices, or translation dictionaries may not be used during the examination.

### Eating/Drinking/Smoking

Candidates are not permitted to eat, drink, or smoke during the examination.

### Misconduct

Candidates causing a disturbance of any kind or engaging in any kind of misconduct will be dismissed from the examination and reported to the Oklahoma Department of Labor for disciplinary measures.

### Guest/Visitors

No guests, visitors, pets or children are allowed at the testing site.

### Use of Restrooms

Candidates must obtain permission from the written test proctor to use the restroom during testing. All testing materials will be collected from the candidate. No additional testing time will be granted.

## Test Taking Strategies

This section of the study guide contains valuable information for testing success and provides a common-sense approach for preparing for and performing well on any test.

### General Testing Advice

1. Get a good night's rest the night before the test — eight hours of sleep is recommended.
2. Avoid junk food and “eat right” several days before the test.
3. Do not drink a lot or eat a large meal prior to testing.
4. Be confident in your knowledge and skills!
5. Relax and try to ignore distractions during the test.
6. Focus on the task at hand — taking the test and doing your best!
7. Listen carefully to the instructions provided by the exam proctor. If the instructions are not clear, ask for clarification.

### Testing Tips

1. Read the entire question before attempting to answer it.
2. Try to answer the question before reading the choices. Then, read the choices to determine if one matches, or is similar, to your answer.
3. Do not change your answer unless you misread the question or are certain that your first answer is incorrect.
4. Answer questions you know first, so you can spend additional time on the more difficult questions.
5. Check to make sure you have answered every question before you submit the assessment for scoring — unanswered questions are marked incorrect.



## NOTES

[illegible]



## NOTES

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