Procurement
300 Turner Street NW
North End Center, Ste 2100
Blacksburg, Virginia 24061
P: (540) 231-6221 F: (540) 231-9628
www.procurement.vt.edu

January 22, 2025

VSC Fire & Security Inc
Rob McCoy
1201 Electric Rd
Salem, VA 24153

Dear Rob,

Subject: Contract Renewal Letter

Virginia Tech Contract #:	VTS-1092-2019
Commodity/Service:	Sprinkler System Services
Renewal Period:	4/1/25 - 3/31/26
Renewal #:	(6 of 9) one-year renewal

In accordance with the renewal provision of the original contract, the university would like to renew the contract for an additional term. Please advise concerning your intention by signing in the appropriate space below. A signed copy of this letter should be received in Procurement by 3/1/25.

If allowed by the contract, price adjustments must be requested at the time of renewal in accordance with the contract documents. Price adjustments are not automatic or retroactive and are only implemented upon request by the vendor at the time of renewal.

In addition, review the attached form which shows your company information as listed in the university's vendor database. If any of this information has changed, make corrections directly on the form, and return with this letter. It is essential this information be accurate for payments to be processed in a timely manner.

Virginia Tech recommends that our vendors utilize the Wells One AP Control Payment System for payment of all invoices and strongly encourages all vendors under contract with the university to participate in this program. If your firm is not enrolled in the program, refer to our website: http://www.procurement.vt.edu/Vendor/WellsOne.html or contact me directly for more information.

Sincerely,

Chad Dalton
Systems and Contracts Lead
(540) 231-9129

VSC Fire & Security Inc **agrees** to renew the contract under the terms and conditions of the subject contract.

Authorized Signature: Signed by: Rob McCoy BA7CAB070CB5448... Date: 1/28/2025

Name: Rob McCoy (please print) Title: VP, District Manager

We currently participate in the Wells One Program: _____

We would like to participate in the Wells One Program: _____

Approved: DocuSigned by: Reed Nagel 5EF51DA320D049B...
Director of Procurement

Date: 1/28/2025

Procurement
300 Turner Street NW
North End Center, Ste 2100
Blacksburg, Virginia 24061
P: (540) 231-6221 F: (540) 231-9628
www.procurement.vt.edu

March 13, 2024

VSC Fire & Security Inc.
Attn: William Walker
1201 Electric Rd
Salem, VA 24153

Dear Mr. Walker:

Subject: Contract Renewal Letter

Virginia Tech Contract #:	VTS-1092-2019
Commodity/Service:	Sprinkler System Services
Renewal Period:	April 1, 2024 - March 31, 2025
Renewal #:	(5) one-year renewal

In accordance with the renewal provision of the original contract, the university would like to renew the contract for an additional term. Please advise concerning your intention by signing in the appropriate space below. A signed copy of this letter should be received in Procurement by March 20.

If allowed by the contract, price adjustments must be requested at the time of renewal in accordance with the contract documents. Price adjustments are not automatic or retroactive and are only implemented upon request by the vendor at the time of renewal.

In addition, review the attached form which shows your company information as listed in the university's vendor database. If any of this information has changed, make corrections directly on the form, and return with this letter. It is essential this information be accurate for payments to be processed in a timely manner.

Virginia Tech recommends that our vendors utilize the Wells One AP Control Payment System for payment of all invoices and strongly encourages all vendors under contract with the university to participate in this program. If your firm is not enrolled in the program, refer to our website: http://www.procurement.vt.edu/Vendor/WellsOne.html or contact me directly for more information.

Sincerely,
Kim Widrig
Senior Buyer

Telephone: (540) 231-8543

VSC Fire & Security Inc. **agrees** to renew the contract under the terms and conditions of the subject contract.

Authorized Signature: _____ Date: 3-20-24

Name: Bob McCoy (please print) Title: DM

We currently participate in the Wells One Program. _____

We would like to participate in the Wells One Program _____

Approved: DocuSigned by: Mary Helmick 45C0F5F337E04D0... _____
Mary
Director of Procurement
3/25/2024

Date: _____

Attachment E

Proposed Pricing Schedule

WEEKLY
Fire pump runs:

$23,520.00

14 pumps @ ~~$40.00~~ $42.00 each per week Total for 40 weeks ~~$22,400.00~~

NOTE: The other 12 weeks, this equipment will be tested as a part of the routine monthly and annual sprinkler inspections.

MONTHLY

$8,288.00

Fire pump operational tests:
14 pumps @ ~~$70.00~~ 74 each per month Total for 8 months ~~$7,840.00~~

$75,440.00

Control valve inspections:
230 systems @ ~~$39.00~~ 41 each per month Total for 8 months ~~$71,760.00~~

NOTE: The other four months, this equipment will be tested as part of the routine sprinkler inspections.

QUARTERLY

$75,900.00

Sprinkler system inspection and tests; (includes the operational tests)
230 systems @ ~~$105.00~~ 110 each per quarter Total for 3 quarters $72,450.00

NOTE: The fourth quarterly inspection is part of the annual inspection and testing.

ANNUALLY

$4774.00

Sprinkler system and fire pump annual testing:
Fire pump flow test for 14 pumps @ ~~$325.00~~ 341 each Total annually $ ~~4,550.00~~

$38,180.00

Sprinkler system test for 230 systems @ $ ~~158.00~~ 1626 each Total annually $ ~~36,340.00~~

TOTAL ANNUAL COST FOR ALL $ ~~215,340.00~~

$226,102.00

OTHER

1. Wet standpipe system inspection and flow tests; ~~$530.00~~ 556 (EACH)
2. Dry standpipe system inspection and hydrostatic tests ~~$550.00~~ 577 (EACH)
3. Alarm and check valve 5-year inspection ~~$400.00~~ 420 (EACH)
4. Backflow Preventer Inspection & Test ~~$105.00~~ 110 (EACH)

Continued

HOURLY LABOR RATES & MATERIAL DISCOUNT RATES

1. Please list hourly rates for all positions which could be used during the term of the contract to provide repair, maintenance, additional testing or inspections (Price per hour):

	POSITION	HR. RATE
a.	Sprinkler Service Technician	$85.00 140.00
b.	Sprinkler Service	$80.00 140.00
c.	Inspector	~~$85.00~~ 105.00
d.	Inspector Helper	$75.00 95.00
e.	Alarm Service Technician	~~$85.00~~ 135.00
f.	Alarm Helper	$80.00 85.00
g.		$
h.		$

2. Please list material discount off list price: 30 %

PREPAYMENT DISCOUNT

% Discount offered from vendor for quarterly prepayment: 5 %

** NOTE: VSC Fire & Security, Inc. is only bidding for Zone 8.

All other zones are up for negotiation.

Procurement
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www.procurement.vt.edu

October 19, 2022

VSC Fire & Security Inc
William Walker
1201 Electric Rd
Salem, VA 24153

Dear William,

Subject: Contract Renewal Letter

Virginia Tech Contract #:	VTS-1092-2019
Commodity/Service:	Sprinkler System Services
Renewal Period:	4/1/23 - 3/31/24
Renewal #:	(4 of 9) one-year renewal

In accordance with the renewal provision of the original contract, the university would like to renew the contract for an additional term. Please advise concerning your intention by signing in the appropriate space below. A signed copy of this letter should be received in Procurement by 11/4/22.

If allowed by the contract, price adjustments must be requested at the time of renewal in accordance with the contract documents. Price adjustments are not automatic or retroactive and are only implemented upon request by the vendor at the time of renewal.

In addition, review the attached form which shows your company information as listed in the university's vendor database. If any of this information has changed, make corrections directly on the form, and return with this letter. It is essential this information be accurate for payments to be processed in a timely manner.

Virginia Tech recommends that our vendors utilize the Wells One AP Control Payment System for payment of all invoices and strongly encourages all vendors under contract with the university to participate in this program. If your firm is not enrolled in the program, refer to our website: http://www.procurement.vt.edu/Vendor/WellsOne.html or contact me directly for more information.

Sincerely,

Chad Dalton
Procurement Contract Support Specialist
(540) 231-9129

VSC Fire & Security Inc **agrees** to renew the contract under the terms and conditions of the subject contract.

Authorized Signature: DocuSigned by: William Walker 04224A4F9EFB4D0... Date: 11/2/2022

Name: William Walker (please print) Title: Vice President/ General Manager

We currently participate in the Wells One Program: _____

We would like to participate in the Wells One Program: _____

Approved: DocuSigned by: Mary Helmick 5943314F5CD3478...
Director of Procurement

Date: 11/4/2022

VIRGINIA TECH

Procurement
300 Turner Street NW
North End Center, Ste 2100
Blacksburg, Virginia 24061
P: (540) 231-6221 F: (540) 231-9628
www.procurement.vt.edu

November 15, 2021

VSC Fire & Security Inc.
Attn: William Walker
1201 Electric Rd
Salem, VA 24153

Dear Mr. Walker:

Subject: Contract Renewal Letter

Virginia Tech Contract #:	VTS-1092-2019
Commodity/Service:	Sprinkler System Services
Renewal Period:	April 1, 2022 - March 31, 2023
Renewal #:	(3) one-year renewal

In accordance with the renewal provision of the original contract, the university would like to renew the contract for an additional term. Please advise concerning your intention by signing in the appropriate space below. A signed copy of this letter should be received in Procurement by November 29, 2021.

If allowed by the contract, price adjustments must be requested at the time of renewal in accordance with the contract documents. Price adjustments are not automatic or retroactive and are only implemented upon request by the vendor at the time of renewal.

In addition, review the attached form which shows your company information as listed in the university's vendor database. If any of this information has changed, make corrections directly on the form, and return with this letter. It is essential this information be accurate for payments to be processed in a timely manner.

Virginia Tech recommends that our vendors utilize the Wells One AP Control Payment System for payment of all invoices and strongly encourages all vendors under contract with the university to participate in this program. If your firm is not enrolled in the program, refer to our website: http://www.procurement.vt.edu/Vendor/WellsOne.html or contact me directly for more information.

Sincerely,
Kim Widrig SC for KW
Senior Buyer

Telephone: (540) 231-8543

VSC Fire & Security Inc. **agrees** to renew the contract under the terms and conditions of the subject contract.

Authorized Signature: William Walker Date: 11/17/21

Name: William Walker Title: V.P. / General Manager
(please print)

We currently participate in the Wells One Program. _____

We would like to participate in the Wells One Program _____

KW/sr

Approved: DocuSigned by: Mary Helmick
Mary Helmick 3478...
Director of Procurement

Date: 11/18/2021

VIRGINIA TECH

Procurement
300 Turner Street NW
North End Center, Ste 2100
Blacksburg, Virginia 24061
P: (540) 231-6221 F: (540) 231-9628
www.procurement.vt.edu

November 24, 2020

VSC Fire & Security Inc.
Attn: William Walker
773 Union Street
Salem, VA 24153

Dear Mr. Walker:

Subject: Contract Renewal Letter

Virginia Tech Contract #:	VTS-1092-2019
Commodity/Service:	Sprinkler System Services
Renewal Period:	April 1, 2021 - March 31, 2022
Renewal #:	(2) one-year renewal

In accordance with the renewal provision of the original contract, the university would like to renew the contract for an additional term. Please advise concerning your intention by signing in the appropriate space below. A signed copy of this letter should be received in Procurement as soon as possible.

If allowed by the contract, price adjustments must be requested at the time of renewal in accordance with the contract documents. Price adjustments are not automatic or retroactive and are only implemented upon request by the vendor at the time of renewal.

In addition, review the attached form which shows your company information as listed in the university's vendor database. If any of this information has changed, make corrections directly on the form, and return with this letter. It is essential this information be accurate for payments to be processed in a timely manner.

Virginia Tech recommends that our vendors utilize the Wells One AP Control Payment System for payment of all invoices and strongly encourages all vendors under contract with the university to participate in this program. If your firm is not enrolled in the program, refer to our website: http://www.procurement.vt.edu/Vendor/WellsOne.html or contact me directly for more information.

Sincerely,
Kim Widrig
Senior Buyer

Telephone: (540) 231-8543

VSC Fire & Security Inc. **agrees** to renew the contract under the terms and conditions of the subject contract.

Authorized Signature: William Walker Date: 12/1/2020

Name: William Walker (please print) Title: General Manager

We currently participate in the Wells One Program. _____

We would like to participate in the Wells One Program _____

KW/sr

Approved: Mary W. Helmick
Director of Procurement

Date: 12/3/20

VIRGINIA TECH

Procurement
300 Turner Street NW
North End Center, Ste 2100
Blacksburg, Virginia 24061
P: (540) 231-6221 F: (540) 231-9628
www.procurement.vt.edu

November 21, 2019

VSC Fire & Security Inc.
Attn: William Walker
773 Union Street
Salem, VA 24153

Dear Mr. Walker:

Subject: Contract Renewal Letter

Virginia Tech Contract #:	VTS-1092-2019
Commodity/Service:	Sprinkler System Services
Renewal Period:	April 1, 2010 - March 31, 2021
Renewal #:	(1 of 9) one-year renewal

In accordance with the renewal provision of the original contract, the university would like to renew the contract for an additional term. Please advise concerning your intention by signing in the appropriate space below. A signed copy of this letter should be received in Procurement by December 6, 2019.

If allowed by the contract, price adjustments must be requested at the time of renewal in accordance with the contract documents. Price adjustments are not automatic or retroactive and are only implemented upon request by the vendor at the time of renewal.

In addition, review the attached form which shows your company information as listed in the university's vendor database. If any of this information has changed, make corrections directly on the form, and return with this letter. It is essential this information be accurate for payments to be processed in a timely manner.

Virginia Tech recommends that our vendors utilize the Wells One AP Control Payment System for payment of all invoices and strongly encourages all vendors under contract with the university to participate in this program. If your firm is not enrolled in the program, refer to our website: http://www.procurement.vt.edu/Vendor/WellsOne.html or contact me directly for more information.

Sincerely,
Kim Widrig, VCO
Buyer Senior KW

Telephone: (540) 231-8543

VSC Fire & Security Inc. agrees to renew the contract under the terms and conditions of the subject contract.

Authorized Signature: William Walker Date: 12/4/2019

Name: William Walker (please print) Title: General Manager

We currently participate in the Wells One Program. ____

We would like to participate in the Wells One Program ____

KW/sr

Approved: Mary W. Helmick
Director of Procurement

Date: 12/4/19

COMMONWEALTH OF VIRGINIA

STANDARD CONTRACT

Contract Number: VTS-1092-2019

This contract entered into this 12th day of March 2019 by VSC Fire & Security, Inc. hereinafter called the "Contractor" and Commonwealth of Virginia, Virginia Polytechnic Institute and State University called "Virginia Tech."

WITNESSETH that the Contractor and Virginia Tech, in consideration of the mutual covenants, promises and agreements herein contained, agree as follows:

SCOPE OF CONTRACT: The Contractor shall provide the Sprinkler Systems Services to Virginia Tech as set forth in the Contract Documents.

PERIOD OF CONTRACT: From April 1, 2019 through March 31, 2020, with an option for nine (9) one-year renewals, or as negotiated.

COMPENSATION AND METHOD OF PAYMENT: The Contractor shall be paid by Virginia Tech in accordance with the Contract Documents.

CONTRACT DOCUMENTS: The Contract Documents shall consist of this signed contract, Request for Proposal (RFP) number 0058208 dated December 20, 2018, together with Addendum Number 1 To RFP dated January 10, 2019, the proposal submitted by the Contractor dated January 22, 2019, Virginia Tech's letter dated February 27, 2019 and the Contractor's response dated March 4, 2019, all of which Contract Documents are incorporated herein.

In WITNESS WHEREOF, the parties have caused this Contract to be duly executed intending to be bound thereby.

Contractor
By: William Walker
(Signature)
William Walker, General Manager
Name and Title

Virginia Tech
By: Mary W Helmick
Mary W. Helmick
Director of Procurement

Request for Proposal # 0058208

For

Sprinkler Systems Services

December 20, 2018

Note: This public body does not discriminate against faith-based organizations in accordance with the *Code of Virginia*, § 2.2-4343.1 or against a bidder or offeror because of race, religion, color, sex, national origin, age, disability, or any other basis prohibited by state law relating to discrimination in employment.

RFP 0058208
GENERAL INFORMATION FORM

QUESTIONS: All inquiries for information regarding this solicitation should be directed to: Daysha Holmes, Contracts Specialist Phone: (540) 231-1269 e-mail: daysha94@vt.edu

DUE DATE: Proposals will be received until **Tuesday, January 22, 2019 at 3:00 PM**. Failure to submit proposals to the correct location by the designated date and hour will result in disqualification.

Virginia Tech will be closed for holiday break from Monday, December 24, 2018 through Tuesday, January 1, 2019 and will reopen on Wednesday, January 2, 2019.

ADDRESS: Proposals should be mailed or hand delivered to: Virginia Polytechnic Institute and State University (Virginia Tech), Procurement Department (MC 0333) North End Center, Suite 2100, 300 Turner Street NW, Blacksburg, Virginia 24061. Reference the due date and hour, and RFP Number in the lower left corner of the return envelope or package.

Please note that USPS is delivered to a central location and is not delivered directly to Procurement. Allow extra time if sending proposal via USPS. It is the vendor's responsibility to ensure proposals are received in the Procurement office at the appropriate date and time for consideration.

PRE-PROPOSAL CONFERENCE: A pre-proposal conference will be held on **January 9, 2019 at 2:00 p.m.** in the Sterrett Classroom located at the Sterrett Facilities Center, 230 Sterrett Drive. See section X, Pre-proposal Conference for additional information.

TYPE OF BUSINESS: (Please check all applicable classifications). If your classification is certified by the Virginia Department of Small Business and Supplier Diversity (SBSD), provide your certification number: _____. For assistance with SWaM certification, visit the SBSD website at http://sbsd.virginia.gov/

____ **Large**

____ **Small business** – An independently owned and operated business which, together with affiliates, has 250 or fewer employees or average annual gross receipts of $10 million or less averaged over the previous three years. Commonwealth of Virginia Department of Small Business and Supplier Diversity (SBSD) certified women-owned and minority-owned business shall also be considered small business when they have received SBSD small business certification.

____ **Women-owned business** – A business concern that is at least 51% owned by one or more women who are U. S. citizens or legal resident aliens, or in the case of a corporation, partnership, or limited liability company or other entity, at least 51% of the equity ownership interest is owned by one or more women who are citizens of the United States or non-citizens who are in full compliance with the United States immigration law, and both the management and daily business operations are controlled by one or more women who are U. S. citizens or legal resident aliens.

____ **Minority-owned business** – A business concern that is at least 51% owned by one or more minority individuals (see Section 2.2-1401, Code of Virginia) or in the case of a corporation, partnership, or limited liability company or other entity, at least 51% of the equity ownership interest in the corporation, partnership, or limited liability company or other entity is owned by one or more minority individuals and both the management and daily business operations are controlled by one or more minority individuals.

COMPANY INFORMATION/SIGNATURE: In compliance with this Request For Proposal and to all the conditions imposed therein and hereby incorporated by reference, the undersigned offers and agrees to furnish the goods or services in accordance with the attached signed proposal and as mutually agreed upon by subsequent negotiation.

<table>
<tr><td colspan="2">FULL LEGAL NAME (PRINT)
(Company name as it appears with your Federal Taxpayer Number)</td><td colspan="2">FEDERAL TAXPAYER NUMBER (ID#)</td></tr>
<tr><td colspan="2">BUSINESS NAME/DBA NAME/TA NAME
(If different than the Full Legal Name)</td><td colspan="2">BILLING NAME
(Company name as it appears on your invoice)</td></tr>
<tr><td colspan="2">PURCHASE ORDER ADDRESS</td><td colspan="2">PAYMENT ADDRESS</td></tr>
<tr><td colspan="3">CONTACT NAME/TITLE (PRINT)</td><td>E-MAIL ADDRESS</td></tr>
<tr><td>TELEPHONE NUMBER</td><td>TOLL FREE TELEPHONE NUMBER</td><td>FAX NUMBER TO RECEIVE
E-PROCUREMENT ORDERS</td><td></td></tr>
</table>

I acknowledge that I have received the following addendums posted for this solicitation.

1 _____ 2 _____ 3 _____ 4 _____ 5_____ 6_____ (Please check all that apply)

Is any member of the firm an employee of the Commonwealth of Virginia who has a personal interest in this contract pursuant to the Code of Virginia, 2.2 – 3102 - 3112

YES_____ NO_____

SIGNATURE _____ Date: _____

I. PURPOSE:

The purpose of this Request for Proposal (RFP) is to solicit proposals to establish a contract through competitive negotiations for Sprinkler Systems Services by Virginia Polytechnic Institute and State University (Virginia Tech), an agency of the Commonwealth of Virginia.

II. SMALL, WOMAN-OWNED AND MINORITY (SWAM) BUSINESS PARTICIPATION:

The mission of the Virginia Tech supplier opportunity program is to foster inclusion in the university supply chain and accelerate economic growth in our local communities through the engagement and empowerment of high quality and cost competitive small, minority-owned, women-owned, and local suppliers. Virginia Tech encourages prime suppliers, contractors, and service providers to facilitate the participation of small businesses, and businesses owned by women and minorities through partnerships, joint ventures, subcontracts, and other inclusive and innovative relationships.

III. CONTRACT PERIOD:

The term of this contract is for one (1) year, or as negotiated. There will be an option for nine (9) one- year renewals, or as negotiated.

IV. BACKGROUND:

Virginia Polytechnic Institute and State University (Virginia Tech) is located in Blacksburg, Virginia, approximately 40 miles southwest of Roanoke, Virginia, the major commercial hub of the area. In addition to the university's main campus in Blacksburg, major off campus locations include twelve agriculture experiment research stations, the Marion duPont Scott Equine Medical Center and graduate centers in Roanoke and Fairfax, Virginia. Regularly scheduled air service is provided at the Roanoke Regional Airport.

Dedicated to its motto, Ut Prosim (That I May Serve), Virginia Tech takes a hands-on, engaging approach to education, preparing scholars to be leaders in their fields and communities. As the Commonwealth's most comprehensive university and its leading research institution, Virginia Tech offers 240 undergraduate degree programs to more than 31,000 students and manages a research portfolio of nearly $513 million. The university fulfills its land-grant mission of transforming knowledge to practice through technological leadership and by fueling economic growth and job creation locally, regionally, and across Virginia.
the Roanoke Regional Airport.

Virginia Tech endeavors to procure the services of a qualified Contractor(s) to perform inspections, tests, maintenance and repairs for sprinkler systems, fire pumps, and standpipe systems currently in operation on the main campus in Blacksburg, Virginia. Inspections and tests shall be performed on a regularly scheduled basis while maintenance and repairs shall be provided as deemed necessary by Virginia Tech.

V. EVA BUSINESS-TO-GOVERNMENT ELECTRONIC PROCUREMENT SYSTEM:

The eVA Internet electronic procurement solution streamlines and automates government purchasing activities within the Commonwealth of Virginia. Virginia Tech, and other state agencies and institutions, have been directed by the Governor to maximize the use of this system in the procurement of goods and services. *We are, therefore, requesting that your firm register as a vendor within the eVA system.*

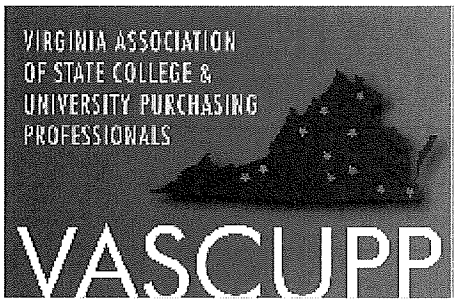
There are transaction fees involved with the use of eVA. These fees must be considered in the provision of quotes, bids and price proposals offered to Virginia Tech. Failure to register within the

eVA system may result in the quote, bid or proposal from your firm being rejected and the award made to another vendor who is registered in the eVA system.

Registration in the eVA system is accomplished on-line. Your firm must provide the necessary information. Please visit the eVA website portal at http://www.eva.virginia.gov/pages/eva-registration-buyer-vendor.htm and **register both with eVA and Ariba**. *This process needs to be completed before Virginia Tech can issue your firm a Purchase Order or contract.* If your firm conducts business from multiple geographic locations, please register these locations in your initial registration.

For registration and technical assistance, reference the eVA website at: http://www.eva.virginia.gov, or call 866-289-7367 or 804-371-2525.

VI. CONTRACT PARTICIPATION:



It is the intent of this solicitation and resulting contract to allow for cooperative procurement. Accordingly, any public body, public or private health or educational institutions, or Virginia Tech's affiliated corporations and/or partnerships may access any resulting contract if authorized by the contractor.

Participation in this cooperative procurement is strictly voluntary. If authorized by the Contractor, the resultant contract may be extended to the entities indicated above to purchase at contract prices in accordance with contract terms. The Contractor shall notify Virginia Tech in writing of any such entities accessing the contract, if requested. No modification of this contract or execution of a separate contract is required to participate. The Contractor will provide semi-annual usage reports for all entities accessing the Contract, as requested. Participating entities shall place their own orders directly with the Contractor and shall fully and independently administer their use of the contract to include contractual disputes, invoicing and payments without direct administration from Virginia Tech. Virginia Tech shall not be held liable for any costs or damages incurred by any other participating entity as a result of any authorization by the Contractor to extend the contract. It is understood and agreed that Virginia Tech is not responsible for the acts or omissions of any entity, and will not be considered in default of the contract no matter the circumstances.

Please refer to Attachment B, Zone Map, if the offeror wishes to submit separate pricing structure based on approved zones for cooperative institutions. Refer to Attachment B for the approved Zone Map. If no other prices are offered, pricing provided will apply to all zones in the Commonwealth. If you wish to provide pricing for a zone other than which this solicitation originated, please indicate you are doing so in the response. If you anticipate pricing differentials for different zones, a separate pricing sheet must be submitted for each zone that includes appropriate pricing for that zone.

Use of this contract does not preclude any participating entity from using other contracts or competitive processes as the need may be.

VII. STATEMENT OF NEEDS:

A. Service Requirements:

1. The scope of the sprinkler system services shall include all equipment inspection, testing, maintenance and repair services required by the applicable fire prevention codes on automatic sprinkler systems, standpipe and hose systems, and fire pumps.

2. The Contractor shall provide all labor, tools, equipment, and all incidentals required and/or implied for the complete and satisfactory performance of the fire protection system services. Virginia Tech reserves the right to reject services from any personnel deemed by Virginia Tech to be unqualified, disorderly, or otherwise unable to perform assigned work. The Contractor shall provide and keep up to date a list of all personnel performing work under this contract with written evidence of the personnel's qualifications.

3. Inspection, testing and maintenance services shall be provided on a regularly scheduled basis and performed in strict accordance with all applicable fire prevention codes, regulations and standards.

4. When signal circuits have been disconnected for testing purposes, the Contractor shall be responsible for providing personnel to monitor fire alarm panel for alarms, which are not associated with testing in progress and shall notify the Virginia Tech Police Department and building occupants immediately.

5. Repair services shall be provided on an as needed hourly labor rate basis and performed in strict accordance with all applicable fire prevention codes, regulations and standards. Replacement materials, parts and equipment required in the performance of the repair services may be provided by the Contractor, but only on the basis of a published list price. Virginia Tech will retain all parts replaced by the Contractor. Repairs made by the Contractor must not void the United Laboratories, Inc. (U.L.) or other approved third party laboratory listing.

6. Contractor must provide all labor, supervision, materials, replacement parts, supplies, tools, equipment, transport, travel, shipping, permits, expenses and all incidental items not specified, but reasonably necessary for all repairs, replacements and adjustments necessary to maintain the operation and condition, of the sprinkler systems provided under this contract.

    a. The contractor will provide text notification to appropriate designated University Management team at the time any service is needed.

    b. The designated manager will confirm the work with a work order request number anytime service is needed.

    c. The manager will text confirmation number to the contractor in advance of any work.

    d. As soon as work is completed the contractor will notify designated manager with a text message. The contractor will notify manager of any expected completion times and/or changes to completion times by text message.

    e. When repair is complete the contractor will submit a work ticket that includes the time required for the repair and a detailed, itemized list of parts used. The work ticket must include the names of all technicians performing repairs, dates, starting and stopping times work was performed along with the confirmation number. All check lists, Work

Orders and Invoices shall include the designated University building ID number to clearly identify equipment.

7. Reporting:
   a. Require service and emergency personnel to report to the University upon arrival at the facility and again upon departure from the facility by text message.

   b. Provide work tickets or other approved reporting method, as approved by the University, for maintenance, inspection, repair or adjustment work, for each unit worked on, specifying at a minimum, the following:

      1) Date service performed.
      2) Start and stop time for each day worked for each technician.
      3) Time unit is returned to service
      4) Name of Technicians.
      5) Work order confirmation number.
      6) Complete description of work.
      7) Classification of work performed, i.e. Preventative Maintenance; routine repairs, non-routine repairs, Annual Maintenance; Performance Testing; or Code Required Jurisdictional Tests and Inspections.
      8) Itemized list of material and/or parts used.
      9) The designated University building ID number to clearly identify equipment.

8. Virginia Tech reserves the right to bid separately any repairs, modifications, and equipment replacement.

9. Rapid response to emergency repair calls is of the utmost importance. The Contractor shall have qualified service personnel on the job at the work site within two (2) hours from the time the call for emergency repair service is received by the Contractor. This service shall be available twenty-four (24) hours a day, three hundred sixty five (365) days a year.

10. All equipment repairs shall be performed on site whenever possible. Off-site repairs must be approved in advance by Virginia Tech.

11. The Contractor must provide a written estimate of the cost of repair services to Virginia Tech and receive prior written authorization to proceed. Equipment repair services performed by the Contractor without such prior written authorization will not be processed for payment. Equipment repairs performed by the Contractor as a result of an emergency repair call from Virginia Tech will not require prior written estimates and written authorization.

    a. The contractor will provide text notification to designated University management team at the time any service is needed.

    b. The manager will confirm the work with a work order request number in advance of any work performed.

    c. The contractor will provide the University with a quote for repairs.

    d. Upon approval, the manager will text a confirmation number to the contractor in advance of any work.

e. As soon as work is completed the contractor will notify designated manager with a text message. The contractor will notify manager of any expected completion times and/or changes to completion times by text message.

f. When repair is complete the contractor will submit a work ticket that includes the time required for the repair and a detailed, itemized list of parts used. The work ticket must include the names of all technicians performing repairs, dates, starting and stopping times work was performed along with the confirmation number. All Work Orders and Invoices shall include the designated University building ID number to clearly identify equipment.

g. The work order confirmation number will serve as verification that authorization for repairs has been received. Failure to obtain a work order confirmation number prior to the start of work will constitute unauthorized work and will release the University from responsibility to pay for repair.

h. The contractor will furnish the manager with an invoice that includes the work order confirmation number, labor, and itemized priced parts list, within 30 days of service. Failure to provide proper invoice within 30 days will release University from responsibility to pay for repair. All check lists, Work Orders and Invoices shall include the designated University building ID number to clearly identify equipment.

i. Upon receipt of authorization, as indicated in the above paragraph, the Contractor shall provide all labor, supervision, materials, replacement parts, supplies, tools, equipment, transport, permits, expenses and all incidental items not specified, but reasonably necessary for the execution of all authorized repairs, replacements and adjustments. All parts used shall be compensated in accordance with **published price list.**

j. The Contractor shall complete all repairs within a time period that is mutually agreed upon, in writing, between the University and the Contractor. In the event repairs cannot be completed as agreed, the Contractor shall notify the University's Representative by text message and in writing. The contractor will provide status updates for all repairs by text message to the management team.

12. Upon contract award, it is the Contractor's responsibility to verify and update the fire protection inventories included in attachments to this solicitation.

B. Contractor Qualifications:

Virginia Tech requires the services of a contractor that has:

1. Sufficient financial and personnel resources to successfully provide the scope of service described herein.

2. Demonstrated experience in performing inspections, tests, maintenance and repairs of similar scope and magnitude as described herein.

3. Demonstrated experience in performing similar services on equipment of the type, age and condition as described herein.

4. Demonstrated understanding of and experience with the current Statewide Fire Prevention Code of the Commonwealth of Virginia, "Virginia Statewide Building Code", National Fire Prevention Code, and applicable National Fire Protection Association (NFPA) codes.

5. Demonstrated understanding of and experience with all applicable code related certification and reporting requirements for all work described herein.

6. Demonstrated understanding of and experience with the installation of the fire protection systems to be inspected, tested, maintained and repaired.

7. Experienced fire protection technicians (minimum of five (5) years experience is desirable), properly trained and qualified to perform required inspections, testing, maintenance, repair and installation services on the type of fire protection system equipment included in this solicitation. The personnel shall have a thorough knowledge of the standard practices, materials, codes and processes of building fire protection system equipment and the ability to efficiently use the tools, equipment and materials of the fire protection technician trade. The technicians shall be able to supervise one or more assistants and all personnel shall be uniformed with a visible picture ID while on campus.

8. Registered in accordance with Attachment B, Item 6: Contractor Registration.

C. Fire Protection Equipment Inventory:

1. Automatic Sprinkler, Standpipe and Fire Pump Equipment: An inventory of the automatic sprinkler, standpipe and fire pump equipment inventory is included as Attachments E, F, and G. All information included in the fire protection equipment inventories provided as attachments to this solicitation is based on the best information available to Virginia Tech at the time of this solicitation.

D. Other Requirements:

1. Virginia Tech Parking Services requires the purchase and display of a parking permit for ALL vendor/ business/contractor vehicles, privately and company owned, that park on campus. The cost of the permit is the same as the faculty/staff permit (permit options: one year, six months, three month summer, or day). Existing permits and additional information is available from the Virginia Tech Parking Services (540) 231-3200 located at 455 Tech Center Drive, or via their website www.parking.vt.edu.

   a. Parking Policy: All Contractor vehicles parked on the Virginia Tech campus must display a parking permit. Contractors shall note that vehicles parked on the Virginia Tech campus without a parking pass or permit are subject to ticketing and fines.

      For overnight parking, the Contractor's company owned vehicles shall use the parking lot in front of Virginia Tech Printing Services and Surplus Property offices at 1411 South Main Street also known as the old K-Mart parking lot. Privately owned vehicles (POV) may park at the location. No overnight (24 hours) parking is allowed on campus. If parking POV's on campus, Parking Services will identify which lot the POV shall park; currently the Track/Soccer, Overflow or East Cassell lot. To be entitled to park in these lots the Contractor shall be required to buy a daily, weekly, monthly or annual permit from Parking Services. It shall be the responsibility of the Contractor to shuttle employees to the job site.

      If the need arises, Virginia Tech may direct that Contractor owned vehicles be parked in a location or locations other than 1411 South Main Street, Blacksburg, VA.

   b. Turf Policy: Turf permits are issued by Parking Services to all vehicles requiring temporary parking on the grass, except for construction equipment, loaders, graders, etc. Parking Services' management shall decide who can obtain a Turf Permit. Turf

permits do not allow parking on sidewalks and plazas. As a courtesy please do not park under trees.

c. Sidewalk Policy: Sidewalk access to land-locked buildings is only allowed along designated routes. Vehicle pull-offs are designed at land-locked building sites to move parked vehicles off sidewalks (but not onto turf). Parking an unattended vehicle on a sidewalk is strictly prohibited by State Law and shall be subject to fines. The vehicle operator shall be made aware that extreme caution shall be used to operate the vehicle in a way that will not be a hazard or hindrance to pedestrians using the sidewalk. The Contractor shall be responsible for any damage to the turf and anything that is located adjacent to the sidewalk.

   The procedure to obtain a permit to operate vehicles on a sidewalk is the same as outlined for Turf Policy. Any vehicle parked illegally on a sidewalk shall be subject to ticketing, fines and towing if necessary.

2. Time paid for hourly rate personnel and equipment (used during project use) shall start upon arrival and sign-in at Virginia Tech and end upon sign-out and shall not including travel time, lunch breaks, or other breaks. Time shall be rounded to the nearest 1/2 hour.

3. Utilities: Virginia Tech will provide water and electricity as necessary for the performance of this work. The Contractor shall supply all connections to utilities, such as hoses, cords, etc.

4. Schedule of Tests: The Contractor should schedule tests which may cause disruption of activities on campus during school breaks. Tests which are not expected to cause disruption of campus activities may be performed during normal work hours. The contractor shall coordinate all tests with the Physical Plant.

5. Check-in and out Procedures: During the University's normal working hours, the Contractor personnel shall check-in with the designated University representative immediately upon arrival to the University. Contractor personnel shall sign-in and pick up any keys they will need for access. Check out during University's normal working hours shall include sign out, and return of any keys issues. Outside the University's normal working hours, Contractor shall report to the Campus Police Department for check in and out. Additionally, Contractor personnel may be asked to check in and out with a building contact person.

6. Asbestos: The Contractor is contracted by Virginia Tech to perform work in buildings where asbestos-containing materials (ACM) may be located. The Contractor will be informed by the Virginia Tech project coordinator/manager of the location of suspect and known ACM in the work area(s) to which the Contractor is assigned. The Contractor shall under no circumstances damage or disturb suspect or known ACM's unless the Contractor has been specially retained to perform this work as a part of the contract and is legally qualified to perform this work. The Contractor shall provide his/her employees with asbestos awareness and other training or activities required by 29 CFR 1926.1101 for the safe performance of their work. Prior to commencement of work, the Contractor shall submit to Virginia Tech Environmental Health & Safety Services (EHSS), for review and approval, his written work practices, precautions, procedures, and engineering controls to be used during work that may disturb ACM. Work shall not proceed until the proposed work practices have been approved by EHSS.

7. Lead: The Contractor is contracted by Virginia Tech to perform work in buildings where lead-containing materials such as lead-based paint may be located. Work performed under this contract may impact these lead materials (for example, during building renovations),

but does not include lead abatement or de-leading operations. The Contractor will be informed by Virginia Tech project coordinator/manager of the location of suspect and known lead containing materials in the work area(s) to which the Contractor is assigned. The Contractor shall provide all training and equipment required by 29 CFR 1926.62 for the safe performance of the work. The Contractor may not perform de-leading or lead abatement unless the Contractor holds a valid Virginia Lead Contractor License and has been specifically retained to perform this work as a part of the contract. Prior to commencement of this work the Contractor shall submit to Virginia Tech EHSS Department, for review and approval, all his written work practices, precautions, procedures, and engineering controls to be used during work that may disturb ACM. Work shall not proceed until the proposed work practices have been approved by EHSS.

8. Uniforms: Contractual employees shall be in uniform or other identifying standardized clothing, presenting a neat and professional appearance at all times when on duty. All uniforms are to be furnished by and paid for by the Contractor. All employees must be easily identifiable as employees of Contractor at all times.

9. Duty to Protect Property: The Contractor shall continuously maintain adequate protection of all his work from damage and shall protect all other property from damage, injury, or loss arising in connection with the work. The Contractor shall make good any such damage, injury, or loss except such as may be directly the result of errors in the Contract Documents or such as shall be caused directly by the Owner.

10. Safety Precautions: The Contractor shall comply with the rules and regulations of OSHA and the Department of Labor. The Contractor alone shall be responsible for the safety, efficiency and adequacy of his plant, appliances, and methods, and for any damage which may result from their improper construction, maintenance or operation. The Contractor shall erect and properly maintain at all times, as required by the conditions and progress of the work, proper safeguards for the protection of workers and the public and shall post danger warnings against any hazards created by the construction operations. The Contractor shall designate a responsible member of his organization on the work whose duty shall be the prevention of accidents. In the absence of notice to the contrary, filed with the Owner in writing with copy to Virginia Tech Police, this person shall be the Superintendent of the Contractor.

11. Submission of List: As soon as possible, after notice of Work Order and in any event not later than three days prior to the time fixed in the Work Order, the Contractor will submit in writing to the Owner a list of the names of Subcontractors the Contractor shall employ on the work. The list is to include all emergency contract phone/pager/cellular phone numbers of Contractor and Subcontractor. The list of Subcontractors is for the purpose of establishing what trades and portions of the work are to be performed under the Work Order.

12. Key Control:

    a. Keys and Entry Procedures

    1) The contractor is required to comply with all University and department access policies. The contractor is required to comply with all University entry procedures when entering occupied buildings. Identification must be visible at all times and must include the employee as well as the contractor name.

    2) No person shall knowingly possess an unauthorized key to property owned by Virginia Tech. the University's' Key Control Office is the only authorized vendor for University key requests

3) All keys remain the property of Virginia Tech. Keys which are no longer needed must be returned to the Key Control Office.

4) Stolen or lost keys must be reported immediately to the Virginia Tech Police Department & Key Control Office.

5) The installation, changing or removal of locks shall be performed only by the contractor to an authorized Key Control Office designate

6) Unauthorized locks are prohibited on doors and if found will be removed and discarded. Any damage or repairs necessitated by the removal of unauthorized locks will be the responsibility of the Contractor found in violation of this section.

7) Keys should at no time be left unattended (hanging in a door lock, lying on a desk, etc.).

8) Each Contractor will be responsible for developing and enforcing a key return policy. All The contractors must surrender all University keys issued to them upon termination or completion of project.

9) Keys are not to be transferred from their assigned carrier to another without proper documentation.

10) The contractor shall be responsible for the total cost of keys requested and for work done to re-secure an area whenever a key is lost or stolen.

11) The contractor shall return any existing hardware removed from a project to the Key Control Office.

12) No area outside of the project scope will be accessed by the contractor for an individual without the approval of Virginia Tech's representative designated as responsible for the area. Said designate will be responsible for the area for verifying authority and identify of the individual requesting access

VIII. PROPOSAL PREPARATION AND SUBMISSION:

A. Specific Requirements

Proposals should be as thorough and detailed as possible so that Virginia Tech may properly evaluate your capabilities to provide the required goods or services. Offerors are required to submit the following information/items as a complete proposal:

1. Qualifications and Experiences:

   a. Provide a listing of Offeror's management and staff personnel to be used for this contract, designated by discipline and detailing qualifications and experience relative to the services described herein. Include a resume for each and proof of required certifications.

   b. Offeror's organization data, including size, number of employees, financial rating/standing, and structure of firm, as well as any joint venture and/or subcontractor arrangements if any, and location of branch offices.

c. Complete and detailed description of the Offeror's qualifications and experience relative to the services described herein. Include proof of required certifications.

2. Plan for providing services:

   a. Complete and detailed description of the Offeror's method and plan for providing the services described herein.

   b. Description of what specific services the Offeror proposes to provide to include but not be limited to when the services will be performed, by whom, and the anticipated time duration's for typical services. Offeror must also clearly identify all inspection, testing and maintenance services NOT included in the Offeror's proposal which are required by the applicable fire prevention codes and which Virginia Tech should perform.

   c. Description of all certification and reporting documentation to be provided by the Offeror in the performance of work included in this solicitation. Include samples of all Offeror's standard certifications, tags, and reports.

   d. Identification of applicable fire prevention codes, regulations, standards and manufacturer's recommended practices to be followed by the Offeror in the performance of specific tasks proposed by the Offeror.

   e. List of service equipment to be used by the Offeror in the performance of work included in this solicitation.

3. Price:
   a. Complete and detailed pricing schedule for the services proposed by the Offeror in Attachment E of this Request for Proposal. As a minimum, the proposed pricing schedule shall be broken down as shown in the attachment. Equipment catalogues and published list prices for all repair parts and equipment proposed by the Offeror should be included with all discounts off published list prices indicated.

   b. Comment on price firmness discuss your plan for conveying price decreases/increases if Virginia Tech elects to renew the contract as provided for in Section III. Contract Period.

4. References:

   Please complete Attachment D.

5. Participation of Small, Women-owned and Minority-owned Business (SWAM) Business:

   If your business cannot be classified as SWaM, describe your plan for utilizing SWaM subcontractors if awarded a contract. Describe your ability to provide reporting on SWaM subcontracting spend when requested. If your firm or any business that you plan to subcontract with can be classified as SWaM, but has not been certified by the Virginia Department of Small Business and Supplier Diversity (SBSD), it is expected that the certification process will be initiated no later than the time of the award. If your firm is currently certified, you agree to maintain your certification for the life of the contract. For assistance with SWaM certification, visit the SBSD website at http://www.sbsd.virginia.gov/

6. The return of the General Information Form and addenda, if any, signed and filled out as required.

B. General Requirements

1. RFP Response: In order to be considered for selection, Offerors shall submit a complete response to this RFP to include;

   a. One (1) **original** of the entire proposal, including all attachments. Any proprietary information should be clearly marked in accordance with 2.e. below.

   b. **One (1) electronic copy** in WORD format or searchable PDF (*flash drive*) of the entire proposal as one document, INCLUDING ALL ATTACHMENTS. Any proprietary information should be clearly marked in accordance with 2.e. below.

   c. Should the proposal contain **proprietary information**, provide **one (1) redacted hard copy** of the proposal and attachments **with proprietary portions removed or blacked out**. This copy should be clearly marked *"Redacted Copy"* on the front cover. The classification of an entire proposal document, line item prices and/or total proposal prices as proprietary or trade secrets is not acceptable. Virginia Tech shall not be responsible for the Contractor's failure to exclude proprietary information from this redacted copy.

   Response shall be submitted to:

   Virginia Polytechnic Institute and State University (Virginia Tech)
   Procurement Department (MC 0333)
   North End Center, Suite 2100
   300 Turner Street NW
   Blacksburg, Virginia 24061

   Reference the Due Date and Hour, and RFP Number in the lower left hand corner of the return envelope or package.

   No other distribution of the proposals shall be made by the Offeror.

2. Proposal Preparation:

   a. Proposals shall be signed by an authorized representative of the Offeror. All information requested should be submitted. Failure to submit all information requested may result in Virginia Tech requiring prompt submission of missing information and/or giving a lowered evaluation of the proposal. Proposals which are substantially incomplete or lack key information may be rejected by Virginia Tech at its discretion. Mandatory requirements are those required by law or regulation or are such that they cannot be waived and are not subject to negotiation.

   b. Proposals should be prepared simply and economically providing a straightforward, concise description of capabilities to satisfy the requirements of the RFP. Emphasis should be on completeness and clarity of content.

   c. Proposals should be organized in the order in which the requirements are presented in the RFP. All pages of the proposal should be numbered. Each paragraph in the proposal should reference the paragraph number of the corresponding section of the RFP. It is also helpful to cite the paragraph number, subletter, and repeat the text of the requirement as it appears in the RFP. If a response covers more than one page, the paragraph number and subletter should be repeated at the top of the next page.

The proposal should contain a table of contents which cross references the RFP requirements. Information which the offeror desires to present that does not fall within any of the requirements of the RFP should be inserted at an appropriate place or be attached at the end of the proposal and designated as additional material. Proposals that are not organized in this manner risk elimination from consideration if the evaluators are unable to find where the RFP requirements are specifically addressed.

d. Each copy of the proposal should be bound in a single volume where practical. All documentation submitted with the proposal should be bound in that single volume.

e. Ownership of all data, material and documentation originated and prepared for Virginia Tech pursuant to the RFP shall belong exclusively to Virginia Tech and be subject to public inspection in accordance with the Virginia Freedom of Information Act. Trade secrets or proprietary information submitted by an Offeror shall not be subject to public disclosure under the Virginia Freedom of Information Act. However, to prevent disclosure the Offeror must invoke the protections of Section 2.2-4342F of the Code of Virginia, in writing, either before or at the time the data or other materials is submitted. The written request must specifically identify the data or other materials to be protected and state the reasons why protection is necessary. The proprietary or trade secret material submitted must be identified by some distinct method such as highlighting or underlining and must indicate only the specific words, figures, or paragraphs that constitute trade secret or proprietary information. The classification of an entire proposal document, line item prices and/or total proposal prices as proprietary or trade secrets is not acceptable and may result in rejection of the proposal.

3. Oral Presentation: Offerors who submit a proposal in response to this RFP may be required to give an oral presentation of their proposal to Virginia Tech. This will provide an opportunity for the Offeror to clarify or elaborate on the proposal but will in no way change the original proposal. Virginia Tech will schedule the time and location of these presentations. Oral presentations are an option of Virginia Tech and may not be conducted. Therefore, proposals should be complete.

IX. SELECTION CRITERIA AND AWARD:

A. Selection Criteria

Proposals will be evaluated by Virginia Tech using the following:

Criteria	Maximum Point Value
1. Quality of products/services offered and suitability for the intended purposes	15
2. Qualifications and experiences of Offeror in providing the goods/services	30
3. Specific plans or methodology to be used to provide the Services	15
4. Cost (or Price)	30
5. Participation of Small, Women-Owned and Minority (SWAM) Business	10
Total	100

B. Award

Selection shall be made of two or more offerors deemed to be fully qualified and best suited among those submitting proposals on the basis of the evaluation factors included in the Request for Proposal, including price, if so stated in the Request for Proposal. Negotiations shall then be conducted with the offerors so selected. Price shall be considered, but need not be the sole determining factor. After negotiations have been conducted with each offeror so selected, Virginia Tech shall select the offeror which, in its opinion, has made the best proposal, and shall award the contract to that offeror. Virginia Tech may cancel this Request for Proposal or reject proposals at any time prior to an award. Should Virginia Tech determine in writing and in its sole discretion that only one offeror has made the best proposal, a contract may be negotiated and awarded to that offeror. The award document will be a contract incorporating by reference all the requirements, terms and conditions of this solicitation and the Contractor's proposal as negotiated. See Attachment C for sample contract form.

Virginia Tech reserves the right to award multiple contracts as a result of this solicitation.

X. OPTIONAL PRE-PROPOSAL CONFERENCE:

An optional pre-proposal conference will be held on Wednesday, January 9, 2019 at 2:00 pm in The Sterrett Classroom located at Sterrett Facilities, 230 Sterrett Drive, Blacksburg, VA 24061. The purpose of this conference is to allow potential Offerors an opportunity to present questions and obtain clarification relative to any facet of this solicitation.

While attendance at this conference will not be a prerequisite to submitting a proposal, offerors who intend to submit a proposal are encouraged to attend.

Bring a copy of this solicitation with you. Any changes resulting from this conference will be issued in a written addendum to this solicitation.

It is strongly recommended that you obtain a Virginia Tech parking permit for display on your vehicle prior to attending the conference. Parking permits are available from the Virginia Tech Parking Services Department located at 605 Research Center Drive, phone: (540) 231-3200, e-mail: parking@vt.edu.

XI. INQUIRIES:

All inquiries concerning this solicitation should be submitted in writing via email, citing the particular RFP section and paragraph number. All inquiries will be answered in the form of an addendum. Inquiries must be submitted by 10:00 am on Monday, January 7, 2019. Inquiries must be submitted to the procurement officer identified in this solicitation.

XII. INVOICES:

Invoices for goods or services provided under any contract resulting from this solicitation shall be submitted by email to vtinvoices@vt.edu or by mail to:

Virginia Polytechnic Institute and State University (Virginia Tech)
Accounts Payable
North End Center, Suite 3300
300 Turner Street NW
Blacksburg, Virginia 24061

XIII. METHOD OF PAYMENT:

Virginia Tech will authorize payment to the contractor as negotiated in any resulting contract from the aforementioned Request for Proposal.

Payment can be expedited through the use of the Wells One AP Control Payment System. Virginia Tech strongly encourages participation in this program. For more information on this program please refer to Virginia Tech's Procurement website: http://www.procurement.vt.edu/vendor/wellsone.html or contact the procurement officer identified in the RFP.

XIV. ADDENDUM:

Any **ADDENDUM** issued for this solicitation may be accessed at http://www.apps.vpfin.vt.edu/html.docs/bids.php. Since a paper copy of the addendum will not be mailed to you, we encourage you to check the web site regularly.

XV. COMMUNICATIONS:

Communications regarding this solicitation shall be formal from the date of issue, until either a Contractor has been selected or the Procurement Department rejects all proposals. Formal communications will be directed to the procurement officer listed on this solicitation. Informal communications, including but not limited to request for information, comments or speculations regarding this solicitation to any University employee other than a Procurement Department representative may result in the offending Offeror's proposal being rejected.

XVI. CONTROLLING VERSION OF SOLICITATION:

The posted version of the solicitation and any addenda issued by Virginia Tech Procurement Services is the mandatory controlling version of the document. Any modification of/or additions to the solicitation by the Offeror shall not modify the official version of the solicitation issued by Virginia Tech Procurement Services. Such modifications or additions to the solicitation by the Offeror may be cause for rejection of the proposal; however, Virginia Tech reserves the right to decide, on a case by case basis, in its sole discretion, whether to reject such a proposal.

XVII. TERMS AND CONDITIONS:

This solicitation and any resulting contract/purchase order shall be governed by the attached terms and conditions, see Attachment A.

XVIII. CONTRACT ADMINISTRATION:

A. Kathryn M. Dicken, Contract Officer, Facilities Department, at Virginia Tech or their designee, shall be identified as the Contract Administrator and shall use all powers under the contract to enforce its faithful performance.

B. The Contract Administrator, or their designee, shall determine the amount, quantity, acceptability, fitness of all aspects of the services and shall decide all other questions in connection with the services. The Contract Administrator, or their designee, shall not have authority to approve changes in the services which alter the concept or which call for an extension of time for this contract. Any modifications made must be authorized by the Virginia Tech Procurement Department through a written amendment to the contract.

XIX. ATTACHMENTS:

Attachment A - Terms and Conditions
Attachment B - Zone Map for Cooperative Contracts
Attachment C - Sample of Standard Contract Form
Attachment D - Offeror Data Sheet
Attachment E – Proposed Pricing Schedule
Attachment F – Sprinkler Inventory

ATTACHMENT A

TERMS AND CONDITIONS

RFP GENERAL TERMS AND CONDITIONS

See:
https://procurement.vt.edu/content/dam/procurement_vt_edu/docs/terms/GTC_RFP_09172018.pdf

ADDITIONAL TERMS AND CONDITIONS

A. **ADDITIONAL GOODS AND SERVICES**: The University may acquire other goods or services that the supplier provides other than those specifically solicited. The University reserves the right, subject to mutual agreement, for the Contractor to provide additional goods and/or services under the same pricing, terms and conditions and to make modifications or enhancements to the existing goods and services. Such additional goods and services may include other products, components, accessories, subsystems, or related services newly introduced during the term of the Agreement.

B. **AUDIT**: The Contractor hereby agrees to retain all books, records, and other documents relative to this contract for five (5) years after final payment, or until audited by the Commonwealth of Virginia, whichever is sooner. Virginia Tech, its authorized agents, and/or the State auditors shall have full access and the right to examine any of said materials during said period.

C. **AVAILABILITY OF FUNDS**: It is understood and agreed between the parties herein that Virginia Tech shall be bound hereunder only to the extent of the funds available or which may hereafter become available for the purpose of this agreement.

D. **CANCELLATION OF CONTRACT**: Virginia Tech reserves the right to cancel and terminate any resulting contract, in part or in whole, without penalty, upon 60 days written notice to the Contractor. In the event the initial contract period is for more than 12 months, the resulting contract may be terminated by either party, without penalty, after the initial 12 months of the contract period upon 60 days written notice to the other party. Any contract cancellation notice shall not relieve the Contractor of the obligation to deliver and/or perform on all outstanding orders issued prior to the effective date of cancellation.

E. **CONTRACT DOCUMENTS**: The contract entered into by the parties shall consist of the Request for Proposal including all modifications thereof, the proposal submitted by the Contractor, the written results of negotiations, the Commonwealth Standard Contract Form, all of which shall be referred to collectively as the Contract Documents.

F. **IDENTIFICATION OF BID/PROPOSAL ENVELOPE**: The signed bid or proposal should be returned in a separate envelope or package and identified as follows:

From:_____

Name of Bidder or Offeror — Due Date — Time Due

_____

Street or Box No. — Solicitation Number

_____

City, State, Zip Code — Solicitation Title

Name of Procurement Officer: _____

The envelope should be addressed to:

VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY (Virginia Tech)
Procurement Department (MC 0333)
North End Center, Suite 2100
300 Turner Street NW
Blacksburg, Virginia 24061

The offeror takes the risk that if the envelope is not marked as described above, it may be inadvertently opened and the information compromised, which may cause the proposal to be disqualified. Bids or Proposals may be hand delivered to the designated location in the office issuing the solicitation. No other correspondence or other bids/proposals should be placed in the envelope.

G. NOTICES: Any notices to be given by either party to the other pursuant to any contract resulting from this solicitation shall be in writing, hand delivered or mailed to the address of the respective party at the following address

If to Contractor: Address Shown On RFP Cover Page
Attention: Name Of Person Signing RFP

If to Virginia Tech:

Virginia Polytechnic Institute and State University (Virginia Tech)
Attn: Daysha Holmes
Procurement Department (MC 0333)
North End Center, Suite 2100
300 Turner Street NW
Blacksburg, Virginia 24061

and

Virginia Polytechnic Institute and State University (Virginia Tech)
Attn: Kathryn Dicken
Facilities Contracts
230 Sterrett Drive
Blacksburg, Virginia 24061

H. SEVERAL LIABILITY: Virginia Tech will be severally liable to the extent of its purchases made against any contract resulting from this solicitation. Applicable entities described herein will be severally liable to the extent of their purchases made against any contract resulting from this solicitation.

I. CLOUD OR WEB HOSTED SOFTWARE SOLUTIONS: For agreements involving Cloud-based Web-hosted software/applications refer to link for additional terms and conditions: http://www.ita.vt.edu/purchasing/VT_Cloud_Data_Protection_Addendum_final03102017.pdf

SPECIAL TERMS AND CONDITIONS

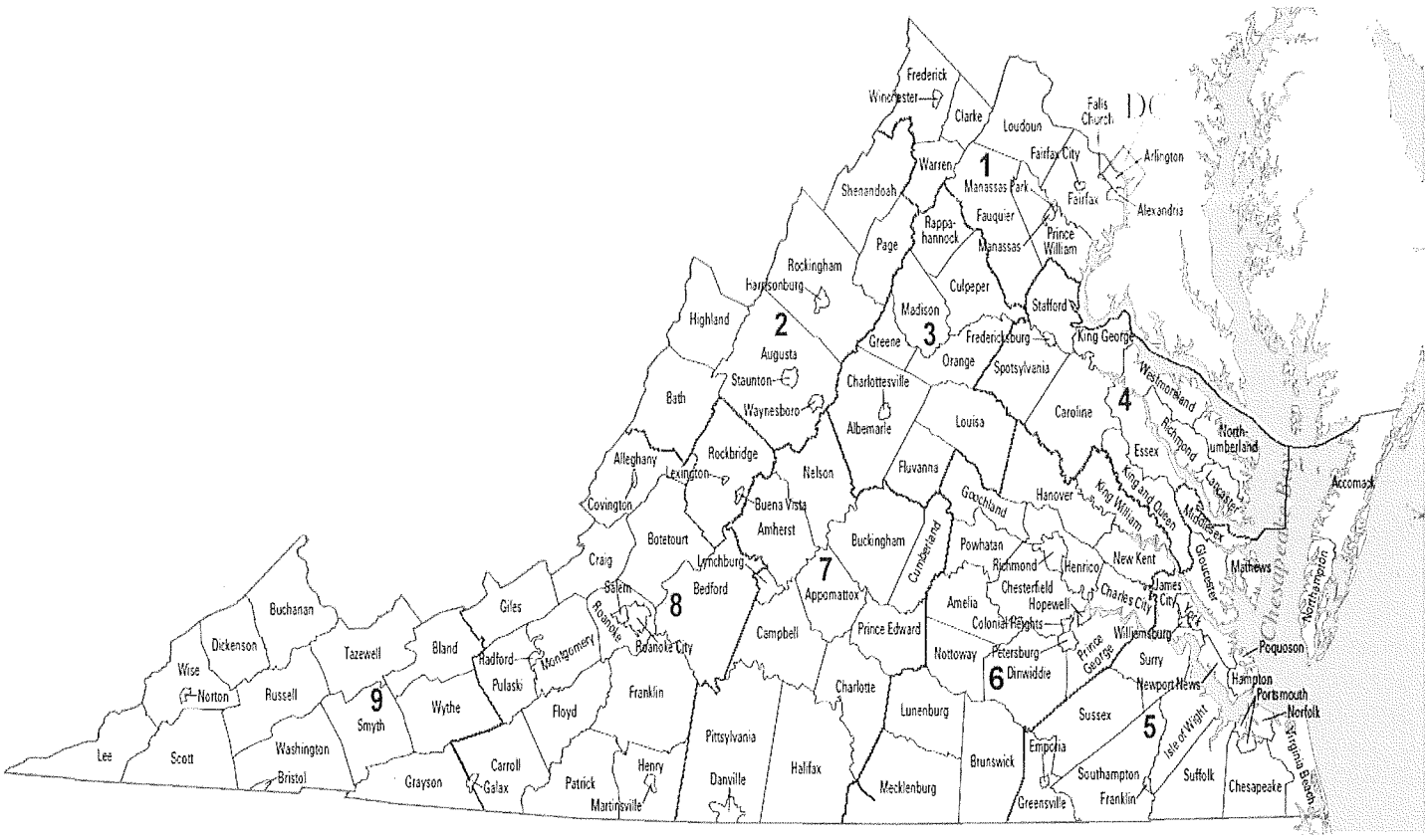
1. **ADVERTISING**: In the event a contract is awarded for supplies, equipment, or services resulting from this solicitation, no indication of such sales or services to Virginia Tech will be used in product literature or advertising. The contractor shall not state in any of the advertising or product literature that the Commonwealth of Virginia or any agency or institution of the Commonwealth has purchased or uses its products or services.

2. **INSURANCE**: By signing and submitting a Proposal/Bid under this solicitation, the offeror/bidder certifies that if awarded the contract, it will have the following insurance coverages at the time the work commences. Additionally, it will maintain these during the entire term of the contract and that all insurance coverages will be provided by insurance companies authorized to sell insurance in Virginia by the Virginia State Corporation Commission.
   During the period of the contract, Virginia Tech reserves the right to require the contractor to furnish certificates of insurance for the coverage required.
   INSURANCE COVERAGES AND LIMITS REQUIRED:
   A. Worker's Compensation - Statutory requirements and benefits.
   B. Employers Liability - $100,000.00
   C. General Liability - $1,000,000.00 combined single limit. Virginia Tech and the Commonwealth of Virginia shall be named as an additional insured with respect to goods/services being procured. This coverage is to include Premises/Operations Liability, Products and Completed Operations Coverage, Independent Contractor's Liability, Owner's and Contractor's Protective Liability and Personal Injury Liability.
   D. Automobile Liability - $500,000.00
   F. The contractor agrees to be responsible for, indemnify, defend and hold harmless Virginia Tech, its officers, agents and employees from the payment of all sums of money by reason of any claim against them arising out of any and all occurrences resulting in bodily or mental injury or property damage that may happen to occur in connection with and during the performance of the contract, including but not limited to claims under the Worker's Compensation Act. The contractor agrees that it will, at all times, after the completion of the work, be responsible for, indemnify, defend and hold harmless Virginia Tech, its officers, agents and employees from all liabilities resulting from bodily or mental injury or property damage directly or indirectly arising out of the performance or nonperformance of the contract.

3. **SUBCONTRACTS**: No portion of the work shall be subcontracted without prior written consent of Virginia Tech. In the event that the contractor desires to subcontract some part of the work specified herein, the contractor shall furnish Virginia Tech the names, qualifications and experience of their proposed subcontractors. The contractor shall, however, remain fully liable and responsible for the work to be done by his subcontractor(s) and shall assure compliance with all requirements of the contract.

ATTACHMENT B

Zone Map



Virginia Association of State College & University Purchasing Professionals (VASCUPP)

List of member institutions by zones

Zone 1 **George Mason University (Fairfax)**	**Zone 2** **James Madison University (Harrisonburg)**	**Zone 3** **University of Virginia (Charlottesville)**
Zone 4 **University of Mary Washington (Fredericksburg)**	**Zone 5** **College of William and Mary (Williamsburg)** **Old Dominion University (Norfolk)**	**Zone 6** **Virginia Commonwealth University (Richmond)**
Zone 7 **Longwood University (Farmville)**	**Zone 8** **Virginia Military Institute (Lexington)** **Virginia Tech (Blacksburg)** **Radford University (Radford)**	**Zone 9** **University of Virginia - Wise (Wise)**

The zone map is provided for the offeror to determine appropriate pricing structures based on approved zones for cooperative institutions. If no other prices are offered, pricing provided will apply to all zones in the Commonwealth. If you wish to provide pricing for a zone other than which this solicitation originated, please indicate you are doing so in the response. If you anticipate pricing differentials for different zones, a separate pricing sheet must be submitted for each zone that includes appropriate pricing for that zone

ATTACHMENT C

SAMPLE CONTRACT FORM

Standard Contract form for reference only
Offerors do not need to fill in this form

COMMONWEALTH OF VIRGINIA
STANDARD CONTRACT

Contract Number:_____

This contract entered into this ____ day of _____ 20___, by _____, hereinafter called the "Contractor" and Commonwealth of Virginia, Virginia Polytechnic Institute and State University called "Virginia Tech".

WITNESSETH that the Contractor and Virginia Tech, in consideration of the mutual covenants, promises and agreements herein contained, agrees as follows:

SCOPE OF CONTRACT: The Contractor shall provide the _____ to Virginia Tech as set forth in the Contract Documents.

PERIOD OF CONTRACT: From _____ through _____.

COMPENSATION AND METHOD OF PAYMENT: The Contractor shall be paid by Virginia Tech in accordance with the contract documents.

CONTRACT DOCUMENT: The Contract Documents shall consist of this signed contract, Request For Proposal Number _____ dated _____, together with all written modifications thereof and the proposal submitted by the Contractor dated _____ and the Contractor's letter dated _____, all of which Contract Documents are incorporated herein.

In WITNESS WHEREOF, the parties have caused this Contract to be duly executed intending to be bound thereby.

Contractor: Virginia Tech

By:_____ By: _____

Title:_____ Title:_____

Attachment D

OFFEROR DATA SHEET

(To be completed by Offeror. Use extra sheets and attachments as necessary to provide complete information).

1. OFFEROR REFERENCES: The Offeror shall be experienced in this type of work. Please list below four (4) references for whom you have performed work similar to those specified in this RFP within the past five years.

CLIENT: _____

ADDRESS: _____

CONTACT PERSON/PHONE #: _____

PROJECTS/DATES/DESCRIPTION: _____

_____

_____

CLIENT: _____

ADDRESS: _____

CONTACT PERSON/PHONE #: _____

PROJECTS/DATES/DESCRIPTION: _____

_____

_____

CLIENT: _____

ADDRESS: _____

CONTACT PERSON/PHONE #: _____

PROJECTS/DATES/DESCRIPTION: _____

_____

_____

CLIENT: _____

ADDRESS: _____

CONTACT PERSON/PHONE #: _____

PROJECTS/DATES/DESCRIPTION: _____

_____

Attachment E

Proposed Pricing Schedule

WEEKLY

Fire pump runs:

14 pumps @ $_____ each per week Total for 40 weeks $_____

NOTE: The other 12 weeks, this equipment will be tested as a part of the routine monthly and annual sprinkler inspections.

MONTHLY

Fire pump operational tests:

14 pumps @ $_____ each per month Total for 8 months $_____

Control valve inspections:

230 systems @ $_____ each per month Total for 8 months $_____

NOTE: The other four months, this equipment will be tested as part of the routine sprinkler inspections.

QUARTERLY

Sprinkler system inspection and tests; (includes the operational tests)

230 systems @ $_____ each per quarter Total for 3 quarters $_____

NOTE: The fourth quarterly inspection is part of the annual inspection and testing.

ANNUALLY

Sprinkler system and fire pump annual testing:

Fire pump flow test for 14 pumps @ $_____ each Total annually $_____

Sprinkler system test for 230 systems @ $_____ each Total annually $_____

TOTAL ANNUAL COST FOR ALL $_____

OTHER

1. Wet standpipe system inspection and flow tests; $_____ (EACH)
2. Dry standpipe system inspection and hydrostatic tests $_____ (EACH)
3. Alarm and check valve 5-year inspection $_____ (EACH)
4. Backflow Preventer Inspection & Test $_____ (EACH)

HOURLY LABOR RATES & MATERIAL DISCOUNT RATES

1. Please list hourly rates for all positions which could be used during the term of the contract to provide repair, maintenance, additional testing or inspections (Price per hour):

POSITION	HR. RATE
a. _____	$_____
b. _____	$_____
c. _____	$_____
d. _____	$_____
e. _____	$_____
f. _____	$_____
g. _____	$_____
h. _____	$_____

2. Please list material discount off list price: _____%

PREPAYMENT DISCOUNT

% Discount offered from vendor for quarterly prepayment: _____%

Attachment F
Sprinkler Inventory

Group	*Building*	*Systems*	*Fire Pumps*	*Backflow Preventers*	*Check Valves*	*Check Valve Notes*	*Standpipes*	*Internal System Pipe Inspections*
ACADEMIC	Alphin-Stuart Arena	2	0	1	2	ALARM, FDC		2
ACADEMIC	Arts & Design Learning	1	0	1	2	ALARM, FDC		1
ACADEMIC	Bishop Favrao Hall	2	0	2	2	PREACTION, FDC	WET	2
ACADEMIC	Black Box Theater 101	2	0	1	3	PREACTION, WET, FDC		2
ACADEMIC	Brooks Center	1	0	0	2	RISER CHECK, FDC		1
ACADEMIC	Burchard Hall	4	0	1	4	2 WETS, PREACTION, FDC	WET	4
ACADEMIC	Cheatham Hall	1	0	1	2	WET, FDC		1
ACADEMIC	Classroom Building	1	0	1	2	FDC, WET		1
ACADEMIC	Cowgill Hall	3	1	1	6	2 WET, PREACTION, FDC, 3 FIRE PUMP	WET	3
ACADEMIC	Davidson Hall	2	0	1	8	ALARM, FDC, 6 FLOOR ZONES		2
ACADEMIC	Derring Hall	0	0	0	0		DRY	
ACADEMIC	Durham Hall	5	0	2	2	FDC, PREACTION	WET	5
ACADEMIC	Fralin Biotechnology Center	2	0	1	3	PREACTION, FDC, RISER CHECK	WET	2
ACADEMIC	Goodwin Hall was (Signature Eng Bldg)	3	0	2	18	15 FLOOR ZONES, WET, PREACTION, FDC		3
ACADEMIC	HABB1 (Human Bioscience Building)	1	0	1	6	RISER, FDC, 4 FLOOR ZONES		1
ACADEMIC	Hahn Hall North	3	0	1	4	2 PREACTONS, 1 WET, 1 FDC	WET	3
ACADEMIC	Hahn/Robeson						WET	
ACADEMIC	Hahn South	2	1	1	5	FDC, WET, 3 FIRE PUMP		2
ACADEMIC	Hancock Hall	4	0	0	6	FDC, 4 WET, WAFER RISER	WET	4
ACADEMIC	Henderson Hall	3	0	1	3	ALARM, PREACTION, FDC		3
ACADEMIC	ICTAS II	1	0	2	5	3 FLOOR ZONES, RISER, FDC		1
ACADEMIC	Infectious Disease Research Facility	1	0	1	2	FDC, WET		1
ACADEMIC	Kelly Hall	4	0	2	4	2 PREACTION, WET, FDC	WET	4
ACADEMIC	Latham Hall	4	0	1	4	2 PREACTION, WET, FDC	WET	4
ACADEMIC	Library Storage Facility	2	0	2	3	FDC, 2 WET		2
ACADEMIC	Life Science I Facility	3	0	1	7	3 FLOOR ZONES, 2 PREACTION, WET, FDC	WET	3
ACADEMIC	Litton Reaves Hall	1	1	1	4	FDC, 3 FIRE PUMP	WET	1
ACADEMIC	Major Williams Hall	3	0	1	3	PREACTION, WET, FDC	WET	3
ACADEMIC	Marching Virginians Practic Facility	1	0	2	1	FDC		1
ACADEMIC	Material Management Facility	2	0	1	5	FDC, 2 WET, 2 FOAM SYSTEM		2
ACADEMIC	Military Laundry Bldg.	1	0	1	2	WET, FDC		1
ACADEMIC	Mining & Minerals Laboratory	1	0	0	2	WET, FDC		1
ACADEMIC	Moss Arts Center	9	1	2	28	3 FIRE PUMP, 9 WET, FDC, PREACTION, 14 FLOOR ZONES		9
ACADEMIC	Newman Library	2	0	1	2	FDC, PREACTION	DRY	2
ACADEMIC	Pamplin Hall	2	0	0	3	WET, FDC, SUPPLY WAFER	WET	2

Group	Building	Systems	Fire Pumps	Backflow Preventers	Check Valves	Check Valve Notes	Standpipes	Internal System Pipe Inspections
ACADEMIC	Shanks Hall	4	1	1	5	3 FIRE PUMP, PREACTION, FDC	WET	4
ACADEMIC	Solid Fuel Combustion Lab	1	0	1	1	FDC		1
ACADEMIC	Steger (BioInformatics)	7	0	1	18	6 PREACTION, FDC, WET, 10 FLOOR ZONES	WET	7
ACADEMIC	Sterrett Center	1	0	0	1	WET		1
ACADEMIC	Student Services Center	2	0	2	3	PREACTION, WET, FDC	WET	2
ACADEMIC	Surge Space Building	1	0	1	1	FDC		1
ACADEMIC	Torgersen Hall	3	0	1	32	2 PREACTION, WET, 28 FLOOR ZONES, FDC	WET	3
ACADEMIC	Vet Med I.D.U.(Price's Fork Road)	1	0	0	2	FDC, WET		1
ACADEMIC	Vet Med I	1	0	0	3	WET, FDC, WAFER RISER		1
ACADEMIC	Vet Med II	3	1	3	5	3 FIRE PUMP, FDC, PREACTION	WET	3
ACADEMIC	Vet Med III	1	0	0	1	WET	WET	1
ACADEMIC	Vet Med Instructional Addition	2	0	0	5	4 FLOOR ZONES, WET		2
ACADEMIC	Vet Med 4-A	1	0	0	1	WET		1
ACADEMIC	Vet Med 4-B	3	0	0	5	WET, FDC, 2 PREACTION, RISER WAFER		3
ACADEMIC	Vet Med 4-C	2	0	0	2	PREACTION, WET		2
ACADEMIC	Vet IDRF 0142	1	0	1	2	FDC, WET		1
ACADEMIC	Vet Med Hay Barn	1	0	1	1	FDC		1
ACADEMIC	Vet Med Dry Rendering	2	0	0	2	WET, PREACTION		2
ACADEMIC	Vet Med Finger Barns	1	0	0	2	WET, FDC		1
ACADEMIC	Visitors & Undergraduate Admission Cntr	1	0	2	1	FDC		1
ACADEMIC	Wallace Hall	1	0	1	1	FDC	WET	1
ACADEMIC	Whittemore Hall	0	1	0	4	3 FIRE PUMP, FDC	WET	0
ACADEMIC	Williams Hall	2	0	1	4	2 PREACTION, WET, FDC	WET	2
GENERAL	Airport Hangar - Air Transportation Services	1	0	2	2	ALARM, FDC		1
GENERAL	Electrical Services	3	0	1	3	FDC, WET, PREACTION		3
GENERAL	English Baseball Stadium	2	0	1	4	FDC, WET, 2 FLOOR ZONES		2
GENERAL	Hahn Hurst Basketball Training	3	0	2	4	3 ALARM, FDC,		3
GENERAL	Indoor Athletic Training	1	0	1	1	FDC		1
GENERAL	Jamerson Athletic Center	1	0	1	5	3 FLOOR ZONES, FDC, WET	WET	1
GENERAL	Jamerson Athletic Center	1	0	0	3	3 FLOOR ZONES,		1
GENERAL	Johnston Student Cntr	1	0	0	2	FDC, WET	WET	1
GENERAL	Math Emporium	2	0	2	3	2 RISER, FDC		2
GENERAL	McComas Hall	3	0	1	3	WET, PREACTION, FDC	WET	3
GENERAL	Merryman Athletic Center	2	0	1	3	WET, PREACTION, FDC	WET	2
GENERAL	Parking Services	1	0	1	1	FDC		1
GENERAL	Power House	3	0	1	3	FDC, PREACTION, WET		3
GENERAL	Rector Field House	2	0	2	3	2 WET, FDC		2
GENERAL	Skelton Conference Center						WET	
GENERAL	Smith Career Center	2	0	2	3	FDC, WET, PREACTION		2
GENERAL	Squires Student Center	3	1	0	6	3 FIRE PUMP, FDC, 2 WET	WET	3
GENERAL	Tennis Pavilion	1	0	1	1	FDC		1

Group	*Building*	*Systems*	*Fire Pumps*	*Backflow Preventers*	*Check Valves*	*Check Valve Notes*	*Standpipes*	*Internal System Pipe Inspections*
GENERAL	Lane Stadium - South Endzone	8	0	2	3	2 FDC, PREACTION	DRY-AUTO	8
GENERAL	Lane Stadium - West Sideline	7	1	3	8	3 FIRE PUMP, FDC, 4 PREACTION	WET	7
GENERAL	The Inn at Virginia Tech	6	0	1	7	2 WET, 3 PREACTION, 2 FDC	WET	6
HOUSING	Cochrane Hall	2	1	1	5	3 FIRE PUMP, FDC, RISER	WET	2
HOUSING	East Eggleston	1	0	1	5	FDC, RISER, 3 FLOOR ZONES		1
HOUSING	Graduate Life Ctr. @ Donaldson Brown	4	0	2	3	2 ALARM, FDC,	WET	4
HOUSING	Harper Hall	2	0	1	3	RISER, PREACTION, FDC	WET	2
HOUSING	Lee Hall	1	0	1	3	2 FDC, WET	WET	1
HOUSING	New Cadet Hall	1	0	1	6	FDC, WET, 4 FLOOR ZONES	WET	1
HOUSING	New Hall West	1	0	1	6	4 FLOOR ZONES, WET, FDC		1
HOUSING	New Residence Hall - East	2	0	1	3	FDC, PREACTION, WET	WET	2
HOUSING	Newman Hall	1	0	1	0	NONE		1
HOUSING	O'Shaugnessy Hall	1	1	1	12	3 FIRE PUMP, FDC, 8 FLOOR ZONES	WET	1
HOUSING	Payne Hall	4	0	0	5	2 WET, 2 PREACTION, FDC	WET	4
HOUSING	Pearson Hall	1	0	1	6	FDC, WET, 4 FLOOR ZONES	WET	1
HOUSING	Peddrew Yates Residence Hall	2	0	1	3	FDC, WET, PREACTION	WET	2
HOUSING	Pritchard Hall	1	1	1	4	3 FIRE PUMP, FDC	WET	1
HOUSING	Sigma Phi Epsilon House (Innovate)	2	0	1	2	WET, FDC		2
HOUSING	Slusher Hall	1	1	1	4	3 FIRE PUMP, FDC	WET	1
HOUSING	Ambler Johnston Hall	1	1	1	4	3 FIRE PUMP, FDC	WET	1
HOUSING	Special Purpose Housing I & II (SPH A)	1	0	0	0	(DOMESTIC SYSTEM)		1
HOUSING	Special Purpose Housing I & II (SPH B)	1	0	0	0	(DOMESTIC SYSTEM)		1
HOUSING	Special Purpose Housing I & II (SPH C)	1	0	0	0	(DOMESTIC SYSTEM)		1
HOUSING	Special Purpose Housing I & II (SPH D)	1	0	0	1	WET		1
HOUSING	Special Purpose Housing I & II (SPH E)	1	0	0	1	WET		1
HOUSING	Special Purpose Housing I & II (SPH F)	1	0	0	1	WET		1
HOUSING	Special Purpose Housing I & II (SPH G)	1	0	0	1	WET		1
HOUSING	Special Purpose Housing I & II (SPH H)	1	0	0	1	WET		1
HOUSING	Special Purpose Housing I & II (SPH I)	1	0	0	1	WET		1
HOUSING	Special Purpose Housing I & II (SPH J)	1	0	0	1	WET		1
HOUSING	Special Purpose Housing III (SPH K-L)	2	0	1	3	WET, FDC, PREACTION		2

Group	*Building*	*Systems*	*Fire Pumps*	*Backflow Preventers*	*Check Valves*	*Check Valve Notes*	*Standpipes*	*Internal System Pipe Inspections*
HOUSING	Special Purpose Housing III (SPH M-N)	2	0	1	3	WET, FDC, PREACTION		2
HOUSING	Special Purpose Housing III (SPH O-P)	2	0	1	3	WET, FDC, PREACTION		2
HOUSING	Special Purpose Housing III (SPH Q-R)	2	0	1	3	WET, FDC, PREACTION		2
DINING	Dietrick Hall	3	0	0	5	2 WET, PREACTION, FDC, RISER		3
DINING	Lavery Hall	3	0	2	2	FDC, WET		3
DINING	Southgate Center	4		0	4	FDC, WET, PREACTION, RISER WAFER	WET	4
	totals	230	14	101	429			230

Notes:	Updated 11/30/2018*

* This list shows the general order of magnitude and quantities are subject to change *

ADDENDUM # 1 TO RFP # 0058208

VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY (Virginia Tech)
Procurement Department (MC 0333)
North End Center, Suite 2100
300 Turner Street NW
Blacksburg, Virginia 24061

DATE	Original DUE DATE AND HOUR
Thursday, January 10, 2019	Tuesday, January 22, 2019 3pm

ADDRESS ALL INQUIRIES AND CORRESPONDENCE TO: Daysha Holmes, Contracts Specialist
E-MAIL ADDRESS: daysha94@vt.edu TELEPHONE NUMBER (540) 231-1269
FAX NUMBER (540) 231-9628 AFTER HOUR MESSAGES (540) 231-6221

Sprinkler Systems Services

1. The following questions have arisen as a result of the aforementioned RFP:

Question 1: Are the 12 building outside of VT campus included in the contract?

Virginia Tech Answer: This solicitation is in reference to the Blacksburg campus. The language provided would allow us to incorporate any offsite locations if agreed to by both the vendor and VT. If the vendor has different pricing according to Zones outlined in Attachment B of the RFP, please provide those with your response as not only VT may utilize different areas, but other VASCUPP schools may want to utilize the contract as provided for in the VASCUPP Cooperative language in section VI. of the RFP.

Question 2: When working on the sprinkler system, will there be a shutdown fee to perform the work?

Virginia Tech Answer: No.

Question 3: Section VII statement of needs #12 states, "It is the contractor's responsibility to verify and update the fire protection inventories included in attachments to this solicitation."

a. Where are the inventories attachments?

b. Does this mean there are more systems or devices that are not included?

Virginia Tech Answer:

a. Please see Attachment F of the RFP for Sprinkler Inventory Listing.

b. This is the best list we have at present. Pricing is per system so this should not affect vendor's ability to provide a proposal.

Question 4: Is there a charge to shut down panels?

Virginia Tech Answer: No.

Question 5: What is the effective date of the contract?

Virginia Tech Answer: The contract we have in place now is set to expire March 31 2019. Our hope is to have this new contract in place by April 1, 2019 with services starting July 1st. If the process of selecting a new vendor exceeds the timeframe, we may extend our current contract until we have made a selection.

Question 6: How do you know which type of SWAM business you are?

Virginia Tech Answer: Please refer to http://sbsd.virginia.gov/ for classification of each type of business.

Question 7: Is there a price escalation clause in this solicitation?

Virginia Tech Answer: No. If you wish to increase prices during the time of renewal, you will have to state this in your proposal or during negotiations to be included in any contract document.

Question 8: How many plastic and/or steel systems do you currently have?

Virginia Tech Answer: We are not sure of how many. We can confirm we have a low quantity of plastic.

2. Please see Attachment G, attached to this solicitation by this addendum, for attendance roster of our pre-proposal conference held on Wednesday, January 9, 2019 at 2:00 pm.
3. No further questions will be accepted for this solicitation.
4. All other terms, conditions and descriptions remain the same.
5. The due date and hour remains ***Tuesday, January 22, 2019 at 3:00 PM***.

I acknowledge that I have read and understand this addendum in its entirety.

_____ _____

Signature Date

Pages have been redacted for public version of contract

FIRE · SECURITY

Proposal for:

Virginia Polytechnic Institute and State University

RFP # 0058208

Submitted by:

VSC Fire & Security, Inc.

773 Union Street

Salem, VA 24153

540-765-1300

January 22, 2019

Table of Contents

1.A. PRICING SCHEDULE

Attachment E

Proposed Pricing Schedule

WEEKLY
Fire pump runs:

14 pumps @ $40.00 each per week Total for 40 weeks $22,400.00
NOTE: The other 12 weeks, this equipment will be tested as a part of the routine monthly and annual sprinkler inspections.

MONTHLY

Fire pump operational tests:
14 pumps @ $70.00 each per month Total for 8 months $7,840.00

Control valve inspections:
230 systems @ $39.00 each per month Total for 8 months $71,760.00

NOTE: The other four months, this equipment will be tested as part of the routine sprinkler inspections.

QUARTERLY

Sprinkler system inspection and tests; (includes the operational tests)

230 systems @ $105.00 each per quarter Total for 3 quarters $72,450.00

NOTE: The fourth quarterly inspection is part of the annual inspection and testing.

ANNUALLY

Sprinkler system and fire pump annual testing:

Fire pump flow test for 14 pumps @ $325.00 each Total annually $ 4,550.00

Sprinkler system test for 230 systems @ $ 158.00 each Total annually $ 36,340.00

TOTAL ANNUAL COST FOR ALL $ 215,340.00

OTHER

1. Wet standpipe system inspection and flow tests; $530.00 (EACH)
2. Dry standpipe system inspection and hydrostatic tests $550.00 (EACH)
3. Alarm and check valve 5-year inspection $400.00 (EACH)
4. Backflow Preventer Inspection & Test $105.00 (EACH)

1.A. Continued

HOURLY LABOR RATES & MATERIAL DISCOUNT RATES

1. Please list hourly rates for all positions which could be used during the term of the contract to provide repair, maintenance, additional testing or inspections (Price per hour):

	POSITION	HR. RATE
a.	Sprinkler Service Technician	$85.00
b.	Sprinkler Service	$80.00
c.	Inspector	$85.00
d.	Inspector Helper	$75.00
e.	Alarm Service Technician	$85.00
f.	Alarm Helper	$80.00
g.		$
h.		$

2. Please list material discount off list price: 30 %

PREPAYMENT DISCOUNT

% Discount offered from vendor for quarterly prepayment: 5 %

** **NOTE**: VSC Fire & Security, Inc. is only bidding for Zone 8.

All other zones are up for negotiation.

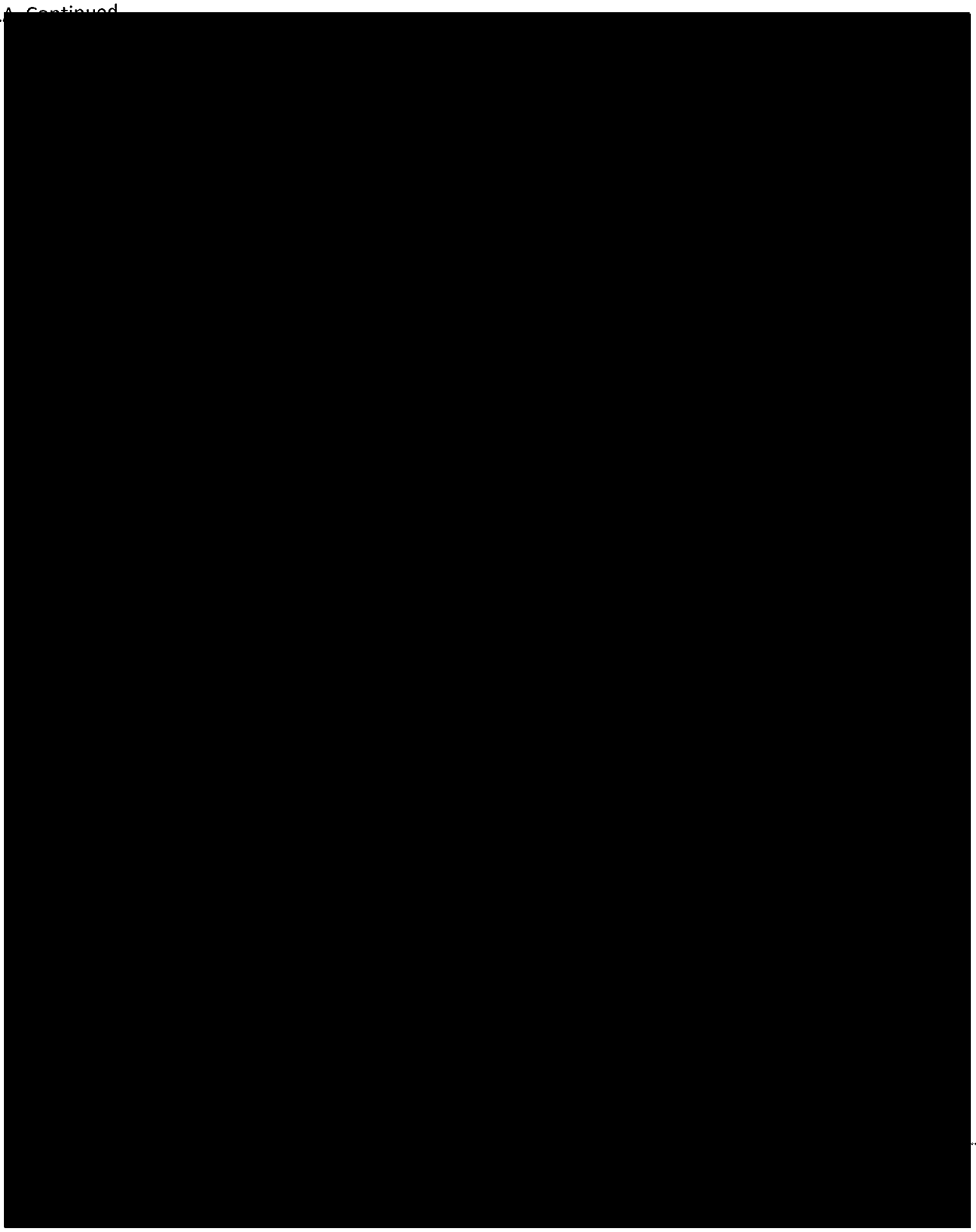
1.B. Continued

Plan for Cost Adjustments

VSC Fire & Security anticipates a two (2) percent increase after the third year and it is up for negotiation. VSC Fire & Security has the experience to quote each contract accurately and fairly with upfront cost to our customers. VSC Fire & Security is compatible to other sprinkler services in our area to maintain good competition. We also strive for excellence while we work with customers so we can provide them with great service while keeping cost down.

For the first three (3) years of the contract, VSC Fire & Security will maintain a firm fixed price as proposed. For the subsequent years of the contract, VSC Fire & Security will propose a percentage increase in accordance with the policy of our corporate pricing standards each year for which we believe will be no more than two (2) percent.

2.A Continued



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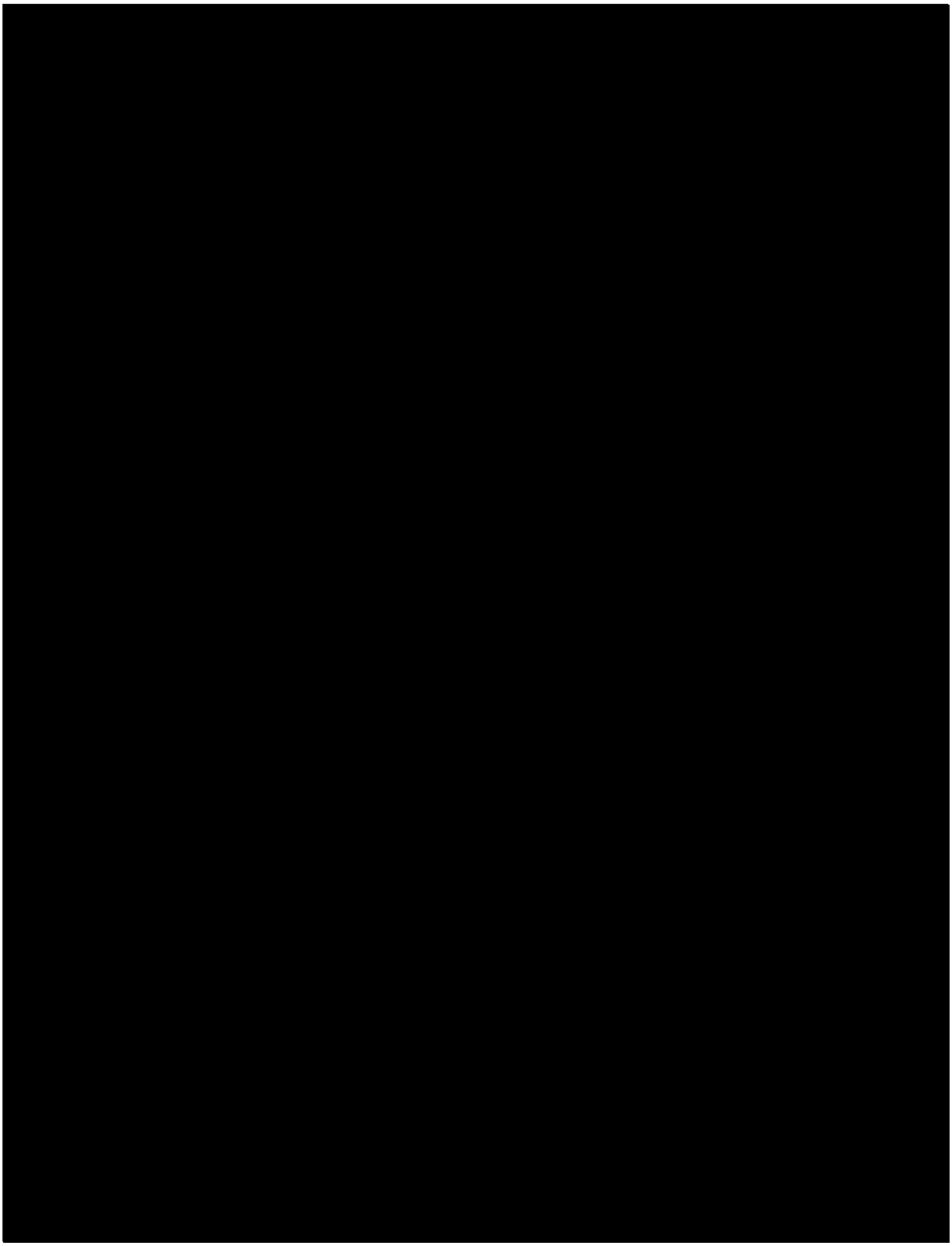
2.A. Continued



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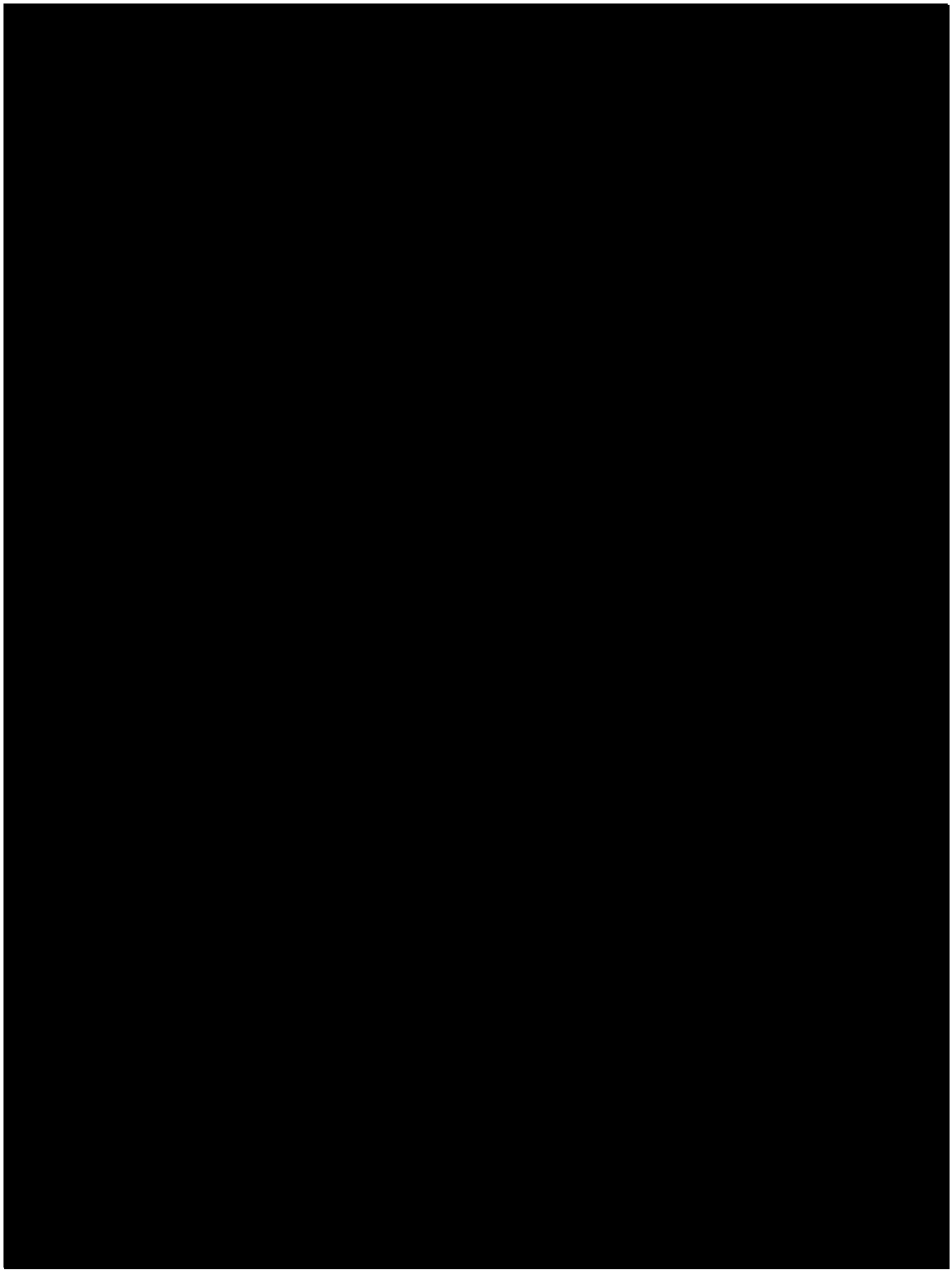

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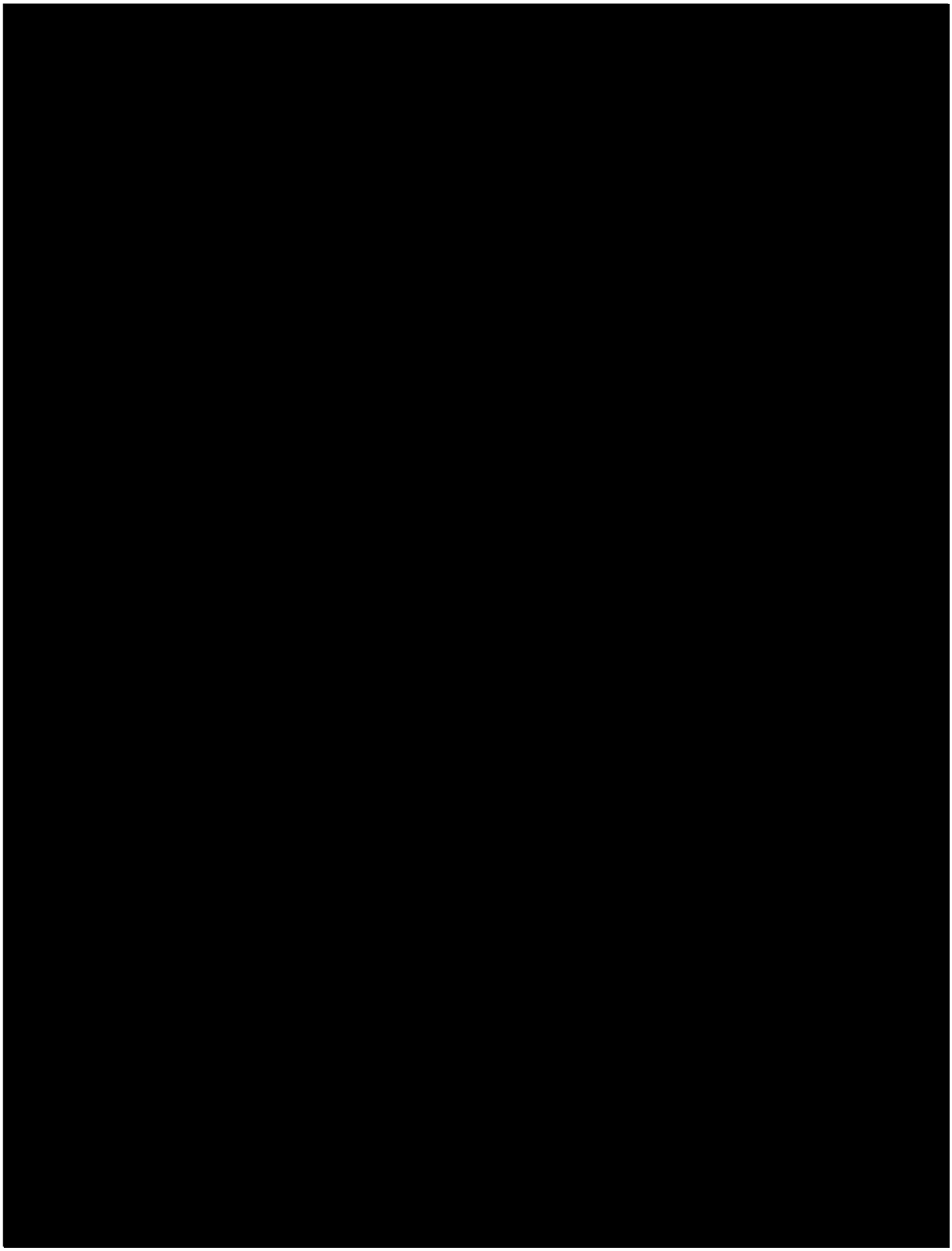

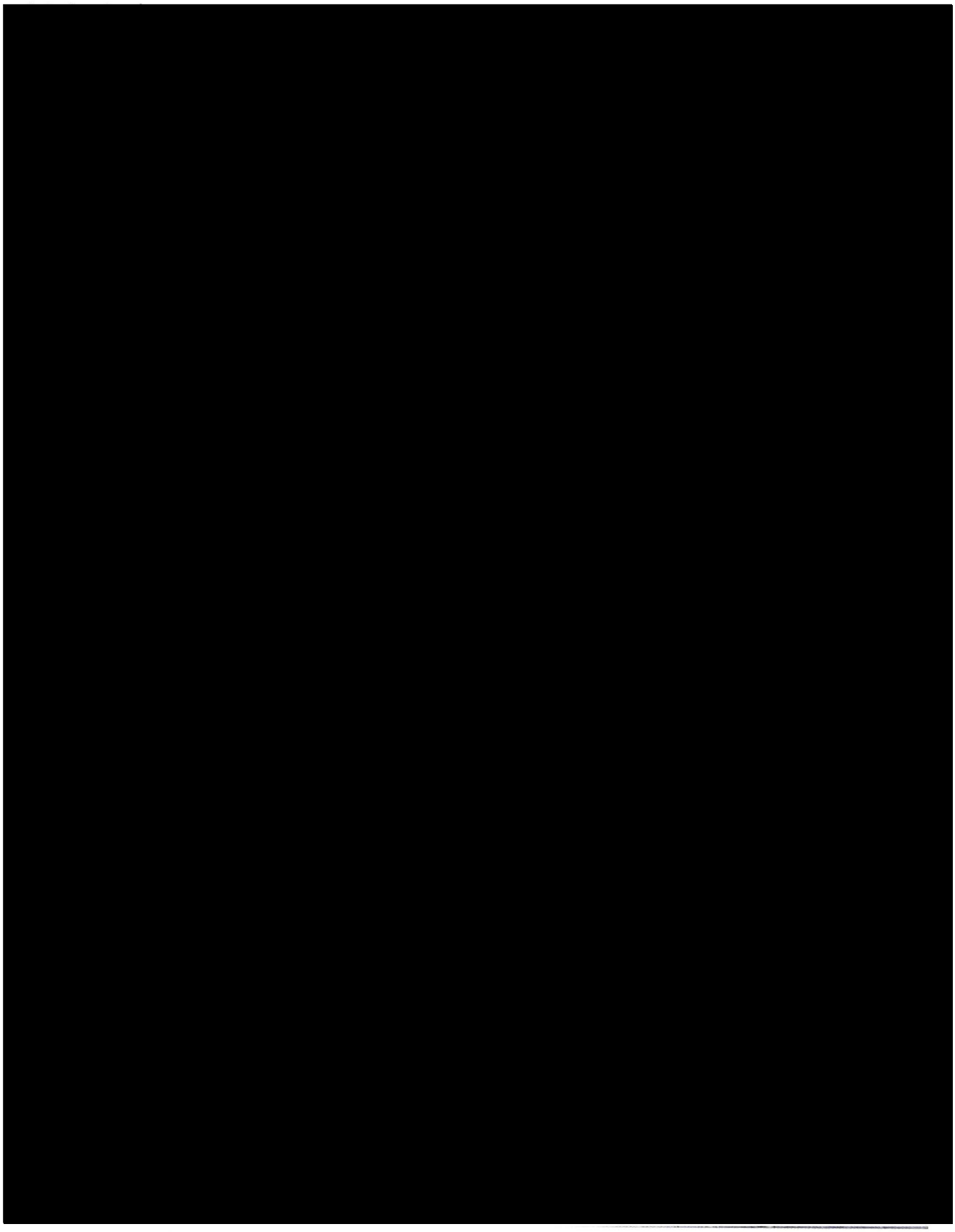

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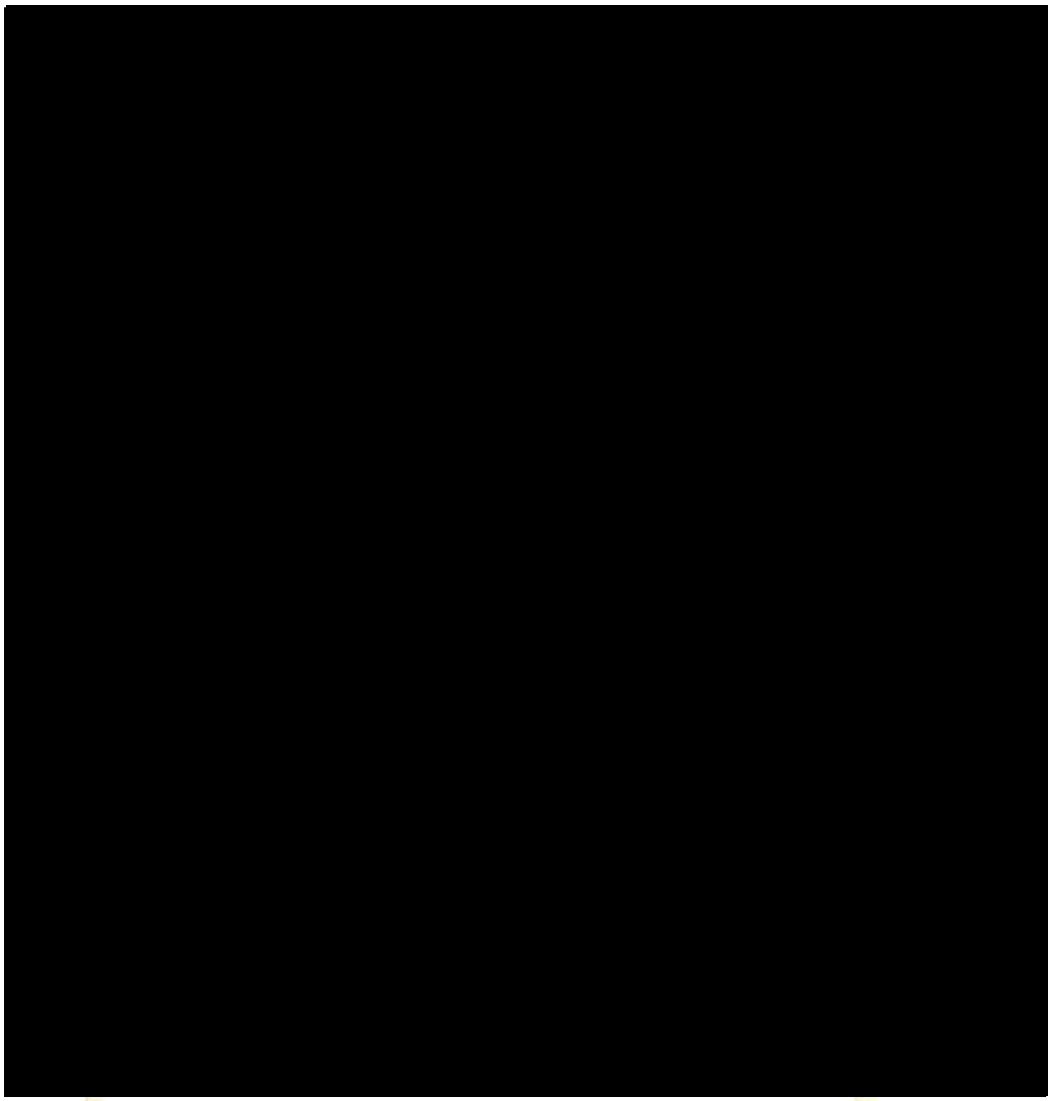

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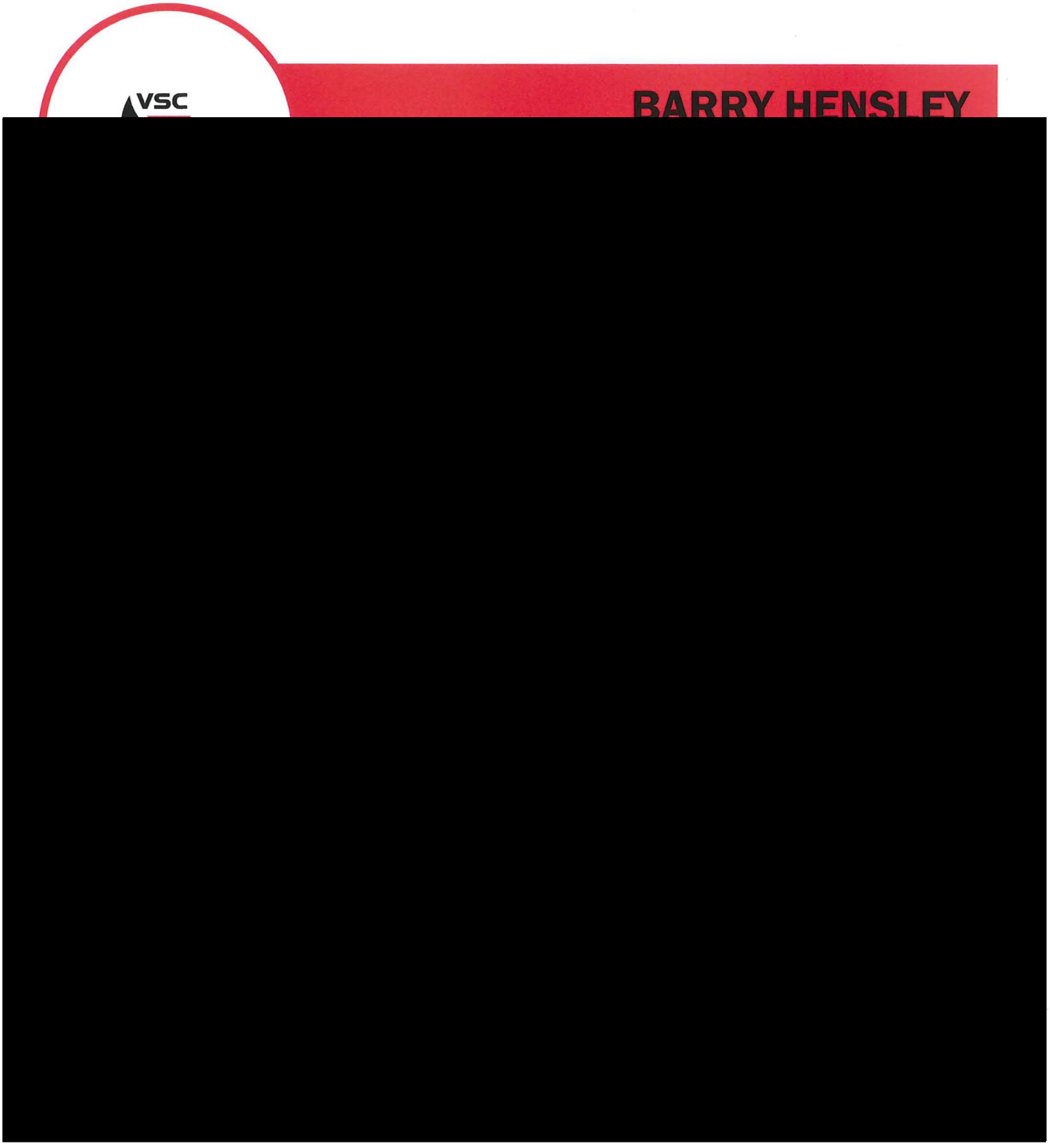

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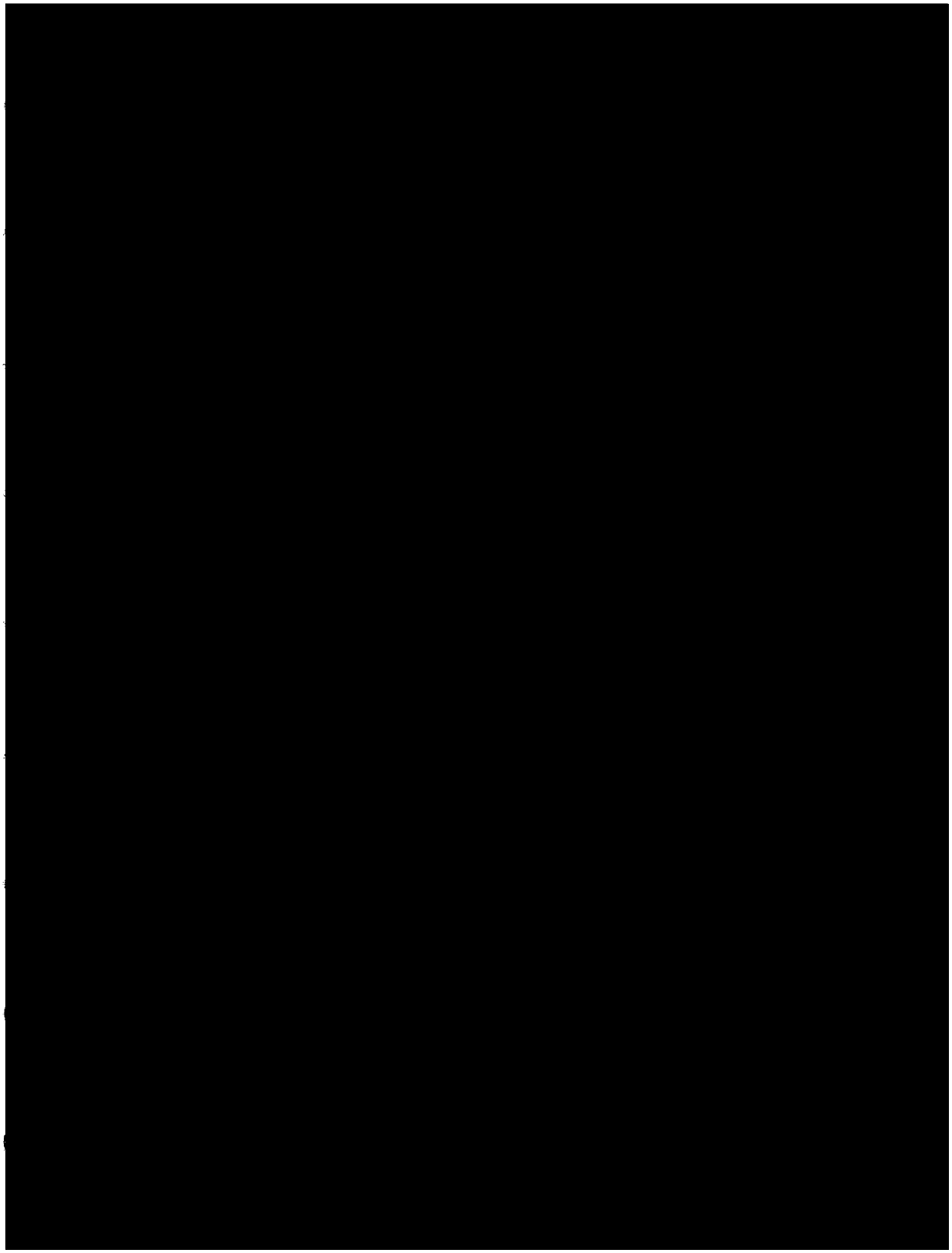

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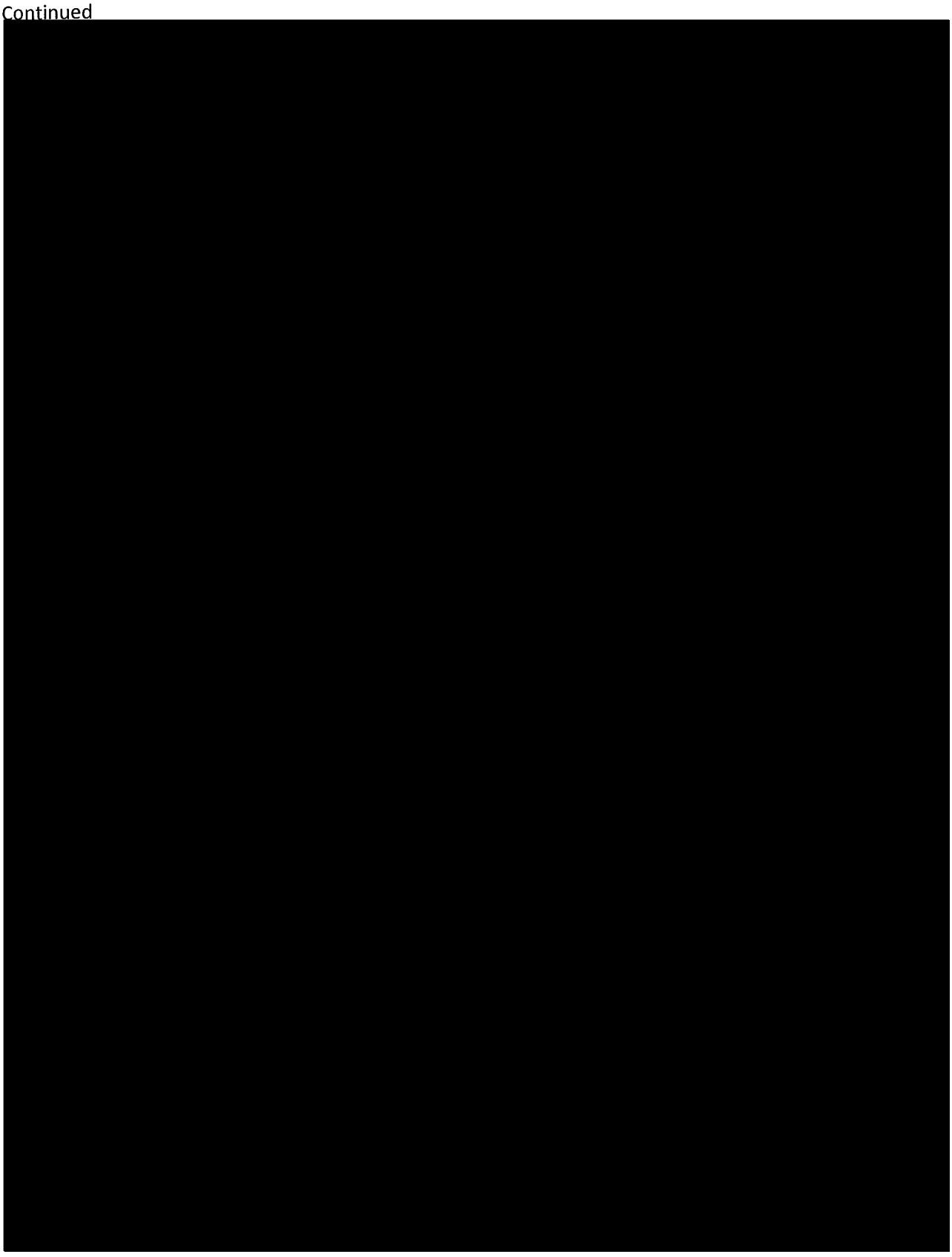

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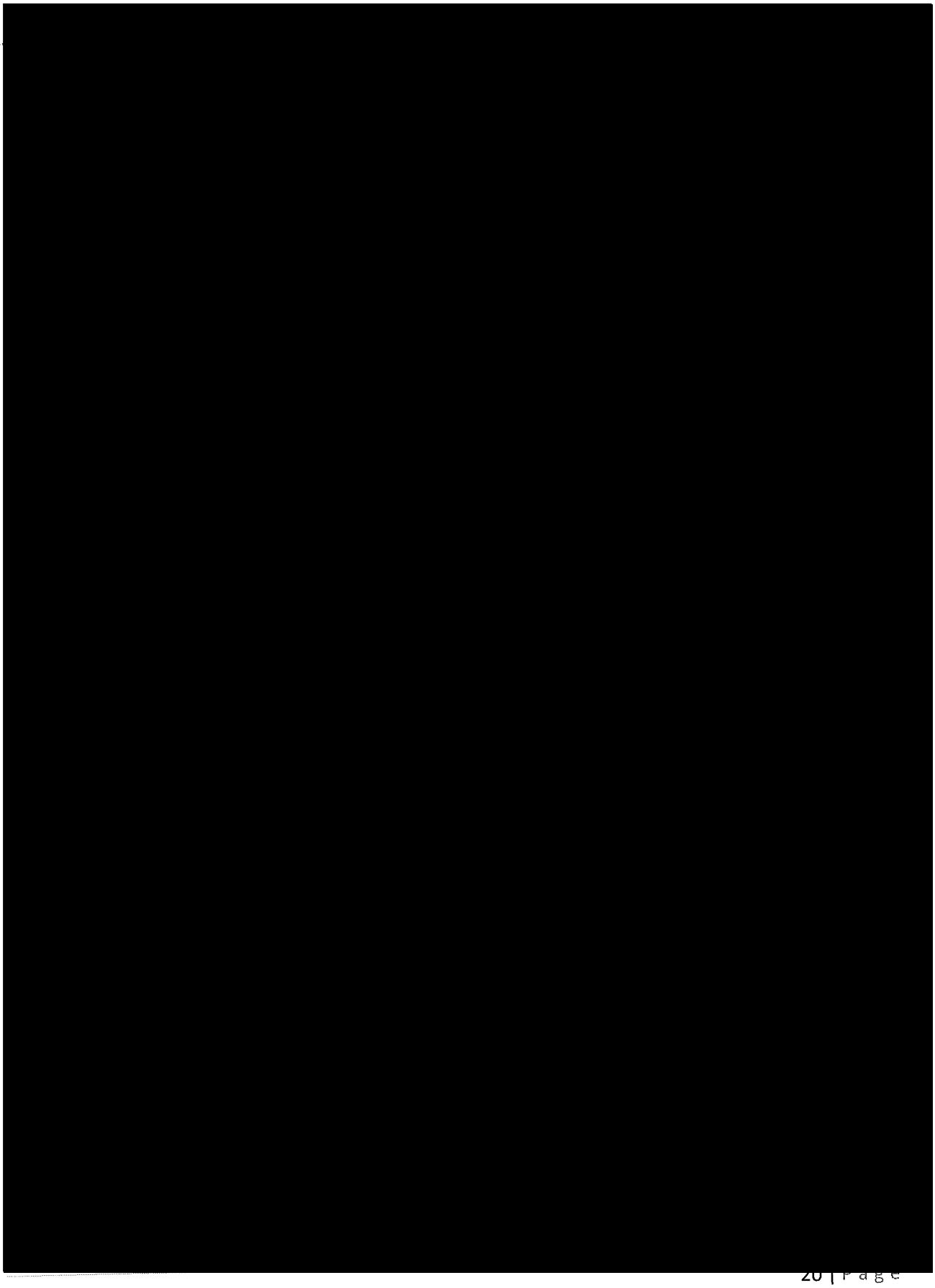

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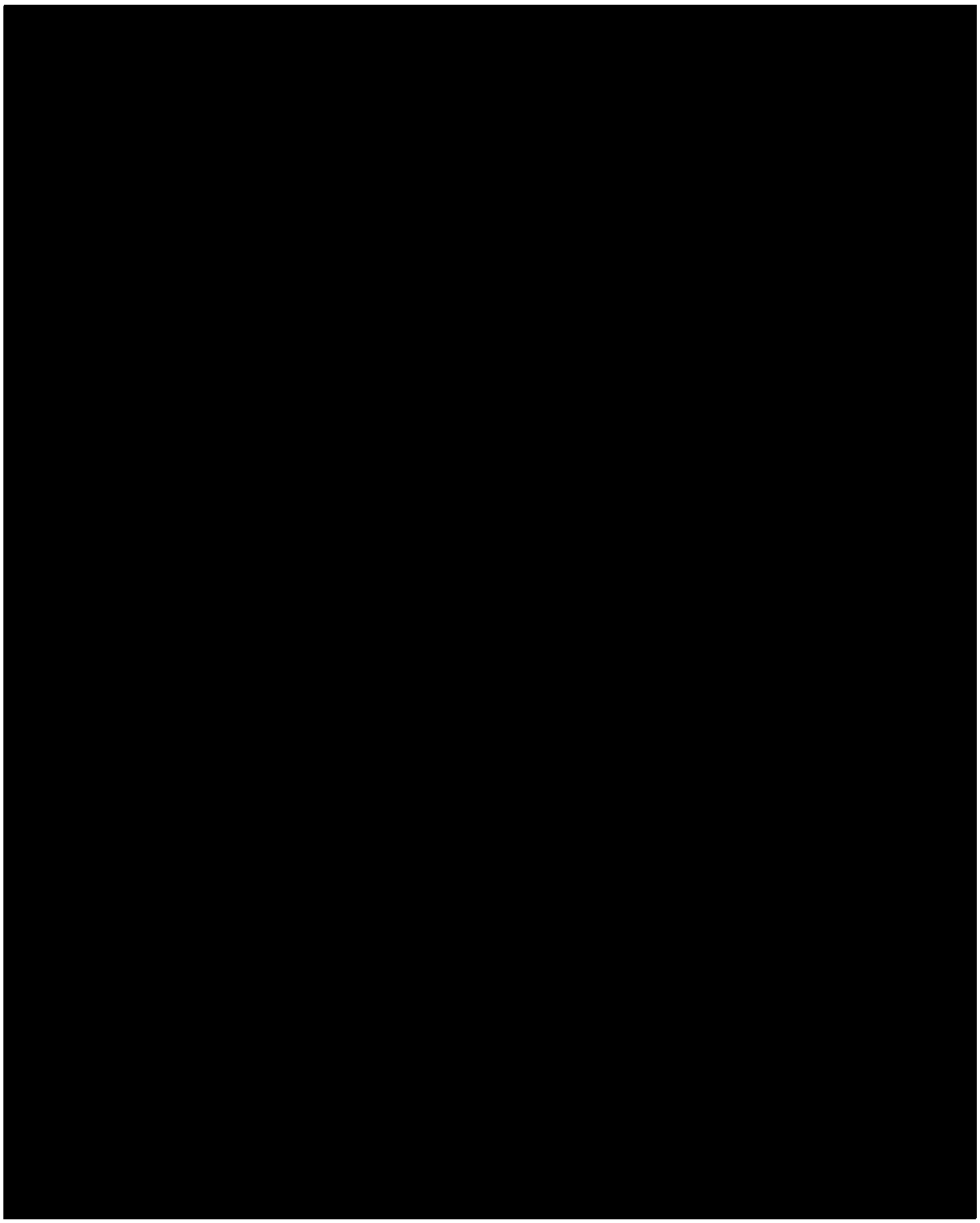

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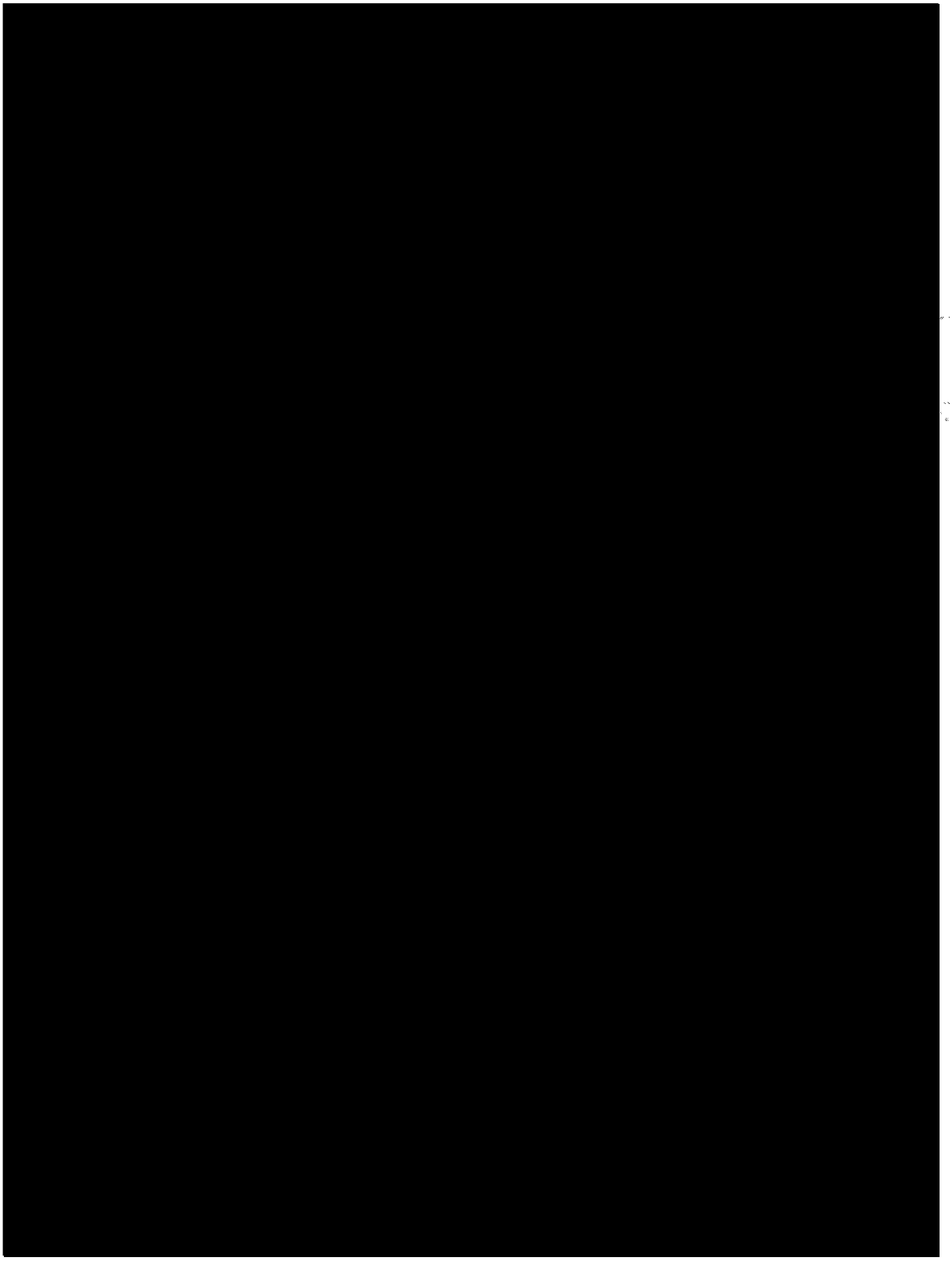

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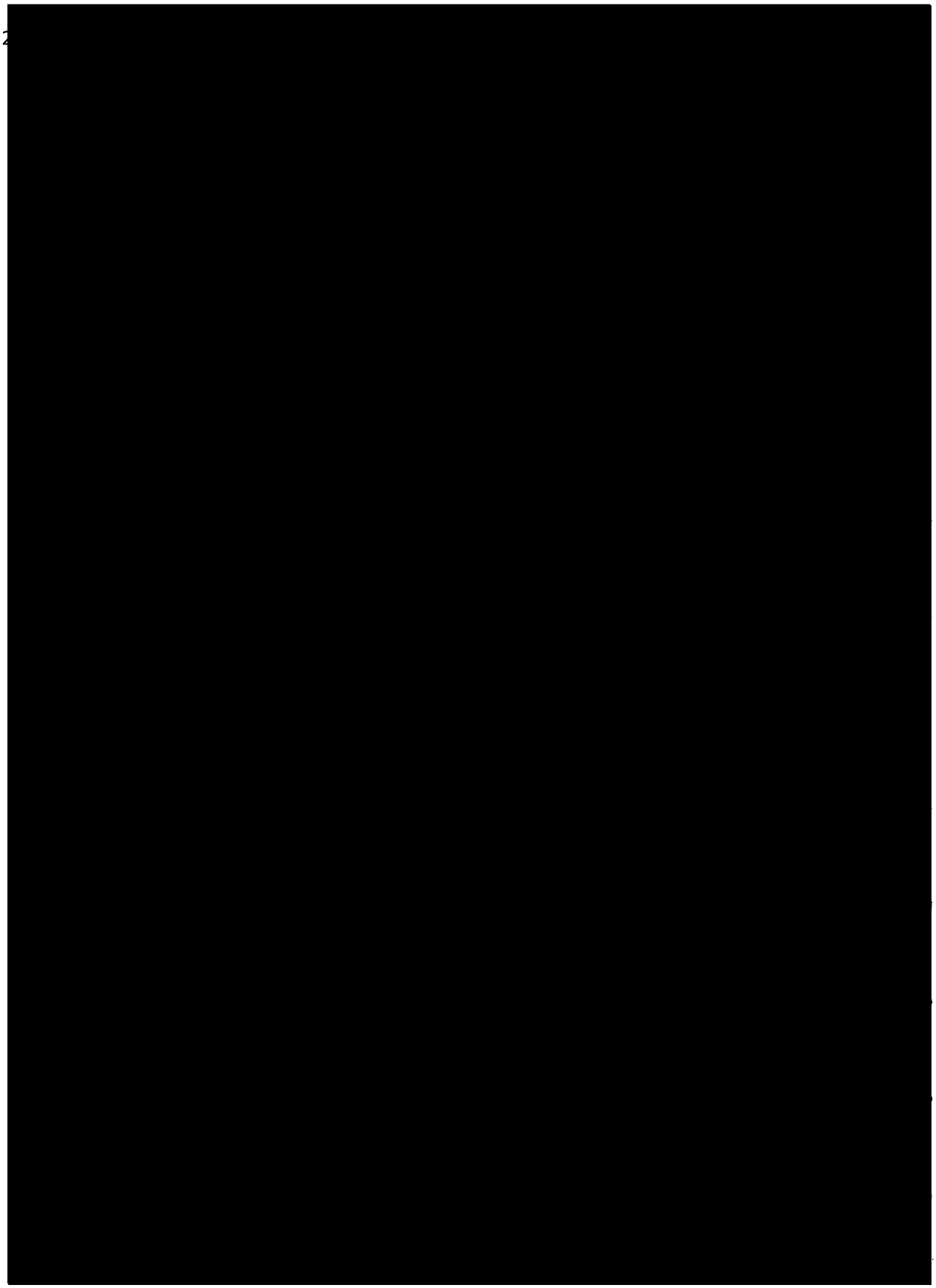

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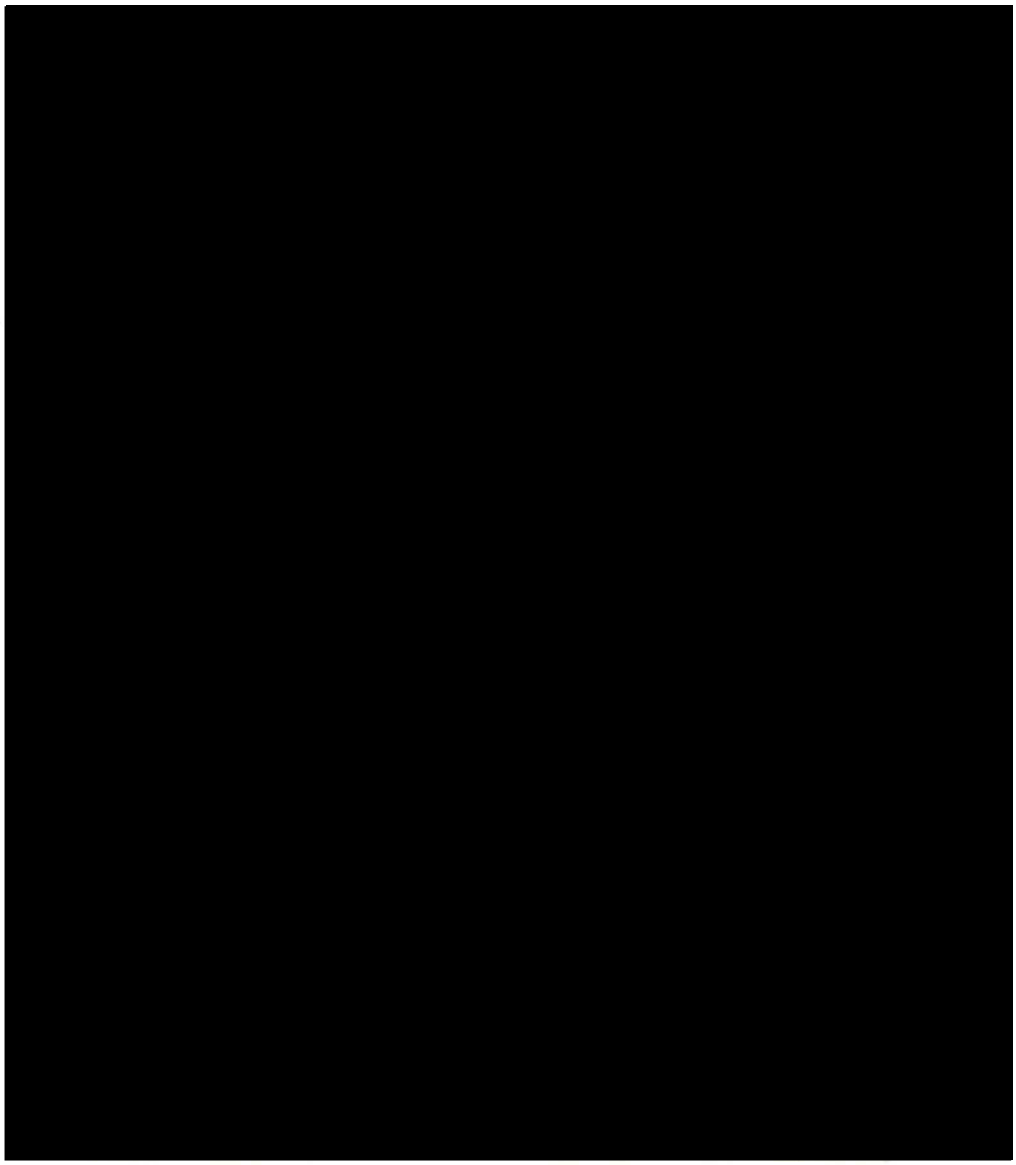

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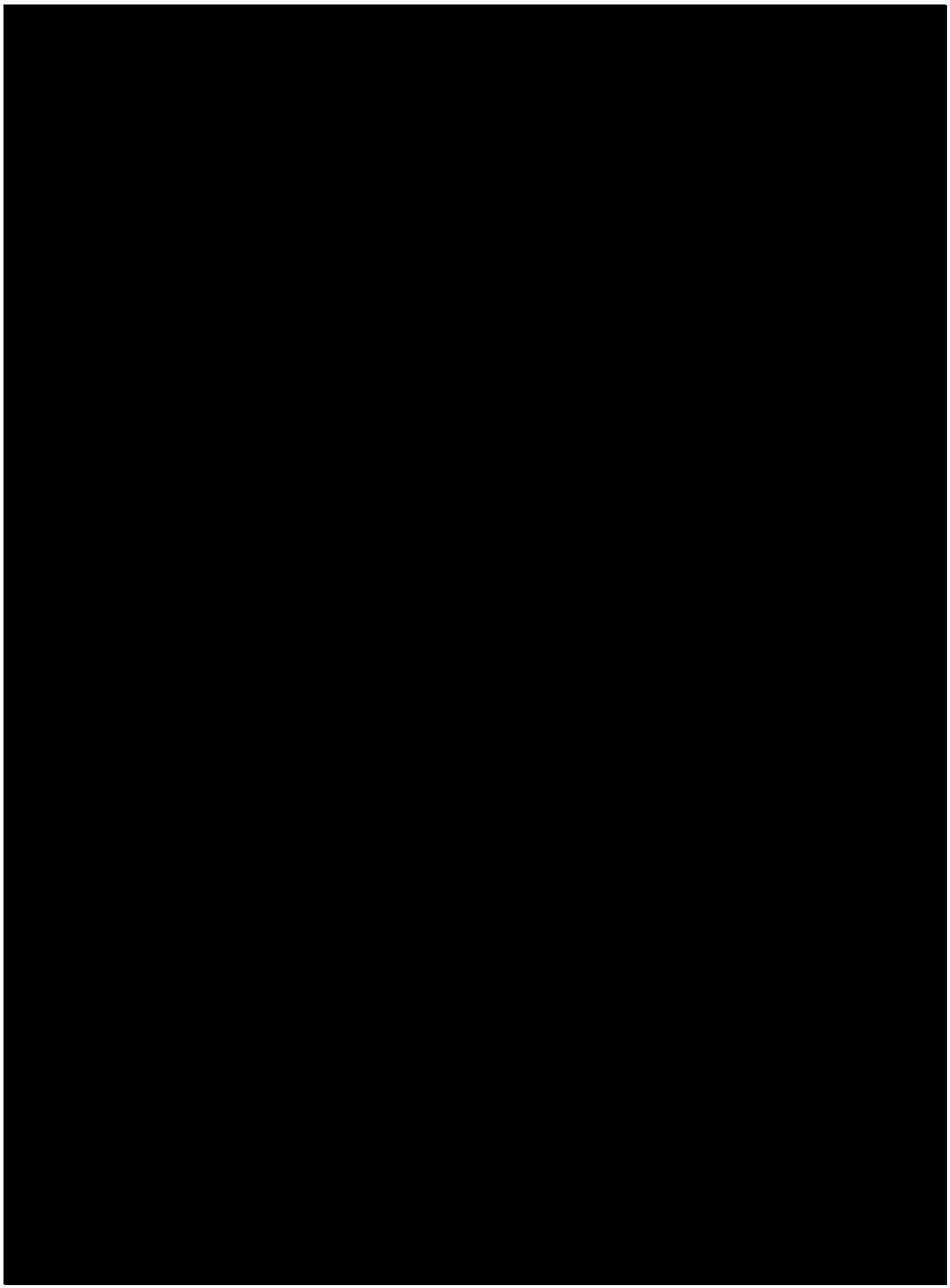

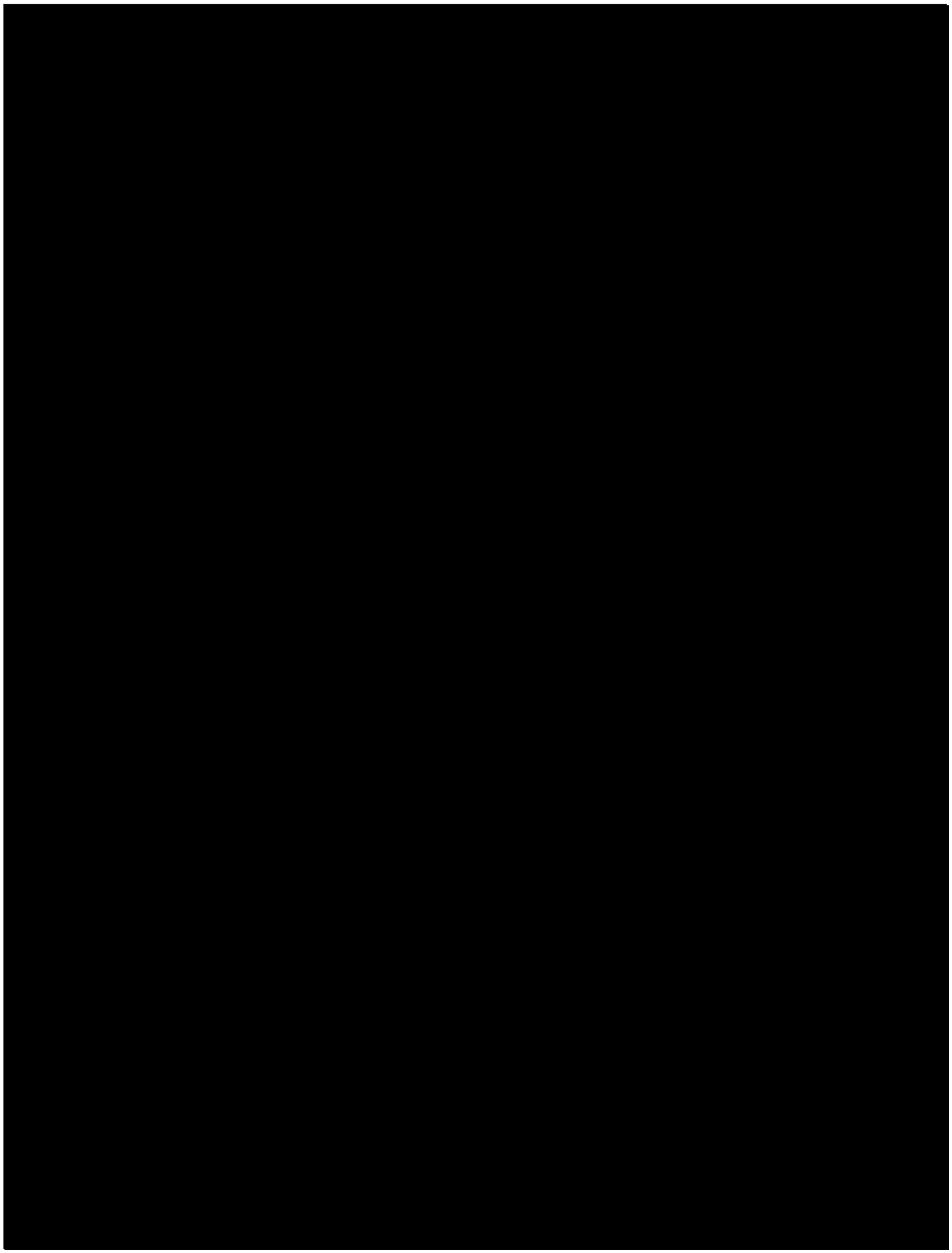

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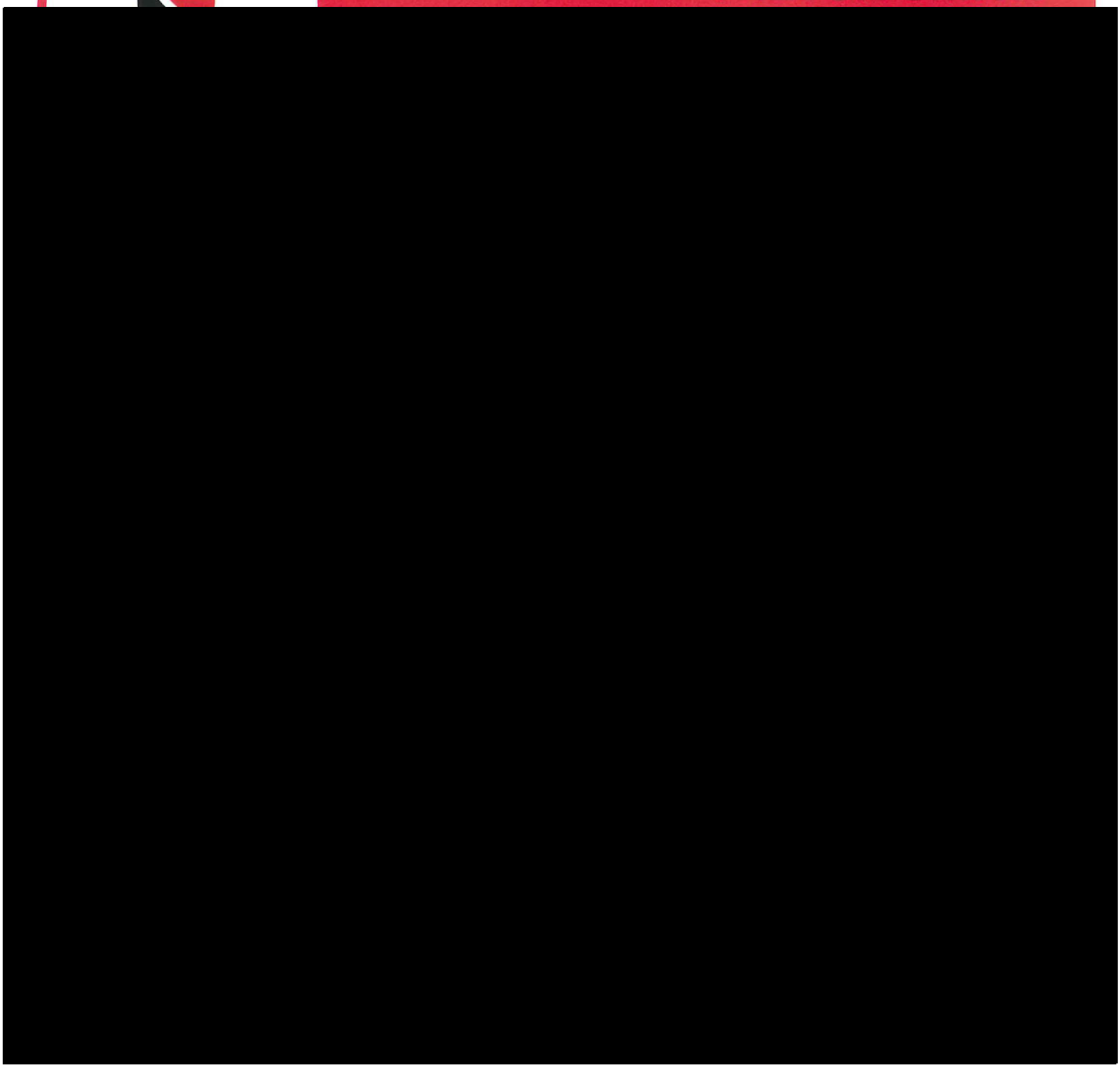

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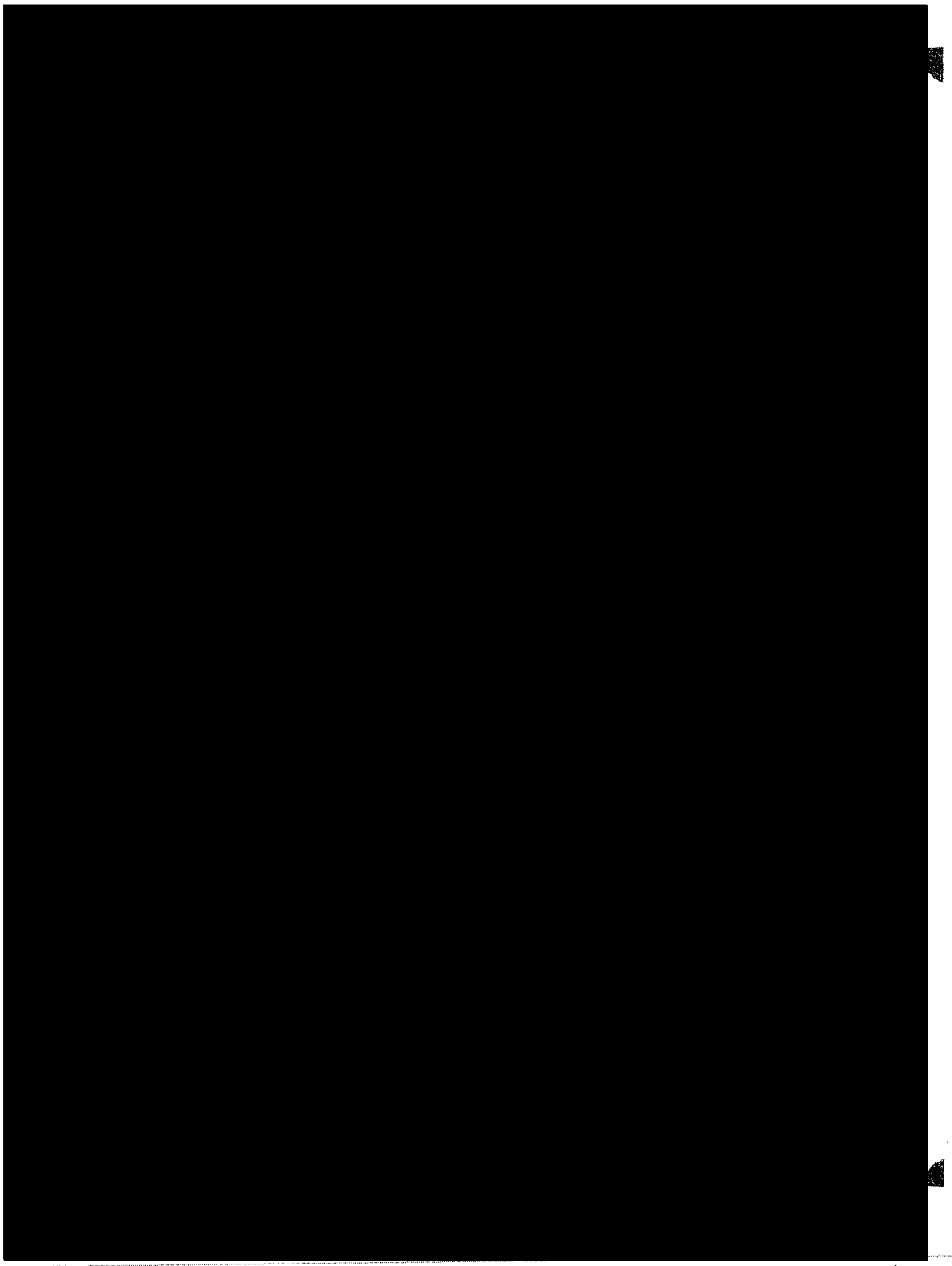

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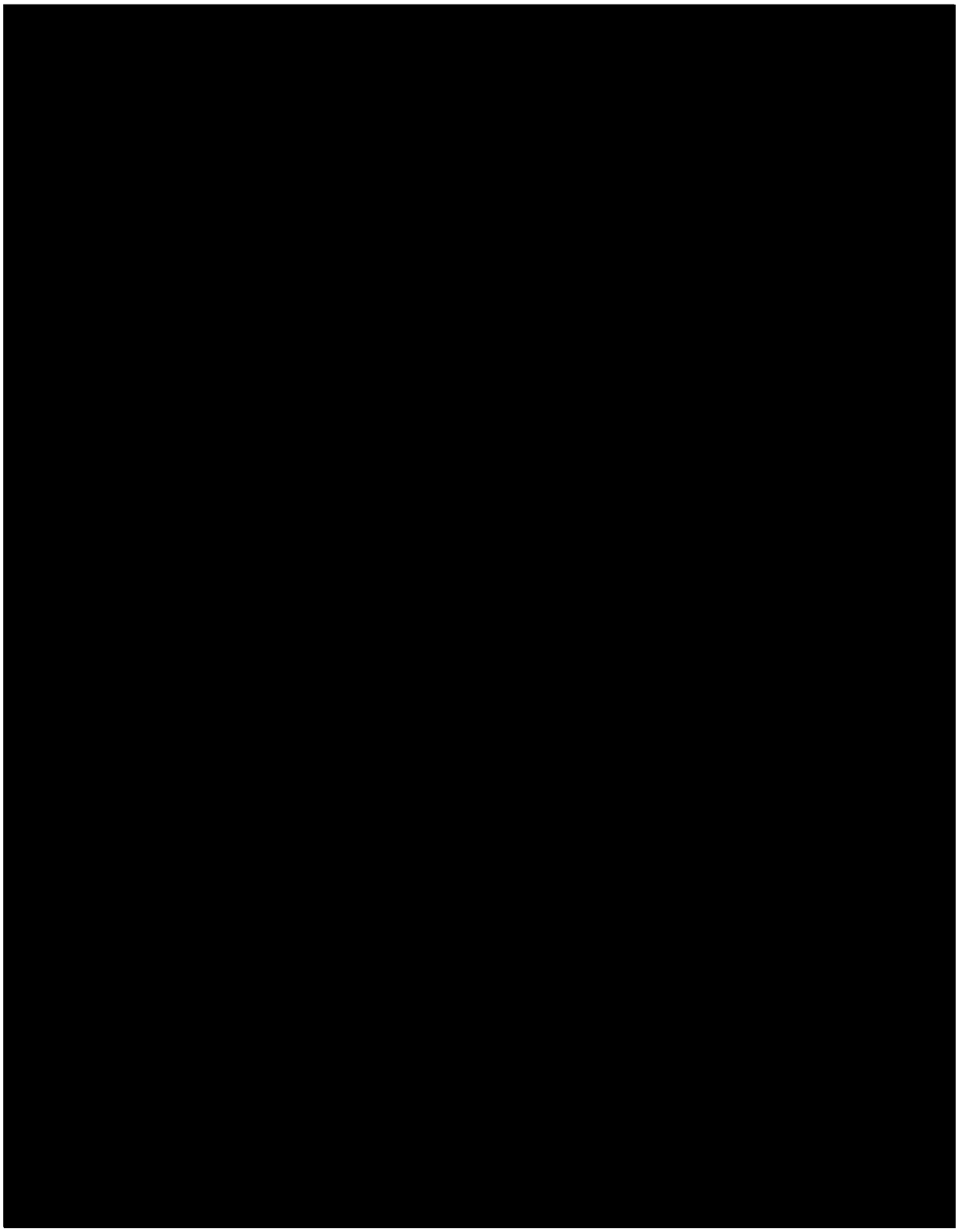

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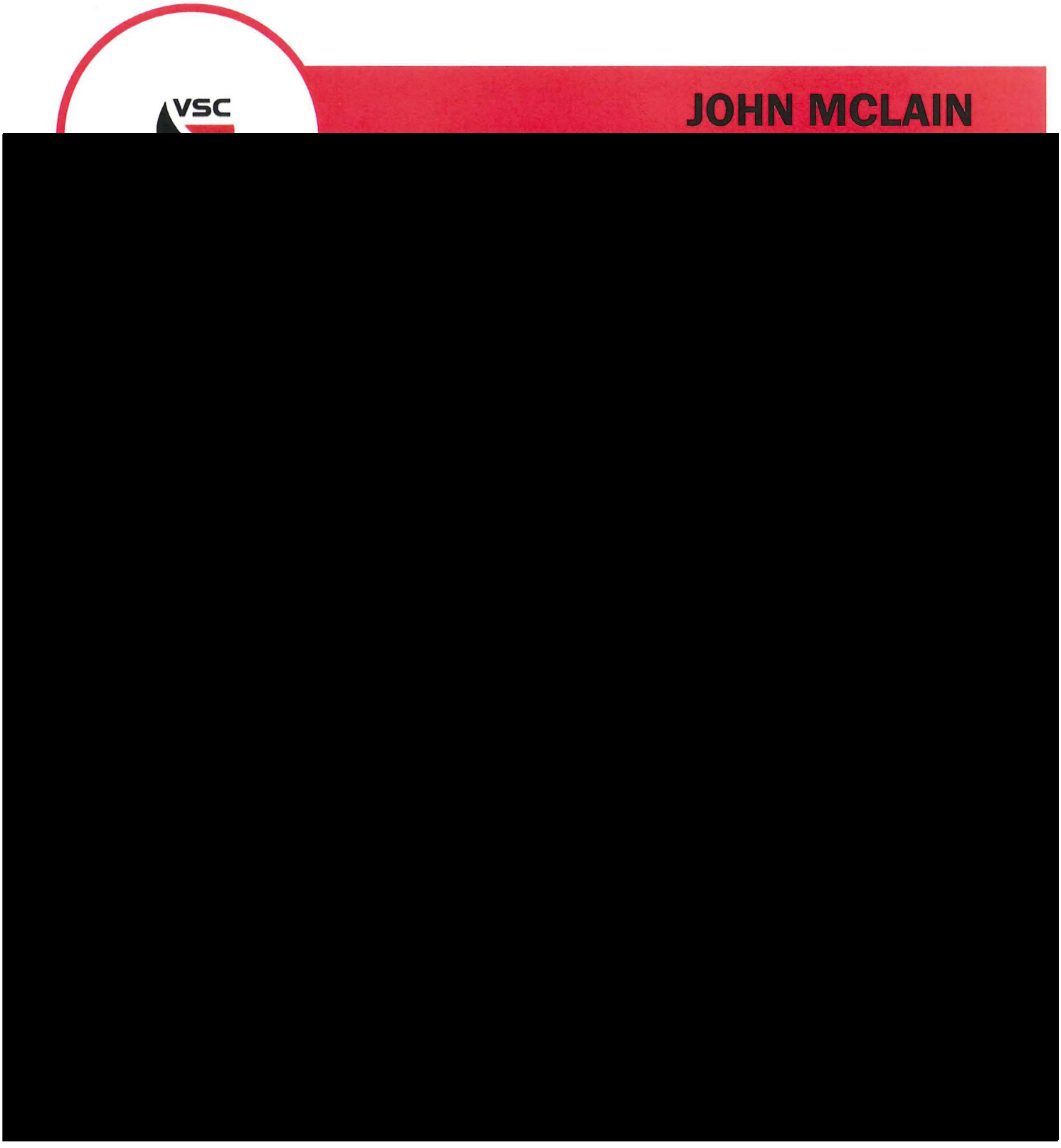

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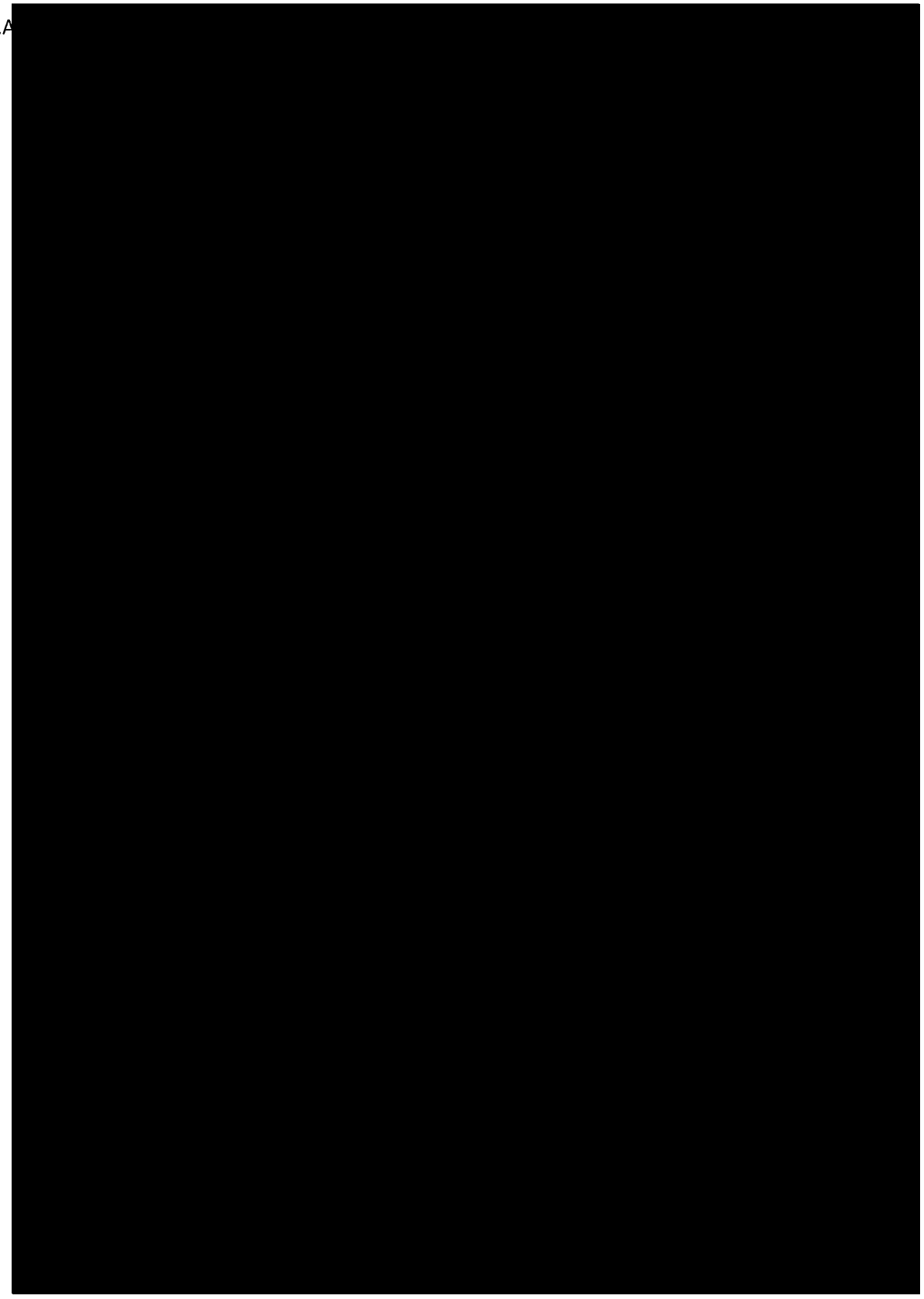

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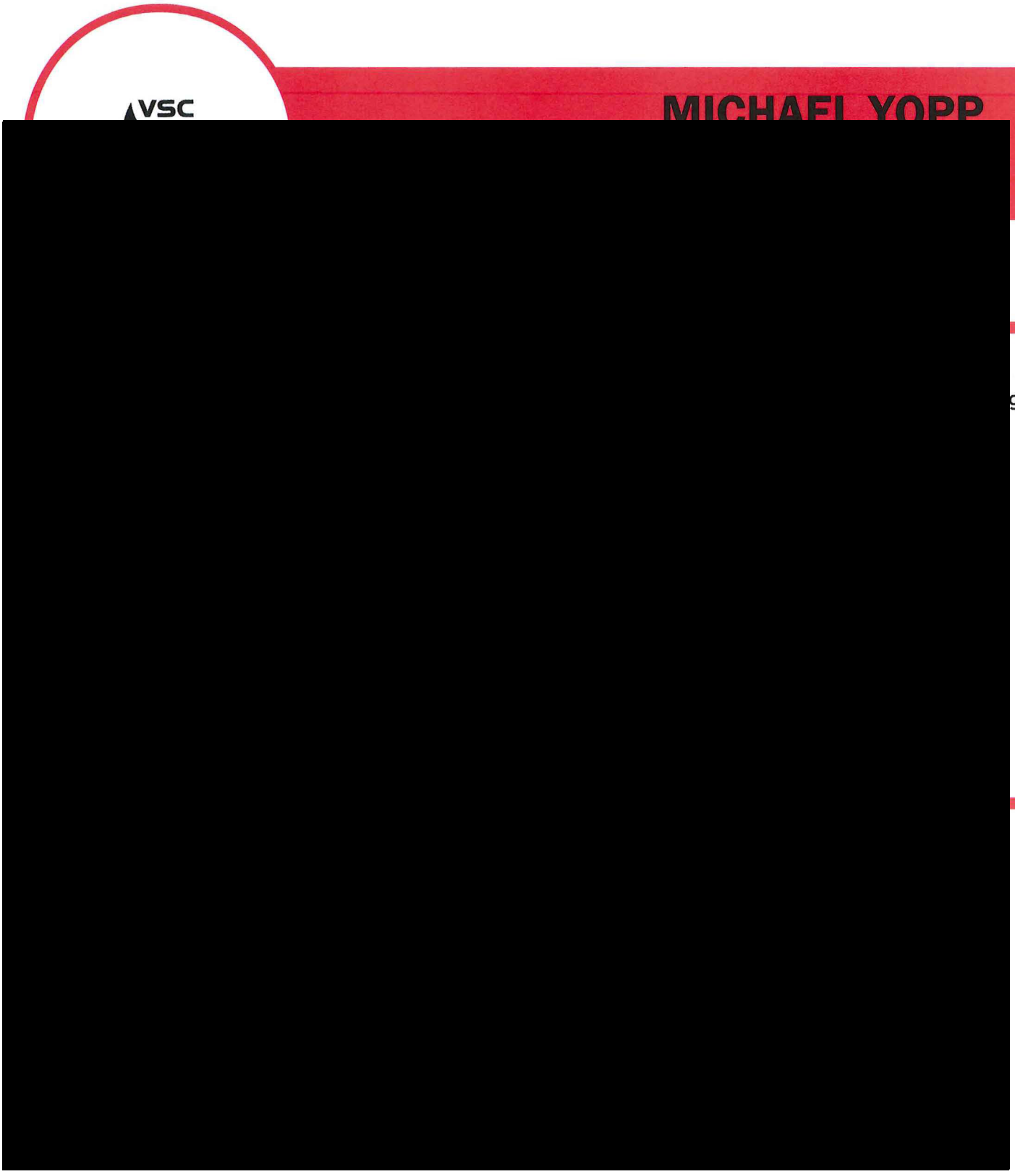

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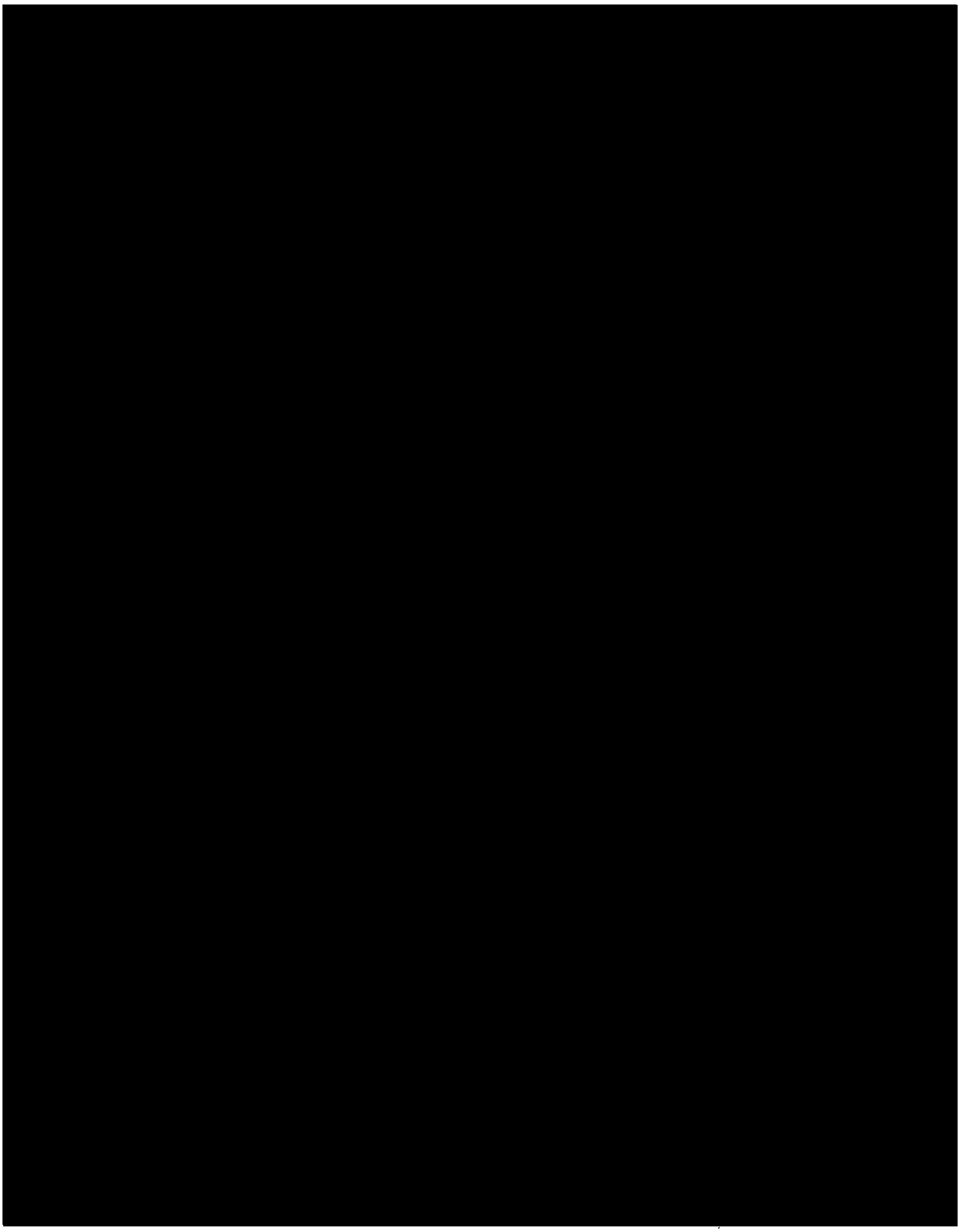

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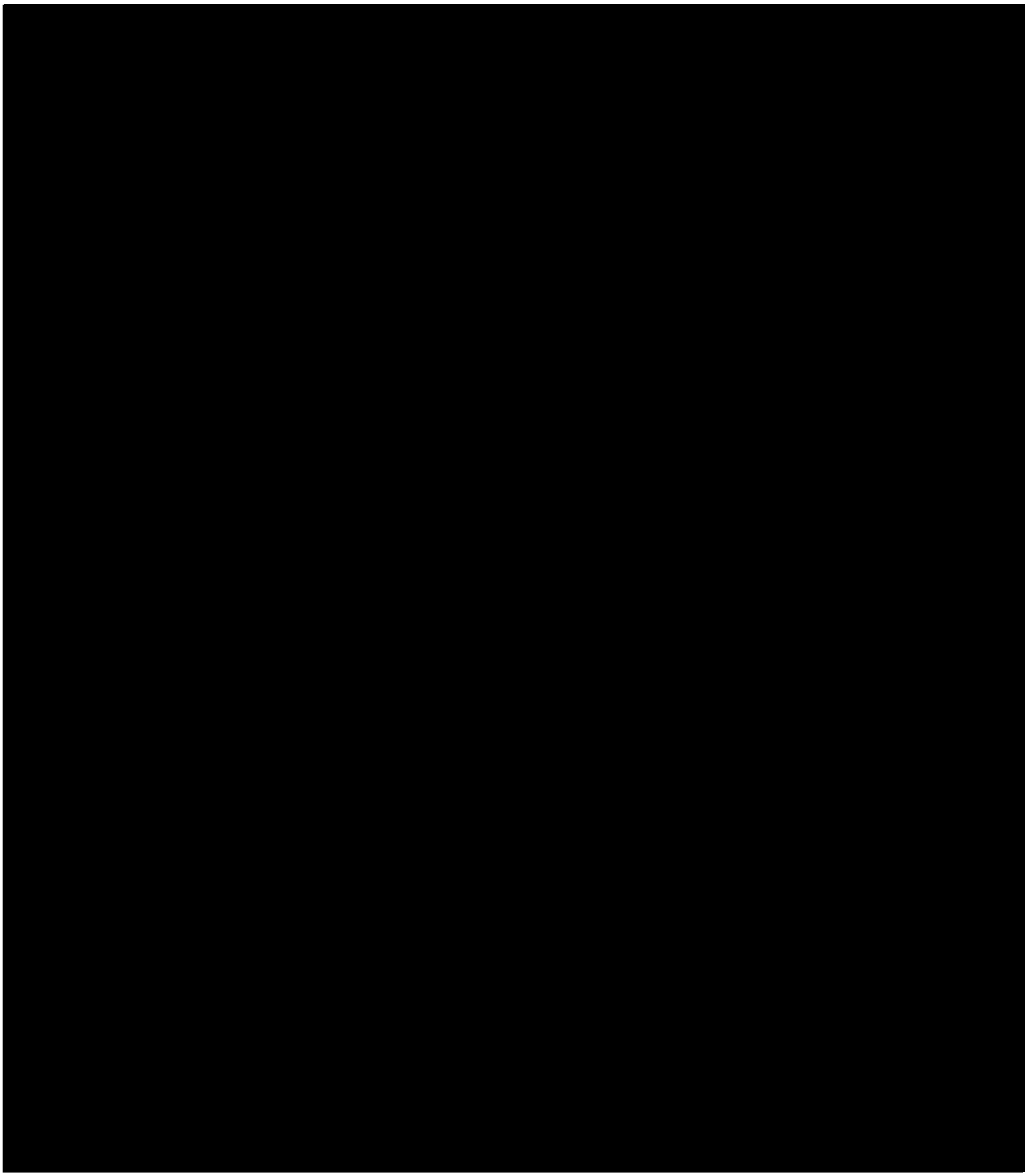

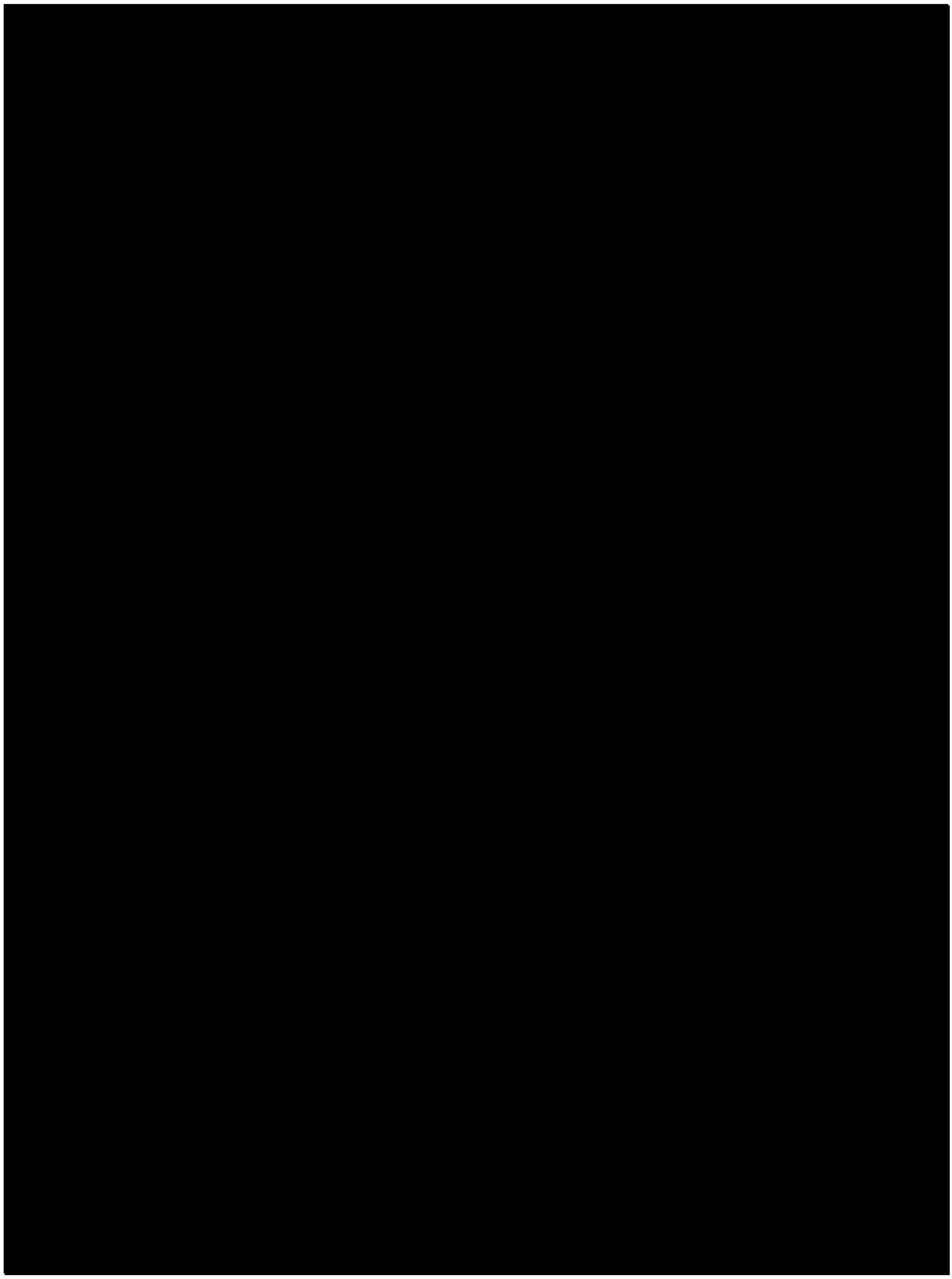

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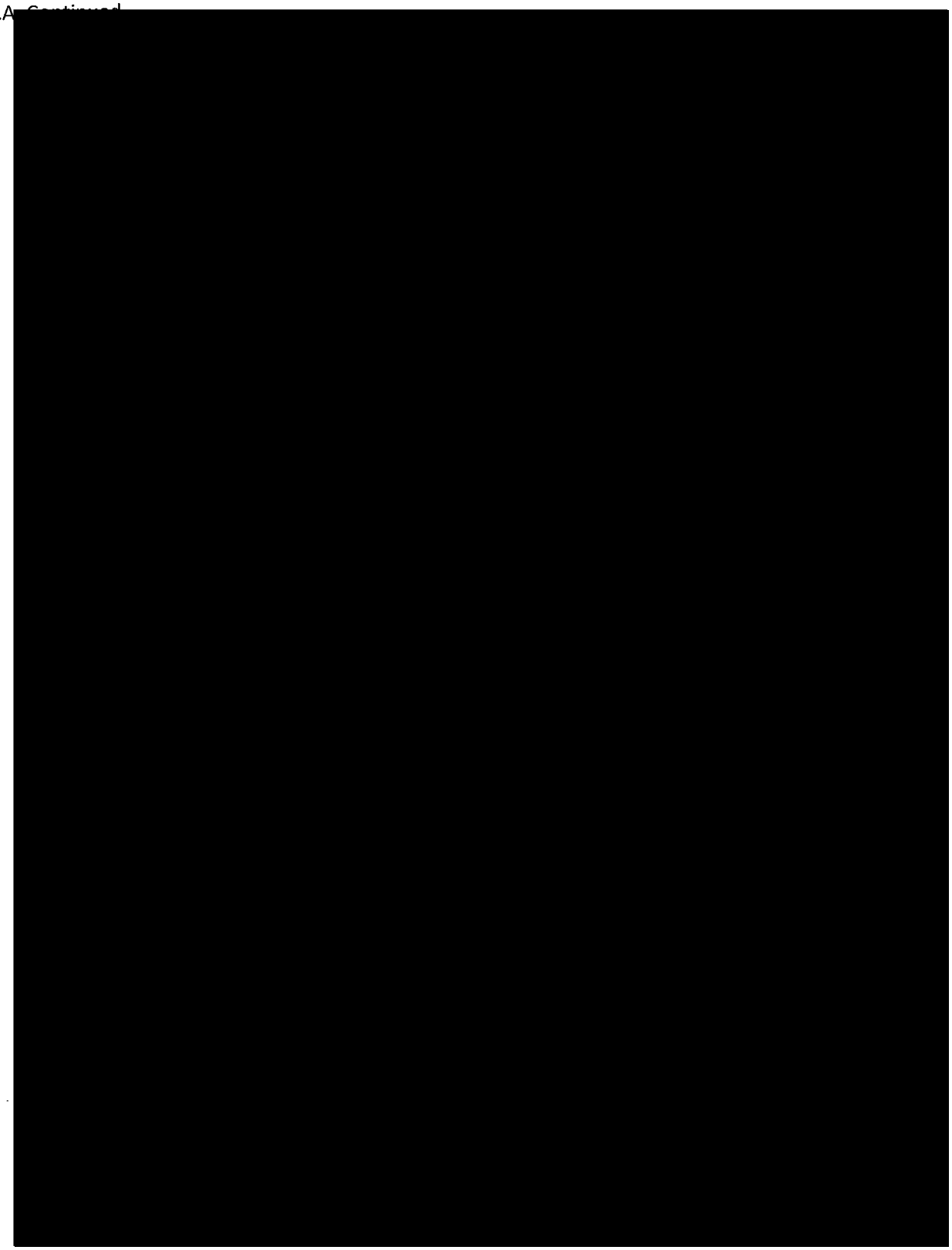

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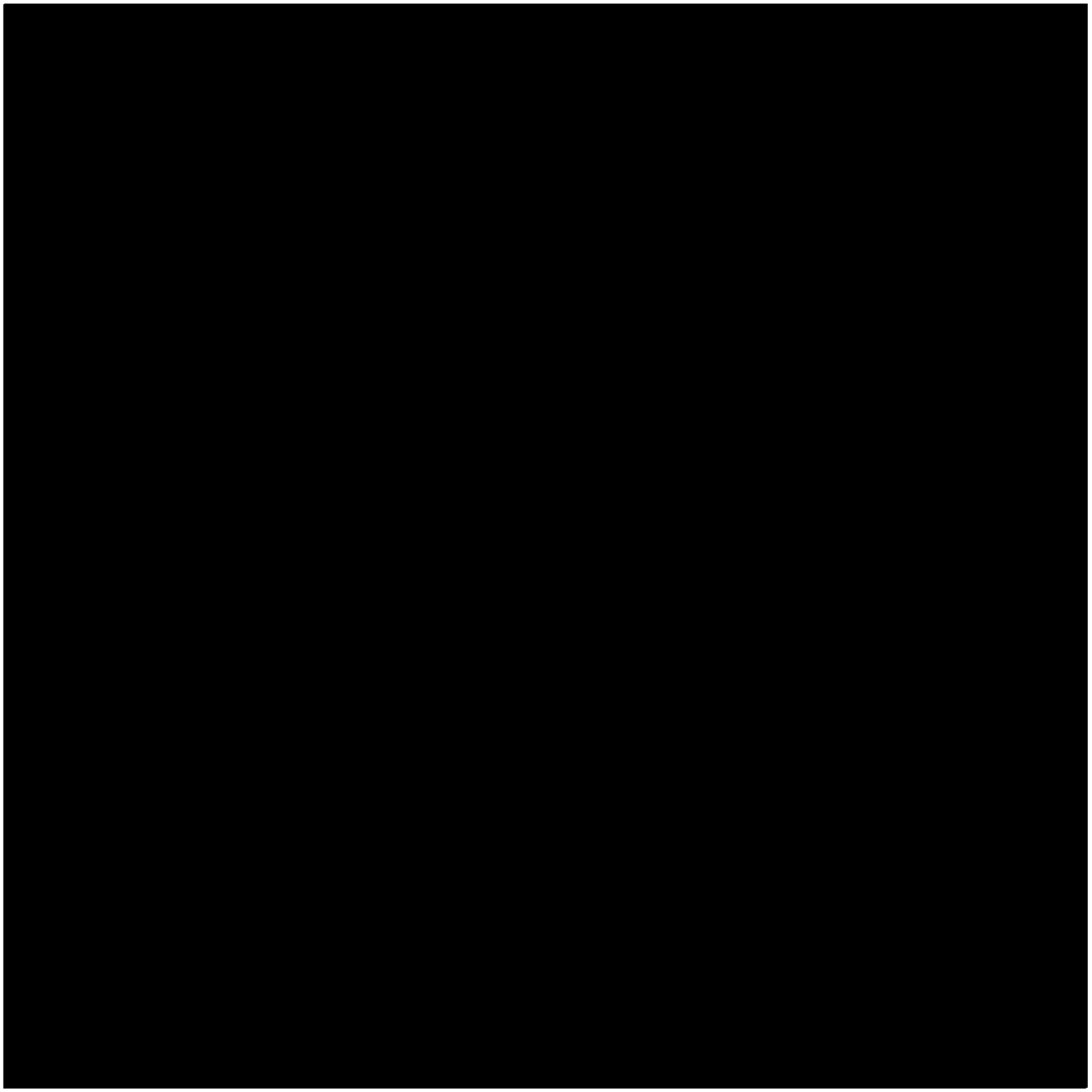

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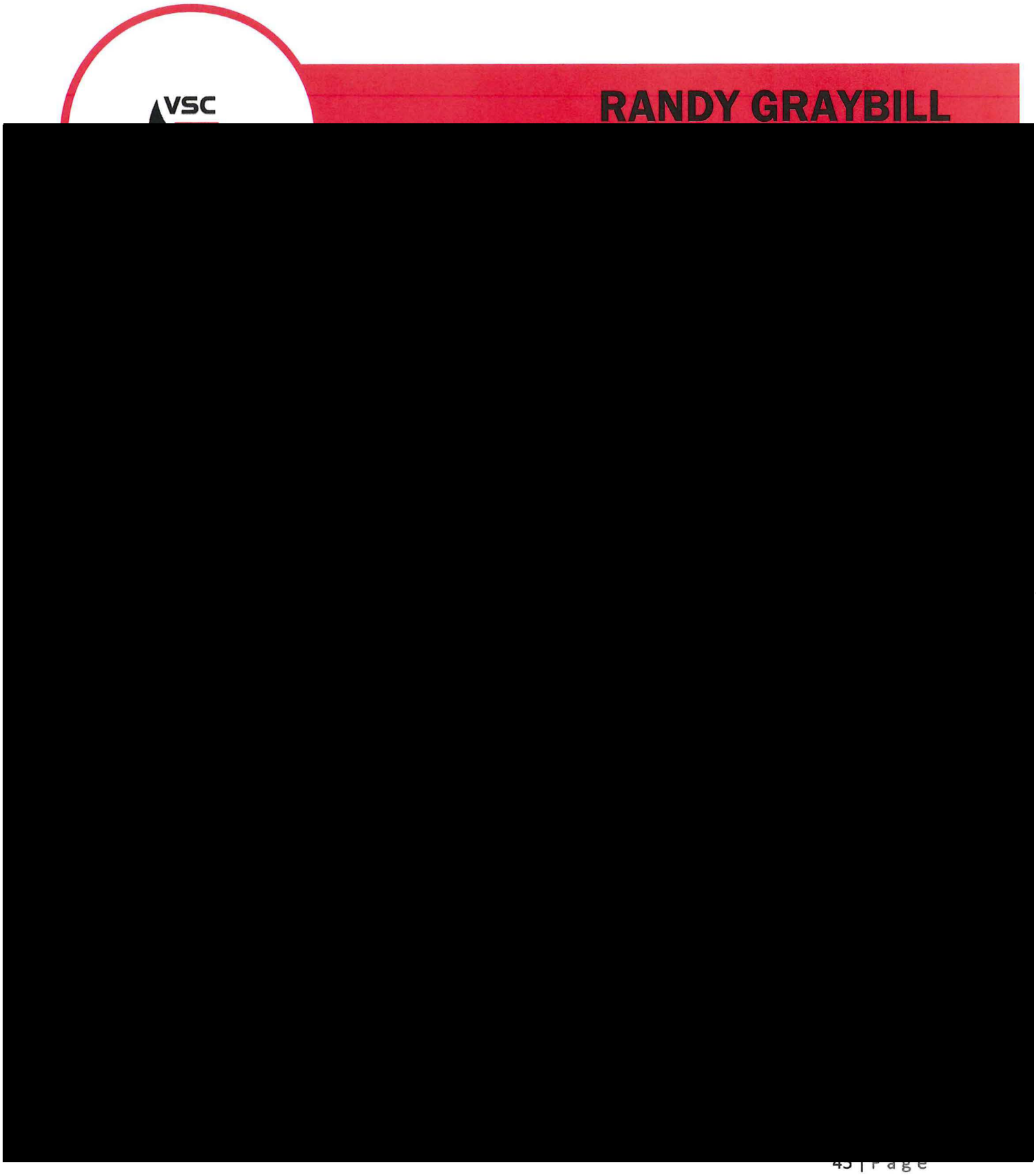

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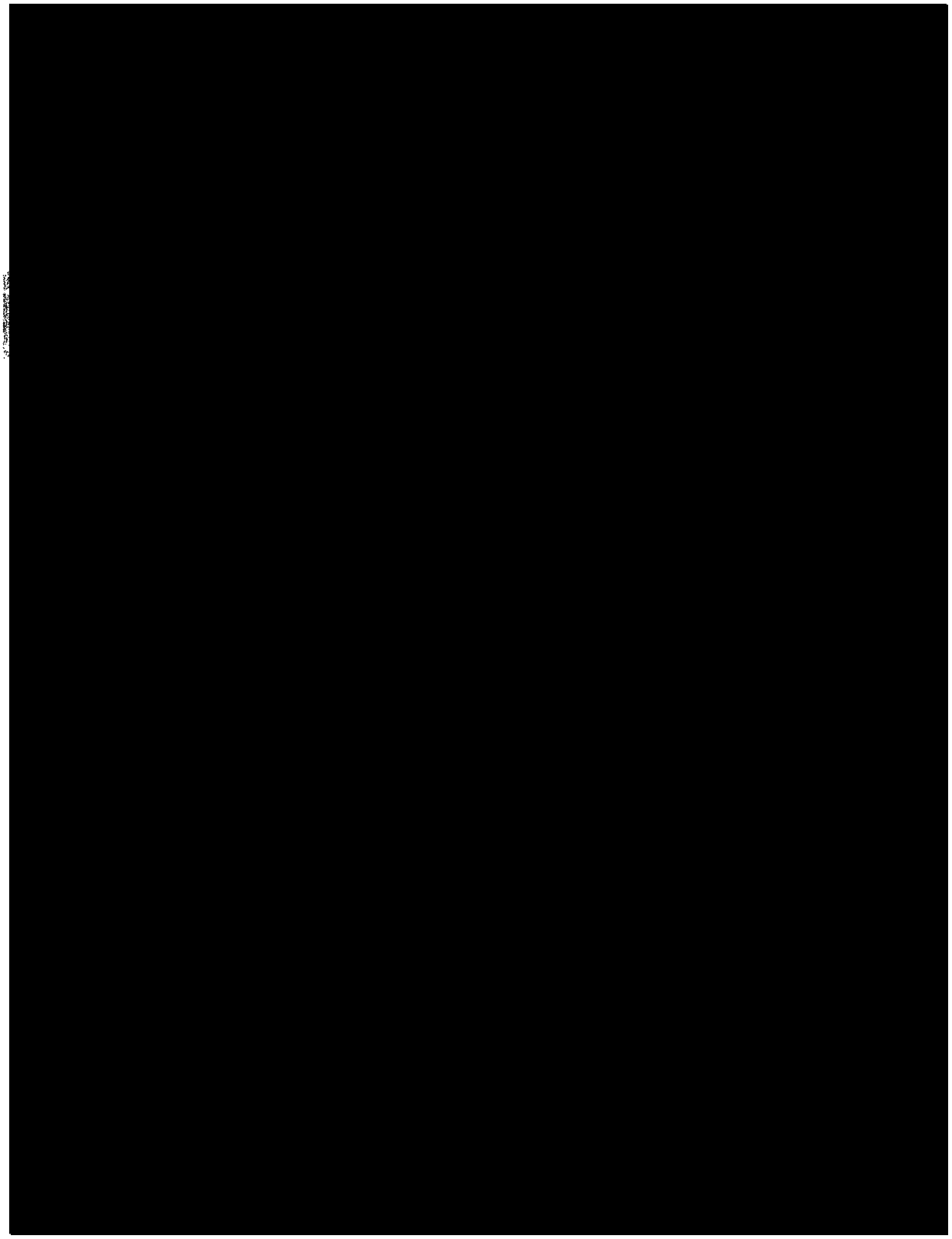

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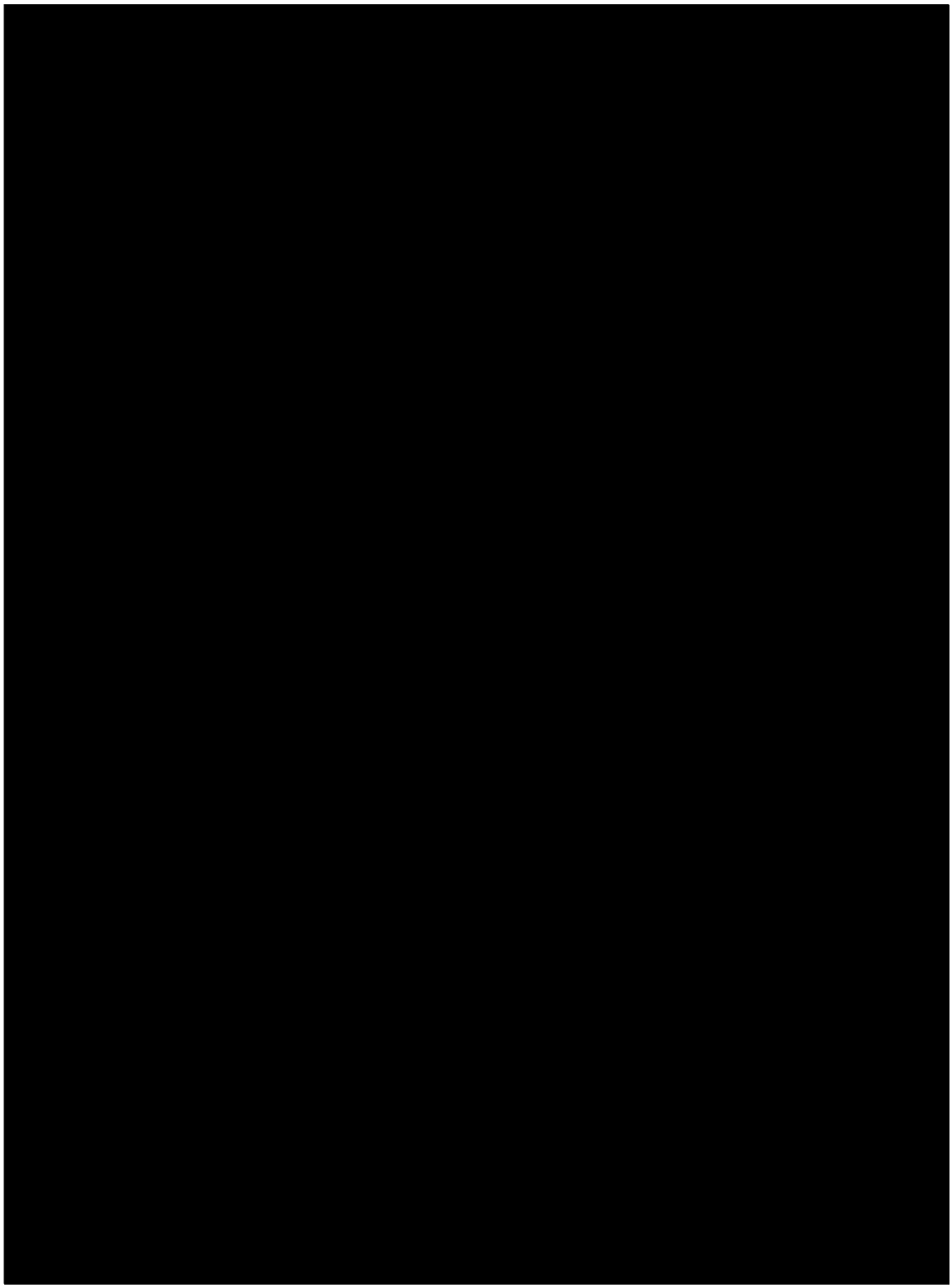


3.A. Organization

Company Overview

VSC Fire & Security is a full service fire protection company serving over 2,300 customers in the Roanoke district and over 84,500 company-wide. The company currently has offices in Arkansas, Alabama, Florida, Georgia Maryland, North Carolina, South Carolina, and Texas, Virginia, where our Corporate Headquarters are located.

Operations and Service Overview: VSC Fire & Security is a leading fire and life safety contractor, capable of inspecting, testing and maintaining all life safety systems within the fire protection industry.

Inspection: Under the direction of the Inspections Manager, our inspection staff performs extensive inspection and testing of all types of fire suppression and fire extinguishers.

Service: Under the direction of the Service Manager, our service department personnel respond to emergencies, install and repair fire suppression systems. The department maintains a close working relationship with customers and vendors to ensure that schedules and contracts are met.

Alarm: Under the direction of the Alarms Manager, our alarms department staff works closely with all customers to install or repair all fire alarm systems. They also respond to emergency calls if the alarm company calls us with a fault.

3.B. Organization

Sub-Contractor Arrangements

VSC Fire & Security will not be having Subcontracts on this project.

CONTACT INFORMATION

3.C.

ALABAMA

MOBILE
4940 Tufts Road
Mobile, AL 36619
Phone (251) 706-8100
Fax (251) 706-8101
Toll Free (855) 615-4872

ORANGE BEACH
22653 Canal Road
Orange Beach, AL 36561
Phone (251) 970-3473
Fax (251) 970-2989

FLORIDA

TAMPA
6901 Bryan Dairy Road, Suite 110
Largo, FL 33777
Phone (727) 456-5200
Phone (800) 373-3473
Fax (727) 456-5201

ORLANDO
2401 Lynx Lane, Suite 2
Orlando, FL 32804
Phone (407) 679-3332
Fax (407) 679-1733

GEORGIA

ATLANTA
1780 Corporate Drive. Suite 425
Norcross, GA 30093
Phone (678- 252-0600
Fax (678) 252-0601

MARYLAND

BALTIMORE
10640 Iron Bridge Road, Suite G
Jessup, MD 20794
Phone (301) 575-1500
Phone (800) 999-1356
Fax (301) 575-1501

NORTH CAROLINA

RALEIGH
343 Technology Drive
Suite 2110
Garner, NC 27529
Phone (919) 645-5880
Phone (800) 840-2553
Fax (919) 645-5881

CHARLOTTE
3109 Westinghouse Blvd.
Charlotte, NC 28273
Phone (704) 805-9700
Fax (704) 805-9701

SOUTH CAROLINA

MYRTLE BEACH
609 Seaboard Street
Myrtle Beach, SC 29577
(843) 443-3260
Fax (843) 443-3261

CHARLESTON
7271-A Investment Drive
North Charleston, SC 29418
Phone: 843-416-1300
Fax: 843-416-1301

VIRGINIA

RICHMOND FIRE PROTECTION
10343-A Kings Acres Road
Ashland, VA 23005
Phone 804-459-2200
Phone (800) 695-9596
Fax (804) 459-2201

RICHMOND
SECURITY & LOW VOLTAGE
9424-J Atlee Commerce Blvd.
Ashland, VA 23005
Phone (804) 412-1330
Phone (800) 695-9596
Fax (804) 412-1331

VIRGINIA BEACH
1417 Miller Store Road, Suite C
Virginia Beach, VA 23455
Phone (757) 213-3660
Phone (800) 395-9599
Fax (757) 213-3661

ROANOKE
773 Union Street
Salem, VA 24153
Phone (540) 765-1300
Phone (800) 678-3339
Fax (540) 765-1301

WASHINGTON, DC

FIRE PROTECTION
7708 Fullerton Road
Springfield, VA 22153
Phone 703-584-2200
Phone (800) 866-8638
Fax 703-584-2201

SECURITY & LOW VOLTAGE
7839C Rolling Road
Springfield, VA 22153
Phone (703) 584-2250
Phone (800) 866-8638
Fax (703) 584-2251

VSC FIRE & SECURITY HEADQUARTERS

10343-B Kings Acres Road
Ashland, VA 23005
Phone (804) 459-2220
Phone (800) 695-9596
Fax (804) 459-2221

MORE THAN 50 YEARS 1958 2017 OF EXPERIENCE & STABILITY

visit us online at vscfs.com

3.D. Organization

UNION

April 12, 2018

To whom it may concern,

RE: VSC Fire & Security, Inc. and Arkansas Automatic Sprinklers, its subsidiary (referred to below as "VSC Fire").

Ladies and Gentlemen:

[redacted]

Sincerely,

Mark R. Westbrook
Senior Vice President
Union Bank & Trust

4.A. About VSC Fire & Security, Inc.

History of VSC Fire & Security, Inc.

As a privately held company headquartered in Ashland, Virginia, VSC Fire & Security's heritage as a leader in the fire protection industry is based upon the sterling reputation of Virginia Sprinkler Company, Inc., the founding company of VSC Fire & Security, Inc.

1958 Virginia Sprinkler Company, Inc. is founded in 1958 in Ashland, Virginia by Roland C. Giles and V.M. Buck. In fact, Mr. Giles began the fire sprinkler company from his office in his family home.

1965 Virginia Pipe and Supply Company, Inc. is founded to provide in-house pipe fabrication services to the growing company.

1972 Martin L. Giles, son of co-founder Roland C. Giles, becomes President.

1973 Expansion of Virginia Sprinkler Company, Inc. into the Northern Virginia/Metro DC region under the direction of John C. McDonald.

1990 VSC Corporation, Inc. is established as a holding corporation for the firm's expanding fire sprinkler companies.

1998 Virginia Fire Protection, Inc. is established. Beta Systems of Virginia, Inc. in the Chesapeake, Virginia area is acquired. The 40th Anniversary of the company is celebrated.

1999 VSC Corporation headquarters building constructed in Ashland, Virginia.

2001 John C. McDonald is named President of VSC Corporation. Martin L. Giles becomes Chairman of VSC Corporation.

2002 Precision Sprinkler Company, Inc. in the Raleigh, North Carolina area is acquired.

2003 Virginia Sprinkler Company Inspection Services, Inc. is established. Worsham Sprinkler Company, Inc. joins VSC Corporation with offices in Georgia, North Carolina, South Carolina and Virginia.

2007 Industrial Fire & Safety in the Tampa, Florida area is acquired.

2008 The 50th Anniversary of the company is celebrated. Southeastern Fire Control, Inc. in Charlotte and Davy Fire Protection in Orlando, Florida are acquired.

2009 VSC Corporation becomes VSC Fire & Security, Inc. Virginia Sprinkler Company, Inc.; Virginia Fire Protection, Inc.; Industrial Fire & Safety Inc.; Davy Fire Protection; Precision Sprinkler Company; Southeastern Fire Control, Inc.; Virginia Sprinkler Company Inspections Services, Inc.; and Worsham Sprinkler Company transition to the VSC Fire & Security name.

2011 VSC Fire & Security acquires certain assets of Fire Protection Specialists, Inc. and establishes an office in Mobile, Alabama.

2014 An office is opened in Orange Beach, Alabama.

2018 Acquired Arkansas Automatic Sprinklers, Inc. DBA United Fire Suppression and Delta Fire & Safety, Inc.

As an industry leader in the Southeastern and Mid-Atlantic regions of the United States, VSC Fire & Security, Inc. delivers integrated, leading-edge fire protection, life safety, and security solutions.

4.B. About VSC Fire & Security, Inc.

VSC Mission and Values

For more than 60 years, VSC Fire & Security, Inc. has partnered with thousands of customers as a trusted contractor for the inspection and installation of fire sprinkler, fire alarm, security, life-safety and low voltage systems. VSC Fire & Security, which is a privately held company with annual sales of over $200 million, over 1200 employees, including over 700 fire protection and security project managers, technicians, installers and inspection technicians, and a fleet of more than 600 vehicles. VSC Fire & Security operates from nineteen offices located in Arkansas, Alabama, Florida, Georgia, Maryland, North Carolina, South Carolina, Virginia, and Texas.

Founded in 1958 with the values of quality craftsmanship, exceptional customer service and solid company values of integrity and reliability, VSC Fire & Security offers highly trained technicians, a strong safety record, cutting-edge technological expertise, exceptional bonding capacity and financial strength. Serving the mid-Atlantic and southeast regions of the United States, VSC Fire & Security delivers outstanding, efficient and cost-effective installation with reliable repair and inspection services to a wide range of clients including universities, medical facilities, military bases, retail establishments, office buildings and data center clean rooms.

4.C. About VSC Fire & Security, Inc.

Safety

The safety and health of each employee is a priority for VSC Fire & Security. The Company supports a comprehensive, written Safety Program and is committed to providing a safe working environment for each employee. The Corporation makes every effort to comply with all federal and state workplace safety requirements, monitor job site safety, and provide safety training.

Each employee is expected to obey all safety rules, wear all appropriate personal protective equipment, and exercise caution and common sense in all work activities. Newly hired field employees are required to complete a Safety Orientation upon hire to ensure their awareness and avoidance of unsafe conditions, the safe handling and use of materials and equipment, and also the notification and abatement of potential dangerous hazards in the employee's work environment.

All employees are periodically trained to recognize and avoid potential hazards associated with work in the construction trades. Foremen and Superintendents are responsible for weekly "safety talks" with their work teams, and the Corporation provides mandatory safety workshops to maintain a high level of safety awareness.

Employees who do not follow safety instructions, safety procedures or policies of the Company, or other job site safety requirements, may be subject to disciplinary action, up to and including termination.

For more detailed information on all safety procedures and policies, employees should refer to the Health & Safety Program manual(s) provided to them during Orientation. These manual(s) are also available to them electronically through each division office and/or the Corporate Risk & Safety Department

4.D. About VSC Fire & Security, Inc.

Code of Business Ethics and Conduct

VSC Fire & Security insists on the highest ethical standards in conducting its business. Doing the right thing and acting with integrity are two of the driving forces behind VSC's success story. Business should be conducted in a manner that excludes considerations of personal advantage or gain and should always be in the best interest of the Company and its customers. All employees are expected to abide by the following guidelines:

BUILD TRUST AND CREDIBILITY - The success of our business is dependent on the trust and confidence we earn from our employees and customers. We gain credibility by adhering to our commitments, displaying honesty and integrity and reaching Company goals solely through honorable conduct.

UPHOLD THE LAW - Our commitment to integrity begins with complying with laws, rules and regulations where we do business. Further, each of us must have an understanding of the Company policies, laws, rules and regulations that apply to our specific jobs. We are responsible for preventing violations of the law and for speaking up if we see possible violations.

OPEN AND HONEST COMMUNICATION – We strongly believe that every employee should feel comfortable to speak his or her mind, particularly with respect to ethics concerns. Managers have a responsibility to create an open and supportive environment where employees feel comfortable raising such questions or concerns.

RESPECT - We all deserve to work in an environment where we are treated with dignity and respect. We are an equal employment/affirmative action employer and are committed to providing a workplace that is free of discrimination and any type of abusive, offensive or harassing behavior.

CONFLICTS OF INTEREST - We must avoid any relationship that might impair our ability to make objective and fair decisions when performing our jobs. We must never use the Company's property or information for personal gain or personally take for ourselves any opportunity that is discovered through our position with the Company. Determining whether a conflict of interest exists is not always easy to do. Therefore, before engaging in an activity, transaction or relationship that might give rise to a conflict of interest, employees must seek review from their Division Manager or Human Resources.

GIFTS, GRATUITIES AND BUSINESS COURTESIES - The Company is committed to competing solely on the merit of our products and services, and should avoid any actions that create a perception that favorable treatment of outside entities was sought, received or given in exchange for personal gain. We will neither give nor accept items that could constitute unfair business inducements that would violate law, regulation or policies of the Company or customers, or would cause embarrassment or reflect negatively on VSC's reputation.

CONFIDENTIAL AND PROPRIETARY INFORMATION - Integral to VSC Fire & Security's business success is our protection of confidential Company information, as well as nonpublic information entrusted to us by employees, customers and other business partners. Confidential and proprietary information includes such things as pricing and financial data, customer names/addresses or non- public information about

4.D. Continued

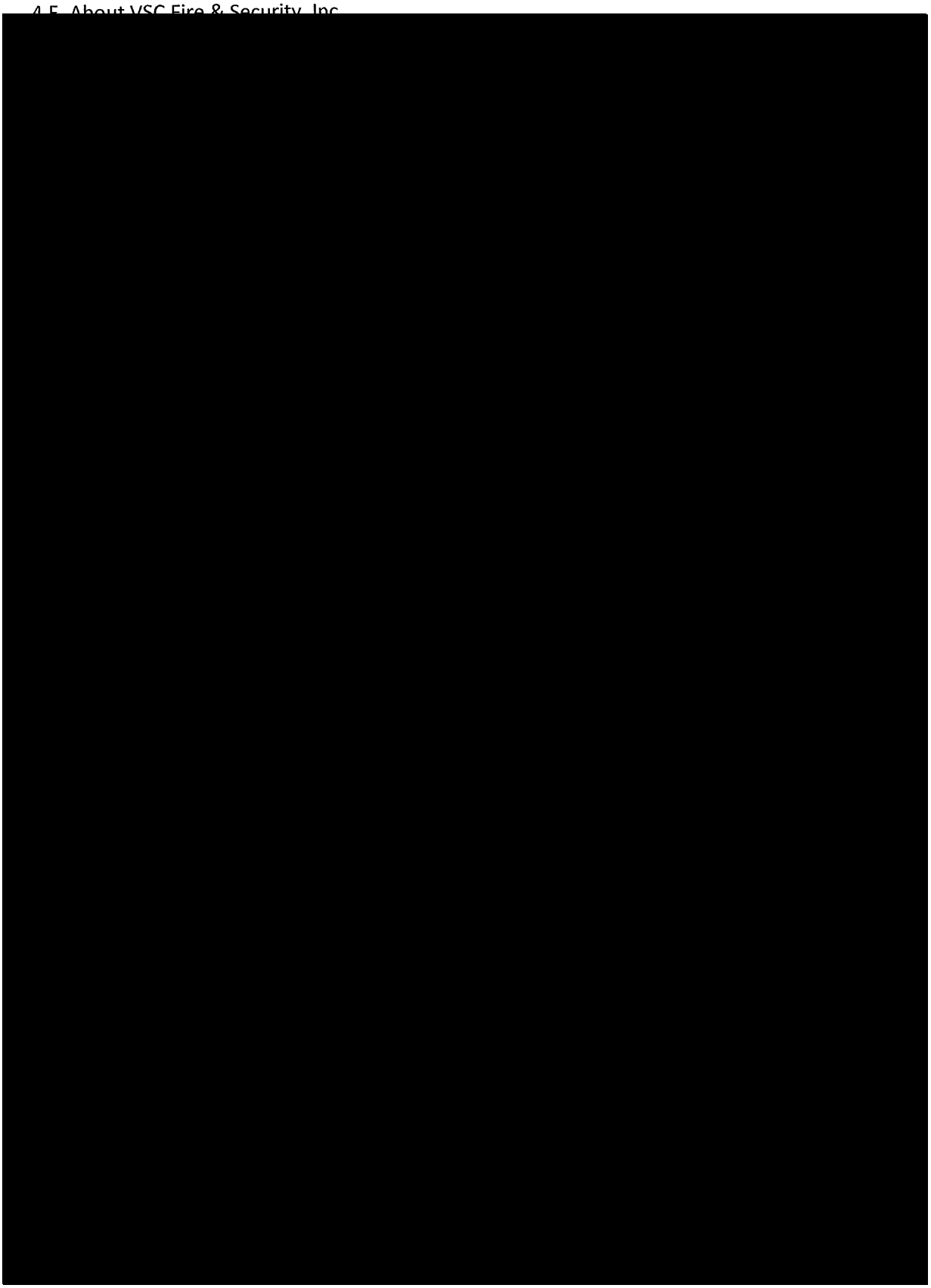
other companies, including current or potential suppliers and vendors. We will not disclose confidential and nonpublic information without a valid business purpose and proper authorization. We will not acquire or seek to acquire by improper means a competitor's trade secrets or other proprietary or confidential information. We will not engage in unauthorized use, copying, distribution or alteration of software or other intellectual property.

USE OF COMPANY RESOURCES - Company resources, including time, material, equipment and information, are provided for Company business use. They are not for personal use unless authorization from management is received.

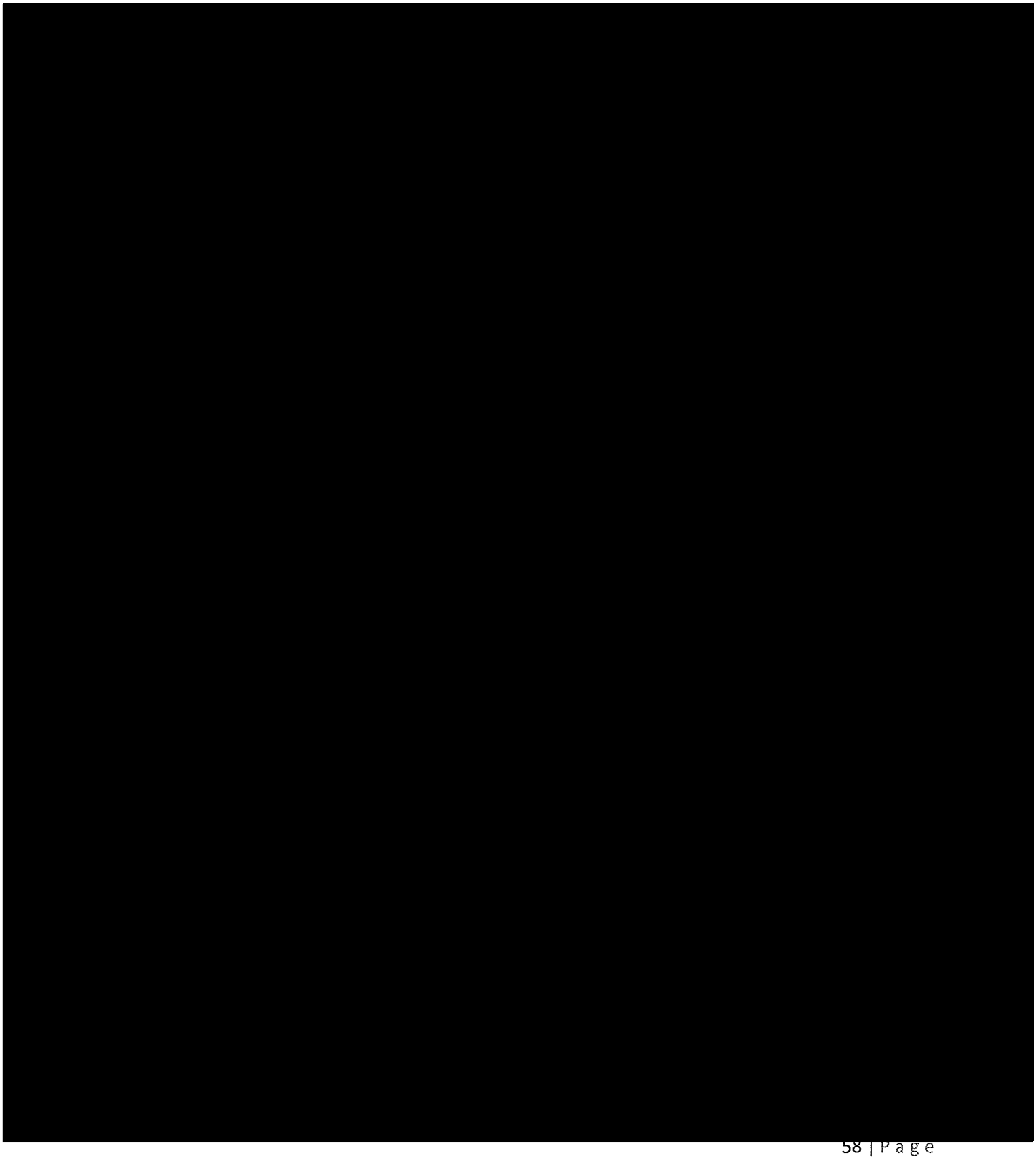
Every employee has the responsibility to report suspected violations and express concern regarding compliance with these guidelines, and employees are encouraged to contact their manager, Human Resources or any Officer of the Company regarding any concerns they may have. In addition, when faced with ethical issues, employees are expected to make a professional decision consistent with the Company's principles and standards. If employees are unsure of the professional decision to make or are unclear on any Company principle or standard, they are expected to discuss the issue or situation with their manager.

We require our employees to follow these guidelines. If any employee chooses to disregard the guidelines outlined in this policy, he or she will be subject to the appropriate disciplinary action, up to and including termination.

4.5 About VSC Fire & Security, Inc.



4.F. About VSC Fire & Security, Inc.



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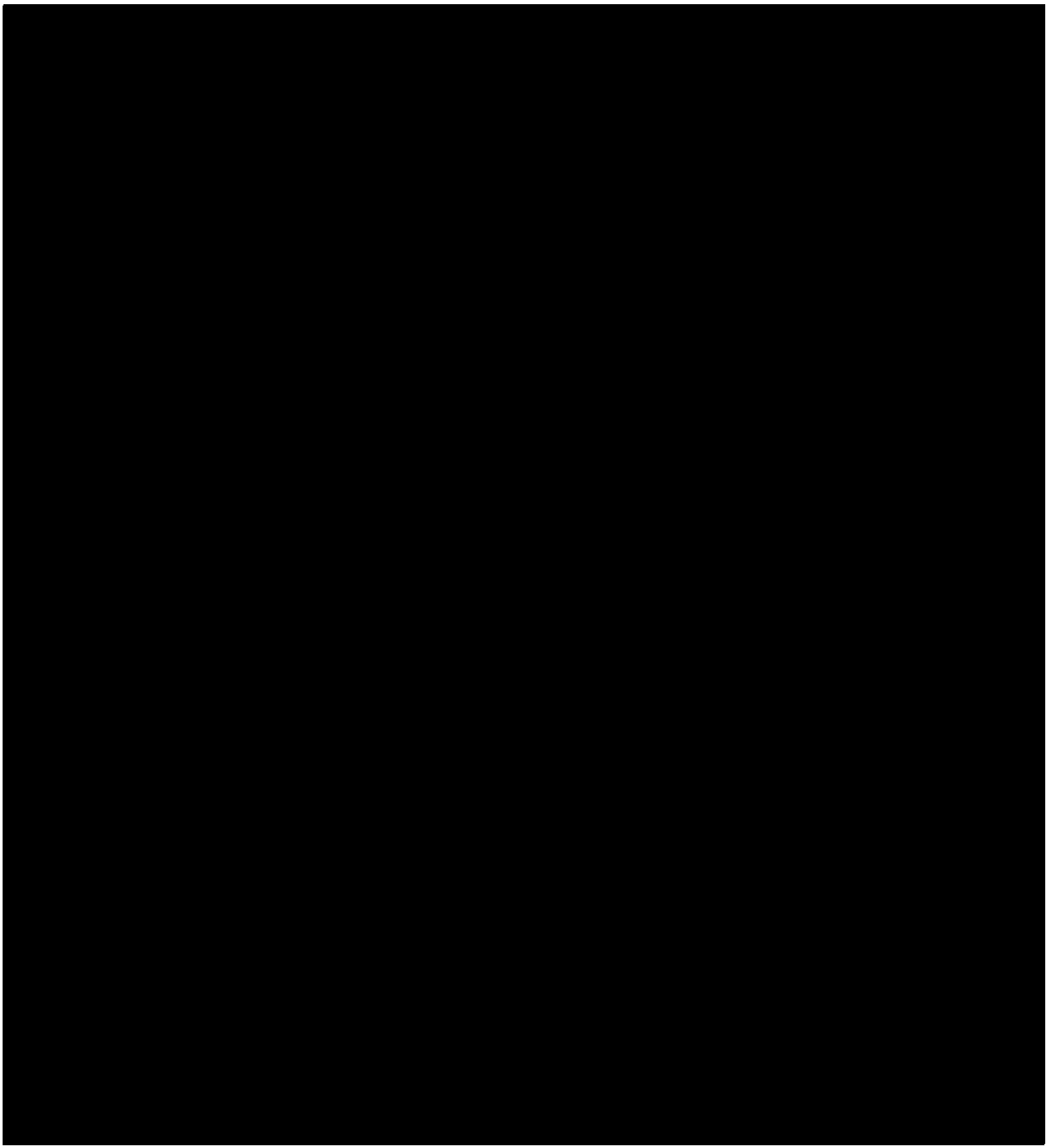

5.A. Plan For Providing Serviced

Management Plan

Because of our overwhelming focus on inspection, testing and maintenance, VSC Fire & Security has developed a comprehensive plan to manage these processes.

A computerized tracking program is in place to monitor all inspection contracts and to notify our division managers thirty days ahead of schedule, as the inspections are due. Inspections are scheduled with the customer point of contact at least two weeks prior to the due date. Adequate manpower is then assigned to the project. If awarded this contract, we intend to utilize the same staff throughout the entire course of this project to ensure continuity of service.

VSC Fire & Security manages the inspection process in the following manner:

1. The inspections manager reviews the contract requirements and assesses specific needs
2. The inspection manager assigns qualified technicians to buildings based on the type of systems in the building, the number of systems, the equipment needed to perform the inspection, the procedures for the inspection and the skill level required by the technician
3. The inspection manager then reviews total hours required to perform the various inspections to establish a schedule
4. The contract administrator enters information for the entire contract into our Service Trade program. Once this information is entered, a computer generated work order is printed 15 days in advance of the required inspection schedule and given to the responsible technician
5. After the scope of work is reviewed, the technician ensures that he/she has the proper tools, equipment, reports, tags, seals and other testing necessities to perform the inspection.

5.B. Plan For Providing Services

Quality Plan

Drug Screens

VSC Fire & Security test all potential employees before offering a position with our company. We also drug screen for any near miss, vehicle accident. And any job related incident is subject to a random drug screen.

DMV Driving Record & Background Check:

VSC Fire & Security goes through the DMV to check the driving record of each employee that may drive a company vehicle prior to being hired. We also re-check each drivers record every year to make sure they have not accumulated no more than nine (9) points in a three year timeframe. If they do, they have to take a safe driver class. All managers, supervisors, foreman and office personnel have background checks before being hired.

Orientation

All employees beginning work, whether new hire or rehire, goes through a half day of orientation. This includes our company handbook, safety videos, policies and procedures.

Training

We offer training in many different ways and options to help meet the needs of our employees. Some of our training is by book and manuals, one-on-one classroom, web based, presentation slides, or hands on training.

Apprentice Program

VSC Fire & Security, Inc. does offer an Apprentice Program for those interested. First year apprentices will be registered with The Virginia Department of Labor and will receive an apprenticeship card. The apprentice must be at least 18 years of age. The apprentice must possess a high school diploma or must have passed the GED exam.

During the term of the apprenticeship, the apprentice will be under the supervision of the apprenticeship committee. The committee shall be obligated to protect the apprentice's welfare and also to instruct and direct him or her. A journey person will be responsible for the supervision of the apprentice's on the job training. The supervisor will be responsible for seeing that the apprentice is trained in all branches of the trade, including safety in the use of tools and equipment and in job conduct

5.B. Continued

Safety Incentive Program

All VSC Fire & Security field employees are eligible for recognition.

The risk management team, through its observation of employee's job performance and commitment to standards of practice, will recognize employees for their contributions.

Managers can also nominate employees for recognition. The Risk Management team will evaluate each nomination to determine award type.

6.A. Description of Specific Services

Service Providers

VSC Fire & Security Inspectors that will perform all routine scheduled inspections and test:

- Barry Hensley
- Cory Jones
- Trevor Smith

In the event of illness or injury, VSC Fire & Security has a team of qualified technicians to serve as back up:

- John McLain III
- Eric Hurt
- Dale Yopp

VSC Fire & Security has highly qualified Service Technicians personnel:

- Mike Yopp
- Christopher Preston
- Sherman Hale
- Ronald Miller
- Jason Bell

VSC Fire & Security will provide a two (2) person crew for each inspection. We will provide a three (3) person crew, if needed, to fulfill contract obligation to monitor the fire control panel.

6.B. Description of Specific Services

Inspection Specific Requirements

The inspection, testing and maintenance requirements that apply to your building's fire sprinkler system start from the date of initial installation and continue on at specific intervals throughout the life of the system. What follows is a brief synopsis of some of the major requirements you need to be aware of.

Monthly

The following monthly inspections can be performed by facility staff:

1. Visually inspect control valves to ensure that they are:
    - In normal open position
    - Accessible
    - Properly sealed
    - Locked and/or supervised
    - Free from leaks
    - Provided with appropriate signage identifying the portion of the system they control
2. Visually inspect gauges on wet pipe systems to verify that they are in good condition and that normal water pressure is being maintained.
3. Visually inspect gauges on dry pipe systems to verify that they are in good condition and that normal air and water pressure is being maintained.
   Note: Where air pressure is not supervised at a constantly attended location, these gauges need to be inspected on a weekly basis.

Quarterly

1. The following quarterly inspections are in addition to those required monthly and can be performed by facility staff:

a. For hydraulically designed sprinkler systems, inspect the hydraulic nameplate to verify that it's securely attached to the sprinkler riser and is legible.
   Note: Most newly installed fire sprinkler systems are now hydraulically designed. When in doubt, ask your sprinkler contractor.
b. Inspect alarm devices to verify that they are free of physical damage.
c. Inspect fire department connections to verify that:
    - They are visible and accessible
    - Couplings or swivels are not damaged and rotate smoothly
    - Plugs or caps are in place and not damaged
    - Gaskets are in place and in good condition
    - Identification signs are in place
    - The check valve is not leaking
    - The automatic drain valve is in place and operating properly

6.B. Continued

2. With proper training the following quarterly tests can be performed by facility staff:
a. Test the waterflow alarm on wet pipe sprinkler systems by opening the inspector's test connection. This simulates the opening of a sprinkler head.
   Note: Where freezing weather conditions or other circumstances prohibit the use of the inspector's test connection, the bypass connection is allowed to be used.
b. Test the waterflow alarm on dry pipe sprinkler systems *by using the bypass connection.*
   Caution: *Opening the inspector's test connection can cause the system to trip accidentally, allowing the pipes to fill with water and creating a potential for a serious freeze problem.*

Annual

In addition to the monthly and quarterly inspections and tests, NFPA 25 has a very detailed and specific inspection, testing and maintenance services that need to be performed an annual basis. Because of their complexity, and to comply with NFPA 25, these services must be performed by a licensed sprinkler contractor and would include such things as:

- An inspection of the facility's supply of spare sprinkler heads to ensure that there are a minimum of two sprinklers of each type and temperature rating and that there is a sprinkler wrench for each type of sprinkler.
- A check of all sprinklers, hangers, pipe and fittings
- Testing of the main drain
- Testing of any antifreeze solution used
- Testing and maintenance of valves

Dry pipe sprinkler systems require some additional testing and maintenance. Priming water level, low pressure alarms and quick-opening devices must be tested. An annual trip test is also required.

Long Term

1. A full flow trip test is required for dry pipe sprinkler systems every 3 years [see NFPA 25(14), Sec. 9-4.4.2.2.1 or NFPA 25(14), Sec. 12.4.4.2.2.2].
2. Sprinkler system gauges typically have a life expectancy of 10 to 15 years. As a result, these gauges must be replaced every 5 years or tested every 5 years by comparison to a calibrated gauge. Gauges not accurate to within 3 percent of the full scale must be recalibrated or replaced [see NFPA 25(14), Sec.2-3.2 or NFPA 25(14), Sec. 5.3.2].
3. System check valves must be inspected internally every 5 years to verify that all components operate properly, move freely and are in good condition [see NFPA 25(14), Sec. 9-4.2.1 or NFPA 25(14), Sec. 12.4.2.1].
4. The 2014 edition of NFPA 25 has specific requirements dealing with testing of sprinkler heads that have been in service for an extended period of time [see NFPA 25(14), Sec. 2-3.1]. These requirements, which emphasize the importance of knowing the history of your facility's fire sprinkler system, would include:
   a. Sprinkler manufactured prior to 1920 must be replaced.

6.B. Continued

b. Representative samples of solder-type, extra-high temperature sprinklers (i.e. 325°-375° F) that are exposed to semi-continuous or continuous maximum allowable ambient temperature conditions are required to be tested at 5 year intervals. These would be sprinklers you might find, for example, in your boiler room and would have red-colored frame arms.
c. Sprinklers manufactured using fast response elements that have been in service for 20 years are required to be tested. Retesting is required at 10 year intervals.
d. Sprinklers that have been in service for 50 years must be replaced. An alternative is to submit representative samples from one or more sample areas to a recognized testing laboratory acceptable to the AHJ for testing. Such tests are required to be repeated at 10 year intervals.
e. Sprinklers in service for 75 years are required to be replaced or representative samples submitted for testing. Retesting is then required at 5 year intervals.

5. The 2014 edition of NFPA 25 has the following additional testing requirements [see NFPA 25(14), Sec. 5.3.1]:
   a. Dry sprinklers that have been in service for 10 years must be tested or replaced. They must be re-tested at 10 year intervals.
   b. Where sprinklers are subjected to harsh environments, including corrosive atmospheres and corrosive water supplies, the sprinklers must be replaced or representative samples tested every 5 years.

      Note: "Harsh environments" have been interpreted to include areas exposed to outside weather (e.g. sprinklers installed under exterior canopies) and cold storage areas (e.g. coolers and freezers).

Fire Pumps

1. Fire pumps, where present, are also subject to very specific inspection, testing and maintenance requirements to help ensure that they will function properly when needed. Some of the basics include:
   a. Fire pumps must be inspected weekly to verify that the pump assembly appears to be in operating condition and is free from physical damage [see NFPA 25(14), Sec. 5-2 or NFPA 25(14), Sec. 8.2 for specific conditions that must be checked].
   b. Fire pump assemblies must be tested weekly [see NFPA 25(14), Sec. 5-3.2 or NFPA 25(14), Sec. 8.3 for specific observations and adjustments that need to be made while the pump is running].
   c. An annual test of the fire pump assembly is required. This test must be conducted under minimum, rated and peak flows of the pump [see NFPA 25(14), Sec. 5-3.3 or NFPA 25(14), Sec. 8.3.3 for specific visual observations, measurements and adjustments that need to be made while the pump is running and flowing water under the specified output condition].
2. NFPA 25 requires that a preventative maintenance program be established on all components of the pump assembly in accordance with manufacturer's recommendations [see NFPA 25(14), Sec.5-5 or NFPA 25(14), Sec. 8.5].

   Note: NFPA 25 provides a helpful table to use in the absence of manufacturer's recommendations for preventative maintenance [see NFPA 25(14), Table 5-5.1 or NFPA 25(14), Table 8.5.3].

6.C. Continued

Inspection Layout

System Types

The requirements contained in NFPA 25 are based on the type of sprinkler system installed. Some buildings contain both types of systems – a wet pipe system in heated areas and a dry-pipe system in unheated areas. Simply put, a *wet pipe sprinkler system* is a piping system containing water so arranged that water discharges immediately from sprinklers activated by heat from a fire. A *dry pipe sprinkler system* is a piping system containing air or nitrogen under pressure so arranged that upon activation of a sprinkler, the loss of air pressure allows the valve to activate, releasing water to flow into the systems and out of the open sprinkler.

Definitions

In order to follow the requirements of the standard, it's important to have a good understanding of what's meant by "inspection", "testing" and "maintenance". Those terms are defined in NFPA 25 (2014), Sec. 1-5 as follows:

- *Inspection*. A visual examination of a system or portion thereof to verify that it appears to be in operating condition and is free of physical damage.

Applicable Standards

1. Specific requirements relating to the inspection, testing and maintenance of fire sprinkler systems can be found in:
- Chapters 2 and 9 of the 2014 edition of NFPA 25
- Chapters 5 and 12 of the 2014 edition of the NFPA 25
2. Specific requirements relating to the inspection, testing and maintenance of fire pumps can be found in:
- Chapter 5 of the 2014 edition of the NFPA 25

Chapter 8 of the 2014 edition of the NFPA 25

6.D. Continued

Inspection Schedule Overview

VSC Fire & Security will lay out a schedule for quarterly inspection where one third of the sprinkler system will be done each month for three months to fulfill one hundred percent of quarterly test. VSC Fire & Security will also do the monthly and weekly services on the buildings not having a quarterly.

The annual inspection will be done June thru August when there are fewer students and staff in the buildings. The annual sprinkler inspections include a visual of all sprinklers and piping where exposed and need access to all areas of the building.

7.A. Reporting Documentation

Description of Certification and Reporting Document

Use of Technology

VSC Fire & Security has always strived to provide customers with service that has been recognized as a leader within the industry. This commitment is ongoing within VSC Fire & Security to constantly review its business processes to meet its customers' needs and requirements competitively. The review of these business processes are performed to ensure the value of the services provided meet or exceed customers' expectations, both from a service side and from a cost perspective. VSC Fire & Security continues to make investments in resources, suppliers and technology to provide the best business processes to its customers and the industry.

Productivity improvements have been made in many areas with VSC Fire & Security resources, suppliers and technology. One of the areas VSC Fire & Security has committed to improve is its inspection data capture and reporting process.

There are numerous improvements in this new initiative, both externally and internally. Some of the more significant external improvements include the following:

- VSC Fire & Security field technicians will be using tablets in the field to capture inspection data and create inspection reports for its customers. These reports can be reviewed through print preview on the tablet much like reviewing a Microsoft Word document on a laptop and then formally created and emailed to all required parties.
- Customer's equipment will be captured in greater detail allowing for better analysis of systems and specific equipment in those systems.
- Improved compliance reporting of NFPA codes using standardized conventions around inspections with improved tracking and reporting on outstanding deficiencies.
- The implementation of these mobility solutions will give VSC Fire & Security better communication abilities with its resources allowing greater flexibility to respond to any customer's urgent or emergency situations.

VSC Fire & Security is committed to improving its business processes through technology and other resources to ensure that the value of service always meets or exceeds the customer's expectations. Through its strategic planning processes, VSC Fire & Security will continue to implement technology in its business processes to keep its standards at the highest level.

VSC Fire & Security also has a customer portal, where customers will have direct access to all of their reports, scheduled work and invoices.

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VSC Fire & Security, Inc.

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FIRE · SECURITY

www.VSCFire.com

Important *: Deficiencies, comments and explanations of any* ***FAIL*** *or* ***NEGATIVE*** *responses are indicated on the* ***Work Acknowledgment*** *attachment for this Inspection/Test.*

Frequency:	Quarterly	**Inspection Type:**	Water-Based Fire Protection System Inspection
In Accordance with:	The NFPA 25 Standard, applicable Year Edition		
Technician's Name:	Example Report	**Inspection Date:**	1/1/2019

LOCATION

Location Name:	Virginia Polytechnic Institute and State University (Virginia Tech)				
Street Address:	230 Sterrett Drive				
City:	Blacksburg	**State:**	VA	**Zip Code:**	24061

BILLING

Billing Name:	Virginia Polytechnic Institute and State University (Virginia Tech)				
Street Address:	300 Turner Street NW, North End Center, Suite 2100 (Attn: Daysha Holmes)				
City:	Blacksburg	**State:**	VA	**Zip Code:**	24061

CONTACT INFORMATION

Name:	Kathryn Dicken	**Phone:**	(xxx) xxx-xxxx
Email:	Customers email address here		

NOTIFICATIONS

☐ ***NOTE*** *: If checked, this Inspection test does not require disabling/restoring a Fire System and/or notifying a Monitoring Service.*

Date(s) put on test:	1/1/2019	**Time(s) put on test:**	8:00am
Date(s) restored:	1/1/2019	**Time(s) restored:**	5:00pm

Monitoring Company and Operator Name(s) notified of test and restoral: Monitoring Entity

Name(s) of Owner, Owner's Rep., Occupants and/or Tenants notified of test, restoral and any deficiencies:

Contact Person's, or other's notified name(s)

Local Emergency Services, AHJ, or Insurance Rep. notified of test, restoral or any impairments, if required:

Dispatch Center

TECHNICIAN'S COMMENTS

Any known adverse conditions noted which existed prior to this inspection and test:	Issues regarding restoral, or conditions which preclude restoral of Fire Protection Equipment/System(s):
No existing problems were brought to our attention or noted prior to this inspection/test. EXAMPLE REPORT	All systems have been restored, no apparent problems noted on system still existing after inspection/test. EXAMPLE REPORT

Dated Service Requirements Summary

** Indicates not considered part of normal contract. (YES = Service Due)	YES	NO	N/A	Due Date
1. Dry pipe valve 3 year full flow trip test due?	☒	☐	☐	This Insp
2. Preaction valve 3 year full flow trip test due?	☒	☐	☐	This Insp
3. Deluge valve annual full flow trip test due?	☒	☐	☐	This Insp
4. Are check valves due for 5 year internal inspection? **	☐	✓	☐	2023
5. Are gauges due for 5 year calibration or replacement? **	☐	✓	☐	2023
6. Is a 5 year internal obstruction inspection due? **	☐	✓	☐	2023
7. Is a 5 year hydrostatic test of FDC piping due? **	☐	✓	☐	2023
8. Dry pipe and Preaction systems due for 3 year air leak test? **	☒	☐	☐	This Insp
9. Wet standpipe systems 5 year flow test due? **	☐	☐	✓	
10. Dry standpipe system 5 year year hydrostatic test due? **	☐	☐	✓	
11. Is an annual ice obstruction inspection due? (freezers) **	☐	☐	✓	
12. Pressure regulating/restricting valves 5 year flow test due? **	☐	☐	✓	
13. Water storage tank 3 year/5 year internal inspection due? **	☐	☐	✓	
14. Sprinklers in Harsh Environments 5 Year Sample Test due? **	☐	✓	☐	2022
15. Dry-type sprinklers 10 year sample test due? **	☐	☐	✓	
16. Fast Response sprinklers 20 year/10 year sample test due? **	☐	✓	☐	2025
17. Sprinkler which are 50 years or older due for sample test? **	☐	✓	☐	2035

Annual Pipe and Sprinkler Inspection

Date Last Annual Inspection: 1/1/2019

As per NFPA 25, only pipe and sprinklers which are visible from floor level inspected	PASS	FAIL	N/A
Pipe, hangers, seismic bracing free of damage, loading, corrosion and missing components?	✓	☐	☐
Sprinklers free of foreign materials, damage, corrosion, misalignment and of proper type?	✓	☐	☐
Spare sprinklers and appropriate wrenches present?	✓	☐	☐

Fire Department Connection Inspection and Information

ID # / Area / Location	PASS	FAIL	N/I
(Virginia Tech Building Name - Example Report)	✓		

Wet Riser Systems

Riser Information & Inspection

ID # / Area / Location	Manufacturer	Model	Size
Wet Riser #1 - 1st Fl, Large Mech Rm back corner	Globe	H	6"

Visual inspection of riser and components acceptable? PASS

Hydraulic Data Plate present and legible, if applicable? PASS

Water Motor Gong and/or Riser Electric Bell in good condition and functional, if applicable? PASS

Inspection Tag Color? N/A

Seal #(s), if applicable: Alarm Line = 552312

Riser Main Drain Test

Static Pressure	Residual Pressure	Static Pressure	Return Time (sec)	Drain Test Acceptable?
155	145	155	2	PASS

Riser Information & Inspection

ID # / Area / Location	Manufacturer	Model	Size
Wet Riser #2 - Basement, Fire Pump Room	Viking	EZ Riser	6"

Visual inspection of riser and components acceptable? PASS

Hydraulic Data Plate present and legible, if applicable? PASS

Water Motor Gong and/or Riser Electric Bell in good condition and functional, if applicable? PASS

Inspection Tag Color? N/A

Seal #(s), if applicable: Alarm Line = 552780

Riser Main Drain Test

Static Pressure	Residual Pressure	Static Pressure	Return Time (sec)	Drain Test Acceptable?
155	150	155	1	PASS

Riser Information & Inspection

ID # / Area / Location	Manufacturer	Model	Size
2nd Fl - Center Stairs, Test & Drain Floor Control	Victaulic	N/A	2 1/2"

Visual inspection of riser and components acceptable? PASS

Hydraulic Data Plate present and legible, if applicable? N/A

Water Motor Gong and/or Riser Electric Bell in good condition and functional, if applicable? N/A

Inspection Tag Color? N/A

Seal #(s), if applicable: 552012

Riser Main Drain Test

Static Pressure	Residual Pressure	Static Pressure	Return Time (sec)	Drain Test Acceptable?
155	145	155	2	PASS

Wet Riser Systems

Riser Information & Inspection

ID # / Area / Location	Manufacturer	Model	Size
3rd Fl - Center Stairs, Test & Drain Floor Control	Victaulic	N/A	2 1/2"

Visual inspection of riser and components acceptable? PASS

Hydraulic Data Plate present and legible, if applicable? PASS

Water Motor Gong and/or Riser Electric Bell in good condition and functional, if applicable? PASS

Inspection Tag Color? N/A

Seal #(s), if applicable: Alarm Line = 552444

Riser Main Drain Test

Static Pressure	Residual Pressure	Static Pressure	Return Time (sec)	Drain Test Acceptable?
155	145	155	1	PASS

Riser Information & Inspection

ID # / Area / Location	Manufacturer	Model	Size
4th Fl - Center Stairs, Test & Drain Floor Control	Victaulic	N/A	2 1/2"

Visual inspection of riser and components acceptable? PASS

Hydraulic Data Plate present and legible, if applicable? PASS

Water Motor Gong and/or Riser Electric Bell in good condition and functional, if applicable? PASS

Inspection Tag Color? N/A

Seal #(s), if applicable: Alarm Line = 550701

Riser Main Drain Test

Static Pressure	Residual Pressure	Static Pressure	Return Time (sec)	Drain Test Acceptable?
155	145	155	2	PASS

Riser Information & Inspection

ID # / Area / Location	Manufacturer	Model	Size

Visual inspection of riser and components acceptable?

Hydraulic Data Plate present and legible, if applicable?

Water Motor Gong and/or Riser Electric Bell in good condition and functional, if applicable?

Inspection Tag Color?

Seal #(s), if applicable:

Riser Main Drain Test

Static Pressure	Residual Pressure	Static Pressure	Return Time (sec)	Drain Test Acceptable?

Dry Pipe Riser Systems

Riser Information & Inspection

ID # / Area / Location	Manufacturer	Model	Size
Dry Riser - 1st Fl, Large Mech Rm - Covering Front Canopy	Viking	DPV-1	4"

Visual inspection of riser and components acceptable?	PASS	Hydraulic Data Plate present and legible, if applicable?	PASS
Water Motor Gong and/or Riser Electric Bell in good condition and functional, if applicable?	PASS	Inspection Tag Color?	N/A
Dry System Air Gauge Pressure:	38	Air supply satisfactory? PASS	Priming water drained to proper level? YES
Seal #(s), if applicable:	Alarm Line = 552790, Air Line = 552656, AMD = 552111		

Annual / 3 Year Trip Test Results

Note: Trip Test Result section only to be completed during the required Annual or 3 Year Trip Test

Partial Trip Test:	3 Year-Full Flow Trip Test:	Last Full Flow Trip Test date:
	✓	1/1/2019 This Insp

Air Pressure Prior To Test	Air Pressure At Valve Trip	Valve Trip Time (3 Year Only)	Time Water Delivery At ITC
38	36	4 sec	14 sec

Riser Main Drain Test

Static Pressure	Residual Pressure	Static Pressure	Return Time (sec)	Drain Test Acceptable?
155	145	155	1	PASS

Riser Information & Inspection

ID # / Area / Location	Manufacturer	Model	Size

Visual inspection of riser and components acceptable?		Hydraulic Data Plate present and legible, if applicable?	
Water Motor Gong and/or Riser Electric Bell in good condition and functional, if applicable?		Inspection Tag Color?	N/A
Dry System Air Gauge Pressure:		Air supply satisfactory?	Priming water drained to proper level?
Seal #(s), if applicable:			

Annual / 3 Year Trip Test Results

Note: Trip Test Result section only to be completed during the required Annual or 3 Year Trip Test

Partial Trip Test:	3 Year-Full Flow Trip Test:	Last Full Flow Trip Test date:

Air Pressure Prior To Test	Air Pressure At Valve Trip	Valve Trip Time (3 Year Only)	Time Water Delivery At ITC

Riser Main Drain Test

Static Pressure	Residual Pressure	Static Pressure	Return Time (sec)	Drain Test Acceptable?

Quick Opening Devices

ID # / Area / Location	Manufacturer	Model	QOD Air Pressure	QOD Trip Pressure	Seal #	Insp & Test Pass	Insp & Test Fail
Dry Riser - 1st Fl, Large Mech Rm	Viking	D1	38	36	155223	✓	

Pre-action Riser Systems

Riser Information & Inspection

ID # / Area / Location	Manufacturer	Model	Size
3rd Fl Computer Lab - Server Rm	Reliable	D	2"

Detection Type: Electrical Devices
Activation Type: Single Interlock - Electric
Inspection/test of riser and components acceptable? PASS
Hydraulic Data Plate present and legible, if applicable? PASS
Water Motor Gong and/or Riser Electric Bell in good condition and functional, if applicable? PASS
Inspection Tag Color? N/A
System Air Pressure, if applicable: 15
Air supply satisfactory? PASS
Priming valve in correct position? PASS
Seal #(s), if applicable: Alarm Line = 552333, Priming Valve = 553101, Air Line = 553002

Annual / 3 Year Trip Test Results

Note: Trip Test Result section only to be completed during the required Annual or 3 Year Trip Test

Partial Trip Test: [ ]
3 Year-Full Flow Trip Test: [✓]
Last Full Flow Trip Test date: 1/1/2019 This Insp
[ ] Per Owner's/Owner's Representative's specific directions: "*System is not to be trip tested*."

Air Pressure Prior To Test	Air Pressure At Valve Trip	Valve Trip Time (3 Year Only)	Time Water Delivery At ITC
15	15	3 Sec	N/A

Riser Main Drain Test

Static Pressure	Residual Pressure	Static Pressure	Return Time (sec)	Drain Test Acceptable?
155	150	155	1	PASS

Riser Information & Inspection

ID # / Area / Location	Manufacturer	Model	Size

Detection Type:
Activation Type:
Inspection/test of riser and components acceptable?
Hydraulic Data Plate present and legible, if applicable?
Water Motor Gong and/or Riser Electric Bell in good condition and functional, if applicable?
Inspection Tag Color? N/A
System Air Pressure, if applicable:
Air supply satisfactory?
Priming valve in correct position?
Seal #(s), if applicable:

Annual / 3 Year Trip Test Results

Note: Trip Test Result section only to be completed during the required Annual or 3 Year Trip Test

Partial Trip Test: [ ]
3 Year-Full Flow Trip Test: [ ]
Last Full Flow Trip Test date:
[ ] Per Owner's/Owner's Representative's specific directions: "*System is not to be trip tested*."

Air Pressure Prior To Test	Air Pressure At Valve Trip	Valve Trip Time (3 Year Only)	Time Water Delivery At ITC

Riser Main Drain Test

Static Pressure	Residual Pressure	Static Pressure	Return Time (sec)	Drain Test Acceptable?

Deluge Riser Systems

Riser Information & Inspection

ID # / Area / Location	Manufacturer	Model	Size
Fire Pump Rm - Covering Outside Propane Cylinders	Viking	D	6"

Detection Type: Pilot Line

Activation Type: Single Interlock-Pneumatic

Visual inspection of riser and components acceptable? PASS

Hydraulic Data Plate present and legible, if applicable? PASS

Water Motor Gong and/or Riser Electric Bell in good condition and functional, if applicable? PASS

Inspection Tag Color? N/A

Pilot Line Pressure, if applicable: 30

Air supply satisfactory? PASS

Priming valve in correct position? PASS

Seal #(s), if applicable: Alarm Line = 552000, Priming Valve = 553112, Air Line = 552921

Annual Trip Test Results

Note: Trip Test Result section only to be completed during the required Annual Test.

** Exception : Where the nature of the protected property is such that full flow testing is not possible, testing and inspection to be performed in accordance with NFPA 25 alternative procedures and frequency. Full flow test frequency shall not exceed 3 years.*

** Exception : NFPA 409; Deluge Valves installed in Aircraft Hangars full flow trip test at 5 Years.*

*Trip Test exception: ☐ Annual Full Flow Trip Test: ✓ Last Full Flow Trip Test date, if not done annually:

☐ Per Owner's/Owner's Representative's specific directions: "*System is not to be trip tested*."

Did Deluge Valve operate properly upon activation? Pass

Unobstructed flow from all nozzles/open sprinklers? Pass

Pilot Line Pressure, if applicable	Pilot Line Trip Pressure	Time To Water Discharge	Flow Pressure At Remote Outlet
30	17	6 Sec	105

Riser Main Drain Test

Static Pressure	Residual Pressure	Static Pressure	Return Time (sec)	Drain Test Acceptable?
155	150	155	2	PASS

VSC FIRE·SECURITY

Dry Pipe/Preaction/Deluge Auxiliary Drain List

ID # / Area / Location	Drain Type	Visual Inspection			Drained?		
		Pass	Fail	N/I	Yes	No	N/I
Dry System Priming Level - Large Mech Rm	Other	✓			✓		
Dry System - Large Mech Rm	Drum Drip	✓			✓		
Dry System - Inspector's Test Connection	ITC	✓			✓		
Preaction Riser - Riser Drain	2" Riser Drain	✓			✓		
Preaction System - Server Rm, Trapped Area above Ceiling	Globe Valve	✓			✓		
Deluge Riser - Riser Drain	2" Riser Drain	✓			✓		
Deluge Riser - Piping below propane Cylinder #1	Ball Valve	✓			✓		
Deluge Riser - Piping below propane Cylinder #2	Ball Valve	✓			✓		

Fire Pump Inspection & Test

Fire Pump Information

ID # / Area / Location	Manufacturer	Model	Serial Number
Basement, Fire Pump Room	IT-ACC	4x6 CPC-3232	G-023222-01-01

Type	GPM	Max PSI (Churn)	Rated PSI (100%)	150% Rated PSI	Pump Speed
Horizontal Split-Case	750	112	100	70	3550

Fire Pump Driver Information

Type	Manufacturer	Model	Serial Number
Electric	GE	7523-XY	21350-GX-12

Rated Speed	Rated Volts	Rated Amps	Horse Power	Cycles	Phase	Service Factor
3550	460	24	350	60	3	1.15

Fire Pump Controller Information

Manufacturer	Model	Seial Number
GE	IJJ-2323-7	7-02-BXY-2567

Controller Type	Volts	Amps	Cycles	Phase
Reduced Voltage/Reduced Current	460	24	60	3

Transfer Switch Information, Inspection and Test

Manufacturer	Model	Serial Number
GE	VVV-721	37808345608

During each inspection: Transfer Switch free of any damage of abnormal conditions, and controls in normal position?	Pass
Annualy: Transfer, or simulated transfer of power, and return to normal power during full flow conditions acceptable?	Pass

Jockey Pump System Information

Motor	Manufacturer	GE	Model	3455	Serial #	08080088766
	HP	1/2	Volts	280	Amps	18
Pump	Manufacturer	Fairbanks	Model	01-01-134	Serial #	JKJK-099
Controller	Manufacturer	GE	Model	RE-72	Serial #	34156

Fire Pump Inspection & Operational Test

Visual Inspection and Operational Test satisfactory?	Pass	*Annual Flow Test* within acceptable percentage of ratings?	Pass
BEFORE OPERATION - SUCTION Gauge pressure:	70	BEFORE OPERATION - SYSTEM LINE Gauge pressure:	155
Jockey Pump Start Pressure from Sensing Line Gauge:	145	Jockey Pump Stop Pressure from Sensing Line Gauge:	155
Fire Pump Start Pressure from Sensing Line Gauge:	135	Jockey Start/Stop and Fire Pump Start settings satisfactory?	Pass
DURING CHURN - Fire Pump SUCTION Gauge pressure:	61	DURING CHURN - Fire Pump DISCHARGE Gauge pressure:	164
Is there a Low Suction Control Panel or Device?	No	Did the Low Suction Panel or Device Function Properly?	N/A
Diesel Engine Fuel Level at, or above, 2/3 Full?	N/A	Record Diesel Engine Run Time Hours, if applicable:	N/A

Control Valve List

○ Visual Inspection only performed this date. ◉ Visual Inspection and Functional Test performed this date.

ID # / Area / Location	Manufacturer	Type	Size	Seal #	Pass	Fail	N/I
Basement, Fire Pump Rm - Backflow In CV #1	Mueller	OS&Y	6"	152458	✓		
Basement, Fire Pump Rm - Backflow Out CV #2	Mueller	OS&Y	6"	152468	✓		
Fire Pump Suction CV	Mueller	OS&Y	6"	153720	✓		
Fire Pump Discharge CV	Victaulic	Butterfly	6"	155834	✓		
Fire Pump Bypass CV #1	Victaulic	Butterfly	6"	155902	✓		
Fire Pump Bypass CV #2	Victaulic	Butterfly	6"	155899	✓		
Jockey Pump Suction CV	Kennedy	OS&Y	1 1/2"	153020	✓		
Jockey Pump Discharge CV	Kennedy	OS&Y	1 1/2"	153021	✓		
Fire Pump Test Header	Mueller	OS&Y	6"	155255	✓		
Wet Riser # 2 CV, Basement Fire Pump Rm	Kennedy	OS&Y	6"	155555	✓		
Wet Riser #1 CV, 1st Fl, Large Mech Rm back corner	Victaulic	Butterfly	6"	152801	✓		
Dry Riser CV, 1st Fl, Large Mech Rm	Kennedy	OS&Y	4"	152738	✓		
Preaction Riser CV, 3rd Fl, Computer Lab	Victaulic	Butterfly	2"	155211	✓		
Deluge Riser CV, Fire Pump Rm	Kennedy	OS&Y	6"	152669	✓		
2nd Fl, Center Stairs Floor Control CV	Victaulic	Butterfly	2 1/2"	155212	✓		
3rd Fl, Center Stairs Floor Control CV	Victaulic	Butterfly	2 1/2"	155199	✓		
4thFl, Center Stairs Floor Control CV	Victaulic	Butterfly	2 1/2"	155210	✓		
Outside By FDC	Mueller	Post Indicator	31 Turns	152001	✓		

VSC FIRE·SECURITY

Job # 177023456

Supervisory Tamper Switch Device List

○ Visual Inspection only performed this date. ◉ Visual Inspection and Functional Test performed this date.

Zone or Address	ID # / Area / Location	Inspection & Test Pass	Fail	N/I
L1M021	Basement, Fire Pump Rm - Backflow In CV #1			
L1M022	Basement, Fire Pump Rm - Backflow Out CV #2			
L1M013	Fire Pump Suction CV			
L1M014	Fire Pump Discharge CV			
L1M012	Fire Pump Bypass CV #1			
L1M011	Fire Pump Bypass CV #2			
L1M015	Jockey Pump Suction CV			
L1M016	Jockey Pump Discharge CV			
L1M010	Wet Riser # 2 CV, Basement Fire Pump Rm			
L1M018	Wet Riser #1 CV, 1st Fl, Large Mech Rm back corner			
L1M017	Dry Riser CV, 1st Fl, Large Mech Rm			
L1M019	Preaction Riser CV, 3rd Fl, Computer Lab			
L1M008	Deluge Riser CV, Fire Pump Rm			
L1M005	2nd Fl, Center Stairs Floor Control CV			
L1M006	3rd Fl, Center Stairs Floor Control CV			
L1M007	4thFl, Center Stairs Floor Control CV			
L1M004	Outside By FDC			

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Waterflow Device List

○ Visual Inspection only performed this date. ◉ Visual Inspection and Functional Test performed this date.

Zone or Address	ID # / Area / Location	Device Type	Inspection & Test Pass	Fail	N/I
L1M037	Main Riser, Basement Fire Pump Rm	Paddle Switch	✓		
L1M038	Wet Riser # 2, Basement Fire Pump Rm	Paddle Switch	✓		
L1M025	Wet Riser #1, 1st Fl, Large Mech Rm back corner	Paddle Switch	✓		
L1M026	Dry Riser, 1st Fl, Large Mech Rm	Pressure Switch	✓		
L1M042	Preaction Riser, 3rd Fl, Computer Lab	Pressure Switch	✓		
L1M036	Deluge Riser, Fire Pump Rm	Pressure Switch	✓		
L1M029	2nd Fl, Center Stairs Floor Control	Paddle Switch	✓		
L1M028	3rd Fl, Center Stairs Floor Control	Paddle Switch	✓		
L1M027	4thFl, Center Stairs Floor Control	Paddle Switch	✓		

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Supervisory Device List

○ Visual Inspection only performed this date. ◉ Visual Inspection and Functional Test performed this date.

Zone or Address	ID # / Area / Location	Device Type	Inspection & Test Pass	Fail	N/I
L1M052	Fire Pump Rm	Pump Power	✓		
L1M051	Fire Pump Rm	Pump Running	✓		
L1M054	Dry Riser, 1st Fl, Large Mech Rm	Hi/Low Air	✓		
L1M055	Preaction Riser, 3rd Fl, Computer Lab	Hi/Low Air	✓		

VSC FIRE·SECURITY

Rev 1-9-19

Job # 177023456

VSC Fire & Security, Inc.

773 Union Street, P.O. Box 1597
Salem
VA
24153
(540) 765-1300
www.VSCFire.com

FIRE·SECURITY

Backflow Prevention Device Test Report

Name of Premises: (Virginia Tech Building Name - Example Report) Account #:

Service Address: (Street Address of Building to be inspected) Blacksburg VA 24061

Location of device: Basement Fire Pump Room Use of Device: Fire System

Manufacturer: Ames Model: 2000SS Size: 6" S/N: 123456 Meter #:

Line Pressure at time of test: 70 PSI [X] Existing [ ] New [ ] Replacement

Device Type	Requirement	Initial Test	Repairs	Retest
Reduced Pressure Device:				
Check Valve #1:	Closed Tight? Pressure Drop across check valve?	Yes [ ] No [ ] ____ PSID		Yes [ ] No [ ] ____ PSID
Check Valve #2:	Closed Tight? Pressure Drop across check valve?	Yes [ ] No [ ] ____ PSID		Yes [ ] No [ ] ____ PSID
Differential Pressure Relief Port:	Opened properly? Pressure opened:	Yes [ ] No [ ] ____ PSID		Yes [ ] No [ ] ____ PSID
Double Check Valve:				
Check Valve #1:	Closed Tight? Pressure Drop across check valve?	Yes [✓] No [ ] 2.0 PSID		Yes [ ] No [ ] ____ PSID
Check Valve #2:	Closed Tight? Pressure Drop across check valve?	Yes [✓] No [ ] 1.8 PSID		Yes [ ] No [ ] ____ PSID
Pressure Vacuum Breaker:				
Air Inlet:	Opened properly? Pressure opened:	Yes [ ] No [ ] ____ PSID		Yes [ ] No [ ] ____ PSID
Check Valve:	Closed properly: Closed at:	Yes [ ] No [ ] ____ PSID		Yes [ ] No [ ] ____ PSID

Did Assembly Pass Test? PASS [✓] FAIL [ ] Did #2 Control Valve Shut Tight? YES [✓] NO [ ]

Remarks: Backflow in satisfactory condition - EXAMPLE REPORT

Test Kit Make: Midwest Model: 844P S/N: 123456 Calibration Date: 1/1/2019

I have completed the above test and hereby certify that this backflow device performed satisfactorily and meets all Federal, State and Local Codes and Regulations as required.

Tester's Name: (Inspection Technician) Phone #: (xxx) xxx-xxxx License #: xxxxxxxx

License Expiration Date: 1/1/2019 Jurisdiction where License was issued: State of Virginia

Date of Test: 1/1/2019 Tester's Signature:

8. Tools and Equipment

Tools and Equipment

PPE – provided to VSC Fire & Security employees which include:

- Hard hats
- Gloves
- Safety Vest
- Ear Plugs
- VSC t-shirt

We also ask each employee purchase their own steel toe shoes.

Vehicle – All authorized VSC Fire & Security vehicles have the proper tools to execute any inspection or service work including ladders, fire extinguishers and first aid kits. Each vehicle is clearly marked with our company logo and contact information.

All necessary testing equipment.
All necessary service repair equipment

9. REFERENCES

Attachment D

OFFEROR DATA SHEET

(To be completed by Offeror. Use extra sheets and attachments as necessary to provide complete information).

1. OFFEROR REFERENCES: The Offeror shall be experienced in this type of work. Please list below four (4) references for whom you have performed work similar to those specified in this RFP within the past five years.

Wytheville Community College

CLIENT:

ADDRESS: [redacted]

CONTACT PERSON/PHONE #: [redacted]

PROJECTS/DATES/DESCRIPTION: [redacted]

New River Community College

CLIENT:

ADDRESS: [redacted]

CONTACT PERSON/PHONE #:

PROJECTS/DATES/DESCRIPTION: [redacted]

Ferrum College

CLIENT:

ADDRESS: [redacted]

CONTACT PERSON/PHONE #: [redacted]

PROJECTS/DATES/DESCRIPTION: [redacted]

Centra Health, Inc.

CLIENT:

ADDRESS: [redacted]

CONTACT PERSON/PHONE #: [redacted]

PROJECTS/DATES/DESCRIPTION: [redacted]

10. Account Numbers

eVa Account Number

[redacted]

Ariba Account Number

[redacted]

11. Safety Program

Drug-Free Workplace

VSC Fire & Security has a longstanding commitment to providing a safe and productive work environment for all employees. We recognize that alcohol and drug abuse pose a threat to the health and safety of employees and have no place in the workplace. In addition, the Drug-Free Workplace Act requires federal contractors to provide a drug-free workplace and to follow certain guidelines. Below are the Company's guidelines:

1. The unauthorized and/or unlawful manufacture, distribution, dispensation, possession or use of a controlled substance or alcohol is strictly prohibited in all VSC facilities, on all VSC property, in any VSC-owned vehicle, and at any VSC-sponsored activity. As a condition of employment, all employees must abide by this prohibition.
2. All employees are expected to comply at all times with VSC's policy regarding the use of drugs and alcohol abuse. Any employee, who receives a criminal drug or alcohol conviction for a violation occurring in the workplace or in a Company vehicle, must notify VSC no later than five (5) days after the conviction. The Company will take appropriate action within thirty (30) days of notification.
3. Any employee who self-discloses his own substance abuse or chemical dependency or off-duty drug or alcohol conviction may be placed in mandatory referral to the Employee Assistance Program (EAP) to ensure that the employee is receiving support to meet VSC's drug-free workplace standards.
4. VSC requires drug testing of all employees as a condition of employment. All employees are expected to cooperate with any drug testing requirements or requests made in accordance with pre-employment, workplace safety to include accident/incident policies, federal, state or local law, reasonable suspicion, and/or pre-duty by VSC or a customer due to contractual obligations.
5. Upon receiving notice of an employee conviction or positive drug test result, as described above, VSC will:

   a) Take appropriate action against such employee, up to and including termination of employment; or

   b) Refer the employee to the Company's EAP to receive assistance and rehabilitation; and if required:

      a) Require such employee to satisfactorily participate in a drug or alcohol abuse assistance or rehabilitation program approved for such purposes by a federal, state, or local health, law enforcement, or other appropriate agency.
      b) An employee's refusal to complete a drug or alcohol abuse assistance or rehabilitation program, if required, may be considered grounds for termination.

   c) If the employee is referred to the Company's EAP, the employee will also be placed on a one (1) year probationary status that includes periodic at-will drug/alcohol testing.
   d) An employee who is placed in a one (1) year probationary status and then either tests positive or receives an additional conviction may be terminated immediately.

Candidate for Hire

A candidate who has been offered employment must take a pre-employment drug screen and may not work until a negative result is received. If approved by management, a candidate who tests positive on a pre-employment drug screen may be offered the opportunity for a second screening within fifteen (15) days of the initial screening prior to becoming a VSC employee. If the second drug screen result is negative

11. Continued

or levels of the illegal substance have declined, the candidate may be offered employment If offered employment, the candidate may begin work for the Company as a one (1) year probationary employee and is placed in mandatory referral to the EAP, subject to the conditions and requirements outlined above If the second drug screen produces positive results at the same or higher levels for the initial substance or for a different substance, the candidate may not be considered for employment for a minimum of one (1) year.

Should the employee be hired into a role that requires operation of company equipment, the Risk Manager will work with the Division Manager to specifically outline what the employee may or may not be able to operate. A letter will be provided to the employee explaining the conditions of continued employment.

Appendix

A. Inspection, Testing, and Maintenance of Water Based Fire Protection

B. Potter

- PS10 Series Pressure Switch Guide
- VSR Vane Type Waterflow Alarm Switch with Retard
- OSYSU Series

C. Fire Sprinkler Systems Monitoring

D. RFP General Information Form

E. Addendum #1 to RFP #0058208

F. RFP Attachment A: Terms and Conditions

G. Recommendation Letters / Emails

NFPA® 25

Standard for the

Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems

2014 Edition

This edition of NFPA 25, *Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems*, was prepared by the Technical Committee on Inspection, Testing, and Maintenance of Water-Based Systems and acted on by NFPA at its June Association Technical Meeting held June 10–13, 2013, in Chicago, IL. It was issued by the Standards Council on August 1, 2013, with an effective date of August 21, 2013, and supersedes all previous editions.

This edition of NFPA 25 was approved as an American National Standard on August 21, 2013.

Origin and Development of NFPA 25

The first edition of NFPA 25, in 1992, was a collection of inspection, testing, and maintenance provisions that helped ensure the successful operation of water-based fire protection systems. NFPA 25 was developed as an extension of existing documents such as NFPA 13A, *Recommended Practice for the Inspection, Testing, and Maintenance of Sprinkler Systems*, and NFPA 14A, *Recommended Practice for the Inspection, Testing, and Maintenance of Standpipe and Hose Systems*, which have successfully assisted authorities having jurisdiction and property owners with routine inspections of sprinkler systems and standpipes. These documents have since been withdrawn from the NFPA standards system. NFPA 25 became the main document governing sprinkler systems as well as related systems, including underground piping, fire pumps, storage tanks, water spray systems, and foam-water sprinkler systems.

This document provides instruction on how to conduct inspection, testing, and maintenance activities. It also stipulates how often such activities are required to be completed. Requirements are provided for impairment procedures, notification processes, and system restoration. This type of information, where incorporated into a building maintenance program, enhances the demonstrated favorable experience of all water-based fire protection systems.

The 1995 edition incorporated several improvements that reflected the initial experience with the standard. A new chapter was added that addressed obstructions in pipe as well as appropriate corrective actions.

The 1998 edition refined testing requirements and frequencies and provided additional guidance for preplanned impairment programs. The document scope was expanded to include marine systems.

The 2002 edition continued to refine testing frequencies for waterflow devices and evaluation of the annual fire pump test data. This edition also included additional information regarding evaluation and test methods for microbiologically influenced corrosion (MIC).

In the 2008 edition a section permitting performance-based testing was added, providing guidance on alternative means for determining testing frequencies based on system/component failure rates. Component replacement testing tables were introduced in this edition to provide guidance for the appropriate tests to be performed following replacement of system components. Inspection, testing, and maintenance requirements for water mist systems were extracted from NFPA 750 and were inserted into a new chapter. This action consolidated inspection, testing, and maintenance requirements for all water-based fire protection systems into one document.

The 2011 edition further updated testing frequencies based on a growing database of inspection, testing, and maintenance records. In two new annexes information was provided for classification of needed repairs and hazard evaluation. The 2011 edition also added new definitions differentiating the levels of deficiency for determining the priority of repair.

The 2014 edition of NFPA 25 has many significant changes with many specific to the chapter on fire pumps. The operating test requirements were rewritten to consider a baseline weekly test for all pumps with a series of exceptions that would allow for a modified testing frequency. New language was added to address confirmation of pressure recordings and a new fuel quality test for diesel-driven pumps.

Definitions were added for the various frequencies of inspection, testing, and maintenance (ITM) tasks to create a "window" for completion of the task. The concept of internal inspection has been modified to an internal assessment concept, where a performance-based assessment frequency is explicitly addressed. The scope of the Technical Committee on Inspection, Testing, and -Based Systems was updated to specifically address water mist systems. The water mist system was modified such that the extract tags from NFPA 750 have been removed, since the material in this chapter is now in the jurisdiction of NFPA 25.

A new chapter was added to address NFPA 13D systems that are installed outside of one- and two-family homes. The requirements for inspecting antifreeze systems have been updated to include the latest information from the Fire Protection Research Foundation testing on standard spray sprinklers. The table providing examples of classifications for deficiencies and impairments has been relocated from Annex E to Annex A and is attached to the definition of *Deficiency*.

4.9 Safety.

4.9.1 General. Inspection, testing, and maintenance activities shall be conducted in accordance with applicable safety regulations.

4.9.2 Confined Spaces. Legally required precautions shall be taken prior to entering confined spaces such as tanks, valve pits, or trenches.

4.9.3 Fall Protection. Legally required equipment shall be worn or used to prevent injury from falls to personnel.

4.9.4 Hazards. Precautions shall be taken to address any hazards, such as protection against drowning where working on the top of a filled embankment or a supported, rubberized fabric tank, or over open water or other liquids.

4.9.5* Hazardous Materials.

4.9.5.1 Legally required equipment shall be used where working in an environment with hazardous materials present.

4.9.5.2 The property owner or designated representative shall advise anyone performing inspection, testing, and maintenance on any system under the scope of this document, with regard to hazardous materials stored on the premises.

4.9.6* Electrical Safety. Legally required precautions shall be taken when testing or maintaining electric controllers for motor-driven fire pumps.

Chapter 5 Sprinkler Systems

5.1 General.

5.1.1 Minimum Requirements.

5.1.1.1 This chapter shall provide the minimum requirements for the routine inspection, testing, and maintenance of sprinkler systems.

5.1.1.2 Table 5.1.1.2 shall be used to determine the minimum required frequencies for inspection, testing, and maintenance.

5.1.2 Valves and Connections. Valves and fire department connections shall be inspected, tested, and maintained in accordance with Chapter 13.

5.1.3 Obstruction Investigations. The procedures outlined in Chapter 14 shall be followed where there is a need to conduct an obstruction investigation.

5.1.4 Impairments. The procedures outlined in Chapter 15 shall be followed where an impairment to protection occurs.

5.1.5 Hose Connections. Hose connections shall be inspected, tested, and maintained in accordance with Chapters 6 and 13.

5.2* Inspection.

5.2.1 Sprinklers.

5.2.1.1* Sprinklers shall be inspected from the floor level annually.

5.2.1.1.1* Sprinklers shall not show signs of leakage; shall be free of corrosion, foreign materials, paint, and physical damage; and shall be installed in the correct orientation (e.g., upright, pendent, or sidewall).

5.2.1.1.2 Any sprinkler that shows signs of any of the following shall be replaced:

(1) Leakage
(2)*Corrosion
(3) Physical damage
(4) Loss of fluid in the glass bulb heat-responsive element
(5)*Loading
(6) Painting unless painted by the sprinkler manufacturer

5.2.1.1.3* Any sprinkler that has been installed in the incorrect orientation shall be corrected by repositioning the branchline, drop, or sprig, or shall be replaced.

5.2.1.1.4* Sprinklers installed in concealed spaces such as above suspended ceilings shall not require inspection.

5.2.1.1.5 Sprinklers installed in areas that are inaccessible for safety considerations due to process operations shall be inspected during each scheduled shutdown.

5.2.1.1.6 Escutcheons and coverplates for recessed, flush, and concealed sprinklers shall be replaced if found missing during the inspection.

5.2.1.1.7 Escutcheons for pendent sprinklers that are not recessed, flush, or concealed shall not be required to be replaced if found missing during the inspection.

5.2.1.2* The minimum clearance to storage as described in 5.2.1.2.1 through 5.2.1.2.6 shall be maintained below all sprinkler deflectors.

5.2.1.2.1* Unless greater distances are required by 5.2.1.2.2, 5.2.1.2.3, or 5.2.1.2.4, or lesser distances are permitted by 5.2.1.2.6, clearance between the deflector and the top of storage shall be 18 in. (457 mm) or greater.

5.2.1.2.2 Where standards other than NFPA 13, *Standard for the Installation of Sprinkler Systems*, specify greater clearance to storage minimums, they shall be followed.

5.2.1.2.3* Clearance between the deflector and the top of storage shall be 36 in. (914 mm) or greater for special sprinklers.

5.2.1.2.4 Clearance from the top of storage to sprinkler deflectors shall be 36 in. (914 mm) or greater where rubber tires are stored.

5.2.1.2.5 In-rack sprinklers shall not be required to meet the obstruction criteria and clearance from storage requirements.

5.2.1.2.6* Clearance between the deflector and the top of storage shall be permitted to be less than 18 in. (457 mm) where shown to be permitted by the installation standard.

5.2.1.3* Storage closer to the sprinkler deflector than permitted by the clearance rules of the installation standard described in 5.2.1.2.1 through 5.2.1.2.4 shall be corrected.

5.2.1.4 The supply of spare sprinklers shall be inspected annually for the following:

(1) The correct number and type of sprinklers as required by 5.4.1.5
(2) A sprinkler wrench for each type of sprinkler as required by 5.4.1.5.5
(3) The list of spare sprinklers as required by 5.4.1.5.6

Table 5.1.1.2 Summary of Sprinkler System Inspection, Testing, and Maintenance

Item	Frequency	Reference
Inspection		
Gauges (dry, preaction, and deluge systems)	Weekly/quarterly	5.2.4.2, 5.2.4.3, 5.2.4.4
Control valves		Table 13.1.1.2
Waterflow alarm devices	Quarterly	5.2.5
Valve supervisory signal devices	Quarterly	5.2.5
Supervisory signal devices (except valve supervisory switches)	Quarterly	5.2.5
Gauges (wet pipe systems)	Quarterly	5.2.4.1
Hydraulic nameplate	Quarterly	5.2.6
Buildings	Annually (prior to freezing weather)	4.1.1.1
Hanger/seismic bracing	Annually	5.2.3
Pipe and fittings	Annually	5.2.2
Sprinklers	Annually	5.2.1
Spare sprinklers	Annually	5.2.1.4
Information sign	Annually	5.2.8
Fire department connections		Table 13.1.1.2
Valves (all types)		Table 13.1.1.2
Obstruction, internal inspection of piping	5 years	14.2
Heat trace	Per manufacturer's requirements	5.2.7
Test		
Waterflow alarm devices		
Mechanical devices	Quarterly	5.3.3.1
Vane and pressure switch–type devices	Semiannually	5.3.3.2
Valve supervisory signal devices		Table 13.1.1.2
Supervisory signal devices (except valve supervisory switches)		Table 13.1.1.2
Main drain		Table 13.1.1.2
Antifreeze solution	Annually	5.3.4
Gauges	5 years	5.3.2
Sprinklers (extra-high or greater temperature solder type)	5 years	5.3.1.1.1.4
Sprinklers (fast-response)	At 20 years and every 10 years thereafter	5.3.1.1.1.3
Sprinklers	At 50 years and every 10 years thereafter	5.3.1.1.1
Sprinklers	At 75 years and every 5 years thereafter	5.3.1.1.1.5
Sprinklers (dry)	At 10 years and every 10 years thereafter	5.3.1.1.1.6
Sprinklers (in harsh environments)	5 years	5.3.1.1.2
Valves (all types)		Table 13.1.1.2
Valve status test		13.3.1.2.1
Maintenance		
Valves (all types)		Table 13.1.1.2
Low-point drains (dry pipe system)		13.4.4.3.2
Sprinklers and automatic spray nozzles protecting commercial cooking equipment and ventilation systems	Annually	5.4.1.9
Investigation		
Obstruction		14.3

5.2.2* Pipe and Fittings. Sprinkler pipe and fittings shall be inspected annually from the floor level.

5.2.2.1* Pipe and fittings shall be in good condition and free of mechanical damage, leakage, and corrosion.

5.2.2.2 Sprinkler piping shall not be subjected to external loads by materials either resting on the pipe or hung from the pipe.

5.2.2.3* Pipe and fittings installed in concealed spaces such as above suspended ceilings shall not require inspection.

5.2.2.4 Pipe and fittings installed in areas that are inaccessible for safety considerations due to process operations shall be inspected during each scheduled shutdown.

5.2.3* Hangers and Seismic Braces. Sprinkler pipe hangers and seismic braces shall be inspected annually from the floor level.

5.2.3.1 Hangers and seismic braces shall not be damaged, loose, or unattached.

5.2.3.2 Hangers and seismic braces that are damaged, loose, or unattached shall be replaced or refastened.

5.2.3.3* Hangers and seismic braces installed in concealed spaces such as above suspended ceilings shall not require inspection.

5.2.3.4 Hangers and seismic bracing installed in areas that are inaccessible for safety considerations due to process operations shall be inspected during each scheduled shutdown.

5.2.4 Gauges.

5.2.4.1* Gauges on wet pipe and deluge sprinkler systems shall be inspected quarterly to ensure that they are in good condition and that normal water supply pressure is being maintained.

5.2.4.2 Gauges on dry and preaction systems shall be inspected weekly to ensure that normal air or nitrogen and water pressures are being maintained.

5.2.4.3 Where air pressure supervision is connected to a constantly attended location, gauges shall be inspected monthly.

5.2.4.4* For dry pipe or preaction systems protecting freezers with two air pressure gauges on the air line(s) between the compressor and the dry pipe or preaction valve, the air pressure gauge near the compressor shall be compared weekly to the pressure gauge above the dry pipe or preaction valve.

5.2.4.4.1 When the gauge near the compressor is reading higher than the gauge near the dry pipe valve, the air line in service shall be taken out of service, and the alternate air line opened to equalize the pressure.

5.2.4.4.2 The air line taken out of service shall be internally inspected, shall have all ice blockage removed, and shall be reassembled for use as a future alternate air line.

5.2.5 Waterflow Alarm and Supervisory Signal Initiating Device. Waterflow alarm and supervisory signal initiating devices shall be inspected quarterly to verify that they are free of physical damage.

5.2.6* Hydraulic Design Information Sign. The hydraulic design information sign shall be inspected quarterly to verify that it is provided, attached securely to the sprinkler riser, and is legible.

5.2.6.1 A hydraulic design information sign that is missing or illegible shall be replaced.

5.2.6.2 A pipe schedule system shall have a hydraulic design information sign that reads "Pipe Schedule System."

5.2.7 Heat Tracing. Heat tracing shall be inspected and maintained in accordance with manufacturer's requirements.

5.2.8 Information Sign. The information sign required by 4.1.9 shall be inspected annually to verify that it is provided, securely attached, and legible.

5.2.9* General Information Sign. The general information sign required by NFPA 13 shall be inspected annually to verify that it is provided, securely attached, and legible.

5.3 Testing.

5.3.1* Sprinklers.

5.3.1.1* Where required by this section, sample sprinklers shall be submitted to a recognized testing laboratory acceptable to the authority having jurisdiction for field service testing.

5.3.1.1.1 Where sprinklers have been in service for 50 years, they shall be replaced or representative samples from one or more sample areas shall be tested.

5.3.1.1.1.1 Test procedures shall be repeated at 10-year intervals.

5.3.1.1.1.2 Sprinklers manufactured prior to 1920 shall be replaced.

5.3.1.1.1.3* Sprinklers manufactured using fast-response elements that have been in service for 20 years shall be replaced or representative samples shall be tested and then retested at 10-year intervals.

5.3.1.1.1.4* Representative samples of solder-type sprinklers with a temperature classification of extra high [325°F (163°C)] or greater that are exposed to semicontinuous to continuous maximum allowable ambient temperature conditions shall be tested at 5-year intervals.

5.3.1.1.1.5 Where sprinklers have been in service for 75 years, they shall be replaced or representative samples from one or more sample areas shall be submitted to a recognized testing laboratory acceptable to the authority having jurisdiction for field service testing and repeated at 5-year intervals.

5.3.1.1.1.6* Dry sprinklers that have been in service for 10 years shall be replaced or representative samples shall be tested and then retested at 10-year intervals.

5.3.1.1.2* Where sprinklers are subjected to harsh environments, including corrosive atmospheres and corrosive water supplies, on a 5-year basis, either sprinklers shall be replaced or representative sprinkler samples shall be tested.

5.3.1.1.3 Where historical data indicate, longer intervals between testing shall be permitted.

5.3.1.2* A representative sample of sprinklers for testing per 5.3.1.1.1 shall consist of a minimum of not less than four sprinklers or 1 percent of the number of sprinklers per individual sprinkler sample, whichever is greater.

5.3.1.3 Where one sprinkler within a representative sample fails to meet the test requirement, all sprinklers within the area represented by that sample shall be replaced.

5.3.1.3.1 Manufacturers shall be permitted to make modifications to their own sprinklers in the field with listed devices that restore the original performance as intended by the listing, where acceptable to the authority having jurisdiction.

5.3.2* Gauges.

5.3.2.1 Gauges shall be replaced every 5 years or tested every 5 years by comparison with a calibrated gauge.

5.3.2.2 Gauges not accurate to within 3 percent of the full scale shall be recalibrated or replaced.

5.3.2.3 Where multiple system risers are supplied by a common water supply source with gauges located at the same elevation, and the gauges for all systems read within 3 percent of the other(s), only one gauge shall be required to be tested to determine if replacement is required.

5.3.3 Waterflow Alarm Devices.

5.3.3.1 Mechanical waterflow alarm devices including, but not limited to, water motor gongs, shall be tested quarterly.

5.3.3.2* Vane-type and pressure switch–type waterflow alarm devices shall be tested semiannually.

5.3.3.3 Testing waterflow alarm devices on wet pipe systems shall be accomplished by opening the inspector's test connection.

5.3.3.3.1 Where freezing weather conditions or other circumstances prohibit use of the inspector's test connection, the bypass connection shall be permitted to be used.

5.3.3.4 Fire pumps shall not be taken out of service during testing unless constantly attended by qualified personnel or all impairment procedures contained in Chapter 15 are followed.

5.3.3.5* Testing waterflow alarm devices on dry pipe, preaction, or deluge systems shall be accomplished by using the bypass connection.

5.3.4* Antifreeze Systems. Annually, before the onset of freezing weather, the antifreeze solution shall be tested using the following procedure:

(1) Using installation records, maintenance records, information from the owner, chemical tests, or other reliable sources of information, the type of antifreeze in the system shall be determined.
   (a) If the type of antifreeze is found to be a type that is no longer permitted, the system shall be drained completely and replaced with an acceptable solution.
   (b) If the type of antifreeze cannot be reliably determined, the system shall be drained completely and replaced with an acceptable solution.

(2) If the antifreeze is not replaced in accordance with step 1, test samples shall be taken at the top of each system and at the bottom of each system.
   (a) If the most remote portion of the system is not near the top or the bottom of the system, an additional sample shall be taken at the most remote portion.
   (b) If the connection to the water supply piping is not near the top or the bottom of the system, an additional sample shall be taken at the connection to the water supply.

(3) The specific gravity of each solution shall be checked using a hydrometer with a suitable scale or a refractometer having a scale calibrated for the antifreeze solution.

(4) If any of the samples exhibits a concentration in excess of what is permitted by NFPA 25, the system shall be emptied and refilled with a new acceptable solution. If a concentration greater than what is currently permitted by NFPA 25 was necessary to keep the fluid from freezing, alternate methods of preventing the pipe from freezing shall be employed.

(5) If any of the samples exhibits a concentration lower than what is necessary to keep the fluid from freezing, the system shall be emptied and refilled with a new acceptable solution.

5.3.4.1 The use of antifreeze solutions shall be in conformity with state and local health regulations.

5.3.4.1.1* Listed CPVC sprinkler pipe and fittings shall be protected from freezing with glycerine only.

5.3.4.1.1.1 The use of diethylene, ethylene, or propylene glycols shall be specifically prohibited.

5.3.4.2 Except as permitted by 5.3.4.2.1 and 5.3.4.2.2, all antifreeze systems shall utilize listed antifreeze solutions.

5.3.4.2.1* For systems installed prior to September 30, 2012, listed antifreeze solutions shall not be required until September 30, 2022, where all of the following conditions are met:

(1) *The concentration of the antifreeze solution shall be limited to 50 percent glycerine by volume or 40 percent propylene glycol by volume.
(2) Newly introduced solutions shall be factory premixed antifreeze solutions (chemically pure or United States Pharmacopeia 96.5 percent).
(3) *Antifreeze systems with concentrations in excess of 30 percent propylene glycol and 38 percent glycerine shall be permitted based upon an approved deterministic risk assessment prepared by a qualified person approved by the authority having jurisdiction.

5.3.4.2.2 Premixed antifreeze solutions of propylene glycol exceeding 30 percent concentration by volume shall be permitted for use with ESFR sprinklers where the ESFR sprinklers are listed for such use in a specific application.

5.3.4.3 The antifreeze solution shall be tested at its most remote portion and where it interfaces with the wet pipe system.

5.3.4.4 When antifreeze systems have a capacity larger than 150 gal (568 L), tests at one additional point for every 100 gal (379 L) shall be made.

5.3.4.4.1 If the results indicate an incorrect freeze point at any point in the system, the system shall be drained and refilled with new premixed antifreeze.

5.3.4.4.2 For premixed solutions, the manufacturer's instructions shall be permitted to be used with regard to the number of test points and refill procedure.

5.4 Maintenance.

5.4.1 Sprinklers.

5.4.1.1 Where a sprinkler has been removed for any reason, it shall not be reinstalled.

5.4.1.2* Replacement sprinklers shall have the proper characteristics for the application intended, which include the following:

(1) Style
(2) Orifice size and K-factor
(3) Temperature rating
(4) Coating, if any
(5) Deflector type (e.g., upright, pendent, sidewall)
(6) Design requirements

5.4.1.2.1* Spray sprinklers shall be permitted to replace old-style sprinklers.

5.4.1.2.2 Replacement sprinklers for piers and wharves shall comply with NFPA 307, *Standard for the Construction and Fire Protection of Marine Terminals, Piers, and Wharves.*

5.4.1.3 Only new, listed sprinklers shall be used to replace existing sprinklers.

5.4.1.4* Special and quick-response sprinklers as defined by NFPA 13, *Standard for the Installation of Sprinkler Systems,* shall be replaced with sprinklers of the same orifice, size, temperature range and thermal response characteristics, and K-factor.

5.4.1.5* A supply of at least six spare sprinklers shall be maintained on the premises so that any sprinklers that have operated or been damaged in any way can be promptly replaced.

5.4.1.5.1 The sprinklers shall correspond to the types and temperature ratings of the sprinklers in the property.

5.4.1.5.2 The sprinklers shall be kept in a cabinet located where the temperature in which they are subjected will at no time exceed 100°F (38°C).

5.4.1.5.3 Where dry sprinklers of different lengths are installed, spare dry sprinklers shall not be required, provided that a means of returning the system to service is furnished.

5.4.1.5.4 The stock of spare sprinklers shall include all types and ratings installed and shall be as follows:

(1) For protected facilities having under 300 sprinklers — no fewer than 6 sprinklers
(2) For protected facilities having 300 to 1000 sprinklers — no fewer than 12 sprinklers
(3) For protected facilities having over 1000 sprinklers — no fewer than 24 sprinklers

5.4.1.5.5* One sprinkler wrench as specified by the sprinkler manufacturer shall be provided in the cabinet for each type of sprinkler installed to be used for the removal and installation of sprinklers in the system.

5.4.1.5.6 A list of the sprinklers installed in the property shall be posted in the sprinkler cabinet.

5.4.1.5.6.1* The list shall include the following:

(1) Sprinkler identification number (SIN) if equipped; or the manufacturer, model, orifice, deflector type, thermal sensitivity, and pressure rating
(2) General description
(3) Quantity of each type to be contained in the cabinet
(4) Issue or revision date of the list

5.4.1.6* Sprinklers shall not be altered in any respect or have any type of ornamentation, paint, or coatings applied after shipment from the place of manufacture.

5.4.1.7 Sprinklers and automatic spray nozzles used for protecting commercial-type cooking equipment and ventilating systems shall be replaced annually.

5.4.1.7.1 Where automatic bulb-type sprinklers or spray nozzles are used and annual examination shows no buildup of grease or other material on the sprinklers or spray nozzles, such sprinklers and spray nozzles shall not be required to be replaced.

5.4.1.8 Protective Coverings.

5.4.1.8.1* Sprinklers protecting spray areas and mixing rooms in resin application areas installed with protective coverings shall continue to be protected against overspray residue so that they will operate in the event of fire.

5.4.1.8.2 Sprinklers installed as described in 5.4.1.8.1 shall be protected using cellophane bags having a thickness of 0.003 in. (0.076 mm) or less or thin paper bags.

5.4.1.8.3 Coverings shall be replaced periodically so that heavy deposits of residue do not accumulate.

5.4.2* Dry Pipe Systems. Dry pipe systems shall be kept dry at all times.

5.4.2.1 During nonfreezing weather, a dry pipe system shall be permitted to be left wet if the only other option is to remove the system from service while waiting for parts or during repair activities.

5.4.2.2 Refrigerated spaces or other areas within the building interior where temperatures are maintained at or below 40°F (4.0°C) shall not be permitted to be left wet.

5.4.2.3 Air driers shall be maintained in accordance with the manufacturer's instructions.

5.4.2.4 Compressors used in conjunction with dry pipe sprinkler systems shall be maintained in accordance with the manufacturer's instructions.

5.4.3* Marine Systems. Sprinkler systems that are normally maintained using fresh water as a source shall be drained and refilled, then drained and refilled again with fresh water following the introduction of raw water into the system.

5.5 Component Action Requirements.

5.5.1 Whenever a component in a sprinkler system is adjusted, repaired, reconditioned, or replaced, the actions required in Table 5.5.1 shall be performed.

5.5.2 Where the original installation standard is different from the cited standard, the use of the appropriate installing standard shall be permitted.

5.5.3 These actions shall not require a design review, which is outside the scope of this standard.

Chapter 6 Standpipe and Hose Systems

6.1 General.

6.1.1 Minimum Requirements.

6.1.1.1 This chapter shall provide the minimum requirements for the routine inspection, testing, and maintenance of standpipe and hose systems.

6.1.1.2 Table 6.1.1.2 shall be used to determine the minimum required frequencies for inspection, testing, and maintenance.

6.1.2 Table 6.1.2 shall be used for the inspection, testing, and maintenance of all classes of standpipe and hose systems.

6.1.3 Checkpoints and corrective actions outlined in Table 6.1.2 shall be followed to determine that components are free of corrosion, foreign material, physical damage, tampering, or other conditions that adversely affect system operation.

6.1.4 Valves and fire department connections shall be inspected, tested, and maintained in accordance with Chapter 13.

6.1.5 The procedures outlined in Chapter 14 shall be followed where there is a need to conduct an obstruction investigation.

6.1.6 Where the inspection, testing, and maintenance of standpipe and hose systems results or involves a system that is out of service, the impairment procedures outlined in Chapter 15 shall be followed.

6.1.7 Where approved by the authority having jurisdiction, existing hose shall be permitted to be removed and shall not be recorded as a deficiency.

6.2 Inspection.

6.2.1 Components. Components of standpipe and hose systems shall be visually inspected annually or as specified in Table 6.1.1.2.

6.2.2 Gauges.

6.2.2.1 Gauges on automatic wet and semiautomatic dry standpipe systems shall be inspected quarterly to ensure that they are in good condition and that normal water supply pressure is being maintained.

Table 6.1.1.2 Summary of Standpipe and Hose Systems Inspection, Testing, and Maintenance

Item	Frequency	Reference
Inspection		
Control valves		Table 13.1.1.2
Pressure-regulating devices		Table 13.1.1.2
Piping	Annually	6.2.1
Hose connections		Table 13.1.1.2]
Cabinet	Annually	NFPA 1962
Gauges	Weekly/quarterly	6.2.2
Hose	Annually	NFPA 1962
Hose storage device	Annually	NFPA 1962
Hose nozzle	Annually and after each use	NFPA 1962
Hydraulic design information sign	Annually	6.2.3
Hose valves		Table 13.1.1.2
Hose connection		Table 13.1.1.2
Test		
Waterflow alarm devices		Table 13.1.1.2
Valve supervisory devices		Table 13.1.1.2
Supervisory signal devices (except valve supervisory switches)		Table 13.1.1.2
Hose storage device	Annually	NFPA 1962
Hose	5 years/3 years	NFPA 1962
Pressure control valve		Table 13.1.1.2
Pressure-reducing valve		Table 13.1.1.2
Hydrostatic test	5 years	6.3.2
Flow test	5 years	6.3.1
Main drain test		Table 13.1.1.2
Hose valves		Table 13.1.1.2
Hose connections		Table 13.1.1.2
Valve status test		13.3.1.2.1
Maintenance		
Hose connections	Annually	Table 6.1.2
Valves (all types)	Annually/as needed	Table 13.1.1.2
Hose valves		Table 13.1.1.2

Table 6.1.2 Standpipe and Hose Systems

Component/Checkpoint	Corrective Action
Hose Connections	
Cap missing	Replace
Fire hose connection damaged	Repair
Valve handles missing	Replace
Cap gaskets missing or deteriorated	Replace
Valve leaking	Close or repair
Visible obstructions	Remove
Restricting device missing	Replace
Manual, semiautomatic, or dry standpipe — valve does not operate smoothly	Lubricate or repair
Piping	
Damaged piping	Repair
Control valves damaged	Repair or replace
Missing or damaged pipe support device	Repair or replace
Damaged supervisory signal initiating device	Repair or replace
Hose	
Inspect	Remove and inspect the hose, including gaskets, and rerack or rereel at intervals in accordance with NFPA 1962, *Standard for the Care, Use, Inspection, Service Testing, and Replacement of Fire Hose, Couplings, Nozzles, and Fire Hose Appliances*
Mildew, cuts, abrasions, and deterioration evident	Replace with listed lined, jacketed hose
Coupling damaged	Replace or repair
Gaskets missing or deteriorated	Replace
Incompatible threads on coupling	Replace or provide thread adapter
Hose not connected to hose rack nipple or valve	Connect
Hose test outdated	Retest or replace in accordance with NFPA 1962
Hose Nozzle	
Hose nozzle missing	Replace with listed nozzle
Gasket missing or deteriorated	Replace
Obstructions	Remove
Nozzle does not operate smoothly	Repair or replace
Hose Storage Device	
Difficult to operate	Repair or replace
Damaged	Repair or replace
Obstruction	Remove
Hose improperly racked or rolled	Remove
Nozzle clip in place and nozzle correctly contained?	Replace if necessary
If enclosed in cabinet, will hose rack swing out at least 90 degrees?	Repair or remove any obstructions
Cabinet	
Inspect overall condition for corroded or damaged parts	Repair or replace parts; replace entire cabinet if necessary
Difficult to open	Repair
Cabinet door will not open fully	Repair or move obstructions
Door glazing cracked or broken	Replace
If cabinet is break-glass type, is lock functioning properly?	Repair or replace
Glass break device missing or not attached	Replace or attach
Not properly identified as containing fire equipment	Provide identification
Visible obstructions	Remove
All valves, hose, nozzles, fire extinguisher, etc., easily accessible	Remove any material not related

6.2.2.2 Gauges on automatic dry standpipe systems shall be inspected weekly to ensure that normal air or nitrogen and water pressure are being maintained.

6.2.2.3 Where air pressure supervision is connected to a constantly attended location, gauges shall be inspected monthly.

6.2.3* Hydraulic Design Information Sign. The hydraulic design information sign for standpipe systems shall be inspected annually to verify that it is provided, attached securely, and legible.

6.2.3.1 A hydraulic design information sign that is missing or illegible shall be replaced.

6.2.3.2 A standpipe system that was not sized by hydraulic design shall have a hydraulic design information sign that reads "Pipe Schedule System."

6.3 Testing. Where water damage is a possibility, an air test shall be conducted on the system at 25 psi (1.7 bar) prior to introducing water to the system.

6.3.1 Flow Tests.

6.3.1.1* A flow test shall be conducted every 5 years on all Class I and Class III standpipe systems to verify that the required flow and pressure are available at the hydraulically most remote hose valve outlet(s) while flowing the standpipe system demand.

6.3.1.1.1 Where a flow test of the hydraulically most remote outlet(s) is not practical, the authority having jurisdiction shall be consulted for the appropriate location for the test.

6.3.1.2* The standpipe system demand shall include 500 gpm (1892 L/min) for the first standpipe and 250 gpm (946 L/min) for each additional standpipe until the total system demand is simultaneously flowing.

6.3.1.2.1* The 250 gpm (946 L/min) required from each additional standpipe shall be allowed to be flowed from the most convenient hose valve on that standpipe.

6.3.1.2.2* Where the 250 gpm (946 L/min) cannot be flowed from each additional standpipe, the authority having jurisdiction shall determine where the additional flow can be taken.

6.3.1.3 The standpipe system demand shall be based on the design criteria in effect at the time of the installation.

6.3.1.3.1 Where the standpipe system demand cannot be determined, the authority having jurisdiction shall determine the standpipe system demand.

6.3.1.3.2 The actual test method(s) and performance criteria shall be discussed in advance with the authority having jurisdiction.

6.3.1.4 Standpipes, sprinkler connections to standpipes, or hose stations equipped with pressure-reducing valves or pressure-regulating valves shall have these valves inspected, tested, and maintained in accordance with the requirements of Chapter 13.

6.3.1.5 A main drain test shall be performed on all standpipe systems with automatic water supplies in accordance with the requirements of Chapter 13.

6.3.1.5.1 The test shall be performed at the low point drain for each standpipe or the main drain test connection where the supply main enters the building (when provided).

6.3.1.5.2 Pressure gauges shall be provided for the test and shall be maintained in accordance with 5.3.2.

6.3.2 Hydrostatic Tests.

6.3.2.1* Hydrostatic tests of not less than 200 psi (13.8 bar) pressure for 2 hours, or at 50 psi (3.4 bar) in excess of the maximum pressure, where maximum pressure is in excess of 150 psi (10.3 bar), shall be conducted every 5 years on manual standpipe systems and semiautomatic dry standpipe systems, including piping in the fire department connection.

6.3.2.1.1 Manual wet standpipes that are part of a combined sprinkler/standpipe system shall not be required to be tested in accordance with 6.3.2.1.

6.3.2.2 The hydrostatic test pressure shall be measured at the low elevation point of the individual system or zone being tested.

6.3.2.2.1 The inside standpipe piping shall show no leakage.

6.3.3 Waterflow Alarm and Supervisory Alarm Devices.

6.3.3.1 Where provided, waterflow alarm and supervisory alarm devices shall be tested in accordance with 13.2.6 and 13.3.3.5.

6.3.3.2 Where freezing conditions necessitate a delay in testing, tests shall be performed as soon as weather allows.

6.3.4* Gauges.

6.3.4.1 Gauges shall be replaced every 5 years or tested every 5 years by comparison with a calibrated gauge.

6.3.4.2 Gauges not accurate to within 3 percent of the full scale shall be recalibrated or replaced.

6.4 Maintenance.

6.4.1 Maintenance and repairs shall be in accordance with 6.1.3 and Table 6.1.2.

6.4.2 Equipment that does not pass the inspection or testing requirements shall be repaired and tested again or replaced.

6.5 Component Action Requirements.

6.5.1 Whenever components in standpipe and hose systems are adjusted, repaired, reconditioned, or replaced, the actions required in Table 6.5.1 shall be performed.

6.5.2 Where the original installation standard is different from the cited standard, the use of the appropriate installing standard shall be permitted.

6.5.3 These actions shall not require a design review, which is outside the scope of this standard.

Table 7.5.1 Summary of Component Replacement Action Requirements

Component	Adjust	Repair/ Recondition	Replace	Test Criteria
Water Delivery Components				
Pipe and fittings (exposed)	X	X	X	Hydrostatic test in conformance with NFPA 24, *Standard for the Installation of Private Fire Service Mains and Their Appurtenances*
Pipe and fittings (underground)				Flush in conformance with NFPA 24 or NFPA 20, as appropriate
Hydrants	X	X	X	Hydrostatic test in conformance with NFPA 24 Waterflow in conformance with NFPA 24 Inspect for proper drainage
Monitor nozzles	X	X	X	Hydrostatic test in conformance with NFPA 24 Flush in conformance with NFPA 24
Mainline strainers	X	X	X	Flow test downstream of strainer
Fire department connection	X	X	X	See Chapter 13
Alarm and Supervisory Components				
Valve supervisory device	X	X	X	Operational test for conformance with NFPA 24 and/or *NFPA 72, National Fire Alarm and Signaling Code*
System-Indicating Components				
Gauges			X	Verify at 0 psi (0 bar) and system working pressure
System Housing and Protection Components				
Hose houses	X	X	X	Verify integrity of hose house and hose house components
Hose		X		Repair and test hose in accordance with NFPA 1962
Hose			X	No action required
Structural Components				
Thrust blocks	X	X	X	Test at system working pressure
Tie rods	X	X	X	Test at system working pressure
Retainer glands	X	X	X	Test at system working pressure
Informational Components				
Identification signs	X	X	X	Verify conformance with NFPA 24

Chapter 8 Fire Pumps

8.1* General.

8.1.1 Minimum Requirements.

8.1.1.1 This chapter shall provide the minimum requirements for the routine inspection, testing, and maintenance of fire pump assemblies.

8.1.1.2 Table 8.1.1.2 shall be used to determine the minimum required frequencies for inspection, testing, and maintenance.

8.1.2 Alternative Inspection, Testing, and Maintenance Procedures. In the absence of manufacturer's recommendations for preventive maintenance, Table 8.1.2 shall be used for alternative requirements.

8.1.3 Valves and Connections. Valves and fire department connections shall be inspected, tested, and maintained in accordance with Chapter 13.

8.1.4 Obstruction Investigations. The procedures outlined in Chapter 14 shall be followed where there is a need to conduct an obstruction investigation.

8.1.5* Auxiliary Equipment. The pump assembly auxiliary equipment shall include the following:

(1) Pump accessories as follows:
   (a) Pump shaft coupling
   (b) Automatic air release valve
   (c) Pressure gauges
   (d) Circulation relief valve (not used in conjunction with diesel engine drive with heat exchanger)

Table 8.1.2 Alternative Fire Pump Inspection, Testing, and Maintenance Procedures

Complete as Applicable	Visual Inspection	Inspect	Change	Clean	Test	Frequency
Pump System						
Pump bearings		X				Annually
Lubricate pump bearings			X			As needed
Inspect pump shaft end play		X				Annually
Inspect accuracy of pressure gauges and sensors		X	X			Annually (replace or recalibrate when 5% out of calibration)
Inspect pump coupling alignment		X				Annually
Wet pit suction screens		X		X		After each pump operation
Mechanical Transmission						
Lubricate coupling			X			Annually
Lubricate right-angle gear drive			X			Annually
Electrical System						
Exercise isolating switch and circuit breaker					X	Monthly
Trip circuit breaker (if mechanism provided)					X	Annually
Operate manual starting means (electrical)					X	Semiannually
Inspect and operate emergency manual starting means (without power)	X				X	Annually
Tighten electrical connections as necessary		X				Annually
Lubricate mechanical moving parts (excluding starters and relays)		X				Annually
Calibrate pressure switch settings		X				Annually
Grease motor bearings		X				Annually
			X			Annually or as needed
Voltmeter and ammeter for accuracy (5%)		X				Annually
Any corrosion on printed circuit boards (PCBs)	X					Annually
Any cracked cable/wire insulation	X					Annually
Any leaks in plumbing parts	X					Annually
Any signs of water on electrical parts	X					Annually
Diesel Engine System						
Fuel						
Tank level	X	X				Weekly
Tank float switch	X				X	Weekly
Solenoid valve operation	X				X	Weekly
Strainer, filter, or dirt leg, or combination thereof				X		Quarterly
Water and foreign material in tank				X		Annually
Water in system		X		X		Weekly
Flexible hoses and connectors	X					Weekly
Tank vents and overflow piping unobstructed		X			X	Annually
Piping	X					Annually
Lubrication system						
Oil level	X	X				Weekly
Oil change			X			50 hours or annually
Oil filter(s)			X			50 hours or annually
Lube oil heater		X				Weekly
Crankcase breather	X		X	X		Quarterly

Table 8.1.2 *Continued*

Complete as Applicable	Visual Inspection	Inspect	Change	Clean	Test	Frequency
Cooling system						
Level	X	X				Weekly
Antifreeze protection level					X	Semiannually
Antifreeze		X				Annually
Adequate cooling water to heat exchanger		X				Weekly
Rod out heat exchanger				X		Annually
Water pump(s)	X					Weekly
Condition of flexible hoses and connections	X	X				Weekly
Jacket water heater		X				Weekly
Inspect duct work, clean louvers (combustion air)	X	X	X			Annually
Water strainer				X		Quarterly
Exhaust system						
Leakage	X	X				Weekly
Drain condensate trap		X				Weekly
Insulation and fire hazards	X					Quarterly
Excessive back pressure					X	Annually
Exhaust system hangers and supports	X					Annually
Flexible exhaust section	X					Semiannually
Battery system						
Electrolyte level		X				Weekly
Terminals clean and tight	X	X				Quarterly
Case exterior clean and dry	X	X				Monthly
Specific gravity or state of charge					X	Monthly
Charger and charge rate	X					Monthly
Equalize charge		X				Monthly
Clean terminals				X		Annually
Cranking voltage exceeds 9 volts on a 12 volt system or 18 volts on a 24 volt system		X				Weekly
Electrical system						
General inspection	X					Weekly
Tighten control and power wiring connections		X				Annually
Wire chafing where subject to movement	X	X				Quarterly
Operation of safeties and alarms		X			X	Semiannually
Boxes, panels, and cabinets				X		Semiannually
Circuit breakers or fuses	X	X				Monthly
Circuit breakers or fuses			X			Biennially
Voltmeter and ammeter for accuracy (5%)		X				Annually
Any corrosion on printed circuit boards (PCBs)	X					Annually
Any cracked cable/wire insulation	X					Annually
Any leaks in plumbing parts	X					Annually
Any signs of water on electrical parts	X					Annually

(2) Pump test device(s)
(3) Pump relief valve and piping (where maximum pump discharge pressure exceeds the rating of the system components or the driver is of variable speed)
(4) Alarm sensors and indicators
(5) Right-angle gear sets (for engine-driven vertical shaft turbine pumps)
(6) Pressure maintenance (jockey) pump and accessories

8.1.6 Water Supply to Pump Suction.

8.1.6.1 The suction supply for the fire pump shall provide the required flow at a gauge pressure of 0 psi (0 bar) or higher at the pump suction flange to meet the system demand.

8.1.6.2 Those installations for which NFPA 20, *Standard for the Installation of Stationary Pumps for Fire Protection*, permitted negative suction gauge pressures at the time of pump installation, where the system demand still can be met by the pump and water supply, shall be considered to be in compliance with 8.1.6.

8.1.7 Energy Source. The energy sources for the pump driver shall supply the necessary brake horsepower of the driver so that the pump meets system demand.

8.1.8 Driver. The pump driver shall not overload beyond its rating (including any service factor allowance) when delivering the necessary brake horsepower.

Table 8.1.1.2 Summary of Fire Pump Inspection, Testing, and Maintenance

Item	Frequency	Reference
Inspection		
Pump house, heating ventilating louvers	Weekly	8.2.2(1)
Fire pump system	Weekly	8.2.2
Test		
Pump operation		
No-flow condition		8.3.1
Diesel engine–driven fire pump	Weekly	
Electric motor–driven fire pump	See 8.3.1.2	
Flow condition	Annually	8.3.3
Fire pump alarm signals	Annually	8.3.3.5
Maintenance		
Hydraulic	Annually	8.5
Mechanical transmission	Annually	8.5
Electrical system	Varies	8.5
Controller, various components	Varies	8.5
Motor	Annually	8.5
Diesel engine system, various components	Varies	8.5

8.1.9* Controller. Automatic and manual controllers for applying the energy source to the driver shall be capable of providing this operation for the type of pump used.

8.1.10 Impairments. The procedures outlined in Chapter 15 shall be followed where an impairment to protection occurs.

8.2 Inspection.

8.2.1 The purpose of inspection shall be to verify that the pump assembly appears to be in operating condition and is free from physical damage.

8.2.2* The pertinent visual observations specified in the following checklists shall be performed weekly:

(1) Pump house conditions as follows:
   (a) Heat is adequate, not less than 40°F (4°C) for pump room with diesel engine–driven pumps with engine heaters.
   (b) Heat is adequate, not less than 70°F (21°C) for pump room with diesel engine–driven pumps without engine heaters.
   (c) Ventilating louvers are free to operate.

(2) Pump system conditions as follows:
   (a) Pump suction and discharge and bypass valves are fully open.
   (b) Piping is free of leaks.
   (c) Suction line pressure gauge reading is within acceptable range.
   (d) System line pressure gauge reading is within acceptable range.
   (e) Suction reservoir has the required water level.
   (f) Wet pit suction screens are unobstructed and in place.
   (g) Waterflow test valves are in the closed position.

(3) Electrical system conditions as follows:
   (a) Controller pilot light (power on) is illuminated.
   (b) Transfer switch normal pilot light is illuminated.
   (c) Isolating switch is closed — standby (emergency) source.
   (d) Reverse phase alarm pilot light is off, or normal phase rotation pilot light is on.
   (e) Oil level in vertical motor sight glass is within acceptable range.
   (f) Power to pressure maintenance (jockey) pump is provided.

(4) Diesel engine system conditions as follows:
   (a) Fuel tank is at least two-thirds full.
   (b) Controller selector switch is in auto position.
   (c) Batteries' (2) voltage readings are within acceptable range.
   (d) Batteries' (2) charging current readings are within acceptable range.
   (e) Batteries' (2) pilot lights are on or battery failure (2) pilot lights are off.
   (f) All alarm pilot lights are off.
   (g) Engine running time meter is reading.
   (h) Oil level in right angle gear drive is within acceptable range.
   (i) Crankcase oil level is within acceptable range.
   (j) Cooling water level is within acceptable range.
   (k) Electrolyte level in batteries is within acceptable range.
   (l) Battery terminals are free from corrosion.
   (m) Water-jacket heater is operating.

(5) *Steam system conditions: Steam pressure gauge reading is within acceptable range.

8.3* Testing.

8.3.1 Frequency.

8.3.1.1* A non-flow test shall be conducted for diesel engine–driven fire pumps without recirculating water back to the pump suction on a test frequency in accordance with 8.3.1.1.1 or 8.3.1.1.2.

8.3.1.1.1 Except as permitted in 8.3.1.1.2, a weekly test frequency shall be required.

8.3.1.1.2* The test frequency shall be permitted to be established by an approved risk analysis.

8.3.1.2* A non-flow test shall be conducted for electric motor–driven fire pumps without recirculating water back to the pump suction on a test frequency in accordance with 8.3.1.2.1, 8.3.1.2.2, 8.3.1.2.3, or 8.3.1.2.4.

8.3.1.2.1 Except as permitted in 8.3.1.2.2 and 8.3.1.2.3, a weekly test frequency shall be required for the following electric fire pumps:

(1) Fire pumps that serve fire protection systems in high rise buildings that are beyond the pumping capacity of the fire department
(2) Fire pumps with limited service controllers
(3) Vertical turbine fire pumps
(4) Fire pumps taking suction from ground level tanks or a water source that does not provide sufficient pressure to be of material value without the pump

8.3.1.2.2 A monthly test frequency shall be permitted for electric fire pumps not identified in 8.3.1.2.1.

8.3.1.2.3* A monthly test frequency shall be permitted for electric fire pump systems having a redundant fire pump.

8.3.1.2.4* The test frequency shall be permitted to be established by an approved risk analysis.

8.3.2 No-Flow Condition.

8.3.2.1 A test of fire pump assemblies shall be conducted without flowing water.

8.3.2.2 The test shall be conducted by starting the pump automatically.

8.3.2.3 The electric pump shall run a minimum of 10 minutes.

8.3.2.4 The diesel pump shall run a minimum of 30 minutes.

8.3.2.5 A valve installed to open as a safety feature shall be permitted to discharge water.

8.3.2.6 An automatic timer that meets 8.3.2.6.1 through 8.3.2.6.3 shall be permitted to be substituted for the starting procedure.

8.3.2.6.1 A solenoid valve drain on the pressure control line shall be the initiating means for a pressure-actuated controller.

8.3.2.6.2 In a pressure-actuated controller, performance of this program timer shall be recorded as a pressure drop indication on the pressure recorder.

8.3.2.6.3 In a non-pressure-actuated controller, the test shall be permitted to be initiated by means other than a solenoid valve.

8.3.2.7 Qualified personnel shall be in attendance whenever the pump is in operation.

8.3.2.7.1* The use of the automatic timer allowed in 8.3.2.6 shall not eliminate the requirement of 8.3.2.7 to have qualified personnel present during test.

8.3.2.8 The pertinent visual observations or adjustments specified in the following checklists shall be conducted while the pump is idle:

(1) Record the system suction and discharge pressure gauge readings
(2) For pumps that use electronic pressure sensors to control the fire pump operation, record the current pressure and the highest and the lowest pressure shown on the fire pump controller event log
(3) If the highest or lowest pressure is outside of the expected range, record all information from the event log that helps identify the abnormality

8.3.2.9* The pertinent visual observations or adjustments specified in the following checklists shall be conducted while the pump is running:

(1) Pump system procedure as follows:
   (a) Record the pump starting pressure from the pressure switch or pressure transducer
   (b) Record the system suction and discharge pressure gauge readings
   (c) Inspect the pump packing glands for slight discharge
   (d) Adjust gland nuts if necessary
   (e) Inspect for unusual noise or vibration
   (f) Inspect packing boxes, bearings, or pump casing for overheating
   (g) Record pressure switch or pressure transducer reading and compare to the pump discharge gauge
   (h) For pumps that use electronic pressure sensors to control the fire pump operation, record the current pressure and the highest and the lowest pressure shown on the fire pump controller event log
   (i) For electric motor and radiator cooled diesel pumps, check the circulation relief valve for operation to discharge water
(2) Electrical system procedure as follows:
   (a) Observe the time for motor to accelerate to full speed
   (b) Record the time controller is on first step (for reduced voltage or reduced current starting)
   (c) Record the time pump runs after starting (for automatic stop controllers)
(3) Diesel engine system procedure as follows:
   (a) Observe the time for engine to crank
   (b) Observe the time for engine to reach running speed
   (c) Observe the engine oil pressure gauge, speed indicator, water, and oil temperature indicators periodically while engine is running
   (d) Record any abnormalities
   (e) Inspect the heat exchanger for cooling waterflow
(4) Steam system procedure as follows:
   (a) Record the steam pressure gauge reading
   (b) Observe the time for turbine to reach running speed

8.3.3 Annual Flow Testing.

8.3.3.1* An annual test of each pump assembly shall be conducted by qualified personnel under no-flow (churn), rated flow, and 150 percent of the pump rated capacity flow of the fire pump by controlling the quantity of water discharged through approved test devices.

8.3.3.1.1 If available suction supplies do not allow flowing of 150 percent of the rated pump capacity, the fire pump shall be tested to the maximum allowable discharge.

8.3.3.1.2* The annual test shall be conducted as described in 8.3.3.1.2.1, 8.3.3.1.2.2, or 8.3.3.1.2.3.

8.3.3.1.2.1 Use of Pump Discharge via Hose Streams.

(A) Pump suction and discharge pressures and the flow measurements of each hose stream shall determine the total pump output.

(B) Care shall be taken to prevent water damage by verifying there is adequate drainage for the high pressure water discharge from hoses.

8.3.3.1.2.2 Use of Pump Discharge via Bypass Flowmeter to Drain or Suction Reservoir. Pump suction and discharge pressures and the flowmeter measurements shall determine the total pump output.

8.3.3.1.2.3 Use of Pump Discharge via Bypass Flowmeter to Pump Suction (Closed-Loop Metering).

(A) Pump suction and discharge pressures and the flowmeter measurements shall determine the total pump output.

(B) When testing includes recirculating water back to the fire pump suction, the temperature of the recirculating water shall be monitored to verify that it remains below temperatures that could result in equipment damage as defined by the pump and engine manufacturers.

8.3.3.1.3 Where the annual test is conducted periodically in accordance with 8.3.3.1.2.3, a test shall be conducted every 3 years in accordance with 8.3.3.1.2.1 or 8.3.3.1.2.2 in lieu of the method described in 8.3.3.1.2.3.

8.3.3.1.4 Where 8.3.3.1.2.2 or 8.3.3.1.2.3 is used, the flowmeter shall be adjusted immediately prior to conducting the test in accordance with the manufacturer's instructions.

8.3.3.1.4.1 If the test results are not consistent with the previous annual test, 8.3.3.1.2.1 shall be used.

8.3.3.1.4.2 If testing in accordance with 8.3.3.1.2.1 is not possible, a flowmeter calibration shall be performed and the test shall be repeated.

8.3.3.2 The pertinent visual observations, measurements, and adjustments specified in the following checklists shall be conducted annually while the pump is running and flowing water under the specified output condition:

(1) At no-flow condition (churn) as follows:
   (a) Inspect the circulation relief valve for operation to discharge water
   (b) Inspect the pressure relief valve (if installed) for proper operation
(2) At each flow condition as follows:
   (a) Record the electric motor voltage and current (all lines)
   (b) Record the pump speed in rpm
   (c) Record the simultaneous (approximately) readings of pump suction and discharge pressures and pump discharge flow
(3) *For electric motor–driven pumps, do not shut down the pump until it has run for 10 minutes
(4) For diesel motor–driven pumps, do not shut down the pump until it has run for 30 minutes

8.3.3.3* For installations having a pressure relief valve, the operation of the relief valve shall be closely observed during each flow condition to determine whether the pump discharge pressure exceeds the normal operating pressure of the system components.

8.3.3.3.1* The pressure relief valve shall also be observed during each flow condition to determine whether the pressure relief valve closes at the proper pressure.

8.3.3.3.2 The pressure relief valve shall be closed during flow conditions if necessary to achieve minimum rated characteristics for the pump and reset to normal position at the conclusion of the pump test.

8.3.3.3.2.1 When it is necessary to close the relief valve to achieve minimum rated characteristics for the pump, the pump discharge control valve shall be closed if the pump churn pressure exceeds the system rated pressure.

8.3.3.3.3 When pressure relief valves are piped back to the fire pump suction, the temperature of the recirculating water shall be monitored to verify that it remains below temperatures that could result in equipment damage as defined by the pump and engine manufacturers.

8.3.3.4 For installations having an automatic transfer switch, the following test shall be performed to ensure that the overcurrent protective devices (i.e., fuses or circuit breakers) do not open:

(1) Simulate a power failure condition while the pump is operating at peak load
(2) Verify that the transfer switch transfers power to the alternate power source
(3) Verify that the pump continues to perform at peak horsepower load on the alternate power source for 10 minutes for an alternate utility or 30 minutes if the alternate power source is a standby generator set
(4) Remove the power failure condition and verify that, after a time delay, the pump is reconnected to the normal power source

8.3.3.5* Alarm conditions shall be simulated by activating alarm circuits at alarm sensor locations, and all such local or remote alarm indicating devices (visual and audible) shall be observed for operation.

8.3.3.6* Safety. Section 4.9 shall be followed for safety requirements while working near electric motor–driven fire pumps.

8.3.3.7* Suction Screens. After the waterflow portions of the annual test or fire protection system activations, the suction screens shall be inspected and cleared of any debris or obstructions.

8.3.3.8* Where engines utilize electronic fuel management control systems, the backup electronic control module (ECM) and the primary and redundant sensors for the ECM shall be tested annually.

8.3.4 Diesel Fuel Testing and Maintenance.

8.3.4.1 Diesel fuel shall be tested for degradation no less than annually.

8.3.4.1.1* Fuel degradation testing shall comply with ASTM D 975-11b, *Standard Specification for Diesel Fuel Oils,* or ASTM D 6751-11b, *Standard Specification for Biodiesel Fuel Blend Stock (B100) for Middle Distillate Fuels,* as approved by the engine manufacturer, using ASTM D 7462-11, *Standard Test Method for Oxidation Stability of Biodiesel (B100) and Blends of Biodiesel with Middle Distillate Petroleum Fuel (Accelerated Method).*

8.3.4.2* If diesel fuel is found to be deficient in the testing required in 8.3.4.1.1, the fuel shall be reconditioned or replaced, the supply tank shall be cleaned internally, and the engine fuel filter(s) shall be changed.

8.3.4.2.1 After the restoration of the fuel and tank in 8.3.4.2, the fuel shall be retested every 6 months until experience indicates the fuel can be stored for a minimum of 1 year without degradation beyond that allowed in 8.3.4.1.1.

8.3.4.3 When provided, active fuel maintenance systems shall be listed for fire pump service.

8.3.4.3.1 Maintenance of active fuel maintenance systems shall be in accordance with the manufacturer's recommendations.

8.3.4.3.2 Maintenance of active fuel maintenance systems shall be performed at a minimum annual frequency for any portion of the system that the manufacturer does not provide a recommended maintenance frequency.

8.3.4.3.3 Fuel additives shall be used and maintained in accordance with the active fuel maintenance system manufacturer's recommendations.

8.3.5 Positive Displacement Pumps. [20:14.2.6.4.3]

8.3.5.1 Except as provided in 8.3.5.1 through 8.3.5.7, positive displacement pumps shall be tested in accordance with 8.3.1 through 8.3.3.

8.3.5.2 The pump flow for positive displacement pumps shall be tested and determined to meet the specified rated performance criteria where only one performance point is required to establish positive displacement pump acceptability. [**20:**14.2.6.4.3.1]

8.3.5.3 The pump flow test for positive displacement pumps shall be accomplished using a flowmeter or orifice plate installed in a test loop back to the supply tank, to the inlet side of a positive displacement water pump, or to drain. [**20:**14.2.6.4.3.2]

8.3.5.4 The flowmeter reading or discharge pressure shall be recorded and shall be in accordance with the pump manufacturer's flow performance data. [**20:**14.2.6.4.3.3]

8.3.5.5 If orifice plates are used, the orifice size and corresponding discharge pressure to be maintained on the upstream side of the orifice plate shall be made available to the authority having jurisdiction. [**20:**14.2.6.4.3.4]

8.3.5.6 Flow rates shall be as specified while operating at the system design pressure. Tests shall be performed in accordance with HI 3.6, *Rotary Pump Tests.* [**20:**14.2.6.4.3.5]

8.3.5.7 Positive displacement pumps intended to pump liquids other than water shall be permitted to be tested with water; however, the pump performance will be affected, and manufacturer's calculations shall be provided showing the difference in viscosity between water and the system liquid. [**20:**14.2.6.4.3.6]

8.3.6 Other Tests.

8.3.6.1 Engine generator sets supplying emergency or standby power to fire pump assemblies shall be tested routinely in accordance with NFPA 110, *Standard for Emergency and Standby Power Systems.*

8.3.6.2 Automatic transfer switches shall be tested routinely and exercised in accordance with NFPA 110.

8.3.6.3 Tests of appropriate environmental pump room space conditions (e.g., heating, ventilation, illumination) shall be made to ensure proper manual or automatic operation of the associated equipment.

8.3.6.4* Parallel and angular alignment of the pump and driver shall be inspected during the annual test, and any misalignment shall be corrected.

8.3.7 Test Results and Evaluation.

8.3.7.1* Interpretation.

8.3.7.1.1 The interpretation of the test results shall be the basis for determining performance of the pump assembly.

8.3.7.1.2 Qualified individuals shall interpret the test results.

8.3.7.2 Engine Speed.

8.3.7.2.1 Theoretical factors for correction to the rated speed shall be applied where determining the compliance of the pump per the test.

8.3.7.2.2 Increasing the engine speed beyond the rated speed of the pump at rated condition shall not be permitted as a method for meeting the rated pump performance.

8.3.7.3 The fire pump assembly shall be considered acceptable if either of the following conditions is shown during the test:

(1)*The test is no less than 95 percent of the pressure at rated flow and rated speed of the initial unadjusted field acceptance test curve, provided that the original acceptance test curve matches the original certified pump curve by using theoretical factors.
(2) The fire pump is no less than 95 percent of the performance characteristics as indicated on the pump nameplate.

8.3.7.4* Degradation in excess of 5 percent of the pressure of the initial unadjusted acceptance test curve or nameplate shall require an investigation to reveal the cause of degraded performance.

8.3.7.5 Current and voltage readings whose product does not exceed the product of the rated voltage and rated full-load current multiplied by the permitted motor service factor shall be considered acceptable.

8.3.7.6 Voltage readings at the motor within 5 percent below or 10 percent above the rated (i.e., nameplate) voltage shall be considered acceptable.

8.3.7.7 The pump performance shall be evaluated using the unadjusted flow rates and pressures to ensure the pump can supply the system demand as supplied by the owner.

8.4 Reports.

8.4.1 Any abnormality observed during inspection or testing shall be reported promptly to the property owner or designated representative.

8.4.2 Test results and any documented performance issues shall be recorded and retained for comparison purposes in accordance with Section 4.3.

8.4.3 All time delay intervals associated with the pump's starting, stopping, and energy source transfer shall be recorded.

8.5 Maintenance.

8.5.1* A preventive maintenance program shall be established on all components of the pump assembly in accordance with the manufacturer's recommendations or Table 8.1.2.

8.5.2 Records shall be maintained on all work performed on the pump, driver, controller, and auxiliary equipment.

8.5.3 The preventive maintenance program shall be initiated immediately after the pump assembly has passed acceptance tests.

8.6 Component Replacement Testing Requirements.

8.6.1 Whenever a component in a fire pump is adjusted, repaired, rebuilt, or replaced, the tests required to restore the system to service shall be performed in accordance with Table 8.6.1.

Table 13.1.1.2 Summary of Valves, Valve Components, and Trim Inspection, Testing, and Maintenance

Item	Frequency	Reference
Inspection		
Control Valves		
Sealed	Weekly	13.3.2.1
Locked or electrically supervised	Monthly	13.3.2.1.1
Valve Supervisory Signal Initiating Device	Quarterly	13.3.2.1.2
Alarm Valves		
Exterior	Monthly	13.4.1.1
Interior	5 years	13.4.1.2
Strainers, filters, orifices	5 years	13.4.1.2
Check Valves		
Interior	5 years	13.4.2.1
Preaction/Deluge Valves		
Enclosure (during cold weather)	Daily/weekly	13.4.3.1
Exterior	Monthly	13.4.3.1.6
Interior	Annually/5 years	13.4.3.1.7
Strainers, filters, orifices	5 years	13.4.3.1.8
Dry Pipe Valves/ Quick-Opening Devices		
Gauges	Weekly/monthly	13.4.4.1.2.4, 13.4.4.1.2.5
Enclosure (during cold weather)	Daily/weekly	13.4.4.1.1
Exterior	Monthly	13.4.4.1.4
Interior	Annually	13.4.4.1.5
Strainers, filters, orifices	5 years	13.4.4.1.6
Pressure-Reducing and Relief Valves		
Sprinkler systems	Quarterly	13.5.1.1
Hose connections	Annually	13.5.2.1
Hose racks	Annually	13.5.3.1
Fire pumps		
Casing relief valves	Weekly	13.5.7.1, 13.5.7.1.1
Pressure-relief valves	Weekly	13.5.7.2, 13.5.7.2.1
Backflow Prevention Assemblies		
Reduced pressure	Weekly/monthly	13.6.1
Reduced-pressure detectors	Weekly/monthly	13.6.1
Fire Department Connections	Quarterly	13.7.1
Testing		
Main Drains	Annually/quarterly	13.2.5, 13.2.5.1, 13.3.3.4
Gauges	5 years	13.2.7.2
Waterflow Alarms	Quarterly/semiannually	13.2.6
Control Valves		
Position	Annually	13.3.3.1
Operation	Annually	13.3.3.1
Supervisory	Semiannually	13.3.3.5
Preaction/Deluge Valves		
Priming water	Quarterly	13.4.3.2.1
Low air pressure alarms	Quarterly/annually	13.4.3.2.13, 13.4.3.2.14
Full flow	Annually	13.4.3.2.2
Air leakage	3 years	13.4.3.2.6

Table 13.1.1.2 *Continued*

Item	Frequency	Reference
Dry Pipe Valves/ Quick-Opening Devices		
Air leakage	3 years	13.4.4.2.9
Priming water	Quarterly	13.4.4.2.1
Low air pressure alarm	Quarterly	13.4.4.2.6
Quick-opening devices	Quarterly	13.4.4.2.4
Trip test	Annually	13.4.4.2.2
Full flow trip test	3 years	13.4.4.2.2.2
Pressure-Reducing and Relief Valves		
Sprinkler systems	5 years	13.5.1.2
Circulation relief	Annually	13.5.7.1.2
Pressure relief valves	Annually	13.5.7.2.2
Hose connections	5 years	13.5.2.2
Hose racks	5 years	13.5.3.2
Backflow Prevention Assemblies	Annually	13.6.2
Maintenance		
Control Valves	Annually	13.3.4
Preaction/Deluge Valves	Annually	13.4.3.3.2
Dry Pipe Valves/ Quick-Opening Devices	Annually	13.4.4.3

13.2 General Provisions.

13.2.1 The property owner or designated representative shall have manufacturers' literature available to provide specific instructions for inspecting, testing, and maintaining the valves and associated equipment.

13.2.2 All pertinent personnel, departments, authorities having jurisdiction, or agencies shall be notified that testing or maintenance of the valve and associated alarms is to be conducted.

13.2.3* All system valves shall be protected from physical damage and shall be accessible.

13.2.4 Before opening a test or drain valve, it shall be verified that adequate provisions have been made for drainage.

13.2.5* Main Drain Test. A main drain test shall be conducted annually for each water supply lead-in to a building water-based fire protection system to determine whether there has been a change in the condition of the water supply.

13.2.5.1 Where the lead-in to a building supplies a header or manifold serving multiple systems, a single main drain test shall be permitted.

13.2.5.2 In systems where the sole water supply is through a backflow preventer and/or pressure-reducing valves, the main drain test of at least one system downstream of the device shall be conducted on a quarterly basis.

13.2.5.3 When there is a 10 percent reduction in full flow pressure when compared to the original acceptance test or previously performed tests, the cause of the reduction shall be identified and corrected if necessary.

13.2.6 Alarm Devices.

13.2.6.1 Mechanical waterflow alarm devices, including but not limited to water motor gongs, shall be tested quarterly.

13.2.6.2 Vane-type and pressure switch–type waterflow devices shall be tested semiannually.

13.2.7 Gauges.

13.2.7.1 Gauges shall be inspected monthly to verify that they are in good condition and that normal pressure is being maintained.

13.2.7.1.1 Where other sections of this standard have different frequency requirements for specific gauges, those requirements shall be used.

13.2.7.2 Gauges shall be replaced every 5 years or tested every 5 years by comparison with a calibrated gauge.

13.2.7.3 Gauges not accurate to within 3 percent of the full scale shall be recalibrated or replaced.

13.2.8 Records. Records shall be maintained in accordance with Section 4.3.

13.3 Control Valves in Water-Based Fire Protection Systems.

13.3.1* Each control valve shall be identified and have a sign indicating the system or portion of the system it controls.

13.3.1.1 Systems that have more than one control valve that must be closed to work on a system shall have a sign on each affected valve referring to the existence and location of other valves.

13.3.1.2* When a normally open valve is closed, the procedures established in Chapter 15 shall be followed.

13.3.1.2.1 When the valve is returned to service, a valve status test (either main or sectional drain, as appropriate) shall be conducted to determine that the valve is not closed.

13.3.1.3 Each normally open valve shall be secured by means of a seal or a lock or shall be electrically supervised in accordance with the applicable NFPA standards.

13.3.1.4 Normally closed valves shall be secured by means of a seal or shall be electrically supervised in accordance with the applicable NFPA standard.

13.3.1.5 Sealing or electrical supervision shall not be required for hose valves.

13.3.2 Inspection.

13.3.2.1 All valves shall be inspected weekly.

13.3.2.1.1 Valves secured with locks or supervised in accordance with applicable NFPA standards shall be permitted to be inspected monthly.

13.3.2.1.2 Control valve supervisory alarm devices shall be inspected quarterly to verify that they are free of physical damage.

13.3.2.1.3 After any alterations or repairs, an inspection shall be made by the property owner or designated representative to ensure that the system is in service and all valves are in the normal position and properly sealed, locked, or electrically supervised.

13.3.2.2* The valve inspection shall verify that the valves are in the following condition:

(1) In the normal open or closed position
(2) *Sealed, locked, or supervised
(3) Accessible
(4) Post indicator valves (PIVs) are provided with correct wrenches
(5) Free from external leaks
(6) Provided with applicable identification

13.3.3 Testing.

13.3.3.1 Each control valve shall be operated annually through its full range and returned to its normal position.

13.3.3.2* Post indicator valves shall be opened until spring or torsion is felt in the rod, indicating that the rod has not become detached from the valve.

13.3.3.2.1 This test shall be conducted every time the valve is closed.

13.3.3.3 Post indicator and outside screw and yoke valves shall be backed a one-quarter turn from the fully open position to prevent jamming.

13.3.3.4 A main drain test shall be conducted any time the control valve is closed and reopened at system riser.

13.3.3.5* Supervisory Switches.

13.3.3.5.1 Valve supervisory switches shall be tested semiannually.

13.3.3.5.2 A distinctive signal shall indicate movement from the valve's normal position during either the first two revolutions of a hand wheel or when the stem of the valve has moved one-fifth of the distance from its normal position.

13.3.3.5.3 The signal shall not be restored at any valve position except the normal position.

13.3.4 Maintenance.

13.3.4.1 The operating stems of outside screw and yoke valves shall be lubricated annually.

13.3.4.2 The valve then shall be completely closed and reopened to test its operation and distribute the lubricant.

13.4 System Valves.

13.4.1 Inspection of Alarm Valves. Alarm valves shall be inspected as described in 13.4.1.1 and 13.4.1.2.

13.4.1.1* Alarm valves and system riser check valves shall be externally inspected monthly and shall verify the following:

(1) The gauges indicate normal supply water pressure is being maintained.
(2) The valve is free of physical damage.
(3) All valves are in the appropriate open or closed position.
(4) The retarding chamber or alarm drains are not leaking.

13.4.1.2* Alarm valves and their associated strainers, filters, and restriction orifices shall be inspected internally every 5 years unless tests indicate a greater frequency is necessary.

13.4.1.3 Maintenance.

13.4.1.3.1 Internal components shall be cleaned/repaired as necessary in accordance with the manufacturer's instructions.

13.4.1.3.2 The system shall be returned to service in accordance with the manufacturer's instructions.

13.4.2 Check Valves.

13.4.2.1 Inspection. Valves shall be inspected internally every 5 years to verify that all components operate correctly, move freely, and are in good condition.

13.4.2.2 Maintenance. Internal components shall be cleaned, repaired, or replaced as necessary in accordance with the manufacturer's instructions.

13.4.3 Preaction Valves and Deluge Valves.

13.4.3.1 Inspection.

13.4.3.1.1 Valve enclosures for preaction and deluge valves subject to freezing shall be inspected daily during cold weather to verify a minimum temperature of 40°F (4.0°C).

13.4.3.1.1.1 Valve enclosures equipped with low temperature alarms shall be inspected weekly.

13.4.3.1.2 Low temperature alarms, if installed in valve enclosures, shall be inspected annually at the beginning of the heating season to verify that they are free of physical damage.

13.4.3.1.3 Gauges shall be inspected weekly.

13.4.3.1.3.1 The gauge on the supply side of the preaction or deluge valve shall indicate that the normal supply water pressure is being maintained.

13.4.3.1.4 The gauge monitoring the preaction system supervisory air pressure, if provided, shall be inspected monthly to verify that it indicates that normal pressure is being maintained.

13.4.3.1.5 The gauge monitoring the detection system pressure, if provided, shall be tested monthly to verify that it indicates that normal pressure is being maintained.

13.4.3.1.6 The preaction or deluge valve shall be externally inspected monthly to verify the following:

(1) The valve is free from physical damage.
(2) All trim valves are in the appropriate open or closed position.
(3) The valve seat is not leaking.
(4) Electrical components are in service.

13.4.3.1.7 The interior of the preaction or deluge valve and the condition of detection devices shall be inspected annually when the trip test is conducted.

13.4.3.1.7.1 Internal inspection of valves that can be reset without removal of a faceplate shall be permitted to be conducted every 5 years.

13.4.3.1.8 Strainers, filters, restricted orifices, and diaphragm chambers shall be inspected internally every 5 years unless tests indicate a greater frequency is necessary.

13.4.3.2 Testing.

13.4.3.2.1* The priming water level in supervised preaction systems shall be tested quarterly for compliance with the manufacturer's instructions.

13.4.3.2.2* Each deluge valve shall be trip tested annually at full flow in warm weather and in accordance with the manufacturer's instructions.

13.4.3.2.2.1* Full flow tests shall incorporate full functionality of the system as a unit, including automatic and manual activation.

13.4.3.2.2.2 Protection shall be provided for any devices or equipment subject to damage by system discharge during tests.

13.4.3.2.2.3 Where the nature of the protected property is such that water cannot be discharged for test purposes, the trip test shall be conducted in a manner that does not necessitate discharge in the protected area.

13.4.3.2.2.4 Where the nature of the protected property is such that water cannot be discharged unless protected equipment is shut down (e.g., energized electrical equipment), a full flow system test shall be conducted at the next scheduled shutdown.

13.4.3.2.2.5 The full flow test frequency shall not exceed 3 years.

13.4.3.2.2.6 The water discharge patterns from all of the open spray nozzles or sprinklers shall be observed to ensure that patterns are not impeded by plugged nozzles, that nozzles are correctly positioned, and that obstructions do not prevent discharge patterns from wetting surfaces to be protected.

(A) Where the nature of the protected property is such that water cannot be discharged, the nozzles or open sprinklers shall be inspected for correct orientation and the system tested with air to ensure that the nozzles are not obstructed.

(B) Where obstructions occur, the piping and sprinklers or nozzles shall be cleaned and the system retested.

13.4.3.2.3 Except for preaction systems covered by 13.4.3.2.5, every 3 years the preaction valve shall be trip tested with the control valve fully open.

13.4.3.2.4 During those years when full flow testing in accordance with 13.4.3.2.3 is not required, the preaction valve shall be trip tested with the control valve partially open.

13.4.3.2.5 Preaction or deluge valves protecting freezers shall be trip tested in a manner that does not introduce moisture into the piping in the freezer.

13.4.3.2.6 Preaction systems shall be tested once every 3 years for air leakage, using one of the following test methods:

(1) A pressure test at 40 psi (3.2 bar) for 2 hours. The system shall be permitted to lose up to 3 psi (0.2 bar) during the duration of the test. Air leaks shall be addressed if the system loses more than 3 psi (0.2 bar) during this test.
(2) With the system at normal system pressure, shut off the air source (compressor or shop air) for 4 hours. If the low air pressure alarm goes off within this period, the air leaks shall be addressed.

13.4.3.2.7 Deluge System Pressure Readings.

13.4.3.2.7.1 Pressure readings shall be recorded at the hydraulically most remote nozzle or sprinkler.

13.4.3.2.7.2 A second pressure reading shall be recorded at the deluge valve.

13.4.3.2.7.3 These readings shall be compared to the hydraulic design pressures to ensure the original system design requirements are met by the water supply.

13.4.3.2.7.4 Where the hydraulically most remote nozzle or sprinkler is inaccessible, nozzles or sprinklers in other than foam-water systems shall be permitted to be inspected visually without taking a pressure reading on the most remote nozzle or sprinkler.

13.4.3.2.7.5 Where the reading taken at the riser indicates that the water supply has deteriorated, a gauge shall be placed on the hydraulically most remote nozzle or sprinkler and the results compared with the required design pressure.

13.4.3.2.8 Multiple Systems. The maximum number of systems expected to operate in case of fire shall be tested simultaneously to inspect the adequacy of the water supply.

13.4.3.2.9 Manual Operation. Manual actuation devices shall be operated annually.

13.4.3.2.10 Return to Service. After the full flow test, the system shall be returned to service in accordance with the manufacturer's instructions.

13.4.3.2.11 Grease or other sealing materials shall not be applied to the seating surfaces of preaction or deluge valves.

13.4.3.2.12* Records indicating the date the preaction or deluge valve was last tripped and the tripping time, as well as the individual and organization conducting the test, shall be maintained at a location or in a manner readily available for review by the authority having jurisdiction.

13.4.3.2.13 Low air pressure alarms, if provided, shall be tested quarterly in accordance with the manufacturer's instructions.

13.4.3.2.14 Low temperature alarms, if installed in valve enclosures, shall be tested annually at the beginning of the heating season.

13.4.3.2.15 Automatic air pressure maintenance devices, if provided, shall be tested yearly at the time of the annual preaction or deluge valve trip test, in accordance with the manufacturer's instructions.

13.4.3.3 Maintenance.

13.4.3.3.1 Leaks causing drops in supervisory pressure sufficient to sound warning alarms, and electrical malfunctions causing alarms to sound, shall be located and repaired.

13.4.3.3.2 During the annual trip test, the interior of the preaction or deluge valve shall be cleaned thoroughly and the parts replaced or repaired as necessary.

13.4.3.3.2.1 Interior cleaning and parts replacement or repair shall be permitted every 5 years for valves that can be reset without removal of a faceplate.

13.4.3.3.3* Auxiliary drains in preaction or deluge systems shall be operated after each system operation and before the onset of freezing conditions (and thereafter as needed).

13.4.3.3.4 Additional maintenance as required by the manufacturer's instructions shall be provided.

13.4.4 Dry Pipe Valves/Quick-Opening Devices.

13.4.4.1 Inspection.

13.4.4.1.1 Valve enclosures for preaction and deluge valves subject to freezing shall be inspected daily during cold weather to verify a minimum temperature of 40°F (4°C).

13.4.4.1.1.1 Valve enclosures equipped with low temperature alarms shall be inspected weekly.

13.4.4.1.1.2 Low temperature alarms, if installed in valve enclosures, shall be inspected annually at the beginning of the heating season to verify that they are free of physical damage.

13.4.4.1.2 Gauges.

13.4.4.1.2.1 The gauge on the supply side of the dry pipe valve shall indicate that the normal supply water pressure is being maintained.

13.4.4.1.2.2 The gauge on the system side of the dry pipe valve shall indicate that the proper ratio of air or nitrogen pressure to water supply pressure is being maintained in accordance with the manufacturer's instructions.

13.4.4.1.2.3* The gauge on the quick-opening device, if provided, shall indicate the same pressure as the gauge on the system side of the dry pipe valve.

13.4.4.1.2.4 Gauges on systems with low air or nitrogen pressure alarms shall be inspected monthly.

13.4.4.1.2.5 Gauges on systems other than those with low air or nitrogen pressure alarms shall be inspected weekly.

13.4.4.1.3 Systems with auxiliary drains shall require a sign at the dry or preaction valve indicating the number of auxiliary drains and location of each individual drain.

13.4.4.1.4 The dry pipe valve shall be externally inspected monthly to verify the following:

(1) The valve is free of physical damage.
(2) All trim valves are in the appropriate open or closed position.
(3) The intermediate chamber is not leaking.

13.4.4.1.5 The interior of the dry pipe valve shall be inspected annually when the trip test is conducted.

13.4.4.1.6 Strainers, filters, and restricted orifices shall be inspected internally every 5 years unless tests indicate a greater frequency is necessary.

13.4.4.2 Testing.

13.4.4.2.1* The priming water level shall be tested quarterly.

13.4.4.2.2* Each dry pipe valve shall be trip tested annually during warm weather.

13.4.4.2.2.1 Dry pipe valves protecting freezers shall be trip tested in a manner that does not introduce moisture into the piping in the freezers.

13.4.4.2.2.2* Every 3 years and whenever the system is altered, the dry pipe valve shall be trip tested with the control valve fully open and the quick-opening device, if provided, in service.

13.4.4.2.2.3* During those years when full flow testing in accordance with 13.4.4.2.2.2 is not required, each dry pipe valve shall be trip tested with the control valve partially open.

13.4.4.2.2.4 When refilling a dry system, the air supply shall be capable of restoring normal air pressure in the system within 30 minutes.

13.4.4.2.2.5 The requirements of 13.4.4.2.2.4 shall not apply in refrigerated spaces maintained below 5°F (–15°C), where normal system air pressure shall be permitted to be restored within 60 minutes.

13.4.4.2.3 Grease or other sealing materials shall not be applied to the seating surfaces of dry pipe valves.

13.4.4.2.4* Quick-opening devices, if provided, shall be tested quarterly.

13.4.4.2.5 A tag or card that shows the date on which the dry pipe valve was last tripped, and the name of the person and organization conducting the test, shall be attached to the valve.

13.4.4.2.5.1 Separate records of initial air and water pressure, tripping air pressure, and dry pipe valve operating conditions shall be maintained on the premises for comparison with previous test results.

13.4.4.2.5.2 Records of tripping time shall be maintained for full flow trip tests.

13.4.4.2.6 Low air pressure alarms, if provided, shall be tested quarterly in accordance with the manufacturer's instructions.

13.4.4.2.7 Low temperature alarms, if installed in valve enclosures, shall be tested annually at the beginning of the heating season.

13.4.4.2.8 Automatic air pressure maintenance devices, if provided, shall be tested annually during the dry pipe valve trip test in accordance with the manufacturer's instructions.

13.4.4.2.9 Dry pipe systems shall be tested once every 3 years for gas leakage, using one of the following test methods:

(1) A gas (air or nitrogen) pressure test at 40 psi (3.2 bar) shall be performed for 2 hours.
   (a) The system shall be permitted to lose up to 3 psi (0.2 bar) during the duration of the test.
   (b) Gas leaks shall be addressed if the system loses more than 3 psi (0.2 bar) during this test.
(2) With the system at normal system pressure, the gas source (nitrogen supply, compressor, or shop air) shall be shut off for 4 hours. If the low pressure alarm goes off within this period, the leaks shall be addressed.

13.4.4.3 Maintenance.

13.4.4.3.1 During the annual trip test, the interior of the dry pipe valve shall be cleaned thoroughly, and parts replaced or repaired as necessary.

13.4.4.3.2* Auxiliary drains in dry pipe sprinkler systems shall be drained after each operation of the system, before the onset of freezing weather conditions, and thereafter as needed.

13.5 Pressure-Reducing Valves and Relief Valves.

13.5.1 Inspection and Testing of Sprinkler Pressure-Reducing Valves. Sprinkler pressure-reducing valves shall be inspected and tested as described in 13.5.1.1 and 13.5.1.2.

13.5.1.1 All valves shall be inspected quarterly to verify that the valves are in the following condition:

(1) In the open position
(2) Not leaking
(3) Maintaining downstream pressures in accordance with the design criteria
(4) In good condition, with handwheels installed and unbroken

13.5.1.2* A full flow test shall be conducted on each valve at 5-year intervals and shall be compared to previous test results.

13.5.1.2.1 Adjustments shall be made in accordance with the manufacturer's instructions.

13.5.1.3 A partial flow test adequate to move the valve from its seat shall be conducted annually.

13.5.2 Hose Connection Pressure-Regulating Devices.

13.5.2.1 All devices shall be inspected annually to verify the following:

(1) The handwheel is not broken or missing.
(2) The outlet hose threads are not damaged.
(3) No leaks are present.
(4) The hose adapter and the cap are not missing.

13.5.2.2* A full flow test shall be conducted on each device at 5-year intervals and shall be compared to previous test results.

13.5.2.2.1 Adjustments shall be made in accordance with the manufacturer's instructions.

13.5.2.3 A partial flow test adequate to move the device from its seat shall be conducted annually.

13.5.3 Hose Rack Assembly Pressure-Regulating Devices.

13.5.3.1 All devices shall be inspected annually to verify the following:

(1) The handwheel is not missing or broken.
(2) No leaks are present.

13.5.3.2 A full flow test shall be conducted on each device at 5-year intervals and compared to previous test results.

13.5.3.2.1 Adjustments shall be made in accordance with the manufacturer's instructions.

13.5.3.3 A partial flow test adequate to move the device from its seat shall be conducted annually.

13.5.4 Master Pressure-Regulating Devices.

13.5.4.1* Devices shall be inspected weekly to verify that the devices are in the following condition:

(1)*The downstream pressures are maintained in accordance with the design criteria.
(2) The supply pressure is in accordance with the design criteria.
(3) The devices are not leaking.
(4) The devices and trim are in good condition.

13.5.4.2* A partial flow test adequate to move the valve from its seat shall be conducted quarterly.

13.5.4.3* A full flow test shall be conducted on each valve annually and shall be compared to previous test results.

13.5.4.4 When valve adjustments are necessary, they shall be made in accordance with the manufacturer's instructions.

13.5.5 Pressure-Reducing Valves.

13.5.5.1 All pressure-reducing valves installed on fire protection systems not covered by 13.5.1, 13.5.2, 13.5.3, or 13.5.4 shall be inspected in accordance with 13.5.1.1.

13.5.5.2 All pressure-reducing valves installed on fire protection systems not covered by 13.5.1, 13.5.2, 13.5.3, or 13.5.4 shall be tested in accordance with 13.5.1.2.

13.5.6 Hose Valves.

13.5.6.1 Inspection.

13.5.6.1.1 Hose valves shall be inspected quarterly to verify that the valves are in the following condition:

(1) Hose caps are in place and not damaged.
(2) Hose threads are not damaged.
(3) Valve handles are present and not damaged.
(4) Gaskets are not damaged or showing signs of deterioration.
(5) No leaks are present.
(6) Valves are not obstructed or otherwise not capable of normal operation.

13.5.6.1.2 Hose valves shall be inspected to ensure that hose caps are in place and not damaged.

13.5.6.1.3 Hose threads shall be inspected for damage.

13.5.6.1.4 Valve handles shall be present and not damaged.

13.5.6.1.5 Gaskets shall be inspected for damage or deterioration.

13.5.6.1.6 Hose valves shall be inspected for leaks.

13.5.6.1.7 Hose valves shall be inspected to ensure no obstructions are present.

13.5.6.1.8 Hose valves shall be inspected to ensure that restricting devices are present.

13.5.6.2 Testing.

13.5.6.2.1* Class I and Class III standpipe system hose valves shall be tested annually by fully opening and closing the valves.

13.5.6.2.1.1 Class I and Class III standpipe system hose valves that are difficult to operate or leak shall be repaired or replaced.

13.5.6.2.2* Hose valves on hose stations attached to sprinkler systems and Class II standpipe systems shall be tested every 3 years by opening and closing the valves.

13.5.6.2.2.1 Hose valves on hose stations attached to sprinkler systems and Class II standpipe systems that are difficult to operate or leak shall be repaired or replaced.

13.5.6.3 Maintenance. Hose valves that do not operate smoothly or open fully shall be lubricated, repaired, or replaced.

13.5.7 Fire Pump Relief Valves.

13.5.7.1 Circulation Relief Valves.

13.5.7.1.1 Where installed, circulation relief valves shall be inspected on the same frequency as the no-flow (churn) test.

13.5.7.1.2 The inspection shall verify that water flows through the valve when the fire pump is operating at shutoff pressure (i.e., churn) to prevent the pump from overheating.

13.5.7.1.3 On completion of any fire pump test, the closure of the circulation relief valve shall be verified.

13.5.7.2 Main Pressure Relief Valve.

13.5.7.2.1 Where installed, main pressure relief valves shall be inspected during any fire pump test.

13.5.7.2.2 The inspection shall verify that the pressure downstream of the relief valve fittings in the fire pump discharge piping does not exceed the pressure for which the system components are rated.

13.5.7.2.3 During the annual fire pump flow test, the pressure relief valve shall be verified to be correctly adjusted and set to relieve at the correct pressure and to close below that pressure setting.

13.5.8 Maintenance. All damaged or missing components noted during the inspections specified in 13.5.6.1 through 13.5.6.2.2 shall be repaired or replaced in accordance with the manufacturer's instructions.

13.6 Backflow Prevention Assemblies.

13.6.1 Inspection. Inspection of backflow prevention assemblies shall be as described in 13.6.1.1 through 13.6.1.4.

13.6.1.1 The isolation valves on double check assemblies (DCA) and double check detector assemblies (DCDA) shall be inspected weekly to ensure that the valves are in the normal open position.

13.6.1.1.1 Valves secured with locks or electrically supervised in accordance with applicable NFPA standards shall be inspected monthly.

13.6.1.2 The isolation valves on reduced-pressure assemblies (RPA) and reduced-pressure detector assemblies (RPDA) shall be inspected weekly to ensure that the valves are in the normal open position.

13.6.1.2.1 Valves secured with locks or electrically supervised in accordance with applicable NFPA standards shall be inspected monthly.

13.6.1.2.2* RPAs and RPDAs shall be inspected weekly to ensure that the differential-sensing valve relief port is not continuously discharging.

13.6.1.3 After any testing or repair, an inspection by the property owner or designated representative shall be made to ensure that the system is in service and all isolation valves are in the normal open position and properly locked or electrically supervised.

13.6.1.4* Backflow prevention assemblies shall be inspected internally every 5 years to verify that all components operate correctly, move freely, and are in good condition.

13.6.2 Testing.

13.6.2.1* All backflow preventers installed in fire protection system piping shall be exercised annually by conducting a forward flow test at a minimum flow rate of the system demand.

13.6.2.1.1 Where water rationing is enforced during shortages lasting more than 1 year, an internal inspection of the backflow preventer to ensure the check valves will fully open shall be permitted in lieu of conducting the annual forward flow test.

13.6.2.1.2 The forward flow test shall not be required where annual fire pump testing causes the system flow rate to flow through the backflow preventer device.

13.6.2.2 Where hydrants or inside hose stations are located downstream of the backflow preventer, the forward flow test shall include hose stream demand.

13.6.2.3 Where connections do not permit verification of the forward flow test at the minimum flow rate of system demand, tests shall be conducted at the maximum flow rate possible.

13.6.3 Maintenance. Maintenance of all backflow prevention assemblies shall be conducted by a qualified individual following the manufacturer's instructions in accordance with the procedure and policies of the authority having jurisdiction.

13.7 Fire Department Connections.

13.7.1 Fire department connections shall be inspected quarterly to verify the following:

(1) The fire department connections are visible and accessible.
(2) Couplings or swivels are not damaged and rotate smoothly.
(3) Plugs or caps are in place and undamaged.
(4) Gaskets are in place and in good condition.
(5) Identification signs are in place.
(6) The check valve is not leaking.
(7) The automatic drain valve is in place and operating properly.
(8) The fire department connection clapper(s) is in place and operating properly.
(9)*Interior of the connection is inspected for obstructions.

13.7.2 Components shall be repaired or replaced as necessary in accordance with the manufacturer's instructions.

13.7.3 Any obstructions that are present shall be removed.

13.7.4 The piping from the fire department connection to the fire department check valve shall be hydrostatically tested at 150 psi (10 bar) for 2 hours at least once every 5 years.

13.8 Component Testing Requirements.

13.8.1 Whenever a valve, valve component, and/or valve trim is adjusted, repaired, reconditioned, or replaced, the action required in Table 13.8.1 shall be performed.

13.8.2 Where the original installation standard is different from the cited standard, the use of the appropriate installing standard shall be permitted.

13.8.3* These actions shall not require a design review.

Table 13.8.1 Summary of Component Replacement Action Requirements

Component	Adjust	Repair/ Recondition	Replace	Inspection, Test, and Maintenance Procedures
Water delivery components				
Post indicator and wall indicator valves	X	X	X	(1) Inspect for leaks at system pressure (2) Perform full operational test conforming to 13.3.3.1 (3) Perform spring torsion inspection conforming to 13.3.3.1 and 13.3.3.2 (4) Verify target visibility at shut and full open position (5) Test supervisory device (6) Main drain test
Control valves other than post indicator and wall indicator valves	X	X	X	(1) Inspect for leaks at system pressure (2) Perform full operational test conforming to 13.3.3.1 (3) Perform spring torsion inspection for OS&Y valves conforming to 13.3.3.2 (4) Verify supervisory device (5) Main drain test
Alarm check valve	X	X	X	(1) Inspect for leaks at system pressure per 13.4.1 (2) Test all alarms and supervisory signals affected by the alarm valve (3) Main drain test
Dry pipe valve	X	X	X	(1) Inspect for leaks at system pressure (2) Trip test per 13.4.4.2 (3) Inspect condition of valve seat (4) Test all dry pipe system alarms and supervisory signals (5) Main drain test
Deluge/preaction valve	X	X	X	(1) Inspect for leaks at system pressure per 13.4.3 (2) Trip test (3) Inspect condition of valve seat (4) Test all deluge/preaction system alarms and supervisory signals (5) Main drain test
Quick-opening device	X	X	X	(1) Inspect for leaks at system pressure per 13.4.4.2.2 (2) Trip test (3) Main drain test
Pressure-regulating device — hose valves	X	X	X	(1) Inspect for leaks at system pressure per 13.5.1 (2) Full flow test (3) Main drain test (Only when a control valve has been closed)
Pressure-regulating devices — other than hose valves	X	X	X	(1) Inspect for leaks at system pressure per Section 13.5 (2) Test pressure setting with full flow and without flow (3) Test supervisory device and alarm (4) Main drain test
Hose valve	X	X	X	(1) Inspect for leaks at system pressure per 13.5.6 (2) Main drain test

(continues)

Table 13.8.1 *Continued*

Component	Adjust	Repair/ Recondition	Replace	Inspection, Test, and Maintenance Procedures
Backflow prevention device	X	X	X	(1) Inspect for leaks at system pressure per Section 13.6 (2) Forward flow test per 13.6.2.1 (3) Test supervisory device and alarm (4) Main drain test
Check valves	X	X	X	(1) Inspect for leaks at system pressure per 13.4.2 (2) Inspect for leaking through check valve (3) Main drain test
Fire department connection	X	X		(1) Inspect for leaks at system pressure per Section 13.7 (2) Main drain test (Only when a control valve has been closed)
Fire department connection — sprinkler system(s)			X	(1) Isolate and hydrostatic test for 2 hours at 150 psi (10 bar) (2) Main drain test (Only when a control valve has been closed)
Fire department connection — other than sprinkler system(s)			X	(1) Isolate and hydrostatic test for 2 hours at 50 psi (3.5 bar) above the normal working pressure [200 psi (14 bar) minimum] (2) Main drain test (Only when a control valve has been closed)
Strainers	X	X	X	Inspect and clean in accordance with manufacturer's instructions
Main drain valves	X	X	X	Main drain test per 13.2.5
Gauges			X	Calibrate per 13.2.7
Alarm and supervisory components				
Alarm device	X	X	X	Test for conformance with NFPA 13 and/or *NFPA 72*
Supervisory device	X	X	X	Test for conformance with NFPA 13 and/or *NFPA 72*
System protection components				
Pressure relief valve — fire pump installation	X	X	X	See 8.3.3.3 and 13.5.7
Pressure relief valve — other than fire pump installation			X	Verify relief valve is listed or approved for the application and set to the correct pressure
Informational components				
Identification signs	X	X	X	Inspect for compliance with NFPA 13 and 13.3.1

Chapter 14 Internal Piping Condition and Obstruction Investigation

14.1* General. This chapter shall provide the minimum requirements for conducting investigations of fire protection system piping for possible sources of materials that could cause pipe blockage.

14.2 Assessment of Internal Condition of Piping.

14.2.1* An assessment of the internal condition of piping shall be conducted on a frequency determined by 14.2.1.1 or 14.2.1.2 for the purpose of inspecting for the presence of foreign organic and inorganic material.

14.2.1.1 An assessment of the internal condition of piping shall be conducted at a minimum of every 5 years or in accordance with 14.2.1.2 for the purpose of inspecting for the presence of foreign organic and inorganic material.

14.2.1.2* Where an assessment frequency has been established by an approved risk analysis, the assessment shall be performed at a frequency determined by the approved risk analysis.

14.2.1.3 Tubercules or slime, if found, shall be tested for indications of microbiologically influenced corrosion (MIC).

14.2.1.4* If the presence of sufficient foreign organic or inorganic material is found to obstruct pipe or sprinklers, an obstruction investigation shall be conducted as described in Section 14.3.

14.2.1.5 Nonmetallic pipe shall not be required to comply with Section 14.2.

14.2.2* In buildings having multiple wet pipe systems, every other system shall have an assessment of the internal condition of piping as described in 14.2.1.

14.2.2.1 During the next inspection frequency required by 14.2.1.1 or 14.2.1.2, the alternate systems not assessed during the previous assessment shall be assessed as described in 14.2.1.

14.2.2.2 If foreign organic and/or inorganic material is found in any system in a building, all systems shall be assessed.

14.3 Obstruction Investigation and Prevention.

14.3.1* An obstruction investigation shall be conducted for system or yard main piping wherever any of the following conditions exist:

(1) Defective intake for fire pumps taking suction from open bodies of water
(2) The discharge of obstructive material during routine water tests
(3) Foreign materials in fire pumps, in dry pipe valves, or in check valves
(4) Foreign material in water during drain tests or plugging of inspector's test connection(s)
(5) Unknown materials are heard in the system piping during draining, refilling, or otherwise flowing water through the system
(6) Plugged sprinklers
(7) The presence of sufficient foreign organic or inorganic material is found in the pipe
(8) Failure to flush yard piping or surrounding public mains following new installations or repairs
(9) A record of broken public mains in the vicinity
(10) Abnormally frequent false tripping of a dry pipe valve(s)
(11) A system that is returned to service after an extended shutdown (greater than 1 year)
(12) There is reason to believe that the sprinkler system contains sodium silicate or highly corrosive fluxes in copper systems
(13) A system has been supplied with raw water via the fire department connection
(14) Pinhole leaks
(15) A 50 percent increase in the time it takes water to travel to the inspector's test connection from the time the valve trips during a full flow trip test of a dry pipe sprinkler system when compared to the original system acceptance test

14.3.2* Systems shall be examined for internal obstructions where conditions exist that could cause obstructed piping.

14.3.2.1 If the condition has not been corrected or the condition is one that could result in obstruction of the piping despite any previous flushing procedures that have been performed, the system shall be examined for internal obstructions every 5 years.

14.3.2.2* Internal examination shall be performed at the following minimum four points:

(1) System valve
(2) Riser
(3) Cross main
(4) Branch line

14.3.2.3* Alternative nondestructive examination methods shall be permitted.

14.3.3* If an obstruction investigation indicates the presence of sufficient material to obstruct pipe or sprinklers, a complete flushing program shall be conducted by qualified personnel.

14.3.4 Tubercules or slime, if found during an obstruction investigation, shall be tested for indications of microbiologically influenced corrosion (MIC).

14.4 Ice Obstruction. Dry pipe or preaction sprinkler system piping that protects or passes through freezers or cold storage rooms shall be inspected internally on an annual basis for ice obstructions at the point where the piping enters the refrigerated area.

14.4.1 Alternative nondestructive examinations shall be permitted.

14.4.2 All penetrations into the cold storage areas shall be inspected and, if an ice obstruction is found, additional pipe shall be examined to ensure no ice blockage exists.

Chapter 15 Impairments

15.1 General.

15.1.1 Minimum Requirements.

15.1.1.1 This chapter shall provide the minimum requirements for a water-based fire protection system impairment program.

15.1.1.2 Measures shall be taken during the impairment to ensure that increased risks are minimized and the duration of the impairment is limited.

15.2 Impairment Coordinator.

15.2.1 The property owner or designated representative shall assign an impairment coordinator to comply with the requirements of this chapter.

15.2.2 In the absence of a specific designee, the property owner or designated representative shall be considered the impairment coordinator.

15.2.3 Where the lease, written use agreement, or management contract specifically grants the authority for inspection, testing, and maintenance of the fire protection system(s) to the tenant, management firm, or managing individual, the tenant, management firm, or managing individual shall assign a person as impairment coordinator.

15.3 Tag Impairment System.

15.3.1* A tag shall be used to indicate that a system, or part thereof, has been removed from service.

15.3.2* The tag shall be posted at each fire department connection and the system control valve, and other locations required by the authority having jurisdiction, indicating which system, or part thereof, has been removed from service.

15.4 Impaired Equipment.

15.4.1 The impaired equipment shall be considered to be the water-based fire protection system, or part thereof, that is removed from service.

15.4.2 The impaired equipment shall include, but shall not be limited to, the following:

(1) Sprinkler systems
(2) Standpipe systems
(3) Fire hose systems
(4) Underground fire service mains
(5) Fire pumps
(6) Water storage tanks
(7) Water spray fixed systems
(8) Foam-water systems
(9) Water mist systems
(10) Fire service control valves

15.5* Preplanned Impairment Programs.

15.5.1 All preplanned impairments shall be authorized by the impairment coordinator.

15.5.2 Before authorization is given, the impairment coordinator shall be responsible for verifying that the following procedures have been implemented:

(1) The extent and expected duration of the impairment have been determined.
(2) The areas or buildings involved have been inspected and the increased risks determined.
(3) Recommendations to mitigate any increased risks have been submitted to management or the property owner or designated representative.
(4) Where a fire protection system is out of service for more than 10 hours in a 24-hour period, the impairment coordinator shall arrange for one of the following:
   (a) Evacuation of the building or portion of the building affected by the system out of service
   (b)*An approved fire watch
   (c)*Establishment of a temporary water supply
   (d)*Establishment and implementation of an approved program to eliminate potential ignition sources and limit the amount of fuel available to the fire
(5) The fire department has been notified.
(6) The insurance carrier, the alarm company, property owner or designated representative, and other authorities having jurisdiction have been notified.
(7) The supervisors in the areas to be affected have been notified.
(8) A tag impairment system has been implemented. *(See Section 15.3.)*
(9) All necessary tools and materials have been assembled on the impairment site.

15.6* Emergency Impairments.

15.6.1 Emergency impairments shall include, but are not limited to, interruption of water supply, frozen or ruptured piping, and equipment failure, and includes impairments found during inspection, testing, or maintenance activities.

15.6.2* The coordinator shall implement the steps outlined in Section 15.5.

15.7* Restoring Systems to Service. When all impaired equipment is restored to normal working order, the impairment coordinator shall verify that the following procedures have been implemented:

(1) Any necessary inspections and tests have been conducted to verify that affected systems are operational. The appropriate chapter of this standard shall be consulted for guidance on the type of inspection and test required.
(2) Supervisors have been advised that protection is restored.
(3) The fire department has been advised that protection is restored.
(4) The property owner or designated representative, insurance carrier, alarm company, and other authorities having jurisdiction have been advised that protection is restored.
(5) The impairment tag has been removed.

Chapter 16 Special Requirements from Other NFPA Documents

16.1 General.

16.1.1 Application.

16.1.1.1* This chapter shall include the inspection, testing, and maintenance requirements for water-based fire protection systems found in other NFPA standards that are different from those included in this standard.

16.1.1.2* The requirements of this chapter shall be extracted from the other referenced standards.

16.1.1.3 Where the requirements of the referenced standard differ from the requirements of this standard, the referenced standard shall take precedence.

16.1.2 Definitions. For terms not defined in Chapter 3, the definitions of the reference standard shall apply.

16.2 Small Residential Board and Care Occupancies.

16.2.1 The requirements in this section shall only apply to residential board and care facilities with sprinkler systems installed in accordance with NFPA 13D, *Standard for the Installa-*

POTTER
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PS10 SERIES
PRESSURE SWITCH

UL, cUL, and CSFM Listed, FM and LPC Approved, NYMEA Accepted, CE Marked

Dimensions: 3.78" (9,6cm)W x 3.20" (8,1cm)D x 4.22" (10,7cm)H

Conduit Entrance: Two knockouts provided for 1/2" conduit. Individual switch compartments and ground screws suitable for dissimilar voltages.

Enclosure: Cover - Die-cast with textured red powdercoat finish, single cover screw and rain lip.

Base - Die-cast

Pressure Connection: Nylon 1/2" NPT Male

Factory Adjustment: 4 - 8 PSI (0,27 - 0,55 BAR)
Differential: 2 PSI (0,13 BAR) typical

Maximum System Pressure: 300 PSI (20,68 BAR)

Switch Contacts: SPDT (Form C)
10.1 Amps at 125/250VAC, 2.0 Amps at 30VDC
One SPDT in PS10-1, Two SPDT in PS10-2

Environmental Specifications:
NEMA 4/IP66 Rated Enclosure - indoor or outdoor when used with NEMA 4 conduit fittings.
Temperature range: -40°F to 140°F (-40°C to 60°C)

Service Use:

Automatic Sprinkler	NFPA-13
One or two family dwelling	NFPA-13D
Residential Occupancy up to four stories	NFPA-13R
National Fire Alarm Code	NFPA-72

Ordering Information

Model	Description	Stock No.
PS10-1	Pressure switch with one set SPDT contacts	1340103
PS10-2	Pressure switch with two sets SPDT contacts	1340104
	Hex Key	5250062
	Cover Tamper Switch Kit	0090200

Tamper
Cover incorporates tamper resistant fastener that requires a special key for removal. One key is supplied with each device. For optional cover tamper switch kit, order Stock No. 0090200. See bulletin #5401200 PSCTSK.

Installation
The Potter PS10 Series Pressure Actuated Switches are designed for the detection of a waterflow condition in automatic fire sprinkler systems of particular designs such as wet pipe systems with alarm check valves, dry pipe, preaction, or deluge valves. The PS10 is also suitable to provide a low pressure supervisory signal; adjustable between 4 and 15 psi (0,27 and 1,03 BAR).

1. Apply Teflon tape to the threaded male connection on the device. (Do not use pipe dope)
2. Device should be mounted in the upright position (threaded connection down).
3. Tighten the device using a wrench on the flats on the device.

Wiring Instructions
1. Remove the tamper resistant screw with the special key provided.
2. Carefully place a screwdriver on the edge of the knockout and sharply apply a force sufficient to dislodge the knockout plug. See Fig 9
3. Run wires through an approved conduit connector and affix the connector to the device.
4. Connect the wires to the appropriate terminal connections for the service intended. See Figures 2,4,5, and 6. See Fig 7 for two switch, one conduit wiring.

Testing
The operation of the pressure alarm switch should be tested upon completion of installation and periodically thereafter in accordance with the applicable NFPA codes and standards and/or the authority having jurisdiction (manufacturer recommends quarterly or more frequently).

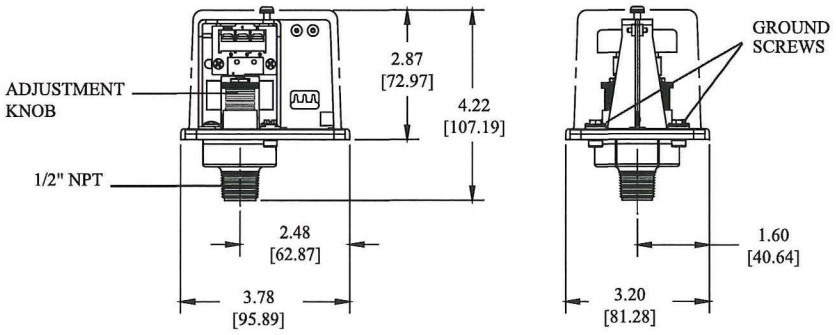
Wet System
Method 1: When using PS10 and control unit with retard - connect PS10 into alarm port piping on the input side of retard chamber and electrically connect PS10 to control unit that provides a retard to compensate for surges. Insure that no unsupervised shut-off valves are present between the alarm check valve and PS10.
Method 2: When using the PS10 for local bell application or with a control that does not provide a retard feature - the PS10 must be installed on the alarm outlet side of the retard chamber of the sprinkler system.
Testing: Accomplished by opening the inspector's end-of-line test valve. Allow time to compensate for system or control retard.
Note: Method 2 is not applicable for remote station service use, if there is an unsupervised shut-off valve between the alarm check valve and the PS10.

Wet System With Excess Pressure
Connect PS10 into alarm port piping extending from alarm check valve. Retard provisions are not required. Insure that no unsupervised shut-off valves are present between the alarm check valve and the PS10.
Testing: Accomplished by opening the water by-pass test valve or the inspector's end-of-line test valve. When using end-of-line test, allow time for excess pressure to bleed off.

Dry System
Connect PS10 into alarm port piping that extends from the intermediate chamber of the alarm check valve. Install on the outlet side of the in-line check valve of the alarm port piping. Insure that no unsupervised shut-off valves are present between the alarm check valve and the PS10.
Testing: Accomplished by opening the water by-pass test valve.
Note: The above tests may also activate any other circuit closer or water motor gongs that are present on the system.

Dimensions

Fig. 1

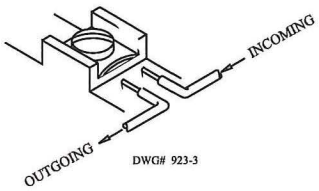


NOTE: To prevent leakage, apply Teflon tape sealant to male threads only.

DWG# 930-1

Switch Clamping Plate Terminal

Fig. 2

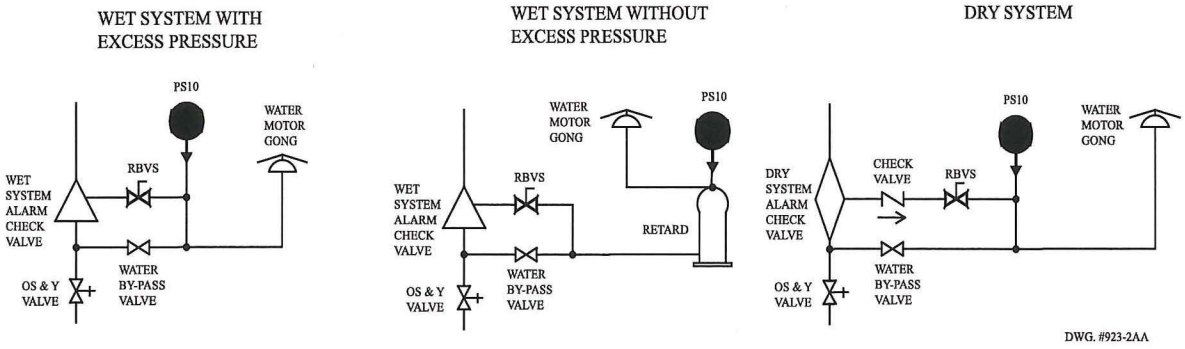


⚠ WARNING

An uninsulated section of a single conductor should not be looped around the terminal and serve as two separate connections. The wire must be severed, thereby providing supervision of the connection in the event that the wire becomes dislodged from under the terminal.

Typical Sprinkler Applications

Fig. 3

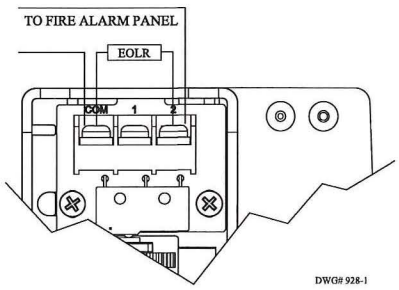


⚠ CAUTION

Closing of any shutoff valves between the alarm check valve and the PS10 will render the PS10 inoperative. To comply with NFPA-72 any such valve shall be electrically supervised with a supervisory switch such as Potter Model RBVS.

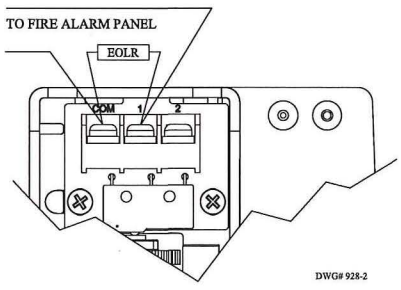
Low Pressure Signal Connection

Fig. 4



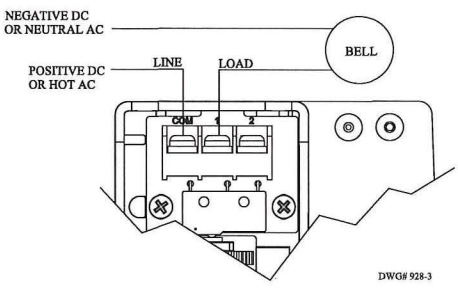
Waterflow Signal Connection

Fig. 5



Local Bell For Waterflow Connection

Fig. 6



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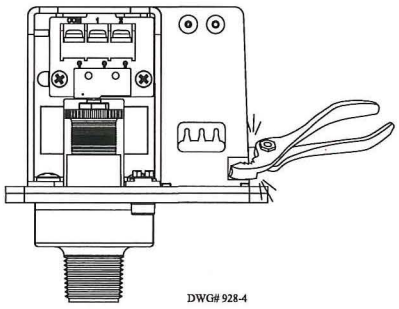
PS10 SERIES
PRESSURE SWITCH

One Conduit Wiring
Fig. 7

Break out thin section of divider to provide path for wires when wiring both switches from one conduit entrance.

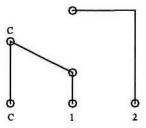


DWG# 928-4

Switch Operation
Fig. 8

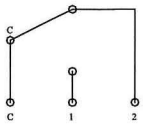
Terminal
C: Common
1: Closed when installed under normal system pressure.
2: Open when installed under normal system pressure. Closes on pressure drop. Use for low pressure supervision.

W/ PRESSURE APPLIED



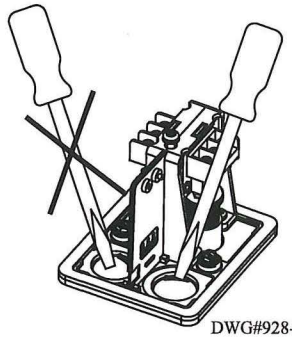
Terminal
1: Open with no pressure supplied. Closes upon detection of pressure. Use for waterflow indication.
2: Closed with no pressure applied.

W/O PRESSURE APPLIED



DWG#928-6

Removing Knockouts
Fig. 9



DWG#928-5

⚠ WARNING

- Installation must be performed by qualified personnel and in accordance with all national and local codes and ordinances.
- Shock hazard. Disconnect power source before servicing. Serious injury or death could result.
- Read all instructions carefully and understand them before starting installation. Save instructions for future use. Failure to read and understand instructions could result in improper operation of device resulting in serious injury or death.
- Risk of explosion. Not for use is hazardous locations. Serious injury or death could result.

⚠ CAUTION

- Do not tighten by grasping the switch enclosure. Use wrenching flats on the bushing only. Failure to install properly could damage the switch and cause improper operation resulting in damage to equipment and property.
- To seal threads, apply Teflon tape to male threads only. Using joint compounds or cement can obstruct the pressure port inlet and result in improper device operation and damage to equipment.
- Do not over tighten the device, standard piping practices apply.

Engineer/Architect Specifications Pressure Type Waterflow Switch

Pressure type waterflow switches; shall be a Model PS10 as manufactured by Potter Electric Signal Company, St Louis MO., and shall be installed on the fire sprinkler system as shown and or specified herein.

Switches shall be provided with a ½" NPT male pressure connection and shall be connected to the alarm port outlet of; Wet Pipe Alarm Valves, Dry Pipe Valves, Pre-Action Valves, or Deluge Valves. The pressure switch shall be actuated when the alarm line pressure reaches 4 - 8 PSI (0,27 - 0,55 BAR).

Pressure type waterflow switches shall have a maximum service pressure rating of 300 PSI (20,68 BAR) and shall be factory adjusted to operate on a pressure increase of 4 - 8 PSI (0,27 - 0,55 BAR)

Pressure switch shall have one or two form C contacts, switch contact rating 10.1 Amps at 125/250 VAC, 2.0 Amps at 30 VDC.

Pressure type waterflow switches shall have two conduit entrances one for each individual switch compartment to facilitate the use of dissimilar voltages for each individual switch.

The cover of the pressure type waterflow switch shall be Zinc die-cast with rain lip and shall attach with one tamper resistant screw. The Pressure type waterflow switch shall be suitable for indoor or outdoor service with a NEMA 4/IP66 rating.

The pressure type waterflow switch shall be UL Ulc and CSFM listed, FM and LPC approved and NYMEA accepted.

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VSR
VANE TYPE WATERFLOW ALARM SWITCH WITH RETARD

UL, CUL and CSFM Listed, FM Approved, LPCB Approved, For CE Marked (EN12259-5) / VdS Approved model use VSR-EU

Service Pressure: 450 PSI (31 BAR) - UL

Flow Sensitivity Range for Signal:
4-10 GPM (15-38 LPM) - UL

Maximum Surge: 18 FPS (5.5 m/s)

Contact Ratings: Two sets of SPDT (Form C)
10.0 Amps at 125/250VAC
2.0 Amps at 30VDC Resistive
10 mAmps min. at 24VDC

Conduit Entrances: Two knockouts provided for 1/2" conduit. Individual switch compartments suitable for dissimilar voltages.

Environmental Specifications:

- NEMA 4/IP54 Rated Enclosure suitable for indoor or outdoor use with factory installed gasket and die-cast housing when used with appropriate conduit fitting.
- Temperature Range: 40°F - 120°F, (4.5°C - 49°C) - UL
- Non-corrosive sleeve factory installed in saddle.

Service Use:

Automatic Sprinkler	NFPA-13
One or two family dwelling	NFPA-13D
Residential occupancy up to four stories	NFPA-13R
National Fire Alarm Code	NFPA-72

Specifications subject to change without notice.

Ordering Information			
Nominal Pipe Size		Model	Part Number
2"	DN50	VSR-2	1144402
2 1/2"	DN65	VSR-2 1/2	1144425
3"	DN80	VSR-3	1144403
3 1/2"	-	VSR-3 1/2	1144435
4"	DN100	VSR-4	1144404
5"	-	VSR-5	1144405
6"	DN150	VSR-6	1144406
8"	DN200	VSR-8	1144408

Optional: Cover Tamper Switch Kit, stock no. 0090148
Replaceable Components: Retard/Switch Assembly, stock no. 1029030

⚠ WARNING

- Installation must be performed by qualified personnel and in accordance with all national and local codes and ordinances.
- Shock hazard. Disconnect power source before servicing. Serious injury or death could result.
- Risk of explosion. Not for use in hazardous locations. Serious injury or death could result.

CAUTION

Waterflow switches that are monitoring wet pipe sprinkler systems shall not be used as the sole initiating device to discharge AFFF, deluge, or chemical suppression systems. Waterflow switches used for this application may result in unintended discharges caused by surges, trapped air, or short retard times.

Important: This document contains important information on the installation and operation of the VSR waterflow switches. Please read all instructions carefully before beginning installation. A copy of this document is required by NFPA 72 to be maintained on site.

General Information

The Model VSR is a vane type waterflow switch for use on wet sprinkler systems. It is UL Listed for use on a steel pipe; schedules 5 through 40, sizes 2" - 6" and is UL Listed and FM Approved for use on steel pipe; schedules 10 through 40, sizes 2" thru 8" (50 mm thru 200 mm). LPC approved sizes are 2" thru 8" (50 mm thru 200 mm). See Ordering Information chart.

The VSR may also be used as a sectional waterflow detector on large systems. The VSR contains two single pole, double throw, snap action switches and an adjustable, instantly recycling pneumatic retard. The switches are actuated when a flow of 10 GPM (38 LPM) or more occurs downstream of the device. The flow condition must exist for a period of time necessary to overcome the selected retard period.

Enclosure

The VSR switches and retard device are enclosed in a general purpose, die-cast housing. The cover is held in place with two tamper resistant screws which require a special key for removal. A field installable cover tamper switch is available as an option which may be used to indicate unauthorized removal of the cover. See bulletin number 5401103 for installation instructions of this switch.

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VSR
VANE TYPE WATERFLOW ALARM SWITCH WITH RETARD

Installation (see Fig. 1)

These devices may be mounted on horizontal or vertical pipe. On horizontal pipe they shall be installed on the top side of the pipe where they will be accessible. The device should not be installed within 6" (15 cm) of a fitting which changes the direction of the waterflow or within 24" (60 cm) of a valve or drain.

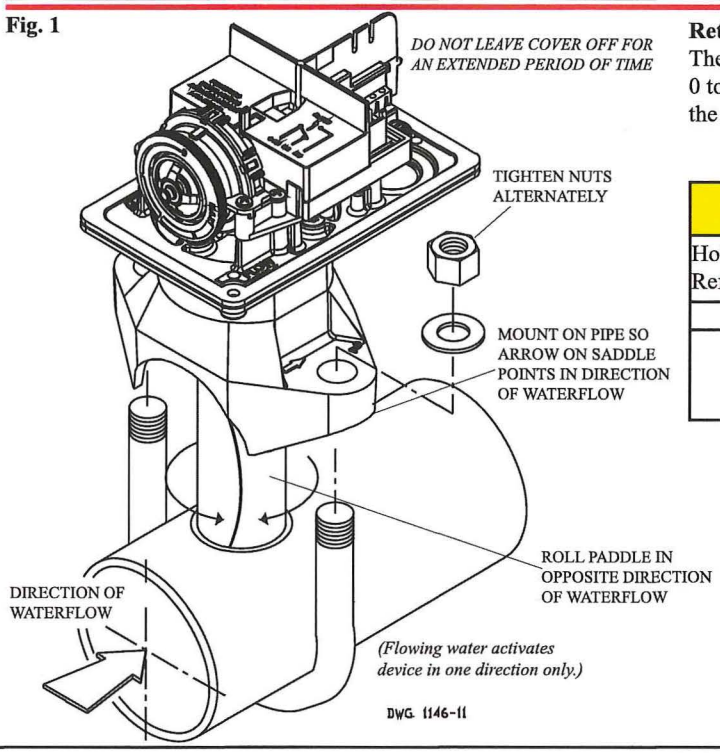
NOTE: Do not leave cover off for an extended period of time.

Drain the system and drill a hole in the pipe using a hole saw in a slow speed drill (see Fig. 1). Clean the inside pipe of all growth or other material for a distance equal to the pipe diameter on either side of the hole. Roll the vane so that it may be inserted into the hole; do not bend or crease it. Insert the vane so that the arrow on the saddle points in the direction of the waterflow. Take care not to damage the non-corrosive bushing in the saddle. The bushing should fit inside the hole in the pipe. Install the saddle strap and tighten nuts alternately to required torque (see the chart in Fig. 1). The vane must not rub the inside of the pipe or bind in any way.

⚠ CAUTION

Do not trim the paddle. Failure to follow these instructions may prevent the device from operating and will void the warranty. Do not obstruct or otherwise prevent the trip stem of the flow switch from moving when water flows as this could damage the flow switch and prevent an alarm. If an alarm is not desired, a qualified technician should disable the alarm system.

Fig. 1

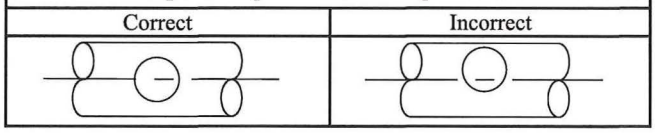


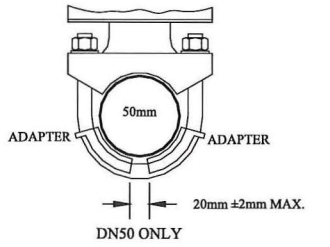
Retard Adjustment

The delay can be adjusted by rotating the retard adjustment knob from 0 to the max setting (60-90 seconds). The time delay should be set at the minimum required to prevent false alarms

CAUTION

Hole must be drilled perpendicular to the pipe and vertically centered. Refer to the Compatible Pipe/Installation Requirements chart for size.





USE (2) 5180162 ADAPTERS AS SHOWN ABOVE

DWG# 1146-1F

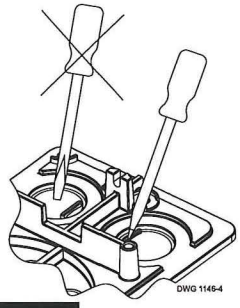
Compatible Pipe/ Installation Requirements

Model	Nominal Pipe Size		Nominal Pipe O.D.		Pipe Wall Thickness										Hole Size		U-Bolt Nuts Torque	
					Lightwall		Schedule 10 (UL)		Schedule 40 (UL)		BS-1387 (LPC)		DN (VDS)					
	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	ft-lb	n-m
VSR-2	2	DN50	2.375	60.3	.065	1.651	0.109	2.77	0.154	3.91	0.142	3.6	0.091	2.3	1.25 + .125/- .062	33.0 ± 2.0	20	27
VSR-2 1/2	2.5	-	2.875	73.0	.084	2.134	0.120	3.05	0.203	5.16	-	-	-	-				
VSR-2 1/2	-	DN65	3.000	76.1	-	-	-	-	-	-	0.142	3.6	0.102	2.6				
VSR-3	3	DN80	3.500	88.9	.083	2.108	0.120	3.05	0.216	5.49	0.157	4.0	0.114	2.9	2.00 ± .125	50.8 ± 2.0		
VSR-3 1/2	3.5	-	4.000	101.6	-	-	0.120	3.05	0.226	5.74	-	-	-	-				
VSR-4	4	DN100	4.500	114.3	.084	2.134	0.120	3.05	0.237	6.02	0.177	4.5	0.126	3.2				
VSR-5	5	-	5.563	141.3	-	-	0.134	3.40	0.258	6.55	-	-	-	-				
VSR-6	6	DN150	6.625	168.3	.115	2.921	0.134	3.40	0.280	7.11	0.197	5.0	0.157	4.0				
VSR-8	8	DN200	8.625	219.1	-	-	0.148	3.76	0.322	8.18	0.248	6.3	0.177	4.5				

NOTE: For copper or plastic pipe use Model VSR-CF.

VSR
VANE TYPE WATERFLOW ALARM SWITCH WITH RETARD

Fig. 2
To remove knockouts: Place screwdriver at inside edge of knockouts, not in the center.



NOTICE
Do not drill into the base as this creates metal shavings which can create electrical hazards and damage the device. Drilling voids the warranty.

Fig. 3
Break out thin section of cover when wiring both switches from one conduit entrance.

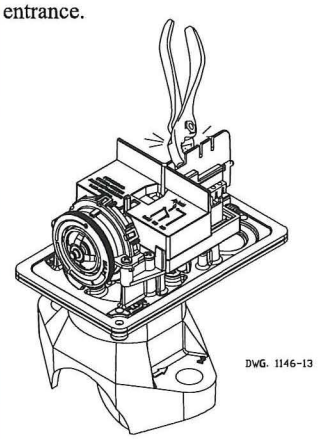
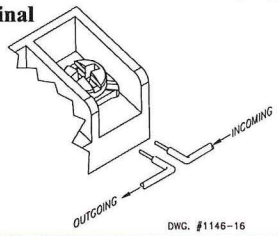


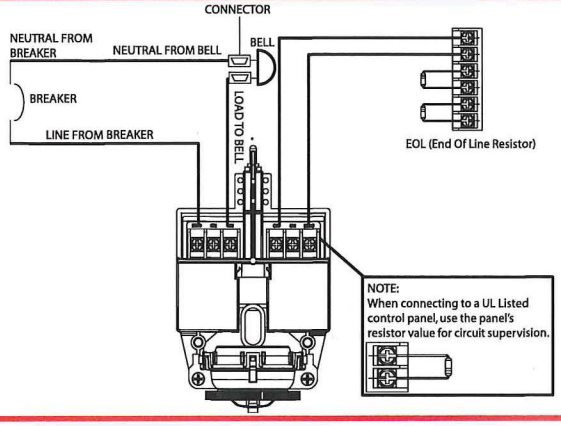
Fig. 4 Switch Terminal Connections Clamping Plate Terminal



⚠ WARNING
An uninsulated section of a single conductor should not be looped around the terminal and serve as two separate connections. The wire must be severed, thereby providing supervision of the connection in the event that the wire become dislodged from under the terminal. Failure to sever the wire may render the device inoperable risking severe property damage and loss of life.

Do not strip wire beyond 3/8" of length or expose an uninsulated conductor beyond the edge of the terminal block. When using stranded wire, capture all strands under the clamping plate.

Fig. 5 Typical Electrical Connections



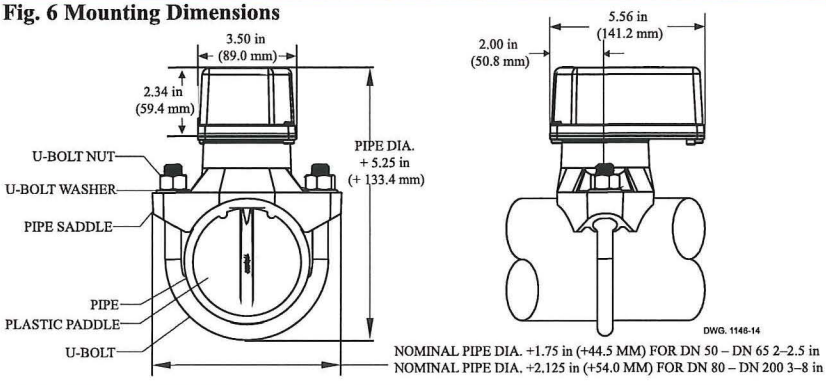
Notes:
1. The Model VSR has two switches, one can be used to operate a central station, proprietary or remote signaling unit, while the other contact is used to operate a local audible or visual annunciator.
2. For supervised circuits, see "Switch Terminal Connections" drawing and warning note (Fig. 4).

Testing
The frequency of inspection and testing for the Model VSR and its associated protective monitoring system shall be in accordance with applicable NFPA Codes and Standards and/or the authority having jurisdiction (manufacturer recommends quarterly or more frequently).

If provided, the inspector's test valve shall always be used for test purposes. If there are no provisions for testing the operation of the flow detection device on the system, application of the VSR is not recommended or advisable.
A minimum flow of 10 GPM (38 LPM) is required to activate this device.

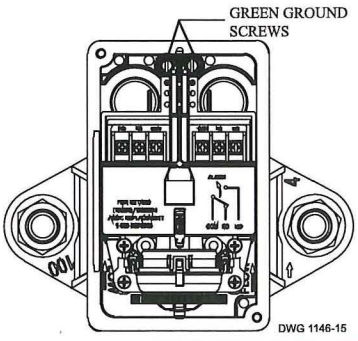
NOTICE Advise the person responsible for testing of the fire protection system that this system must be tested in accordance with the testing instructions.

Fig. 6 Mounting Dimensions



NOMINAL PIPE DIA. +1.75 in (+44.5 MM) FOR DN 50 – DN 65 2–2.5 in
NOMINAL PIPE DIA. +2.125 in (+54.0 MM) FOR DN 80 – DN 200 3–8 in

Fig. 7



Maintenance

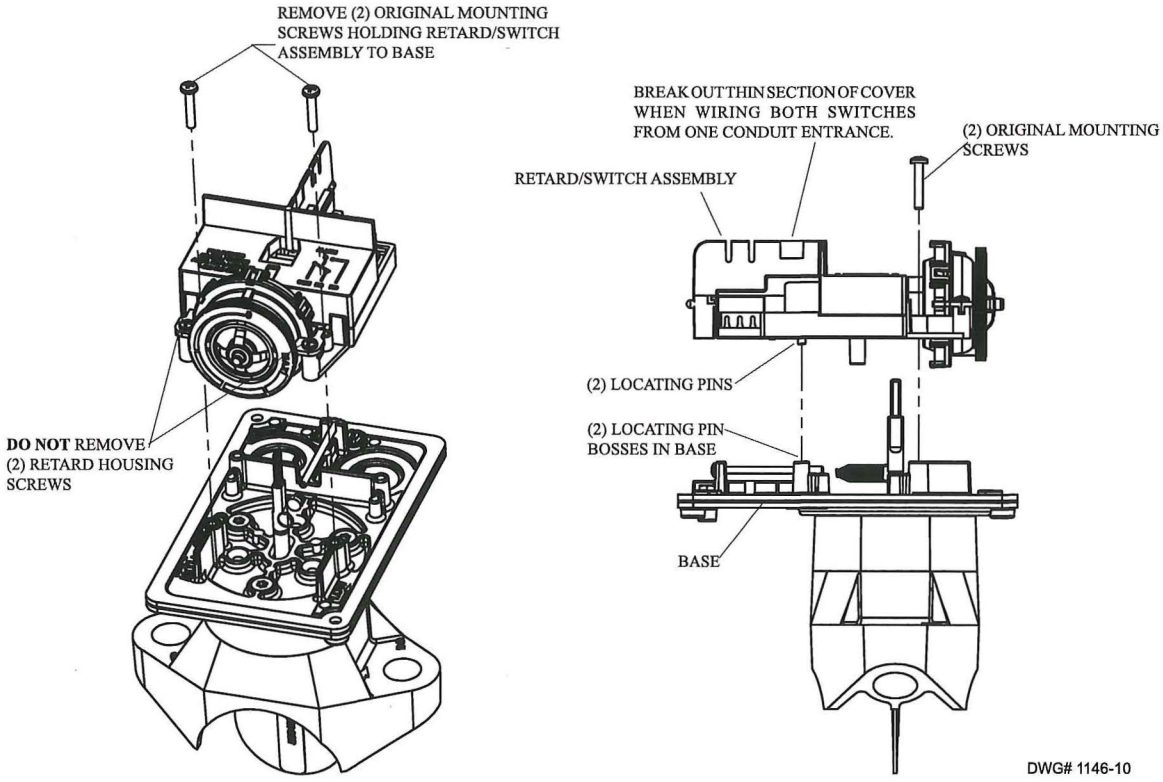
Inspect detectors monthly. If leaks are found, replace the detector. The VSR waterflow switch should provide years of trouble-free service. The retard and switch assembly are easily field replaceable. In the unlikely event that either component does not perform properly, please order replacement retard switch assembly stock #1029030 (see Fig. 8). There is no maintenance required, only periodic testing and inspection.

Retard/Switch Assembly Replacement (See Fig. 8)

NOTICE The Retard/Switch Assembly is field-replaceable without draining the system or removing the waterflow switch from the pipe

1. Make sure the fire alarm zone or circuit connected to the waterflow switch is bypassed or otherwise taken out of service.
2. Disconnect the power source for local bell (if applicable).
3. Identify and remove all wires from the waterflow switch.
4. Remove the (2) mounting screws holding retard/switch assembly to the base. **Do not** remove the (2) retard housing screws.
5. Remove the retard assembly by lifting it straight up over the tripstem.
6. Install the new retard assembly. Make sure the locating pins on the retard/switch assembly fit into the locating pin bosses on the base.
7. Re-install the (2) original mounting screws.
8. Reconnect all wires. Perform a flow test and place the system back in service.

Fig. 8



Removal of Waterflow Switch

- To prevent accidental water damage, all control valves should be shut tight and the system completely drained before waterflow detectors are removed or replaced.
- Turn off electrical power to the detector, then disconnect wiring.
- Loosen nuts and remove U-bolts.
- Gently lift the saddle far enough to get your fingers under it. With your fingers, roll the vane so it will fit through the hole while continuing to lift the waterflow detector saddle.
- Lift detector clear of pipe.

OSYSU Series

Outside Screw and Yoke Valve Supervisory Switch

Features

- NEMA 4X* (IP 65) and 6P (IP 67)

  **Enclosure is 4X. For additional corrosion protection of mounting hardware, use model OSYSU-2 CRH*
- -40° to 140° (-40°C to 60°C) operating temperature range
- Visual switch indicators
- Two conduit entrances
- Adjustable length trip rod
- Accomodates up to 12AWG wire
- Three position switch detects tampering and valve closure
- Knurled mounting bracket prevents slipping
- Fine adjustment feature for fast, easy installation
- RoHS compliant
- One or two SPDT contact models (-1,-2)

NOTICE

Before any work is done on the fire sprinkler or fire alarm system, the building owner or their authorized representative shall be notified. Before opening any closed valve, ensure that opening the valve will not cause any damage from water flow due to open or missing sprinklers, piping, etc.

SIGNALING c UL us LISTED

FM APPROVED

CE

Important: This document contains important information on the installation and operation of OS&Y valve supervisory switches. Please read all instructions carefully before beginning installation. A copy of this document is required by NFPA 72 to be maintained on site.

Description

The OSYSU is used to monitor the open position of an OS&Y (outside screw and yoke) type gate valve. This device is available in two models; the OSYSU-1, containing one set of SPDT (Form C) contacts and the OSYSU-2, containing two sets of SPDT (Form C) contacts. These switches mount conveniently to most OS&Y valves ranging in size from 2" to 12" (50mm to 300mm). They will mount on some valves as small as ½" (12,5mm).

The cover is held in place by two tamper resistant screws that require a special tool to remove. The tool is furnished with each device.

Testing

The operation of the OSYSU and its associated protective monitoring system shall be inspected, tested, and maintained in accordance with all applicable local and national codes and standards and/or the Authority Having Jurisdiction (manufacturer recommends quarterly or more frequently). A minimum test shall consist of turning the valve wheel towards the closed position. The OSYSU shall operate within the first two revolutions of the wheel. Fully close the valve and ensure that the OSYSU does not restore. Fully open the valve and ensure that the OSYSU restores to normal only when the valve is fully opened.

⚠ CAUTION

Close the valve fully to determine that the stem threads do not activate the switch. The switch being activated by the stem threads could result in a ***false valve open*** indication.

Technical Specifications

Dimensions	See Fig 8
Weight	1.6 lbs (0,73 kg)
Enclosure	Cover: Die Cast Finish: Red Powder Coat Base: Die Cast Finish: Black Powder Coat All parts have corrosion resistant finishes
Cover Tamper	Tamper Resistant Screws Optional Cover Tamper Switch Available
Contact Ratings	OSYSU-1: One Set of SPDT (Form C) OSYSU-2: Two Sets of SPDT (Form C) 10.0 Amps at 125/250 VAC 2.0 Amps at 30VDC Resistive 10 mAmps minimum at 24 VDC
Environmental Limitations	-40° F to 140°F (-40°C to 60°C) NEMA 4X (IP 65) and NEMA 6P (IP 67) Enclosure (Use suitably rated conduit and connector) Indoor or Outdoor Use (See OSYSU-EX Bulletin 5400705 for Hazardous locations)
Conduit Entrances	Two Knockouts for 1/2" conduit provided (See Notice on Page 6 and Fig. 9 on Page 5)
Service Use	NFPA 13, 13D, 13R, 72

Specifications subject to change without notice

Theory of Operation

The OSYSU is a 3 position switch. The center position is the normal installation position. Normal is when the switch is installed on the OS&Y valve, the valve is fully open and the trip rod of the OSYSU is in the groove of the valve stem. Closing the valve causes the trip rod to ride up out of the groove and activates the switches. Removing the OSYSU from the valve causes the spring to pull the trip rod in the other direction and activates the switches.

Visual Switch Status Indication

There are 3 visual indicators to determine the status of the switches.

Fig 1; the actuator button of the micro switches are on the raised section of the switch actuator.

Fig 2; the trip rod is perpendicular to the base and lined up with the alignment mark on the mounting bracket.

Fig 3; the white visual indicator is visible through the window on the back of the switch actuator.

A final test is to meter the contacts marked COM and N.O. to ensure they are an open circuit when the valve is open and that they close and have continuity within 2 revolutions of turning the valve handwheel towards the closed position and the contacts remain closed as the valve is completely closed and until the valve is completely opened when the trip rod drops back into the groove in the valve stem.

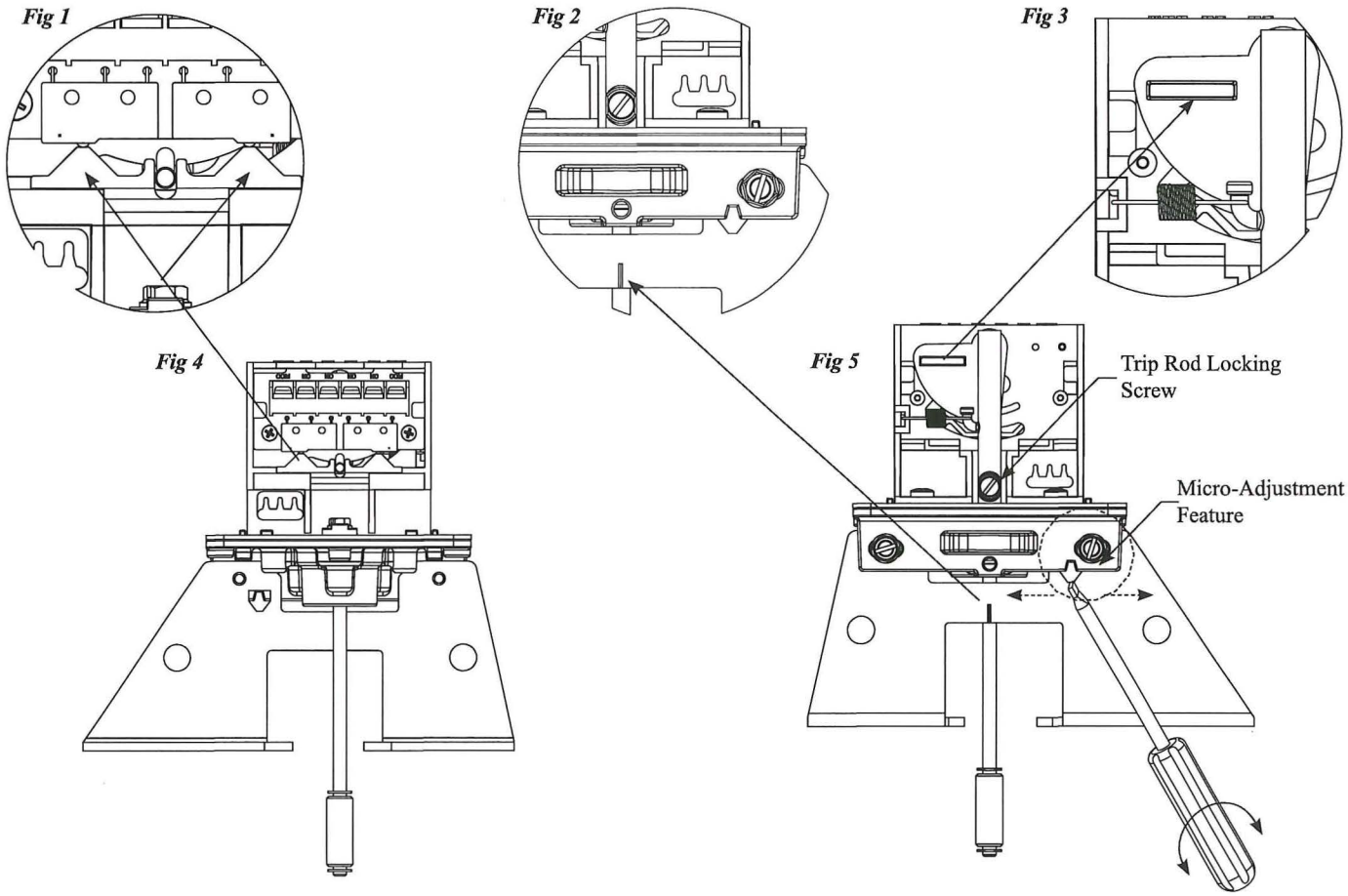
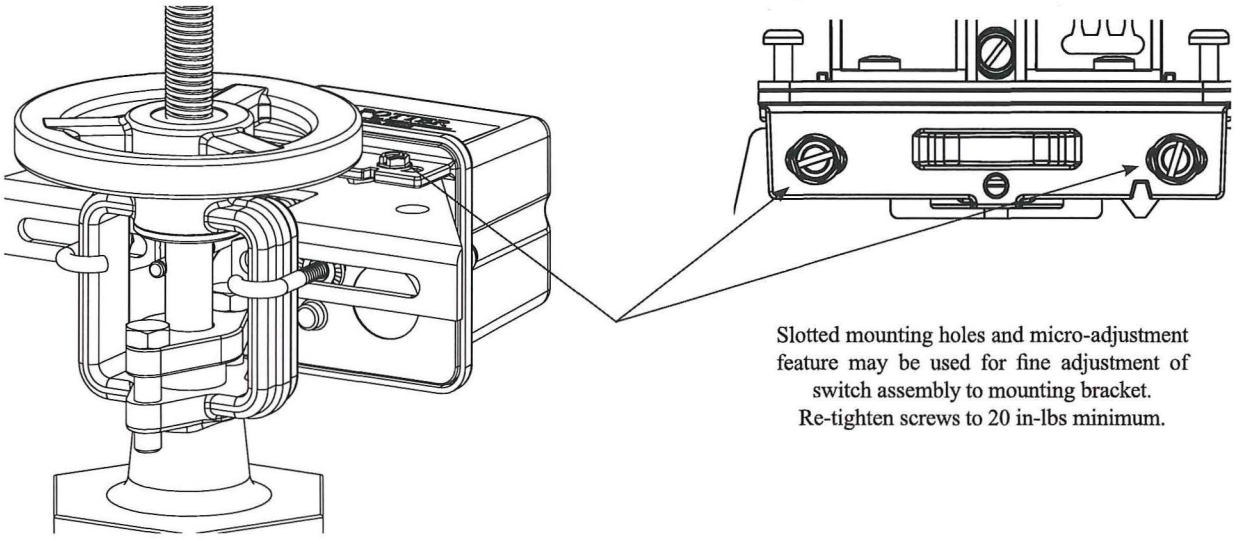


Fig 6

Small Valve Installation - 1/2" Through 2 1/2" Sizes



Slotted mounting holes and micro-adjustment feature may be used for fine adjustment of switch assembly to mounting bracket. Re-tighten screws to 20 in-lbs minimum.

Small Valve Installation

NOTE: If the valve stem is pre-grooved at 1/8" minimum depth; proceed to step 7.

1. Remove and discard "E" ring and roller from the trip rod.
2. With the valve in the FULL OPEN position, locate the OSYSU across the valve yoke as far as possible from the valve gland so that the spring loaded trip rod of the OSYSU is pulled against the non threaded portion of the valve stem. Position the OSYSU with the bracket near the handwheel as shown in Fig. 6 if possible to avoid creating a pinch point between the wheel and the OSYSU.
3. Loosen the locking screw that holds the trip rod in place and adjust the rod length (see Fig. 5). When adjusted properly, the rod should extend past the valve screw, but not so far that it contacts the clamp bar. Tighten the locking screw to 5 in-lbs minimum to hold the trip rod in place and properly seal the enclosure.

   NOTE: If trip rod length is excessive, loosen the locking screw and remove the trip rod from the trip lever. Using pliers, break off the one (1) inch long notched section (see Fig. 10). Reinstall trip rod and repeat Step 3 procedure.
4. Mount the OSYSU loosely with the carriage bolts and clamp bar supplied. On valves with limited clearance use J-hooks supplied instead of the carriage bolts and clamp bar to mount the OSYSU.
5. Mark the valve stem at the center of the trip rod.
6. Remove the OSYSU. Utilizing a 3/16" or 1/4" diameter straight file, file a 1/8" minimum depth groove centered on the mark on the valve stem. Deburr and smooth the edges of the groove to prevent damage to the valve packing and to allow the trip rod to move easily in and out of the groove as the valve is operated.

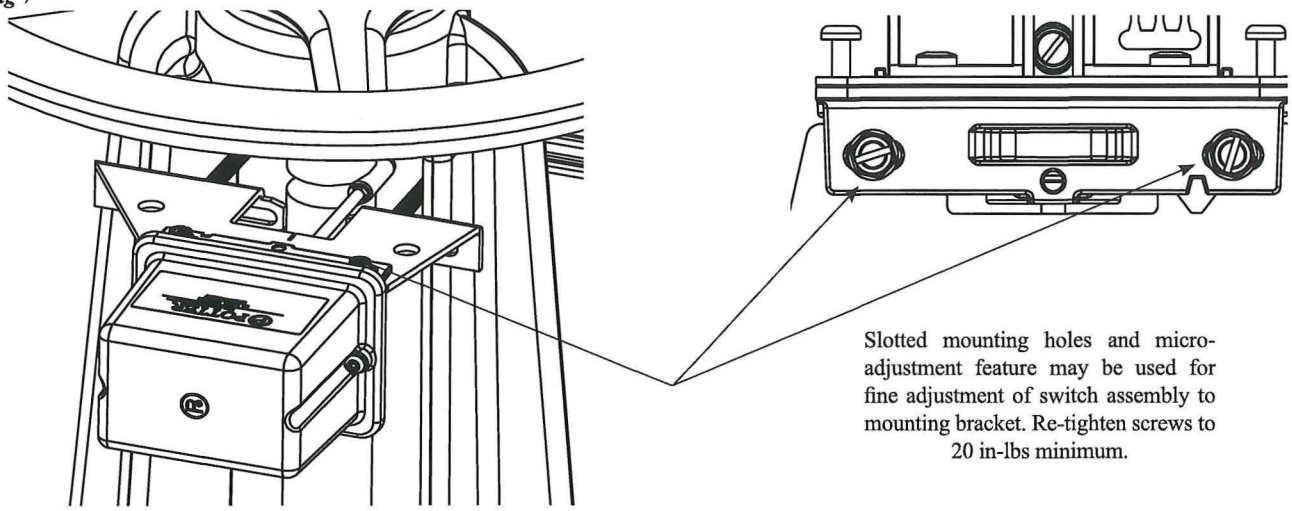
   NOTE: A groove depth of up to approximately 3/16" can make it easier to install the OSYSU so that it does not restore as it rolls over by the threads of the valve stem.
7. Mount the OSYSU on the valve yoke with the spring loaded trip rod of the OSYSU pulled against the valve stem and centered in the groove of the stem. If possible, position the OSYSU with the flat side of the bracket toward the hand wheel, as shown in Fig. 6, to help avoid creating a pinch point between the wheel and OSYSU. When in this preferred mounting position, it is usually best to use the white indicator visible through the window, as illustrated in Fig. 3, to aid in initially locating the OSYSU in the correct position on the yoke. If the unit must be installed inverted with the white indicator no longer easily visible, use the visual indicators of the actuator buttons on the micro-switches, as illustrated in Fig. 1, or the trip rod alignment mark on the bracket, as illustrated in Fig. 2 , to aid in initially locating the OSYSU.
8. Final adjustment can be made by slightly loosening the two screws on the bracket and using the fine adjustment feature (see Fig. 5). The adjustment is correct when the plungers on the switches are depressed by the actuator and there is no continuity between the COM and NO terminals on the switches.
9. Tighten the adjustment screws and all mounting hardware securely (20 in-lbs minimum). Check to insure that the rod moves out of the groove easily and that the switches activate within two turns when the valve is operated from the FULL OPEN towards the CLOSED position.
10. Reinstall the cover and tighten the cover screws to 15 in-lbs minimum to properly seal the enclosure.

⚠ CAUTION

Close the valve fully to determine that the stem threads do not activate the switch. The switch being activated by the stem threads could result in a ***false valve open*** indication.

Large Valve Installation - 3" Through 12" Sizes

Fig 7



Slotted mounting holes and micro-adjustment feature may be used for fine adjustment of switch assembly to mounting bracket. Re-tighten screws to 20 in-lbs minimum.

Large Valve Installation

NOTE: If the valve stem is pre-grooved at 1/8" minimum depth; proceed to step 6.

1. With the valve in the FULL OPEN position, locate the OSYSU across the valve yoke as far from the valve gland as possible so that the spring loaded trip rod of the OSYSU is pulled against the non threaded portion of the valve stem. Position the OSYSU with the bracket near the handwheel as shown in Fig. 7 if possible to avoid creating a pinch point between the wheel and the OSYSU.
2. Mount the OSYSU loosely with the carriage bolts and clamp bar supplied.
3. Loosen the locking screw that holds the trip rod in place and adjust the rod length (see Fig. 5). When adjusted properly, the rod should extend past the valve screw, but not so far that it contacts the clamp bar. Tighten the locking screw to 5 in-lbs minimum to hold the trip rod in place and properly seal the enclosure.

   NOTE: If trip rod length is excessive, loosen the locking screw and remove the trip rod from the trip lever. Using pliers, break off the one (1) inch long notched section (see Fig. 10). Reinstall trip rod and repeat Step 3 procedure.
4. Mark the valve stem at the center of the trip rod.
5. Remove the OSYSU. Utilizing a 3/8" or ½" diameter straight file, file a 1/8" minimum depth groove centered on the mark on the valve stem. Deburr and smooth the edges of the groove to prevent damage to the valve packing and to allow the trip rod to move easily in and out of the groove as the valve is operated.

   NOTE: A groove depth of up to approximately 3/16" can make it easier to install the OSYSU so that it does not restore as it rolls over by the threads of the valve stem.
6. Mount the OSYSU on the valve yoke with the spring loaded trip rod of the OSYSU pulled against the valve stem and centered in the groove of the stem. If possible, position the OSYSU with the flat side of the bracket toward the hand wheel, as shown in Fig. 7, to help avoid creating a pinch point between the wheel and OSYSU. When in this preferred mounting position, it is usually best to use the white indicator visible through the window, as illustrated in Fig. 3, to aid in initially locating the OSYSU in the correct position on the yoke. If the unit must be installed inverted with the white indicator no longer easily visible, use the visual indicators of the actuator buttons on the micro-switches, as illustrated in Fig. 1, or the trip rod alignment mark on the bracket, as illustrated in Fig. 2 , to aid in initially locating the OSYSU.
7. Final adjustment can be made by slightly loosening the two screws on the bracket and using the fine adjustment feature (see Fig. 5). The adjustment is correct when the plungers on the switches are depressed by the actuator and there is no continuity between the COM and NO terminals on the switches.
8. Tighten the adjustment screws and mounting hardware securely (minimum 20 in-lbs). Check to insure that the rod moves out of the groove easily and that the switches activate within two turns when the valve is operated from the FULL OPEN towards the CLOSED position.
9. Reinstall the cover and tighten the cover screws to 15 in-lbs minimum to properly seal the enclosure.

⚠ CAUTION

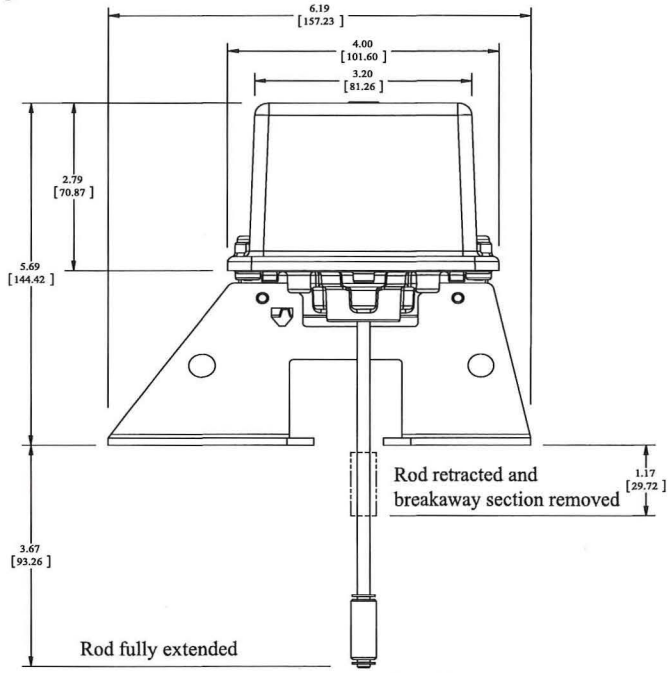
Close the valve fully to determine that the stem threads do not activate the switch. The switch being activated by the stem threads could result in a ***false valve open*** indication.

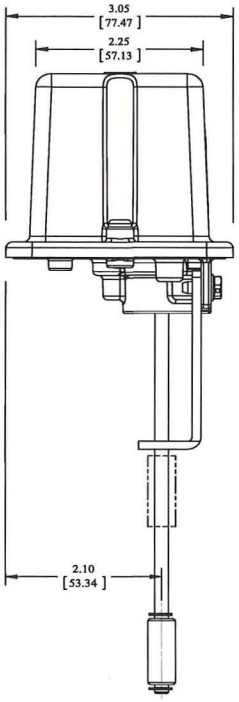
OSYSU Series

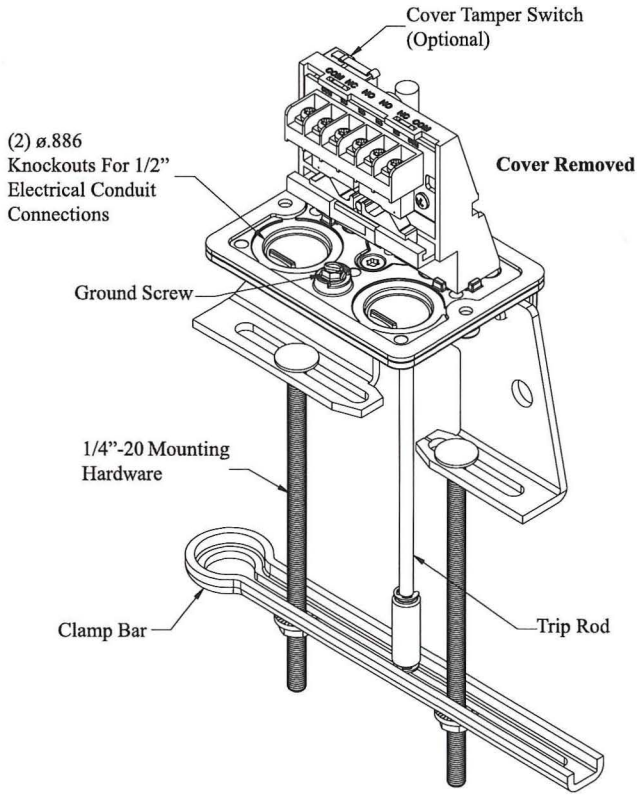
Outside Screw and Yoke Valve Supervisory Switch

Dimensions

Fig 8



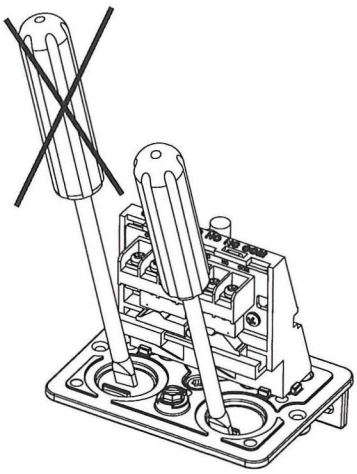




Knockout Removal

Fig 9

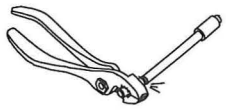
To remove knockouts: Place screwdriver at inside edge of knockouts, not in the center.



NOTE: Do not drill into the base as this creates metal shavings which can create electrical hazards and damage the device. Drilling voids the warranty.

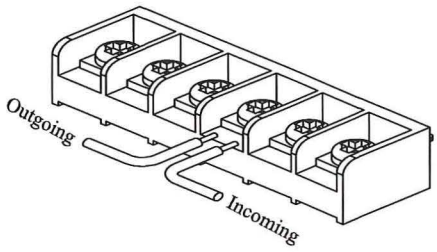
Breaking Excessive Rod Length

Fig 10



Switch Terminal Connections Clamping Plate Terminal

Fig 11



⚠ WARNING

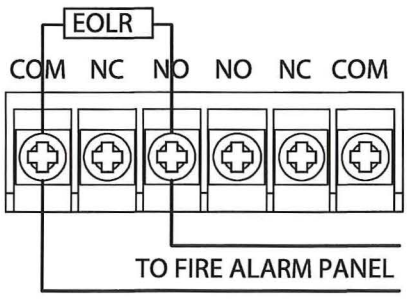
An uninsulated section of a single conductor should not be looped around the terminal and serve as two separate connections. The wire must be severed, thereby providing supervision of the connection in the event that the wire become dislodged from under the terminal. Failure to sever the wire may render the device inoperable risking severe property damage and loss of life. Do not strip wire beyond 3/8" of length or expose an uninsulated conductor beyond the edge of the terminal block. When using stranded wire, capture all strands under the clamping plate.

NOTICE

All conduit and connectors selected for the installation of this product shall be suitable for the environment for which it is to be used and shall be installed to the manufacturer's installation instructions. For NEMA 4, 4X, 6, 6P installations, the cover screws are recommended to be tightened to 15 in-lbs minimum and the trip rod locking screw tightened to 5 in-lbs minimum to properly seal the enclosure.

Typical Electrical Connections

Fig 12



Ordering Information

Model	Description	Stock No.
OSYSU-1	Outside Screw & Yoke Supervisory Switch (Single switch)	1010102
OSYSU-2	Outside Screw & Yoke Supervisory Switch (Double switch)	1010202
OSYSU-2 CRH	Outside Screw & Yoke Supervisory Switch (Double Switch). Corrosion resistant hardware of 316 stainless steel & nickel plated to ASTM B377 Type V Brackets	1010210
	Cover Screw	5490424
	Hex Key for Cover Screws and Installation Adjustments	5250062
	Optional Cover Tamper Switch Kit	0090200

Engineering Specifications: OS&Y Valves

UL, CUL Listed / FM Approved and CE Marked valve supervisory switches shall be furnished and installed on all OS&Y type valves that can be used to shut off the flow of water to any portion of the fire sprinkler system, where indicated on the drawings and plans and as required by applicable local and national codes and standards. The supervisory switch shall be NEMA 4X and 6P rated and capable of being mounted in any position indoors or out and be completely submerged without allowing water to enter the enclosure.. The enclosure shall be held captive by tamper resistant screws. The device shall contain two ½" conduit entrances and one or two Single Pole Double Throw (SPDT) switches. There shall be a visual indicator to display the status of the switches. To aid in installation, it shall be possible to make fine adjustments to the position of the switch on the valve without loosening the mounting bracket from the valve. The device shall contain an adjustable length trip rod and roller, the trip rod shall be held captive by a set screw accessible upon removal of the cover. The switch contacts shall be rated at 10A, 125/250VAC and 2A, 30VDC. OS&Y Valve supervisory switch shall be model OSYSU-1 for the single switch model and OSYSU-2 for the two switch model manufactured by Potter Electric Signal Company LLC

NOTICE

Supervisory switches have a normal service life of 10-15 years. However, the service life may be significantly reduced by local environmental conditions.

APPLICATIONS GUIDE

Fire Sprinkler Systems Monitoring

SYSTEM SENSOR®

Fire Sprinkler Systems Monitoring

Contents

Preface

Before the first automatic fire sprinkler system was developed in the 1870s, a fire sprinkler system consisted of a perforated pipe, a valve, a person to open the valve, and an elevated barrel or tank filled with water. A more dependable system was created in response to increased fire loads and increased values of buildings and their contents. A more advanced fire sprinkler system became possible as technology became more sophisticated.

Fire sprinkler systems automatically detect and then control, suppress, or extinguish fires. Water supplies can come from city water mains, dedicated storage tanks or ponds. Valves and alarm devices control and monitor the water's flow. Distribution pipes send water to the fire sprinkler heads using a water source to maintain and increase water pressure according to design criteria. Modern systems can detect a fire condition and discharge water quickly, before a fire grows to a fatal or catastrophic size, reducing fire deaths by nearly 100 percent. Understanding your fire fire sprinkler system can be life saving. After reading this guide, you will be more knowledgeable about the waterflow detectors, supervisory switches, pressure switches, explosion proof products, and alarm bells within a fire sprinkler system.

This guide provides information for the proper application, installation and maintenance of System Sensor fire sprinkler and notification products. Installation must comply with all code requirements such as NFPA and comply with directives from Authorities Having Jurisdiction (AHJ). AHJ directives always take precedence over other codes and have final authority.

System Sensor was founded in 1984, and has become the largest manufacturer of fire detection and notification appliances in the world. More than 1,900 System Sensor associates collaborate to build quality products for conventional detection; intelligent detection; audible and visible (AV) notification; heating, ventilation, air conditioning (HVAC) monitoring; and fire sprinkler systems monitoring. High production standards and strong customer engagement contribute to the solid demand for System Sensor products.

Every day we aim to develop advanced ideas that deliver advanced solutions.

Section 1
Fire Sprinkler Systems

There are four types of fire sprinkler systems: wet pipe, dry pipe, deluge, and pre-action. These choices allow fire sprinkler systems to provide an array of of hazard and environmental protection, customized to each individual situation.

Wet Pipe Fire Sprinkler Systems
Wet pipe fire sprinkler systems are the most common systems. They have the fewest number of components and require less installation time than other systems. A wet pipe fire sprinkler system has a series of pipes connected to regularly distributed fire sprinkler heads, fed by a main riser. Maintenance is minimal, so financial savings are also realized.

Wet pipe fire sprinkler systems cannot be installed in an area where distribution pipes are exposed to freezing temperatures, such as parking garages, because they always contain water.

The operation of a wet pipe fire sprinkler system depends on the heat reactive fire sprinkler heads. When a fire starts, its heat causes a fusible glass bulb or metallic heat sensor within the fire sprinkler head to shatter or melt and separate. Either action causes water to discharge from the distribution piping, striking the deflector on the open fire sprinkler head and spraying water onto the fire in an engineered pattern or throw.

Wet pipe systems are fixed temperature installations, meaning each fire sprinkler head is activated only if exposed to a predetermined temperature as low as 155°F or as high as 286°F.

There are three types of wet pipe fire sprinkler systems: wet pipe fire sprinkler system with an alarm check valve, wet pipe fire sprinkler system with maintained excess pressure, or wet pipe fire sprinkler system with a straight pipe riser.

Wet Pipe Fire Sprinkler System with an Alarm Check Valve
When water enters the fire sprinkler system piping, it becomes non-potable and unsuitable for drinking. To keep the non-potable water from leaking back into the city water supply, an alarm check valve can be installed. The alarm check valve is a small device consisting of a spring, valve clapper and alarm port.

The spring holds the valve clapper closed, so that water will flow only in one direction. Water will not flow out of the fire sprinkler head until a predetermined temperature causes the individual fire sprinkler head to activate. When a sprinkler head is activated, the clapper opens allowing water to flow through the valve to feed the system. As the alarm port becomes exposed to water pressure, it causes a water motor gong, mechanical bell, or A/V device to sound. A waterflow detector connected to an electric bell, horn, or horn/strobe has become the most common waterflow alarm notification device, replacing the mechanical water motor gong. The alarm port also becomes exposed to the incoming water supply where an alarm pressure switch can be installed to send an alarm signal to a panel.

To prevent a city water surge from activating alarms, a retard chamber can be installed. The retard chamber is a metal reservoir that holds the water during a brief city water surge. A drip valve at the bottom of the reservoir allows the water from the surge to slowly drain out. If sustained waterflow occurs, as when a fire sprinkler is activated due to a fire condition, the reservoir cannot drain the water fast enough and the water motor gong or alarm pressure switch is activated.

Wet Pipe Fire Sprinkler System with Maintained Excess Pressure
Wet pipe fire sprinkler systems with maintained excess pressure are offered with an alarm check valve. In this type of system, excess pressure is pumped in just above the alarm check valve to hold the clapper down even during a city water surge. This type of system eliminates false alarms caused by surges in the municipal water supply.

There are two ways to measure pressure loss in this type of system:

- A pressure switch is connected to the system above the check valve. When a fire sprinkler head is activated, the switch detects a drop in pressure and sends an alarm. Usually a supervisory pressure switch is used to monitor leaks in the system.
- A pressure switch is connected to the alarm port of the alarm check valve. When the fire sprinkler head is activated, the alarm check valve opens. When the valve opens, the alarm port is exposed to the incoming water supply. The pressure switch detects the pressure change and sends an alarm.

Wet Pipe Fire Sprinkler System with a Straight Pipe Riser
Wet pipe fire sprinkler systems with straight pipe risers, located downstream of a check valve or backflow preventer, are the most common wet pipe fire sprinkler systems. The straight pipe riser, or vertical supply pipe within the fire sprinkler system, does not have a retard chamber or alarm port like other types of wet pipe fire sprinkler systems. Instead, this system has a riser check valve.

A riser check valve utilizes a vane type waterflow detector to monitor waterflow in the fire sprinkler system. When a continuous flow of water — occurs, a standard check valve or a waterflow detector monitors the system and activates an alarm after a predetermined amount of time. The amount of time delay is selected on the flow switch to prevent short duration city water surges from causing false alarms. The time delay mechanism allows a predetermined alarm delay time to be set. If water surges beyond the predetermined time, an alarm will sound.

Dry Pipe Fire Sprinkler Systems

Dry pipe fire sprinkler systems are installed in areas where distribution pipes are subject to freezing temperatures, such as unheated buildings and parking garages. Unlike wet pipe fire sprinkler systems that contain water, dry pipe fire sprinkler systems contain compressed air. The compressed air is supplied by an electric air compressor, nitrogen bottles, or other source.

Dry pipe fire sprinkler systems also have a valve clapper and alarm port. The dry pipe valve clapper is held closed by a pressure differential between air pressure and water pressure at the valve interface. Supervisory pressure switches are used to maintain the pressure on the system side, and can send a low or high pressure signal to a panel. The panel then either turns on a pump or releases pressure from the system through a ball valve to ensure that the right pressure is maintained in the system. When a fire starts, its heat causes a fire sprinkler head to open, and the compressed air is released. When the air pressure drops to a trip point (usually 10 psi below normal), a dry pipe valve opens and a rush of water from the main line floods the distribution pipes. With the rush of water from the main line flowing through the open clapper valve the alarm port is exposed to water. Once exposed, a pressure switch senses the increase in pressure and sounds an alarm.

Dry Pipe Valve
The dry pipe valve is located above the main system control valve and must be installed in a heated area or enclosure to keep the water below the valve from freezing. The purpose of the dry pipe valve is to keep water from entering the pipes and potentially freezing.

The dry pipe valve has a one-way clapper that is partially covered with water called the priming water, to seal the valve seat, and has an intermediate chamber that connects the valve to the alarm line.

Pressure Switches
There are two types of pressure switches connected to the alarm line, an alarm pressure switch and a supervisory air pressure switch. Both switches monitor the air pressure on the system side of the dry pipe valve.

- Alarm pressure switches measure pressure changes within a system and send alerts to the panel and to an annunciator.
- Supervisory pressure switches monitor air pressure on the system side of the dry pipe valve. They perform the following two functions:
  - The first supervisory switch monitors low air pressure and prevents the accidental operation of the dry pipe valve due to low air pressure from an air compressor failure or other leaks in the system.
  - The second supervisory switch monitors high air pressure to prevent damage to the clapper and rubber gaskets in the dry pipe valve. High pressure can damage the pipe. If air pressure is too high, the valve won't operate until it bleeds off some of the system air.

Note:

- The pressure switch does not require a delay mechanism because water surges are not present with this type of system.
- Vane type switches should not be installed on a dry pipe system because the sudden rush of water could tear the paddle from the switch.
- There are a few specialized applications where wet pipe and dry pipe systems are not suitable. In these instances, deluge or pre-action fire sprinkler systems are used. These instances are called "special hazards applications."

Deluge Fire Sprinkler Systems

Deluge fire sprinkler systems are installed in high hazard operations, such as power generating stations, aircraft hangers, petrochemical and munitions plants, and areas that store items such as flammable liquids. These systems work with independent fire detection systems to deliver water immediately to the protected area.

Deluge fire sprinkler systems work similarly to the wet pipe fire sprinkler system, except the system incorporates open fire sprinkler heads or nozzles that do not operate individually. The water is held back by an electric solenoid valve that is connected to a compatible releasing panel. An initiating device, such as a smoke detector, sends a signal to the monitoring panel which energizes the release circuit which opens the solenoid valve.

Water is not adequate to control fires in areas where flammable liquids are manufactured or stored. Sometimes a foam concentrate is mixed with the water in a part of the system referred to as a proportioner. This foam is called Aqueous Fire Fighting Foam or AFFF. The foam and water combination causes the concentrate to expand when released through the fire sprinkler head, depriving the fire source of oxygen required to support combustion of flammable materials.

Pre-action Fire Sprinkler Systems

Pre-action fire sprinkler systems are installed in water sensitive environments such as computer rooms and refrigerated warehouses. These areas require systems that will operate only in an actual fire condition to save the building and its components from severe fire damage.

The pre-action system is similar to a dry pipe system, except that air pressure may or may not be used. It is also similar to the deluge system, except that the valve is electronically held closed and standard "closed" fire sprinkler heads are used. This design eliminates operational delays and water damage. The valve will only open if an independent detection system installed in the same area as the fire sprinkler system is activated, verifying a fire condition. In effect, opening a pre-action valve turns a pre-action system into a standard wet pipe fire sprinkler system.

Section 2
Standards

The National Fire Protection Association (NFPA) publishes standards for the proper application, installation and maintenance of fire protection products. The principal standards for fire sprinkler monitoring products are as follows:

NFPA 13: Standard for Installation of Sprinkler Systems
NFPA 13 guarantees a reasonable degree of protection for life and property from fire by standardizing design, installation and testing requirements for sprinkler systems. These standards are based on engineering principles, test data and field experience.

- A wet pipe system must be fitted with an alarm check valve or other listed waterflow detecting alarm device with necessary attachments to provide an alarm.
- A dry pipe system must be fitted with listed alarm attachments to the dry pipe valve.
- In pre-action and deluge systems, the alarm apparatus shall consist of alarms actuated independently by the detection system and the flow of water.
- Paddle-type waterflow alarm indicators shall be installed in wet systems only.

NFPA 13D: Installation of Sprinkler Systems in One- and Two-Family Dwellings and Manufactured Homes
NFPA 13D guarantees to provide a sprinkler system that aids in the detection and control of residential fires, specifically in this type of dwelling, and thus provides improved protection against injury, life loss, and property damage.

- If the sprinkler system piping has a separate control valve installed, it must be supervised.
- Local waterflow alarms shall be provided on all sprinkler systems in homes not equipped with smoke detectors in accordance with *NFPA 72, National Fire Alarm Code.*

NFPA 13R: Installation of Sprinkler Systems in Residential Occupancies up to and Including Four Stories in Height
NPFA 13R provides design and installation requirements for a sprinkler system to aid in the detection and control of fires in residential occupancies and thus provide improved protection against injury, life loss, and property damage.

- A local waterflow alarm shall be provided on all sprinkler systems.
- Where a building fire alarm system is provided, the local waterflow alarms shall be connected to the building fire alarm system.

NFPA 25: Standard for the Inspection, Testing and Maintenance of Water-Based Fire Protection

NFPA 25 guarantees a reasonable degree of protection for life and property from fire by inspecting, testing and maintaining water-based fire protection systems to ensure operating conditions are within the standards.

- Alarm devices shall be inspected quarterly to verify that they are free of physical damage.
- Waterflow devices including, but not limited to, mechanical water motor gongs and pressure switches shall be tested quarterly.
- Vane type waterflow devices shall be tested semi-annually.
- Where provided, waterflow alarm and supervisory devices shall be tested on a quarterly basis.
- Valve supervisory switches shall be tested semiannually.
- A distinctive signal shall indicate movement from the valve's normal position during either the first two revolutions of a hand wheel or when the stem of the valve has moved one-fifth of the distance from its normal position.
- The signal shall not be restored at any valve position except the normal position.

NFPA 72: National Fire Alarm Code

NFPA 72 guarantees a reasonable degree of protection for life and property from fire by defining requirements for signal initiation, transmission, notification and annunciation, as well as the levels of performance and the reliability of various fire alarm systems.

- Initiation of the alarm signal shall occur within 90 seconds of waterflow at the alarm-initiating device when flow occurs that is equal to or greater than that from a single sprinkler of the smallest orifice size installed in the system.
- Movement of water due to waste, surges or variable pressure shall not initiate an alarm signal.
- Two separate and distinct signals shall be initiated: one indicating movement of the valve from its normal position (off-normal), and the other indicating restoration of the valve to its normal position.
- The off-normal signal shall be initiated during the first two revolutions of the hand wheel or during one-fifth of the travel distance of the valve control apparatus from its normal position.
- The off-normal signal shall not be restored at any valve position except normal.
- Two separate and distinct signals shall be initiated: one indicating that the required pressure has increased or decreased (off-normal), and the other indicating restoration of the pressure to its normal value.
- A pressure supervisory signal-initiating device for a dry pipe fire sprinkler system shall indicate both high and low pressure conditions. The off-normal signal shall be initiated when the pressure increases or decreases by 70 kPa (10 psi).
- A dry pipe or pre-action fire sprinkler system supplied with water by a connection beyond the alarm-initiating device of a wet pipe system shall be equipped with a separate waterflow alarm-initiating pressure switch or other approved means to initiate a waterflow alarm.
- The number of waterflow switches permitted to be connected to a single initiating device circuit shall not exceed five.
- NFPA 72 states that if anything could cause the system to malfunction, a switch must be added to the system.
- This section leaves it up to the designer to indicate any supervisory device, which will help ensure that the building's suppression systems will work properly.
- The number of supervisory devices permitted to be connected to a single initiating device circuit shall not exceed 20.
- Alarm signals initiated by manual fire alarm boxes, automatic fire detectors, waterflow from the automatic sprinkler system, or actuation of other fire suppression system(s) or equipment shall be treated as fire alarms.

NFPA 101: Life Safety Code

NFPA 101 guarantees a reasonable degree of protection for life and property from fire by providing requirements for designing, operating and maintaining buildings. Requirements are based on building type and occupancy.

- Where a sprinkler system provides automatic detection and alarm system initiation, it shall be provided with an approved alarm initiation device that operates when the flow of water is equal to or greater than that from a single automatic sprinkler.
- A supervisory signal shall be provided to indicate a condition that would impair the satisfactory operation of the sprinkler system.
- Monitoring shall include but not be limited to monitoring of control valves, fire pump power supplies and running conditions, water tank levels and temperatures, tank pressure, and air pressure on dry pipe valves.
- Where supervision of automatic sprinkler systems is provided in accordance with another provision of this Code, waterflow alarms shall be transmitted to an approved, proprietary alarm receiving facility, or the fire department.

NFPA 5000: Building Construction and Safety Code

NFPA 5000 guarantees a reasonable degree of protection for life and property from fire through three independent regional organizations that write uniform building codes for the country. These codes, based on building type and occupancy, become law when adopted by local and state governments.

- Where a sprinkler system provides automatic detection and alarm system initiation, it shall be provided with an approved alarm initiation device that operates when the flow of water is equal to or greater than that from a single automatic sprinkler.
- In high-rise buildings, a sprinkler control valve and a waterflow device shall be provided for each floor.
- Supervisory signals shall sound and be displayed either at a location within the protected building that is constantly attended by qualified personnel or at an approved, remotely located receiving facility.
- Where electrical supervision of automatic sprinkler systems is required by another section of this Code, waterflow alarms shall be transmitted to an approved proprietary alarm receiving facility, a remote station, or a central station of the fire department.

The International Building Code and International Fire Code were created by the International Code Council Inc. (ICC) in an effort to harmonize the country under one set of standards. The purpose of the *International Building Code* and *International Fire Code* is to protect safety to life and property from fire and other hazards attributed to the built environment, and to provide safety to fire fighters and emergency responders during emergency operations.

- All valves controlling the water supply for automatic sprinkler systems, pumps, tanks, water levels, and temperatures, critical air pressures, and waterflow switches on all sprinkler systems shall be electrically supervised.

- In occupancies required to be equipped with a fire alarm system, the backflow preventer valves shall be electrically supervised by a tamper switch installed in accordance with NFPA 72 and separately annunciated.

- Approved audible devices shall be connected to every automatic sprinkler system. Such sprinkler waterflow alarm devices shall be activated by waterflow equivalent to the flow of a single sprinkler of the smallest orifice size installed in the system. Alarm devices shall be provided on the exterior of the building in an approved location.

- Where a fire alarm system is installed, actuation of the automatic sprinkler system shall actuate the building fire alarm system.

The organizations that develop and enforce these standards are located at the following addresses:

Building Officials and Code Administrators (BOCA)
4051 West Flossmoor Road
Country Club Hills, IL 60478

International Conference of Building Officials (ICBO)
5360 Workman Mill Road
Whittier, CA 90601

Southern Building Code Congress International (SBCCI)
900 Montclair Road
Birmingham, AL 35213

International Code Council Inc.
Three different standards organizations, BOCA, ICBO, and SBCCI formed the umbrella organization ICC. The purpose of ICC is to produce a single set of model building and fire codes. ICC is located at 5360 Workman Mill Road in Whittier, California 90601-2298.

Testing Laboratories

Testing laboratories were created to test a wide variety of products and systems to ensure product safety. Today, almost every product sold in the United States must be approved or listed by these testing laboratories. All sprinkler system monitoring products and fire sprinkler system components are tested and approved by these laboratories and feature the testing laboratories' label.

Two common testing laboratories that provide approval of Fire Sprinkler Monitoring products are as follows:

Underwriters Laboratories Inc. (UL)
Laboratory and Testing Facilities

Corporate
333 Pfingsten Road
Northbrook, IL 60062

Also located at:
1285 Walt Whitman Road
Melville, NY 11747

1655 Scott Blvd.
Santa Clara, CA 95050

North Carolina Division
12 Laboratory Drive
P.O. Box 13995
Research Triangle Park, NC 27709

Factory Mutual Research (FM)
1151 Boston-Providence Turnpike
P.O. Box 9102
Norwood, MA 02062

Section 3

Fire Sprinkler System Monitoring Devices

The monitoring of waterflow, valve position, or system status is typically needed in fire sprinkler systems in order to alert the fire department and/or facility manager of a fire or trouble condition that needs immediate attention. Vane or paddle type waterflow detectors and pressure type switches are used to detect the flow of water in a fire sprinkler system and to send an alarm signal. Valve supervisory switches are used to monitor the open or closed position of the valves that control the water supply in the fire sprinkler system. Supervisory pressure switches monitor the status of the system air pressure in dry and pre-action systems. In certain situations, they also are used to monitor water pressure in wet pipe fire sprinkler systems.

Vane Type Waterflow Detectors

Principles of Operation

Vane type waterflow detectors, which monitor the flow of water in a wet pipe fire sprinkler system, send an alarm when a continuous flow of water occurs from an activated fire sprinkler head or from a leak in the system. Waterflow detectors can be mounted to vertical up flow or horizontal run distribution pipes in wet pipe fire sprinkler systems. Waterflow detectors are available for two through eight inch pipe sizes, and can be installed on Schedule 7 thru 40 fire sprinkler pipe. T-tap type waterflow detectors are also available and are installed to one inch NPT outlets of threaded steel, copper and CPVC tees on T-style connectors. T-tap waterflow detectors accommodate a wide range of tee and pipe sizes from one inch to two inch tee sizes; different tees require the installation of different paddle sizes.

The detectors include a plastic vane or paddle, which installs through an opening in the wall of the distribution pipe. When the flow of water reaches 10 gallons per minute, the vane or paddle deflects, which produces a switched output, usually after a preset time delay. To minimize false alarms due to pressure surges or air trapped in the fire sprinkler system, a mechanical delay is often used to postpone switch activation. This delay is frequently referred to as a retard as it takes the place of the previously mentioned retard chamber in wet pipe systems. If waterflow decreases to four gallons per minute or below, the timing mechanism will reset to zero; delays do not accumulate. Time delays are adjustable from 0 to 90 seconds.

Typically, waterflow detectors are equipped with dual SPDT (Form C) switches for activation of an alarm panel and alarm bell, or audible visible device. When a waterflow detector is connected to a listed fire sprinkler/fire alarm control panel, the initiating circuit must be non-silenceable. Waterflow detectors are designed to be installed in a variety of environments and are approved for both indoor and outdoor applications. U-bolt type waterflow detectors are designed primarily for use in commercial applications; whereas, T-tap style waterflow detectors are designed for primary signaling in residential applications and branch line signaling in larger systems. The only differences between U-bolt and T-tap style waterflow detectors are the methods in which they attach to the pipe. T-tap style waterflow detectors also are available without a time delay mechanism.

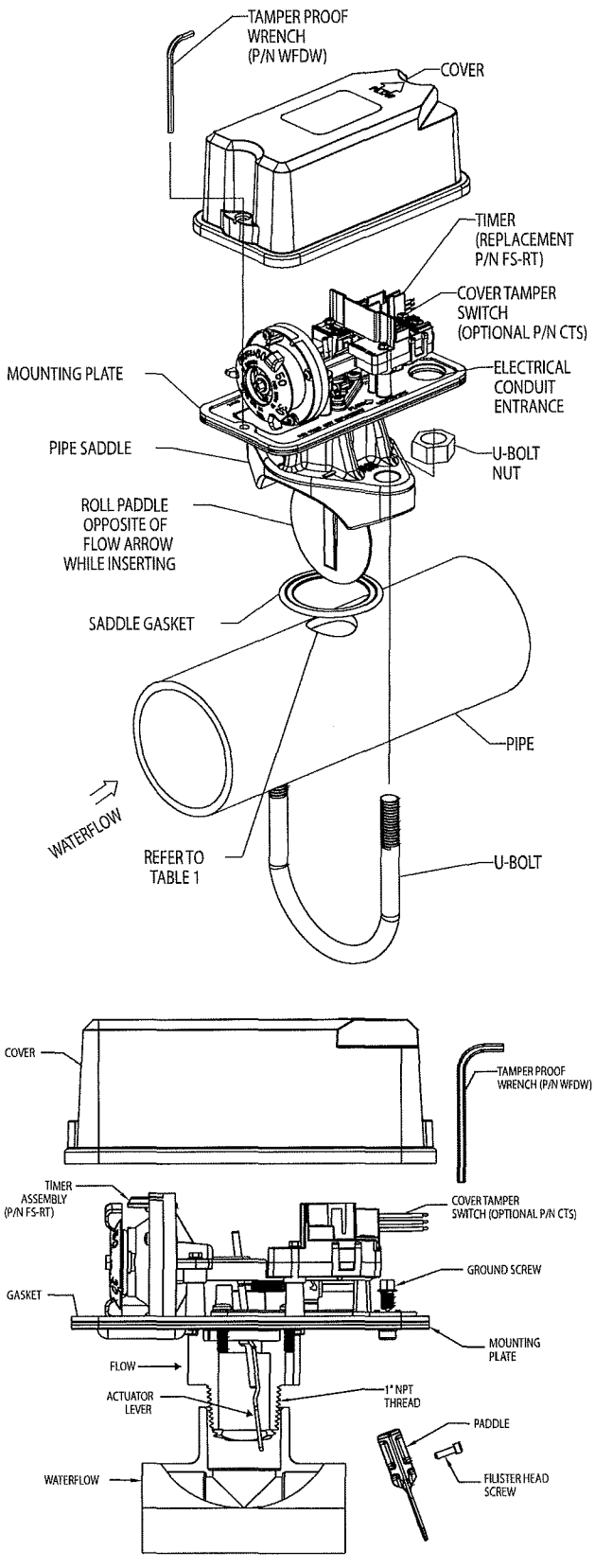
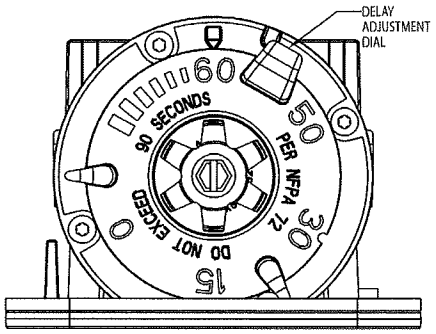


Figure 1: Parts of a vane type waterflow detector



NOTE: RETARD TIME MAY EXCEED 90 SECONDS. ADJUST AND VERIFY THAT TIME DOES NOT EXCEED 90 SECONDS. NUMBER ON DIAL IS APPROXIMATE TIME DELAY IN SECONDS

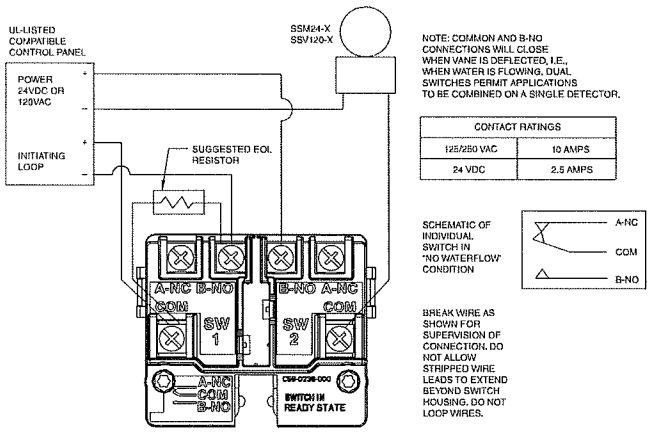
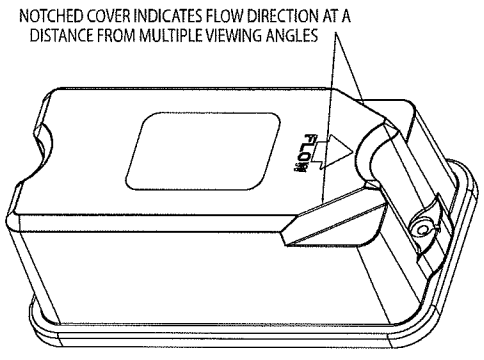


Figure 2: Vane type waterflow detector delay settings and wiring diagram

Product Placement

For optimal performance waterflow detectors should be mounted in an area where there is adequate clearance for installation, removal and inspection. To prevent damage, waterflow detectors should be installed between six and seven feet above the floor. When installing a waterflow detector on horizontal pipe, the detector should always be placed on top of the pipe to avoid build up of rust or other particles from collecting and interfering with the actuation of the device. When installing a waterflow detector on vertical pipes, make sure the detector is installed in an area where there is an upward flow.

For the accurate detection of waterflow, detectors should be installed at least six inches from fittings that change the direction of flow in the pipe, and at least 24 inches from a drain or valve. It is important that the detector is installed in the proper flow direction, which is indicated by the directional cover and and arrow markings on the base plate and saddle.



Testing, Maintenance and Service

System Sensor waterflow detectors offer replaceable terminal /switch assembly so the detector can be serviced or maintained without draining the fire sprinkler system and removing the detector. Before repairing, maintaining, or testing waterflow devices, it is important to notify the central station monitoring the waterflow alarms. To prevent accidental water damage during maintenance, control valves should be closed and the system completely drained before the waterflow detectors are removed or replaced. Any detector that shows evidence of water leakage should be replaced. If a detector needs to be removed, the pipe must be drained, then the electrical power must be turned off to the detector before disconnecting wires. Once the wires are removed, the nuts can be loosened and the U-bolt removed. Lift the detector to allow enough room for the paddle to be manually rolled inward and clear the opening in the pipe.

Waterflow detectors should be tested at least quarterly to ensure proper operation; however, the AHJ may require detectors to be tested more frequently. When testing the fire sprinkler system, open the inspector's test valve and time how long it takes for the detector to indicate a flow condition. The waterflow detector should stay in alarm until the inspector's test valve is closed. Timing can be adjusted if the desired time is not achieved.

Supervisory Switches

Principles of Operation/Product Placement

Supervisory switches are used primarily to monitor the open position of valves in a fire sprinkler system. One of the major causes of sprinkler system failure occurs when control valves are accidentally left closed, rendering the fire sprinkler system inoperable. Supervisory switches are required to send a signal if a valve is closed one-fifth of its total travel distance.

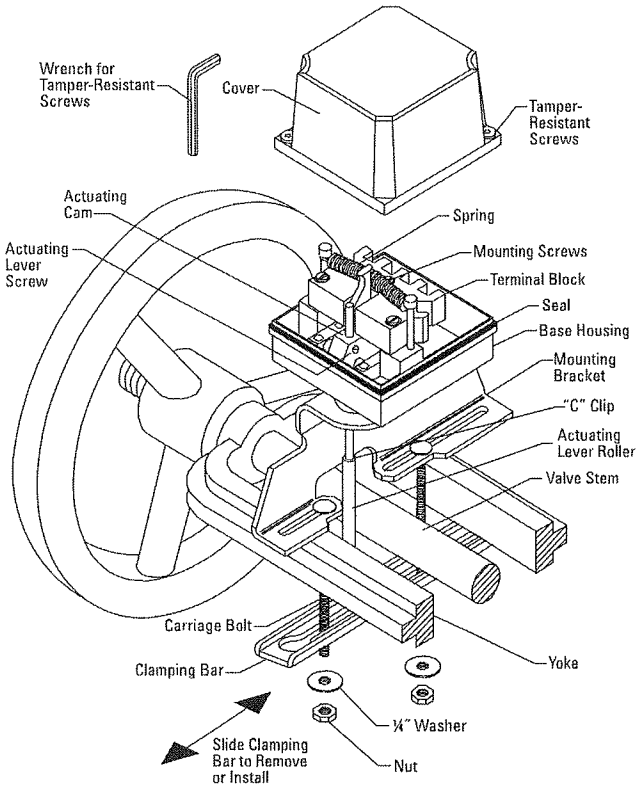


Figure 3: Parts of an outside screw and yoke supervisory switch

There are three main types of valves used in fire sprinkler systems: outside screw and yoke (OS&Y), butterfly (BFV), and post indicator valves (PIV).

Any valve that can affect the flow of water in a fire sprinkler system must be monitored. Three different types of supervisory switches are available for monitoring the open position of these different valve types. These switches – OS&Y, PIBV and special purpose – are equipped with dual SPDT (Form C) synchronized switches for activation of a supervisory signal at a panel or auxiliary device.

OS&Y type supervisory switches are designed to monitor the open position of OS&Y type gate valves. A large hand wheel with a threaded shaft controls the position of the valve. The shaft moves when the valve's position changes. The switch is equipped with an actuator rod, which sits in a groove filed into the shaft or provided by the valve manufacturer. As the valve is closed by the turning of the hand wheel, the actuator rod slides out of the groove in the shaft, causing the switches to operate and send a supervisory/trouble signal. A signal also sounds if the tamper switch is removed from the valve.

OS&Y type supervisory switches can be mounted on the yoke of OS&Y valves, which range in size from ½ inch to 12 inches in diameter. The adjustable shaft and mounting brackets allow installation to various sizes of valves. OS&Y supervisory switches are suitable for indoor or outdoor use and can be mounted vertically or horizontally. Two switches simultaneously activate both a local bell and an alarm panel. These supervisory switches are mounted on the yoke of the valve using either "J" hooks or carriage bolts with clamping bars. "J" hooks are typically used for mounting the switch on smaller valves. When mounting the OS&Y switch to the valve, be sure the actuator rod is resting in either the factory-provided or filed groove.

PIBV type supervisory switches monitor the open position of butterfly, pressure reducing, wall post indicator, and yard post indicator valves.

When installing a PIBV supervisory switch on a post indicator type valve, the switch is placed in a one half inch NPT tapped hole located so that the actuating lever of the switch engages the target or flag of the valve. The target or flag is the part of the valve that moves when the state of the valve changes. At times, the target or flag is attached to the display that shows "open" or "shut" through a window on the post to indicate the position of the valve.

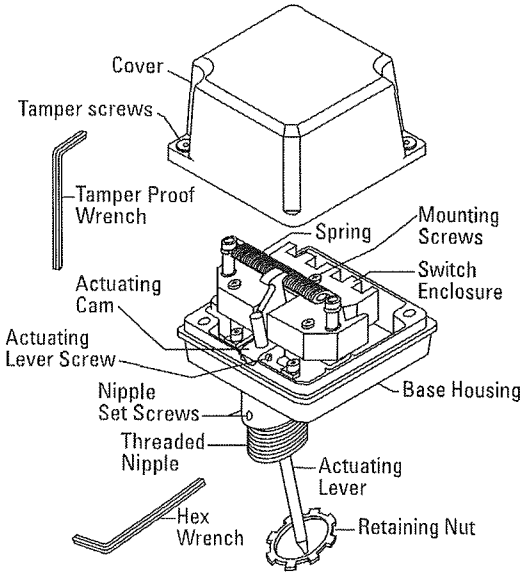


Figure 4: Parts of a post indicator butterfly valve supervisory switch

There are two types of post indicator valves: rising flag and falling flag. In rising flag applications, the PIBV supervisory switch mounts below the target assembly. When the valve is closed, the target assembly raises and releases the actuating lever on the PIBV switch. In falling flag applications, the opposite holds true. When that valve is in the open position, its target should be pushing the trip rod against the spring force of the actuator. When closing a PIBV type valve, the supervisory switch must trip within one-fifth of the full travel distance of the valve.

When a PIBV supervisory switch is installed on a butterfly valve, it is placed in a one half inch NPT hole on the valve. The actuator rod is operated by a cam inside of the valve that rotates as the valve is opened and closed.

A special purpose supervisory switch is available, also, and is suitable for applications where no other type of listed supervisory switch will work. The special purpose switch is the plug-in type that is used on non-rising stem gate, and ball and angle valves. This type of switch has an adjustable-length cord, which allows more freedom during installation, and offers a 360 degree mounting design. The cord can be woven through the handle valve so that the cord plug must be disengaged in order to close the valve, sending a signal to the panel. This type of supervisory switch is wired to the trouble circuit of the fire alarm control panel, and is approved for both indoor and outdoor applications. A lockout feature prevents the plug from being reinserted unless the cover of the switch is removed with a tamper-proof wrench.

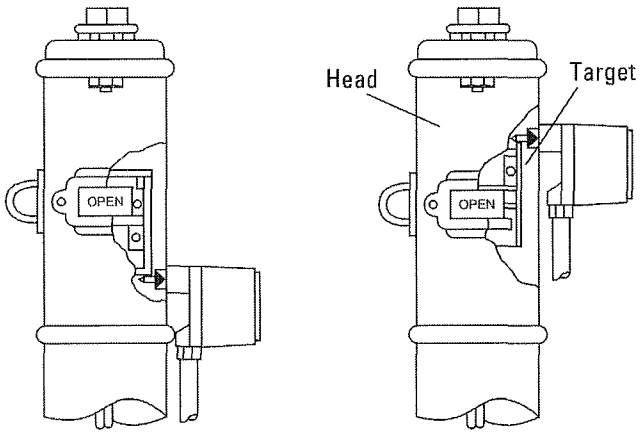


Figure 5: Operation of a post indicator butterfly valve supervisory switch

Maintenance and Service

All supervisory switches should be tested after the completion of installation and before they are placed into service. Thereafter, the switches should be tested at least semi-annually, or as required by the local AHJ.

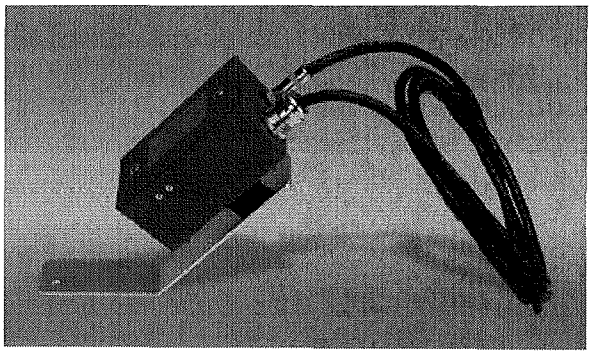


Figure 6: A special purpose supervisory switch

Pressure Switches

Principles of Operation/Product Placement

There are two main types of pressure switches, alarm pressure switches and supervisory pressure switches. Alarm pressure switches are suitable for use in wet, dry, deluge and pre-action automatic fire sprinkler systems to indicate a discharge of water from one or more sprinkler heads or to regulate the pressure in a dry pipe system. They are, however, most commonly installed in dry pipe sprinkler systems. Alarm pressure switches are the only way to detect the flow of water in dry pipe, pre-action and deluge sprinkler systems. Unlike the paddle type switches, these pressure switches are not damaged from the sudden inrush of water.

In a dry pipe sprinkler system, the alarm pressure switch is installed on the alarm line trim of the dry pipe, deluge, and pre-action valves. No delay is required since pressure surges from the water supply are not an issue in these types of systems.

In a wet pipe sprinkler system, an alarm pressure switch is typically installed on top of the retard chamber into a one half inch tapped outlet. A time delay is not needed when using a pressure switch because the retard chamber will divert waterflowing through the alarm line during pressure surges from the city water supply. A drip valve allows water to drain from the chamber.

Alarm pressure switches are pre-set to alarm at 4 to 8 PSI on rising pressure. The pressure setting can be field adjusted to obtain a specific pressure alarm response between 4 and 20 PSI.

Supervisory pressure switches monitor the status of system conditions, primarily the status of air pressure in dry pipe and pre-action systems. In certain conditions, they also monitor water pressure in wet pipe sprinkler systems.

Air pressure in a dry pipe system is supplied by an air compressor or other source, and is usually kept 15 to 20 PSI above the trip point of the dry pipe valve. A low air supervisory pressure switch should be installed to monitor the air pressure on the system side of the dry pipe valve. The low air supervisory pressure switch monitors the low air pressure within the system, and should be set to signal an alarm when the system air pressure drops 10 PSI below normal. The supervisory alarm will help prevent the accidental operation of the dry pipe valve due to low air pressure from air compressor failure or air leaks in the system.

A second type of supervisory pressure switch monitors the system for both the low and the high air pressure levels. Too much air pressure can damage the clapper and rubber gaskets in the dry pipe valve, delaying the operation of the valve due to the time it would take to bleed off the high air pressure within the system.

The low air and high/low air supervisory pressure switches are installed in the small trim piping that is connected to the automatic air compressor or other source.

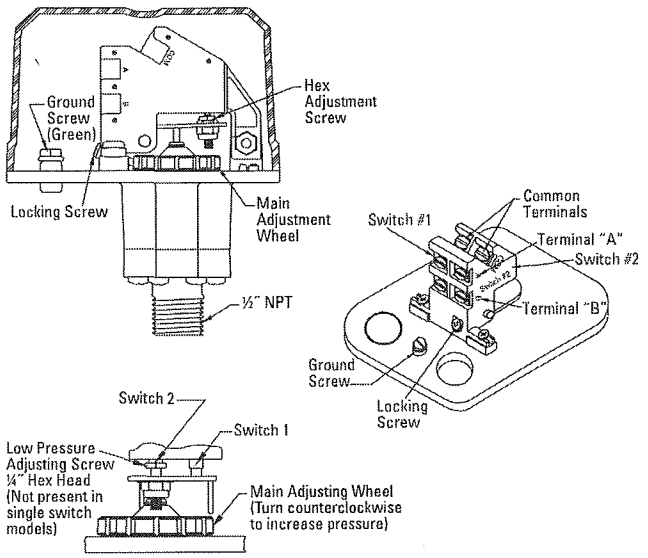


Figure 7: Parts of a pressure switch

Low pressure alarm switches should be installed with a ball valve in the line. A ball valve, which has a small orifice in it, is utilized to exhaust the pressure between the ball valve and the pressure switch. The ball valve allows testing of the pressure switch without any possibility of accidental operation of the dry pipe valve. In addition, it speeds up the testing process since a small amount of air is being released.

Maintenance and Service

After installation is complete, the pressure switch trip points should be tested by slowly introducing pressure from the test source. Test points should be tested several times to ensure accuracy of the setting. Preventative maintenance and periodic testing should be performed as required by the applicable NFPA standards. It is recommended that testing be done at least bi-monthly, or as often as required by the AHJ.

Explosion Proof Detectors

Principles of Operation

The majority of fire sprinkler monitoring devices are available in explosion proof designs. Typically, devices include U-bolt style waterflow detectors; alarm and supervisory pressure switches; and OS&Y and PIBV supervisory switches.

Explosion proof products are typically installed in special applications that house high hazard operations. Examples include pulp and paper mills, distilleries, aircraft hangers, munitions plants, petrochemical factories, petroleum tank farms, and other areas that store flammable liquids and materials.

All explosion proof sprinkler monitoring devices are enclosed in rugged housings to prevent any internal spark (that could be caused by the activation of the switches enclosed in the housings) from becoming a secondary ignition point.

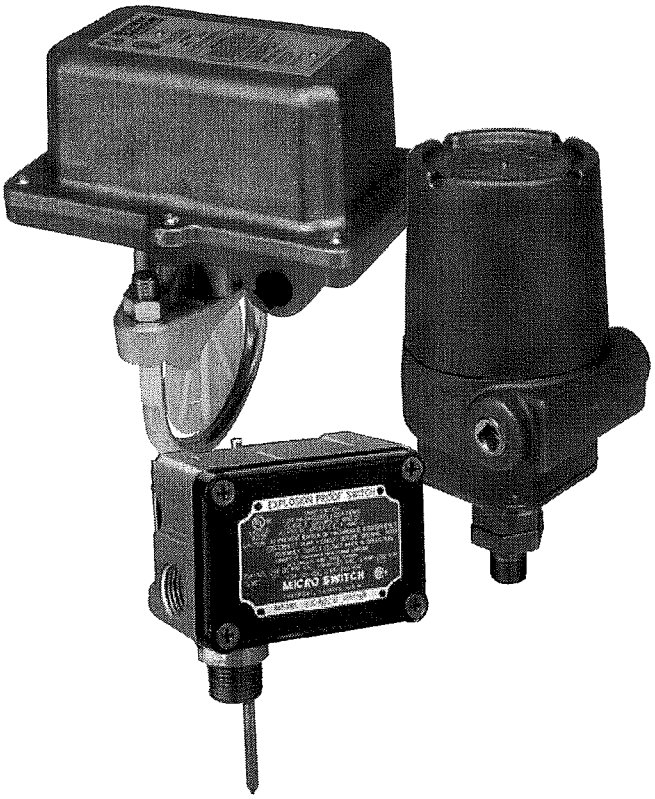


Figure 7: Explosion proof waterflow detector, pressure switch, and supervisory switch

Product Placement/Maintenance and Service
Products are placed in the same manner and location as those installed in non-explosive environments. Testing and maintenance would be performed in the same manner.

Testing may be required more frequently to ensure the system is operating properly, since a fire in an explosive environment could have devastating effects.

Alarm Bells and Horn/Strobes

Principles of Operation
Alarm bells are low current, high decibel notification devices, which emit loud resonant tones during fire, burglary, or other alarm situations. The most common sizes of alarm bells are 6 inch, 8 inch, and 10 inch. Alarm bells that operate on 24 VDC are motor driven, and those that operate on 120 VAC have a vibrating mechanism. Alarm bells are suitable for both indoors and outdoors. Indoor alarm bells mount directly to a four inch square electrical box. Outdoor alarm bells must be used with a weatherproof back box. Typically, alarm bells are pre-wired, reducing installation time. The 24 VDC models incorporate a polarized electrical design for use with supervision circuitry.

Alarm bells are usually suitable for surface or semi-flush mounting, and incorporate under dome strikers and operating mechanisms.

Alarm bells are intended to be connected to alarm indication circuits of fire alarm control panels.

An outdoor horn/strobe can be installed in place of an alarm bell with the added benefit of providing both a visible and an audible notification.

Testing and Maintenance
After installation, all bells should be tested in accordance with NFPA 72. Periodic testing should also be performed at least annually, or as often as required by the AHJ.

Figure 8: Alarm bell and horn/strobe

Appendix 1

Glossary of Terms

alarm check valve
(non-approved back flow preventer) a single, soft-seated check valve (it may or may not be internally loaded) that will sound an alarm when the check valve opens. The alarm check shall have suitable connections for testing the water tightness and operation of the check valve.

automatic fire sprinkler system
an integrated system of underground and overhead piping connected to fire sprinkler heads, usually mounted in the ceiling, that is activated at a relatively low temperature during the initial stage of a fire. The fire sprinkler heads release a spray of water to extinguish the fire or prevent it from spreading. Insurance underwriters typically require automatic fire sprinkler systems in certain types of buildings or occupancies. Usually, fire sprinkler water supply systems must be independent of normal water service to the protected building. Periodic inspection and testing of fire sprinklers is required. The existence of an approved fire sprinkler system normally reduces premiums for the insured property.

alarm valve
a valve in automatic fire sprinkler systems, which automatically sends an alarm (sometimes a water motor gong or signal) directly to a notification device, alarm panel, and or the fire department. An alarm valve operates as a fire sprinkler head(s) fuses, allowing water to flow through the system.

deluge automatic fire sprinkler system
an automatic fire sprinkler system where all the sprinkler heads are open and the water is held back at a main (deluge) valve. When the valve is triggered, water is discharged from all the sprinkler heads simultaneously. The triggering device is usually a heat or smoke detector. This type of system is used where it is necessary to wet down a large area quickly, such as an airplane hangar or explosives factory.

dry pipe automatic fire sprinkler system
an automatic fire sprinkler system where all piping contains pressurized air. When a sprinkler head opens, the air is released causing the valve that is being held shut by the compressed air to open, allowing the water to flow into the system and to any open sprinkler heads. This type of system is used in areas where the sprinkler heads and the immediately adjacent piping can be exposed to freezing conditions.

dry valve
an automatic fire sprinkler valve under air pressure, designed to allow air to escape prior to the release of water. The air prevents freezing and bursting of pipes.

pre-action automatic fire sprinkler system
an automatic fire sprinkler system that is similar to a dry pipe system, but air pressure may or may not be used. The main sprinkler system control valve is opened by an actuating device, which permits water to flow to the individual sprinkler heads, and the system then functions as a wet pipe system. It is generally used in areas where piping systems are subject to mechanical damage, and where it is important to prevent accidental discharge of water.

riser
vertical supply pipes, valves and accessories in a sprinkler system.

wet pipe automatic fire sprinkler system
an automatic fire sprinkler system where all piping is filled with water under pressure and released by a fusible mechanism in the sprinkler head.

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RFP 0058208
GENERAL INFORMATION FORM

QUESTIONS: All inquiries for information regarding this solicitation should be directed to: Daysha Holmes, Contracts Specialist Phone: (540) 231-1269 e-mail: daysha94@vt.edu

DUE DATE: Proposals will be received until **Tuesday, January 22, 2019 at 3:00 PM**. Failure to submit proposals to the correct location by the designated date and hour will result in disqualification.

Virginia Tech will be closed for holiday break from Monday, December 24, 2018 through Tuesday, January 1, 2019 and will reopen on Wednesday, January 2, 2019.

ADDRESS: Proposals should be mailed or hand delivered to: Virginia Polytechnic Institute and State University (Virginia Tech), Procurement Department (MC 0333) North End Center, Suite 2100, 300 Turner Street NW, Blacksburg, Virginia 24061. Reference the due date and hour, and RFP Number in the lower left corner of the return envelope or package.

Please note that USPS is delivered to a central location and is not delivered directly to Procurement. Allow extra time if sending proposal via USPS. It is the vendor's responsibility to ensure proposals are received in the Procurement office at the appropriate date and time for consideration.

PRE-PROPOSAL CONFERENCE: A pre-proposal conference will be held on **January 9, 2019 at 2:00 p.m.** in the Sterrett Classroom located at the Sterrett Facilities Center, 230 Sterrett Drive. See section X, Pre-proposal Conference for additional information.

TYPE OF BUSINESS: (Please check all applicable classifications). If your classification is certified by the Virginia Department of Small Business and Supplier Diversity (SBSD), provide your certification number: _____. For assistance with SWaM certification, visit the SBSD website at http://sbsd.virginia.gov/

_X_ **Large**

____ **Small business** – An independently owned and operated business which, together with affiliates, has 250 or fewer employees or average annual gross receipts of $10 million or less averaged over the previous three years. Commonwealth of Virginia Department of Small Business and Supplier Diversity (SBSD) certified women-owned and minority-owned business shall also be considered small business when they have received SBSD small business certification.

____ **Women-owned business** – A business concern that is at least 51% owned by one or more women who are U. S. citizens or legal resident aliens, or in the case of a corporation, partnership, or limited liability company or other entity, at least 51% of the equity ownership interest is owned by one or more women who are citizens of the United States or non-citizens who are in full compliance with the United States immigration law, and both the management and daily business operations are controlled by one or more women who are U. S. citizens or legal resident aliens.

____ **Minority-owned business** – A business concern that is at least 51% owned by one or more minority individuals (see Section 2.2-1401, Code of Virginia) or in the case of a corporation, partnership, or limited liability company or other entity, at least 51% of the equity ownership interest in the corporation, partnership, or limited liability company or other entity is owned by one or more minority individuals and both the management and daily business operations are controlled by one or more minority individuals.

COMPANY INFORMATION/SIGNATURE: In compliance with this Request For Proposal and to all the conditions imposed therein and hereby incorporated by reference, the undersigned offers and agrees to furnish the goods or services in accordance with the attached signed proposal and as mutually agreed upon by subsequent negotiation.

<table>
<tr><td colspan="2">FULL LEGAL NAME (PRINT)
(Company name as it appears with your Federal Taxpayer Number)
VSC Fire & Security, Inc.</td><td colspan="2">FEDERAL TAXPAYER NUMBER (ID#)
[redacted]</td></tr>
<tr><td colspan="2">BUSINESS NAME/DBA NAME/TA NAME
(If different than the Full Legal Name)</td><td colspan="2">BILLING NAME
(Company name as it appears on your invoice)</td></tr>
<tr><td colspan="2">PURCHASE ORDER ADDRESS
773 Union Street
Salem, VA 24153</td><td colspan="2">PAYMENT ADDRESS
10343-B Kings Acres Rd.
Ashland, VA 23005</td></tr>
<tr><td colspan="3">CONTACT NAME/TITLE (PRINT)
William Walker, General Manager / Assistant Secretary</td><td>E-MAIL ADDRESS
WTWalker@vscfs.com</td></tr>
<tr><td>TELEPHONE NUMBER
540-765-1300</td><td>TOLL FREE TELEPHONE NUMBER</td><td>FAX NUMBER TO RECEIVE E-PROCUREMENT ORDERS
540-765-1301</td><td></td></tr>
</table>

I acknowledge that I have received the following addendums posted for this solicitation.

1 _X_ 2 _____ 3 _____ 4 _____ 5_____ 6_____ (Please check all that apply)

Is any member of the firm an employee of the Commonwealth of Virginia who has a personal interest in this contract pursuant to the Code of Virginia, 2.2 – 3102 - 3112

YES_____ NO___X_____

SIGNATURE William Walker Date: 1/22/2019

ADDENDUM # 1 TO RFP # 0058208

VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY (Virginia Tech)
Procurement Department (MC 0333)
North End Center, Suite 2100
300 Turner Street NW
Blacksburg, Virginia 24061

DATE	Original DUE DATE AND HOUR
Thursday, January 10, 2019	Tuesday, January 22, 2019 3pm

ADDRESS ALL INQUIRIES AND CORRESPONDENCE TO: Daysha Holmes, Contracts Specialist
E-MAIL ADDRESS: daysha94@vt.edu TELEPHONE NUMBER (540) 231-1269
FAX NUMBER (540) 231-9628 AFTER HOUR MESSAGES (540) 231-6221

Sprinkler Systems Services

1. The following questions have arisen as a result of the aforementioned RFP:

Question 1: Are the 12 building outside of VT campus included in the contract?

Virginia Tech Answer: This solicitation is in reference to the Blacksburg campus. The language provided would allow us to incorporate any offsite locations if agreed to by both the vendor and VT. If the vendor has different pricing according to Zones outlined in Attachment B of the RFP, please provide those with your response as not only VT may utilize different areas, but other VASCUPP schools may want to utilize the contract as provided for in the VASCUPP Cooperative language in section VI. of the RFP.

Question 2: When working on the sprinkler system, will there be a shutdown fee to perform the work?

Virginia Tech Answer: No.

Question 3: Section VII statement of needs #12 states, "It is the contractor's responsibility to verify and update the fire protection inventories included in attachments to this solicitation."

a. Where are the inventories attachments?

b. Does this mean there are more systems or devices that are not included?

Virginia Tech Answer:

a. Please see Attachment F of the RFP for Sprinkler Inventory Listing.

b. This is the best list we have at present. Pricing is per system so this should not affect vendor's ability to provide a proposal.

Question 4: Is there a charge to shut down panels?

Virginia Tech Answer: No.

Question 5: What is the effective date of the contract?

Virginia Tech Answer: The contract we have in place now is set to expire March 31 2019. Our hope is to have this new contract in place by April 1, 2019 with services starting July 1st. If the process of selecting a new vendor exceeds the timeframe, we may extend our current contract until we have made a selection.

Question 6: How do you know which type of SWAM business you are?

Virginia Tech Answer: Please refer to http://sbsd.virginia.gov/ for classification of each type of business.

Question 7: Is there a price escalation clause in this solicitation?

Virginia Tech Answer: No. If you wish to increase prices during the time of renewal, you will have to state this in your proposal or during negotiations to be included in any contract document.

Question 8: How many plastic and/or steel systems do you currently have?

Virginia Tech Answer: We are not sure of how many. We can confirm we have a low quantity of plastic.

2. Please see Attachment G, attached to this solicitation by this addendum, for attendance roster of our pre-proposal conference held on Wednesday, January 9, 2019 at 2:00 pm.
3. No further questions will be accepted for this solicitation.
4. All other terms, conditions and descriptions remain the same.
5. The due date and hour remains ***Tuesday, January 22, 2019 at 3:00 PM***.

I acknowledge that I have read and understand this addendum in its entirety.

William Walker — Signature

1/22/2019 — Date

Pages have been redacted for public version of contract

ATTACHMENT A

TERMS AND CONDITIONS

RFP GENERAL TERMS AND CONDITIONS

See:
https://procurement.vt.edu/content/dam/procurement_vt_edu/docs/terms/GTC_RFP_09172018.pdf

ADDITIONAL TERMS AND CONDITIONS

A. **ADDITIONAL GOODS AND SERVICES**: The University may acquire other goods or services that the supplier provides other than those specifically solicited. The University reserves the right, subject to mutual agreement, for the Contractor to provide additional goods and/or services under the same pricing, terms and conditions and to make modifications or enhancements to the existing goods and services. Such additional goods and services may include other products, components, accessories, subsystems, or related services newly introduced during the term of the Agreement.

B. **AUDIT**: The Contractor hereby agrees to retain all books, records, and other documents relative to this contract for five (5) years after final payment, or until audited by the Commonwealth of Virginia, whichever is sooner. Virginia Tech, its authorized agents, and/or the State auditors shall have full access and the right to examine any of said materials during said period.

C. **AVAILABILITY OF FUNDS**: It is understood and agreed between the parties herein that Virginia Tech shall be bound hereunder only to the extent of the funds available or which may hereafter become available for the purpose of this agreement.

D. **CANCELLATION OF CONTRACT**: Virginia Tech reserves the right to cancel and terminate any resulting contract, in part or in whole, without penalty, upon 60 days written notice to the Contractor. In the event the initial contract period is for more than 12 months, the resulting contract may be terminated by either party, without penalty, after the initial 12 months of the contract period upon 60 days written notice to the other party. Any contract cancellation notice shall not relieve the Contractor of the obligation to deliver and/or perform on all outstanding orders issued prior to the effective date of cancellation.

E. **CONTRACT DOCUMENTS**: The contract entered into by the parties shall consist of the Request for Proposal including all modifications thereof, the proposal submitted by the Contractor, the written results of negotiations, the Commonwealth Standard Contract Form, all of which shall be referred to collectively as the Contract Documents.

F. **IDENTIFICATION OF BID/PROPOSAL ENVELOPE**: The signed bid or proposal should be returned in a separate envelope or package and identified as follows:

From: VSC Fire & Security, Inc. | 1/22/19 | 3:00pm
Name of Bidder or Offeror | Due Date | Time Due

773 Union Street | RFP 0058208
Street or Box No. | Solicitation Number
Salem, VA 24153 | Sprinkler Systems Service
City, State, Zip Code | Solicitation Title

Name of Procurement Officer: Daysha Holmes

CENTRA

1920 Atherholt Road
Lynchburg, Virginia 24501

PHONE: 434.200.4709
WEB: www.centrahealth.com

January 22, 2019

To whom it may concern:

I would like to take this opportunity to recommend VSC Fire and Security. Centra Health has been using VSC for a number of years to perform maintenance, installs and testing of our sprinkler systems within our hospitals and many of our business occupancies. It is extremely critical within a hospital that the fire protection equipment is maintained and installed at the highest standards and VSC has been a critical partner in helping us maintain compliance. As such, I feel comfortable recommending them. Please contact me with any additional questions on my office line (434) 200-1877.

Regards,

Kevin Bourne
Director of Plant Engineering, LGH

VIRGINIA TECH

Procurement
300 Turner Street NW
North End Center, Ste 2100
Blacksburg, Virginia 24061
P: (540) 231-6221 F: (540) 231-9628
www.procurement.vt.edu

February 27, 2019

VSC Fire & Security, Inc.
Attn: William Walker
773 Union Street,
Salem, VA 24153

Dear William:

Subject: RFP # 0058208

Thank you for submitting a proposal in response to the subject RFP.

We have reached the point in the evaluation process where we are ready to negotiate as provided for in Section VIII.B of the RFP. We are pleased to inform you VSC Fire & Security, Inc. has been selected for negotiations. Therefore, please review the following information and respond accordingly:

1. Are there any additional forms or documents that you will require to be incorporated into the contract documents? If so, please submit.

2. Do you agree to Virginia Tech's Terms and Conditions?

3. Please confirm that you are proposing for the initial contract period to be for one (1) year, or as negotiated.

4. Upon completion of the initial proposed contract period, does VSC Fire & Security, Inc. agree that the contract may be renewed by Virginia Tech upon written agreement of both parties for nine (9) one-year periods per your proposal, under the terms of the current contact?

5. Please identify the highest-level executive in your organization that is aware of this solicitation. Describe that person's commitment to assuring the highest quality service to Virginia Tech if your organization is awarded a contract.

6. Please describe your quickest turn around time if emergency services are needed. Also include your planned response to emergency call backs.

7. Will you be able to handle increased volumes of business and/or provide service to additional buildings during the course of the contract?

8. How soon after contract award can you begin providing services.

9. Since our purchasing system requires precise and accurate information, please provide the following:

a. Legal name of your company.
b. Trade name (DBA) if different from legal name.
c. Taxpayer identification Number.
d. Company name and address to which Virginia Tech should mail purchase orders.
e. Company name and address to which Virginia Tech should mail payments.
f. IRS W-9 form (Request for Taxpayer Identification Number and Certification).

10. Does VSC Fire & Security, Inc. acknowledge, agree, and understand that the terms and conditions of the RFP # 0058208 shall govern the contract if a contract is awarded to them?

11. If awarded a contract, please confirm that you agree to limit price increases to no more than the increase in the Consumer Price Index, CPI-W, all items category for the latest twelve (12) months for which statistics are available at the time of renewal or 2.5 percent, whichever is less?

12. If awarded a contract, please confirm that you are willing to hold prices firm for the initial contract period and the first renewal year?

13. Are the prices for all goods/services listed in your proposal inclusive of all applicable eVA system transaction fees?

14. While other factors such as the methodology, quality of service and prior experience are considered during the selection process, the evaluation of price is a key element of the evaluation. With this in mind, please provide VSC Fire & Security, Inc. most competitive price structure.

15. Do you acknowledge, agree and understand that Virginia Tech cannot guarantee a minimum amount of business if a contract is awarded to your company?

16. Please provide pricing for other testing required but not addressed in RFP such as:
    a. Forward flow testing of back flow preventors annually
    b. Internal piping condition and obstruction investigations every 5 years
    c. Dry system air tests every 3 years
    d. Fire Department connection piping hydrotesting every 5 years
    e. Electric pump runs monthly.

17. Please clarify references to "facilities staff" in section 6.B., specifically what services is VSC Fire & Security, Inc. providing.

18. Inspection Schedule Overview – please clarify your statement regarding systems which do not receive a quarterly service.

19. Apprentices will not fulfill VT requirements of minimum 5 years experience. Please indicate whether this will impact your pricing plan and if so provide revised pricing.

Please submit your response to negotiation questions numbered 1-19 by 3:00 p.m. on Thursday, March 7, 2019.

In the meantime, if you have specific questions for us, don't hesitate to contact me at 540-231-1269 or daysha94@vt.edu.

.

Sincerely,

Daysha Holmes
Contracts Specialist
Telephone: (540) 231-1269

VIRGINIA TECH

Procurement
300 Turner Street NW
North End Center, Ste 2100
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February 27, 2019

VSC Fire & Security, Inc.
Attn: William Walker
773 Union Street,
Salem, VA 24153

Dear William:

Subject: RFP # 0058208

Thank you for submitting a proposal in response to the subject RFP.

We have reached the point in the evaluation process where we are ready to negotiate as provided for in Section VIII.B of the RFP. We are pleased to inform you VSC Fire & Security, Inc. has been selected for negotiations. Therefore, please review the following information and respond accordingly:

1. Are there any additional forms or documents that you will require to be incorporated into the contract documents? If so, please submit. No

2. Do you agree to Virginia Tech's Terms and Conditions? Yes

3. Please confirm that you are proposing for the initial contract period to be for one (1) year, or as negotiated. Yes

4. Upon completion of the initial proposed contract period, does VSC Fire & Security, Inc. agree that the contract may be renewed by Virginia Tech upon written agreement of both parties for nine (9) one-year periods per your proposal, under the terms of the current contact? Yes

5. Please identify the highest-level executive in your organization that is aware of this solicitation. Describe that person's commitment to assuring the highest quality service to Virginia Tech if your organization is awarded a contract. President of VSC Fire & Security, Mike Meehan, is aware of the RFP that VSC Fire & Security turned into Virginia Tech and has treated this with his utmost attention.

6. Please describe your quickest turn around time if emergency services are needed. Also include your planned response to emergency call backs. Within an hour of the call. Randy Graybill will get the call and Dispatch one of his technicians. They will be onsite within the hour.

7. Will you be able to handle increased volumes of business and/or provide service to additional buildings during the course of the contract? Yes

8. How soon after contract award can you begin providing services. As soon as needed by Virginia Tech

9. Since our purchasing system requires precise and accurate information, please provide the following:
    a. Legal name of your company. VSC Fire & Security, Inc.
    b. Trade name (DBA) if different from legal name. n/a
    c. Taxpayer identification Number. [redacted]
    d. Company name and address to which Virginia Tech should mail purchase orders.
    VSC Fire & Security, Inc.
    773 Union Street
    Salem VA 24153
    e. Company name and address to which Virginia Tech should mail payments.
    VSC Fire & Security, Inc.
    10343-B Kings Acres Rd
    Ashland, VA 23005
    f. IRS W-9 form (Request for Taxpayer Identification Number and Certification).
    See attached

10. Does VSC Fire & Security, Inc. acknowledge, agree, and understand that the terms and conditions of the RFP # 0058208 shall govern the contract if a contract is awarded to them? Yes

11. If awarded a contract, please confirm that you agree to limit price increases to no more than the increase in the Consumer Price Index, CPI-W, all items category for the latest twelve (12) months for which statistics are available at the time of renewal or 2.5 percent, whichever is less? Yes

12. If awarded a contract, please confirm that you are willing to hold prices firm for the initial contract period and the first renewal year? Yes

13. Are the prices for all goods/services listed in your proposal inclusive of all applicable eVA system transaction fees? Yes

14. While other factors such as the methodology, quality of service and prior experience are considered during the selection process, the evaluation of price is a key element of the evaluation. With this in mind, please provide VSC Fire & Security, Inc. most competitive price structure.
    - Weekly Fire Pump runs $40.00 each
    - Monthly Fire Pump Operational test $70.00 each
    - Control Valve Inspections $39.00 each
    - Quarterly Inspection Sprinkler Inspection and test (includes the operational test) $105.00 each
    - Annually Sprinkler Systems and Fire Pumps Annual test (walk thru of entire Building) Fire Pumps $325.00 each
    - Sprinkler Systems $258.00 each
    - Wet Standpipe System Inspection and Flow Test every 5 years $530.00 each
    - Dry Standpipe System Inspection and Test every 5 years $550.00 each

- Alarm and Check Valve 5-Year Inspection (also includes Internal inspection and obstruction investigation) $400.00 each
- Annual Backflow Inspection and Test $105.00 each

15. Do you acknowledge, agree and understand that Virginia Tech cannot guarantee a minimum amount of business if a contract is awarded to your company? Yes

16. Please provide pricing for other testing required but not addressed in RFP such as:
    a. Forward flow testing of back flow preventors annually $85.00 each (as long as system rise has test header for testing)
    b. Internal piping condition and obstruction investigations every 5 years $400.00
    c. Dry system air tests every 3 years $225.00 each
    d. Fire Department connection piping hydrotesting every 5 years $400.00 each
    e. Electric pump runs monthly. $70.00 each

17. Please clarify references to "facilities staff" in section 6.B., specifically what services is VSC Fire & Security, Inc. providing.
    - VSC Fire & Security will do a walk thru of the entire building and test all devices that are in the scope of work annually.
    - The quarterly inspection, we will test and inspect all devices in the scope of work.
    - Monthly inspections we will do operational test on Fire Pumps and Control Valves.
    - Weekly we will run all Fire Pumps.

18. Inspection Schedule Overview – please clarify your statement regarding systems which do not receive a quarterly service. All services that do not need a quarterly inspection will be done when the annal services are done at that location. 3-year Air Test and 5-year Internal Inspection will also be set up during the Annual Test of each location.

19. Apprentices will not fulfill VT requirements of minimum 5 years experience. Please indicate whether this will impact your pricing plan and if so provide revised pricing. No, all of our technicians have more than 5 years experience.

Please submit your response to negotiation questions numbered 1-19 by 3:00 p.m. on Thursday, March 7, 2019.

In the meantime, if you have specific questions for us, don't hesitate to contact me at 540-231-1269 or daysha94@vt.edu.

.
Sincerely,

Daysha Holmes
Contracts Specialist
Telephone: (540) 231-1269