

DEADLINE FOR SUBMISSIONS: 5:00 PM, October 19, 2026

REQUEST FOR PROPOSALS – INVITATION TO BID

Asbestos Abatement Services in Connection with Fire Sprinkler System Installation New Castle Fire District No. 1 – Chappaqua, New York

1. Introduction and Background

The Board of Fire Commissioners of New Castle Fire District No. 1 ("District") is soliciting proposals/bids from qualified, licensed asbestos abatement contractors to perform asbestos abatement services required to facilitate installation of a new fire sprinkler system at the District's firehouse located at 491 King Street, Chappaqua, New York. The work includes the first floor, the second floor, and the unfinished third-floor attic of the original building. The firehouse remains in active operation throughout this project, and all work must be coordinated to preserve uninterrupted fire apparatus response capability.

2. Contract Documents

The following documents are attached and form part of this solicitation:

- Asbestos survey/assessment report, first floor.
- Asbestos survey/assessment report, second floor.
- Asbestos Test Results – Attic (GEO# 6483), prepared by Geo-Environmental Co., Inc., Yorktown Heights, New York (Robert Violante, NYS-DOL certified Asbestos Inspector), dated September 25, 2026, consisting of the consultant's letter, Eastern Analytical Services, Inc. bulk sample laboratory reports (EAS Batch Nos. 2606606, 2606607, and 2606608), the bulk sample chain of custody, and site photographs. Samples were collected September 17, 2026.
- Sprinkler system plans and specifications.
- The attic-level sprinkler routing remains a **delegated design** to be developed later by the sprinkler contractor's engineer of record. Because the final attic layout is not yet known, the attic asbestos assessment describes the asbestos-containing materials (ACM) present in the attic generally and is not tied to specific sprinkler pipe locations. Full sprinkler drawings and specifications are available upon request.

Limitations of the attic assessment. Bidders should note that (i) the attic samples were collected by the District's consultant for informational use; (ii) the laboratory reports do not identify sample locations; (iii) the consultant's report does not state quantities of ACM; and (iv) Samples 2 and 4 were not analyzed under the "positive stop" instruction on the chain of custody because Samples 1 and 3, from the same homogeneous materials, were positive. Each bidder is responsible for verifying locations, quantities, and conditions during the pre-bid site visit (Section 6).

3. Scope of Services

3.1 General Scope

Contractor shall furnish all labor, supervision, materials, equipment, containment, abatement, transportation, disposal, project and clearance air monitoring coordination, documentation, and coordination necessary to abate ACM identified in the attached first-floor, second-floor, and attic assessments, to the extent impacted by the sprinkler installation shown on the attached plans or otherwise as described in this Section 3, including but not limited to:

- Pre-abatement notification, permitting, and NYSDOL project notification (including any required variance) [ICR 56]. Contractor shall determine the applicable ICR 56 project classification based on its verified quantities.
- Critical barrier and containment construction, negative pressure enclosures as required by scope
- Removal, bagging, and proper labeling of ACM
- Decontamination unit setup and operation
- Transportation and disposal of ACM by a NYSDEC-permitted hauler at a permitted disposal facility; Contractor shall provide the District with copies of all waste shipment records/manifests
- Daily sign-in logs, personal air monitoring records, and final project documentation package
- **Unit pricing** for additional ACM as described in Section 3.4

3.2 Summary of Attic (Third Floor) Assessment Results

The following summary is provided for convenience. The attached consultant's letter and laboratory reports govern.

Material / Sample Nos.	Laboratory Result	Condition / Consultant Finding
Corrugated pipe insulation (wrapped with glass wool) Samples 1–2	Asbestos-containing. Sample 1: 18.2% chrysotile (NYS-DOH 198.1, PLM). Sample 2 not analyzed (positive stop).	Runs along the attic perimeter in undamaged, intact condition, except for a minor amount around the access hatch, which is in poor condition; consultant recommends removal of the hatch-area material.
Mudded joints / mudded insulation Samples 3–4	Asbestos-containing. Sample 3: 36.4% chrysotile (NYS-DOH 198.1, PLM). Sample 4 not analyzed (positive stop).	Same as above.
Roofing tar paper (inside roof, adjacent) Samples 7–8	Trace chrysotile. 0.1% and 0.2% (NYS-DOH 198.4, TEM). PLM (198.6) reported <0.1%, inconclusive.	Less than 1%; considered negative by NYS-DOL. Consultant advises OSHA considers it positive for construction purposes.
Batting paper Samples 5–6	No asbestos detected.	Non-ACM.

Material / Sample Nos.	Laboratory Result	Condition / Consultant Finding
Floor insulation – yellow (fibrous glass) Samples 9–10	No asbestos detected.	Non-ACM.

3.3 Attic (Third Floor) Work

All attic abatement authorized by the District shall be completed, and clearance achieved, before the sprinkler contractor begins work in the affected areas of the attic.

(a) Base Bid – Attic Access Hatch Area. Remove and dispose of all damaged/poor-condition ACM pipe insulation and mudded joints in the vicinity of the attic access hatch, together with ACM debris and fallout in that area. Non-ACM insulation and debris that is commingled with or contaminated by this ACM shall be handled and disposed of as ACM. Contractor shall clean all affected surfaces to clearance. Contractor shall verify the extent and quantity of this work during the pre-bid site visit.

(b) Alternate No. 1 – Intact Perimeter ACM Pipe Insulation and Mudded Joints. Remove and dispose of all remaining ACM pipe insulation and mudded joints in the attic, including the intact insulated piping along the attic perimeter, on a lump-sum basis. This work will be awarded only if the District so elects, in whole or in part, once the sprinkler layout is known or if the District otherwise determines that removal is preferable to leaving the material in place. Contractor shall verify quantities during the pre-bid site visit. This is an optional alternate.

(c) Roofing Tar Paper. Removal of the roofing tar paper is not included in the Base Bid or Alternate No. 1. If the attic sprinkler layout or other work will disturb it, the District will direct removal or protection in writing. Contractor's work plan shall describe the work practices, exposure assessment, and worker protection it will apply to any disturbance of this material in accordance with OSHA (29 CFR 1926.1101) and ICR 56, and Contractor shall provide a unit price for removal and disposal (Section 3.4). The District's consultant will advise on waste classification.

(d) Non-ACM Materials. Yellow floor insulation and batting paper were found to be non-asbestos-containing. Where Contractor must move or remove these materials to gain access to ACM, Contractor shall protect, restore, or replace them as directed by the District, and shall dispose of any uncontaminated non-ACM material as ordinary construction waste.

3.4 Unit Pricing

Contractor shall provide unit prices for ACM not included in the Base Bid or Alternate No. 1, including (i) ACM discovered during final delegated-design attic sprinkler routing or during the work that was not identifiable in the existing first-, second-, or third-floor assessments; (ii) additional ACM pipe insulation and mudded joints in the attic beyond the quantities included in the Base Bid or Alternate No. 1; and (iii) roofing tar paper, if the District directs its removal. Unit prices shall be stated in the bid and shall include labor, containment, disposal, and air monitoring coordination for that increment of work.

3.5 Air Clearance / Independent Monitoring

Continuous and final clearance air monitoring shall be performed by an accredited, monitoring firm. If bidder wishes to perform the monitoring, provide a separate cost and appropriate licenses/credentials.

4. Site Access and Operational Coordination

The firehouse will remain in active use during the project. Contractor shall:

- Submit a written phasing/access plan demonstrating how fire apparatus response access and egress will be maintained at all times, or how apparatus will be temporarily relocated, subject to Fire Chief approval
- Address in the phasing/access plan how the attic access hatch and the path of travel to it will be contained, and how occupied areas below the attic will be protected during attic work
- Coordinate all containment and work hours with the Fire Chief or designee; work outside of [normal business hours, e.g., 8 AM–5 PM weekdays] requires prior written approval
- Restore all affected areas to a condition suitable for continued fire district operations upon completion of each phase

5. Special Coordination Requirement – Delegated-Design Attic Sprinkler Layout

Because the attic-level sprinkler routing will be finalized by the sprinkler contractor's engineer after this contract is awarded, the selected Contractor shall coordinate directly with the sprinkler engineer and the District's asbestos consultant to determine which ACM identified in the attic assessment (and any additional ACM) will be impacted by the final attic layout. Contractor shall:

- Respond to attic-related RFIs/coordination requests within 3 business days
- Price any additional identified ACM using the unit prices submitted with its proposal
- Not proceed with additional attic abatement work (including any portion of Alternate No. 1 or roofing tar paper work) until issued written authorization by the District
- Where ACM is left in place after abatement, assist the District in clearly identifying and marking it so that it is not disturbed by the sprinkler contractor

6. Pre-Bid Site Visit

A mandatory pre-bid site visit will be held at the firehouse, 491 King Street, Chappaqua, New York. The visit will include the attic, and bidders should arrange to measure and verify the ACM pipe insulation, mudded joints, and access hatch conditions described in the attic assessment. Prospective bidders should contact RFP@NCFD1.ORG . Questions arising from the site visit should be submitted in writing per Section 17.

7. Contractor Qualifications

Bidder/Proposer must demonstrate:

- Current NYS Asbestos Handling License (contractor, supervisors, and workers as applicable)

- Certified asbestos supervisors and workers currently in good standing
- Minimum five (5) years of experience performing commercial/institutional asbestos abatement
- Three (3) references from similar completed projects (institutional/occupied-building abatement preferred), including contact name, phone, and project value
- Not appear on any federal or NYS debarment or ineligibility list
- OSHA 10/30-hour training documentation for supervisory personnel

8. Regulatory Compliance

Contractor shall comply with all applicable federal, state, and local requirements, including but not limited to:

- NYS Department of Labor Industrial Code Rule 56 (12 NYCRR Part 56)
- OSHA asbestos standards (29 CFR 1926.1101 and related)
- EPA NESHAP (40 CFR Part 61, Subpart M)
- NYS Labor Law, including Article 8 (prevailing wage) and Article 10 (public work)
- NYSDEC waste transport and disposal regulations
- All applicable local building and fire codes

9. Prevailing Wage

This project is subject to New York prevailing wage and supplement rates as determined by the NYS Department of Labor for Westchester County. Contractor shall pay not less than the applicable prevailing wage schedule and shall submit certified payroll records to the District on a before the project.

10. Insurance Requirements

Contractor shall maintain, at minimum, the following coverage, naming New Castle Fire District No. 1 as an additional insured (except Workers' Compensation) with a waiver of subrogation in the District's favor, evidenced by certificates of insurance delivered prior to Notice to Proceed:

Coverage	Minimum Limit
Commercial General Liability	\$1,000,000 per occurrence / \$2,000,000 aggregate
Automobile Liability	\$1,000,000 combined single limit
Contractor's Pollution Liability (including completed operations, minimum [X]-year tail)	\$5,000,000
Umbrella/Excess Liability	\$5,000,000
Workers' Compensation and Disability Benefits	Statutory NYS limits

11. Bonding Requirements

If required by the District, Bidder shall furnish, with its bid, bid security in the form of a bid bond, certified check, or letter of credit in the amount of 5% of the base bid. If required by the District, the successful bidder shall furnish a Performance Bond and a Labor and Material (Payment) Bond, each in the amount of 100% of the contract price, within 10 days of notice of award.

12. Schedule / Contract Duration

Work shall commence within 7 days of Notice to Proceed and be substantially completed within 7 calendar days, subject to the phasing and delegated-design coordination described in Section 5. Attic abatement authorized by the District, including clearance, must be completed before the sprinkler contractor begins work in the affected areas of the attic; Contractor shall coordinate its schedule accordingly.

13. Proposal/Bid Submission Requirements

Submit your proposal via email as an electronic PDF or as written copy:

- Technical approach and work plan (including the attic work plan and the approach to roofing tar paper under Section 3.3(c))
- Firm qualifications, licenses, and certifications (Section 7)
- Project schedule
- Three references
- Base bid, itemized by scope area: (1) first floor; (2) second floor; (3) attic (third floor) – access hatch area (Section 3.3(a))
- Alternate No. 1 – lump-sum price for intact perimeter ACM pipe insulation and mudded joints in the attic (Section 3.3(b))
- Unit prices for additional and unforeseen ACM, including roofing tar paper (Section 3.4)
- Proof of insurance capacity and bonding capacity
- Non-collusive bidding certification (Section 15)
- Additional forms may required by the District after submission

Proposals/bids must be received at RFP@NCFD1.ORG or left in the dropbox at 491 King Street, Chappaqua, NY no later than **5:00 pm, October 19, 2026**. Late submissions may not be accepted.

14. Evaluation and Award

Award will be made to the lowest responsible bidder meeting all qualification and submission requirements of this solicitation, subject to the District's Procurement Policy and applicable law.

15. Statutory Certifications

Bidder shall submit, with its proposal:

- A Non-Collusive Bidding Certification pursuant to General Municipal Law §103-d
- An Iran Divestment Act certification pursuant to State Finance Law §165-a

16. Reservation of Rights

The District reserves the right to reject any or all proposals/bids, to waive informalities or irregularities in any proposal/bid, and to negotiate with the responsive, responsible bidder to the extent permitted by law, in the best interest of the District.

17. Questions and Deadline

All questions regarding this solicitation must be submitted in writing by email to Nancy Zezze, Chair, Board of Fire Commissioners, at **NZEZZE@NCFD1.ORG**, no later than October 14, 2026. Answers will be issued to all known bidders via written addendum.



GEO-ENVIRONMENTAL CO., INC

Air Quality Testing, Inspections, Consulting

www.GeoEnv.us

P.O. Box 491
Yorktown Heights, NY 10598

Laboratory / Office
2043 Saw Mill River Road, Yorktown Heights, N.Y. 10598

914-962-1086

geoenv@verizon.net

September 25, 2026

Chappaqua Fire House
491 King Street
Chappaqua, New York

RE: GEO# 6483 – Asbestos - Attic

Sir or Madam,

Please find attached the lab analysis results for the bulk samples collected from the above stated address in Chappaqua, New York. Single samples were collected for informational use only by NYS-DOL certified Asbestos Inspector Robert Violante on September 17, 2026. The material was analyzed for asbestos at E.A.S., a NYS-DOH ELAP approved laboratory.

Samples were collected in the unfinished attic space of the original building due to renovation activity. Please attach these results to the original pre renovation report completed for this location.

Samples found in the attic space include floor insulation, corrugated pipe insulation wrapped with glass wool, glass batting insulation, and a section of old roofing.

The lab results indicate that corrugated pipe insulation and mudded joints contain asbestos. A minor amount around the hatch is found in poor condition and removal is recommended. The remaining material which runs along the perimeter is found in undamaged, intact condition. The roofing material was found to have a trace of asbestos (< 1%) and is considered negative by NYS-DOL. For construction purposes, OSHA considers it positive.

Please follow all Federal, State and local regulations when disturbing asbestos containing materials.

If there are any questions, let us know.

Thank You,

Robert Violante, CIEC
Project Manager

Eastern Analytical Services, Inc.**Bulk Sample Results**

RE: CPN 6483 - 491 King Street - Attic

Date Collected : 09/17/2026

Collected By : R. Violante

Date Received : 09/20/2026

Date Analyzed : 09/22/2026

Analyzed By : George Htay

Signature : 

Analytical Method : NYS-DOH 198.1

NVLAP Lab Code : 101646-0 (Testing)

NYS Lab No. 10851

Paul Stascavage , Lab DirectorClient: GEO Environmental Co., Inc.
2043 Saw Mill River Road - Floor 2
Yorktown Heights, NY 10598

Sample ID Number	1	3	5	6
Layer Number				
Lab ID Number	3207446	3207448	3207450	3207451
Sample Location	Not Given	Not Given	Not Given	Not Given

Sample Description	Pipe Insulation	Mudded Insulation	Batting Paper	Batting Paper
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Method of Quantification	Point Count	Point Count	Scanning Option	Scanning Option
Appearance				
Layered	No	No	No	No
Homogenous	No	No	Yes	Yes
Fibrous	Yes	Yes	Yes	Yes
Color	Gray	Gray/Brown	Brown	Brown

Sample Treatment	Homogenized	Homogenized	None	None
Asbestos	% Amosite	ND	ND	ND
Content	% Chrysotile	18.2	36.4	ND
	% Other	ND	ND	ND
	% Total Asbestos	18.2	36.4	ND
Other Fibrous	% Fibrous Glass	ND	ND	ND
Materials	% Cellulose	27.3	ND	65.0
Present	% Other	ND	ND	ND
	% Unidentified	ND	ND	ND
Non-Fibrous	% Silicates	ND	ND	5.0
Materials	% Carbonates	ND	ND	ND
Present	% Other	ND	ND	ND
	% Unidentified	54.5	63.6	30.0
				35.0

Results Applicable To Those Items Tested. Report Cannot be Reproduced, Except Entirely, Without Written Approval of the Laboratory. ND = Not Detected. Reporting Limit is <1%.

Liability Limited To Cost Of Analysis. This Report Must Not be Used by the Client to Claim Product Endorsement by NVLAP or Any Agency of the US Government.

These Results Can Not Be Used To Claim That NOB Items Tested Are Non-Asbestos Containing. Samples received in acceptable condition unless otherwise noted.

AIHA LAP, LLC No. 100263 Rhode Island DOH No. AAL-072 Massachusetts DOL No. A A 000072 Connecticut DOH No. PH-0622 Maine DEP No. LA-024 Vermont DOH No. AL-709936

Eastern Analytical Services, Inc.**Bulk Sample Results**

RE: CPN 6483 - 491 King Street - Attic

Date Collected : 09/17/2026

Collected By : R. Violante

Date Received : 09/20/2026

Date Analyzed : 09/22/2026

Analyzed By : George Htay

Signature : 

Analytical Method : NYS-DOH 198.1

NVLAP Lab Code : 101646-0 (Testing)

NYS Lab No. 10851

Paul Stascavage , Lab DirectorClient: GEO Environmental Co., Inc.
2043 Saw Mill River Road - Floor 2
Yorktown Heights, NY 10598

Sample ID Number	9	10
Layer Number		
Lab ID Number	3207452	3207453
Sample Location	Not Given	Not Given

Sample Description	Floor Insulation - Yellow	Floor Insulation - Yellow
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Method of Quantification	Scanning Option	Scanning Option
Appearance Layered	No	No
Homogenous	No	No
Fibrous	Yes	Yes
Color	Yellow/Brown	Yellow/Brown

Sample Treatment	Homogenized	Homogenized
Asbestos % Amosite	ND	ND
Content % Chrysotile	ND	ND
% Other	ND	ND
% Total Asbestos	ND	ND
Other Fibrous % Fibrous Glass	70.0	70.0
Materials % Cellulose	ND	ND
Present % Other	ND	ND
% Unidentified	ND	ND
Non-Fibrous % Silicates	5.0	5.0
Materials % Carbonates	ND	ND
Present % Other	ND	ND
% Unidentified	25.0	25.0

Eastern Analytical Services, Inc.**Bulk Sample Results**

RE: CPN 6483 - 491 King Street - Attic

Date Collected : 09/17/2026

Collected By : R. Violante

Date Received : 09/20/2026

Date Analyzed : 09/24/2026

Analyzed By : George Htay

Signature :

Analytical Method : NYS-DOH 198.6

NVLAP Lab Code : 101646-0 (Testing)

NYS Lab No. 10851

Paul Stascavage , Lab Director

Client GEO Environmental Co., Inc.
 2043 Saw Mill River Road - Floor 2
 Yorktown Heights, NY 10598

Sample ID Number	7	8
Layer Number		
Lab ID Number	3207657	3207658
Sample Location	Inside Roof Adjacent	Inside Roof Adjacent

Sample Description	Tar Paper	Tar Paper
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Analytical Method	NOB Plm	NOB Plm
Appearance		
Layered	No	No
Homogenous	Yes	Yes
Fibrous	Yes	Yes
Color	Black	Black

Asbestos	% Amosite	ND	ND
Content	% Chrysotile	< 0.1	< 0.1
	% Other	ND	ND
	% Total Asbestos	< 0.1 Inconclusive	< 0.1 Inconclusive

Other	% Organic	97.6	97.4
Materials			
Present	% Carbonates	1.2	1.0
	% Other Inorganic	1.2	1.6

Eastern Analytical Services, Inc.**Bulk Sample Results**

RE: CPN 6483 - 491 King Street - Attic

Date Collected : 09/17/2026
Collected By : R. Violante
Date Received : 09/20/2026
Date Analyzed : 09/25/2026
Analyzed By : Fahrudin Lalic

Client GEO Environmental Co., Inc.
2043 Saw Mill River Road - Floor 2
Yorktown Heights, NY 10598

Signature : 
Analytical Method : NYS-DOH 198.4
NVLAP Lab Code : 101646-0 (Testing)
NYS Lab No. 10851
Paul Stascavage , Lab Director

Sample ID Number	7	8
Layer Number		
Lab ID Number	3207657	3207658
Sample Location	Inside Roof Adjacent	Inside Roof Adjacent

Sample Description	Tar Paper	Tar Paper
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Analytical Method	NOB Tem	NOB Tem
Appearance		
Layered	No	No
Homogenous	Yes	Yes
Fibrous	Yes	Yes
Color	Black	Black

Asbestos	% Amosite	ND	ND
Content	% Chrysotile	0.1	0.2
	% Other	ND	ND
	% Total Asbestos	0.1	0.2

Other	% Organic	97.6	97.4
Materials			
Present	% Carbonates	1.2	1.0
	% Other Inorganic	1.1	1.4

GEO ENVIRONMENTAL CO. INC.2043 Saw Mill River Road - Floor 2
Yorktown Heights, New York 10598

www.GeoEnv.us

914-962-1086

BULK SAMPLE DATA AND CHAIN OF CUSTODYProject Name: 491 KING ST - ATTIC Project #: 6483E-mail Results: geoenv@verizon.net Laboratory: EAS
Eric@geoenv.us, Michael@geoenv.usTurnaround Time: 24 Hrs. ☐ 48 Hrs. ☐ 72 Hrs. ☐ 5 Days ☒ Other ☐Sampled By: R Violante Signature: [Signature]Date: 9/17/26 Time: 10- Cert. # 26-6227BAnalysis Requested: ☒ NYS 198.1 PLM Friable ☒ NYS 198.6 PLM / 198.4 TEM Non-FriableOther: ☐ Positive Stop on Multi-Samples: ☒ YES / NO

Sample #	Sample Description	NOB	Multi-Sample ID
1 3207446	Pipe Insul		A
2 3207447	↓		A
3 3207448	Mudded ↓		B
4 3207449	↓		B
5 3207450	BATT Paper		C
6 3207451	↓		C
7	INSIDE Roof Tar Paper ADJ	✓	D
8	↓ ↓	✓	D
9 3207452	Floor Insul - Yellow		
10 3207453	↓ ↓		

Total Samples: 10 Relinquished [Signature] Date/Time 9/17/26Received [Signature] Date/Time

Doc:7, Rev.1, 02/27/24

Page 1 of 1

SEP 20 '26 12:25

Intact perimeter insulated piping



Damaged minor piping insulation around the access hatch.



LICENSES & CERTIFICATIONS

GEO Environmental Co. Inc.

EAS 26
BULK

NEW YORK STATE DEPARTMENT OF HEALTH
WADSWORTH CENTER



Expires 12:01 AM April 01, 2027
Issued April 01, 2026

CERTIFICATE OF APPROVAL FOR LABORATORY SERVICE

Issued in accordance with and pursuant to section 502 Public Health Law of New York State

MR. PAUL STASCAVAGE
EAS INC - EASTERN ANALYTICAL SERVICES INC
6 WESTCHESTER PLAZA
ELMSFORD, NY 105231610

NY Lab Id No: 10851

*is hereby APPROVED as an Environmental Laboratory for the category
ENVIRONMENTAL ANALYSES SOLID AND HAZARDOUS WASTE
All approved subcategories and/or analytes are listed below:*

Miscellaneous

Asbestos in Friable Material	Item 198.1 of Manual
Asbestos in Non-Friable Material-PLM	Item 198.6 of Manual (NOB by PLM)
Asbestos in Non-Friable Material-TEM	Item 198.4 of Manual
Asbestos-Vermiculite-Containing Mate	Item 198.8 of Manual
Lead in Dust Wipes	EPA 7000B
Lead in Paint	EPA 7000B

Sample Preparation Methods

EPA 3050B

Serial No.: 71950

Property of the New York State Department of Health. Certificates are valid only at the address shown and must be conspicuously posted by the laboratory. Continued accreditation depends on the laboratory's successful ongoing participation in the Program. Consumers may verify a laboratory's accreditation status online at <https://apps.health.ny.gov/pubdoh/applinks/wc/elappublicweb/>, by phone (518) 485-5570 or by email to elap@health.ny.gov.

GEO
LAB 26

NEW YORK STATE DEPARTMENT OF HEALTH
WADSWORTH CENTER



Expires 12:01 AM April 01, 2027
Issued April 01, 2026

CERTIFICATE OF APPROVAL FOR LABORATORY SERVICE

Issued in accordance with and pursuant to section 502 Public Health Law of New York State

MR. ROBERT VIOLANTE
GEO ENVIRONMENTAL CO., INC.
2043 SAW MILL RIVER ROAD FLOOR 2
YORKTOWN HEIGHTS, NY 10598

NY Lab Id No: 11124

*is hereby APPROVED as an Environmental Laboratory for the category
ENVIRONMENTAL ANALYSES AIR AND EMISSIONS
All approved subcategories and/or analytes are listed below:*

Miscellaneous

Fibers

NIOSH 7400 A RULES

Serial No.: 72035

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STATE OF NEW YORK - DEPARTMENT OF LABOR
ASBESTOS CERTIFICATE



ROBERT VIOLANTE

CLASS(EXPIRES)

C ATEC (12/26) D INSP (12/26)

I PD (12/26) H PM (12/26)

CERT# 25-6LU75-SHAB
DMV# 504123466

MUST BE CARRIED ON ASBESTOS PROJECTS



ASBESTOS ANALYSIS of BULK SAMPLE by POLARIZED LIGHT MICROSCOPY and TRANSMISSION ELECTRON MICROSCOPY

Client: **Lawal Environmental**
Address: 55 East Mosholu Pkwy North Apt 3G
Bronx NY 10467
P: (646) 528-0914 F:
Contact: **Lawal Ahmed**
M:
E: lawalenvironmental@yahoo.com

Contract: **491 King Street**
Client Job #: **LE26105**
Location: **491 King Street**
Fire House - NCFD 1
Chappagua NY
Sampled By: **L.A.**
Sampled Date: **08/22/2026**
Turnaround Time: **48 hrs**

Metro Lab ID #: **B26080674**

Sample Received: **08/24/2026**
PLM Analysis Date: **08/24/2026 , 08/25/2026**
TEM Analysis Date: **08/26/2026**
Reported By: **Mariam Awad**
Report Date: **08/26/2026**

Summary of Analysis

LAB ID #	Client Sample #	Sample Description	Test	Fibrous Material	Non-Fibrous Material	Asbestos	Total Asbestos
1	1	Grey Homogenous Fibrous ATTIC - CORRUGATED PAPER - GRAY	NY ELAP 198.1 NY ELAP 198.6 NY ELAP 198.4	60.0% Cellulose	25.71% Non-Fibrous	14.29% Chrysotile	14.29%
2	2	ATTIC - CORRUGATED PAPER - GRAY	NY ELAP 198.1 NY ELAP 198.6 NY ELAP 198.4			Positive Stop Not Analyzed	
3	3	ATTIC - CORRUGATED PAPER - GRAY	NY ELAP 198.1 NY ELAP 198.6 NY ELAP 198.4			Positive Stop Not Analyzed	
4	4	Beige Homogenous Fibrous ATTIC - ELBOWS - PIPE INSULATION - BEIGE	NY ELAP 198.1 NY ELAP 198.6 NY ELAP 198.4	30.0% Cellulose	58.24% Non-Fibrous	11.76% Chrysotile	11.76%
5	5	ATTIC - ELBOWS - PIPE INSULATION - BEIGE	NY ELAP 198.1 NY ELAP 198.6 NY ELAP 198.4			Positive Stop Not Analyzed	
6	6	ATTIC - ELBOWS - PIPE INSULATION - BEIGE	NY ELAP 198.1 NY ELAP 198.6 NY ELAP 198.4			Positive Stop Not Analyzed	
7	7	Grey Homogenous Granular CONFERENCE ROOM - CEILING - PLASTER - BEIGE	NY ELAP 198.1 NY ELAP 198.6 NY ELAP 198.4	3.0% Cellulose	97.0% Non-Fibrous	None Detected	
8	8	Grey Homogenous Granular CONFERENCE ROOM - CEILING - PLASTER - BEIGE	NY ELAP 198.1 NY ELAP 198.6 NY ELAP 198.4	5.0% Cellulose	95.0% Non-Fibrous	None Detected	
9	9	Grey Homogenous Granular CONFERENCE ROOM - CEILING - PLASTER - BEIGE	NY ELAP 198.1 NY ELAP 198.6 NY ELAP 198.4	4.0% Cellulose	96.0% Non-Fibrous	None Detected	
10	10	Brown / Grey Inhomogenous Fibrous KITCHEN - CEILING - SHEETROCK - BEIGE	NY ELAP 198.1 NY ELAP 198.6 NY ELAP 198.4	60.0% Cellulose 5.0% Fiberglass	35.0% Non-Fibrous	None Detected	
Comments					Equipment	PLM SCOPE Nikon Optiphot-2 TEM SCOPE #1 - Hitachi H-600	

Zlatan Dimitrijevic
Laboratory Director

Jose Gutierrez / Jose Perez
PLM Analyst

Michael Issa
TEM Analyst

NYS ELAP ID # 12003

NVLAP Lab Code 500081-0

ASBESTOS ANALYSIS of BULK SAMPLE by POLARIZED LIGHT MICROSCOPY and TRANSMISSION ELECTRON MICROSCOPY

Client: **Lawal Environmental**
Address: 55 East Mosholu Pkwy North Apt 3G
Bronx NY 10467
P: (646) 528-0914 F:
Contact: **Lawal Ahmed**
M:
E: lawalenvironmental@yahoo.com

Contract: **491 King Street**
Client Job #: **LE26105**
Location: **491 King Street**
Fire House - NCFD 1
Chappagua NY
Sampled By: **L.A.**
Sampled Date: **08/22/2026**
Turnaround Time: **48 hrs**

Metro Lab ID #: **B26080674**

Sample Received: 08/24/2026
PLM Analysis Date: 08/24/2026 , 08/25/2026
TEM Analysis Date: 08/26/2026
Reported By: Mariam Awad
Report Date: 08/26/2026

Summary of Analysis

LAB ID #	Client Sample #	Sample Description	Test	Fibrous Material	Non-Fibrous Material	Asbestos	Total Asbestos
11	11	Brown / Grey Inhomogenous Fibrous KITCHEN - CEILING - SHEETROCK - BEIGE	NY ELAP 198.1 NY ELAP 198.6 NY ELAP 198.4	30.0% Cellulose 5.0% Fiberglass	65.0% Non-Fibrous	None Detected	
12	12	Brown / Grey Inhomogenous Fibrous KITCHEN - CEILING - SHEETROCK - BEIGE	NY ELAP 198.1 NY ELAP 198.6 NY ELAP 198.4	40.0% Cellulose 5.0% Fiberglass	55.0% Non-Fibrous	None Detected	
13	13	White Homogenous Granular KITCHEN PANTRY - CEILING - PLASTER - GRAY	NY ELAP 198.1 NY ELAP 198.6 NY ELAP 198.4	1.0% Cellulose	99.0% Non-Fibrous	None Detected	
14	14	White Homogenous Granular KITCHEN PANTRY - CEILING - PLASTER - GRAY	NY ELAP 198.1 NY ELAP 198.6 NY ELAP 198.4	3.0% Cellulose	97.0% Non-Fibrous	None Detected	
15	15	White Homogenous Granular KITCHEN PANTRY - CEILING - PLASTER - GRAY	NY ELAP 198.1 NY ELAP 198.6 NY ELAP 198.4	2.0% Cellulose	98.0% Non-Fibrous	None Detected	
16	16	Various Homogenous NOB HALLWAY FROM KITCHEN TO LOUNGE ROOM - DROP CEILING - GRAY	NY ELAP 198.1 NY ELAP 198.6 NY ELAP 198.4			Inconclusive None Detected None Detected	
17	17	Various Homogenous NOB HALLWAY FROM KITCHEN TO LOUNGE ROOM - DROP CEILING - GRAY	NY ELAP 198.1 NY ELAP 198.6 NY ELAP 198.4			Inconclusive None Detected None Detected	
18	18	Various Homogenous NOB HALLWAY FROM KITCHEN TO LOUNGE ROOM - DROP CEILING - GRAY	NY ELAP 198.1 NY ELAP 198.6 NY ELAP 198.4			Inconclusive None Detected None Detected	
19	19	Beige / Off-Wh Homogenous NOB HALLWAY TO ALL ROOMS UPSTAIRS - DROP CEILING - GRAY	NY ELAP 198.1 NY ELAP 198.6 NY ELAP 198.4			Inconclusive None Detected None Detected	
20	20	Beige / Off-Wh Homogenous NOB CHIEFS OFFICE ENTRANCE - DROP CEILING - GRAY	NY ELAP 198.1 NY ELAP 198.6 NY ELAP 198.4			Inconclusive None Detected None Detected	
Comments					Equipment	PLM SCOPE Nikon Optiphot-2 TEM SCOPE #1 - Hitachi H-600	

Zlatan Dimitrijevic
Laboratory Director

Jose Gutierrez / Jose Perez
PLM Analyst

Michael Issa
TEM Analyst

NYS ELAP ID # 12003

NVLAP Lab Code 500081-0

ASBESTOS ANALYSIS of BULK SAMPLE by POLARIZED LIGHT MICROSCOPY and TRANSMISSION ELECTRON MICROSCOPY

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Address: 55 East Mosholu Pkwy North Apt 3G
Bronx NY 10467
P: (646) 528-0914 F:
Contact: **Lawal Ahmed**
M:
E: lawalenvironmental@yahoo.com

Contract: **491 King Street**
Client Job #: **LE26105**
Location: **491 King Street**
Fire House - NCFD 1
Chappagua NY
Sampled By: **L.A.**
Sampled Date: **08/22/2026**
Turnaround Time: **48 hrs**

Metro Lab ID #: **B26080674**

Sample Received: 08/24/2026
PLM Analysis Date: 08/24/2026 , 08/25/2026
TEM Analysis Date: 08/26/2026
Reported By: Mariam Awad
Report Date: 08/26/2026

Summary of Analysis

LAB ID #	Client Sample #	Sample Description	Test	Fibrous Material	Non-Fibrous Material	Asbestos	Total Asbestos
21	21	Brown / Tan Homogenous NOB LOUNGE ROOM - ABOVE CEILING - GLUE - BROWN	NY ELAP 198.1 NY ELAP 198.6 NY ELAP 198.4			Inconclusive None Detected None Detected	
22	22	Brown / Tan Homogenous NOB LOUNGE ROOM - ABOVE CEILING - GLUE - BROWN	NY ELAP 198.1 NY ELAP 198.6 NY ELAP 198.4			Inconclusive None Detected None Detected	
23	23	Brown / Tan Homogenous NOB HALLWAY ABOVE CEILING - GLUE - BROWN	NY ELAP 198.1 NY ELAP 198.6 NY ELAP 198.4			Inconclusive None Detected None Detected	
24	24	Grey Homogenous Granular SERVER ROOM - CEILING - PLASTER - GRAY	NY ELAP 198.1 NY ELAP 198.6 NY ELAP 198.4	1.0% Cellulose	99.0% Non-Fibrous	None Detected	
25	25	Grey Homogenous Granular SERVER ROOM - CEILING - PLASTER - GRAY	NY ELAP 198.1 NY ELAP 198.6 NY ELAP 198.4	4.0% Cellulose	96.0% Non-Fibrous	None Detected	
26	26	Grey Homogenous Granular SERVER ROOM - CEILING - PLASTER - GRAY	NY ELAP 198.1 NY ELAP 198.6 NY ELAP 198.4	2.0% Cellulose	98.0% Non-Fibrous	None Detected	
27	27	Grey Homogenous Granular MENS ROOM - CEILING - PLASTER - GRAY	NY ELAP 198.1 NY ELAP 198.6 NY ELAP 198.4	3.0% Cellulose	97.0% Non-Fibrous	None Detected	
28	28	Grey Homogenous Granular MENS ROOM - CEILING - PLASTER - GRAY	NY ELAP 198.1 NY ELAP 198.6 NY ELAP 198.4	3.0% Cellulose	97.0% Non-Fibrous	None Detected	
29	29	Grey Homogenous Granular WOMENS ROOM - CEILING - PLASTER - GRAY	NY ELAP 198.1 NY ELAP 198.6 NY ELAP 198.4	2.0% Cellulose	98.0% Non-Fibrous	None Detected	
30	30	White Homogenous Granular HALLWAY INFRONT OF CHIEF'S OFFICE - CEILING - PLASTER - GRAY	NY ELAP 198.1 NY ELAP 198.6 NY ELAP 198.4	4.0% Cellulose	96.0% Non-Fibrous	None Detected	
Comments					Equipment	PLM SCOPE Nikon Optiphot-2 TEM SCOPE #1 - Hitachi H-600	

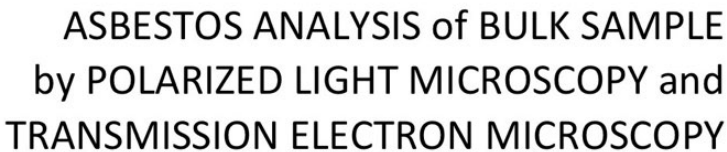

Zlatan Dimitrijevic
Laboratory Director


Jose Gutierrez / Jose Perez
PLM Analyst


Michael Issa
TEM Analyst

NYS ELAP ID # 12003

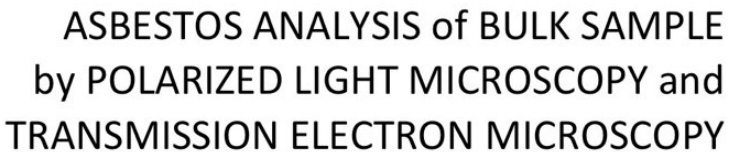
NVLAP Lab Code 500081-0



Metro Lab ID #:	B26080674
Sample Received:	08/24/2026
PLM Analysis Date:	08/24/2026 , 08/25/2026
TEM Analysis Date:	08/26/2026
Reported By:	Mariam Awad
Report Date:	08/26/2026

LAB ID #	Client Sample #	Sample Description	Test	Fibrous Material	Non-Fibrous Material	Asbestos	Total Asbestos
31	31	White Homogenous Granular HALLWAY TO BACK PARKING LOT - CEILING - PLASTER - GRAY	NY ELAP 198.1	1.0% Cellulose	99.0% Non-Fibrous	None Detected	
			NY ELAP 198.6				
			NY ELAP 198.4				
32	32	White Homogenous Granular HALLWAY LEADING STAIRWELL GOING DOWN - CEILING - PLASTER - GRAY	NY ELAP 198.1	2.0% Cellulose	98.0% Non-Fibrous	None Detected	
			NY ELAP 198.6				
			NY ELAP 198.4				
33	33	Grey Homogenous Granular GARAGE - CORNER - PLASTER - GRAY	NY ELAP 198.1		100.0% Non-Fibrous	None Detected	
			NY ELAP 198.6				
			NY ELAP 198.4				
34	34	Grey Homogenous Granular GARAGE - CORNER - PLASTER - GRAY	NY ELAP 198.1		100.0% Non-Fibrous	None Detected	
			NY ELAP 198.6				
			NY ELAP 198.4				
35	35	Grey Homogenous Granular STORAGE - UNIFORMS - PLASTER - GRAY	NY ELAP 198.1		100.0% Non-Fibrous	None Detected	
			NY ELAP 198.6				
			NY ELAP 198.4				
36	36	Grey Homogenous Granular LAUNDRY ROOM - PLASTER - GRAY	NY ELAP 198.1	2.0% Cellulose	98.0% Non-Fibrous	None Detected	
			NY ELAP 198.6				
			NY ELAP 198.4				
37	37	Grey Homogenous Granular OFFICE INSIDE GARAGE - PLASTER - GRAY	NY ELAP 198.1	1.0% Cellulose	99.0% Non-Fibrous	None Detected	
			NY ELAP 198.6				
			NY ELAP 198.4				
Comments					Equipment	PLM SCOPE Nikon Optiphot-2 TEM SCOPE #1 - Hitachi H-600	

4 / 5



Metro Lab ID #:	B26080755
Sample Received:	08/26/2026
PLM Analysis Date:	08/26/2026
TEM Analysis Date:	08/27/2026
Reported By:	Mariam Awad
Report Date:	08/27/2026

Summary of Analysis								
LAB ID #	Client Sample #	Sample Description	Test	Fibrous Material	Non-Fibrous Material	Asbestos	Total Asbestos	
1	38	Beige Homogenous NOB	NY ELAP 198.1					
		HALLWAY LEADING TO THE LOUNGE ROOM -	NY ELAP 198.6		Inconclusive	None Detected		
		DROP-CEILING - GREY	NY ELAP 198.4			None Detected		
2	39	Beige Homogenous NOB	NY ELAP 198.1					
		HALLWAY LEADING TO THE LOUNGE ROOM -	NY ELAP 198.6		Inconclusive	None Detected		
		DROP-CEILING - GREY	NY ELAP 198.4			None Detected		
Comments					Equipment	PLM SCOPE Nikon Optiphot-2 TEM SCOPE #1 - Hitachi H-600		

M.S.L.

NVLAP Lab Code 500081-0

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- All samples will be properly disposed of after 60 days.
- Quality Control data (including 95% confidence limits, laboratory / analysis accuracy and precision) is available upon request.

Notes Regarding Asbestos Testing

- Air Sample Analysis by Phase Contrast Microscopy (PCM) adheres to Method NIOSH-7400. Results < 7 fibers / mm² are statistically insignificant.
- Percentages are calculated using the EPA equivalent Stratified Point-Count Method.
- Bulk Sample Analysis by Polarized Light Microscopy (PLM) Friable adheres to EPA/600/M4-082-20 or NYS ELAP 198.1.
- Bulk Sample Analysis by Polarized Light Microscopy (PLM) NOB adheres to NYS ELAP 198.6. This method does not remove vermiculite and may underestimate the level of asbestos present in a sample containing greater than 10% vermiculite.
- All inhomogeneous layers of the bulk samples were analyzed separately.
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- Polarized Light Microscopy is not consistently reliable in detecting asbestos in floor coverings and similar non-friable organically bound materials. Quantitative TEM is currently the only method that can be used to determine if this material can be considered or treated as non-asbestos containing.
- Bulk Sample Analysis by Transmission Electron Microscopy (TEM) NOB adheres to NYS ELAP Method 198.4.
- Air Sample Analysis by Transmission Electron Microscopy (TEM) adheres to Method EPA CFR Part 763 Final Rule (AHERA).
- Air Sample Analysis by Transmission Electron Microscopy (TEM) Worksheets are available upon request.

B260805/14

BULK SAMPLE-CHAIN OF CUSTODY FORM



55E Mosholu Pkwy North Suite 3G Bronx, NY 10467: 646-528-0913: lawalenvironmental@yahoo.com

Date Sampled: 8/22/26	Building Address: 491 King St, Chappaqua NY	Matrix	Analysis	Turnaround
Project # LE26105	Location: Fire House - NYCFD 1	Bulk	Paint	24 48
Page # 1-4	Investigator: Lawal Prince Ahmed	Tape	Wipe	72 5 Days

Sample #	Group	Sample Location	Material	Color	Condition
1	1	Attic	Corrugated Paper	Gray	Damage
2	1				
3	1				
4	2	→ Elbows	Pipe Insulations	Beige	
5	2				
6	2				
7	3	Conference Room - Ceiling	Plaster	Beige	Intact
8	3				
9	3				
10	4	Kitchen - Ceiling	Sheetrock	Beige	
11	4				
12	4				

*****STOP AT FIRST HOMOGENOUS POSITIVE*****

Relinquished By: Lawal Ahmed	Date: 8/22/26	Analyzed By:	Date:	Time:
Signature: [Signature]	Date: 8/24/26	Signature:	Date:	Time:

10136A

B26080674

BULK SAMPLE-CHAIN OF CUSTODY FORM



55E Mosholu Pkwy North Suite 3G Bronx, NY 10467: 646-528-0913: lawalenvironmental@yahoo.com

Date Sampled: 8/22/26	Building Address: 491 King Street, Chappague, NY	Matrix	Analysis	Turnaround
Project # LE26105	Location: Fire House - NCFD 1	Bulk Paint	24	48
Page # 2-4	Investigator: Lawal Prince Ahmed	Tape Wipe	72	5 Days

Sample #	Group	Sample Location	Material	Color	Condition
13	5	Kitchen Pantry - Ceiling	Plaster	Gray	
14	5				
15	5				
16	6	Hallway from Kitchen to Lounge Room	Drop Ceiling		
17	6				
18	6				
19	6	Hallway to all rooms upstairs			
20	6	Chiefs office entrance			
21	7	Lounge room - Above Ceiling	Glue	Brown	
22	7				
23	7	Hallway above ceiling			

*****STOP AT FIRST HOMOGENOUS POSITIVE*****

Relinquished By: Lawal Ahmed	Date: 8/22/26	Analyzed By:	Date:	Time:
Signature: [Signature]	Date: 08/24/26	Signature:	Date:	Time:

1636A

B26080674

BULK SAMPLE-CHAIN OF CUSTODY FORM



55E Mosholu Pkwy North Suite 3G Bronx, NY 10467: 646-528-0913: lawalenvironmental@yahoo.com

Date Sampled: 8/22/26	Building Address: 491 King Street, Chappagug NY	Matrix: Bulk	Analysis: 24	Turnaround: 48
Project #: LE26105	Location: Fire House - NCED 1	Paint: Tape	Wipe: 72	5 Days
Page #: 3-4	Investigator: Lawal Prince Ahmed			

Sample #	Group	Sample Location	Material	Color	Condition
24	8	Server Room - Ceiling	Plaster	Gray	Intact
25	8	Mensroom - Ceiling			
26	8				
27	8				
28	8				
29	9	Womens room - Ceiling			
30	10	Hallway in front of Chief's office - Ceiling			
31	10	Hallway to back parking lot - Ceiling			
32	10	Hallway leading Stairwell going down - Ceiling			
33	11	Garage - Corner			
34	11	Storage - uniforms			
35	11				

*****STOP AT FIRST HOMOGENOUS POSITIVE*****

Relinquished By: Lawal Ahmed	Date: 8/22/26	Analyzed By:	Date:	Time:
Signature: [Signature]	Date: 8-24-26	Signature:	Date:	Time:

10:56A

B26080674

BULK SAMPLE-CHAIN OF CUSTODY FORM



55E Mosholu Pkwy North Suite 3G Bronx, NY 10467: 646-528-0913: lawalenvironmental@yahoo.com

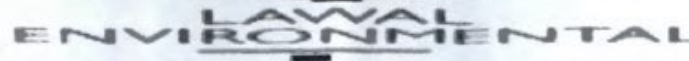
Date Sampled: 8/22/26	Building Address: 491 King Street, Chappaqua NY	Matrix	Analysis	Turnaround	
Project # LE26105	Location: Fire House - NCFD 1	Bulk Paint		24 48	
Page # 4-4	Investigator: Lawal Prince Ahmed	Tape Wipe		72 5 Days	
Sample #	Group	Sample Location	Material	Color	Condition
36	11	Laundry Room	Plaster	Gray	Intact
37	11	Office Inside Garage	↓	↓	↓

*****STOP AT FIRST HOMOGENOUS POSITIVE*****

Relinquished By: Lawal Ahmed	Date: 8/22/26	Analyzed By:	Date:	Time:
Signature: 14. H	Date: 08-27-26	Signature:	Date:	Time:

10:36A

B26080755



1 HR TAT

*****STOP AT FIRST HOMOGENOUS POSITIVE*****

ADU 8/26/26 5:40p

General Notes and Disclaimers

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- Air Sample Analysis by Transmission Electron Microscopy (TEM) adheres to Method EPA CFR Part 763 Final Rule (AHERA).
- Air Sample Analysis by Transmission Electron Microscopy (TEM) Worksheets are available upon request.



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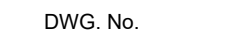
PROJECT TEAM

ARCHITECT
WENDEL | MITCHELL ASSOCIATES ARCHITECTS
29 THACHER PARK ROAD
VOORHEESVILLE, NY 12186
518.765.4571

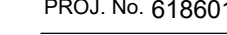
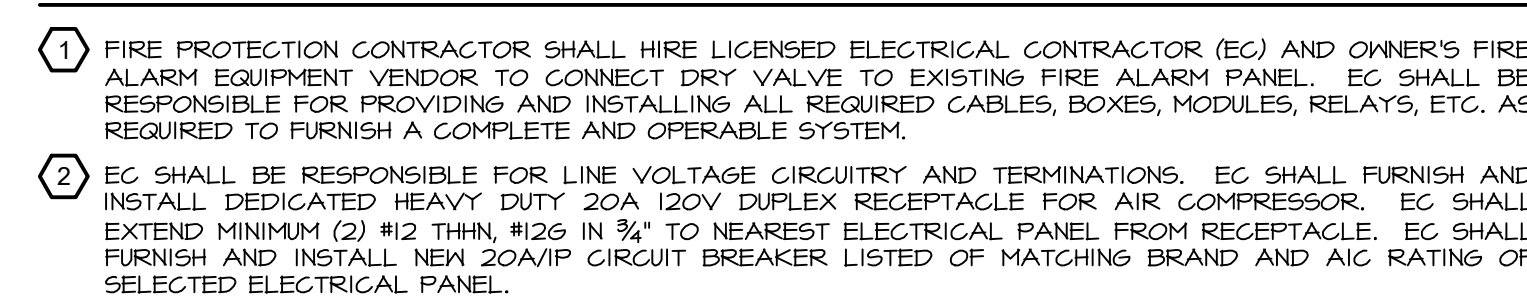
G GERARD ASSOCIATES
CONSULTING ENGINEERS, D.P.
223 MAIN STREET, GOSHEN NY 10924
TEL: (845) 291 1272
info@GerardAssociates.com www.GerardAssociates.com
GA23048-SPK

NO.	REVISIONS	DATE

SPRINKLER SYSTEM: EXISTING BUILDING BASEMENT & FIRST FLOOR PLANS



SPK100





FOR REVIEW ONLY



PROJECT TEAM

ARCHITECT
WENDEL | MITCHELL ASSOCIATES ARCHITECTS
29 THACHER PARK ROAD
VOORHEESVILLE, NY 12186
518.765.4571

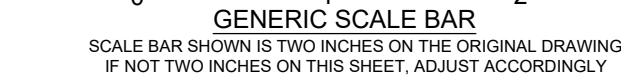
G GERARD ASSOCIATES
CONSULTING ENGINEERS, D.P.C.
223 MAIN STREET, GOSHEN NY 10924
TEL: (845) 291 1272
info@GerardAssociates.com www.GerardAssociates.com
GA23048-SPK

NO.	REVISIONS	DATE

DWG. TITLE

SPRINKLER SYSTEM:

SPRINKLER SYSTEM: EXISTING BUILDING SECOND FLOOR PLAN



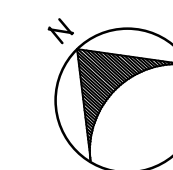
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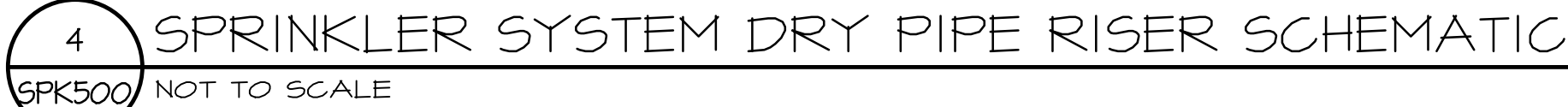
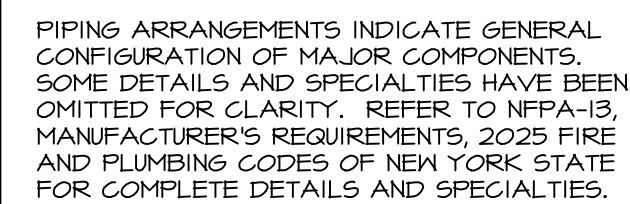
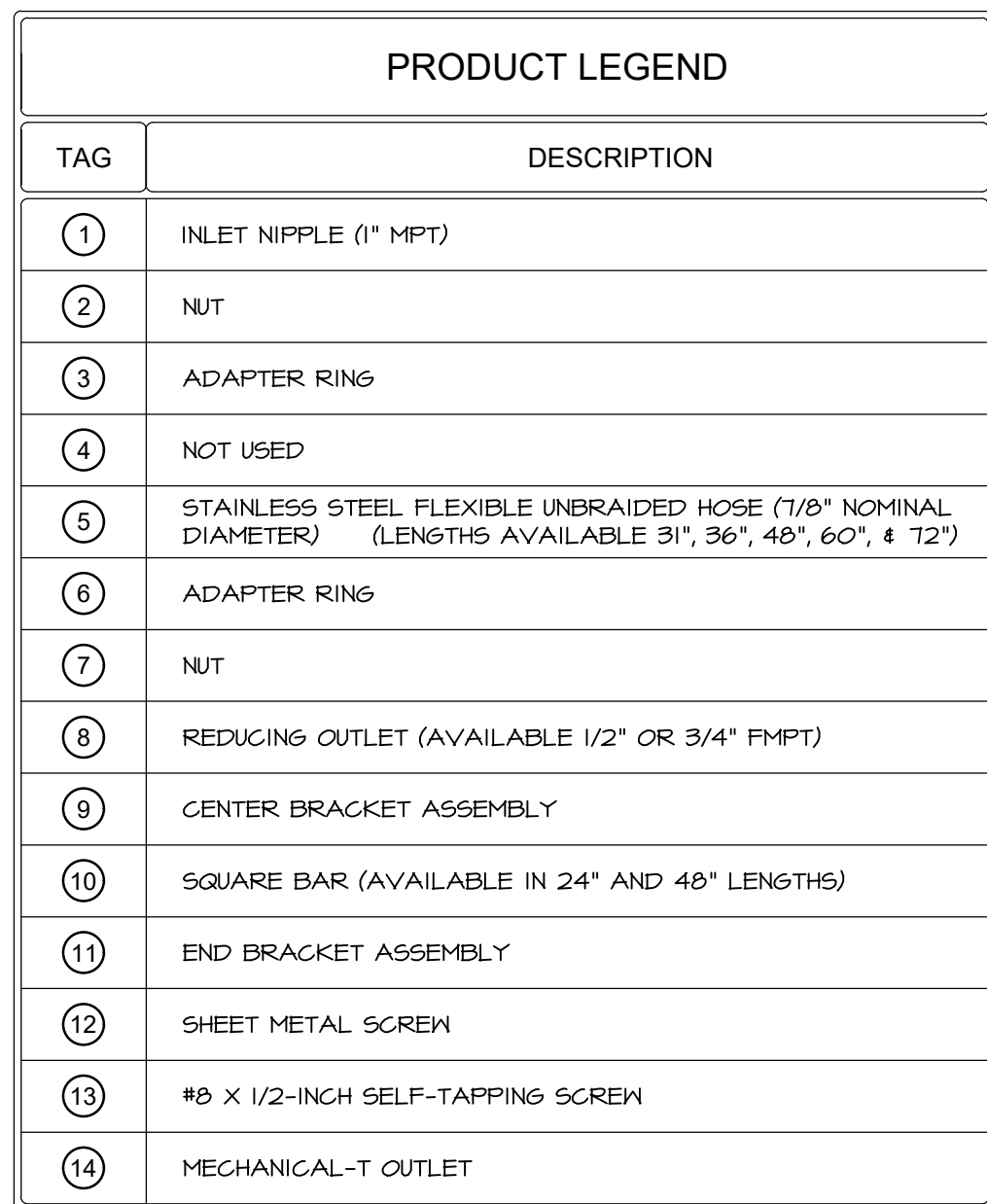
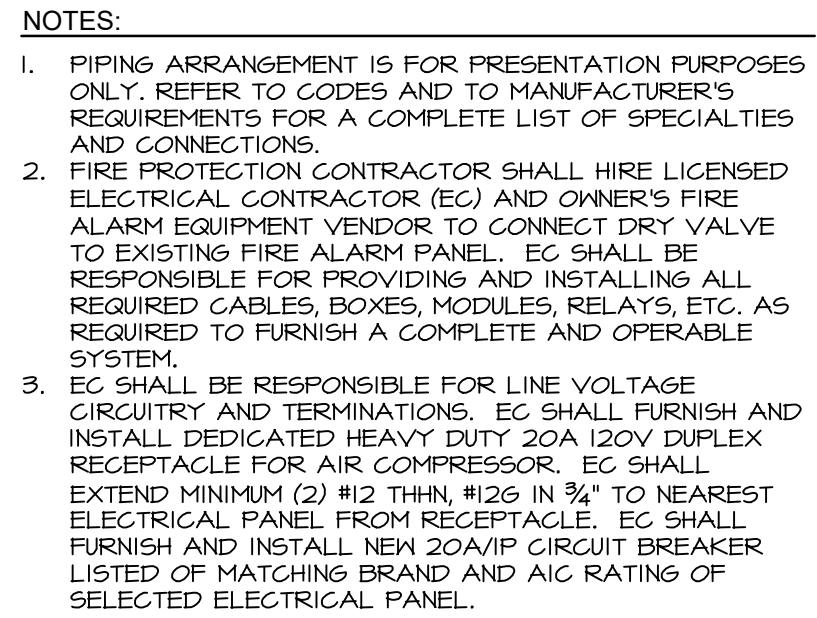
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QRI101

SPK101

SPK101





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[illegible]

NO.	REVISIONS	DATE
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DWG. TITLE

SPRINKLER SYSTEM

SPRINKLER SYSTEM

DETAILS

0 1" 2"

GENERIC SCALE BAR

SCALE BAR SHOWN IS TWO INCHES ON THE ORIGINAL DRAWING

IF NOT TWO INCHES ON THIS SHEET, ADJUST ACCORDINGLY

DATE 05-18-2026

SCALE AS SHOWN

DOWN IT/BLACK CLK IT

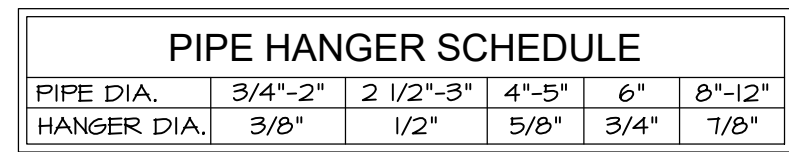
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PROJ. No. 618601

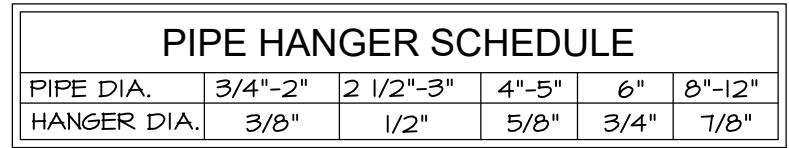
DWG. No.

Abstract

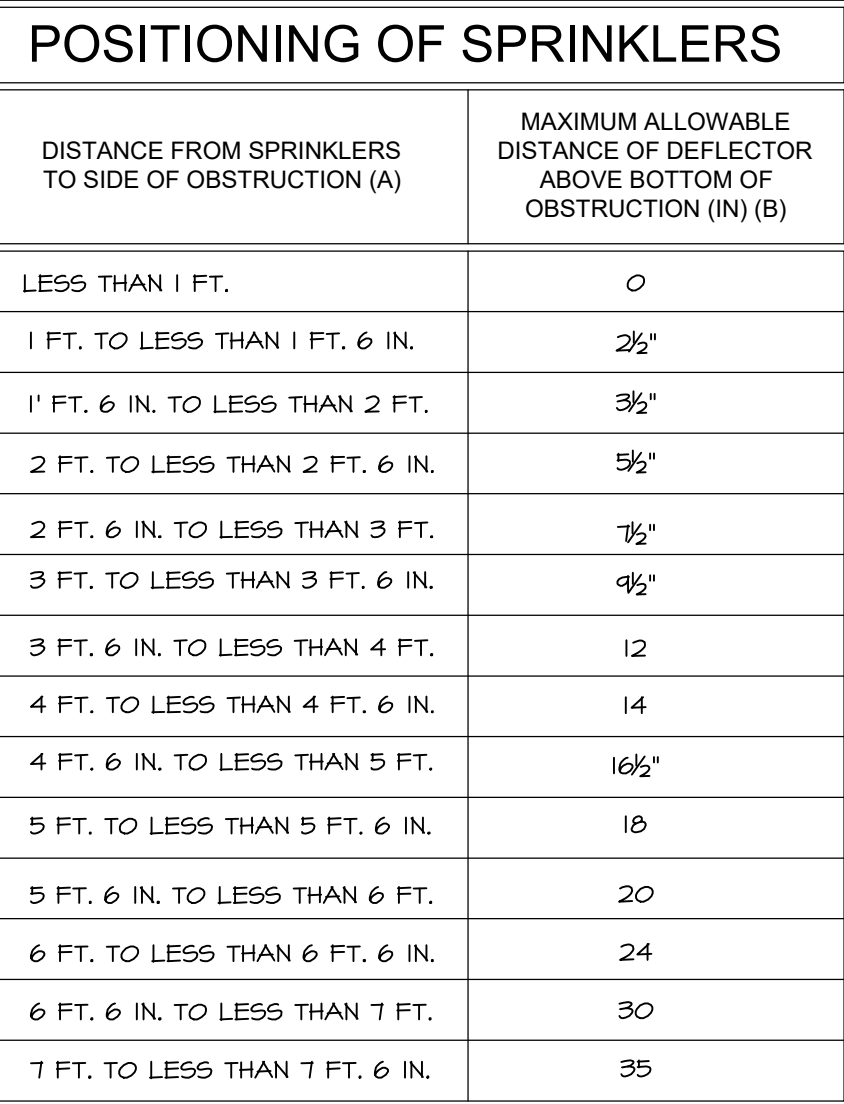
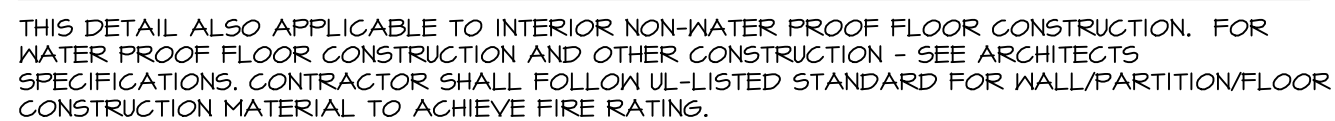
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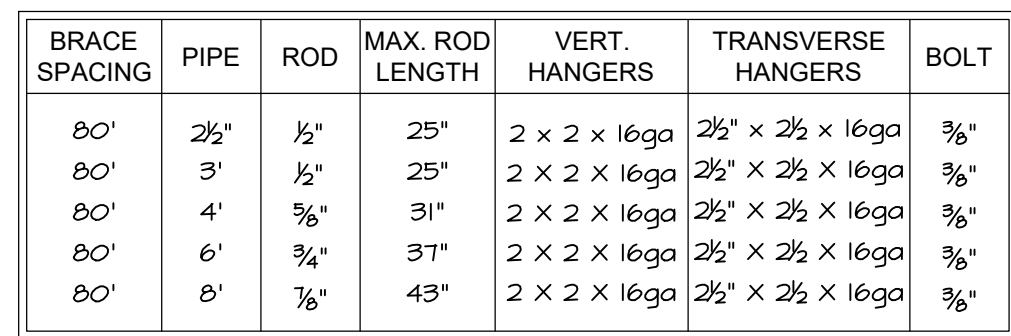
1. CLEVIS HANGERS WITH WELDED INSULATION SHIELDS SIMILAR TO RAUCH FIG. 100SH ON ALL PIPES LARGER THAN 1".
2. ALL PIPE HANGERS SHALL BE GALVANIZED STEEL OR FACTORY PAINTED BLACK WITH ENAMEL.



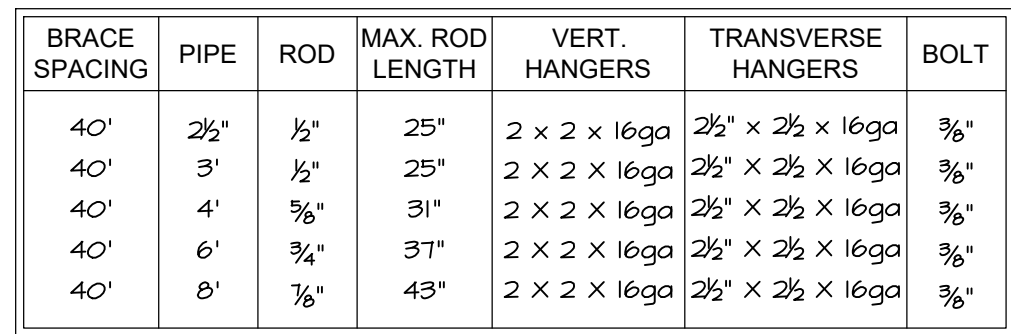
1. CLEVIS HANGERS WITH WELDED INSULATION SHIELDS SIMILAR TO RAUCH FIG. 100SH ON ALL PIPES LARGER THAN 1".
2. FOR PIPES 1" OR SMALLER, A BAND HANGER WITH INSULATION SHIELD MAY BE USED SIMILAR TO RAUCH FIG. NO. 1ASH.
3. FOR NON-INSULATED PIPE, INSULATION SHIELDS MAY BE OMITTED.
4. ALL PIPE HANGERS SHALL BE GALVANIZED STEEL OR FACTORY PAINTED BLACK WITH ENAMEL.
5. FOR NON-FERROUS PIPING WITHOUT INSULATION, THE HANGER SHALL BE COPPER PLATED OR FURNISHED WITH A DI-ELECTRIC BETWEEN PIPE AND HANGERS.
6. WHERE EXISTING BUILDING STRUCTURAL COMPONENTS HAVE FIREPROOF MATERIAL, ANY AREA THAT IS NOT COVERED BY OR UNDER THE REPAIRS OR INSTALLATION SHALL BE PATCHED WITH UL AND FM APPROVED FIREPROOFINGS TO MATCH EXISTING.



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 LONGITUDINAL AND LATERAL BRACE LOCATION
 LATERAL BRACE LOCATION



THE FIRE PROTECTION SYSTEM SHALL COMPLY WITH THE NEW YORK STATE UNIFORM FIRE PROTECTION AND BUILDING CODE, 2025 BUILDING CODE OF NEW YORK STATE SECTION 1613 AND APPLICABLE PROVISIONS OF ASCE 7 (ARCHITECTURAL, MECHANICAL AND ELECTRICAL COMPONENT SEISMIC DESIGN REQUIREMENTS).
SPRINKLER CONTRACTOR SHALL HIRE NY'S LICENSED PROFESSIONAL ENGINEER TO DESIGN AND CALCULATE THE SPRINKLER SYSTEM FOR EACH FLOOR SUPPORT, CONDUIT SUPPORT, MULTIPLE PIPE SUPPORT, TRAPEZOID AND SEISMIC RESTRAINT. SUBMIT SHOP DRAWINGS WITH CALCULATIONS TO ENGINEER FOR RECORD AND TO LOCAL AUTHORITY HAVING JURISDICTION FOR APPROVAL.

SEISMIC REQUIREMENTS:
BUILDING USE CATEGORY - IV
SEISMIC DESIGN CATEGORY - C

(SPK502) NOT TO SCALE



(SPK502) NOT TO SCALE



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DWG. TITLE



SCALE BAR SHOWN IS TWO INCHES ON THE ORIGINAL DRAWING
IF NOT TWO INCHES ON THIS SHEET, ADJUST ACCORDINGLY

DATE 05-18-2026

SCALE AS SHOWN

DWN. JT/RL/KC CHK. JT

PROJ. No. 618601

DWG. No.

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SPK502

GENERAL SPRINKLER NOTES

1. SPRINKLER CONTRACTOR SHALL FURNISH AND INSTALL A COMPLETE AND OPERATIVE AUTOMATIC FIRE PROTECTION SPRINKLER SYSTEM, INCLUDING MAIN VALVES AND TIE-INS WITH FIRE ALARM SYSTEM AS NECESSARY TO COMPLY WITH NFPA 13 SPRINKLER SYSTEM.
2. ALL SPRINKLER SYSTEM WORK SHALL BE INSTALLED IN ACCORDANCE WITH 2025 FIRE PROTECTION CODE, BUILDING CODE, PLUMBING CODE OF NEW YORK STATE, NATIONAL FIRE PROTECTION ASSOCIATION STANDARD 13, T2, AND ALL APPLICABLE LOCAL CODES.
3. SPRINKLER CONTRACTOR SHALL FURNISH AND INSTALL ALL PIPING, VALVES, SPRINKLER HEADS, TESTS, HANGERS, FITTINGS AND MISCELLANEOUS COMPONENTS NOT NECESSARILY DETAILED ON THESE DRAWINGS TO RENDER THE SPRINKLER SYSTEM COMPLETE, OPERABLE, AND IN ACCORDANCE WITH APPLICABLE CODES AND GENERALLY ACCEPTED INDUSTRY STANDARDS.
4. SPRINKLER CONTRACTOR SHALL COORDINATE LOCATIONS OF ALL PIPING, SPRINKLER HEADS AND EQUIPMENT WITH OTHER PRIME CONTRACTORS TO AVOID CONFLICTS.
5. SPRINKLER CONTRACTOR SHALL SEAL AROUND ALL PIPE PENETRATIONS THROUGH FIRE RATED WALLS AND CEILINGS WITH HILTI INTUMESCENT FIRE STOP MATERIALS TO MAINTAIN FIRE AND SMOKE RATINGS.
6. SPRINKLER CONTRACTOR SHALL GUARANTEE ALL WORKMANSHIP AND MATERIAL INSTALLED UNDER THIS CONTRACT FREE FROM DEFECTS FOR A PERIOD OF ONE (1) YEAR FROM DATE OF SUBSTANTIAL COMPLETION AND ACCEPTANCE BY THE OWNER, AND AGREES TO REPLACE DEFECTIVE WORK AT NO ADDITIONAL COST TO OWNER DURING THE GUARANTEE PERIOD.
7. SPRINKLER CONTRACTOR SHALL SUBMIT SHOP DRAWINGS SHOWING ALL EQUIPMENT, SPRINKLER HEADS AND PIPING WITH SIGNED & SEALED HYDRAULIC CALCULATIONS TO ENGINEER AND LOCAL FIRE INSPECTOR FOR APPROVAL PRIOR TO INSTALLATION.
8. DEMONSTRATE NEW SPRINKLER SYSTEM TO OWNER AND REVIEW MAINTENANCE PROCEDURES, SUBMIT (2) EQUIPMENT MANUALS TO ENGINEERS. PROVIDE CHROME PLATED ESCUTCHEON PLATES WHERE PIPES PASS THROUGH WALL, FLOORS, AND CEILINGS IN FINISHED AREAS.
9. SPRINKLER CONTRACTOR SHALL COORDINATE FINAL LOCATIONS OF ALL PIPING IN FINISHED AREAS TO ENSURE CONCEALMENT OF ALL PIPING IN WALLS, FLOORS AND CEILINGS.
10. SPRINKLER CONTRACTOR SHALL PAY FOR ALL PERMITS AND INSPECTIONS FEES REQUIRED BY LOCAL AUTHORITY HAVING JURISDICTION.
11. SPRINKLER CONTRACTOR SHALL NOT DRILL OR CUT ANY STRUCTURAL MEMBERS WITHOUT PERMISSION OF ARCHITECT.
12. SPRINKLER CONTRACTOR IS RESPONSIBLE FOR CUTTING, PATCHING AND PAINTING ASSOCIATED WITH SPRINKLER WORK. SEE ARCHITECT'S SPECIFICATIONS AND GENERAL CONDITIONS FOR APPROVED MATERIALS AND METHODS.
13. EXACT LOCATION OF FIRE DEPARTMENT CONNECTION, TYPE AND SPRINKLER SYSTEM TEST/RAIN SHALL BE APPROVED BY LOCAL FIRE DEPARTMENT CHIEF, LOCAL FIRE INSPECTOR OR AUTHORITY HAVING JURISDICTION PRIOR TO INSTALLATION.
14. SPRINKLER CONTRACTOR SHALL INSTALL ALL EQUIPMENT IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS AND OBSERVE ALL CLEARANCES.
15. ALL CONTROL WIRING SHALL BE IN ACCORDANCE WITH N.E.C. ELECTRICAL CODE AND ALL LOCAL CODES. ALL CONDUCTORS SHALL BE COPPER, (20V) - MINIMUM CONDUCTOR SIZE #12. 24V MINIMUM CONDUCTOR SIZE #10. SEE ELECTRICAL DRAWINGS AND SPECIFICATIONS FOR APPROVED MATERIALS AND INSTALLATION METHODS.
16. SPRINKLER CONTRACTOR SHALL OBSERVE CLEARANCES TO OBSTRUCTIONS.
17. SPRINKLER CONTRACTOR SHALL CHAIN CONTROL VALVE IN THE OPEN POSITION.
18. SPRINKLER CONTRACTOR SHALL FURNISH SHOP DRAWINGS INDICATING LOCATIONS OF ALL EQUIPMENT AND DEVICES.
19. SPRINKLER CONTRACTOR SHALL FURNISH & INSTALL SPRINKLER CABINET WITH MINIMUM SIX SPARE SPRINKLER HEADS AND WRENCH. INCLUDE SEPARATE CABINET WITH SPRINKLERS AND WRENCH FOR EACH TYPE OF HEAD ON PROJECTION IN ACCORDANCE WITH NFPA 13.
20. SPRINKLER CONTRACTOR SHALL FURNISH COORDINATED SHOP DRAWINGS INDICATING LOCATIONS OF ALL EQUIPMENT AND DEVICES INSTALLED IN CEILINGS. THESE DRAWINGS SHALL BE APPROVED BY ALL CONTRACTORS PRIOR TO INSTALLING ANY EQUIPMENT IN CEILINGS. CONTRACTORS THAT DO NOT FOLLOW SHOP DRAWINGS SHALL BEAR ALL COSTS FOR RELOCATING DEVICES AND EQUIPMENT IN CONFLICT WITH OTHER EQUIPMENT.
21. SPRINKLER CONTRACTOR SHALL PROVIDE ACCESS DOORS FOR ALL VALVES CONCEALED IN INACCESSIBLE CEILINGS AND WALLS. SEE ARCHITECT'S SPECIFICATIONS FOR APPROVED MANUFACTURERS AND TYPES. ACCESS DOORS SHALL HAVE (1) PRIME COAT AND (2) COATS OF FINISHED PAINT, COLOR AS DIRECTED BY ARCHITECT. ACCESS DOOR SHALL HAVE APPROPRIATE FIRE RATINGS TO MAINTAIN INTEGRITY OF CEILING AND WALL.
22. SPRINKLER CONTRACTOR MAY USE EXTENDED COVERAGE SPRINKLER HEADS WHERE PRESSURE AND FLOW PERMIT BASED ON HYDRAULIC CALCULATIONS.
23. SPRINKLER CONTRACTOR SHALL SUBMIT SHOP DRAWINGS SHOWING SPRINKLER PIPING EQUIPMENT AND HEAD LOCATIONS WITH HYDRAULIC CALCULATIONS. COORDINATE SPRINKLER HEAD LOCATIONS WITH OTHER CONTRACTORS TO AVOID CONFLICTS. RELOCATE SPRINKLER HEADS TO MEET FIELD CONDITIONS. SHOP DRAWINGS SHALL SHOW SPRINKLER PIPE SIZES, PIPE HANGER REQUIREMENTS, FIRESTOPPING AND NECESSARY DETAILS REQUIRED FOR BUILDING DEPARTMENT AND INSURANCE CARRIER APPROVAL. HYDRAULIC CALCULATIONS SHALL BE BASED ON RESIDUAL FLOW TEST PERFORMED BY THIS CONTRACTOR. SUBMIT SHOP DRAWINGS WITH HYDRAULIC CALCULATION TO ENGINEER FOR APPROVAL. SHOP DRAWINGS THEN SHALL BE SUBMITTED TO BUILDING DEPARTMENT, LOCAL FIRE DEPARTMENT AND INSURANCE CARRIER FOR APPROVAL.
24. WHEN INSTALLING SPRINKLER HEADS, THE SPRINKLER CONTRACTOR SHALL PROVIDE THE SHORTEST HYDRAULIC PIPE LENGTH BETWEEN THE FINAL SPRINKLER HEAD LOCATION AND THE BRANCH LINE CONNECTION.
25. SPRINKLER CONTRACTOR SHALL BE RESPONSIBLE FOR DRAINING AND FILLING THE SPRINKLER SYSTEM AS REQUIRED FOR COMPLETION OF WORK.
26. PROVIDE (2) 2½ GALLON PRESSURIZED WATER AND (1) 10 POUND ABC DRY CHEMICAL EXTINGUISHERS FOR EMERGENCY USE DURING CONSTRUCTION.
27. SPRINKLER SYSTEM PIPING SHALL BE ALTERED AS NEEDED TO ACCOMMODATE CEILING HEIGHTS, DUCTWORK, LIGHTS AND OTHER PIPING. PROVIDE ALL REQUIRED PIPING AND FITTINGS AS NEEDED TO OFFSET SPRINKLER SYSTEM TO AVOID STRUCTURAL, ARCHITECTURAL, MECHANICAL AND ELECTRICAL INTERFERENCES, WHETHER SHOWN ON THE DRAWINGS OR NOT.
28. SPRINKLER HEADS INSTALLED IN HUNG CEILING WILL BE POSITIONED WITH TOLERANCE OF ¼" OF THE CENTERLINE OF THE TILES. INSTALL SPRINKLER HEADS TIGHT TO THE BOTTOM OF THE HUNG CEILING, WITH CARE THAT THE FINISH IS NOT DAMAGED. WHEN CONCEALED TYPE SPRINKLER HEADS ARE USED, THE COVER PLATES SHALL BE FLUSH WITH THE CEILING PLANE, TOLERANCE GREATER THAN ¼" IS UNACCEPTABLE.
29. SPRINKLER CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING START-UP OF ALL NEW EQUIPMENT, CONTROLS, AND ETC. TO ENSURE CORRECT OPERATION OF INSTALLED DEVICES.
30. SPRINKLER CONTRACTOR SHALL PROVIDE OWNER WITH CATALOG DATA, OPERATING INSTRUCTIONS, MAINTENANCE INSTRUCTIONS, AND RECORD (AS-BUILT) DRAWINGS OF ALL COMPLETED WORK.
31. SPRINKLER CONTRACTOR SHALL PROVIDE ADDITIONAL SPRINKLER HEADS AROUND ALL OBSTRUCTIONS SUCH AS LIGHTS, EQUIPMENT, COLUMNS, AND ETC. AS REQUIRED TO PROVIDE COMPLETE COVERAGE IN ACCORDANCE WITH NFPA 13.
32. ALL NEW HOLES IN WALLS AND FLOORS SHALL BE CORE DRILLED BY THIS CONTRACTOR. PRIOR TO CORE DRILLING FLOORS, RADAR SCAN AND/OR PHOTOGRAPH CORE DRILLING TO AVOID DAMAGE TO EQUIPMENT, SYSTEMS, STRUCTURE AND ETC. ANY ITEMS DAMAGED AS A RESULT OF CORE DRILLING SHALL BE REPAIRED BY THIS CONTRACTOR AT NO ADDITIONAL COST TO OWNER.
33. SPRINKLER CONTRACTOR SHALL PROVIDE ALL REQUIRED SIGNAGE FOR FIRE PROTECTION SYSTEM.
34. HEALTH, SAFETY AND CRITICAL OPERATING EQUIPMENT SHALL NOT BE COMPROMISED WITHOUT THE FIRE DISTRICT NOTIFICATION AND SCHEDULED SHUTDOWN DURING OFF HOURS AS TEMPORARY OPERATIONAL PLAN IS IMPLEMENTED AND MAINTAINED.
35. SPRINKLER CONTRACTOR SHALL SCHEDULE ALL SHUT-DOWNS OF EXISTING BASE BUILDING EQUIPMENT/SYSTEMS WITH FIRE DISTRICT AS REQUIRED FOR PERFORMING WORK. NOTICE SHALL BE GIVEN NO LESS THAN (5) FIVE BUSINESS DAYS PRIOR REQUIRED SHUT-DOWN. SHUT-DOWNS SHALL NOT BE PERFORMED WITHOUT APPROVAL FROM FIRE DISTRICT.
36. CEILING REMOVAL, TEMPORARY PROTECTION, AND REPLACEMENT AS REQUIRED PERFORMING SCOPE OF WORK SHALL BE BY THIS CONTRACTOR. CEILING TILES DAMAGED AS A RESULT OF THIS CONTRACTOR'S WORK SHALL BE REPLACED AT NO ADDITIONAL COST TO THE OWNER.
37. CONTRACTOR IS RESPONSIBLE FOR THE REMOVAL AND DISPOSAL OF ALL REFUSE, REMOVED EQUIPMENT AND DEBRIS ASSOCIATED WITH HIS WORK OFF SITE IN A LEGAL MANNER AT HIS EXPENSE.

FIRE PROTECTION EQUIPMENT SCHEDULE			
SYMBOL	MANUFACTURER	CATALOG #	DESCRIPTION
K	TYCO	SERIES TY-FRB	SIDEWALL SPRINKLER, QUICK RESPONSE, K=5.6 - "INTERMEDIATE" TEMPERATURE CLASSIFICATION (175°F). RECESSED WHITE ESCUTCHEON PLATE.
⊙	TYCO	SERIES RFII	CONCEALED PENDENT SPRINKLER, QUICK RESPONSE, K=5.6 -"ORDINARY" TEMPERATURE CLASSIFICATION (155°F). COLOR WHITE.
⊙ _A	TYCO	SERIES RFII	CONCEALED PENDENT SPRINKLER, QUICK RESPONSE, K=5.6 -"INTERMEDIATE" TEMPERATURE CLASSIFICATION (200°F). COLOR WHITE.
⊙ _B	TYCO	SERIES TY-FRB	UPRIGHT/PENDANT SPRINKLER, QUICK RESPONSE, K=5.6 -"INTERMEDIATE" TEMPERATURE CLASSIFICATION (175°F). NATURAL BRASS, CHROME OR COLOR AS DIRECTED BY OWNER. WITH METAL WIRE GUARD
⊙ _C	TYCO	SERIES DS-C	DRY-TYPE CONCEALED PENDANT SPRINKLER, QUICK RESPONSE, K=5.6 - "ORDINARY" TEMPERATURE CLASSIFICATION (155°F). COLOR AS DIRECTED BY ARCHITECT. USE "INTERMEDIATE" TEMPERATURE CLASSIFICATION.
⊙ _D	TYCO	SERIES DS-I	DRY-TYPE CONCEALED PENDANT SPRINKLER, QUICK RESPONSE, K=5.6 - "INTERMEDIATE" TEMPERATURE CLASSIFICATION (200°F). COLOR AS DIRECTED BY ARCHITECT.
ATTIC SPRINKLER HEADS	TYCO	SERIES TY-FRB	UPRIGHT SPRINKLER, STANDARD RESPONSE, K=5.6 - "INTERMEDIATE" TEMPERATURE CLASSIFICATION (175°F) BRASS. EXTENDED COVERAGE AND SPECIALTY ATTIC SPRINKLER HEADS MAY USE IF HYDRAULIC FLOW CALCS PERMIT.
_____	_____	_____	NET PIPE SPRINKLER PIPING ABOVEGROUND, SCHEDULE 40 STEEL WITH SCREWED JOINTS UP TO 2' AND SCHEDULE 10 ABOVE 2' USE MECHANICAL GROOVE COUPLING.
_____	_____	_____	DRY PIPE SPRINKLER PIPING ABOVEGROUND, SCHEDULE 40 GALVANIZED STEEL WITH SCREWED JOINTS UP TO 2' AND SCHEDULE 10 ABOVE 2' USE MECHANICAL GROOVE COUPLING.
NOTES: 1. SPRINKLER HEADS SHALL BE INSTALLED AS PER MANUFACTURER'S RECOMMENDATIONS. 2. PROVIDE METAL WIRE GUARDS WHERE SPRINKLERS ARE SUBJECT TO DAMAGE. 3. ALL HEAT GENERATING EQUIPMENT WHICH CAN AFFECT THE TEMPERATURE RATING OF THE SPRINKLER HEADS SHALL BE CLEARLY IDENTIFIED ON THE SHOP DRAWINGS. COORDINATE HEATING EQUIPMENT LOCATIONS WITH MECHANICAL PLANS. 4. SPRINKLER CONTRACTOR SHALL FURNISH & INSTALL SHIELDS ON SPRINKLERS THAT CANNOT BE SUFFICIENTLY SPACED TO AVOID DISCHARGE INTERACTION. 5. FINAL K-FACTOR OF SPRINKLER HEADS BASED UPON HYDRAULIC CALCULATION REQUIREMENTS.			

SPRINKLER SYSTEM TESTS

1. HYDROSTATIC - 200 PSI FOR 2 HOURS WITHOUT LOSS OF PRESSURE.
2. DRY PIPE AND DOUBLE INTERLOCK SYSTEMS AIR TEST - IN ADDITION TO HYDROSTATIC TEST, AIR PRESSURE LEAKAGE TEST AT 40 PSI FOR 24 HOURS WITH LESS THAN ½" PSI LOSS.
3. SYSTEM OPERATIONAL TESTS - WATER FLOW DETECTING DEVICES.
4. MAIN DRAIN VALVE - STATIC AND RESIDUAL PRESSURES.
5. CONTRACTOR SHALL PERFORM ALL SPRINKLER SYSTEM TESTS REQUIRED BY LOCAL FIRE INSPECTOR OR AUTHORITY HAVING JURISDICTION.
6. ALL TESTS WITNESSED BY LOCAL FIRE INSPECTOR OR AUTHORITY HAVING JURISDICTION. SUBMIT REPORT ON ALL TESTS TO LOCAL FIRE INSPECTOR AND ENGINEER FOR APPROVAL.

SPRINKLER SYSTEM REQUIREMENTS

OCCUPANCY CLASSIFICATIONS

1. NFPA 13 LIGHT HAZARD OCCUPANCY: OFFICE & MEETING
2. NFPA 13 ORDINARY GROUP 1; MECH ROOM, APPARATUS ROOM, AND STORAGE AREAS.

WET SPRINKLER SERVICE REQUIREMENTS

1. NFPA 13 ORDINARY HAZARD:
A. MINIMUM WATER SUPPLY (1500 SQFT. x 15 GPM/SQFT.) = 225 GPM
B. TOTAL COMBINED INSIDE AND OUTSIDE HOSE STREAMS. = 250 GPM
MINIMUM 475 GPM
FINAL FLOW BASED ON APPROVED HYDRAULIC CALCULATIONS
2. NFPA 13 LIGHT HAZARD:
A. MINIMUM WATER SUPPLY (1500 SQFT. x 10 GPM/SQFT. x 13 (SLOPE) = 254 GPM
B. TOTAL COMBINED INSIDE AND OUTSIDE HOSE STREAMS = 254 GPM
MINIMUM 504 GPM
FINAL FLOW BASED ON APPROVED HYDRAULIC CALCULATIONS

HYDRANT FLOW TEST PERFORM BY TOWN OF NEW CASTLE DPM - 11/15/23

- LOCATION, KING STREET
- STATIC PRESSURE: 92 PSI
- RESIDUAL PRESSURE: 65 PSI @ 3,920 GPM

SPRINKLER SYSTEM REQUIREMENTS

1. MINIMUM PRESSURE AT SPRINKLER HEAD SHALL BE 7 PSI UNLESS NOTED OTHERWISE.
2. FLOW VELOCITY IN PIPING SHALL NOT EXCEED 20 FPS.
3. EQUIVALENT FITTING LENGTHS USED IN HYDRAULIC CALCULATIONS SHALL BE IN ACCORDANCE WITH NFPA 13.
4. LIGHT HAZARD MAXIMUM SPRINKLER HEAD PROTECTION AREA: 225 SQFT.
5. ORDINARY GROUP 1 & 11 MAXIMUM SPRINKLER HEAD PROTECTION AREA: 130 SQFT.
6. MAXIMUM FLOOR AREA PROTECTION LIMIT: LIGHT & ORDINARY HAZARD 52,000 SQFT.



MODERNIZATION & CONSOLIDATION PROJECT TO
NEW CASTLE
FIRE DISTRICT No.1

491 KING STREET
CHAPPAQUA, NY

FOR REVIEW ONLY



29 Thacher Park road
Voorhessville, NY 12205
www.wendelcompanies.com
p:518.765.4571 f:518.765.2950

Wendel WD Architecture, Engineering, Surveying and Landscape Architecture, P.C

PROJECT TEAM

CIVIL ENGINEER

JMC PLANNING ENGINEERING
LANDSCAPE ARCHITECTURE & LANDSCAPE SURVEYING, PLLC
120 BEDFORD ROAD
ARMONK, NY 10504
(914) 273-9225 f: (914) 273-2102
jmcstaffer@jmcpllc.com

STRUCTURAL ENGINEER

CRAIG A. MALONEY, P.E.
3 BENEDICT COURT
BALLSTON SPA, NY 12020
(518) 584-6844 f: (518) 584-9955
CAMALONEY@NYCAP.RR.COM

ARCHITECT

WENDEL | MITCHELL ASSOCIATES ARCHITECTS
29 THACHER PARK ROAD
VOORHEESVILLE, NY 12186
518.765.4571

MEP ENGINEER

GERARD ASSOCIATES CONSULTING ENGINEERS, P.C.
223 MAIN STREET
GOSHEN, NY 10924
(845) 291-1272 f: (845) 291-1939
info@gerardassociates.com



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NO.	REVISIONS	DATE

DWG. TITLE

SPRINKLER SYSTEM:
EQUIPMENT
SCHEDULES



GENERIC SCALE BAR
SCALE BAR SHOWN IS TWO INCHES ON THE ORIGINAL DRAWING. IF NOT TWO INCHES ON THIS SHEET, ADJUST ACCORDINGLY.

DATE 05-18-2026

SCALE AS SHOWN

DWN. JTR/LKC CHK. JT

PROJ. No. 618601

DWG. No.

SPK700

SECTION 017000 - EXECUTION AND CLOSEOUT REQUIREMENTS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Examination, preparation, and general installation procedures.
- B. Requirements for alterations work, including selective demolition, except removal, disposal, and/or remediation of hazardous materials and toxic substances.
- C. Pre-installation meetings.
- D. Cutting and patching.
- E. Cleaning and protection.
- F. Starting of systems and equipment.
- G. Tags and labels for systems and equipment.
- H. Demonstration and instruction of Owner personnel.
- I. Closeout procedures, including Contractor's and All Prime Contractor's Correction Punch List, except payment procedures.
- J. General requirements for maintenance service.

1.2 REFERENCE STANDARDS

- A. NFPA 241 - Standard for Safeguarding Construction, Alteration, and Demolition Operations.

1.3 COORDINATION

- A. Coordinate scheduling and work of the various sections of the Project Manual to ensure efficient and orderly sequence of installation of interdependent construction elements, with provisions for accommodating items installed later.
- B. Coordinate space requirements, supports, and installation of work that is indicated diagrammatically on drawings. Follow routing indicated for pipes, ducts, and conduit, as closely as practicable; place runs parallel with lines of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.
- C. Coordinate completion and clean-up of work of separate sections.

PART 2 PRODUCTS

2.1 PATCHING MATERIALS

- A. New Materials: As specified in product sections; match existing products and work for patching and extending work.
- B. Type and Quality of Existing Products: Determine by inspecting and testing products where necessary, referring to existing work as a standard.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that existing site conditions and substrate surfaces are acceptable for subsequent work. Start of work means acceptance of existing conditions.
- B. Verify that existing substrate is capable of structural support or attachment of new work being applied or attached.
- C. Examine and verify specific conditions described in individual specification sections.
- D. Take field measurements before confirming product orders or beginning fabrication, to minimize waste due to over-ordering or misfabrication.
- E. Verify that utility services are available, of the correct characteristics, and in the correct locations.
- F. Prior to Cutting: Examine existing conditions prior to commencing work, including elements subject to damage or movement during cutting and patching. After uncovering existing work, assess conditions affecting performance of work. Beginning of cutting or patching means acceptance of existing conditions.

3.2 PREPARATION

- A. Clean substrate surfaces prior to applying next material or substance.
- B. Seal cracks or openings of substrate prior to applying next material or substance.
- C. Apply manufacturer required or recommended substrate primer, sealer, or conditioner prior to applying any new material or substance in contact or bond.

3.3 PREINSTALLATION MEETINGS

- A. When required in individual specification sections, convene a preinstallation meeting at the site prior to commencing work of the section.
- B. Require attendance of parties directly affecting, or affected by, work of the specific section.

3.4 LAYING OUT THE WORK

- A. Promptly notify Architect of any discrepancies discovered.

3.5 GENERAL INSTALLATION REQUIREMENTS

- A. In addition to compliance with regulatory requirements, conduct construction operations in compliance with NFPA 241, including applicable recommendations in Appendix A.
- B. Install products as specified in individual sections, in accordance with manufacturer's instructions and recommendations, and so as to avoid waste due to necessity for replacement.
- C. Make vertical elements plumb and horizontal elements level, unless otherwise indicated.
- D. Install equipment and fittings plumb and level, neatly aligned with adjacent vertical and horizontal lines, unless otherwise indicated.
- E. Make consistent texture on surfaces, with seamless transitions, unless otherwise indicated.
- F. Make neat transitions between different surfaces, maintaining texture and appearance.

3.6 ALTERATIONS

- A. Drawings showing existing construction and utilities are based on casual field observation and existing record documents only.
 - 1. Verify that construction and utility arrangements are as indicated.
 - 2. Report discrepancies to Architect before disturbing existing installation.
 - 3. Beginning of alterations work constitutes acceptance of existing conditions.
- B. Remove existing work as indicated and as required to accomplish new work.
 - 1. Remove rotted wood, corroded metals, and deteriorated masonry and concrete; replace with new construction specified.
 - 2. Remove items indicated on drawings.
 - 3. Relocate items indicated on drawings.
 - 4. Where new surface finishes are to be applied to existing work, perform removals, patch, and prepare existing surfaces as required to receive new finish; remove existing finish if necessary for successful application of new finish.
 - 5. Where new surface finishes are not specified or indicated, patch holes and damaged surfaces to match adjacent finished surfaces as closely as possible.
- C. Protect existing work to remain.
 - 1. Prevent movement of structure; provide shoring and bracing if necessary.
 - 2. Perform cutting to accomplish removals neatly and as specified for cutting new work.
 - 3. Repair adjacent construction and finishes damaged during new work.
- D. Adapt existing work to fit new work: Make as neat and smooth transition as possible.
 - 1. Where a change of plane of 1/4 inch or more occurs in existing work, submit recommendation for providing a smooth transition for Architect review and request instructions.
- E. Patching: **Where the existing surface is not indicated to be refinished, patch to match the surface finish that existed prior to cutting. Where the surface is indicated to be refinished, patch so that the substrate is ready for the new finish. Assume complete surface refinishing to surface limits in all directions.**
- F. Refinish existing surfaces as indicated:

1. Where rooms or spaces are indicated to be refinished, refinish all visible existing surfaces to remain to the specified condition for each material, with a neat transition to adjacent finishes.
2. If mechanical or electrical work is exposed accidentally during the work, re-cover and refinish to match.

G. Comply with all other applicable requirements of this section.

3.7 CUTTING AND PATCHING

- A. Whenever possible, execute the work by methods that avoid cutting or patching.
- B. See Alterations article above for additional requirements.
- C. Perform whatever cutting and patching is necessary to:
 1. Complete the work.
 2. Fit products together to integrate with other work.
 3. Provide openings for penetration of mechanical, electrical, and other services.
 4. Match work that has been cut to adjacent work.
 5. Repair areas adjacent to cuts to required condition.
 6. Repair new work damaged by subsequent work.
 7. Remove samples of installed work for testing when requested.
 8. Remove and replace defective and non-complying work.
- D. Execute work by methods that avoid damage to other work and that will provide appropriate surfaces to receive patching and finishing.
- E. Cut rigid materials using masonry saw or core drill. Pneumatic tools not allowed without prior approval.
- F. **Cut holes are to be no more than 1/2" larger than object meant to pass through it. All exposed penetrations must be covered with finish escutcheon.**
- G. Restore work with new products in accordance with requirements of Contract Documents.
- H. Fit work air tight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.
- I. At penetrations of fire rated walls, partitions, ceiling, or floor construction, completely seal voids with fire rated material , to full thickness of the penetrated element.
- J. Patching:
 1. Finish patched surfaces to match finish that existed prior to patching. On continuous surfaces, refinish to nearest intersection or natural break. For an assembly, refinish entire unit.
 2. Match color, texture, and appearance.
 3. Repair patched surfaces that are damaged, lifted, discolored, or showing other imperfections due to patching work. If defects are due to condition of substrate, repair substrate prior to repairing finish.

3.8 PROGRESS CLEANING

- A. Maintain areas free of waste materials, debris, and rubbish. Maintain site in a clean and orderly condition.
- B. Remove debris and rubbish from pipe chases, plenums, attics, crawl spaces, and other closed or remote spaces, prior to enclosing the space.
- C. Broom and vacuum clean interior areas prior to start of surface finishing, and continue cleaning to eliminate dust.
- D. Execute cleaning to prevent contamination of wet or newly coated surfaces or of equipment.
- E. Collect and remove waste materials, debris, and trash/rubbish from site twice a week and dispose off-site; do not burn or bury.

3.9 PROTECTION OF INSTALLED WORK

- A. Protect installed work from damage by construction operations.
- B. Provide special protection where specified in individual specification sections.
- C. Provide temporary and removable protection for installed products. Control activity in immediate work area to prevent damage.
- D. Protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects, by protecting with durable sheet materials.
- E. Remove protective coverings when no longer needed; reuse or recycle coverings if possible.

3.10 TAGS AND LABELS

- A. Contractor and all Prime/SubContractors responsible for original installation to provide and install brass valve tags on all plumbing, gas, HVAC, and sprinkler systems; all valves, handles, gates, dampers, etc. Refer to individual specification sections for additional requirements.

3.11 DEMONSTRATION AND INSTRUCTION

- A. Demonstrate operation and maintenance of products to Owner's personnel two weeks prior to date of Substantial Completion.
- B. Demonstrate start-up, operation, control, adjustment, trouble-shooting, servicing, maintenance, and shutdown of each item of equipment at agreed time, at designated location.
- C. Provide a qualified person who is knowledgeable about the Project to perform demonstration and instruction of Owner's personnel.
- D. Utilize operation and maintenance manuals as basis for instruction. Review contents of manual with Owner's personnel in detail to explain all aspects of operation and maintenance.

3.12 ADJUSTING

- A. Adjust operating products and equipment to ensure smooth and unhindered operation.

3.13 FINAL CLEANING

- A. Execute final cleaning prior to final project assessment.
 - 1. Clean areas to be occupied by Owner prior to final completion before Owner occupancy.
- B. Use cleaning materials that are nonhazardous.
- C. Clean interior and exterior glass, mirrors, surfaces exposed to view; remove temporary labels, stains and foreign substances, polish transparent and glossy surfaces, vacuum carpeted and soft surfaces.
- D. Damp wipe water resistant surfaces, cabinet interiors, cabinet exteriors, and tile walls. Wipe dry.
- E. Remove all labels that are not permanent. Do not paint or otherwise cover fire test labels or nameplates on mechanical and electrical equipment.
- F. Clean equipment and fixtures to a sanitary condition with cleaning materials appropriate to the surface and material being cleaned.
- G. Replace filters, strainers, etc. of all operating equipment, including any equipment used during construction.
- H. Clean site; sweep paved areas, rake clean landscaped surfaces.
- I. Remove ALL waste, surplus materials, trash/rubbish, and construction facilities from the site, including debris that has migrated to adjacent property; dispose of in legal manner; do not burn or bury.
- J. Remove temporary protection and labels not otherwise required to remain.
- K. In the event that the Contractor or other Prime Contractor, subcontractors, suppliers, etc., create excessive debris, damage, or any other items that require repair after the final cleaning, then the Architect shall determine such damage and assess back charges accordingly. Architect's decision is final.

3.14 CLOSEOUT PROCEDURES

- A. Make submittals that are required by governing or other authorities.
- B. Notify Owner when work is considered ready for Architect's Substantial Completion inspection.
- C. Submit written certification containing Contractor's and other Prime Contractors Correction Punch List, that Contract Documents have been reviewed, work has been inspected, and that work is complete in accordance with Contract Documents and ready for Architect's Substantial Completion inspection.
- D. Owner will occupy all of the building
- E. Notify owner when work is considered finally complete and ready for Substantial Completion final inspection.

3.15 MAINTENANCE

- A. Provide service and maintenance of components indicated in specification sections.
- B. Maintenance Period: As indicated in specification sections or, if not indicated, not less than one year from the Date of Final Completion or the length of the specified warranty, whichever is longer.
- C. Examine system components at a frequency consistent with reliable operation. Clean, adjust, and lubricate as required.
- D. Include systematic examination, adjustment, and lubrication of components. Repair or replace parts whenever required. Use parts produced by the manufacturer of the original component.
- E. Maintenance service shall not be assigned or transferred to any agent or subcontractor without prior written consent of the Owner.

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END OF SECTION 017000

SECTION 017329 - CUTTING AND PATCHING

PART 1 GENERAL

1.1 GENERAL REQUIREMENTS

- A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.

1.2 SECTION INCLUDES

- A. This Section includes procedural requirements for cutting and patching.
Contractor/SubContractor is responsible for their own cutting and coring. Finish patching of all wall and floor penetrations will be the responsibility of this contractor.

1.3 DEFINITIONS

- A. Cutting: Removal of in-place construction necessary to permit installation or performance of other work.
- B. Patching: Fitting and repair work required to restore surfaces to original conditions after installation of other Work.

1.4 SUBMITTALS

- A. Cutting and Patching: Submit a method describing procedures at least 10 days before the time cutting and patching will be performed, requesting approval to proceed. Include the following information:
 - 1. Extent: Describe cutting and patching, show how they will be performed, and indicate why they cannot be avoided.
 - 2. Changes to In-Place Construction: Describe anticipated results. Include changes to structural elements and operating components as well as changes in building's appearance and other significant visual elements.
 - 3. Products: List products to be used and firms or entities that will perform the Work.
 - 4. Dates: Indicate when cutting and patching will be performed.
 - 5. Utilities: List utilities that cutting and patching procedures will disturb or affect. List utilities that will be relocated and those that will be temporarily out of service. Indicate how long service will be disrupted.
 - 6. Structural Elements: Where cutting & patching involve adding reinforcement to structural elements, submit details and engineering calculations showing integration of reinforcement with original structure.
 - a. Architect's Approval: Obtain approval of cutting and patching before cutting and patching.
 - 1) Approval does not waive right to later require removal and replacement of unsatisfactory work.

B. QUALITY ASSURANCE

1. Structural Elements: Do not cut and patch structural elements in a manner that could change their load-carrying capacity or load-deflection ratio.
 - a. Provide a list of additional elements that are structural elements and that require Architect's or Construction Manager's approval of a cutting and patching proposal.
2. Operational Elements: Do not cut and patch the following operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety.
 - a. Primary operational systems and equipment.
 - b. Air or smoke barriers.
 - c. Fire-protection systems.
 - d. Control systems.
 - e. Communication systems.
 - f. Conveying systems.
 - g. Electrical wiring systems.
3. Miscellaneous Elements: Do not cut and patch the following elements or related components in a manner that could change their load-carrying capacity, that results in reducing their capacity to perform as intended, or that results in increased maintenance or decreased operational life or safety.
 - a. Water, moisture, or vapor barriers.
 - b. Membranes and flashings.
 - c. Exterior curtain-wall construction.
 - d. Equipment supports.
 - e. Piping, ductwork, vessels, and equipment.
 - f. Noise- and vibration-control elements and systems.
4. Visual Requirements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch construction exposed on the exterior or in occupied spaces in a manner that would, in Architect's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.
5. Cutting and Patching Conference: Before proceeding, meet at Project site with parties involved in cutting and patching, including mechanical and electrical trades. Review areas of potential interference and conflict. Coordinate procedures and resolve potential conflicts before proceeding.

C. WARRANTY

1. Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during cutting and patching operations, by methods and with materials so as not to void warranties.

PART 2 PRODUCTS

2.1 MATERIALS

- A. General: Comply with requirements specified in other Sections of these Specifications.
- B. In-Place Materials: Use materials identical to existing materials. For exposed surfaces, use materials that visually match existing adjacent surfaces to the fullest extent possible.

1. If identical materials are unavailable or cannot be used, use materials that, when installed, will match the visual and functional performance of in-place materials.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine surfaces to be cut and patched and conditions under which cutting and patching are to be performed.
 1. Compatibility: Before patching, verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
 2. Proceed with installation only after unsafe or unsatisfactory conditions have been corrected.

3.2 PERFORMANCE

- A. General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.
 1. Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.
- B. Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.
 1. In general, use hand or small power tools designed for sawing and grinding, **not hammering and chopping**. Cut holes and slots as small as possible, neatly to size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
 2. In-Place Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
 3. Concrete and Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
- C. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other Work. Patch with durable seams that are as invisible as possible. Provide materials and comply with installation requirements specified in other Sections of these Specifications.
 1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate integrity of installation.
 2. Exposed Finishes: **Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction** in a manner that will eliminate evidence of patching and refinishing.
 3. Floors and Walls: Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove existing floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.

- a. Where patching occurs in a painted surface, apply primer and intermediate paint coats over the patch and apply final paint coat over entire unbroken surface containing the patch. Provide additional coats until patch blends with adjacent surfaces.
 - 4. Ceilings: Patch, repair, or rehang existing ceilings as necessary to provide an even-plane surface of uniform appearance.
 - 5. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weather-tight condition.
- D. Cleaning: Clean areas and spaces where cutting and patching are performed. Completely remove paint, mortar, oils, putty and similar materials.

END OF SECTION 017329

SECTION 210500 - COMMON WORK RESULTS FOR FIRE SUPPRESSION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 WORK INCLUDED

- A. The installation of the complete, operational and tested automatic fire sprinkler system, including head locations, pipe, fittings, valves, connections, risers, building piping, site piping between the fire riser and the building, shall be performed by Contractors currently experienced in this work and having five continuous years of experience herein. The Contractor shall furnish shop drawings based on this Engineer's permitted Bid Documents. These shop drawings shall include additional information to include, but not be limited to, dimensional information, elevations, elevation rises and drops, and adjustments necessary to coordinate the fire sprinkler piping with the building, building structure and equipment/materials of other trades.
- B. Fire Sprinkler Contractor shall review the information contained herein and shall prepare complete fire system installation shop drawings coinciding with hydraulic calculations sealed by a NYS Registered Professional Engineer experienced in the field. The design and details shall conform to NFPA 13, and all local codes and regulations. These documents shall be considered the Fire Protection System Engineering Documents. Copies of signed and sealed construction drawings shall be submitted to this office for review and comment. When approval is achieved, the Contractor shall submit the necessary number of copies of signed and sealed drawings to Authorities Having Jurisdiction for review and approval.
- C. The intent for the design and installation for the automatic fire sprinkler is to be fully sprinklered within the spaces noted on the drawings. Any exceptions to this (i.e., elevator equipment room, etc.) shall be approved in writing (prior to submission of permit drawings) by the Authority Having Jurisdiction.
- D. This Contractor's shop drawings shall be coordinated with ceilings, air devices, lighting, structural members, etc. The Contractor shall align the sprinkler heads within the center of ceiling tiles. All sprinkler heads in rooms with ceilings shall be concealed type. Any sprinkler heads shown on the performance criteria drawings are to indicate design intent. The Contractor's shop drawings shall be required to comply with the design intent. In certain areas it may be required to install more heads that required by code minimum in order to achieve the ceiling symmetry established in the design intent drawings.
- E. Contractor shall furnish a new flow test at any time during the construction of the project if requested in writing by the Authority Having Jurisdiction and/or Engineer of Record.

1.3 SUMMARY

- A. This Section includes the following:

Common Work Results for Fire Suppression

210500-1

1. Piping materials and installation instructions common to most piping systems.
2. Mechanical sleeve seals.
3. Sleeves.
4. Escutcheons.
5. Grout.
6. Equipment installation requirements common to equipment sections.
7. Painting and finishing.
8. Concrete bases.
9. Supports and anchorages.

1.4 DEFINITIONS

- A. Finished Spaces: Spaces other than mechanical and electrical equipment rooms, furred spaces, pipe chases, unheated spaces immediately below roof, spaces above ceilings, unexcavated spaces, crawlspaces, and tunnels.
- B. Exposed, Interior Installations: Exposed to view indoors. Examples include finished occupied spaces and mechanical equipment rooms.
- C. Exposed, Exterior Installations: Exposed to view outdoors or subject to outdoor ambient temperatures and weather conditions. Examples include rooftop locations.
- D. Concealed, Interior Installations: Concealed from view and protected from physical contact by building occupants. Examples include above ceilings and in chases.
- E. Concealed, Exterior Installations: Concealed from view and protected from weather conditions and physical contact by building occupants but subject to outdoor ambient temperatures. Examples include installations within unheated shelters.

1.5 SUBMITTALS

- A. Product Data: For the following:
 1. Mechanical sleeve seals.
 2. Escutcheons.
- B. Welding certificates.

1.6 QUALITY ASSURANCE

- A. Steel Support Welding: Qualify processes and operators according to AWS D1.1, "Structural Welding Code--Steel."
- B. Steel Pipe Welding: Qualify processes and operators according to ASME Boiler and Pressure Vessel Code: Section IX, "Welding and Brazing Qualifications."
 1. Comply with provisions in ASME B31 Series, "Code for Pressure Piping."
 2. Certify that each welder has passed AWS qualification tests for welding processes involved and that certification is current.
- C. Electrical Characteristics for Fire-Suppression Equipment: Equipment of higher electrical characteristics may be furnished provided such proposed equipment is approved in writing and connecting electrical services, circuit breakers, and conduit sizes are appropriately modified. If

minimum energy ratings or efficiencies are specified, equipment shall comply with requirements.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver pipes and tubes with factory-applied end caps. Maintain end caps through shipping, storage, and handling to prevent pipe end damage and to prevent entrance of dirt, debris, and moisture.

1.8 COORDINATION

- A. Arrange for pipe spaces, chases, slots, and openings in building structure during progress of construction, to allow for fire-suppression installations.
- B. Coordinate installation of required supporting devices and set sleeves in poured-in-place concrete and other structural components as they are constructed.
- C. Coordinate requirements for access panels and doors for fire-suppression items requiring access that are concealed behind finished surfaces. Access panels and doors are specified in Division 08 Section "Access Doors and Frames."

1.9 CLOSE-OUT DOCUMENTS

- A. This Contractor shall furnish Operating and Maintenance (O&M) manuals and As-built drawings before final payment will be issued.
 - 1. O&M manuals shall be submitted in accordance with Division 1, General Requirements, and shall consist of the following (at a minimum):
 - a. All Contractor and Manufacturer warranties.
 - b. List of Contractors and Parts and Equipment Suppliers—complete with contact person, proper company name, address, and telephone numbers.
 - c. Parts list for supplied equipment—including a checklist of recommended components to be stocked on-site.
 - d. Maintenance and replacement parts manuals.
 - e. Start-up and shutdown operating instructions.
 - f. Manufacturer's literature describing the equipment, which shall include wiring diagrams and operating specifications.
 - g. Control system sequence of operation, system diagram, and backup disks of the system configuration.
 - h. Sign-in sheet for Owner's training.
 - 2. List of attic stock signed for by Owner;
 - 3. Fire hydrant flow test report.
 - 4. Approval letter from State Fire Marshall.
 - 5. Sign-in sheet for training and training video, as required;
 - 6. Electronic copy of Close-Out Documents saved in PDF format on compact disk.
 - 7. The Contractor shall provide AutoCAD as-built drawings and copies of each AutoCAD file on CD before final payment will be issued.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. In other Part 2 articles where subparagraph titles below introduce lists, the following requirements apply for product selection:
 - 1. Manufacturers: Subject to compliance with requirements, provide products by the manufacturers specified.

2.2 PIPE, TUBE, AND FITTINGS

- A. Refer to individual Division 21 piping Sections for pipe, tube, and fitting materials and joining methods.
- B. Pipe Threads: ASME B1.20.1 for factory-threaded pipe and pipe fittings.

2.3 JOINING MATERIALS

- A. Refer to individual Division 21 piping Sections for special joining materials not listed below.
- B. Pipe-Flange Gasket Materials: Suitable for chemical and thermal conditions of piping system contents.
 - 1. ASME B16.21, nonmetallic, flat, asbestos-free, 1/8-inch maximum thickness unless thickness or specific material is indicated.
 - a. Full-Face Type: For flat-face, Class 125, cast-iron and cast-bronze flanges.
 - b. Narrow-Face Type: For raised-face, Class 250, cast-iron and steel flanges.
 - 2. AWWA C110, rubber, flat face, 1/8 inch thick, unless otherwise indicated; and full-face or ring type, unless otherwise indicated.
- C. Flange Bolts and Nuts: ASME B18.2.1, carbon steel, unless otherwise indicated.
- D. Solder Filler Metals: ASTM B 32, lead-free alloys. Include water-flushable flux according to ASTM B 813.
- E. Brazing Filler Metals: AWS A5.8, BCuP Series, copper-phosphorus alloys for general-duty brazing, unless otherwise indicated; and AWS A5.8, BAgl, silver alloy for refrigerant piping, unless otherwise indicated.
- F. Welding Filler Metals: Comply with AWS D10.12 for welding materials appropriate for wall thickness and chemical analysis of steel pipe being welded.

2.4 MECHANICAL SLEEVE SEALS

- A. Description: Modular sealing element unit, designed for field assembly, to fill annular space between pipe and sleeve.
 - 1. Manufacturers:
 - a. Advance Products & Systems, Inc.
 - b. Calpico, Inc.
 - c. Metraflex Co.
 - d. Pipeline Seal and Insulator, Inc.

2. Sealing Elements: EPDM interlocking links shaped to fit surface of pipe. Include type and number required for pipe material and size of pipe.
3. Pressure Plates: Galvanized Steel or Stainless Steel Include two for each sealing element.
4. Connecting Bolts and Nuts: Carbon steel with corrosion-resistant coating or Stainless Steel of length required to secure pressure plates to sealing elements. Include one for each sealing element.

2.5 SLEEVES

- A. Galvanized-Steel Sheet: 0.0239-inch minimum thickness; round tube closed with welded longitudinal joint.
- B. Steel Pipe: ASTM A 53, Type E, Grade B, Schedule 40, galvanized, plain ends.
- C. Stack Sleeve Fittings: Manufactured, cast-iron sleeve with integral clamping flange. Include clamping ring and bolts and nuts for membrane flashing.
 1. Underdeck Clamp: Clamping ring with set screws.
- D. Molded PE: Reusable, PE, tapered-cup shaped, and smooth-outer surface with nailing flange for attaching to wooden forms.

2.6 ESCUTCHEONS

- A. Description: Manufactured wall and ceiling escutcheons and floor plates, with an ID to closely fit around pipe, tube, and insulation of insulated piping and an OD that completely covers opening.
- B. One-Piece, Cast-Brass Type: With set screw.
 1. Finish: Polished chrome-plated.
- C. Split-Casting, Cast-Brass Type: With concealed hinge and set screw.
 1. Finish: Polished chrome-plated.
- D. One-Piece, Floor-Plate Type: Cast-iron floor plate.
- E. Split-Casting, Floor-Plate Type: Cast brass with concealed hinge and set screw.

2.7 GROUT

- A. Description: ASTM C 1107, Grade B, nonshrink and nonmetallic, dry hydraulic-cement grout.
 1. Characteristics: Post-hardening, volume-adjusting, nonstaining, noncorrosive, nongaseous, and recommended for interior and exterior applications.
 2. Design Mix: 5000-psi, 28-day compressive strength.
 3. Packaging: Premixed and factory packaged.

PART 3 - EXECUTION

3.1 PIPING SYSTEMS—COMMON REQUIREMENTS

- A. Install piping according to the following requirements and Division 21 Sections specifying piping systems.
- B. Drawing plans, schematics, and diagrams indicate general location and arrangement of piping systems. Indicated locations and arrangements were used to size pipe and calculate friction loss, expansion, and other design considerations. Install piping as indicated unless deviations to layout are approved on Coordination Drawings.
- C. Install piping in concealed locations, unless otherwise indicated and except in equipment rooms and service areas.
- D. Install piping indicated to be exposed and piping in equipment rooms and service areas at right angles or parallel to building walls. Diagonal runs are prohibited unless specifically indicated otherwise.
- E. Install piping above accessible ceilings to allow sufficient space for ceiling panel removal.
- F. Install piping to permit valve servicing.
- G. Install piping at indicated slopes.
- H. Install piping free of sags and bends.
- I. Install fittings for changes in direction and branch connections.
- J. Install piping to allow application of insulation.
- K. Select system components with pressure rating equal to or greater than system operating pressure.
- L. Install escutcheons for penetrations of walls, ceilings, and floors according to the following:
 - 1. New Piping:
 - a. Bare Piping at Wall and Floor Penetrations in Finished Spaces: One-piece, cast-brass type with polished chrome-plated finish.
 - b. Bare Piping at Ceiling Penetrations in Finished Spaces: One-piece or split-casting, cast-brass type with polished chrome-plated finish.
- M. Permanent sleeves are not required for holes formed by removable PE sleeves.
- N. Install sleeves for pipes passing through concrete and masonry walls, gypsum-board partitions, and concrete floor and roof slabs.
 - 1. Cut sleeves to length for mounting flush with both surfaces.
 - a. Exception: Extend sleeves installed in floors of mechanical equipment areas or other wet areas 2" (two inches) above finished floor level. Extend cast-iron sleeve fittings below floor slab as required to secure clamping ring if ring is specified.
 - 2. Install sleeves in new walls and slabs as new walls and slabs are constructed.
 - 3. Install sleeves that are large enough to provide 1/4-inch annular clear space between sleeve and pipe or pipe insulation. Use the following sleeve materials:
 - a. Steel Pipe Sleeves: For pipes smaller than NPS 6.
 - b. Steel Sheet Sleeves: For pipes NPS 6 and larger, penetrating gypsum-board partitions.

- c. Stack Sleeve Fittings: For pipes penetrating floors with membrane waterproofing. Secure flashing between clamping flanges. Install section of cast-iron soil pipe to extend sleeve to two inches above finished floor level. Refer to Division 07 Section "Sheet Metal Flashing and Trim" for flashing.
 - 1) Seal space outside of sleeve fittings with grout.
 - 4. Except for underground wall penetrations, seal annular space between sleeve and pipe or pipe insulation, using joint sealants appropriate for size, depth, and location of joint. Refer to Division 07 Section "Joint Sealants" for materials and installation.
- O. Aboveground, Exterior-Wall Pipe Penetrations: Seal penetrations using sleeves and mechanical sleeve seals. Select sleeve size to allow for 1-inch annular clear space between pipe and sleeve for installing mechanical sleeve seals.
 - 1. Install steel pipe for sleeves.
 - 2. Mechanical Sleeve Seal Installation: Select type and number of sealing elements required for pipe material and size. Position pipe in center of sleeve. Assemble mechanical sleeve seals and install in annular space between pipe and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make watertight seal.
- P. Underground, Exterior-Wall Pipe Penetrations: Install cast-iron "wall pipes" for sleeves. Seal pipe penetrations using mechanical sleeve seals. Select sleeve size to allow for 1-inch annular clear space between pipe and sleeve for installing mechanical sleeve seals.
 - 1. Mechanical Sleeve Seal Installation: Select type and number of sealing elements required for pipe material and size. Position pipe in center of sleeve. Assemble mechanical sleeve seals and install in annular space between pipe and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make watertight seal.
- Q. Fire-Barrier Penetrations: Maintain indicated fire rating of walls, partitions, ceilings, and floors at pipe penetrations. Seal pipe penetrations with firestop materials. Refer to Division 07 Section "Penetration Firestopping" for materials.
- R. Verify final equipment locations for roughing-in.
- S. Refer to equipment specifications in other Sections of these Specifications for roughing-in requirements.

3.2 PIPING JOINT CONSTRUCTION

- A. Join pipe and fittings according to the following requirements and Division 21 Sections specifying piping systems.
- B. Ream ends of pipes and tubes and remove burrs. Bevel plain ends of steel pipe.
- C. Remove scale, slag, dirt, and debris from inside and outside of pipe and fittings before assembly.
- D. Soldered Joints: Apply ASTM B 813, water-flushable flux, unless otherwise indicated, to tube end. Construct joints according to ASTM B 828 or CDA's "Copper Tube Handbook," using lead-free solder alloy complying with ASTM B 32.

- E. Brazed Joints: Construct joints according to AWS's "Brazing Handbook," "Pipe and Tube" Chapter, using copper-phosphorus brazing filler metal complying with AWS A5.8.
- F. Threaded Joints: Thread pipe with tapered pipe threads according to ASME B1.20.1. Cut threads full and clean using sharp dies. Ream threaded pipe ends to remove burrs and restore full ID. Join pipe fittings and valves as follows:
 - 1. Apply appropriate tape or thread compound to external pipe threads unless dry seal threading is specified.
 - 2. Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged. Do not use pipe sections that have cracked or open welds.
- G. Welded Joints: Construct joints according to AWS D10.12, using qualified processes and welding operators according to Part 1 "Quality Assurance" Article.
- H. Flanged Joints: Select appropriate gasket material, size, type, and thickness for service application. Install gasket concentrically positioned. Use suitable lubricants on bolt threads.

3.3 ERECTION OF METAL SUPPORTS AND ANCHORAGES

- A. Cut, fit, and place miscellaneous metal supports accurately in location, alignment, and elevation to support and anchor fire-suppression materials and equipment.
- B. Field Welding: Comply with AWS D1.1.

END OF SECTION 210500

SECTION 210517 - SLEEVES AND SLEEVE SEALS FOR FIRE-SUPPRESSION PIPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Sleeves.
 - 2. Grout.

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated.

PART 2 - PRODUCTS

2.1 SLEEVES

- A. Cast Iron Wall Pipes: Cast or fabricated of cast or ductile iron and equivalent to ductile iron pressure pipe, with plain ends and integral waterstop unless otherwise indicated.
- B. Galvanized Steel Pipe Sleeves: ASTM A 53/A 53M, Type E, Grade B, Schedule 40, zinc coated, with plain ends.

2.2 GROUT

- A. Standard: ASTM C 1107/C 1107M, Grade B, post hardening and volume adjusting, dry, hydraulic cement grout.
- B. Characteristics: Nonshrink; recommended for interior and exterior applications.
- C. Design Mix: 5000 psi, 28-day compressive strength.
- D. Packaging: Premixed and factory packaged.

PART 3 - EXECUTION

3.1 SLEEVE INSTALLATION

- A. Install sleeves for piping passing through penetrations in floors, partitions, roofs, and walls.
- B. Install sleeves in concrete floors, concrete roof slabs, and concrete walls as new slabs and walls are constructed.
 - 1. Cut sleeves to length for mounting flush with both surfaces.
 - a. Exception: Extend sleeves installed in floors of mechanical equipment areas or other wet areas 2 inches above finished floor level.

2. Using grout, seal the space outside of sleeves in slabs and walls without sleeve-seal system.
- C. Install sleeves for pipes passing through interior partitions.
 1. Cut sleeves to length for mounting flush with both surfaces.
 2. Install sleeves that are large enough to provide 1/4 inch annular clear space between sleeve and pipe or pipe insulation.
 3. Seal annular space between sleeve and piping or piping insulation; use joint sealants appropriate for size, depth, and location of joint. Comply with requirements for sealants specified in Division 07 Section "Joint Sealants."
- D. Fire-Barrier Penetrations: Maintain indicated fire rating of walls, partitions, ceilings, and floors at pipe penetrations. Seal pipe penetrations with firestop materials. Comply with requirements for firestopping specified in Division 07 Section "Penetration Firestopping."

3.2 SLEEVE AND SLEEVE-SEAL SCHEDULE

- A. Use sleeves and sleeve seals for the following piping penetration applications:
 1. Concrete Slabs above Grade:
 - a. Piping Smaller Than NPS 6: Galvanized steel-pipe sleeves.
 2. Interior Partitions:
 - a. Piping Smaller Than NPS 6: Galvanized steel pipe sleeves.

END OF SECTION 210517

SECTION 210518 - ESCUTCHEONS FOR FIRE-SUPPRESSION PIPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Escutcheons.
 - 2. Floor plates.

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated.

PART 2 - PRODUCTS

2.1 SCUTCHEONS

- A. One Piece, Cast Brass Type: With polished, chrome plated finish and setscrew fastener.
- B. One Piece, Stamped Steel Type: With chrome-plated finish and spring-clip fasteners.

2.2 FLOOR PLATES

- A. One Piece Floor Plates: Cast iron flange with holes for fasteners.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install escutcheons for piping penetrations of walls, ceilings, and finished floors.
- B. Install escutcheons with ID to closely fit around pipe, tube, and insulation of piping and with OD that completely covers opening.
 - 1. Escutcheons for New Piping:
 - a. Piping with Fitting or Sleeve Protruding from Wall: One piece, deep-pattern type.
 - b. Bare Piping at Wall and Floor Penetrations in Finished Spaces: One piece, cast brass type with polished, chrome-plated finish.
 - c. Bare Piping at Wall and Floor Penetrations in Finished Spaces: One piece, stamped-steel type.
 - d. Bare Piping at Ceiling Penetrations in Finished Spaces: One piece, cast brass type with polished, chrome-plated finish.

- e. Bare Piping at Ceiling Penetrations in Finished Spaces: One piece, stamped-steel type.
 - f. Bare Piping in Unfinished Service Spaces: One piece, cast brass type with polished, chrome-plated finish.
 - g. Bare Piping in Unfinished Service Spaces: One piece, stamped-steel type.
 - h. Bare Piping in Equipment Rooms: One piece, cast brass type with polished, chrome-plated finish.
 - i. Bare Piping in Equipment Rooms: One piece, stamped-steel type.
- C. Install floor plates for piping penetrations of equipment room floors.
- D. Install floor plates with ID to closely fit around pipe, tube, and insulation of piping and with OD that completely covers opening.
- 1. New Piping: One piece, floor plate type.
- 3.2 FIELD QUALITY CONTROL
- A. Replace broken and damaged escutcheons and floor plates using new materials.

END OF SECTION 210518

SECTION 210529 - PIPE HANGERS AND SUPPORTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUBMITTALS

- A. Shop Drawings:
 - 1. Details of upper hanger attachments for piping 4 inches in diameter and over
- B. Product Data: Catalog sheets, specifications and installation instructions for each item specified except fasteners.

1.3 QUALITY ASSURANCE

- A. Regulatory Requirements:
 - 1. Comply with the applicable requirements of the ASME B31 Piping Codes.
 - 2. Unless otherwise shown or specified, comply with the requirements of the Manufacturer's Standardization Society of the Valve and Fittings Industry (MSS) Standards SP-58, and SP-69.
 - 3. Materials for use in Sprinkler Systems shall comply with the requirements of NFPA 13 as applicable.

PART 2 - PRODUCTS

2.1 PIPE HANGERS AND SUPPORTS

- A. Pipe Hangers: Height adjustable standard duty clevis type, with cross bolt and nut.
 - 1. Swivel ring type hangers will be allowed for sprinkler piping up to a maximum of 2 inches in size.
- B. Adjustable Floor Rests and Base Flanges: Steel.
- C. Hanger Rods: Mild, low carbon steel, fully threaded or threaded at each end, with two nuts at each end for positioning rod and hanger, and locking each in place.
- D. Riser Clamps: Malleable iron or steel.

2.2 ANCHORS AND ATTACHMENTS

- A. Sleeve Anchors (Group II, Type 3, Class 3): Molly's Div./USM Corp. Parasleeve Series, Ramset's Dynabolt Series, or Red Head/Phillips AN, HN, or FS Series.
- B. Wedge Anchors (Zinc Plated, Group II, Type 4, Class 1): Hilti's Kwik Bolt Series, Molly's Div./USM Corp. Parabolt PB Series, Ramset's Trubolt T Series, or Red Head/Phillips WS Series.

- C. Self-Drilling Anchors (Group III, Type 1): Ramset's RD Series, or Red Head/Phillips S Series.
- D. Non-Drilling Anchors (Group VIII, Type 1): Ramset's Dynaset DS Series, Hilti's HDI Series, or Red Head/Phillips J Series.
- E. Stud Anchors (Group VIII, Type 2): Red Head/Phillips JS Series.
- F. Beam Clamps: Forged steel beam clamp, with weldless eye nut (right hand thread), steel tie rod, nuts, and washers, Grinnell's Fig No. 292 (size for load, beam flange width, and rod size required).
- G. Metal Deck Ceiling Bolts: B-Line Systems' Fig. B3019.

2.3 FASTENERS

- A. Bolts, Nuts, Washers, Lags, and Screws: Medium carbon steel; size and type to suit application; galvanized for high humidity locations, and treated wood; plain finish for other interior locations. Except where shown otherwise on the Drawings, furnish type, size, and grade required for proper installation of the Work.

2.4 SHOP PAINTING AND PLATING

- A. Hangers, supports, rods, inserts and accessories used for pipe supports, unless chromium plated, cadmium plated or galvanized shall be shop coated with metal primer paint.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Do not hang or support one pipe from another or from ductwork.
 - 1. Do not bend threaded rod.
- B. Space hangers or supports for horizontal piping on maximum center distances as listed in the following hanger schedules, except as otherwise specified, or noted on the Drawings.
 - 1. For Steel Pipe:

PIPE SIZE (Inches)	MAXIMUM SPACING (Feet)
1 and under	8
1-1/4 and 1-1/2	9
2	10
2-1/2 and up	12

2. For Grooved End Steel Pipe:

PIPE SIZE (Inches)	MAXIMUM SPACING (Feet)
1-1/2 and under	7
2 through 4	10

No pipe length shall be left unsupported between any two coupling joints.

3. For Directional Changes: Install a hanger or support close to the point of change of direction of all pipe runs in either a horizontal or vertical plane.
4. For Concentrated Loads: Install additional hangers or supports, spaced as required and directed, at locations where concentrated loads such as valves, fittings or accessories occur, to support the concentrated loads.
5. For Branch Piping Runs and Runouts Over 5 feet In Length: Install a minimum of one hanger, and additional hangers if required by the hanger spacing schedules.

C. Minimum Hanger Rod Size:

PIPE OR TUBING SIZE (Inches)	SINGLE ROD HANGER SIZE (Inches)		DOUBLE ROD HANGER SIZE (Inches)	
	PIPE	TUBING	PIPE	TUBING
1/2 to 2	3/8	1/4	3/8	1/4
2-1/2 and 3	1/2	3/8	3/8	1/4
4 and 5	5/8	1/2	1/2	3/8

E. Vertical Piping:

1. Support vertical risers of piping systems, by means of heavy-duty hangers installed close to base of pipe risers, and by riser clamps with extension arms at intermediate floors, with the distance between clamps not to exceed 25 feet, unless otherwise specified. Support pipe risers in vertical shafts equivalent to the aforementioned. Install riser clamps above floor slabs, with the extension arms resting on floor slabs. Provide adequate clearances for risers that are subject to appreciable expansion and contraction, caused by operating temperature ranges.
2. Support extension arms of riser clamps, secured to risers to be insulated for cold service, 4 inches above floor slabs, to allow room for insulating and vapor sealing around riser clamps.

- F. Floor Supports: Install adjustable yoke rests with base flanges, for the support of piping, unless otherwise indicated on the Drawings. Install supports in a manner, which will not be detrimental to the building structure.

3.2 UPPER HANGER ATTACHMENTS

- A. General:
 - 1. Secure upper hanger attachments to overhead structural steel, steel bar joists, or other suitable structural members.
 - 2. Do not attach hangers to steel decks that are not to receive concrete fill.
 - 3. Do not use flat bars or bent rods as upper hanger attachments.
- B. Attachment to Steel Frame Construction: Provide intermediate structural steel members where required by pipe support spacing. Select steel members for use as intermediate supports based on a minimum safety factor of five.
 - 1. Do not use drive-on beam clamps.
 - 2. Do not support piping over 4 inches in size from steel bar joists. Secure upper hanger attachments to steel bar joists at panel points of joists.
 - 3. Do not drill holes in main structural steel members.
 - 4. Beam clamps, with tie rods as specified, may be used as upper hanger attachments for the support of piping, subject to clamp manufacturer's recommended limits.
- C. Attachment to Concrete Filled Steel Decks:
 - 1. New Construction: Install metal deck ceiling bolts.
 - 2. Existing Construction: Install welding studs (except at roof decks). Do not support a load in excess of 250lbs from any single welded stud.
 - 3. Do not attach hangers to decks less than 2-1/2 inches thick.
- D. Attachment to Existing Cast-In-Place Concrete:
 - 1. For piping up to a maximum of 4 inches in size, secure hangers to overhead construction with self-drilling type expansion shields and machine bolts.
 - 2. Secure hangers to wall or floor construction with single unit expansion shields or self-drilling type expansion shields and machine bolts.

END OF SECTION 210529

SECTION 211313 - WET-PIPE SPRINKLER SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Pipes, fittings, and specialties.
 - 2. Fire-protection valves.
 - 3. Sprinklers.
 - 4. Alarm devices.
 - 5. Manual control stations.
 - 6. Control panels.
 - 7. Pressure gages.

1.3 DEFINITIONS

- A. Standard-Pressure Sprinkler Piping: Wet-pipe sprinkler system piping designed to operate at working pressure of 175 psig maximum.

1.4 SYSTEM DESCRIPTIONS

- A. Wet-Pipe Sprinkler System: Automatic sprinklers are attached to piping containing water and that is connected to water supply through alarm valve. Water discharges immediately from sprinklers when they are opened. Sprinklers open when heat melts fusible link or destroys frangible device. Hose connections are included if indicated.

1.5 PERFORMANCE REQUIREMENTS

- A. Standard-Pressure Piping System Component: Listed for 175 psig minimum working pressure.
- B. Delegated Design: Design sprinkler system(s), including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.
- C. Sprinkler system design shall be approved by authorities having jurisdiction.
 - 1. Margin of Safety for Available Water Flow and Pressure: 10 percent, including losses through water service piping, valves, and backflow preventers.
 - 2. Sprinkler Occupancy Hazard Classifications:
 - a. Refer to drawings.
 - 3. Minimum Density for Automatic Sprinkler Piping Design:
 - a. Light-Hazard Occupancy: 0.10 gpm over 1500-sq. ft. area.
 - 4. Total Combined Hose-Stream Demand Requirement: Refer to drawings.

1.6 SUBMITTALS

- A. Product Data: For each type of product indicated. Include rated capacities, operating characteristics, electrical characteristics, and furnished specialties and accessories.
- B. Shop Drawings: For wet-pipe sprinkler systems. Include plans, elevations, sections, details, and attachments to other work.
 - 1. Wiring Diagrams: For power, signal, and control wiring.
- C. Delegated-Design Submittal: For sprinkler systems indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
- D. Coordination Drawings: Sprinkler systems, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of the items involved:
 - 1. Domestic water piping.
 - 2. HVAC hydronic piping and ductwork.
 - 3. Items penetrating finished ceiling include the following:
 - a. Lighting fixtures.
 - b. Air outlets and inlets.
 - c. HVAC equipment.
- E. Coordinate first paragraph below with qualification requirements in Division 01 Section "Quality Requirements" and as supplemented in "Quality Assurance" Article.
- F. Qualification Data: For qualified Installer and professional engineer.
- G. Approved Sprinkler Piping Drawings: Working plans, prepared according to NFPA 13, that have been approved by authorities having jurisdiction, and including hydraulic calculations.
- H. Welding certificates.
- I. Fire pump flow test report.
- J. Field Test Reports and Certificates: Indicate and interpret test results for compliance with performance requirements and as described in NFPA 13. Include "Contractor's Material and Test Certificate for Aboveground Piping."
- K. Field quality control reports.
- L. Operation and Maintenance Data: For sprinkler specialties to include in emergency, operation, and maintenance manuals.

1.7 QUALITY ASSURANCE

- A. Installer Qualifications:
 - 1. Installer's responsibilities include designing, fabricating, and installing sprinkler systems and providing professional engineering services

needed to assume engineering responsibility. Base calculations on results of fire hydrant flow test.

- a. Engineering Responsibility: Preparation of working plans, calculations, and field test reports by a qualified professional engineer.
- B. Welding Qualifications: Qualify procedures and operators according to ASME Boiler and Pressure Vessel Code.
- C. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- D. NFPA Standards: Sprinkler system equipment, specialties, accessories, installation, and testing shall comply with the following:
 1. NFPA 13, "Installation of Sprinkler Systems."

1.8 PROJECT CONDITIONS

- A. Interruption of Existing Sprinkler Service: Do not interrupt sprinkler service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary sprinkler service according to requirements indicated:
 1. Notify Owner's Representative no fewer than five days in advance of proposed interruption of sprinkler service.
 2. Do not proceed with interruption of sprinkler service without Owner's Representative's written permission.

1.9 COORDINATION

- A. Coordinate layout and installation of sprinklers with other construction that penetrates ceilings, including light fixtures, HVAC equipment, and partition assemblies.

1.10 EXTRA MATERIALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 1. Sprinkler Cabinets: Finished, wall-mounted, steel cabinet with hinged cover, and with space for minimum of six spare sprinklers plus sprinkler wrench. Include number of sprinklers required by NFPA 13 and sprinkler wrench. Include separate cabinet with sprinklers and wrench for each type of sprinkler used on Project.

PART 2 - PRODUCTS

- 2.1 **REFER TO SCHEDULES AND EQUIPMENT NOTES ON DRAWINGS FOR BASIS OF DESIGN MATERIALS, MANUFACTURERS AND MODEL NUMBERS.**

2.2 PIPING MATERIALS

- A. Comply with requirements in "Piping Schedule" Article for applications of pipe, tube, and fitting materials, and for joining methods for specific services, service locations, and pipe sizes.

2.3 STEEL PIPE AND FITTINGS

- A. Standard Weight, Black-Steel Pipe: ASTM A 53/A 53M. Pipe ends may be factory or field formed to match joining method.
- B. Schedule 10, Black-Steel Pipe: ASTM A 135 or ASTM A 795/A 795M, Schedule 10 in NPS 5 and smaller; and NFPA 13-specified wall thickness in NPS 6 to NPS 10, plain end.
- C. Black Steel Pipe Nipples: ASTM A 733, made of ASTM A 53/A 53M, standard weight, seamless steel pipe with threaded ends.
- D. Uncoated, Steel Couplings: ASTM A 865, threaded.
- E. Uncoated, Gray-Iron Threaded Fittings: ASME B16.4, Class 125, standard pattern.
- F. Grooved Joint, Steel Pipe Appurtenances:
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Anvil International, Inc.
 - b. Corcoran Piping System Co.
 - c. National Fittings, Inc.
 - d. Shurjoint Piping Products.
 - e. Tyco Fire & Building Products LP.
 - f. Victaulic Company.
 - 2. Pressure Rating: 175 psig minimum.
 - 3. Uncoated, Grooved-End Fittings for Steel Piping: ASTM A 47/A 47M, malleable-iron casting or ASTM A 536, ductile-iron casting; with dimensions matching steel pipe.
 - 4. Grooved-End-Pipe Couplings for Steel Piping: AWWA C606 and UL 213, rigid pattern, unless otherwise indicated, for steel-pipe dimensions. Include ferrous housing sections, EPDM-rubber gasket, and bolts and nuts.

2.4 LISTED FIRE-PROTECTION VALVES

- A. General Requirements:
 - 1. Valves shall be UL listed or FM approved.
 - 2. Minimum Pressure Rating for Standard-Pressure Piping: 175 psig.
- B. Ball Valves:
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Anvil International, Inc.

- b. Victaulic Company.
 2. Standard: UL 1091 except with ball instead of disc.
 3. Valves NPS 1-1/2 and Smaller: Bronze body with threaded ends.
 4. Valves NPS 2 and NPS 2-1/2: Bronze body with threaded ends or ductile-iron body with grooved ends.
 5. Valves NPS 3: Ductile-iron body with grooved ends.
- C. Iron Butterfly Valves:
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Anvil International, Inc.
 - b. Fivalco Inc.
 - c. Global Safety Products, Inc.
 - d. Kennedy Valve; a division of McWane, Inc.
 - e. Milwaukee Valve Company.
 - f. NIBCO INC.
 - g. Pratt, Henry Company.
 - h. Shurjoint Piping Products.
 - i. Tyco Fire & Building Products LP.
 - j. Victaulic Company.
 2. Standard: UL 1091.
 3. Pressure Rating: 175 psig.
 4. Body Material: Cast or ductile iron.
 5. Style: Lug or wafer.
 6. End Connections: Grooved.
- D. NRS Gate Valves:
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the work include, but are not limited to, the following:
 - a. Retain option in first subparagraph below if manufacturer's name and model number are indicated in schedules or plans on Drawings; delete option and insert manufacturer's name and model number if not included on Drawings.
 - b. American Cast Iron Pipe Company; Waterous Company Subsidiary.
 - c. American Valve, Inc.
 - d. Clow Valve Company; a division of McWane, Inc.
 - e. Crane Co.; Crane Valve Group; Stockham Division.
 - f. Kennedy Valve; a division of McWane, Inc.
 - g. Mueller Co.; Water Products Division.
 - h. NIBCO INC.
 - i. Tyco Fire & Building Products LP.
 2. Standard: UL 262.
 3. Pressure Rating: 250 psig minimum.
 4. Body Material: Cast iron with indicator post flange.
 5. Stem: Nonrising.
 6. End Connections: Flanged or grooved.

2.5 TRIM AND DRAIN VALVES

- A. General Requirements:
 - 1. Standard: UL's "Fire Protection Equipment Directory" listing or "Approval Guide," published by FM Global, listing.
 - 2. Pressure Rating: 175 psig minimum.
- B. Ball Valves:
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Affiliated Distributors.
 - b. Anvil International, Inc.
 - c. Barnett.
 - d. Conbraco Industries, Inc.; Apollo Valves.
 - e. Fire-End & Croker Corporation.
 - f. Fire Protection Products, Inc.
 - g. Flowserve.
 - h. FNW.
 - i. Jomar International, Ltd.
 - j. Kennedy Valve; a division of McWane, Inc.
 - k. Kitz Corporation.
 - l. Legend Valve.
 - m. Metso Automation USA Inc.
 - n. Milwaukee Valve Company.
 - o. NIBCO INC.
 - p. Potter Roemer.
 - q. Red-White Valve Corporation.
 - r. Southern Manufacturing Group.
 - s. Stewart, M. A. and Sons Ltd.
 - t. Tyco Fire & Building Products LP.
 - u. Victaulic Company.
 - v. Watts Water Technologies, Inc.

2.6 SPRINKLER SPECIALTY PIPE FITTINGS

- A. Branch Outlet Fittings:
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the work include, but are not limited to, the following:
 - a. Anvil International, Inc.
 - b. National Fittings, Inc.
 - c. Shurjoint Piping Products.
 - d. Tyco Fire & Building Products LP.
 - e. Victaulic Company.
 - 2. Standard: UL 213.
 - 3. Pressure Rating: 175 psig minimum.
 - 4. Body Material: Ductile-iron housing with EPDM seals and bolts and nuts.
 - 5. Type: Mechanical-T and cross fittings.
 - 6. Configurations: Snap-on and strapless, ductile-iron housing with branch outlets.
 - 7. Size: Of dimension to fit onto sprinkler main and with outlet connections as required to match connected branch piping.

8. Branch Outlets: Grooved, plain-end pipe, or threaded.

B. Flow Detection and Test Assemblies:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the work include, but are not limited to, the following:
 - a. AGF Manufacturing Inc.
 - b. Reliable Automatic Sprinkler Co., Inc.
 - c. Tyco Fire & Building Products LP.
 - d. Victaulic Company.
2. Standard: UL's "Fire Protection Equipment Directory" listing or "Approval Guide," published by FM Global, listing.
3. Pressure Rating: 175 psig minimum.
4. Body Material: Cast- or ductile-iron housing with orifice, sight glass, and integral test valve.
5. Size: Same as connected piping.
6. Inlet and Outlet: Threaded.

C. Branch Line Testers:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the work include, but are not limited to, the following:
 - a. Elkhart Brass Mfg. Company, Inc.
 - b. Fire-End & Croker Corporation.
 - c. Potter Roemer.
2. Standard: UL 199.
3. Pressure Rating: 175 psig.
4. Body Material: Brass.
5. Size: Same as connected piping.
6. Inlet: Threaded.
7. Drain Outlet: Threaded and capped.
8. Branch Outlet: Threaded, for sprinkler.

D. Sprinkler Inspector's Test Fittings:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the work include, but are not limited to, the following:
 - a. AGF Manufacturing Inc.
 - b. Triple R Specialty.
 - c. Tyco Fire & Building Products LP.
 - d. Victaulic Company.
 - e. Viking Corporation.
2. Standard: UL's "Fire Protection Equipment Directory" listing or "Approval Guide," published by FM Global, listing.
3. Pressure Rating: 175 psig minimum.
4. Body Material: Cast- or ductile-iron housing with sight glass.
5. Size: Same as connected piping.
6. Inlet and Outlet: Threaded.

E. Adjustable Drop Nipples:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the work include, but are not limited to, the following:
 - a. CECA, LLC.
 - b. Corcoran Piping System Co.
 - c. Merit Manufacturing; a division of Anvil International, Inc.
2. Standard: UL 1474.
3. Pressure Rating: 250 psig minimum
4. Body Material: Steel pipe with EPDM-rubber O-ring seals.
5. Size: Same as connected piping.
6. Length: Adjustable.
7. Inlet and Outlet: Threaded.

2.7

SPRINKLERS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 1. AFAC Inc.
 2. Globe Fire Sprinkler Corporation.
 3. Reliable Automatic Sprinkler Co., Inc.
 4. Tyco Fire & Building Products LP.
 5. Venus Fire Protection Ltd.
 6. Victaulic Company.
 7. Viking Corporation.
- B. General Requirements:
 1. Standard: UL's "Fire Protection Equipment Directory" listing or "Approval Guide," published by FM Global, listing.
 2. Pressure Rating for Automatic Sprinklers: 175 psig minimum.
- C. Automatic Sprinklers with Heat-Responsive Element:
 1. Characteristics: Nominal 1/2-inch orifice with Discharge Coefficient K of 5.6, and for "Ordinary" temperature classification rating unless otherwise indicated or required by application.
- D. Sprinkler Guards:
 1. See Editing Instruction No. 1 in the Evaluations for cautions about naming manufacturers. See Division 01 Section "Product Requirements."
 2. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Reliable Automatic Sprinkler Co., Inc.
 - b. Tyco Fire & Building Products LP.
 - c. Victaulic Company.
 - d. Viking Corporation.
 3. Standard: UL 199.
 4. Type: Wire cage with fastening device for attaching to sprinkler.

2.8 ALARM DEVICES

- A. Alarm-device types shall match piping and equipment connections.
- B. Water-Flow Indicators:
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. ADT Security Services, Inc.
 - b. McDonnell & Miller; ITT Industries.
 - c. Potter Electric Signal Company.
 - d. System Sensor; a Honeywell company.
 - e. Viking Corporation.
 - f. Watts Industries (Canada) Inc.
 - 2. Standard: UL 346.
 - 3. Water-Flow Detector: Electrically supervised.
 - 4. Components: Two single-pole, double-throw circuit switches for isolated alarm and auxiliary contacts, 7 A, 125-V ac and 0.25 A, 24-V dc; complete with factory-set, field-adjustable retard element to prevent false signals and tamperproof cover that sends signal if removed.
 - 5. Type: Paddle operated.
 - 6. Pressure Rating: 250 psig.
 - 7. Design Installation: Horizontal or vertical.
- C. Valve Supervisory Switches:
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Fire-Lite Alarms, Inc.; a Honeywell company.
 - b. Kennedy Valve; a division of McWane, Inc.
 - c. Potter Electric Signal Company.
 - d. System Sensor; a Honeywell company.
 - 2. Standard: UL 346.
 - 3. Type: Electrically supervised.
 - 4. Components: Single-pole, double-throw switch with normally closed contacts.
 - 5. Design: Signals that controlled valve is in other than fully open position.

2.9 PRESSURE GAGES

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. AMETEK; U.S. Gauge Division.
 - 2. Ashcroft, Inc.
 - 3. Brecco Corporation.
 - 4. WIKA Instrument Corporation.
- B. Standard: UL 393.
- C. Dial Size: 3-1/2- to 4-1/2-inch diameter.

- D. Pressure Gage Range: 0 to 250 psig minimum.
- E. Water System Piping Gage: Include "WATER" or "AIR/WATER" label on dial face.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Perform fire pump flow test according to NFPA 13 and NFPA 291. Use results for system design calculations required in "Quality Assurance" Article.
- B. Report test results promptly and in writing.

3.2 PIPING INSTALLATION

- A. Locations and Arrangements: Drawing plans, schematics, and diagrams indicate general location and arrangement of piping. Install piping as indicated, as far as practical.
 - 1. Deviations from approved working plans for piping require written approval from authorities having jurisdiction. File written approval with Architect before deviating from approved working plans.
- B. Piping Standard: Comply with requirements for installation of sprinkler piping in NFPA 13.
- C. Use listed fittings to make changes in direction, branch takeoffs from mains, and reductions in pipe sizes.
- D. Install unions adjacent to each valve in pipes NPS 2 and smaller.
- E. Install flanges, flange adapters, or couplings for grooved end piping on valves, apparatus, and equipment having NPS 2-1/2 and larger end connections.
- F. Install "Inspector's Test Connections" in sprinkler system piping, complete with shutoff valve, and sized and located according to NFPA 13.
- G. Install sprinkler piping with drains for complete system drainage.
- H. Install sprinkler control valves, test assemblies, and drain risers adjacent to standpipes when sprinkler piping is connected to standpipes.
- I. Install alarm devices in piping systems.
- J. Install hangers and supports for sprinkler system piping according to NFPA 13. Comply with requirements for hanger materials in NFPA 13.
- K. Install pressure gages on riser or feed main, at each sprinkler test connection, and at top of each standpipe. Include pressure gages with connection not less than NPS 1/4 and with soft metal seated globe valve, arranged for draining pipe between gage and valve. Install gages to permit removal, and install where they will not be subject to freezing.

- L. Fill sprinkler system piping with water.
- M. Install sleeves for piping penetrations of walls, ceilings, and floors. Comply with requirements for sleeves specified in Division 21 Section "Sleeves and Sleeve Seals for Fire-Suppression Piping."
- N. Install sleeve seals for piping penetrations of concrete walls and slabs. Comply with requirements for sleeve seals specified in Division 21 Section "Sleeves and Sleeve Seals for Fire-Suppression Piping."
- O. Install escutcheons for piping penetrations of walls, ceilings, and floors. Comply with requirements for escutcheons specified in Division 21 Section "Escutcheons for Fire-Suppression Piping."

3.3 JOINT CONSTRUCTION

- A. Install couplings, flanges, flanged fittings, unions, nipples, and transition and special fittings that have finish and pressure ratings same as or higher than system's pressure rating for aboveground applications unless otherwise indicated.
- B. Install unions adjacent to each valve in pipes NPS 2 and smaller.
- C. Install flanges, flange adapters, or couplings for grooved-end piping on valves, apparatus, and equipment having NPS 2-1/2 and larger end connections.
- D. Ream ends of pipes and tubes and remove burrs. Bevel plain ends of steel pipe.
- E. Remove scale, slag, dirt, and debris from inside and outside of pipes, tubes, and fittings before assembly.
- F. Flanged Joints: Select appropriate gasket material in size, type, and thickness suitable for water service. Join flanges with gasket and bolts according to ASME B31.9.
- G. Threaded Joints: Thread pipe with tapered pipe threads according to ASME B1.20.1. Cut threads full and clean using sharp dies. Ream threaded pipe ends to remove burrs and restore full ID. Join pipe fittings and valves as follows:
 - 1. Apply appropriate tape or thread compound to external pipe threads.
 - 2. Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged.
- H. Twist-Locked Joints: Insert plain end of steel pipe into plain-end pipe fitting. Rotate retainer lugs one-quarter turn or tighten retainer pin.
- I. Steel-Piping, Pressure-Sealed Joints: Join lightwall steel pipe and steel pressure-seal fittings with tools recommended by fitting manufacturer.
- J. Welded Joints: Construct joints according to AWS D10.12M/D10.12, using qualified processes and welding operators according to "Quality Assurance" Article.
 - 1. Shop weld pipe joints where welded piping is indicated. Do not use welded joints for galvanized-steel pipe.

- K. Steel-Piping, Cut-Grooved Joints: Cut square-edge groove in end of pipe according to AWWA C606. Assemble coupling with housing, gasket, lubricant, and bolts. Join steel pipe and grooved-end fittings according to AWWA C606 for steel pipe joints.
- L. Steel-Piping, Roll-Grooved Joints: Roll rounded-edge groove in end of pipe according to AWWA C606. Assemble coupling with housing, gasket, lubricant, and bolts. Join steel pipe and grooved-end fittings according to AWWA C606 for steel pipe grooved joints.
- M. Steel-Piping, Pressure-Sealed Joints: Join Schedule 5 steel pipe and steel pressure-seal fittings with tools recommended by fitting manufacturer.
- N. Dissimilar-Material Piping Joints: Make joints using adapters compatible with materials of both piping systems.

3.4 VALVE AND SPECIALTIES INSTALLATION

- A. Install listed fire-protection valves, trim and drain valves, specialty valves and trim, controls, and specialties according to NFPA 13 and authorities having jurisdiction.
- B. Install listed fire-protection shutoff valves supervised open, located to control sources of water supply except from fire department connections. Install permanent identification signs indicating portion of system controlled by each valve.

3.5 SPRINKLER INSTALLATION

- A. Install sprinklers in suspended ceilings in center of narrow dimension of acoustical ceiling panels.

3.6 IDENTIFICATION

- A. Install labeling and pipe markers on equipment and piping according to requirements in NFPA 13.
- B. Identify system components, wiring, cabling, and terminals. Comply with requirements for identification specified in Division 26 Section "Identification for Electrical Systems."

3.7 FIELD QUALITY CONTROL

- A. Perform tests and inspections.
- B. Tests and Inspections:
 - 1. Leak Test: After installation, charge systems and test for leaks. Repair leaks and retest until no leaks exist.
 - 2. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
 - 3. Flush, test, and inspect sprinkler systems according to NFPA 13, "Systems Acceptance" Chapter.
 - 4. Energize circuits to electrical equipment and devices.
 - 5. Coordinate with fire alarm tests. Operate as required.

- C. Sprinkler piping system will be considered defective if it does not pass tests and inspections.
- D. Prepare test and inspection reports.

3.8 CLEANING

- A. Clean dirt and debris from sprinklers.
- B. Remove and replace sprinklers with paint other than factory finish.

3.9 PIPING SCHEDULE

- A. Sprinkler specialty fittings may be used, downstream of control valves, instead of specified fittings.
- B. Standard-pressure, wet-pipe sprinkler system, NPS 2 and smaller, shall be the following:
 - 1. Standard weight, black-steel pipe with threaded ends; uncoated, gray-iron threaded fittings; and threaded joints.
- C. Standard-pressure, wet-pipe sprinkler system, NPS 2-1/2 AND OVER, shall be the following:
 - 1. Schedule 10, black-steel pipe with roll-grooved ends; uncoated, grooved-end fittings for steel piping; grooved-end pipe couplings for steel piping; and grooved joints.

3.10 SPRINKLER SCHEDULE

- A. Refer to drawings.

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END OF SECTION 211313

SECTION 211316 - DRY-PIPE SPRINKLER SYSTEMS

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Pipes, fittings, and specialties.
2. Fire-protection valves.
3. Sprinkler specialty pipe fittings.
4. Sprinklers.

B. Related Sections:

1. Division 28 Section "Digital, Addressable Fire-Alarm System" for alarm devices not specified in this Section.

1.3 DEFINITIONS

- A. Standard-Pressure Sprinkler Piping: Dry-pipe sprinkler system piping designed to operate at working pressure 175 psig maximum.

1.4 SYSTEM DESCRIPTIONS

- A. Dry-Pipe Sprinkler System: Automatic sprinklers are attached to piping containing compressed air. Opening of sprinklers releases compressed air and permits water pressure to open dry-pipe valve. Water then flows into piping and discharges from sprinklers that are open.

1.5 PERFORMANCE REQUIREMENTS

- A. Standard-Pressure Piping System Component: Listed for 175-psig minimum working pressure.
- B. Delegated Design: Design sprinkler system(s), including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.
- C. Sprinkler system design shall be approved by authorities having jurisdiction.
 1. Margin of Safety for Available Water Flow and Pressure: 10 percent, including losses through water-service piping, valves, and backflow preventers.
 2. Sprinkler Occupancy Hazard Classifications:
 - a. Meeting, Office, Lavatory: Light-Hazard
 - b. Apparatus, Kitchen, Storage: Ordinary-Hazard Group I

3. Minimum Density for Automatic-Sprinkler Piping Design:
 - a. Light-Hazard Occupancy: 0.10 gpm over 1500-sq. ft. area.
 - b. Ordinary-Hazard, Group 1 Occupancy: 0.15 gpm over 1500-sq. ft. area.
4. Maximum Protection Area per Sprinkler: Per UL listing.
5. Maximum Protection Area per Sprinkler:
 - a. Office Spaces: 225 sq. ft.
 - b. Apparatus, Kitchen, Storage Areas: 130 sq. ft..
 - c. Mechanical Equipment Rooms: 130 sq. ft..
 - d. Other Areas: According to NFPA 13 recommendations unless otherwise indicated.

1.6 SUBMITTALS

- A. Product Data: For each type of product indicated. Include rated capacities, operating characteristics, electrical characteristics, and furnished specialties and accessories.
- B. Shop Drawings: For dry-pipe sprinkler systems. Include plans, elevations, sections, details, and attachments to other work.
 1. Wiring Diagrams: For power, signal, and control wiring.
- C. Delegated-Design Submittal: For sprinkler systems indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional NYS licensed engineer responsible for their preparation.
- D. Coordination Drawings: Sprinkler systems, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of the items involved:
 1. Domestic water piping.
 2. HVAC hydronic piping.
 3. Items penetrating finished ceiling including the following:
 - a. Lighting fixtures.
 - b. Air outlets and inlets.
 - c. Fire Alarm Devices.
 4. Sanitary/vent piping.
- E. Approved Sprinkler Piping Drawings: Working plans, prepared according to NFPA 13, that have been approved by authorities having jurisdiction, including hydraulic calculations if applicable.
- F. Fire-hydrant flow test report.
- G. Field Test Reports and Certificates: Indicate and interpret test results for compliance with performance requirements and as described in NFPA 13. Include "Contractor's Material and Test Certificate for Aboveground Piping."
- H. Field quality-control reports.
- I. Operation and Maintenance Data: For sprinkler specialties to include in emergency, operation, and maintenance manuals.

1.7 QUALITY ASSURANCE

A. Installer Qualifications:

1. Installer's responsibilities include designing, fabricating, and installing sprinkler systems and providing professional engineering services needed to assume engineering responsibility. Base calculations on results of fire-hydrant flow test.
 - a. Engineering Responsibility: Preparation of working plans, calculations, and field test reports by a qualified professional engineer.

B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

C. NFPA Standards: Sprinkler system equipment, specialties, accessories, installation, and testing shall comply with the following:

1. NFPA 13, "Installation of Sprinkler Systems."

1.8 COORDINATION

A. Coordinate layout and installation of sprinklers with other construction that penetrates ceilings, including light fixtures, HVAC equipment, and partition assemblies.

1.9 EXTRA MATERIALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Sprinkler Cabinets: Finished, wall-mounted, steel cabinet with hinged cover, and with space for minimum of six spare sprinklers plus sprinkler wrench. Include number of sprinklers required by NFPA 13 and sprinkler wrench. Include separate cabinet with sprinklers and wrench for each type of sprinkler used on Project.

PART 2 PRODUCTS

2.1 PIPING MATERIALS

A. Comply with requirements in "Piping Schedule" Article for applications of pipe, tube, and fitting materials, and joining methods for specific services, service locations, and pipe sizes.

2.2 REFER TO SCHEDULES AND EQUIPMENT NOTES ON DRAWINGS FOR BASIS OF DESIGN MATERIALS, MANUFACTURERS AND MODEL NUMBERS.

2.3 STEEL PIPE AND FITTINGS

A. Standard Weight, Galvanized-Steel Pipe: ASTM A 53/A 53M. Pipe ends may be factory or field formed to match joining method.

B. Galvanized-Steel Pipe Nipples: ASTM A 733, made of ASTM A 53/A 53M, standard-weight, seamless steel pipe with threaded ends.

- C. Galvanized, Steel Couplings: ASTM A 865, threaded.
- D. Galvanized, Gray-Iron Threaded Fittings: ASME B16.4, Class 125, standard pattern.
- E. Malleable- or Ductile-Iron Unions: UL 860.
- F. Cast-Iron Flanges: ASME B16.1, Class 125.
- G. Grooved-Joint, Steel-Pipe Appurtenances:
 - 1. Pressure Rating: 175 psig minimum.
 - 2. Galvanized, Grooved-End Fittings for Steel Piping: ASTM A 47/A 47M, malleable-iron casting or ASTM A 536, ductile-iron casting; with dimensions matching steel pipe.
 - 3. Grooved-End-Pipe Couplings for Steel Piping: AWWA C606 and UL 213, rigid pattern, unless otherwise indicated, for steel-pipe dimensions. Include ferrous housing sections, EPDM-rubber gasket, and bolts and nuts.

2.4 PIPING JOINING MATERIALS

- A. Pipe-Flange Gasket Materials: AWWA C110, rubber, flat face, 1/8 inch thick.
 - 1. Class 125, Cast-Iron and Class 150, Bronze Flat-Face Flanges: Full-face gaskets.
 - 2. Class 250, Cast-Iron and Class 300, Raised-Face Flanges: Ring-type gaskets.
- B. Metal, Pipe-Flange Bolts and Nuts: ASME B18.2.1, carbon steel unless otherwise indicated.
- C. Brazing Filler Metals: AWS A5.8/A5.8M, BCuP Series, copper-phosphorus alloys for general-duty brazing unless otherwise indicated.

2.5 LISTED FIRE-PROTECTION VALVES

- A. General Requirements:
 - 1. Valves shall be UL listed or FM approved.
 - 2. Minimum Pressure Rating for Standard-Pressure Piping: 175 psig.
- B. Ball Valves:
 - 1. Standard: UL 1091 except with ball instead of disc.
 - 2. Valves NPS 1-1/2 and Smaller: Bronze body with threaded ends.
 - 3. Valves NPS 2 and NPS 2-1/2: Bronze body with threaded ends or ductile-iron body with grooved ends.
 - 4. Valves NPS 3: Ductile-iron body with grooved ends.
- C. Check Valves:
 - 1. Standard: UL 312
 - 2. Pressure Rating: 250 psig minimum.
 - 3. Type: Swing check.
 - 4. Body Material: Cast iron.
 - 5. End Connections: Flanged or grooved.
- D. Iron OS&Y Gate Valves:
 - 1. Standard: UL 262.
 - 2. Pressure Rating: 250 psig minimum.

3. Body Material: Cast or ductile iron.
4. End Connections: Flanged or grooved.

2.6 TRIM AND DRAIN VALVES

A. General Requirements:

1. Standard: UL's "Fire Protection Equipment Directory" listing, or "Approval Guide," published by FM Global, listing.
2. Pressure Rating: 175 psig minimum.

2.7 SPRINKLER SPECIALTY PIPE FITTINGS

A. General Requirements for Dry-Pipe-System Fittings: UL listed for dry-pipe service.

B. Branch Outlet Fittings:

1. Standard: UL 213.
2. Pressure Rating: 175 psig minimum.
3. Body Material: Ductile-iron housing with EPDM seals and bolts and nuts.
4. Type: Mechanical-T and cross fittings.
5. Configurations: Snap-on and strapless, ductile-iron housing with branch outlets.
6. Size: Of dimension to fit onto sprinkler main and with outlet connections as required to match connected branch piping.
7. Branch Outlets: Grooved, plain-end pipe, or threaded.

C. Adjustable Drop Nipples:

1. Standard: UL 1474.
2. Pressure Rating: 250 psig minimum.
3. Body Material: Steel pipe with EPDM O-ring seals.
4. Size: Same as connected piping.
5. Length: Adjustable.
6. Inlet and Outlet: Threaded.

D. Flexible, Sprinkler Hose Fittings:

1. Standard: UL 1474.
2. Type: Flexible hose for connection to sprinkler, and with bracket for connection to ceiling grid.
3. Pressure Rating: 175 psig minimum.
4. Size: Same as connected piping, for sprinkler.

2.8 SPRINKLERS

A. General Requirements:

1. Standard: UL's "Fire Protection Equipment Directory" listing, or "Approval Guide," published by FM Global, listing.
2. Pressure Rating for Automatic Sprinklers: 175 psig minimum.

B. Automatic Sprinklers with Heat-Responsive Element:

1. Nonresidential Applications: UL 199.
 2. Characteristics: Nominal 1/2-inch orifice with discharge coefficient K of 5.6, and for "Ordinary" temperature classification rating unless otherwise indicated or required by application. Light-Hazard and Ordinary Group I. Ordinary Group II: Nominal 1/2-inch orifice with discharge coefficient K of 8.0.
- C. Sprinkler Finishes:
1. Chrome plated.
 2. Bronze.
 3. Painted.
- D. Sprinkler Escutcheons: Materials, types, and finishes for the following sprinkler mounting applications. Escutcheons for concealed, flush, and recessed-type sprinklers are specified with sprinklers.
1. Ceiling Mounting: Concealed, white finish, one piece, flat.
 2. Sidewall Mounting: Plastic, white finish, one piece, flat.
- E. Sprinkler Guards:
1. Standard: UL 199.
 2. Type: Wire cage with fastening device for attaching to sprinkler.

PART 3 EXECUTION

3.1 PREPARATION

- A. Perform fire-hydrant flow test according to NFPA 13 and NFPA 291. Use results for system design calculations required in "Quality Assurance" Article.
- B. Report test results promptly and in writing.

3.2 SERVICE-ENTRANCE PIPING

- A. Connect sprinkler piping to 4" sprinkler service from new addition. See Project drawings.

3.3 PIPING INSTALLATION

- A. Locations and Arrangements: Drawing plans, schematics, and diagrams indicate general location and arrangement of piping. Install piping as indicated, as far as practical.
 1. Deviations from approved working plans for piping require written approval from authorities having jurisdiction. File written approval with Architect before deviating from approved working plans.
- B. Piping Standard: Comply with requirements in NFPA 13 for installation of sprinkler piping.
- C. Install seismic restraints on piping. Comply with requirements in NFPA 13 for seismic-restraint device materials and installation.
- D. Use listed fittings to make changes in direction, branch takeoffs from mains, and reductions in pipe sizes.

- E. Install unions adjacent to each valve in pipes NPS 2 and smaller.
- F. Install flanges, flange adapters, or couplings for grooved-end piping on valves, apparatus, and equipment having NPS 2-1/2 and larger end connections.
- G. Install "Inspector's Test Connections" in sprinkler system piping, complete with shutoff valve, and sized and located according to NFPA 13.
- H. Install sprinkler piping with drains for complete system drainage.
- I. Install hangers and supports for sprinkler system piping according to NFPA 13. Comply with requirements in NFPA 13 for hanger materials.
- J. Drain dry-pipe sprinkler piping.
- K. Pressurize and check dry-pipe sprinkler system piping and air-pressure maintenance devices, air compressors.
- L. Install sleeves for piping penetrations of walls, ceilings, and floors. Comply with requirements for sleeves specified in Division 21 Section "Sleeves and Sleeve Seals for Fire-Suppression Piping."
- M. Install sleeve seals for piping penetrations of concrete walls and slabs. Comply with requirements for sleeve seals specified in Division 21 Section "Sleeves and Sleeve Seals for Fire-Suppression Piping."
- N. Install escutcheons for piping penetrations of walls, ceilings, and floors. Comply with requirements for escutcheons specified in Division 21 Section "Escutcheons for Fire-Suppression Piping."

3.4 JOINT CONSTRUCTION

- A. Install couplings, flanges, flanged fittings, unions, nipples, and transition and special fittings that have finish and pressure ratings same as or higher than system's pressure rating for aboveground applications unless otherwise indicated.
- B. Install unions adjacent to each valve in pipes NPS 2 and smaller.
- C. Install flanges, flange adapters, or couplings for grooved-end piping on valves, apparatus, and equipment having NPS 2-1/2 and larger end connections.
- D. Ream ends of pipes and tubes and remove burrs. Bevel plain ends of steel pipe.
- E. Remove scale, slag, dirt, and debris from inside and outside of pipes, tubes, and fittings before assembly.
- F. Flanged Joints: Select appropriate gasket material in size, type, and thickness suitable for water service. Join flanges with gasket and bolts according to ASME B31.9.

- G. Threaded Joints: Thread pipe with tapered pipe threads according to ASME B1.20.1. Cut threads full and clean using sharp dies. Ream threaded pipe ends to remove burrs and restore full ID. Join pipe fittings and valves as follows:
 - 1. Apply appropriate tape or thread compound to external pipe threads.
 - 2. Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged.
- H. Twist-Locked Joints: Insert plain end of steel pipe into plain-end-pipe fitting. Rotate retainer lugs one-quarter turn or tighten retainer pin.
- I. Steel-Piping, Cut-Grooved Joints: Cut square-edge groove in end of pipe according to AWWA C606. Assemble coupling with housing, gasket, lubricant, and bolts. Join steel pipe and grooved-end fittings according to AWWA C606 for steel-pipe joints.
- J. Dissimilar-Material Piping Joints: Make joints using adapters compatible with materials of both piping systems.

3.5 SPRINKLER INSTALLATION

- A. Install sprinklers in suspended ceilings in center of narrow dimension of acoustical ceiling panels.
- B. Install dry-type sprinklers with water supply from heated space. Do not install pendent or sidewall, wet-type sprinklers in areas subject to freezing.
- C. Install sprinklers into flexible, sprinkler hose fittings and install hose into bracket on ceiling grid.

3.6 IDENTIFICATION

- A. Install labeling and pipe markers on equipment and piping according to requirements in NFPA 13.
- B. Identify system components, wiring, cabling, and terminals. Comply with requirements for identification specified in Division 26 Section "Identification for Electrical Systems."

3.7 FIELD QUALITY CONTROL

- A. Perform tests and inspections.
- B. Tests and Inspections:
 - 1. Leak Test: After installation, charge systems and test for leaks. Repair leaks and retest until no leaks exist.
 - 2. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
 - 3. Flush, test, and inspect sprinkler systems according to NFPA 13, "Systems Acceptance" Chapter.
 - 4. Energize circuits to electrical equipment and devices.
 - 5. Start and run air compressors.

6. Coordinate with fire-alarm tests. Operate as required.
7. Verify that equipment hose threads are same as local fire-department equipment.

C. Sprinkler piping system will be considered defective if it does not pass tests and inspections.

D. Prepare test and inspection reports.

3.8 CLEANING

A. Clean dirt and debris from sprinklers.

B. Remove and replace sprinklers with paint other than factory finish.

3.9 PIPING SCHEDULE

A. Sprinkler specialty fittings may be used, downstream of control valves, instead of specified fittings.

B. Standard-pressure, dry-pipe sprinkler system, NPS 2 and smaller, shall be the following:

1. Standard-weight, galvanized-steel pipe with threaded ends; galvanized, gray-iron threaded fittings; and threaded joints.

C. Standard-pressure, dry-pipe sprinkler system, NPS 2-1/2 to NPS 4, shall be the following:

1. Standard-weight, galvanized-steel pipe with cut-grooved ends; galvanized, grooved-end fittings for steel piping; grooved-end-pipe couplings for steel piping; and grooved joints.

3.10 SPRINKLER SCHEDULE

A. Use sprinkler types in subparagraphs below for the following applications:

1. Mechanical Room, Apparatus Room, Attic: Upright sprinklers.
2. Rooms with Ceilings: Recessed sprinklers.
3. Wall Mounting: sidewall sprinklers.

B. Provide sprinkler types in subparagraphs below with finishes indicated.

1. Recessed Sprinklers: chromed brass, with chrome escutcheon plate and Concealed White.
2. Upright Sprinklers: Rough brass.
3. Upright Sprinklers: Rough bronze; wax coated where exposed to acids, chemicals, or other corrosive fumes.

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END OF SECTION 211316