

BLOCK 671 LOT 1.01 QUALIFICATION CODE _____ ADDRESS (SITE) 56, Chambers Bridge Rd. PERMIT NO. 14-1809



CONSTRUCTION PERMIT APPLICATION

Applicant Completes: Sections I, II, III (optional), IV, VI, and VII

C-14-001949

V. FEE SUMMARY (for office use only)

		Update	Update
1. Building	\$ 3818	HA	HB
2. Electrical			
3. Plumbing			
4. Fire Protection		225-	295-
5. Elevator Devices			
6. Subtotal			
7. Less 20% for State Plan Review	\$		
8. Subtotal	\$		
9. State Permit Surcharge Fee	472-		
10. Subtotal	\$		
11. Cert. of Occupancy	687-		
12. Other	150-		
13. TOTAL	\$ 8177	225-	295-

VI. BUILDING/SITE CHARACTERISTICS

1. Number of Stories	1
2. Height of Structure	22' 6" ft.
3. Area - Largest Floor	5940 sq. ft.
4. New Building Area	6284 sq. ft.
5. Volume of New Structure	141390 cu. ft.
6. Max. Live Load	20 lbs
7. Max. Occupancy Load	289
8. If Industrialized Building: State Approved	HUD
9. Total Land Area Disturbed	sq. ft.
10. Flood Hazard Zone	
11. Base Flood Elevation	ft.
12. Wetlands	yes no X

(office use only)

HC
E-1,105
P-1823
2,928
110

I. IDENTIFICATION

1. Proposed Work Site at: 56, Chambers Bridge Rd. Fed Realty Inv. Trust

2. Name of Owner in Fee: Red Robin Gourmet Burgers 1626 E. Jefferson St.
Tel. (847) 298-6900 e-mail Rockville, NJ 20852
Address 6312 S. Fiddlers Grove Cir. Greenwood Co. 80111
street municipality zip code

3. Ownership in Fee: Public Private

4. Principal Contractor: Cowboy-Mannion Tel. (518) 583-4038
Address 36 Phila St. Saratoga Springs NY. 12866 e-mail

License No. OR, if new home, Builder Reg. No. Exp. Date

Home Improvement Contractor Registration No. or Exemption Reason (if applicable):

Federal Emp. ID No. 14-16866116 FAX: ()

5. Architect or Engineer: Chipman Design Contact
Address 2700 S. River Rd. Des Plaines IL e-mail
Tel. (847) 298-6900 FAX: ()

6. Responsible Person in Charge once Work has Begun Daniel Cochran
Tel. (609) 226-8226 FAX: ()

IIa. PROPOSED WORK

- ☐ Minor Work ☒ New Building ☐ Addition ☐ Demolition
- ☐ Repair ☐ Alteration ☐ Renovation ☐ Reconstruction
- ☐ Asbestos Abat. Subch. 8 ☐ Lead Hazard Abatement ☐ Radon Remediation ☐ Annual Permit

IIb. SUBCODES

(Check all that apply)

- ☒ Building
- ☒ Electrical
- ☒ Plumbing
- ☒ Fire Protection
- ☐ Elevator

TOTAL COST

FOR OFFICE USE ONLY (Optional)

Est. Cost	Plans Rec'd by	Date Rec'd	Rejection Date	Approval Date	Re-viewer	Resubmission Dates	Re-viewer
	CL		7/22/14	6/13/14	14		
				8/12/14	70		
				8-7-14	14		
			8/12/14	8/20/14	14		
	Eg	6/6/14		6/6/14	14		

VII. DESCRIPTION OF BUILDING USE

A. RESIDENTIAL (primary use)

1. State Specific Use:
2. Use Group, Proposed: F-1,190
3. Change in Use Group, Indicate Present:
4. No. of dwelling units: Total Units Income-restricted

Gained, Sale	
Gained, Rental	
Lost, Sale	
Lost, Rental	

B. NON-RESIDENTIAL (primary use)

1. State Specific Use:
2. Use Group, Proposed: +E
3. Change in Use Group, Indicate Present: +F

C. MIXED USE -List secondary use(s):

D. Construct. Classification: Present Proposed

III. PLAN REVIEW (optional)

DO YOU WANT:

1. ☐ Partial Releases
2. ☐ Prototype Processing

IV. DOES OR WILL YOUR BUILDING CONTAIN ANY OF THE FOLLOWING?

1. ☐ Elevators/Escalators/Lifts/Dumbwaiters/Moving Walks
2. ☐ High Pressure Boilers
3. ☐ Pressure Vessels
4. ☒ Refrigeration Systems
5. ☒ Cross-Connections/Backflow Preventers
6. ☐ Hazardous Uses/Places of Assembly
7. ☒ Sprinklers/Standpipes
8. ☐ Smoke Control Systems in Open Wells
9. ☐ Underground Storage Tanks
10. ☐ Swimming Pools, Spas and Hot Tubs
11. ☐ LPGas Tanks
12. ☒ Fire Alarm

CERTIFICATION IN LIEU OF OATH

I. OWNER SECTION (to be completed if the applicant is the owner in fee)

I hereby certify that I am the owner in fee of the property listed on Page 1.

Mark the following applicable boxes:

- A. ☐ I further certify that a new home (private residence) will be constructed on this property for my own use and occupancy. This dwelling is to be occupied by myself and is not to be used for any purpose other than single family residential use. I attest that all construction, plumbing, or electrical work will be done, in whole or in part, by me or by subcontractors under my supervision, in accordance with all applicable laws; and, I further acknowledge that said new home is not covered under the New Home Warranty and Builders Registration Act (N.J.S.A. 46:3B-1 et seq.) and that such fact shall be disclosed to any person purchasing this property within ten years of the date of issuance of a certificate of occupancy.

I UNDERSTAND THAT IN MARKING BOX A, I ACKNOWLEDGE THAT I AM ASSUMING RESPONSIBILITY FOR THE WORK DONE ON SAID PROPERTY, THE CONDITION OF THE PROPERTY PRIOR TO, DURING, AND AFTER ANY WORK PERFORMED, AND FOR THE PERFORMANCE OF THE SUBCONTRACTORS I HIRE, EMPLOY, OR OTHERWISE CONTRACT OR WITH WHOM I MAKE AGREEMENTS TO PERFORM WORK. I AM VOLUNTARILY AND KNOWINGLY ASSUMING THIS RESPONSIBILITY.

- B. ☐ I further certify the following as required by the New Jersey Uniform Construction Code, N.J.A.C. 5:23-2.15(f)1.ix:

I personally prepared the plans submitted for: 1) the new home referred to in A.; or, 2) an addition, alteration, renovation, or repair to an existing single family residence owned and occupied by myself and located on the property listed on Page 1; or, 3) a new structure that will be physically separate from, but that will be deemed part of, an existing single family residence that is owned and occupied by myself and located on the property listed on Page 1.

- C. ☒ I further certify that I will perform or supervise the following work:

C.1. ☒ Building C.2. ☐ Fire Protection

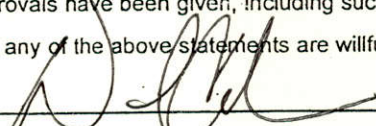
I further certify that I will perform the following work:

C.3. ☐ Electrical C.4. ☐ Plumbing

- D. ☒ I agree to advise all contractors on this project that they are required to be registered with the New Jersey Division of Taxation and to comply with all New Jersey tax laws.

I further certify the following as required by the Uniform Construction Code, N.J.A.C. 5:23-2.15(a)5: All required State, county, and local prior approvals have been given, including such certification as the construction official may require.

I understand that if any of the above statements are willfully false, I am subject to punishment.

Signature  Date 4/29/14

II. AGENT SECTION (to be completed if the applicant is not the owner in fee)

I hereby certify the following as required by the Uniform Construction Code, N.J.A.C. 5:23-2.15(d): the proposed work is authorized by the owner in fee; and I have been authorized by the owner in fee to make this application as his agent.

I further certify the following as required by the Uniform Construction Code, N.J.A.C. 5:23-2.15(a)5: All required State, county, and local prior approvals have been given, including such certification as the construction official may require.

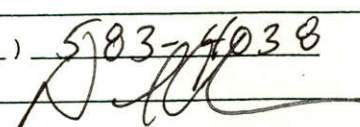
I agree to advise all contractors on this project that they are required to be registered with the New Jersey Division of Taxation and to comply with all New Jersey tax laws.

I understand that if any of the above statements are willfully false, I am subject to punishment.

☒ Check if contractor.

Agent Name Cowboy - Mannion
Address 36 Phila St., Saratoga Springs NY 12866

Telephone (518) 583-4038

Signature 

III. ☐ LEAD HAZARD ABATEMENT: Include Homeowner or Building Owner Affidavit as per N.J.A.C. 5:17.



Brick Township
401 Chambersbridge Rd
Brick, NJ 08723

Date Issued 09/09/2015
Control Number C-14-001949
Permit Number 14-1869
Permit Issue Date 06/19/2014
Certificate Number 14-1869

Certificate

Construction Code Division

(Certificate of Occupancy)

Identification

Work Site Location: 56 CHAMBERS BRIDGE RD. Red Robin Brick Township, NJ 08723 Block: 671 Lot: 1.01 Qual: _____
Owner in Fee: FEDERAL REALTY INVESTMENT TRUST
Owner Address: 1626 EAST JEFFERSON ST ROCKVILLE NJ 20852
Telephone: (847) 298-6900
Contractor Conboy-Mannion
Address 36 Phila St. Saratoga Springs NY 12866
Telephone: (518) 583-4038 Fax: _____
License Number or Builders Registration Number: _____ Federal Emp. Number: 14-16866116

Home Warranty Number: _____

Type of Warranty Plan: ☐ State ☐ Private

Use Group: A-2 Construction Classification: _____

Maximum Live Load: 0 Maximum Occupancy Load: 0

Description of Work/Use: NEW COMMERCIAL STRUCTURE - RED ROBIN RESTAURANT

Certificate Comments:

☒ **Certificate of Occupancy**

This serves notice that said building or structure has been constructed in accordance with the New Jersey Uniform Construction Code and is approved for occupancy.

☐ **Certificate of Approval**

This serves notice that the work completed has been constructed or installed in accordance with the New Jersey Uniform Construction Code and is approved. If the permit was issued for minor work, this certificate was based upon what was visible at the time of inspection.

☐ **Certificate of Continued Occupancy**

This serves notice that based on a general inspection of the visible parts of the building there are no imminent hazards and the building is approved for continued occupancy.

☐ **Temporary Certificate of Compliance**

The following conditions must be met no later than or the owner will be subject to fine or order to vacate:

This certificate has an expiration date of:

Conditions to be met:

☐ **Certificate of Clearance - Lead Abatement 5:17**

This serves notice that based on written certification, lead abatement was performed as per NJAC5:17 to the following extent.

- ☐ Total removal of lead-based paint hazards in scope of work
☐ Partial or limited time period (years); see file

☐ **Certificate of Clearance - Asbestos Abatement**

This serves notice that based on written certification, asbestos abatement was performed to the following extent.

- ☐ Total removal of asbestos hazards in scope of work
☐ Partial or limited time period (years); see file

☐ **Certificate of Compliance**

This serves notice that said potentially hazardous equipment has been installed and/or maintained in accordance with the New Jersey Uniform Construction Code and is approved for use until

☐ **Temporary Certificate of Occupancy**

The following conditions must be met no later than: or the owner will be subject to fine or order to vacate:

This certificate has an expiration date of:

Conditions to be met:


Construction Official

Date Printed: 09/09/2015

U.C.C. F260 (rev. 08/05)

Fee: \$687.00
Check Number: 72472
Collected By: Nichol Ponsi

Page 1

BUILDING SUBCODE TECHNICAL SECTION



609-226-8226

Date Received
Control #

Date Issued
Permit #

6/19/14
14-1869

A. IDENTIFICATION—APPLICANT: COMPLETE ALL APPLICABLE INFORMATION. WHEN CHANGING CONTRACTORS, NOTIFY THIS OFFICE. CALL UTILITY DIG NO: 1-800-272-1000.

Block 671 Lot 1.01 Qualification Code _____
Work Site Location 56 Chambers Bridge Rd
Brick NJ
Owner in Fee: Red Robin Gourmet Burgers Scott
Tel. (847) 298-6900 e-mail Pine Valley
Address 6312 S. Fiddlers Green Circle, Greenwood Co. 80111
Contractor: CONBOY MANNION Tel. (510) 583-4038
Address 36 Phila St e-mail _____
Savannah Springs, NJ 07866 Dan Cochran
Contractor License No. or Builder Registration No. _____ Exp. Date _____
Home Improvement Contractor Registration No. or Exemption Reason (if applicable): _____
Federal Emp. ID No. _____ FAX: () _____

C. CERTIFICATION IN LIEU OF OATH

I hereby certify that I am the (agent or owner of record and am authorized to make this application.

Sign here: [Signature]

Print name here: Daniel Cochran

D. TECHNICAL SITE DATA

DESCRIPTION OF WORK

New Construction
Footings + Foundation
Only

JOB SUMMARY (Office Use Only)

PLAN REVIEW	Date	Initial	INSPECTIONS	Dates (Month/Day)
			Type:	Failure Failure Approval Initial
☒ No Plans Required			Footings * <u>See Back</u>	
☒ All <u>6/13/14</u>			Foundation * <u>10-16-14</u>	<u>10/22/14</u>
☐ Footings/Foundations			Slab - <u>Complete</u>	<u>9-4-14</u>
☐ Structural/Framework			Frame	
☐ Exterior			Backfill * <u>9-25-14</u>	
☐ Interior			* <u>10-8-14</u>	
Joint Plan Review Required:			Insulation	
☐ Elec. ☐ Plumb. ☐ Fire ☐ Elevator			Sh- * <u>10/22/14</u>	<u>12/04/14</u>
SUBCODE APPROVAL for PERMIT			Sheet Water proofing	<u>* 10/22/14</u>
Date: <u>06/16/14</u>			* <u>10-17-14</u>	<u>* 11-3-14</u>
Approved by: <u>KCN</u>			Sheet * <u>10-15-14</u>	<u>* 11-10-14</u>
SUBCODE APPROVAL for CERTIFICATE			TCO * <u>Rec. 90 Days</u>	<u>1-15-15</u>
☒ CO ☐ CCO ☐ CA			Other	
Date: <u>02/10/15</u>			Final * <u>2-4-15</u>	<u>2-5-15</u>
Approved by: <u>KCN</u>			Barrier-Free	

TYPE OF WORK:

- ☒ New Building
- ☐ Addition
- ☐ Rehabilitation
- ☐ Roofing
- ☐ Siding
- ☐ Sign _____ Sq. Ft.
- ☐ Pool
- ☐ Retaining Wall _____ Sq. Ft.
- ☐ Asbestos Abatement Subchapter 8
- ☐ Lead Haz. Abatement NJAC 5:17
- ☐ Radon Remediation
- ☐ Other _____
- ☐ Demolition

FEE (Office Use Only)

\$ _____

Administrative Surcharge \$ _____

Minimum Fee \$ _____

State Permit Surcharge Fee \$ _____

TOTAL FEE \$ _____

B. BUILDING CHARACTERISTICS

Use Group Present _____ Proposed _____ Constr. Class Present _____ Proposed A-2
No. of Stories 1
Height of Structure 22'6" ft.
Area — Largest Floor 5940 sq. ft.
New Bldg. Area/All Floors 6284 sq. ft.
Volume of New Structure 141,390 cu. ft.
Max. Live Load 20 lbs sq. ft.
Max. Occupancy Load 289

If Industrialized Building:
State Approved _____ HUD _____
Est. Cost of Bldg. Work:
1. New Bldg. \$ 750 K
2. Rehabilitation \$ _____
3. Total (1 + 2) \$ _____

U.C.C. F110
(rev. 11/09)

1 White = Inspector Copy
3 Pink = Office Copy

2 Canary = Office Copy
4 Gold = Applicant Copy

Footings

7/3/14 W Foot Appd See
Plans for locations

7/10/14 W Balance of Perimeter Foot
See Plans for details
~~Note~~

07/15/14 Formed Walls/Rebar C12/2
C1 → C7 Perimeter (minus crawl opening)

Formed Piers/Rebar

C2, B1, B3, B4, B5, B6, B8, B.8-8, C.4-8

07/18/14 Formed Walls/Rebar C.2/2 → C2, B6 → C.5-8, B3 → C.6-1

Formed Piers/Rebar BA-9, B.8-9, C.4-9, C.6-9, C7

(2) Int Pier Frgs C-6.1, C-3.8

7/24/14 Open Form Appd - See Site plans for Locations
Partial

7/28/14 Balance of Footing Appd -

***Note:** Contingent on engineers Sealed Certification
that soils at the footing meet the design
standard. Field reports attached -

2-31-14 W Open Form Appd. Ramp/Entrance/Elect Mechanical Rm

9-14-14 W - Foot App - Trash Bin Only

9/25/14 W Backfill (trash Bin) Rej - No Access/Not Ready

10/8/14 W Backfill Rej (Main Bldg) open all corners for insp - (Already backfilled)

10/22/14 W Sh - App Cont on Arch letter for soffits + Parapets

10/28/14 W Sh @ Front ent is not treated at low clearance Areas -
Cont. does not have special Inspector for EIFS

11-3-14 W Shield waterproofing all but South + West walls -

Frame Cooler Box areas only

11-10-14 W Partial Frame and Balance of waterproofing (See Attached)

11-10-14 W Partial Insul Bath walls, Office, Dishwashing
Foot App - Garbage bin -

11-14-14 W Partial Frame/Insul Appd Elect Rm Only

11-24-14 W Partial Frame/Insul Eat walls only - No Double walls on
Front Entrance Foyer - 12/02/14 Inner double walls V.B. removed - Kex

9/16/14 - Above ceiling - Kitchen Only

1-15-15 W Rec. TCO 90 Days Training Only

① Add Emery \$⁵

② Repair Emery \$⁵

③ Rooftop insp not done (no Access)

④ Misc Finishes not installed -

2-4-15 W Final Rg -

* Arrived at inspection and store was
being occupied by public. Unable to
test system and roof Rm was not
completely accessible. Notified Cont.
Official to report findings and
recommend a penalty for occupying
without a C.O. Contractor stated
that they were training and this
was friends and family only.

↑ (B) tech



ELECTRICAL SUBCODE TECHNICAL SECTION



Change of
Contractor only

Date Received
Control #
Date Issued
Permit #

8/22/14

14-1869+0

A. IDENTIFICATION—APPLICANT: COMPLETE ALL APPLICABLE INFORMATION. WHEN CHANGING CONTRACTORS, NOTIFY THIS OFFICE. CALL UTILITY DIG NO: 1-800-272-1000.

Block 671 Lot 1.01 Qualification Code _____

Work Site Location 56 CHAMBERS BRIDGE RD

BRICE, NJ 08723

Owner in Fee: FEDERAL REALTY INVESTMENT TRUST

Tel. 847 298-6900 e-mail _____

Address 1626 EAST JEFFERSON ST ROCKVILLE NJ

Contractor: SIBLO ELECTRIC Tel. 973 670-4208

Address 8 FAIRVIEW DR e-mail _____
NORTH CALDWELL NJ 07006

Contractor License No. 11502 Exp. Date _____

Home Improvement Contractor Registration No. or Exemption Reason (if applicable): _____

Federal Emp. ID No. 22-3377592 FAX: _____

B. ELECTRICAL CHARACTERISTICS

Use Group Present _____ Proposed _____

[] Pole/Pad # _____ [] Temporary [] Other _____

Building Occupied as _____ Utility Co. _____

Est. Cost of Elec. Work \$ _____

JOB SUMMARY (Office Use Only)

PLAN REVIEW

[] No Plans Required

[] Partial -Underslab Utilities Approved

Date: _____ Approved by: _____

[] Electric Plans Approved

Date: _____ Approved by: _____

Joint Plan Review Required:

[] Bldg. [] Plumb. [] Fire. [] Elev.

SUBCODE APPROVAL for PERMIT

Date: _____

Approved by: _____

SUBCODE APPROVAL for CERTIFICATE

[] CO [] CCO [] CA

Date: 1/8/15

Approved by: PC

INSPECTIONS

Type: Office Failure Failure Approval Initial

Rough Walls 4/10/14 to

Barrier-Free SLAB 8/28/14 to

Trench _____

Temp. Serv. _____

Constr. Serv. _____

TCO _____

Other _____

Service _____

Final _____

Barrier-Free _____

Temp. Cut-in-Card Date Issued _____

Final Cut-in-Card Date Issued 12 15 14

Annual Pool Inspection _____

Date of Grounding and Bonding _____

Certification _____

C. CERTIFICATION IN LIEU OF OATH

I hereby certify that I am the (agent of owner of record and am authorized to make this application and perform the work listed on this application.

Applicant sign/Contractor
sign and seal here: [Signature]

Print name here: Rockville

[X] Licensed Elec. Contractor [] Certified Landscape Irrigation Contr' [] Exempt Applicant

D. TECHNICAL SITE DATA

DESCRIPTION OF WORK:

CHANGE OF CONTRACTOR

QTY.	SIZE	ITEMS
_____	_____	Lighting Fixtures
_____	_____	Receptacles
_____	_____	Switches
_____	_____	Detectors
_____	_____	Light Poles
_____	_____	Motors—Fract. HP
_____	_____	Emergency & Exit Lights
_____	_____	Communications Points
_____	_____	Alarm Devices/F.A.C. Panel
_____	_____	TOTAL NUMBERS
_____	_____	Pool Permit/with UW Lights
_____	_____	Storable Pool/Spa/Hot Tub
_____	_____	KW Elec. Range/Receptacle
_____	_____	KW Oven/Surface Unit
_____	_____	KW Elec. Water Heater
_____	_____	KW Elec. Dryer/Receptacle
_____	_____	KW Dishwasher
_____	_____	HP Garbage Disposal
_____	_____	KW Central A/C Unit
_____	_____	HP/KW Space Heater/Air Handler
_____	_____	KW Baseboard Heat
_____	_____	HP Motors 1/+ HP
_____	_____	KW Transformer/Generator
_____	_____	AMP Service
_____	_____	AMP Subpanels
_____	_____	AMP Motor Control Center
_____	_____	KW Elec. Sign/Outline Light

FEE (Office Use Only)

\$ _____

Administrative Surcharge \$ _____
Minimum Fee \$ _____
State Permit Surcharge Fee \$ _____
TOTAL FEE \$ _____

over

11-10-14

Kitchen cooking wall -
Office wall
Bathroom walls -

Lower lighting outside walls

11/17/14

Hand coloring kitchen Area
Bathroom coloring -

11/22/14

RLW Bathroom walls, Hand coloring
Lookbook

12-1-14

Rough not ready

12-12-14

Service not ready

12/15/14

Service Passon 800 AM 3⁰⁰

12 15 14

Coloring kitchen
ceiling DINE AREA

↑ @Tech +C



PLUMBING SUBCODE TECHNICAL SECTION



Date Received
Control #

Date Issued
Permit #

14-1869+C
8-13-14

A. IDENTIFICATION—APPLICANT: COMPLETE ALL APPLICABLE INFORMATION. WHEN CHANGING CONTRACTORS, NOTIFY THIS OFFICE. CALL UTILITY DIG NO: 1-800-272-1000.

Block 671 Lot 1.01 Qualification Code _____
Work Site Location 56 Chambers Bridge Rd
Brick NJ
Owner in Fee: Red Robin Gourmet Burgers
Tel. 847 248-6900 e-mail _____
Address 6312 S. Fiddlers Green Circle, Greenwood CO.
Contractor: Kevin Cichon Plumbing Tel. () _____
Address 170 JOHANSON AVE e-mail KCSCREAMINGOAC
HILLSBOROUGH NJ
Contractor License No. 8643 Exp. Date 6/15
Home Improvement Contractor Registration No. or Exemption Reason (if applicable): _____
Federal Emp. ID No. [REDACTED] FAX: () _____
B. PLUMBING CHARACTERISTICS
Use Group Present _____ Proposed _____
Building Sewer Size _____ Public Sewer _____ Private Septic _____
Water Service Size _____ Public Water _____ Private Well _____
Est. Cost of Plumbing Work \$ 62,500

C. CERTIFICATION IN LIEU OF OATH

I hereby certify that I am the (agent of) owner of record and am authorized to make this application and perform the work listed on this application.

Applicant sign/Contractor
sign and seal here:

Print name here: KEVIN CICHON

☒ Licensed Plumbing Contractor ☐ Exempt Applicant

D. TECHNICAL SITE DATA

DESCRIPTION OF WORK

Mandowoc I server
#1470C/1 11870C/1 12170

QTY.

45

1

20

4

7

5

1

1

2

14

3

1

1

3

1

1

3

37

FIXTURE/EQUIPMENT

Water Closet

Urinal/Bidet

Bath Tub

Lavatory

Shower

Floor Drain

Sink

Dishwasher

Drinking Fountain

Washing Machine

Hose Bibb

Water Heater

Fuel Oil Piping

Gas Piping

LPGas Tank

Steam Boiler

Hot Water Boiler

Sewer Pump

Interceptor/Separator

Backflow Preventer

Greasetrap EXT. RIOT

Sewer Connection

Water Service Connection

Stacks

Other Heating Units

FEE (Office Use Only)

\$ _____

\$ _____

\$ _____

\$ _____

\$ _____

\$ _____

\$ _____

\$ _____

\$ _____

\$ _____

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\$ _____

JOB SUMMARY (Office Use Only)

PLAN REVIEW

☐ No Plans Required

☐ Partial -Underslab Utilities Approved

Date: _____ Approved by: _____

☐ Plumbing Plans Approved

Date: _____ Approved by: _____

Joint Plan Review Required:

☐ Bldg. ☐ Elec. ☐ Fire. ☐ Elev.

SUBCODE APPROVAL for PERMIT

Date: 8-7-14

Approved by: [Signature]

SUBCODE APPROVAL for CERTIFICATE

☐ CO ☐ CCO ☐ CA

Date: 1-8-15

Approved by: [Signature]

INSPECTIONS

Type:

Slab

Rough

Water

Sewer

Fixtures

Gas Equipment

Gas Piping

LPGas Tank

Fuel Oil Piping

Solar

TCO

Final

yoke

Dates (Month/Day)

Failure Failure Approval Initial

8-22-14 10-2-14 11-10-14 9-24-14

11-10-14 9-24-14 9-24-14 9-24-14

11-24-14 1-8-15 2-4-15

1-8-15 2-4-15

1-8-15 2-4-15

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1-8-15 2-4-15

1-8-15 2-4-15

1-8-15 2-4-15

1-8-15 2-4-15

1-8-15 2-4-15

Administrative Surcharge \$ _____

Minimum Fee \$ _____

State Permit Surcharge Fee \$ _____

TOTAL FEE \$ _____

8-22-14

Grease system OK - Passed
DWV. needs proper pitch, bedding,
and 3 Trap Primers

10-31-14

Slab for ~~1st~~ 1st floor Pan
2 floor drains
all 4 need an update

1-20-15 ~~FD~~

No valves for meter

③ Back Flow Reports

① tech + c



Backflow Prevention Device Assembly Test Report Form

Owner of Property Red Robin Gourmet Burgers
 Mailing Address 6312 S Fiddlers Green Circle
Suite 200 North Greenwood Village Co. 80111
 Contact Person Red Robin
 Device Address 56 Chambers Bridge RD
Brick NJ
 Exact Device Location Inside by bag on box
 Test Kit Serial # 330196 Calibration Date 2/10/14

Date 1/6/15 Time 8:15
 Tested by Paul Lomako
 Certificate # 10580
 RPZ ☒ DCVA ☐ PVB ☐ SVB ☐
 Make Wilkins Model No 975162
 Size 1" Serial No 3621342
 Test After Installation ☒
 Test After Repairs ☐
 Annual Test ☐
 Other ☐

Reduced Pressure Backflow Prevention Device Assembly				Pressure Vacuum Breaker	
Check Valve No. 1	Check Valve No. 2	Validated No-Flow	Relief Valve	Check Valve	Validated No-Flow
Closed Tight ☒	Closed Tight ☒	Yes ☒	Opened at <u>3.2</u> PSID		Yes ☐
Leaked ☐	Leaked ☐	No ☐	Did Not Open ☐		No ☐
<u>9.4</u> PSID	<u>PSID</u>	Other ☐			Other ☐
Double Check Valve Assembly				Air Inlet	
Check Valve No. 1	Check Valve No. 2	Validated No-Flow		Opened at _____ PSID	
<u>PSID</u>	<u>PSID</u>	Yes ☐	NO ☐	Did Not Open ☐	

The Downstream Shut-off Valve at the time of the test was: Closed Tight ☐ Leaked ☐ Other ☐
 Line Pressure 80 PSI Protection Type: Service Line ☐ Fire Service Line ☐ Internal Domestic Plumbing System ☒

Signature of Certified Tester _____

Test Witnessed by _____

Water Works Official _____

Owner Agent _____

State Official _____

PASS ☒ FAIL ☐ OTHER ☐

Remarks _____

Downstream Shut-off Valve leaked could not test device ☐

Service Restored and Downstream shut-off valve opened ☐

Owner of Property

Red Robin Council Bureaus

Date

1/6/15

Time

8:30

Mailing Address

6512 S. Fidelity Avenue
200 North Brentwood Village
Brentwood, TN 37020

Tested by

Peter Loumaro

Certificate #

10580

Contact Person

Red Robin

RPZ ☐DCVA ☒PVB ☐SVB ☐

Device Address

56 Chambers Bridge Rd
Buck TN

Make

Apollo

Model No

DC40

Size

1"

Serial No

309674

Exact Device Location

out side Mechanical area

Test After Installation

☒

Test After Repairs

☐

Annual Test

☐

Other

☐

Test Kit Serial #

330196

Calibration Date

2/10/15

Reduced Pressure Backflow Prevention Device Assembly

Check Valve No. 1	Check Valve No. 2	Validated No-Flow	Relief Valve
Closed Tight ☐	Closed Tight ☐	Yes ☐	Opened at _____ PSID
Leaked ☐	Leaked ☐	No ☐	Did Not Open ☐
_____ PSID	_____ PSID	Other ☐	

Pressure Vacuum Breaker

Check Valve	Validated No-Flow
	Yes ☐
_____ PSID	No ☐
	Other ☐

Double Check Valve Assembly

Check Valve No. 1	Check Valve No. 2	Validated No-Flow
_____ PSID	_____ PSID	Yes ☒ NO ☐ Other ☐

Air Inlet

Opened at _____ PSID
Did Not Open ☐

The Downstream Shut-off Valve at the time of the test was: Closed Tight ☐ Leaked ☐ Other ☒ IrrigationLine Pressure _____ PSI Protection Type: Service Line ☒ Fire Service Line ☐ Internal Domestic Plumbing System ☐

Signature of Certified Tester

Test Witnessed by

Water Works Official

Owner Agent

State Official

PASS ☒ FAIL ☐ OTHER ☐

Remarks

Downstream Shut-off Valve leaked could not test device ☐Service Restored and Downstream shut-off valve opened ☐Utility
Cabinet

Owner of Property Red Robin Gourmet Burgers
Mailing Address 6312 S Fiddlers Green Circle
Suite 200 North Greenwood Village Co. 80111
(Town) (Zip)

Date 1/6/15 Time 7:45
Tested by Patricia Conner
Certificate # 10580

Contact Person Red Robin
Device Address 56 Chambers Bridge Rd
Brick NT
(Town) (Zip)

RPZ ☒ DCVA ☐ PVB ☐ SVE ☐
Make WATTS Model No LF709
Size 2" Serial No 14500

Exact Device Location OUTSIDE Mechanical Room

Test After Installation ☒ DOGS
Test After Repairs ☐
Annual Test ☐
Other ☐

Test Kit Serial # 330196 Calibration Date 2/10/14

Reduced Pressure Backflow Prevention Device Assembly				Pressure Vacuum Breaker	
Check Valve No. 1	Check Valve No. 2	Validated No-Flow	Relief Valve	Check Valve	Validated No-Flow
Closed Tight ☒	Closed Tight ☒	Yes ☒	Opened at <u>3.2</u> PSID		Yes ☐
Leaked ☐	Leaked ☐	No ☐	Did Not Open ☐		No ☐
<u>8.8</u> PSID		Other ☐			Other ☐
Double Check Valve Assembly				Air Inlet	
Check Valve No. 1	Check Valve No. 2	Validated No-Flow		Opened at _____ PSID	
_____ PSID	_____ PSID	Yes ☐ NO ☐ Other ☐		Did Not Open ☐	
The Downstream Shut-off Valve at the time of the test was: Closed Tight ☐ Leaked ☐ Other ☐					
Line Pressure <u>80</u> PSI Protection Type: Service Line ☒ Fire Service Line ☐ Internal Domestic Plumbing System ☐					

Signature of Certified Tester _____

PASS ☒ FAIL ☐ OTHER ☐

Test Witnessed by: _____

Remarks _____

Water Works Official _____

Owner Agent _____

State Official _____

Downstream Shut-off Valve leaked could not test device ☐
Service Restored and Downstream shut-off valve opened ☒



FIRE PROTECTION SUBCODE TECHNICAL SECTION



Rep
Robert Pdate

Date Received
Control #
Date Issued
Permit #

12/17/14
14-1869 + F

A. IDENTIFICATION—APPLICANT: COMPLETE ALL APPLICABLE INFORMATION. WHEN CHANGING CONTRACTORS, NOTIFY THIS OFFICE. CALL UTILITY DIG NO: 1-800-272-1000.

Block 101671 Lot 1.01 Qualification Code _____
Work Site Location 56 Chambers Bridge Road
Brick Township NJ
Owner in Fee: Red Robin

Tel. _____ e-mail _____

Address _____

Contractor: Scholes Electric & Communications Tel. (732) 562-1900

Address 1021 Centennial Avenue e-mail Scholes@scholesonline.co

Piscataway, New Jersey 08854

Fire Protection Equipment, NJ Div of Fire Safety Permit No. _____

Fire Protection Equipment, NJ Div of Fire Safety Installer No. _____

Fire Alarm Contractor No. 4319 Exp. Date 03/31/2015

Home Improvement Contractor Registration No. or Exemption Reason (if applicable): _____

Federal Emp. ID No. 222848110 FAX: (732) 562-0900

B. FIRE PROTECTION CHARACTERISTICS

Use Group: Present _____ Proposed _____ Fuel Storage Tank:
Constr. Class: Present _____ Proposed _____ Fuel Type: [] Flammable OR [] Combustible
Capacity _____

Heating System: [] New OR [] Modification to Existing Fire Alarm System: [] New OR [] Existing
OR [] Conversion OR [] Replacement Location of Panel: _____

Fuel Type: [] Gas [] Oil [] Electric [] Solar
[] Other _____ Fire Suppression/Standpipe System:
[] New OR [] Existing

Location: _____ Location of Main Control Valve: _____

Total Cost of Fire Protection Work \$ 8,000

JOB SUMMARY (Office Use Only)		INSPECTIONS		Dates (Month/Day)	
PLAN REVIEW		Type:	Failure	Approval	Initial
[] No Plans Required		Alarm System	_____	_____	_____
[] Partial -Underslab Utilities Approved		Suppression Sys.	_____	_____	_____
Date: _____ Approved by: _____		Standpipe	_____	_____	_____
[] Fire Protection Plans Approved		Fire Pump	_____	_____	_____
Date: <u>12/17/14</u> Approved by: <u>[signature]</u>		Pre-Eng. System	_____	_____	_____
Joint Plan Review Required:		Mechanical	_____	_____	_____
[] Bldg. [] Elec. [] Plumb. [] Elev.		Smoke Control	_____	_____	_____
SUBCODE APPROVAL for PERMIT		TCO	_____	_____	_____
Date: <u>12-18-14</u>		Flam/Combust Tanks	_____	_____	_____
Approved by: <u>[signature]</u>		Fireplace Venting	_____	_____	_____
SUBCODE APPROVAL for CERTIFICATE		Final	_____	_____	_____
[] CO [] CCO [] CA		Other	_____	_____	_____
Date: <u>12-18-14</u>					
Approved by: <u>[signature]</u>					

C. CERTIFICATION IN LIEU OF OATH

I hereby certify that I am the (agent of) owner of record and am authorized to make this application.

Applicant/Contractor sign here: [signature]

Print name here: Thomas J. Demcsak

D. TECHNICAL SITE DATA

DESCRIPTION OF WORK: Installation of a Fire Alarm
Water Supply Source: System
Method of Alarm/Suppression System Supervision: _____

	NUMBER	FEE (Office Use Only)
Flammable/Combustible Tanks	_____	\$ _____
Alarm Systems		
[] System	_____	_____
[] 110v Interconnected	_____	_____
[] CO Detectors/110v	_____	_____
Alarm Devices (i.e., smoke, heat, pulls, water/flow)	<u>10</u>	_____
Supervisory Devices (i.e., tampers, low/high air)	_____	_____
Signaling Devices (i.e., horn/strobes, bells)	<u>21</u>	_____
Other Devices	_____	_____
TOTAL	<u>0</u>	_____
Suppression Systems		
Fire Pump _____ GPM Type _____	_____	_____
Dry Pipe/Alarm Valves	_____	_____
Pre-action Valves	_____	_____
Sprinkler Heads (Dry and Wet)	_____	_____
Standpipes	_____	_____
Pre-engineered Systems		
Wet Chemical	_____	_____
Dry Chemical	_____	_____
CO ₂ Suppression	_____	_____
Foam Suppression	_____	_____
FM200 Suppression	_____	_____
Other _____	_____	_____
Other Systems		
Kitchen Hood Exhaust System	_____	_____
Smoke Control System	_____	_____
Fuel-Fired Appliances [] Gas [] Oil [] Solid _____	_____	_____
Fireplace Venting/Metal Chimney	_____	_____
Other _____	_____	_____

Administrative Surcharge \$ _____
Minimum Fee \$ _____
State Permit Surcharge Fee \$ _____
TOTAL FEE \$ _____

- covers on alarm devices - Front ✓
- add H/s over FDC ✓
- FDC Signage ✓
- Door Labels ✓
- Knox keys ✓
- Sprinkler FinaO ✓
- 2 Sprinkler heads ✓

guarantee
~~33~~
40

Alarm Report ✓
 Supp hidden ✓

Life Hazard Req
 Charge over bay

4
 6 1300L
 to 60 2k

132-417-3219

1/29/15

TCO-60



Sprinkler
 Assult

only need notification
 by fire alarm contractor
 that Cellulose is now
 Secondary

* Primary Cellulose altered until
 end lines installed



FIRE PROTECTION SUBCODE TECHNICAL SECTION



AUG 01 2014

Date Received
Control #

Date Issued
Permit #

14-1869+E
9/15/14

A. IDENTIFICATION—APPLICANT: COMPLETE ALL APPLICABLE INFORMATION. WHEN CHANGING CONTRACTORS, NOTIFY THIS OFFICE. CALL UTILITY DIG NO: 1-800-272-1000.

Block 6771 Lot 1.01 Qualification Code _____
Work Site Location 56 Chambers Bridge Rd
Brick NJ 08723
Owner in Fee: Federal Realty Investment

Tel. () e-mail _____
Address 56 Chambers Bridge Rd Brick NJ 08723
Contractor: Reliable Fire Protection Inc. Tel. (732) 643-0075
Address 20 Meridian Rd., Eatontown, NJ 07724 email: service@reliablefirepro.com

C. CERTIFICATION IN LIEU OF OATH

I hereby certify that I am the (agent of owner of record and am authorized to make this application.

Applicant sign/Contractor
sign and seal here:

Print name here:

COMMERCIAL
Kris CARLSON

D. TECHNICAL SITE DATA

DESCRIPTION OF WORK: INSTALL 1 UL300 Kitchen
Water Supply Source Wet chemical Fire suppression system
Method of Alarm/Suppression System Supervision _____

Fire Protection Equipment, NJ Div of Fire Safety Permit No. P00049
Fire Protection Equipment, NJ Div of Fire Safety Installer No. 153565
Fire Alarm Contractor No. _____ Exp. Date _____
Home Improvement Contractor Registration No. or Exemption Reason (if applicable): _____
Federal Emp. ID No. 22-3103000 FAX: (732) 643-0076

B. FIRE PROTECTION CHARACTERISTICS

Use Group: Present _____ Proposed _____
Constr. Class: Present _____ Proposed _____
Heating System: [] New OR [] Modification to Existing
OR [] Conversion OR [] Replacement
Fuel Type: [] Gas [] Oil [] Electric [] Solar
[] Other _____
Location: _____
Total Cost of Fire Protection Work \$ 2325

Fuel Storage Tank:

Fuel Type: [] Flammable OR [] Combustible
Capacity _____

Fire Alarm System: [] New OR [] Existing

Location of Panel: _____

Fire Suppression/Standpipe System:

[] New OR [] Existing

Location of Main Control Valve: _____

	NUMBER	FEE (Office Use Only)
Flammable/Combustible Tanks	_____	\$ _____
Alarm Systems	_____	_____
[] System	_____	_____
[] 110v Interconnected	_____	_____
[] CO Detectors/110v	_____	_____
Alarm Devices (i.e., smoke, heat, pulls, water/flow)	_____	_____
Supervisory Devices (i.e., tampers, low/high air)	_____	_____
Signaling Devices (i.e., horn/strobes, bells)	_____	_____
Other Devices	_____	_____
TOTAL	_____	_____
Suppression Systems	_____	_____
Fire Pump _____ GPM Type _____	_____	_____
Dry Pipe/Alarm Valves	_____	_____
Pre-action Valves	_____	_____
Sprinkler Heads (Dry and Wet)	_____	_____
Standpipes	_____	_____
Pre-engineered Systems	_____	_____
Wet Chemical	<u>1</u>	_____
Dry Chemical	_____	_____
CO ₂ Suppression	_____	_____
Foam Suppression	_____	_____
FM200 Suppression	_____	_____
Other	_____	_____
Other Systems	_____	_____
Kitchen Hood Exhaust System	_____	_____
Smoke Control System	_____	_____
Fuel-Fired Appliances [] Gas [] Oil [] Solid	_____	_____
Fireplace Venting/Metal Chimney	_____	_____
Other	_____	_____

JOB SUMMARY (Office Use Only)	INSPECTIONS	Dates (Month/Day)
PLAN REVIEW	Type:	Failure Failure Approval Initial
[] No Plans Required	Alarm System	_____
[] Partial -Underslab Utilities Approved	Suppression Sys.	_____
Date: _____ Approved by: _____	Standpipe	_____
[] Fire Protection Plans Approved	Fire Pump	_____
Date: <u>8/14/14</u> Approved by: <u>MD</u>	Pre-Eng. System	_____
Joint Plan Review Required:	Mechanical	_____
[] Bldg. [] Elec. [] Plumb. [] Elev.	Smoke Control	_____
SUBCODE APPROVAL for PERMIT	TCO <u>60</u>	_____
Date: _____ Approved by: _____	Flam/Combust Tanks	_____
SUBCODE APPROVAL for CERTIFICATE	Fireplace Venting	_____
[] CO [] CCO [] CA	Final	_____
Date: <u>8-15</u>	Other	_____
Approved by: _____		_____

To reprint call (609) 390-1400
ALLEGRA
Marketing • Print • Mail

Administrative Surcharge \$ _____
Minimum Fee \$ _____
State Permit Surcharge Fee \$ _____
TOTAL FEE \$ _____

9/24/14

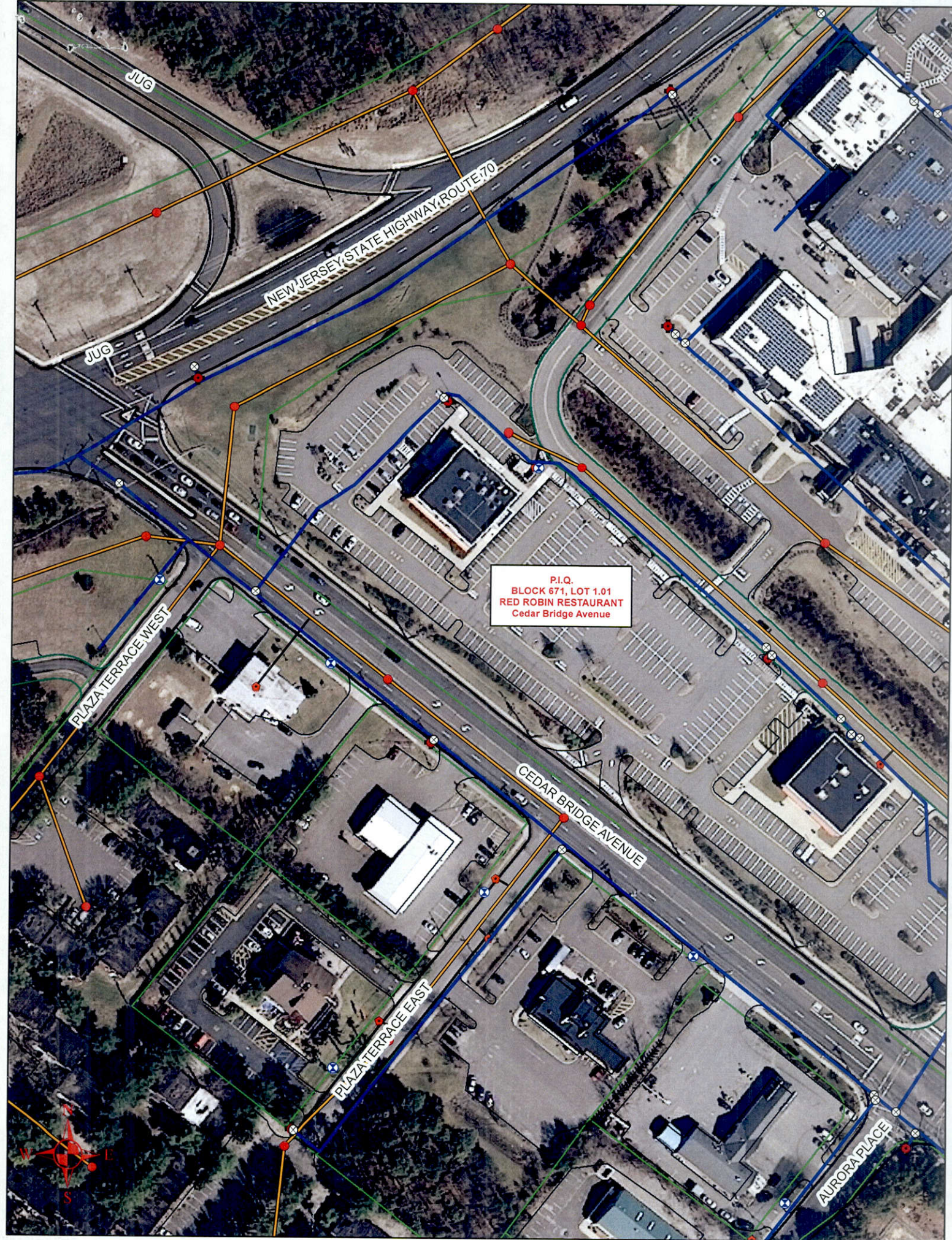
① underground only - visual

12/3/14

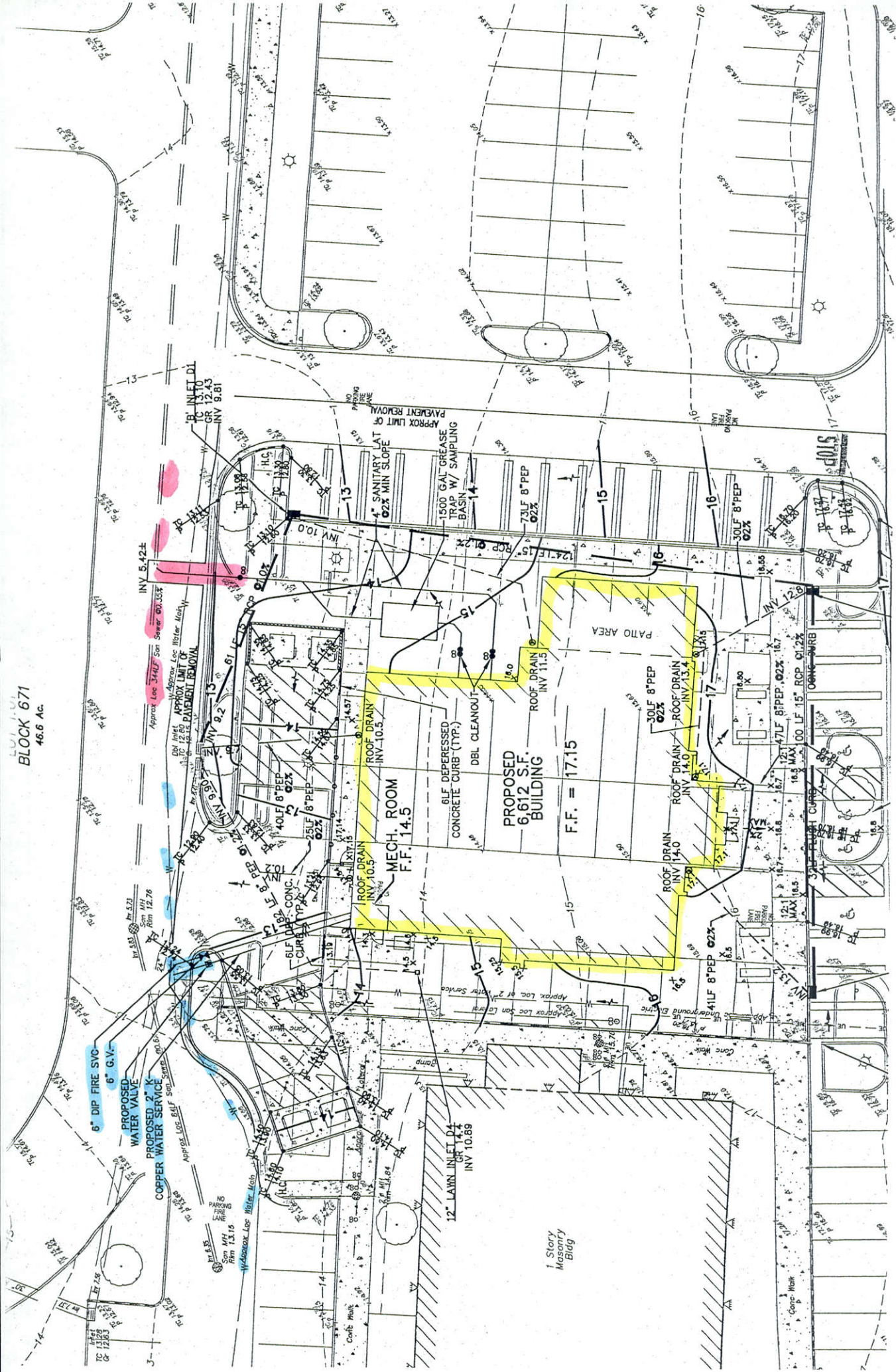
Mixed lightest - pass

↑ (F) tech + E

COMMENCING



BLOCK 671
46.6 AC.



1 Story
Masonry
Bldg



COMcheck Software Version 3.8.1

Envelope Compliance Certificate

ASHRAE

90.1 (2007) Standard

Section 1: Project Information

Project Type: **New Construction**

Project Title : Red Robin Gourmet Burgers

Construction Site:

56 Chambers Bridge
Brick, NJ

Owner/Agent:

Chipman Design Architecture Inc.
2700 S. River Road, Suite 400
Des Plaines, IL 60018
847.298.6900

Designer/Contractor:

Gregory R. Schnackel P.E.
Schnackel Engineers, Inc.
3035 S. 72nd Street
Omaha, NE 68124
402.391.7680

Section 2: General Information

Building Location (for weather data):

Toms River, New Jersey

Climate Zone:

4a

Building Type for Envelope Requirements:

Non-Residential

Vertical Glazing / Wall Area Pct.:

23%

Activity Type(s)

Floor Area

Common Space Types:Lobby	365
Common Space Types:Dining Area - Family Restaurant	3941
Common Space Types:Restrooms	304
Common Space Types:Food Preparation	1883
Common Space Types:Office - Enclosed	61
Common Space Types:Electrical/Mechanical	59

Section 3: Requirements Checklist

Envelope **PASSES**: Design 4% better than code.

Climate-Specific Requirements:

Component Name/Description	Gross Area or Perimeter	Cavity R-Value	Cont. R-Value	Proposed U-Factor	Budget U-Factor ^(a)
Roof: Insulation Entirely Above Deck	6613	---	20.0	0.048	0.048
North Exterior Wall: Wood-Framed, 16" o.c.	1356	21.0	0.0	0.062	0.089
Window: Metal Frame with Thermal Break:Double Pane, Clear, SHGC 0.43, PF 0.29	126	---	---	0.430	0.550
Window: Metal Frame with Thermal Break:Double Pane, Clear, SHGC 0.43, PF 0.29	163	---	---	0.430	0.550
Window: Metal Frame with Thermal Break:Double Pane, Clear, SHGC 0.43, PF 0.30	35	---	---	0.430	0.550
Window: Metal Frame with Thermal Break:Double Pane, Clear, SHGC 0.43, PF 0.30	35	---	---	0.430	0.550
Window: Metal Frame with Thermal Break:Double Pane, Clear, SHGC 0.43, PF 0.30	32	---	---	0.430	0.550
Window: Metal Frame with Thermal Break:Double Pane, Clear, SHGC 0.43, PF 0.30	32	---	---	0.430	0.550
Glass Door: Glass (> 50% glazing), Clear, Non-Entrance Door, SHGC 0.43	73	---	---	0.430	0.400
Glass Door: Glass (> 50% glazing), Clear, Non-Entrance Door, SHGC 0.43, PF 0.29	24	---	---	0.430	0.400

South Exterior Wall: Wood-Framed, 16" o.c.	1357	21.0	0.0	0.062	0.089
Door: Insulated Metal, Swinging	25	---	---	0.500	0.700
Glass Overhead Door: Glass (> 50% glazing):Metal Frame, Clear, Non-Entrance Door, SHGC 0.40	60	---	---	0.920	0.550
West Exterior Wall: Wood-Framed, 16" o.c.	1100	21.0	0.0	0.062	0.089
Window: Metal Frame with Thermal Break:Double Pane, Clear, SHGC 0.43, PF 0.29	91	---	---	0.430	0.550
Window: Metal Frame with Thermal Break:Double Pane, Clear, SHGC 0.43, PF 0.60	25	---	---	0.430	0.550
Glass Door: Glass (> 50% glazing), Clear, Non-Entrance Door, SHGC 0.43, PF 0.29	24	---	---	0.430	0.400
Glass Overhead Door: Glass (> 50% glazing):Metal Frame, Clear, Non-Entrance Door, SHGC 0.40	60	---	---	0.920	0.550
Glass Overhead Door: Glass (> 50% glazing):Metal Frame, Clear, Non-Entrance Door, SHGC 0.40	60	---	---	0.920	0.550
East Exterior Wall: Wood-Framed, 16" o.c.	1108	21.0	0.0	0.062	0.089
Window: Metal Frame with Thermal Break:Double Pane, Clear, SHGC 0.43, PF 0.29	254	---	---	0.430	0.550
Window: Metal Frame with Thermal Break:Double Pane, Clear, SHGC 0.43, PF 0.60	25	---	---	0.430	0.550
Door: Insulated Metal, Swinging	25	---	---	0.500	0.700
Floor: Slab-On-Grade:Unheated, Horizontal without vertical 2 ft.	325	---	8.5	---	---

(a) Budget U-factors are used for software baseline calculations ONLY, and are not code requirements.

Insulation:

- ☐ 1. Open-blown or poured loose-fill insulation has not been used in attic roof spaces with ceiling slope greater than 3 in 12.
- ☐ 2. Wherever vents occur, they are baffled to deflect incoming air above the insulation.
- ☐ 3. Recessed lights, equipment and ducts are not affecting insulation thickness.
- ☐ 4. No roof insulation is installed on a suspended ceiling with removable ceiling panels.
- ☐ 5. All exterior insulation is covered with protective material.
- ☐ 6. Cargo and loading dock doors are equipped with weather seals.

Fenestration and Doors:

- ☐ 7. Windows and skylights are labeled and certified by the manufacturer for U-factor and SHGC.
- ☐ 8. Fixed windows and skylights unlabeled by the manufacturer have been site labeled using the default U-factor and SHGC.
- ☐ 9. Other unlabeled vertical fenestration, operable and fixed, that are unlabeled by the manufacturer have been site labeled using the default U-factor and SHGC. No credit has been given for metal frames with thermal breaks, low-emissivity coatings, gas fillings, or insulating spacers.

Air Leakage and Component Certification:

- ☐ 10. All joints and penetrations are caulked, gasketed, weather-stripped, or otherwise sealed.
- ☐ 11. Windows, doors, and skylights certified as meeting leakage requirements.
- ☐ 12. Component R-values & U-factors labeled as certified.
- ☐ 13. 'Other' components have supporting documentation for proposed U-Factors.
- ☐ 14. Building entrances that separate conditioned space from the exterior have an enclosed vestibule with all doors equipped with self-closing devices. Interior and exterior doors in the closed position are no less than 7 ft apart. Conditioned vestibules comply with the requirements for a conditioned space. Unconditioned vestibules comply with the requirements of a semiheated space.

Exceptions:

- ☐ Building entrances with revolving doors.
- ☐ Doors not intended to be used as a building entrance.
- ☐ Doors opening directly from a dwelling unit.
- ☐ Buildings less than four stories above grade and less than 10,000 ft² in area.
- ☐ Doors that open directly from a space less than 3000 sq. ft. in area and is separate from the building entrance.

Section 4: Compliance Statement

Compliance Statement: The proposed envelope design represented in this document is consistent with the building plans, specifications and other calculations submitted with this permit application. The proposed envelope system has been designed to meet the 90.1 (2007) Standard requirements in COMcheck Version 3.8.1 and to comply with the mandatory requirements in the Requirements Checklist.

Name - Title

Signature

Date

Project Notes:

- Complies with Chapter 5, Section 501.1 of the 2009 IECC, which allows the use of ASHRAE 90.1-2007.



COMcheck Software Version 3.8.1

Interior Lighting and Power Compliance Certificate

ASHRAE

90.1 (2007) Standard

Section 1: Project Information

Project Type: **New Construction**

Project Title : Red Robin Gourmet Burgers

Construction Site:

56 Chambers Bridge
Brick, NJ

Owner/Agent:

Chipman Design Architecture Inc.
2700 S. River Road, Suite 400
Des Plaines, IL 60018
847.298.6900

Designer/Contractor:

Gregory R. Schnackel P.E.
Schnackel Engineers, Inc.
3035 S. 72nd Street
Omaha, NE 68124
402.391.7680

Section 2: Interior Lighting and Power Calculation

A Area Category	B Floor Area (ft ²)	C Allowed Watts / ft ²	D Allowed Watts (B x C)
Common Space Types:Lobby	365	1.3	475
Common Space Types:Dining Area - Family Restaurant	3941	2.1	8276
Common Space Types:Restrooms	304	0.9	274
Common Space Types:Food Preparation	1883	1.2	2260
Common Space Types:Office - Enclosed	61	1.1	67
Common Space Types:Electrical/Mechanical	59	1.5	89
Total Allowed Watts =			11439

Section 3: Interior Lighting Fixture Schedule

A Fixture ID : Description / Lamp / Wattage Per Lamp / Ballast	B Lamps/ Fixture	C # of Fixtures	D Fixture Watt.	E (C X D)
Common Space Types:Lobby (365 sq.ft.)				
Compact Fluorescent: LF19: Downlight / Triple 4-pin 18W / Electronic	1	12	18	216
LED: LF41: Ball Pendant, 75w Max / Incandescent 75W	1	1	75	75
Track: Track: 30-watts Per Linear Foot / Other	1	4	30	120
Common Space Types:Dining Area - Family Restaurant (3941 sq.ft.)				
LED: LF0A: Track Head, (1) 10w LED / Other	1	2	10	20
Compact Fluorescent: LF11: Downlight, 23w CFL / Spiral 23W / Electronic	1	13	23	299
Compact Fluorescent: LF19: Downlight / Triple 4-pin 18W / Electronic	1	13	18	234
LED: LF44: Downlight, 50w Max / Other	1	9	50	450
LED: LF60: Beer Light, (1) 43.2w LED / Other	1	1	44	44
Current Limiters: CL13: 13 AMP Current Limiter / Other	1	1	1560	1560
Transformer: TR: 300w Transformer (Serves LF37) / Other	1	1	300	300
LED Driver: DR: 60w Driver (Serves LF64) / Other	1	1	60	60
Track: Track: 30-watts Per Linear Foot / Other	1	165	30	4950
Common Space Types:Restrooms (304 sq.ft.)				
Incandescent: LF7: Downlight / Incandescent 50W	1	4	50	200
Compact Fluorescent: LF19: Downlight / Triple 4-pin 18W / Electronic	1	14	18	252
Common Space Types:Office - Enclosed (61 sq.ft.)				
Linear Fluorescent: LF1a: 2'x4' Troffer / (3) F28T8 / Electronic	3	1	65	65
Common Space Types:Electrical/Mechanical (59 sq.ft.)				
Linear Fluorescent: LF3: 4' Strip Light / (2) F28T8 / Electronic	2	1	56	56

Common Space Types: Food Preparation (1883 sq.ft.)

Linear Fluorescent: LF1a: 2'x4' Troffer / (3) F28T8 / Electronic	3	16	65	1040
Linear Fluorescent: LF1b: 2'x4' Troffer / (3) F28T8 / Electronic	3	10	65	650
Compact Fluorescent: LF19: Downlight / Triple 4-pin 18W / Electronic	1	16	18	288
Total Proposed Watts =				10879

Section 4: Requirements Checklist

Lighting Wattage:

- ☐ 1. Total proposed watts must be less than or equal to total allowed watts.

Allowed Watts	Proposed Watts	Complies
11439	10879	YES

- ☐ 2. Exit signs 5 Watts or less per sign.

Controls, Switching, and Wiring:

- ☐ 3. Independent manual or occupancy sensing controls for each space (remote switch with indicator allowed for safety or security).
☐ 4. Occupant sensing control in class rooms, conference/meeting rooms, and employee lunch and break rooms.

Exceptions:

- ☐ Spaces with multi-scene control; shop classrooms, laboratory classrooms, and preschool through 12th grade classrooms.
☐ 5. Automatic shutoff control for lighting in >5000 sq.ft buildings by time-of-day device, occupant sensor, or other automatic control.

Exceptions:

- ☐ 24 hour operation lighting; patient care areas; where auto shutoff would endanger safety or security.
☐ 6. Master switch at entry to hotel/motel guest room.
☐ 7. Separate control device for display/accent lighting, case lighting, task lighting, nonvisual lighting, lighting for sale, and demonstration lighting.
☐ 8. Tandem wired one-lamp and three-lamp ballasted luminaires (No single-lamp ballasts).

Exceptions:

- ☐ Electronic high-frequency ballasts.
☐ Luminaires not on same switch.
☐ Recessed luminaires 10 ft. apart or surface/pendant not continuous.
☐ Luminaires on emergency circuits.

Voltage Drop:

- ☐ 9. Feeder conductors have been designed for a maximum voltage drop of 2 percent.
☐ 10. Branch circuit conductors have been designed for a maximum voltage drop of 3 percent.

Interior Lighting PASSES: Design 5% better than code.

Section 5: Compliance Statement

Compliance Statement: The proposed lighting design represented in this document is consistent with the building plans, specifications and other calculations submitted with this permit application. The proposed lighting system has been designed to meet the 90.1 (2007) Standard requirements in COMcheck Version 3.8.1 and to comply with the mandatory requirements in the Requirements Checklist.

Gregory R. Schnackel P.E. - President
Name - Title


Signature

August 1, 2014
Date

Section 6: Post Construction Compliance Statement

Record Drawings and Operating and Maintenance Manuals:

- ☐ 1. Construction documents with record drawings and operating and maintenance manuals provided to the owner.

Lighting Designer or Contractor Name

Signature

Date



COMcheck Software Version 3.8.1

Exterior Lighting Compliance Certificate

ASHRAE

90.1 (2007) Standard

Section 1: Project Information

Project Type: **New Construction**

Project Title : Red Robin Gourmet Burgers

Construction Site:

56 Chambers Bridge
Brick, NJ

Owner/Agent:

Chipman Design Architecture Inc.
2700 S. River Road, Suite 400
Des Plaines, IL 60018
847.298.6900

Designer/Contractor:

Gregory R. Schnackel P.E.
Schnackel Engineers, Inc.
3035 S. 72nd Street
Omaha, NE 68124
402.391.7680

Section 2: Exterior Lighting Area/Surface Power Calculation

A Exterior Area/Surface	B Quantity	C Allowed Watts / Unit	D Tradable Wattage	E Allowed Watts (B x C)	F Proposed Watts
Illuminated length of wall or surface	364 ft	5	No	1820	1716
Other entry/exit	6 ft of door width	20	Yes	120	50
Total Tradable Watts* =				120	50
Total Allowed Watts =				1940	
Total Allowed Supplemental Watts** =				97	

* Wattage tradeoffs are only allowed between tradable areas/surfaces.

** A supplemental allowance equal to 5% of total allowed wattage may be applied toward compliance of both non-tradable and tradable areas/surfaces.

Section 3: Exterior Lighting Fixture Schedule

A Fixture ID : Description / Lamp / Wattage Per Lamp / Ballast	B Lamps/ Fixture	C # of Fixtures	D Fixture Watt.	E (C X D)
Illuminated length of wall or surface (364 ft): Non-tradable Wattage				
Incandescent: LF6: Downlight / Other	1	13	90	1170
LED: LF22: Wall Mounted / Other	1	9	50	450
LED: LF45: Recessed, 96w / Other	1	1	96	96
Other entry/exit (6 ft of door width): Tradable Wattage				
HID: LF24: Wall Mounted Light / Metal Halide 50W / Standard	1	1	50	50
Total Tradable Proposed Watts =				50

Section 4: Requirements Checklist

Lighting Wattage:

- ☐ 1. Within each non-tradable area/surface, total proposed watts must be less than or equal to total allowed watts. Across all tradable areas/surfaces, total proposed watts must be less than or equal to total allowed watts.

Compliance: Passes.

Controls, Switching, and Wiring:

- ☐ 2. All exemption claims are associated with fixtures that have a control device independent of the control of the nonexempt lighting.
- ☐ 3. All lighting fixtures are controlled by a photosensor or astronomical time switch that is capable of automatically turning off the fixture when sufficient daylight is available or the lighting is not required.

Exceptions:

- ☐ Covered vehicle entrance/exit areas requiring lighting for safety, security and eye adaptation.

Exterior Lighting Efficacy:

- ☐ 4. All exterior building grounds luminaires that operate at greater than 100W have minimum efficacy of 60 lumen/watt.

Exceptions:

- ☐ Lighting that has been claimed as exempt and is identified as such in Section 3 table above.
- ☐ Lighting that is specifically designated as required by a health or life safety statute, ordinance, or regulation.
- ☐ Emergency lighting that is automatically off during normal building operation.
- ☐ Lighting that is controlled by motion sensor.

Exterior Lighting PASSES: Design 77% better than code.

Section 5: Compliance Statement

Compliance Statement: The proposed exterior lighting design represented in this document is consistent with the building plans, specifications and other calculations submitted with this permit application. The proposed lighting system has been designed to meet the 90.1 (2007) Standard requirements in COMcheck Version 3.8.1 and to comply with the mandatory requirements in the Requirements Checklist.

Gregory R. Schnackel P.E. - President

Name - Title

Signature

August 1, 2014

Date





COMcheck Software Version 3.8.1

Mechanical Compliance Certificate

ASHRAE

90.1 (2007) Standard

Section 1: Project Information

Project Type: **New Construction**

Project Title : Red Robin Gourmet Burgers

Construction Site:

56 Chambers Bridge
Brick, NJ

Owner/Agent:

Chipman Design Architecture Inc.
2700 S. River Road, Suite 400
Des Plaines, IL 60018
847.298.6900

Designer/Contractor:

Gregory R. Schnackel P.E.
Schnackel Engineers, Inc.
3035 S. 72nd Street
Omaha, NE 68124
402.391.7680

Section 2: General Information

Building Location (for weather data):

Toms River, New Jersey

Climate Zone:

4a

Section 3: Mechanical Systems List

Quantity System Type & Description

- | | |
|---|---|
| 1 | RTU-1 (Single Zone) : |
| | Heating: 1 each - Central Furnace, Gas, Capacity = 284 kBtu/h, Efficiency = 80.00% Ec |
| | Cooling: 1 each - Rooftop Package Unit, Capacity = 186 kBtu/h, Efficiency = 12.00 EER, Air-Cooled Condenser |
| 1 | RTU-2 (Single Zone) : |
| | Heating: 1 each - Central Furnace, Gas, Capacity = 284 kBtu/h, Efficiency = 80.00% Ec |
| | Cooling: 1 each - Rooftop Package Unit, Capacity = 266 kBtu/h, Efficiency = 11.80 EER, Air-Cooled Condenser |
| 1 | RTU-3 (Single Zone) : |
| | Heating: 1 each - Central Furnace, Gas, Capacity = 203 kBtu/h, Efficiency = 80.00% Et |
| | Cooling: 1 each - Rooftop Package Unit, Capacity = 207 kBtu/h, Efficiency = 11.80 EER, Air-Cooled Condenser |
| 2 | ACU-1, 2/ASHP-1, 2 (Single Zone) : Split System Heat Pump |
| | Heating Mode: Capacity = 12 kBtu/h, Efficiency = 7.70 HSPF |
| | Cooling Mode: Capacity = 22 kBtu/h, Efficiency = 13.00 SEER |
| 2 | HWH-1: Gas Storage Water Heater, Capacity: 100 gallons, Input Rating: 199 Btu/h w/ Circulation Pump, |
| | Efficiency: 95.00 % Et |

Section 4: Requirements Checklist

Requirements Specific To: RTU-1 :

- ☐ 1. Equipment minimum efficiency: Central Furnace (Gas): 80.0 % Ec
- ☐ 2. Equipment minimum efficiency: Rooftop Package Unit: 10.8 EER

Requirements Specific To: RTU-2 :

- ☐ 1. Equipment minimum efficiency: Central Furnace (Gas): 80.0 % Ec
- ☐ 2. Equipment minimum efficiency: Rooftop Package Unit: 9.8 EER (9.5 IPLV)

Requirements Specific To: RTU-3 :

- ☐ 1. Equipment minimum efficiency: Central Furnace (Gas): 80.0 % Et (or 78% AFUE)
- ☐ 2. Equipment minimum efficiency: Rooftop Package Unit: 10.8 EER

Requirements Specific To: ACU-1, 2/ASHP-1, 2 :

- ☐ 1. Equipment minimum efficiency: Heat Pump: 7.7 HSPF 13.0 SEER

Requirements Specific To: HWH-1 :

- ☐ 1. Gas Storage Water Heater efficiency: 80.0 % Et (260 SL, kBtu/h)
- ☐ 2. Hot water system sized per manufacturer's sizing guide
- ☐ 3. All piping in circulating system insulated
- ☐ 4. Hot water storage temperature adjustable down to 120°F or lower
- ☐ 5. Automatic time control of heat tapes and recirculating systems present
- ☐ 6. Controls will shut off operation of circulating pump between water heater/boiler and storage tanks within 5 minutes after end of heating cycle

Generic Requirements: Must be met by all systems to which the requirement is applicable:

- ☐ 1. Load calculations per ASHRAE Fundamentals
- ☐ 2. Automatic Controls: Setback to 55°F (heat) and 85°F (cool); 7-day clock, 2-hour occupant override, 10-hour backup
 - ☐ Exception: Continuously operating zones
- ☐ 3. Hot water pipe insulation: 1 in. for pipes ≤1.5 in. and 2 in. for pipes >1.5 in.
Chilled water/refrigerant/brine pipe insulation: 1 in. for pipes ≤1.5 in. and 1.5 in. for pipes >1.5 in.
Steam pipe insulation: 1.5 in. for pipes ≤1.5 in. and 3 in. for pipes >1.5 in.
 - ☐ Exception: Piping within HVAC equipment.
 - ☐ Exception: Fluid temperatures between 60 and 105°F.
 - ☐ Exception: Fluid not heated or cooled.
 - ☐ Exception: Runouts <4 ft in length.
 - ☐ Exception: Pipe unions in heating systems.
- ☐ 4. Piping, insulated to 1/2 in. if nominal diameter of pipe is <1.5 in.;
Larger pipe insulated to 1 in. thickness
- ☐ 5. Lavatory faucet outlet temperatures in public restrooms limited to 110°F (43°C)
- ☐ 6. Thermostatic controls have 5°F deadband
 - ☐ Exception: Thermostats requiring manual changeover between heating and cooling
 - ☐ Exception: Special occupancy or special applications where wide temperature ranges are not acceptable and are approved by the authority having jurisdiction.
- ☐ 7. Demand control ventilation (DCV) present for high design occupancy areas (>40 person/1000 ft² in spaces >500 ft²) and served by systems with any one of 1) an air-side economizer, 2) automatic modulating control of the outdoor air damper, or 3) a design outdoor airflow greater than 3000 cfm.
 - ☐ Exception: Systems with heat recovery.
 - ☐ Exception: Multiple-zone systems without DDC of individual zones communicating with a central control panel.
 - ☐ Exception: Systems with a design outdoor airflow less than 1200 cfm.
 - ☐ Exception: Spaces where the supply airflow rate minus any makeup or outgoing transfer air requirement is less than 1200 cfm.
- ☐ 8. Where separate thermostats are used for heating and cooling, acceptable measures are used to prevent simultaneous heating and cooling
- ☐ 9. Stair and elevator shaft vents are equipped with motorized dampers
 - ☐ Exception: Ventilation systems serving unconditioned spaces.
 - ☐ Exception: Gravity (non-motorized) dampers are acceptable in buildings less than three stories in height above grade.
- ☐ 10. Acceptable measures used to prevent simultaneous humidification and dehumidification
 - ☐ Exception: Desiccant systems and systems for uses requiring specific humidity levels (approval required)
- ☐ 11. Automatic controls for freeze protection systems present
- ☐ 12. Duct, plenum, and piping insulation surfaces suitably protected from weather, moisture, or likely damage
- ☐ 13. Duct Sealing:
 - a) Pressure sensitive tape used as the primary sealant is certified to comply with UL-181A or UL-181B,
 - b) longitudinal and transverse seams for ducts in unconditioned spaces,
 - c) longitudinal and transverse seams and duct wall penetrations for ducts outside the building,
 - d) transverse seams on buried ducts
- ☐ 14. Motorized, automatic shutoff dampers required on exhaust and outdoor air supply openings
 - ☐ Exception: Gravity dampers acceptable in buildings <3 stories
 - ☐ Exception: Gravity dampers acceptable in systems with outside or exhaust air flow rates less than 300 cfm where dampers are interlocked with fan
- ☐ 15. R-6 for supply air ducts located outside the building, in ventilated attics and in unvented attic above insulated ceiling
R-3.5 for supply air ducts in unvented attic with roof insulation, unconditioned and underground spaces
R-3.5 for return air ducts located outside the building, in ventilated attics and in unvented attic above insulated ceiling
- ☐ 16. Humidistat controls prevent reheating, recooling, and mixing of mechanically heated air with mechanically cooled air
 - ☐ Exception: Capability to first reduce flow rate.
 - ☐ Exception: Cooling capacity <80 kBtu/h and capability to unload cooling equipment.

- ☐ Exception: Cooling capacity <40 kBtu/h.
- ☐ Exception: Rigid humidity requirements.
- ☐ Exception: Site-recovered or site-solar energy sources or.
- ☐ Exception: Use of a desiccant systems.
- ☐ 17. Exhaust air heat recovery included for systems 5,000 cfm or greater with more than 70% outside air fraction or specifically exempted
 - ☐ Exception: Laboratory fume hood systems with a total exhaust rate of 15,000 cfm or less.
 - ☐ Exception: Systems serving spaces that are not cooled and heated to <60°F.
 - ☐ Exception: Systems with more than 60% of the outdoor heating energy is provided from site-recovered or site solar energy.
 - ☐ Exception: Cooling systems in climates with a 1% cooling design wet-bulb temperature less than 64°F.
- ☐ 18. Kitchen hoods >5,000 cfm provided with 50% makeup air that is uncooled and heated to no more than 60°F unless specifically exempted
 - ☐ Exception: Where hoods are used to exhaust ventilation air that would otherwise exfiltrate or be exhausted by other fan systems.
 - ☐ Exception: Certified grease extractor hoods that require a face velocity no >60 fpm.
- ☐ 19. Buildings with fume hood systems having an exhaust rate > 15,000 cfm has at least one of the following features:
 - a) VAV hood exhaust and room supply systems capable of reducing exhaust and makeup air volume to 50% or less of design values.
 - b) Direct makeup air supply equal to at least 75% of the exhaust rate, heated no warmer than 2°F below room setpoint, cooled to no cooler than 3°F above room setpoint, no humidification added, and no simultaneous heating and cooling used for dehumidification control.
 - c) Heat recovery systems to precondition makeup air from fume hood exhaust.

Section 5: Compliance Statement

Compliance Statement: The proposed mechanical design represented in this document is consistent with the building plans, specifications and other calculations submitted with this permit application. The proposed mechanical systems have been designed to meet the 90.1 (2007) Standard requirements in COMcheck Version 3.8.1 and to comply with the mandatory requirements in the Requirements Checklist.

Gregory R. Schnackel P.E. - President

Name - Title

Signature

Date

August 1, 2014

Section 6: Post Construction Compliance Statement

- ☐ HVAC record drawings of the actual installation and performance data for each equipment provided to the owner within 90 days after system acceptance.
- ☐ HVAC O&M documents for all mechanical equipment and system provided to the owner within 90 days after system acceptance.
- ☐ Written HVAC balancing report provided to the owner.

The above post construction requirements have been completed.

Principal Mechanical Designer-Name

Signature

Date



COMcheck Software Version 3.8.1

Mechanical Requirements Description

ASHRAE

90.1 (2007) Standard

The following list provides more detailed descriptions of the requirements in Section 4 of the Mechanical Compliance Certificate.

Requirements Specific To: RTU-1 :

1. The specified heating and/or cooling equipment is covered by the ASHRAE 90.1-2007 Standard and must meet the following minimum efficiency: Central Furnace (Gas): 80.0 % Ec
2. The specified heating and/or cooling equipment is covered by the ASHRAE 90.1-2007 Standard and must meet the following minimum efficiency: Rooftop Package Unit: 10.8 EER

Requirements Specific To: RTU-2 :

1. The specified heating and/or cooling equipment is covered by the ASHRAE 90.1-2007 Standard and must meet the following minimum efficiency: Central Furnace (Gas): 80.0 % Ec
2. The specified heating and/or cooling equipment is covered by the ASHRAE 90.1-2007 Standard and must meet the following minimum efficiency: Rooftop Package Unit: 9.8 EER (9.5 IPLV)

Requirements Specific To: RTU-3 :

1. The specified heating and/or cooling equipment is covered by the ASHRAE 90.1-2007 Standard and must meet the following minimum efficiency: Central Furnace (Gas): 80.0 % Et (or 78% AFUE)
2. The specified heating and/or cooling equipment is covered by the ASHRAE 90.1-2007 Standard and must meet the following minimum efficiency: Rooftop Package Unit: 10.8 EER

Requirements Specific To: ACU-1, 2/ASHP-1, 2 :

1. The specified heating and/or cooling equipment is covered by the ASHRAE 90.1-2007 Standard and must meet the following minimum efficiency: Heat Pump: 7.7 HSPF 13.0 SEER

Requirements Specific To: HWH-1 :

1. Service water heating equipment used solely for heating potable water, pool heaters, and hot water storage tanks must meet the following minimum efficiency: Gas Storage Water Heater efficiency: 80.0 % Et (260 SL, kBtu/h)
2. Service water heating system design loads for the purpose of sizing systems and equipment must be determined in accordance with manufacturers' published sizing guidelines.
3. Insulation must be provided for recirculating system piping, including the supply and return piping of a circulating tank type water heater.
4. Temperature controls must be provided that allow for storage temperature adjustment from 120°F or lower to a maximum temperature compatible with the intended use except when the manufacturer's installation instructions specify a higher minimum thermostat setting to minimize condensation and resulting corrosion. Documentation of the installation instructions must be provided to be exempted from this requirement.
5. Systems designed to maintain usage temperatures in hot water pipes, such as recirculating hot water systems or heat trace, must be equipped with automatic time switches or other controls that can be set to switch off the temperature maintenance system during extended periods when hot water is not required.
6. When used to maintain storage tank water temperature, recirculating pumps must be equipped with controls limiting operation to the start of the heating cycle to a maximum of 5 minutes after the end of the heating cycle.

Generic Requirements: Must be met by all systems to which the requirement is applicable:

1. Design heating and cooling loads for the building must be determined using procedures in the ASHRAE Handbook of Fundamentals or an approved equivalent calculation procedure.
2. The system or zone control must be a programmable thermostat or other automatic control meeting the following criteria:
 - a) capable of setting back temperature to 55°F during heating and setting up to 85°F during cooling,
 - b) capable of automatically setting back or shutting down systems during unoccupied hours using 7 different day schedules,
 - c) have an accessible 2-hour occupant override,
 - d) have a battery back-up capable of maintaining programmed settings for at least 10 hours without power.

- Exception: A setback or shutoff control is not required on thermostats that control systems serving areas that operate continuously.
3. All pipes serving space-conditioning systems must be insulated as follows:

Hot water piping for heating systems:

 - 1 in. for pipes $\leq$ 1 1/2-in. nominal diameter,
 - 2 in. for pipes $>$ 1 1/2-in. nominal diameter.

Chilled water, refrigerant, and brine piping systems:

 - 1 in. insulation for pipes $\leq$ 1 1/2-in. nominal diameter,
 - 1 1/2 in. insulation for pipes $>$ 1 1/2-in. nominal diameter.

Steam piping:

- 1 1/2 in. insulation for pipes $\leq$ 1 1/2-in. nominal diameter,
 - 3 in. insulation for pipes $>$ 1 1/2-in. nominal diameter.
- Exception: Factory-installed piping within HVAC equipment.
 - Exception: Piping that conveys fluids having a design operating temperature range between 60°F and 105°F.
 - Exception: Piping that conveys fluids that have not been heated or cooled through the use of nonrenewable energy.
 - Exception: Runout piping not exceeding 4 ft in length between shutoff valve and coil and 1 in. in diameter between the control valve and HVAC coil.
 - Exception: Pipe unions in heating systems.
4. Service hot water piping, where required, must be insulated to 1/2 in. if pipe less than 1.5 in. nominal diameter. Larger pipe must be insulated to 1 in.. Pipe insulation will have a conductivity of less than 0.28 Btu.in/(h-ft²-°F).
 5. Temperature controlling means must be provided to limit the maximum temperature of water delivered from lavatory faucets in public facility restrooms to 110°F.
 6. Thermostats controlling both heating and cooling must be capable of maintaining a 5°F deadband (a range of temperature where no heating or cooling is provided).
 - Exception: Deadband capability is not required if the thermostat does not have automatic changeover capability between heating and cooling.
 - Exception: Special occupancy or special applications where wide temperature ranges are not acceptable and are approved by the authority having jurisdiction.
 7. Demand control ventilation (DCV) required for high design occupancy areas ($>$ 40 person/1000 ft² in spaces $>$ 500 ft²) and served by systems with any one of 1) an air-side economizer, 2) automatic modulating control of the outdoor air damper, or 3) a design outdoor airflow greater than 3000 cfm.
 - Exception: Systems with heat recovery.
 - Exception: Multiple-zone systems without DDC of individual zones communicating with a central control panel.
 - Exception: Systems with a design outdoor airflow less than 1200 cfm.
 - Exception: Spaces where the supply airflow rate minus any makeup or outgoing transfer air requirement is less than 1200 cfm.
 8. Where zone heating and cooling are controlled by separate zone thermostats, means (such as limit switches, mechanical stops, or, for DDC systems, software programming) must be provided to prevent simultaneous heating and cooling to the zone.
 9. Stair and elevator shaft vents must be equipped with motorized dampers capable of being automatically closed during normal building operation and interlocked to open as required by fire and smoke detection systems. All gravity outdoor air supply and exhaust hoods, vents, and ventilators must be equipped with motorized dampers that will automatically shut when the spaces served are not in use.
 - Exception: Ventilation systems serving unconditioned spaces.
 - Exception: Gravity (non-motorized) dampers are acceptable in buildings less than three stories in height above grade.
 10. Where a zone is served by a system(s) with both humidification and dehumidification capability, means (such as limit switches, mechanical stops, or software programming) must be provided to prevent simultaneous operation of humidification and dehumidification equipment.
 - Exception: Zones served by desiccant systems, used with direct evaporative cooling in series; Systems serving zones where specific humidity levels are required.
 11. All freeze protection systems, including self-regulating heat tracing, must include automatic controls capable of shutting off the systems when outside air temperatures are above 40°F or when the conditions of the protected fluid will prevent freezing. Snow- and ice-melting systems must include automatic controls capable of shutting off the systems when the pavement temperature is above 50°F and no precipitation is falling, and an automatic or manual control that will allow shutoff when the outdoor temperature is above 40°F.
 12. Duct and pipe insulation exposed to weather must be suitable for outdoor service; e.g., protected by aluminum, sheet metal, painted canvas, or plastic cover. Cellular foam insulation must be protected as above or painted with a coating that is water retardant and provides shielding from solar radiation that can cause degradation of the material. Insulation covering chilled water piping, refrigerant suction piping, or cooling ducts located outside the conditioned space must include a vapor retardant located outside the insulation (unless the insulation is inherently vapor retardant), all penetrations and joints of which must be sealed.
 13. Duct Sealing Requirements:
 - a) Pressure sensitive tape used as the primary sealant is certified to comply with UL-181A or UL-181B,
 - b) Longitudinal and transverse seams for ducts in unconditioned spaces,
 - c) Longitudinal and transverse seams and duct wall penetrations for ducts outside the building,
 - d) Transverse seams on buried ducts
 14. Outdoor air supply and exhaust systems must have motorized dampers that automatically shut when the systems or spaces served are not in use. Dampers must be capable of automatically shutting off during preoccupancy building warm-up, cool-down, and setback, except when ventilation reduces energy costs (e.g., night purge) or when ventilation must be supplied to meet code requirements. Both outdoor air supply and exhaust air dampers must have a maximum leakage rate of 10(motorized)/20(non-motorized) cfm/ft² at 1.0 in. w.g. when tested in accordance with AMCA Standard 500.
 - Exception: Gravity (non-motorized) dampers are acceptable in buildings less than three stories in height.
 - Exception: Systems with a design outside air intake or exhaust capacity of 300 cfm (140 L/s) or less.
 15. All supply and return ducts and plenum installed as part of an HVAC air distribution system must be thermally insulated:

- R-6 for supply air ducts located outside the building, in ventilated attics and in unvented attic above insulated ceiling,
R-3.5 for supply air duct insulation in unvented attic with roof insulation, unconditioned and underground spaces,
R-3.5 for return air ducts located outside the building, in ventilated attics and in unvented attic above insulated ceiling.
16. Where humidistatic controls are provided, such controls must prevent reheating, mixing of hot and cold air streams, or other means of simultaneous heating and cooling of the same air stream.
- Exception: Capability to first reduce flow rate.
 - Exception: Cooling capacity <80 kBtu/h and capability to unload cooling equipment.
 - Exception: Cooling capacity <40 kBtu/h.
 - Exception: Rigid humidity requirements.
 - Exception: Site-recovered or site-solar energy sources or.
 - Exception: Use of a desiccant systems.
17. Individual fan systems with a design supply air capacity of 5000 cfm or greater and minimum outside air supply of 70% or greater of the supply air capacity must have an energy recovery system with at least a 50% effectiveness. If an air economizer is also required, heat recovery must be bypassed or controlled to permit air economizer operation.
- Exception: Laboratory fume hood systems with a total exhaust rate of 15,000 cfm or less.
 - Exception: Systems serving spaces that are not cooled and heated to <60°F.
 - Exception: Systems with more than 60% of the outdoor heating energy is provided from site-recovered or site solar energy.
 - Exception: Cooling systems in climates with a 1% cooling design wet-bulb temperature less than 64°F.
18. Individual kitchen exhaust hoods larger than 5000 cfm must be provided with make-up air sized for at least 50% of exhaust air volume that is uncooled and either unheated or heated to no more than 60°F
- Exception: Where hoods are used to exhaust ventilation air that would otherwise exfiltrate or be exhausted by other fan systems.
 - Exception: Certified grease extractor hoods that require a face velocity no >60 fpm.
19. Buildings with fume hood systems having an exhaust rate > 15,000 cfm has at least one of the following features:
- a) VAV hood exhaust and room supply systems capable of reducing exhaust and makeup air volume to 50% or less of design values.
 - b) Direct makeup (auxiliary) air supply equal to at least 75% of the exhaust rate, heated no warmer than 2°F below room setpoint, cooled to no cooler than 3°F above room setpoint, no humidification added, and no simultaneous heating and cooling used for dehumidification control.
 - c) Heat recovery systems to precondition makeup air from fume hood exhaust in accordance with Section 6.5.6.1, Exhaust Air Energy Recovery, without using any exception.



11/25/2013



11/25/2013

1

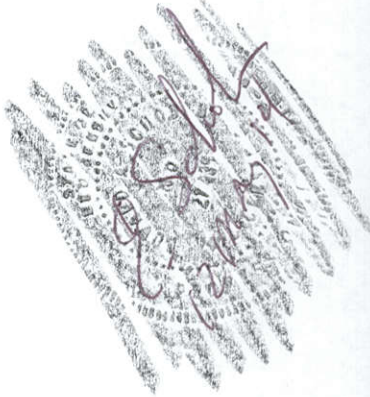
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Levittown, PA**

(215)547-5884

www.MACSprinkler.com



MAC Sprinkler, Inc.
1601-G Harmer Street
Levittown, PA 19057
215-547-5884

Job Name : Red Robin - Brick Township
Building : FP-1
Location : 56 CHAMBERS BRIDGE RD., BRICK TOWNSHIP, NJ 08723
System : #1
Contract : NA
Data File : Calc #1 Red Robin 'Brick' - Light Hazard.WXF

HYDRAULIC CALCULATIONS
for

Project name: Red Robin - Brick Township
Location: 56 CHAMBERS BRIDGE RD., BRICK TOWNSHIP, NJ 08723
Drawing no: FP-1
Date: 5/8/14

Design

Remote area number: #1
Remote area location: RESTAURANT CUSTOMER AREA
Occupancy classification: LIGHT HAZARD
Density: 0.10 - Gpm/SqFt
Area of application: 1092 - SqFt
Coverage per sprinkler: 115 - SqFt
Type of sprinklers calculated: QR UPRIGHT 5.6K
No. of sprinklers calculated: 8
In-rack demand: NA - GPM
Hose streams: 100 - GPM
Total water required (including hose streams): 243.947 - GPM @ 50.1822 - Psi
Type of system: AUTOMATIC WET
Volume of dry or preaction system: NA - Gal

Water supply information

Date: 5/6/14
Location: AT SITE FIRE HYDRANTS
Source: TEST WITH BRICK TOWNSHIP MUNICIPAL UTILITIES

Name of contractor: MAC Sprinkler, Inc.
Address: 1601-G Harmer Street / / Levittown, PA 19057
Phone number: 215-547-5884

Name of designer: JOE CIANFARRA

Authority having jurisdiction: CODE ENFORCEMENT SUB-CODE OFFICIAL

Notes: (Include peaking information or gridded systems here.) REMOTE AREA MODIFIER FOR THE 1500sqft BASE SIZE IS (-27.37%) BASED UPON USING QR SPRINKLERS ON AN WET TYPE SPRINKLER SYSTEM UNDER AN 18.42' CEILING. THE MINIMUM CALCULATED REMOTE AREA AFTER MODIFICATION IS 1089.46sqft.

Water Supply Curve (C)

MAC Sprinkler, Inc.
Red Robin - Brick Township

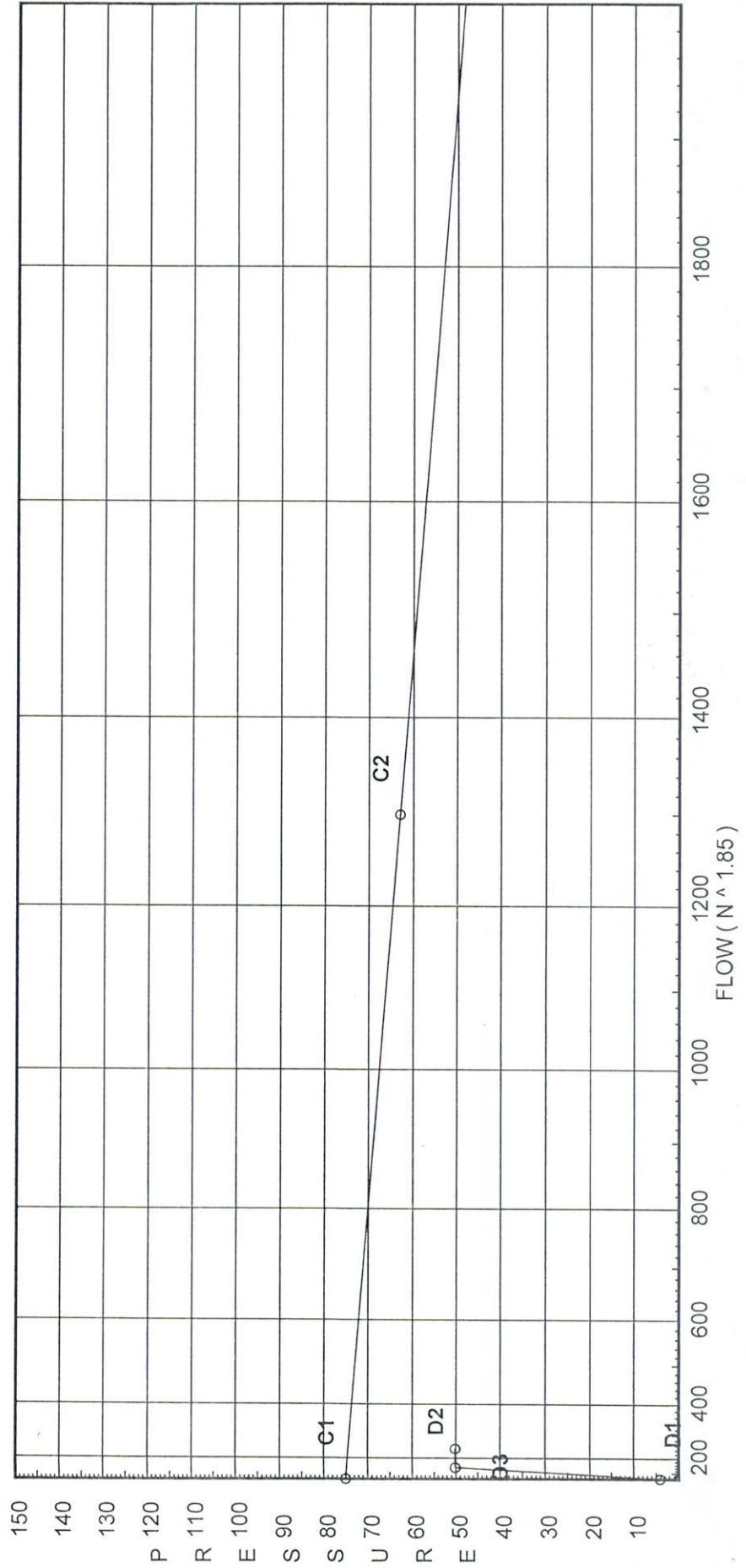
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City Water Supply:

C1 - Static Pressure : 75
C2 - Residual Pressure: 63
C2 - Residual Flow : 1300

Demand:

D1 - Elevation : 4.187
D2 - System Flow : 143.947
D2 - System Pressure : 50.182
Hose (Demand) : 100
D3 - System Demand : 243.947
Safety Margin : 24.275



Fittings Used Summary

MAC Sprinkler, Inc.
Red Robin - Brick Township

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Date 5/8/14

Fitting Legend Abbrev. Name	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4	5	6	8	10	12	14	16	18	20	24
E NFPA 13 90' Standard Elbow	1	2	2	3	4	5	6	7	8	10	12	14	18	22	27	35	40	45	50	61
G NFPA 13 Gate Valve	0	0	0	0	0	1	1	1	1	2	2	3	4	5	6	7	8	10	11	13
T NFPA 13 90' Flow thru Tee	3	4	5	6	8	10	12	15	17	20	25	30	35	50	60	71	81	91	101	121
Zic Wilkins 350ADA	Fitting generates a Fixed Loss Based on Flow																			

Units Summary

Diameter Units Inches
Length Units Feet
Flow Units US Gallons per Minute
Pressure Units Pounds per Square Inch

Note: Fitting Legend provides equivalent pipe lengths for fittings types of various diameters. Equivalent lengths shown are standard for actual diameters of Sched 40 pipe and CFactors of 120 except as noted with *. The fittings marked with a * show equivalent lengths values supplied by manufacturers based on specific pipe diameters and CFactors and they require no adjustment. All values for fittings not marked with a * will be adjusted in the calculation for CFactors of other than 120 and diameters other than Sched 40 per NFPA.

Pressure / Flow Summary - STANDARD

MAC Sprinkler, Inc.
Red Robin - Brick Township

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Node No.	Elevation	K-Fact	Pt Actual	Pn	Flow Actual	Density	Area	Press Req.
1	11.667	5.6	7.02	na	14.83	0.1	115	7.0
2	11.667	5.6	7.81	na	15.65	0.1	115	7.0
3	17.75	5.6	12.68	na	19.94	0.1	175	7.0
4	17.75	5.6	14.7	na	21.47	0.1	175	7.0
5	17.75		18.59	na				
6	17.75		20.84	na				
7	17.75		21.7	na				
8	17.75		25.59	na				
9	17.75		28.21	na				
10	17.75		32.1	na				
T1	17.75		34.53	na				
11	11.667	5.6	7.0	na	14.82	0.1	115	7.0
12	11.667	5.6	7.8	na	15.64	0.1	115	7.0
13	17.5	5.6	12.8	na	20.04	0.1	175	7.0
14	17.5	5.6	14.83	na	21.56	0.1	175	7.0
15	17.5		18.73	na				
16	17.5		20.75	na				
17	17.5		23.38	na				
18	17.5		25.76	na				
19	17.5		28.39	na				
20	17.5		32.3	na				
T2	17.5		34.74	na				
B1	13.75		39.92	na				
B2	13.75		39.94	na				
B3	13.75		40.01	na				
B4	11.5		41.29	na				
B5	11.5		41.31	na				
B6	11.5		41.38	na				
TOR	10.167		42.27	na				
BOR	1.0		49.77	na				
U1	-5.0		52.47	na				
U2	2.0		49.56	na				
S	2.0		50.18	na	100.0			

The maximum velocity is 15.45 and it occurs in the pipe between nodes 14 and 15

Final Calculations - Hazen-Williams

MAC Sprinkler, Inc.
Red Robin - Brick Township

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Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	*****	Notes	*****
*BRANCH LINE #1										
1	14.83	1.049		0.0	10.667	7.016			K Factor = 5.60	
to		120.0		0.0	0.0	0.0				
2	14.83	0.0748		0.0	10.667	0.798			Vel = 5.51	
2	15.66	1.049	4E	8.0	18.417	7.814			K Factor = 5.60	
to		120.0		0.0	8.000	-2.635				
3	30.49	0.2839		0.0	26.417	7.499			Vel = 11.32	
3	19.94	1.38		0.0	10.667	12.678			K Factor = 5.60	
to		120.0		0.0	0.0	0.0				
4	50.43	0.1894		0.0	10.667	2.020			Vel = 10.82	
4	21.47	1.38		0.0	10.667	14.698			K Factor = 5.60	
to		120.0		0.0	0.0	0.0				
5	71.9	0.3651		0.0	10.667	3.894			Vel = 15.42	
5	0.0	1.38		0.0	6.167	18.592				
to		120.0		0.0	0.0	0.0				
6	71.9	0.3652		0.0	6.167	2.252			Vel = 15.42	
6	0.0	1.38		0.0	2.333	20.844				
to		120.0		0.0	0.0	0.0				
7	71.9	0.3648		0.0	2.333	0.851			Vel = 15.42	
7	0.0	1.38		0.0	10.667	21.695				
to		120.0		0.0	0.0	0.0				
8	71.9	0.3651		0.0	10.667	3.894			Vel = 15.42	
8	0.0	1.38		0.0	7.167	25.589				
to		120.0		0.0	0.0	0.0				
9	71.9	0.3650		0.0	7.167	2.616			Vel = 15.42	
9	0.0	1.38		0.0	10.667	28.205				
to		120.0		0.0	0.0	0.0				
10	71.9	0.3651		0.0	10.667	3.894			Vel = 15.42	
10	0.0	1.38	1T	6.0	0.667	32.099				
to		120.0		0.0	6.000	0.0				
T1	71.9	0.3651		0.0	6.667	2.434			Vel = 15.42	
T1	0.0	1.38	1T	6.0	4.000	34.533				
to		120.0		0.0	6.000	1.732				
B1	71.9	0.3651		0.0	10.000	3.651			Vel = 15.42	
	0.0									
	71.90					39.916			K Factor = 11.38	
*BRANCH LINE #2										
11	14.82	1.049		0.0	10.667	7.000			K Factor = 5.60	
to		120.0		0.0	0.0	0.0				
12	14.82	0.0747		0.0	10.667	0.797			Vel = 5.50	
12	15.63	1.049	4E	8.0	18.583	7.797			K Factor = 5.60	
to		120.0		0.0	8.000	-2.526				
13	30.45	0.2833		0.0	26.583	7.530			Vel = 11.30	
13	20.04	1.38		0.0	10.667	12.801			K Factor = 5.60	
to		120.0		0.0	0.0	0.0				
14	50.49	0.1898		0.0	10.667	2.025			Vel = 10.83	
14	21.56	1.38		0.0	10.667	14.826			K Factor = 5.60	
to		120.0		0.0	0.0	0.0				
15	72.05	0.3665		0.0	10.667	3.909			Vel = 15.45	

Final Calculations - Hazen-Williams

MAC Sprinkler, Inc.
Red Robin - Brick TownshipPage 6
Date 5/8/14

Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	*****	Notes	*****
15 to 16	0.0 72.05	1.38 120.0 0.3665		0.0 0.0 0.0	5.500 0.0 5.500	18.735 0.0 2.016			Vel = 15.45	
16 to 17	0.0 72.05	1.38 120.0 0.3664		0.0 0.0 0.0	7.167 0.0 7.167	20.751 0.0 2.626			Vel = 15.45	
17 to 18	0.0 72.05	1.38 120.0 0.3666		0.0 0.0 0.0	6.500 0.0 6.500	23.377 0.0 2.383			Vel = 15.45	
18 to 19	0.0 72.05	1.38 120.0 0.3664		0.0 0.0 0.0	7.167 0.0 7.167	25.760 0.0 2.626			Vel = 15.45	
19 to 20	0.0 72.05	1.38 120.0 0.3666		0.0 0.0 0.0	10.667 0.0 10.667	28.386 0.0 3.910			Vel = 15.45	
20 to T2	0.0 72.05	1.38 120.0 0.3664	1T	6.0 0.0 0.0	0.667 6.000 6.667	32.296 0.0 2.443			Vel = 15.45	
T2 to B2	0.0 72.05	1.38 120.0 0.3666	1T	6.0 0.0 0.0	3.750 6.000 9.750	34.739 1.624 3.574			Vel = 15.45	
	0.0 72.05					39.937			K Factor = 11.40	
*CROSSMAIN										
B1 to B2	71.90 71.9	4.26 120.0 0.0015		0.0 0.0 0.0	13.833 0.0 13.833	39.916 0.0 0.021			Vel = 1.62	
B2 to B3	72.05 143.95	4.26 120.0 0.0054		0.0 0.0 0.0	13.667 0.0 13.667	39.937 0.0 0.074			Vel = 3.24	
B3 to B4	0.0 143.95	4.26 120.0 0.0055	3E	39.501 0.0 0.0	16.583 39.501 56.084	40.011 0.974 0.306			Vel = 3.24	
B4 to B5	0.0 143.95	4.26 120.0 0.0054		0.0 0.0 0.0	3.917 0.0 3.917	41.291 0.0 0.021			Vel = 3.24	
B5 to B6	0.0 143.95	4.26 120.0 0.0055		0.0 0.0 0.0	12.167 0.0 12.167	41.312 0.0 0.067			Vel = 3.24	
B6 to TOR	0.0 143.95	4.26 120.0 0.0055	3E	39.501 0.0 0.0	18.417 39.501 57.918	41.379 0.577 0.316			Vel = 3.24	
	0.0 143.95					42.272			K Factor = 22.14	
*RISER										
TOR to BOR	143.95 143.95	4.26 120.0 0.0053	1Zic	0.0 0.0 0.0	9.167 0.0 9.167	42.272 7.452 0.049			* Fixed loss = 3.482 Vel = 3.24	

Final Calculations - Hazen-Williams

MAC Sprinkler, Inc.
Red Robin - Brick Township

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Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	*****	Notes	*****
BOR to U1	0.0 143.95	4.1 140.0 0.0049	1E	14.534 0.0 0.0	6.000 14.534 20.534	49.773 2.599 0.101			Vel = 3.50	
U1 to U2	0.0 143.95	4.1 140.0 0.0050	1E	14.534 0.0 0.0	10.000 14.534 24.534	52.473 -3.032 0.122			Vel = 3.50	
U2 to S	0.0 143.95	4.1 140.0 0.0049	3E 1G 1T	43.601 2.907 29.067	50.000 75.575 125.575	49.563 0.0 0.619			Vel = 3.50	
	100.00 243.95					50.182			Qa = 100.00 K Factor = 34.44	

MAC

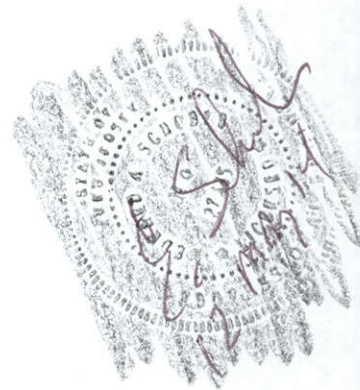
SPRINKLER, INC.

1601-G Harmer St
Levittown, PA

(215)547-5884

www.MACSprinkler.com

#2



MAC Sprinkler, Inc.
1601-G Harmer Street
Levittown, PA 19057
215-547-5884

Job Name : Red Robin - Brick Township
Building : FP-1
Location : 56 CHAMBERS BRIDGE RD., BRICK TOWNSHIP, NJ 08723
System : #2
Contract : NA
Data File : Calc #2 Red Robin 'Brick' - Ordinary Hazard.WXF

HYDRAULIC CALCULATIONS
for

Project name: Red Robin - Brick Township
Location: 56 CHAMBERS BRIDGE RD., BRICK TOWNSHIP, NJ 08723
Drawing no: FP-1
Date: 5/8/14

Design

Remote area number: #2
Remote area location: EMPLOYEE SERVICE AREA
Occupancy classification: ORDINARY HAZARD GROUP 1
Density: 0.15 - Gpm/SqFt
Area of application: 900 - SqFt
Coverage per sprinkler: 130 - SqFt
Type of sprinklers calculated: QR RECESSED PENDENT 5.6K
No. of sprinklers calculated: 9
In-rack demand: NA - GPM
Hose streams: 250 - GPM
Total water required (including hose streams): 457.669 - GPM @ 48.9146 - Psi
Type of system: AUTOMATIC WET
Volume of dry or preaction system: NA - Gal

Water supply information

Date: 5/6/14
Location: AT SITE FIRE HYDRANTS
Source: TEST WITH BRICK TOWNSHIP MUNICIPAL UTILITIES

Name of contractor: MAC Sprinkler, Inc.
Address: 1601-G Harmer Street / / Levittown, PA 19057
Phone number: 215-547-5884
Name of designer: JOW CIANFARRA
Authority having jurisdiction: CODE ENFORCEMENT SUB-CODE OFFICIAL
Notes: (Include peaking information or gridded systems here.) REMOTE AREA MODIFIER FOR THE 1500sqft BASE SIZE IS (-40%) BASED UPON USING QR SPRINKLERS ON AN WET TYPE SPRINKLER SYSTEM UNDER AN 10' MAX CEILING. THE CALCULATED REMOTE AREA AFTER MODIFICATION IS 900sqft.

Water Supply Curve (C)

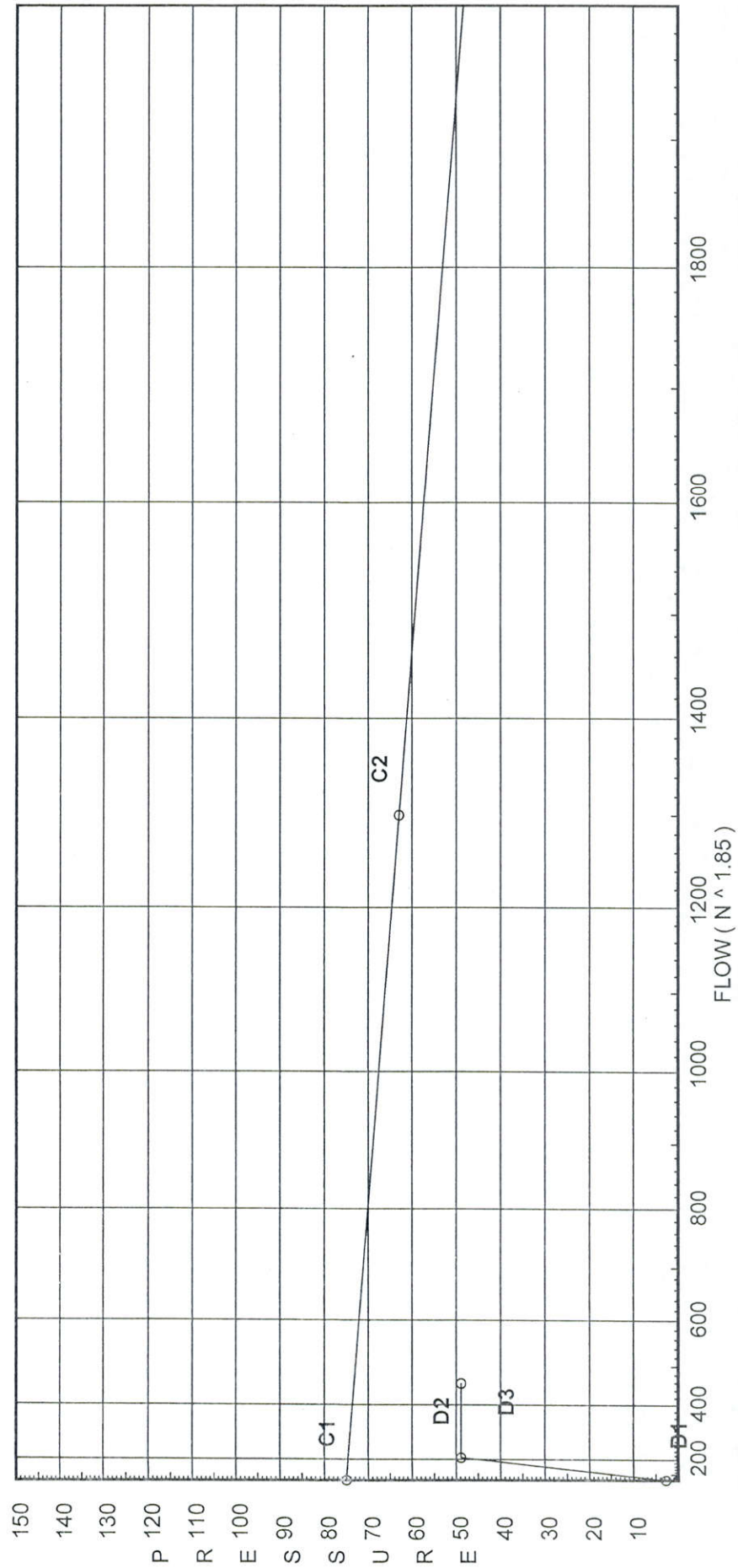
MAC Sprinkler, Inc.
Red Robin - Brick Township

City Water Supply:

C1 - Static Pressure : 75
C2 - Residual Pressure: 63
C2 - Residual Flow : 1300

Demand:

D1 - Elevation : 2.743
D2 - System Flow : 207.669
D2 - System Pressure : 48.915
Hose (Demand) : 250
D3 - System Demand : 457.669
Safety Margin : 24.346



Fittings Used Summary

MAC Sprinkler, Inc.
Red Robin - Brick Township

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Date 5/8/14

Fitting Legend Abbrev. Name	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4	5	6	8	10	12	14	16	18	20	24
E NFPA 13 90' Standard Elbow	1	2	2	3	4	5	6	7	8	10	12	14	18	22	27	35	40	45	50	61
G NFPA 13 Gate Valve	0	0	0	0	0	1	1	1	1	2	2	3	4	5	6	7	8	10	11	13
T NFPA 13 90' Flow thru Tee	3	4	5	6	8	10	12	15	17	20	25	30	35	50	60	71	81	91	101	121
Zic Wilkins 350ADA	Fitting generates a Fixed Loss Based on Flow																			

Units Summary

Diameter Units Inches
Length Units Feet
Flow Units US Gallons per Minute
Pressure Units Pounds per Square Inch

Note: Fitting Legend provides equivalent pipe lengths for fittings types of various diameters. Equivalent lengths shown are standard for actual diameters of Sched 40 pipe and CFactors of 120 except as noted with *. The fittings marked with a * show equivalent lengths values supplied by manufacturers based on specific pipe diameters and CFactors and they require no adjustment. All values for fittings not marked with a * will be adjusted in the calculation for CFactors of other than 120 and diameters other than Sched 40 per NFPA.

MAC Sprinkler, Inc.
Red Robin - Brick Township

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Node No.	Elevation	K-Fact	Pt Actual	Pn	Flow Actual	Density	Area	Press Req.
S21	8.333	5.6	12.13	na	19.5	0.15	130	7.0
S22	8.333	5.6	12.66	na	19.93	0.15	130	7.0
S23	10.0	5.6	16.09	na	22.46	0.15	130	7.0
S24	10.0	5.6	18.73	na	24.24	0.15	130	7.0
S28	8.333	5.6	13.51	na	20.58	0.15	130	7.0
S29	8.333	5.6	14.33	na	21.2	0.15	130	7.0
S30	8.333	5.6	24.07	na	27.48	0.15	130	7.0
S34	8.333	5.6	20.58	na	25.41	0.15	130	7.0
S35	8.333	5.6	23.05	na	26.88	0.15	130	7.0
21	12.167		12.45	na				
22	12.167		13.2	na				
23	12.167		17.19	na				
24	12.167		20.14	na				
25	12.167		25.58	na				
26	12.167		29.45	na				
T4	12.167		35.23	na				
28	11.917		14.29	na				
29	12.0		15.35	na				
30	12.083		25.36	na				
31	12.083		30.47	na				
32	12.083		32.57	na				
T5	12.083		36.43	na				
34	11.75		22.5	na				
35	11.75		25.33	na				
36	11.75		33.03	na				
37	11.833		37.45	na				
B4	11.5		38.91	na				
B5	11.5		38.92	na				
B6	11.5		39.0	na				
TOR	10.167		40.2	na				
BOR	1.0		47.69	na				
U1	-5.0		50.49	na				
U2	2.0		47.69	na				
S	2.0		48.91	na	250.0			

The maximum velocity is 19.41 and it occurs in the pipe between nodes 35 and 36

Final Calculations - Hazen-Williams

MAC Sprinkler, Inc.
Red Robin - Brick Township

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Date 5/8/14

Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	*****	Notes	*****
*SPRINKLER ARMOVERS										
S21	19.50	1.049	2E	4.0	7.000	12.125			K Factor = 5.60	
to		120.0	1T	5.0	9.000	-1.661				
21	19.5	0.1242		0.0	16.000	1.988			Vel = 7.24	
	0.0									
	19.50					12.452			K Factor = 5.53	
S22	19.93	1.049	1E	2.0	5.000	12.660			K Factor = 5.60	
to		120.0	2T	10.0	12.000	-1.661				
22	19.93	0.1293		0.0	17.000	2.198			Vel = 7.40	
	0.0									
	19.93					13.197			K Factor = 5.49	
S23	22.46	1.049	2T	10.0	2.667	16.088			K Factor = 5.60	
to		120.0		0.0	10.000	-0.939				
23	22.46	0.1614		0.0	12.667	2.044			Vel = 8.34	
	0.0									
	22.46					17.193			K Factor = 5.42	
S24	24.24	1.049	2T	10.0	2.667	18.731			K Factor = 5.60	
to		120.0		0.0	10.000	-0.939				
24	24.24	0.1857		0.0	12.667	2.352			Vel = 9.00	
	0.0									
	24.24					20.144			K Factor = 5.40	
S28	20.58	1.049	1E	2.0	5.000	13.508			K Factor = 5.60	
to		120.0	2T	10.0	12.000	-1.552				
28	20.58	0.1372		0.0	17.000	2.332			Vel = 7.64	
	0.0									
	20.58					14.288			K Factor = 5.44	
S29	21.20	1.049	1E	2.0	6.000	14.330			K Factor = 5.60	
to		120.0	2T	10.0	12.000	-1.588				
29	21.2	0.1449		0.0	18.000	2.608			Vel = 7.87	
	0.0									
	21.20					15.350			K Factor = 5.41	
S30	27.48	1.049	1E	2.0	5.417	24.073			K Factor = 5.60	
to		120.0	1T	5.0	7.000	-1.624				
30	27.48	0.2341		0.0	12.417	2.907			Vel = 10.20	
	0.0									
	27.48					25.356			K Factor = 5.46	
S34	25.41	1.049	1E	2.0	4.750	20.583			K Factor = 5.60	
to		120.0	2T	10.0	12.000	-1.480				
34	25.41	0.2026		0.0	16.750	3.393			Vel = 9.43	
	0.0									
	25.41					22.496			K Factor = 5.36	
S35	26.88	1.049	1E	2.0	4.750	23.045			K Factor = 5.60	
to		120.0	2T	10.0	12.000	-1.480				
35	26.88	0.2249		0.0	16.750	3.767			Vel = 9.98	
	0.0									
	26.88					25.332			K Factor = 5.34	
*BRANCH LINE #3										

MAC Sprinkler, Inc.
Red Robin - Brick Township

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Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	*****	Notes	*****
21 to 22	19.50 19.5	1.049 120.0 0.1242		0.0 0.0 0.0	6.000 0.0 6.000	12.452 0.0 0.745			Vel = 7.24	
22 to 23	19.93 39.43	1.049 120.0 0.4567		0.0 0.0 0.0	8.750 0.0 8.750	13.197 0.0 3.996			Vel = 14.64	
23 to 24	22.46 61.89	1.38 120.0 0.2766		0.0 0.0 0.0	10.667 0.0 10.667	17.193 0.0 2.951			Vel = 13.28	
24 to 25	24.23 86.12	1.38 120.0 0.5098		0.0 0.0 0.0	10.667 0.0 10.667	20.144 0.0 5.438			Vel = 18.47	
25 to 26	0.0 86.12	1.38 120.0 0.5098		0.0 0.0 0.0	7.583 0.0 7.583	25.582 0.0 3.866			Vel = 18.47	
26 to T4	0.0 86.12	1.38 120.0 0.5098	1T	6.0 0.0 0.0	5.333 6.000 11.333	29.448 0.0 5.778			Vel = 18.47	
T4 to B4	0.0 86.12	1.38 120.0 0.5098	1T	6.0 0.0 0.0	0.667 6.000 6.667	35.226 0.289 3.399			Vel = 18.47	
	0.0 86.12					38.914			K Factor = 13.81	
*BRANCH LINE #4										
28 to 29	20.58 20.58	1.049 120.0 0.1372	1E	2.0 0.0 0.0	6.000 2.000 8.000	14.288 -0.036 1.098			Vel = 7.64	
29 to 30	21.20 41.78	1.049 120.0 0.5085	1E	2.0 0.0 0.0	17.750 2.000 19.750	15.350 -0.036 10.042			Vel = 15.51	
30 to 31	27.48 69.26	1.38 120.0 0.3407		0.0 0.0 0.0	15.000 0.0 15.000	25.356 0.0 5.110			Vel = 14.86	
31 to 32	0.0 69.26	1.38 120.0 0.3407		0.0 0.0 0.0	6.167 0.0 6.167	30.466 0.0 2.101			Vel = 14.86	
32 to T5	0.0 69.26	1.38 120.0 0.3406	1T	6.0 0.0 0.0	5.333 6.000 11.333	32.567 0.0 3.860			Vel = 14.86	
T5 to B5	0.0 69.26	1.38 120.0 0.3407	1T	6.0 0.0 0.0	0.583 6.000 6.583	36.427 0.252 2.243			Vel = 14.86	
	0.0 69.26					38.922			K Factor = 11.10	
*BRANCH LINE #5										
34 to 35	25.41 25.41	1.049 120.0 0.2026		0.0 0.0 0.0	14.000 0.0 14.000	22.496 0.0 2.836			Vel = 9.43	

Final Calculations - Hazen-Williams

MAC Sprinkler, Inc.
Red Robin - Brick Township

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Date 5/8/14

Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	*****	Notes	*****
35 to 36	26.88 52.29	1.049 120.0 0.7701		0.0 0.0 0.0	10.000 0.0 10.000	25.332 0.0 7.701			Vel = 19.41	
36 to 37	0.0 52.29	1.38 120.0 0.2025	2E	6.0 0.0 0.0	16.000 6.000 22.000	33.033 -0.036 4.456			Vel = 11.22	
37 to B6	0.0 52.29	1.38 120.0 0.2025	1T	6.0 0.0 0.0	0.917 6.000 6.917	37.453 0.144 1.401			Vel = 11.22	
	0.0 52.29					38.998			K Factor = 8.37	
*CROSSMAIN										
B4 to B5	86.12 86.12	4.26 120.0 0.0020		0.0 0.0 0.0	3.917 0.0 3.917	38.914 0.0 0.008			Vel = 1.94	
B5 to B6	69.26 155.38	4.26 120.0 0.0062		0.0 0.0 0.0	12.167 0.0 12.167	38.922 0.0 0.076			Vel = 3.50	
B6 to TOR	52.29 207.67	4.26 120.0 0.0107	3E	39.501 0.0 0.0	18.417 39.501 57.918	38.998 0.577 0.622			Vel = 4.67	
	0.0 207.67					40.197			K Factor = 32.75	
*RISER										
TOR to BOR	207.67 207.67	4.26 120.0 0.0107	1Zic	0.0 0.0 0.0	9.167 0.0 9.167	40.197 7.394 0.098			* Fixed loss = 3.423 Vel = 4.67	
BOR to U1	0.0 207.67	4.1 140.0 0.0097	1E	14.534 0.0 0.0	6.000 14.534 20.534	47.689 2.599 0.199			Vel = 5.05	
U1 to U2	0.0 207.67	4.1 140.0 0.0097	1E	14.534 0.0 0.0	10.000 14.534 24.534	50.487 -3.032 0.239			Vel = 5.05	
U2 to S	0.0 207.67	4.1 140.0 0.0097	3E 1G 1T	43.601 2.907 29.067	50.000 75.575 125.575	47.694 0.0 1.221			Vel = 5.05	
	250.00 457.67					48.915			Qa = 250.00 K Factor = 65.44	

Model 350A

Double Check Valve Assembly

Application

Designed for installation on potable water lines to protect against both backsiphonage and backpressure of polluted water into the potable water supply. The Model 350A shall provide protection where a potential health hazard does not exist. Ideal for use where Lead-Free* valves are required.

Standards Compliance (Horizontal & Vertical)

- ASSE® Listed 1015
- AWWA Compliant C510 (with gates only), and C550
- IAPMO® Listed
- Certified to NSF/ANSI 372* by IAPMO R&T
- CSA® Certified
- UL® Classified
- C-UL® Classified
- FM® Approved
- NYC MEA 220-04-M Vol 2 (2 1/2" - 8")
- Approved by the Foundation for Cross Connection Control and Hydraulic Research at the University of Southern California
- NSF® Listed-Standard 61, Annex G*

*(0.025% MAX. WEIGHTED AVERAGE LEAD CONTENT)

Materials

Main valve body	Ductile Iron ASTM A 536 Grade 4
Access covers	Ductile Iron ASTM A 536 Grade 4
Coatings	FDA Approved electrostatic epoxy finish
Internals	Stainless steel, 300 Series
	NORYL™, NSF Listed
Fasteners & springs	Stainless Steel, 300 Series
Seal ring	EPDM (FDA approved)
O-ring	Buna Nitrile (FDA approved)

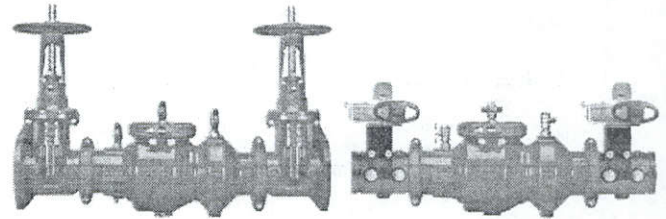
Features

Sizes:	2 1/2", 3", 4", 6", 8", 10"
Maximum working water pressure	175 PSI
Maximum working water temperature	140°F
Hydrostatic test pressure	350 PSI
End connections	
(Grooved for steel pipe)	AWWA C606
(Flanged)	ANSI B16.1
	Class 125

Dimensions & Weights (do not include pkg.)

MODEL SIZE	WEIGHT											
	WITHOUT GATES		WITH NRS GATES (GXG)		WITH OS&Y GATES (GXG)		WITH NRS GATES (GXG)		WITH OS&Y GATES (GXG)		WITH BUTTERFLY VALVES (GXG)	
	in.	mm	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg
2 1/2	65	90	41	18.4	83.5	192	87	176	80	184	83.5	108.8
3	80	89	40.5	204	92.5	210	95.3	194	88	200	90.8	109.4
4	100	76	34.5	220	100	230	104	194	88	204	93	108
6	150	126	57.2	346	157	362	164	316	143	332	151	178
8	200	286	130	738	335	762	335	738	335	738	335	394
10	250	339	153.8	966	438.2	1024	464.5	844	382.8	902	409.1	511

MODEL SIZE		DIMENSION (approximate)																					
		A		A WITH BUTTERFLY		B LESS GATE VALVES		C		D		E OS&Y OPEN		E OS&Y CLOSED		E NRS GATE		E WITH BUTTERFLY VALVES		F		G	
		in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm
2 1/2	65	35 1/8	892	32 1/8	816	20 1/8	511	4 1/2	114	7 1/4	184	16 3/8	416	13 7/8	352	11 3/8	289	8	203	6	152	45 1/4	1150
3	80	36 1/8	918	33	838	20 1/8	511	4 1/2	114	7 1/4	184	18 7/8	479	15 5/8	397	12 3/8	314	8	203	6	152	46 7/8	1191
4	100	38 1/4	972	33 1/4	845	19 7/8	505	4 1/2	114	8	203	22 3/4	578	18 1/4	464	14 3/4	375	9 1/8	232	6	152	53 3/8	1356
6	150	47 1/4	1200	40 1/4	1022	25 7/8	657	5 1/2	140	10	254	30 1/8	765	23 3/4	603	19	483	10 1/8	257	7	178	65 3/8	1661
8	200	62	1575	55	1397	38 1/2	978	10	254	11	279	37 3/4	959	29 1/4	743	22 1/2	572	11 15/16	303	8 1/2	216	86 3/8	2194
10	250	64 5/8	1642	58 1/2	1485	38 1/2	978	10	254	12	305	45 3/4	1162	35 3/8	899	26 1/2	673	13 5/16	338	8 1/2	216	94 3/8	2398



(with OSY gates)

(with BGVIC valves)

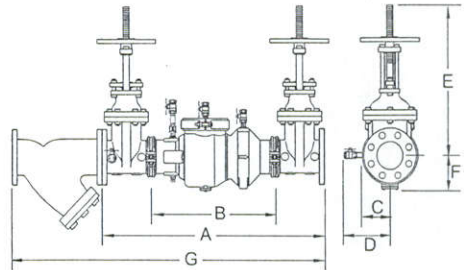


Options

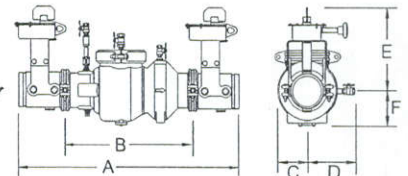
(Suffixes can be combined)

- ☐ - with flanged end NRS gate valves (standard)
- ☐ FSC - with epoxy coated wye type strainer (flanged only)
- ☐ G - with grooved end NRS gate valves
- ☐ GF - with grooved inlet gate connection and flanged outlet gate connection
- ☐ FG - with flanged inlet gate connection and grooved outlet gate connection
- ☐ L - less shut-off valves (grooved body connections)
- ☐ OSY - with flanged end OS&Y gate valves
- ☐ OSYG - with grooved end OS&Y gate valves
- ☐ PI - with Post Indicator Gate Valves
- ☐ BGVIC - with grooved end butterfly valves with integral supervisory switches
- ☐ Accessories
- ☐ Repair kit (rubber only)
- ☐ Thermal expansion tank (Model XT)
- ☐ OS & Y Gate valve tamper switch (OSY-40)

MODEL 350A with OSY & FSC option



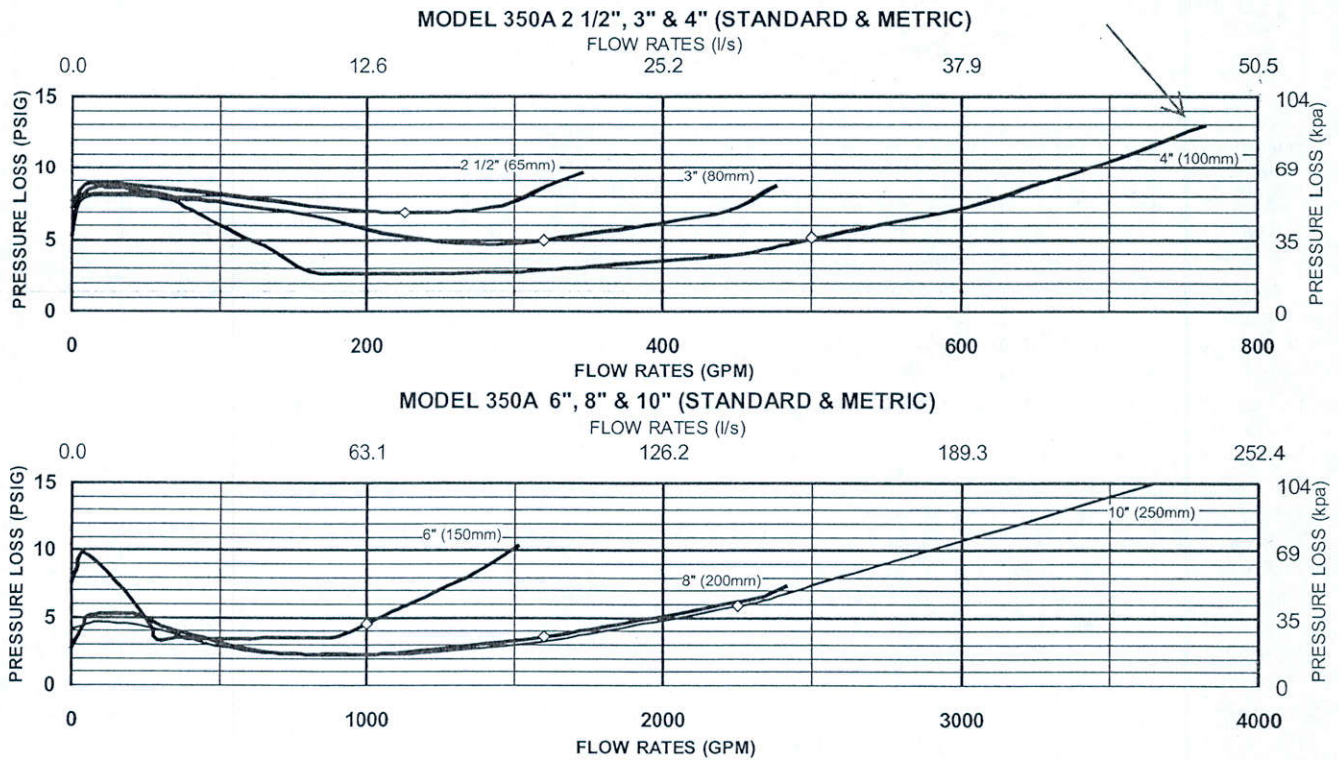
MODEL 350A with BGVIC option



Attention:
Model 350A (grooved body) & Model 350 (flange body) have different lay lengths.

Flow Characteristics

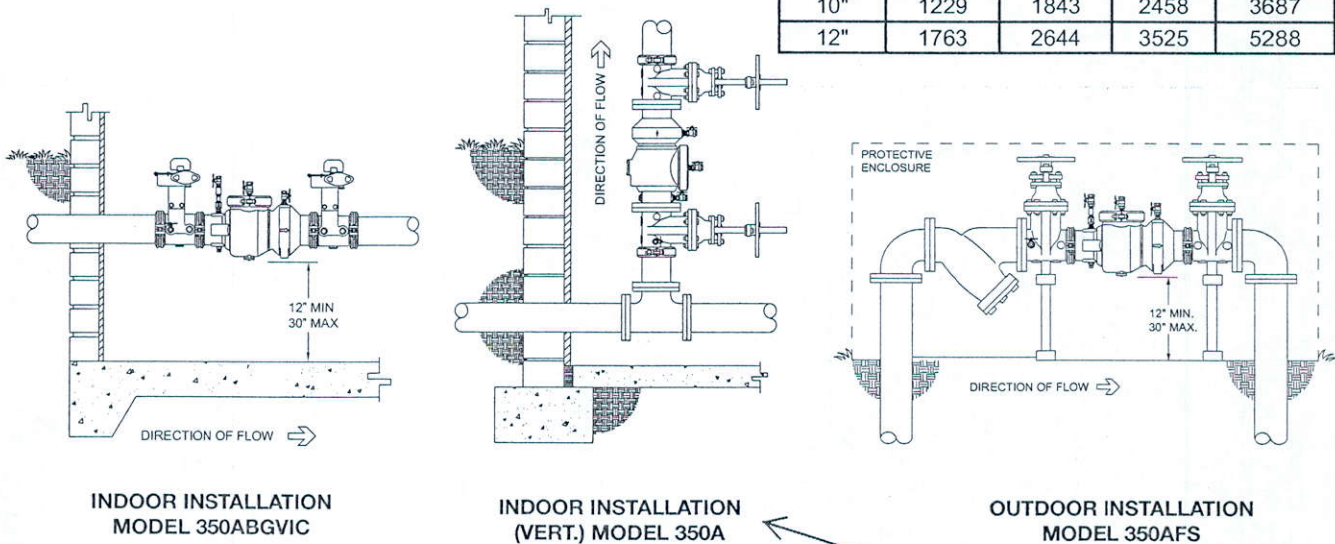
◇ Rated Flow (established by approval agencies)



Typical Installation

Local codes shall govern installation requirements. Unless otherwise specified, the assembly shall be mounted at a minimum of 12" (305mm) and a maximum of 30" (762mm) above adequate drains with sufficient side clearance for testing and maintenance. The installation shall be made so that no part of the unit can be submerged.

Capacity thru Schedule 40 Pipe (GPM)				
Pipe size	5 ft/sec	7.5 ft/sec	10 ft/sec	15 ft/sec
2 1/2"	75	112	149	224
3"	115	173	230	346
4"	198	298	397	595
6"	450	675	900	1351
8"	780	1169	1559	2339
10"	1229	1843	2458	3687
12"	1763	2644	3525	5288



Specifications

The Double Check Backflow Prevention Assembly shall be certified to NSF/ANSI 372, ASSE® Listed 1015, and supplied with full port gate valves. The main body and access cover shall be epoxy coated ductile iron (ASTM A 536 Grade 4), the seat ring and check valve shall be NORYL™, the stem shall be stainless steel (ASTM A 276) and the seat disc elastomers shall be EPDM. The checks shall be accessible for maintenance without removing the device from the line. The Double Check Backflow Prevention Assembly shall be a ZURN WILKINS Model 350A.



TECHNICAL DATA

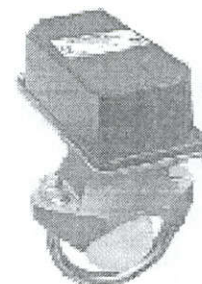
WATERFLOW INDICATOR

The Viking Corporation, 210 N Industrial Park Drive, Hastings MI 49058

Telephone: 269-945-9501 Technical Services 877-384-5464 Fax: 269-818-1680 Email: techsvcs@vikingcorp.com

1. DESCRIPTION

The Waterflow Indicator is a vane-type waterflow switch designed to detect a sustained flow of 10 gpm or more. It is intended for use on wet-pipe sprinkler systems only. The Model VSR has a built-in adjustable pneumatic retard device delays actuation of the electrical switches to reduce the possibility of false alarms caused by one or more transient flow surges. The unit includes two single-pole double-throw snap action switches used to operate local alarms, indicate signals to annunciator panels, trip municipal fire alarm boxes, start fire pumps, or any other function that can be initiated or controlled by the opening or closing of an electrical switch. The device may be installed on the main riser to give a system waterflow signal or on branch feed mains, cross mains, or branch lines to give a waterflow signal by zone or area.



2. LISTINGS AND APPROVALS

Model VSR-S

- UL Listed - Guide No. USQT.S309
- ULC Listed - Guide No. USQTC.S309
- CSFM Listed - 7770-0328:001
- NYC MEA Accepted - BSA-1033-83

Model VSR

- UL Listed - Guide No. USQT.S309
- ULC Listed - Guide No. USQTC.S309
- FM Approved - Waterflow Detectors, Vane Type
- CSFM Listed - 7770-0328:001
- LPCB Approved
- CE Certified - Standard EN-12259-5

Model VSR-10

- UL Listed - Guide No. USQT.S309
- ULC Listed - Guide No. USQTC.S309

3. TECHNICAL DATA

Manufactured by:

Potter Electric Signal Company, LLC
2081 Craig Drive
St. Louis, Missouri 63146

Specifications:

Water Working Pressure:

Model VSR-S rated for water working service pressure up to 300 psi (20.7 bar) for size 1", 1-1/4", 1-1/2" & 2" (25 mm, 32 mm, 38 mm & 50 mm)

Model VSR rated for water working service pressure up to 450 psi (31 bar) for sizes 2" (50 mm) to 8" (200 mm) - UL

Model VSR-10 rated for water working service pressure up to 300 psi (20.7 bar) for size 10" (250 mm)

Maximum Surge: 18 FPS (5.5 m/s)

Flow Sensitivity Range for Signal: 4-10 GPM (15-38 LPM) - UL

Contact Ratings:

Two single-pole double-throw switches with Form C contacts rated at 10 Amps @ 125/250 VAC, 2.0 Amps @ 0-30 VDC, 10m Amps min. @ 24VDC. Each switch can be wired for open or closed circuit operation. See Figure 8.

Conduit Entrances: Two knockouts provided for 1/2" conduit. Individual switch compartments suitable for dissimilar voltages.

Usage: Listed plastic, copper and schedule 40 iron pipe.

VSR-S - Fits pipe sizes 1" (25 mm), 1-1/4" (32 mm), 1-1/2" (38 mm) and 2" (50 mm) Note: 12 paddles are furnished with each unit, one for each pipe size of threaded and sweat TEE, one for 1" (25 mm) CPVC, one for 1" (25 mm) CPVC (Central), one for 1" threaded NIBCO CPVC, and one for 1-1/2" (38 mm) threaded (Japan).

Material Standards:

Body: Cast Aluminum

Base: Cast aluminum.

Enclosure: Die-cast, red enamel finish

Cover held in place with tamper-resistant screws

Viking Technical Data may be found on
The Viking Corporation's Web site at
<http://www.vikinggroupinc.com>.
The Web site may include a more recent
edition of this Technical Data Page.



TECHNICAL DATA

WATERFLOW INDICATOR

The Viking Corporation, 210 N Industrial Park Drive, Hastings MI 49058

Telephone: 269-945-9501 Technical Services 877-384-5464 Fax: 269-818-1680 Email: techsvcs@vikingcorp.com

Ordering Information:

See Table 1.

4. INSTALLATION

VSR-S Model

These devices may be mounted in horizontal or vertical pipe. On horizontal pipe they should be installed on the top side of the pipe where they will be accessible. The units should not be installed within 6" (15 cm) of a valve, drain or fitting that changes the direction of the waterflow. Select the proper paddle for the pipe size and type of TEE used; see Figure 1 for instructions on changing paddle. The unit has a 1" NPT bushing for threading into a non-corrosive TEE. See Figure 2 for proper TEE size, type and installation. Use no more than three wraps of Teflon tape.

Screw the device into the TEE fitting as shown in Figure 2. Care must be taken to properly orient the device for the direction of waterflow. The vane must not rub the inside of the TEE or bind in any way. The stem should move freely when operated by hand. The device can also be used in copper or plastic pipe installations with the proper adapters so that the specified TEE fitting may be installed on the pipe run.

VSR and VSR-10 Model

These devices may be mounted on horizontal or vertical pipe. On horizontal pipe they should be installed on the top side of the pipe where they will be accessible. The device should not be installed within 6" (15 cm) of a fitting which changes the direction of the waterflow or within 24" (60 cm) of a valve or drain. Drain the system and drill a hole in the pipe using a hole saw in a slow speed drill (see Figure 1). Clean the inside pipe of all growth or other material for a distance equal to the pipe diameter on either side of the hole. Roll the vane so that it may be inserted into the hole; do not bend or crease it. Insert the vane so that the arrow on the saddle points in the direction of the waterflow. Install the saddle strap and tighten nuts alternately to required torque (see Figure 4). The vane must not rub the inside of the pipe or bind in any way.

Place the system back in service and test the waterflow indicator using the system inspector's test valve. If necessary, adjust the pneumatic retard and/or equipment and perform quarterly inspection.

Adjustments

- A. The pneumatic retard is adjustable from 0 to approximately 90 seconds. To increase the time delay, turn the dial to the next higher letter. Normal setting is between 30 and 45 seconds. In no case should the time be set less than 20 seconds nor more than 90 seconds.
- B. The flow sensitivity is set at approximately 10 gpm. A small coil spring holds the vane in its normal position against the waterflow. The spring can be adjusted to increase or decrease sensitivity, if necessary, but it must not be over-tightened. Too much tension will decrease the sensitivity of the device. The pneumatic retard must be checked after adjusting the flow sensitivity. All testing and adjusting of the waterflow indicator must be done using the remote inspector's test valve.

5. OPERATION

The Waterflow Indicator detects a flow of water exceeding 10 gpm in the piping when the flexible vane is deflected. This motion activates the field-adjustable pneumatic retard device. The pneumatic retard device delays activation of the electrical switches to reduce the possibility of false alarms caused by a single or series of transient flow surges. The retard device instantly resets during a series of surges to prevent a cumulative effect. After a sustained flow, the two switches operate to open or close electrical contacts.

6. INSPECTIONS, TESTS AND MAINTENANCE

WARNING: Any system maintenance or testing that involves placing a control valve or detection system out of service may eliminate the fire protection of that system. Prior to proceeding, notify all authorities having jurisdiction. Consideration should be given to employment of a fire patrol in the affected area. Ascertain what alarms and equipment are connected to the waterflow indicator and take necessary precautions to protect connected equipment.

Testing

The frequency of inspection and testing for the Model VSR-S, VSR and VSR-10 and its associated protective monitoring system should be in accordance with applicable NFPA Codes and Standards and/or the authority having jurisdiction (manufacturer recommends quarterly or more frequently.) An inspector's test valve (usually located at the end of the most remote branch line) should always be used for test purposes. If there are no provisions for testing the operation of the flow detection device on the system, application of the VSR-S is not recommended or advisable. A minimum flow of 10 gpm (38 Lpm) is required to activate this device.

Maintenance

Inspect detectors monthly for leaks. If leaks are found, replace the detector. The VSR-S, VSR and VSR-10 waterflow switch should provide years of trouble-free service. The retard and switch assembly are easily field replaceable. There is no maintenance required, only periodic testing and inspection.



TECHNICAL DATA

WATERFLOW INDICATOR

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Removal

- To prevent accidental water damage, all control valves should be shut tight and the system completely drained before waterflow detectors are removed or replaced.
- Turn off electrical power to the detector, then disconnect wiring.
- Use a wrench on the flats of the bushing. Turn the switch counterclockwise to disengage the pipe threads.
- Gently lift with your fingers, roll the vane so it will fit through the hole while continuing to lift the waterflow detector.
- Lift detector clear of pipe.

7. AVAILABILITY & SERVICE

Viking Waterflow Indicators are available through a network of domestic and international distributors. See the Viking web site or contact The Viking Corporation for closet distributor.

8. GUARANTEES

For details of warranty, refer to Viking's current list price schedule or contact Viking directly.

Nominal Pipe Size	Hole Size	Friction Loss	Part Number	Model
Inches	Inches	PSI		
1" (25 mm)	See Note 1 below	3	VSRF0100	VSR-S
1-1/4" (32 mm)	See Note 1 below	3	VSRF0100	VSR-S
1-1/2" (38 mm)	See Note 1 below	3	VSRF0100	VSR-S
2" (50 mm)	1-1/4" (32 mm)	3	VSRF0200	VSR-2
2-1/2" (63.5 mm)	1-1/4" (32 mm)	3	VSRF0250	VSR-2 1/2
3" (80 mm)	2" (50 mm)	3	VSRF0300	VSR-3
3-1/2" (88.9 mm)	2" (50 mm)	3	VSRF0350	VSR-3 1/2
4" (101.6 mm)	2" (50 mm)	3	VSRF0400	VSR-4
5" (127 mm)	2" (50 mm)	1	VSRF0500	VSR-5
6" (150 mm)	2" (50 mm)	1	VSRF0600	VSR-6
8" (200 mm)	2" (50 mm)	1	VSRF0800	VSR-8
10" (254 mm)	2" (50 mm)	1	VSRF1000	VSR-10
Notes: ¹ 1" through 1-1/2" is installed in a tee in the piping rather than a hole in the piping. The waterflow indicator has a 1" male NPT fitting that screws into a 1" tee. See Figure 3.				

Table 1



TECHNICAL DATA

WATERFLOW INDICATOR

The Viking Corporation, 210 N Industrial Park Drive, Hastings MI 49058

Telephone: 269-945-9501 Technical Services 877-384-5464 Fax: 269-818-1680 Email: techsvcs@vikingcorp.com

VSR-S MODEL

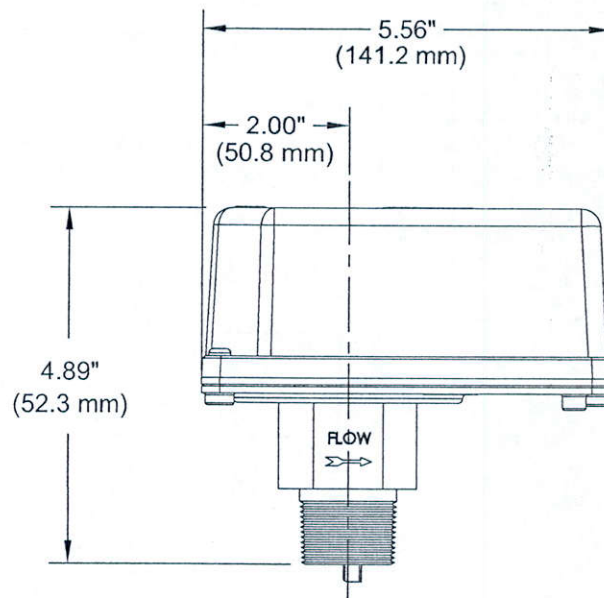
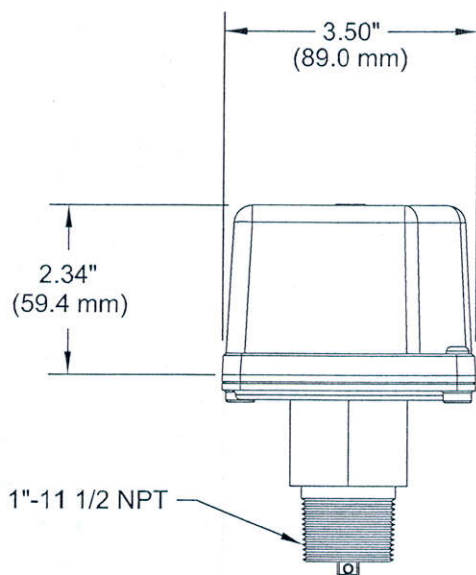


Figure 1

OPTIONAL COVER TAMPER SWITCH

DO NOT LEAVE COVER OFF FOR EXTENDED PERIOD OF TIME

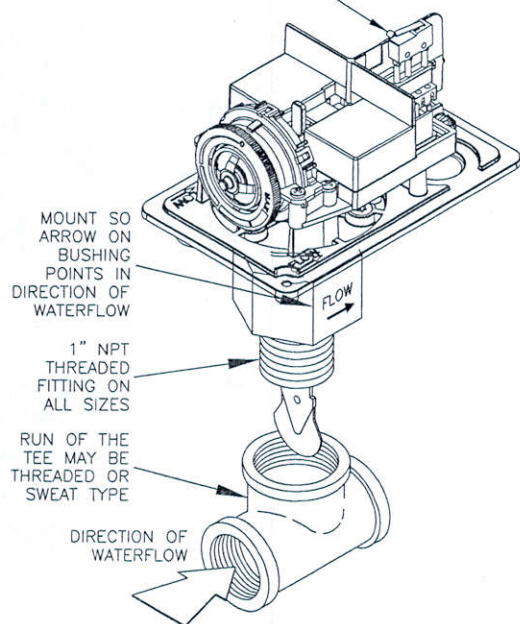
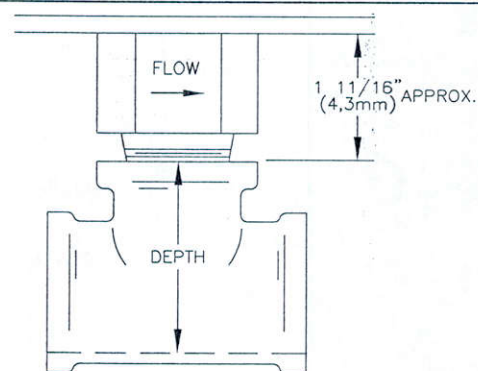


Figure 2



Screw the device into the TEE fitting as shown. Care must be taken to properly orient the device for the direction of the waterflow.

Important - The depth to the inside bottom of the TEE should have the following dimensions:

APPROXIMATE DEPTH REQUIREMENT			
TEE SIZE	THREADED	SWEAT	CPVC
1" x 1" x 1"	2 1/16"	1 3/4"	2 7/16"
1 1/4" x 1 1/4" x 1"	2 7/16"	2 7/16"	N/A
1 1/2" x 1 1/2" x 1"	2 11/16"	2 1/4"	N/A
2" x 2" x 1"	3 3/16"	2 3/4"	N/A

Figure 3



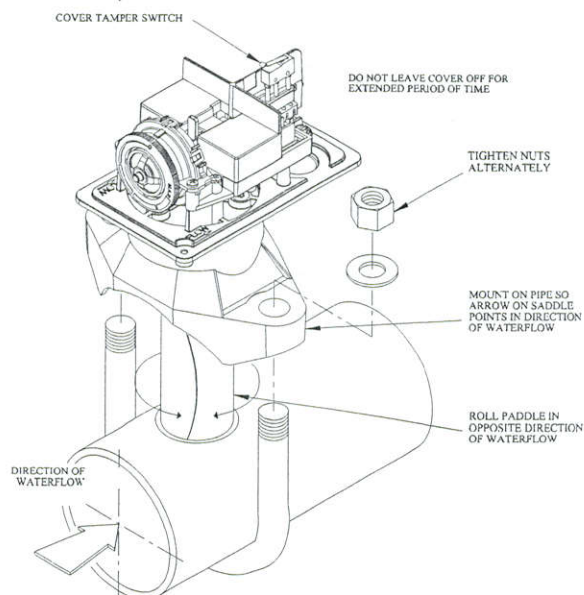
TECHNICAL DATA

WATERFLOW INDICATOR

The Viking Corporation, 210 N Industrial Park Drive, Hastings MI 49058

Telephone: 269-945-9501 Technical Services 877-384-5464 Fax: 269-948-4888 Email: techsvcs@vikingcorp.com

VSR MODEL



INSTALLATION REQUIREMENTS								
Model	Nominal Pipe Size		Nominal Pipe O.D.		Hole Size		U-Bolt Nuts Torque	
	inch	mm	inch	mm	inch	mm	ft-lb	n-m
VSR-2	2	DN50	2.375	60.3	1.25 + .125/- .062	33.0 ± 2.0	20	27
VSR-2 1/2	2 1/2		2.875	73				
VSR-2 1/2	2 1/2	DN65	3.000	76.1				
VSR-3	3	DN80	3.500	88.9	2.00 ± .125	50.8 ± 2.0		
VSR-3 1/2	3 1/2		4.000	101.6				
VSR-4	4	DN100	4.500	114.3				
VSR-5	5		5.563	141.3				
VSR-6	6	DN150	6.625	168.3				
VSR-8	8	DN200	8.625	219.1				

Figure 4

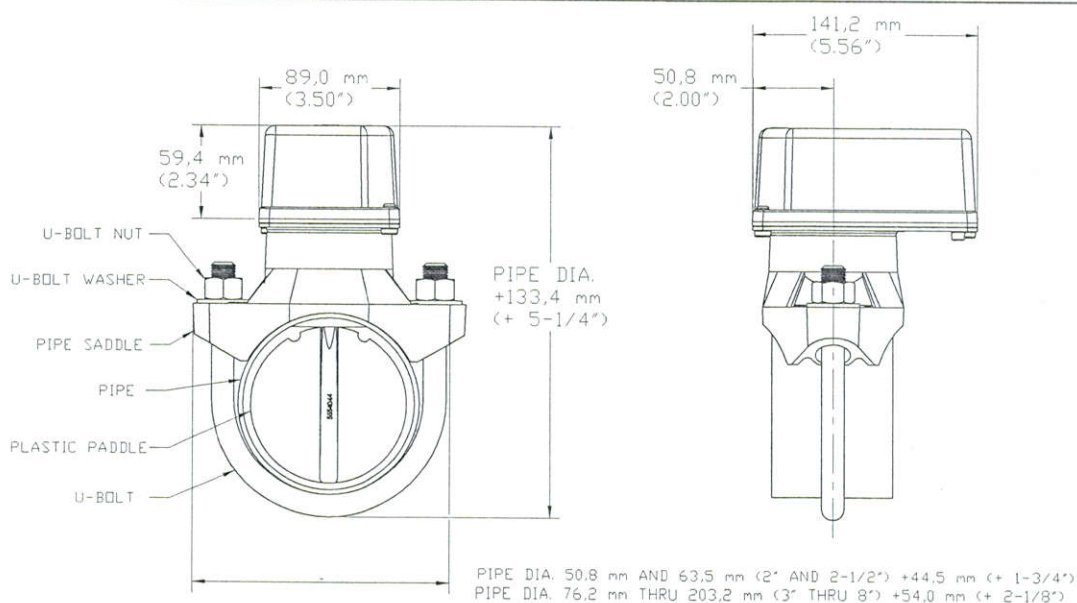


Figure 5



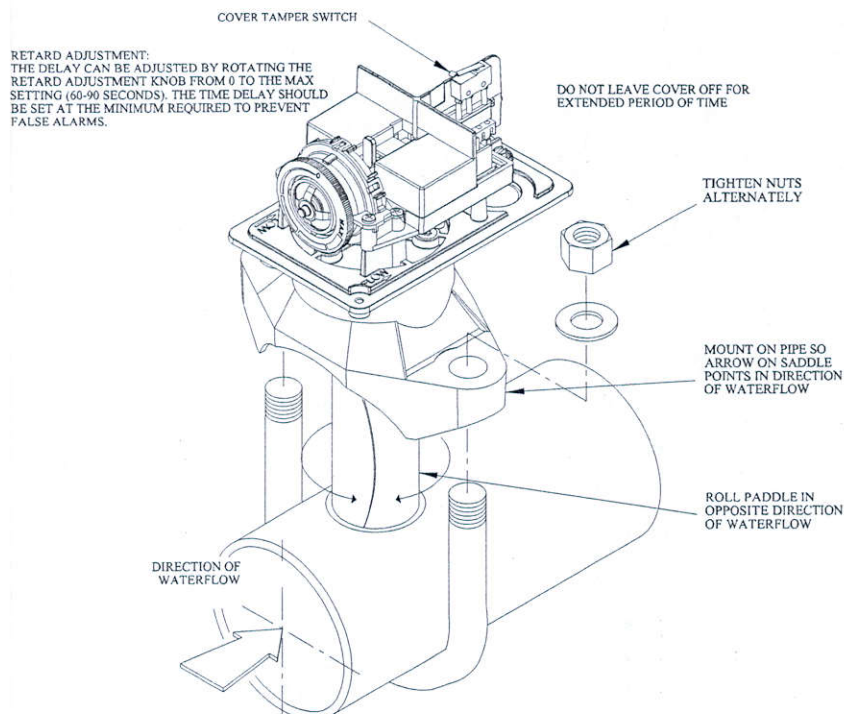
TECHNICAL DATA

WATERFLOW INDICATOR

The Viking Corporation, 210 N Industrial Park Drive, Hastings MI 49058

Telephone: 269-945-9501 Technical Services 877-384-5464 Fax: 269-818-1680 Email: techsvcs@vikingcorp.com

VSR-10 MODEL



Model	Nominal Pipe Size		Nominal Pipe O.D.		Hole Size		U-Bolt Nuts Torque	
	inch	mm	inch	mm	inch	mm	ft-lb	n-m
VSR-10	10	DN250	10.750	273.0	2.00 + .125	50.8 + 2.0	20	27

Figure 6

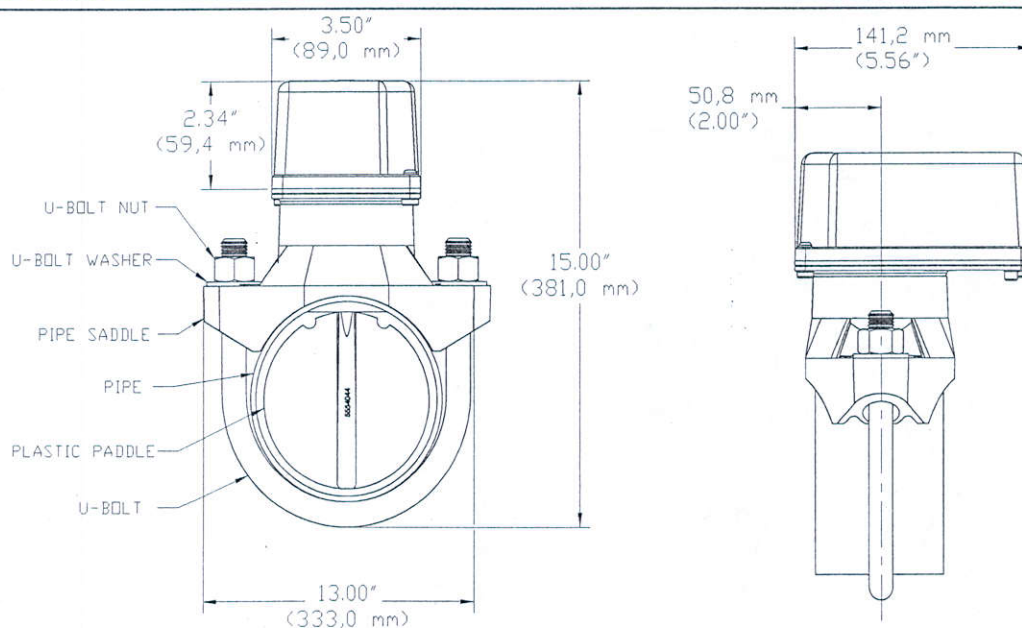


Figure 7



TECHNICAL DATA

WATERFLOW INDICATOR

The Viking Corporation, 210 N Industrial Park Drive, Hastings MI 49058

Telephone: 269-945-9501 Technical Services 877-384-5464 Fax: 269-818-1680 Email: techsvcs@vikingcorp.com

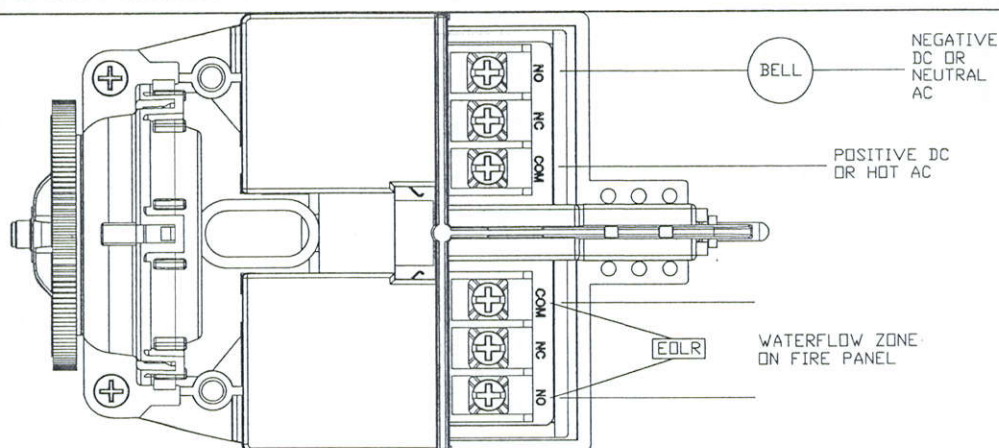


Figure 8: Typical Electrical Connections

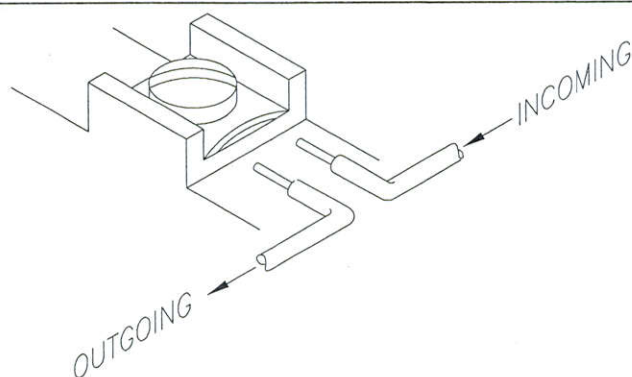


Figure 9: Switch Terminal Connections Clamping Plate Terminal

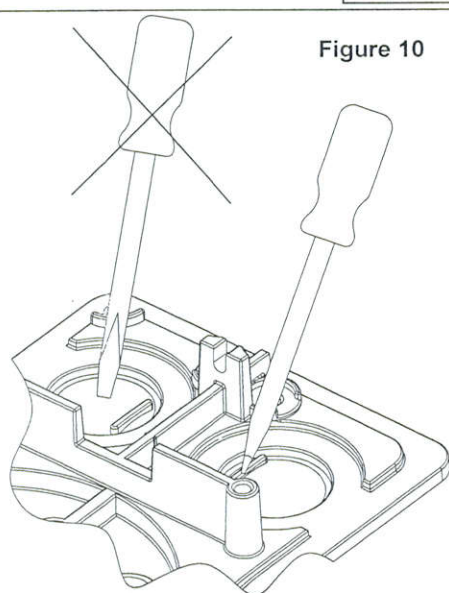


Figure 10

To remove knockouts: Place screwdriver at inside edge of knockouts, not in the center.

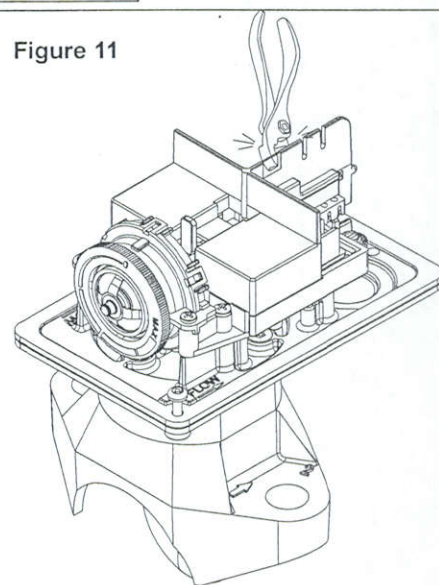


Figure 11

Break out thin section of cover when wiring both switches from one conduit entrance.

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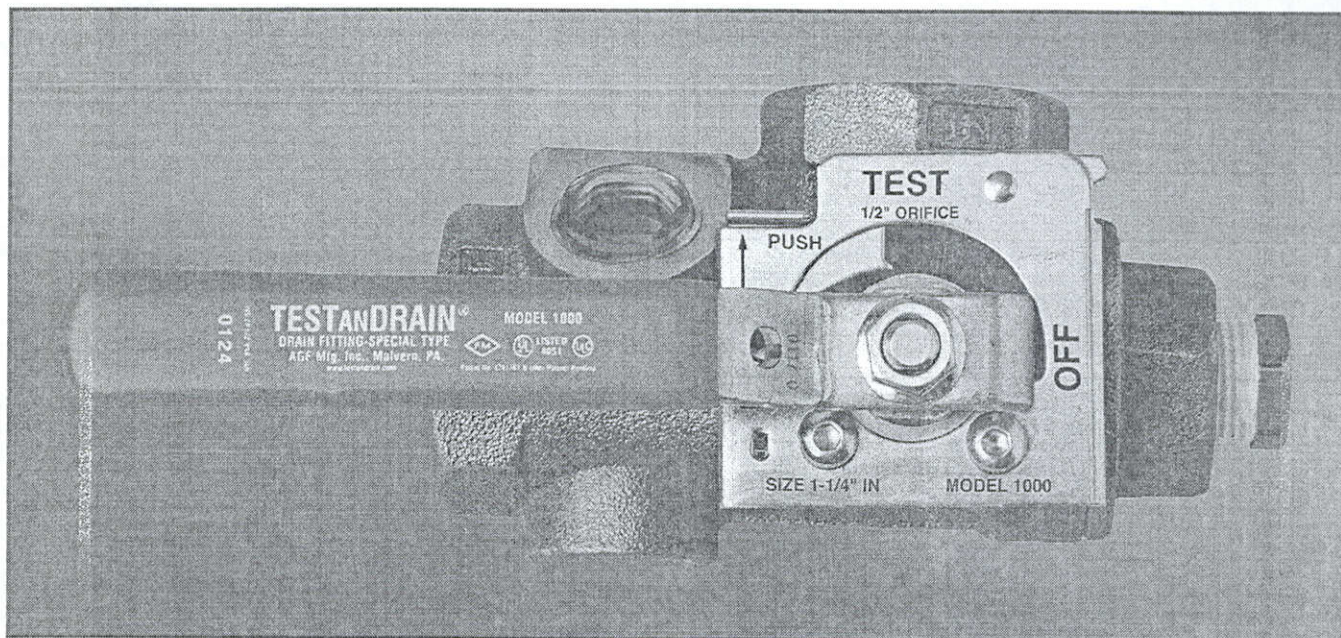
Model 1000

TESTANDRAIN®

Sectional Floor Control Test and Drain Valve

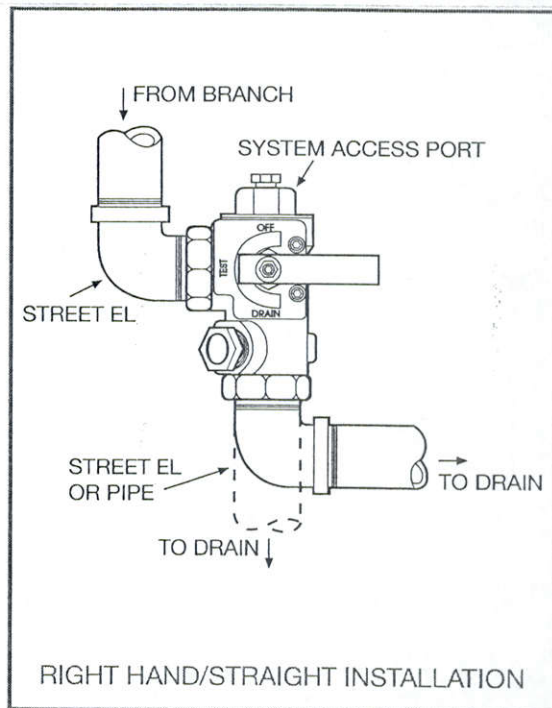


3/4" 1" 1 1/4" 1 1/2" 2"



- The AGF Manufacturing Inc. **Model 1000 TESTANDRAIN®** provides both the test function and the express drain function for a wet fire sprinkler system.
- The **Model 1000** complies with the requirements of NFPA-13, NFPA-13R, and NFPA-13D.
- The **Model 1000 TESTANDRAIN®** is a compact single handle ball valve which includes a tamper resistant test orifice and integral tamper resistant sight glasses, and is 300 PSI rated.
- Available in a full range of sizes from 3/4" to 2" NPT and BSP^T, with all specifiable orifice sizes 3/8" (2.8K), 7/16" (4.2K), 1/2" (5.6K), 17/32" (8.0K), 5/8" (11.2K, ELO), 3/4" (14.0K, ESFR), and K25 as required by NFPA 13, 2007 Edition (see reverse).
- The orifice size is noted on the indicator plate and the valve features a tapped and plugged port for system access.
- A locking kit is available and can be ordered with the valve to provide vandal resistance or prevent unintentional alarm activation.
- Repair kits including (1) adapter gasket, (1) ball, (2) valve seats, (1) stem packing, and (1) stem washer are available for all **TESTANDRAIN®** valves. Valve and orifice size must be specified when ordering.

MODEL 1000 - FRONT VIEW, VERTICAL INSTALLATION



Reliability, Versatility, Code Compatibility

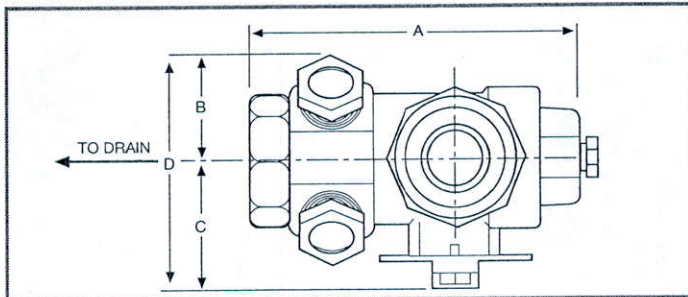


TEST AND DRAIN[®]

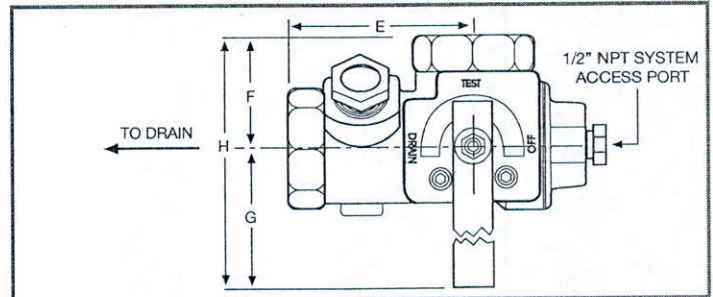
Model 1000

300 PSI Bronze Ball Valve

MODEL 1000 - PLAN VIEW



FRONT VIEW - HORIZONTAL INSTALL



DIMENSIONS

Orifice Size Available: $\frac{3}{8}$ ", $\frac{7}{16}$ ", $\frac{1}{2}$ ", $\frac{17}{32}$ ", ELO ($\frac{5}{8}$ ")*, ESFR ($\frac{3}{4}$ ")*, & K25**

SIZE	A	B	C	D	E	F	G	H
$\frac{3}{4}$ "	5 $\frac{1}{16}$ " (128 mm)	1 $\frac{1}{2}$ " (37.5 mm)	2 $\frac{3}{16}$ " (57 mm)	3 $\frac{5}{8}$ " (93 mm)	3 $\frac{3}{8}$ " (86 mm)	11 $\frac{3}{16}$ " (46 mm)	4 $\frac{9}{16}$ " (117 mm)	6 $\frac{3}{8}$ " (162.5 mm)
1"	5 $\frac{1}{16}$ " (128 mm)	1 $\frac{1}{2}$ " (37.5 mm)	2 $\frac{3}{16}$ " (57 mm)	3 $\frac{5}{8}$ " (93 mm)	3 $\frac{3}{8}$ " (86 mm)	11 $\frac{3}{16}$ " (46 mm)	4 $\frac{9}{16}$ " (117 mm)	6 $\frac{3}{8}$ " (162.5 mm)
1 $\frac{1}{4}$ "	5 $\frac{7}{16}$ " (163 mm)	1 $\frac{11}{16}$ " (43 mm)	2 $\frac{9}{16}$ " (65 mm)	4 $\frac{1}{4}$ " (108 mm)	3 $\frac{5}{16}$ " (83 mm)	11 $\frac{5}{16}$ " (51 mm)	5 $\frac{9}{16}$ " (141 mm)	5 $\frac{1}{2}$ " (192 mm)
1 $\frac{1}{2}$ "	6 $\frac{7}{16}$ " (163 mm)	1 $\frac{13}{16}$ " (45 mm)	3 $\frac{1}{4}$ " (81.5 mm)	5 $\frac{1}{16}$ " (127 mm)	3 $\frac{7}{8}$ " (99 mm)	2 $\frac{5}{8}$ " (67 mm)	8 $\frac{1}{4}$ " (207 mm)	10 $\frac{7}{8}$ " (274 mm)
2"	6 $\frac{7}{16}$ " (163 mm)	1 $\frac{13}{16}$ " (45 mm)	3 $\frac{1}{4}$ " (81.5 mm)	5 $\frac{1}{16}$ " (127 mm)	3 $\frac{7}{8}$ " (99 mm)	2 $\frac{5}{8}$ " (67 mm)	8 $\frac{1}{4}$ " (207 mm)	10 $\frac{7}{8}$ " (274 mm)

* Available on 1 $\frac{1}{4}$ " to 2" size units only

** Available on 1 $\frac{1}{2}$ " and 2" size units only

THE MODEL 1000 PROVIDES ALL OF THE FOLLOWING...

From the 2007 Edition of NFPA 13

- | | |
|---------------------|--|
| Chapter 8.16.2.4.1* | Provisions shall be made to properly drain all parts of the system. |
| Chapter 8.16.2.4.2 | Drain connections, interior sectional or floor control valve(s) – shall be provided with a drain |
| & 8.16.2.4.3 | connection having a minimum size as shown in Table 8.16.2.4.2. |
| Chapter 8.16.2.4.4 | Drains shall discharge outside or to a drain capable of handling the flow of the drain. |
| Chapter A.8.17.4.2 | (Wet Pipe System) test connection is permitted to terminate into a drain capable of accepting full flow... using an approved sight test connection containing a smooth bore corrosion-resistant orifice giving a flow equivalent to one sprinkler... |
| Chapter 8.17.4.2.2 | The test connection valve shall be readily accessible. |
| Chapter 8.17.4.2.4 | shall be permitted to be installed in any location... downstream of the waterflow alarm. |
| Chapter 8.17.4.3.1 | (Dry Pipe System) a trip test connection not less than 1" in diameter, terminating in a smooth bore corrosion-resistant orifice, to provide a flow equivalent to one sprinkler... |
| Chapter 8.17.4.3.2 | The trip test connection... with a shutoff valve and plug not less than 1", at least one of which shall be brass. |

MATERIALS

Handle: Steel
Stem: Rod Brass
Ball: C.P. Brass
Body: Bronze
Valve Seat: Impregnated Teflon[®]
Indicator Plate: Steel
Handle Stop: Steel

APPROVALS

UL and ULC Listed (EX4019)
FM Approved
NYC-BSA No. 720-87-SM



USA Patent # 4741361 and Other Patents Pending



AGF Manufacturing Inc.
100 Quaker Lane, Malvern, PA 19355

Phone: 610-240-4900
Fax: 610-240-4906
www.testandrain.com

Job Name: _____

Architect: _____

Engineer: _____

Contractor: _____

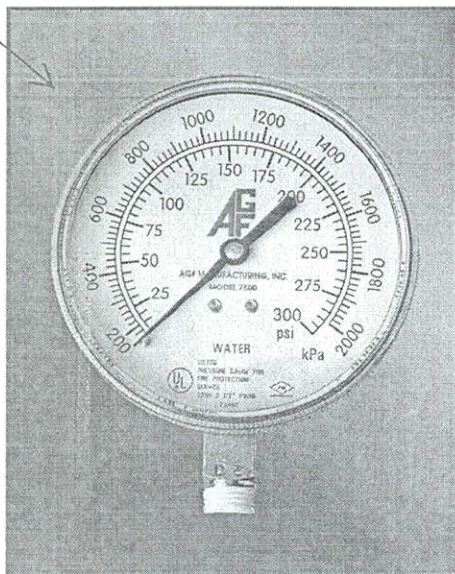


Model 7500
Model 7600

PRESSURE GAUGE & GLOBE VALVE For Fire Sprinkler Systems



1/4" Connection

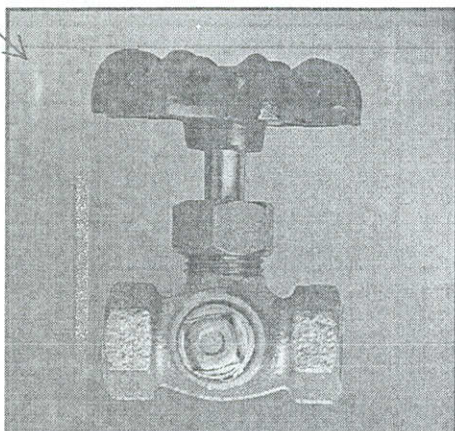
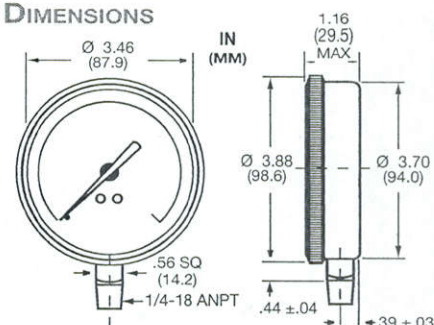


The AGF Manufacturing, Inc. **Model 7500 Pressure Gauge** is an FM Approved/UL Listed 3 1/2" gauge designed for use on "wet" sprinkler systems. The AGF **Model 7500** has been designed to meet the requirements specified in NFPA 13, 2007 Edition Chapters 7.1.1.1 – 7.1.1.2, 7.2.1 – 7.3.1.3, 7.8.7, 8.16.1.2.2, and 8.17.3

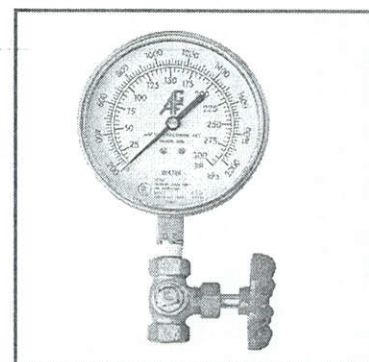
SPECIFICATIONS

Range: 0-300 PSI (Inside)
0-2000 Kpa (Outside)
Accuracy: $\pm 3-2-3\%$
Burdon Tube: Phosphor Bronze
Window: Polycarbonate one-piece ring and crystal
Dial: Galvalume
Pointer: Aluminum, painted black
Case: PGE Xenoy® DX2735
Connection: Brass, 1/4" ANPT LM

DIMENSIONS



The AGF Manufacturing, Inc. **Model 7600 1/4" 3-Way Globe Valve** is an FM Approved/UL Listed valve designed to connect the pressure gauge to the sprinkler systems. The AGF **Model 7600** has been designed to meet NFPA 13 System Attachments stating, "...each gauge shall be equipped with a shutoff valve and provision for drainage."



**MODEL 7500 PRESSURE GAUGE
WITH MODEL 7600 GLOBE VALVE**

USA Patent and Other Patents Pending



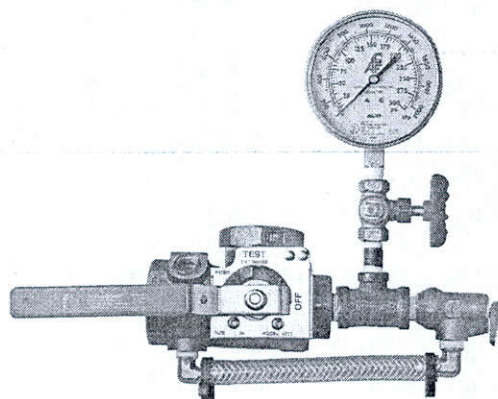
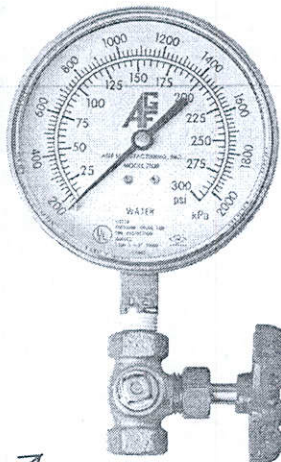
AGF Manufacturing Inc.
100 Quaker Lane, Malvern, PA 19355
T: 610-240-4900 / F: 610-240-4906
E-mail: info@testandrain.com
www.testandrain.com



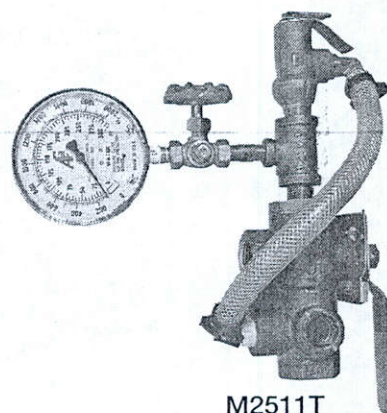
Job Name: _____
Architect: _____
Engineer: _____
Contractor: _____

Reliability, Versatility, Code Compatibility

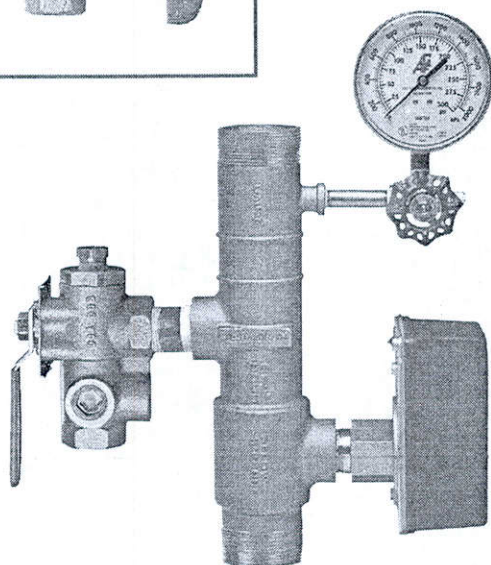
**THE MODEL 7500 PRESSURE GAUGE AND MODEL 7600 3-WAY GLOBE VALVE
ARE ALSO USED ON THE FOLLOWING AGF PRODUCTS:**



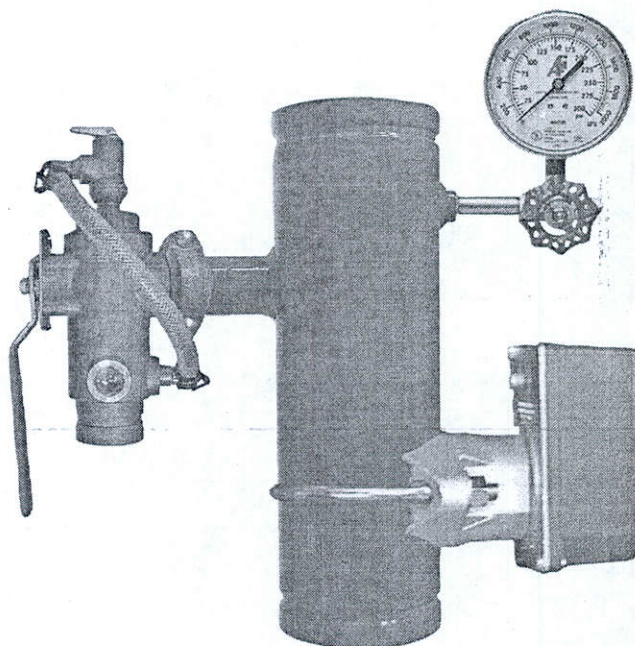
M1011T TEST and DRAIN



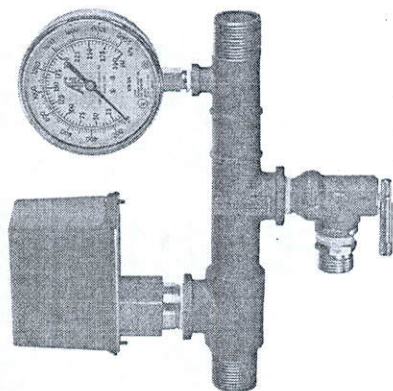
**M2511T
TEST and DRAIN**



M8000 COMMERCIAL RISERPACK



M8011 COMMERCIAL RISERPACK



M8000 RESIDENTIAL RISERPACK



M8011 RESIDENTIAL RISERPACK



Model CV-1F Check Valves 2 to 12 Inch (DN50 to DN300)

General Description

The TYCO Model CV-1F Check Valve is a compact and rugged swing-type unit that allows water flow in one direction and prevents flow in the opposite direction. A resilient elastomer seal facing on the spring-loaded clapper ensures a leak-tight seal and non-sticking operation. The Model CV-1F Check Valves are designed to minimize water hammer caused by flow reversal.

The Model CV-1F Check Valve is furnished with grooved ends and can be installed using Grinnell Grooved Couplings or GRINNELL Figure 71 Flange Adapters. The Model CV-1F Check Valves have been designed with a removable cover for ease of field maintenance. These valves can be installed horizontally (with cover in the upward position) or vertically with the flow in the upward direction. Refer to Figure 4.

A Maintenance Check Valve Kit (TFP1555) is available to allow the maintenance procedure of back-flushing through the fire department connection without removing the Model CV-1F Check Valve from the pipe line.

The Model CV-1F Check Valves are a redesign for the Central Figure 590F and GRINNELL Figure 590F.

NOTICE

Never remove any piping component nor correct or modify any piping deficiencies without first de-pressurizing and draining the system. Failure to do so may result in serious personal injury, property damage, and/or impaired device performance.

The Model CV-1F Check Valves described herein must be installed and maintained in compliance with this document and with the applicable standards of the National Fire Protection Association, in addition to the standards of any authorities having jurisdiction. Failure to do so may impair the performance of this device.

Owners are responsible for maintaining their fire protection system and devices in proper operating condition. The installing contractor or manufacturer should be contacted with any questions.

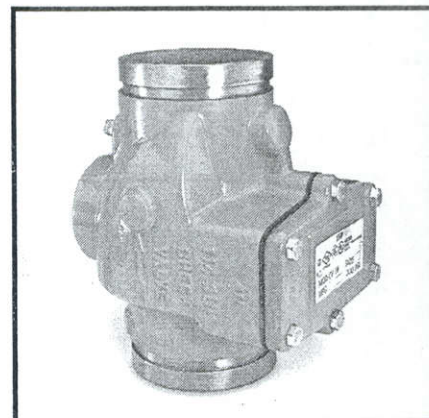
Technical Data

Approvals
UL, C-UL, and FM

Sizes
2 to 12 Inch (DN50 to DN300)

Maximum Working Pressure
300 psi (20,7 bar)

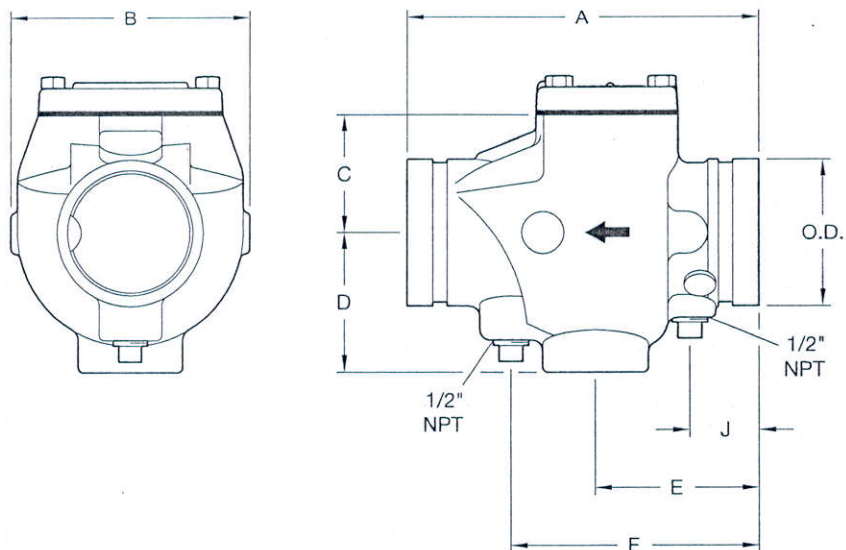
Valve Assembly Finish
Red, non-lead paint



Installation

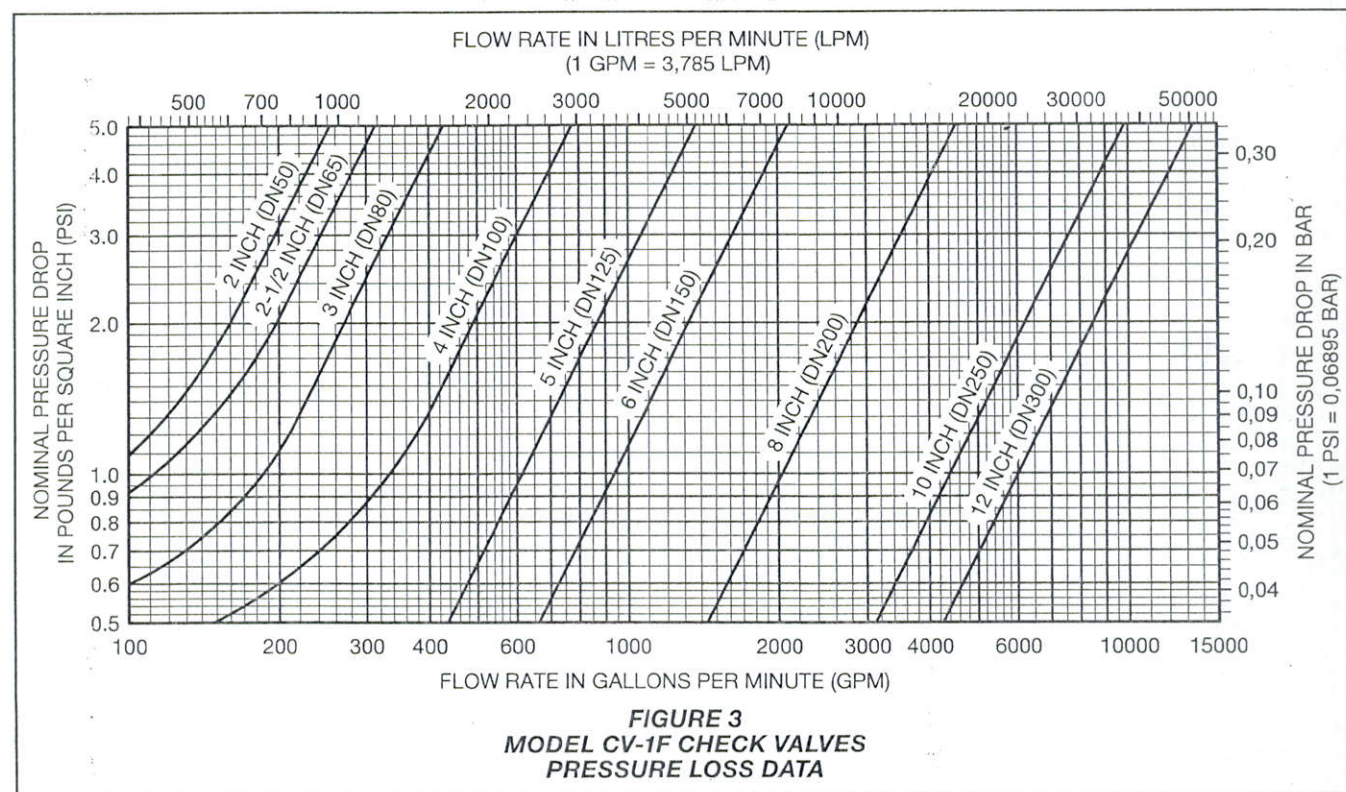
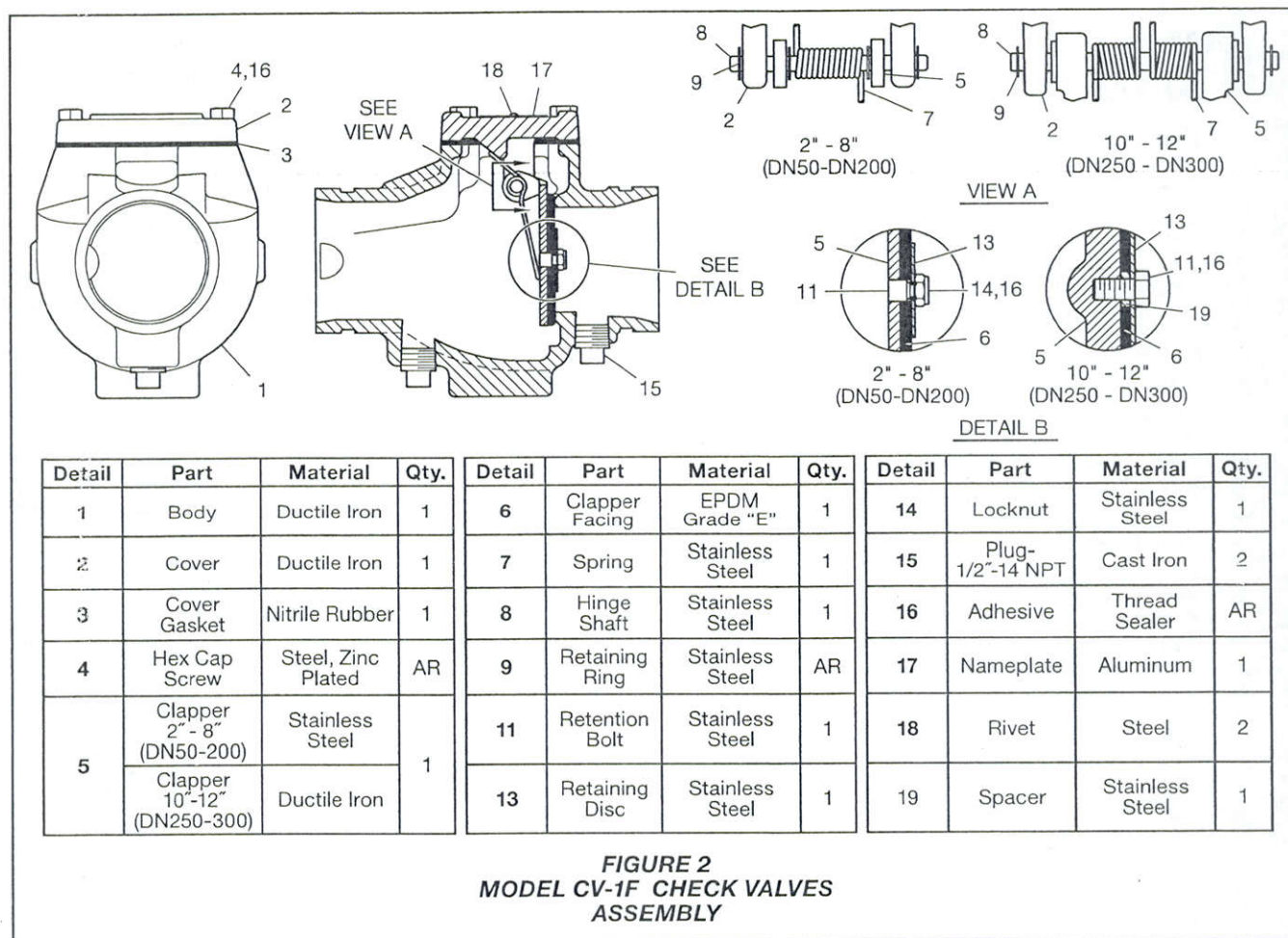
The Model CV-1F Check Valves are to be installed in accordance with the following instructions:

1. The arrow cast on the Body must point in the direction of the flow.
2. Valves installed vertically must be positioned with the flow in the upward direction.
3. Valves installed horizontally must be positioned with the Cover facing up. Refer to Figure 4.
4. Grooved end pipe couplings used with the Model CV-1F Check Valve must be installed in accordance with manufacturer's instructions.



Nominal Pipe Size		Nominal Dimensions Inches (mm)							Cover Bolt Torq. Lbs.-ft. (Nm)	Approx. Weight Lbs. (kg)
ANSI Inches DN	O.D. Inches (mm)	A	B	C	D	E	F	J		
2 DN50	2.375 (60,3)	6.75 (171,5)	4.38 (111,3)	2.55 (64,8)	2.57 (65,3)	3.25 (82,3)	4.75 (120,7)	1.62 (41,5)	18 (25)	9.0 (4,5)
2-1/2 DN65	2.875 (73,0)	8.00 (203,2)	5.80 (147,3)	3.41 (86,6)	3.40 (86,4)	3.88 (98,6)	6.00 (152,4)	1.70 (43,2)	39 (54)	10.0 (4,5)
76.1 DN65	- (76,1)	8.00 (203,2)	5.80 (147,3)	3.41 (86,6)	3.40 (86,4)	3.88 (98,6)	6.00 (152,4)	1.70 (43,2)	39 (54)	10.00 (4,5)
3 DN80	3.500 (88,9)	8.37 (212,6)	5.76 (146,3)	3.60 (91,4)	3.40 (86,4)	3.88 (98,6)	6.00 (152,4)	1.70 (43,2)	39 (54)	11.0 (5,0)
4 DN100	4.500 (114,3)	9.63 (244,6)	6.74 (171,2)	4.61 (117,1)	3.63 (92,2)	4.56 (115,1)	7.13 (181,1)	1.84 (46,7)	50 (69)	25.0 (11,3)
139.7 DN125	- (139,7)	10.50 (266,7)	7.50 (190,5)	5.29 (134,4)	4.20 (106,7)	4.90 (124,5)	7.60 (193,0)	1.90 (48,3)	39 (54)	29.0 (13,2)
5 DN125	5.563 (141,3)	10.50 (266,7)	7.50 (190,5)	5.29 (134,4)	4.20 (106,7)	4.90 (124,5)	7.60 (193,0)	1.90 (48,3)	39 (54)	29.0 (13,2)
165.1 DN150	- (165,1)	11.50 (292,1)	8.05 (204,5)	5.75 (146,1)	4.50 (114,3)	5.00 (127,0)	7.60 (193,0)	1.48 (37,6)	60 (82)	47.0 (21,3)
6 DN150	6.625 (168,3)	11.50 (292,1)	8.05 (204,5)	5.75 (146,1)	4.50 (114,3)	5.00 (127,0)	7.60 (193,0)	1.48 (37,6)	60 (82)	47.0 (21,3)
8 DN200	8.625 (219,1)	14.00 (355,6)	10.25 (260,4)	7.75 (196,9)	5.62 (142,7)	5.45 (138,4)	8.40 (213,4)	2.20 (58,9)	120 (164)	66.0 (29,9)
10 DN250	10.750 (273,1)	18.00 (457,2)	13.00 (330,2)	10.21 (259,3)	6.38 (162,1)	7.50 (190,5)	10.50 (266,7)	3.00 (76,2)	130 (178)	109.7 (49,4)
12 DN300	12.750 (323,9)	21.00 (533,4)	14.28 (362,7)	11.31 (287,2)	7.26 (184,4)	7.62 (193,5)	10.62 (269,7)	2.75 (69,9)	130 (178)	151.0 (68,0)

FIGURE 1
MODEL CV-1F CHECK VALVES
NOMINAL DIMENSIONS



Care and Maintenance

NOTICE

Before closing a fire protection system main control valve for maintenance work on the fire protection system that it controls, obtain permission to shut down the affected fire protection system from the proper authorities and notify all personnel who may be affected by this decision.

After placing a fire protection system in service, notify the proper authorities and advise those responsible for monitoring proprietary and/or central station alarms.

Responsibility lies with owners for the inspection, testing, and maintenance of their fire protection system and devices in compliance with this document, as well as with the applicable standards of the National Fire Protection Association (for example, NFPA 25), in addition to the standards of any authority having jurisdiction. The installing contractor or product manufacturer should be contacted relative to any questions. Any impairments must be immediately corrected.

Automatic sprinkler systems are recommended to be inspected, tested, and maintained by a qualified Inspection Service in accordance with local requirements and/or national codes.

Limited Warranty

Products manufactured by Tyco Fire Suppression & Building Products (TFSBP) are warranted solely to the original Buyer for ten (10) years against defects in material and workmanship when paid for and properly installed and maintained under normal use and service. This warranty will expire ten (10) years from date of shipment by TFSBP. No warranty is given for products or components manufactured by companies not affiliated by ownership with TFSBP or for products and components which have been subject to misuse, improper installation, corrosion, or which have not been installed, maintained, modified or repaired in accordance with applicable Standards of the National Fire Protection Association, and/or the standards of any other Authorities Having Jurisdiction. Materials found by TFSBP to be defective shall be either repaired or replaced, at TFSBP's sole option. TFSBP neither assumes, nor authorizes any person to assume for it, any other obligation in connection with the sale of products or parts of products. TFSBP shall not be responsible for sprinkler system design errors or inaccurate or incomplete information supplied by Buyer or Buyer's representatives.

In no event shall TFSBP be liable, in contract, tort, strict liability or under any other legal theory, for incidental, indirect, special or consequential damages, including but not limited to labor charges, regardless of whether

TFSBP was informed about the possibility of such damages, and in no event shall TFSBP's liability exceed an amount equal to the sales price.

The foregoing warranty is made in lieu of any and all other warranties, express or implied, including warranties of merchantability and fitness for a particular purpose.

This limited warranty sets forth the exclusive remedy for claims based on failure of or defect in products, materials or components, whether the claim is made in contract, tort, strict liability or any other legal theory.

This warranty will apply to the full extent permitted by law. The invalidity, in whole or part, of any portion of this warranty will not affect the remainder.

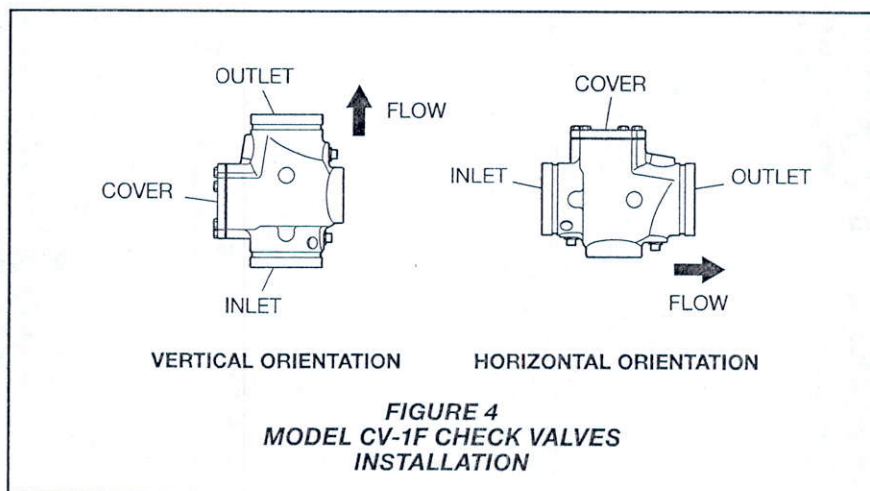
Ordering Procedure

Contact your local distributor for availability. When placing an order, indicate the full product name and Part Number (P/N).

Model CV-1F Check Valves

Specify: size and P/N (below).

2" (DN50)	P/N 59-590-0-020
2-1/2" (DN65)	P/N 59-590-0-025
76,1 mm (DN65)	P/N 59-590-0-076
3" (DN80)	P/N 59-590-0-030
4" (DN100)	P/N 59-590-0-040
139,7 mm (DN125)	P/N 59-590-0-139
5" (DN125)	P/N 59-590-0-050
165,1 mm (DN150)	P/N 59-590-0-165
6" (DN150)	P/N 59-590-0-060
8" (DN200)	P/N 59-590-0-080
10" (DN250)	P/N 59-590-0-100
12" (DN300)	P/N 59-590-0-120



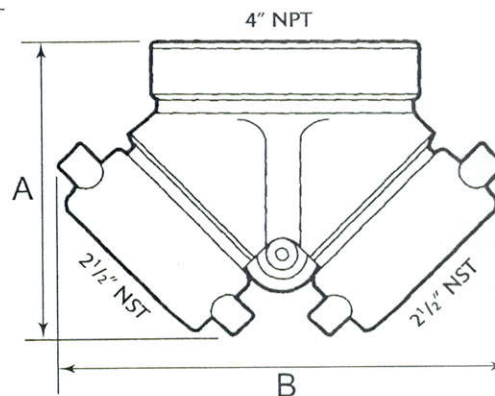


Fire Department Connection (Threaded)

A95

Technical Features

- Sizes available (Nominal) : DN100 x DN65 / 4" x 2 1/2"
- Pressure data :
Working pressure : 20.7 bar (300 psi)
- Finish : Cast Bronze
- Connections : Two-way inlet female threaded NST. Outlet female threaded NPT.
- Specifications : 1,893 l/pm (500 g/pm) flow capacity. Single swing clapper.



Fire Department Connection (Threaded) - A95

Physical Data

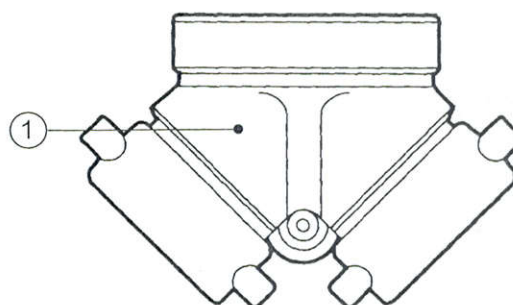
Nominal Pipe Size		Dimensions (mm / inch)		Reference	Weight (kg / lbs)
Metric	inch	A	B		
DN100 x DN65	4" x 2 1/2"	141.0 / 5.55	205.7 / 8.10	A95400250	3.6 / 7.9

Fire Department Connection (Threaded) - A95

Materials List

Item	Description	Material
1	Body	Brass
2	Clapper*	Brass
3	Seat*	Brass

* Not shown



Fire Department Connections

Series TY-FRB, 5.6 K-factor Upright, Pendent, and Recessed Pendent Sprinklers Quick Response, Standard Coverage

General Description

The TYCO Series TY-FRB, 5.6 K-factor, Upright (TY313) and Pendent (TY323) Sprinklers described in this data sheet are quick response, standard coverage, decorative 3 mm glass bulb-type spray sprinklers designed for use in light or ordinary hazard, commercial occupancies such as banks, hotels, and shopping malls.

The recessed version of the Series TY-FRB Pendent Sprinkler, where applicable, is intended for use in areas with a finished ceiling. This recessed pendent sprinkler uses one of the following:

- A two-piece Style 15 Recessed Escutcheon with recessed adjustment up to 5/8 inch (15,9 mm) from the flush pendent position.
- A two-piece Style 20 Recessed Escutcheon with recessed adjustment up to 1/2 inch (12,7 mm) from the flush pendent position.

The adjustment provided by the Recessed Escutcheon reduces the accuracy to which the fixed pipe drops to the sprinklers must be cut.

Intermediate level versions of Series TY-FRB Sprinklers are described in Technical Data Sheet TFP357. Sprinkler guards and shields are described in Technical Data Sheet TFP780.

IMPORTANT

Always refer to Technical Data Sheet TFP700 for the "INSTALLER WARNING" that provides cautions with respect to handling and installation of sprinkler systems and components. Improper handling and installation can permanently damage a sprinkler system or its components and cause the sprinkler to fail to operate in a fire situation or cause it to operate prematurely.

NOTICE

The TYCO Series TY-FRB Sprinklers described herein must be installed and maintained in compliance with this document, as well as with the applicable standards of the National Fire Protection Association, in addition to the standards of any other authorities having jurisdiction. Failure to do so may impair the performance of these devices.

The owner is responsible for maintaining their fire protection system and devices in proper operating condition. The installing contractor or sprinkler manufacturer should be contacted with any questions.

Sprinkler Identification Number (SIN)

TY313 Upright 5.6K, 1/2" NPT
TY323 Pendent 5.6K, 1/2" NPT

Technical Data

Approvals

UL and C-UL Listed
FM, LPCB, and VdS Approved
CE Certified

Sprinklers with Polyester Finish are UL and C-UL Listed as Corrosion-Resistant Sprinklers.

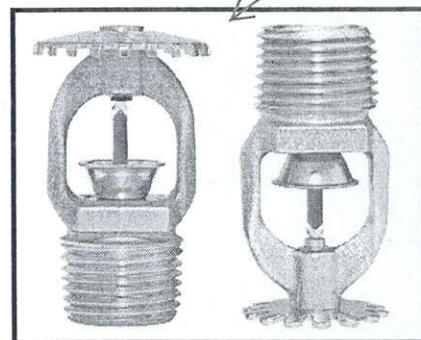
Maximum Working Pressure

175 psi (12.1 bar)
250 psi (17.2 bar)*

* The maximum working pressure of 250 psi (17.2 bar) only applies to the listing by Underwriters Laboratories, Inc. (UL).

Discharge Coefficient

K=5.6 GPM/psi^{1/2} (80,6 LPM/bar^{1/2})



Temperature Rating

135°F (57°C)
155°F (68°C)
175°F (79°C)
200°F (93°C)
286°F (141°C)

Finishes

Sprinkler: Refer to Table A

Recessed Escutcheon: White Coated, Chrome Plated, or Brass Plated

Physical Characteristics

Frame Bronze
Button Brass/Copper
Sealing Assembly Stainless Steel w/TEFLON
Bulb Glass
Compression Screw Bronze
Deflector Bronze

Components:

- | | |
|-------------|-----------------|
| 1 - Frame | 4 - Bulb |
| 2 - Button | 5 - Compression |
| 3 - Sealing | Screw |
| Assembly | 6 - Deflector* |

* Temperature rating is indicated on Deflector.

** Pipe thread connections per ISO 7-1 can be provided on special request.

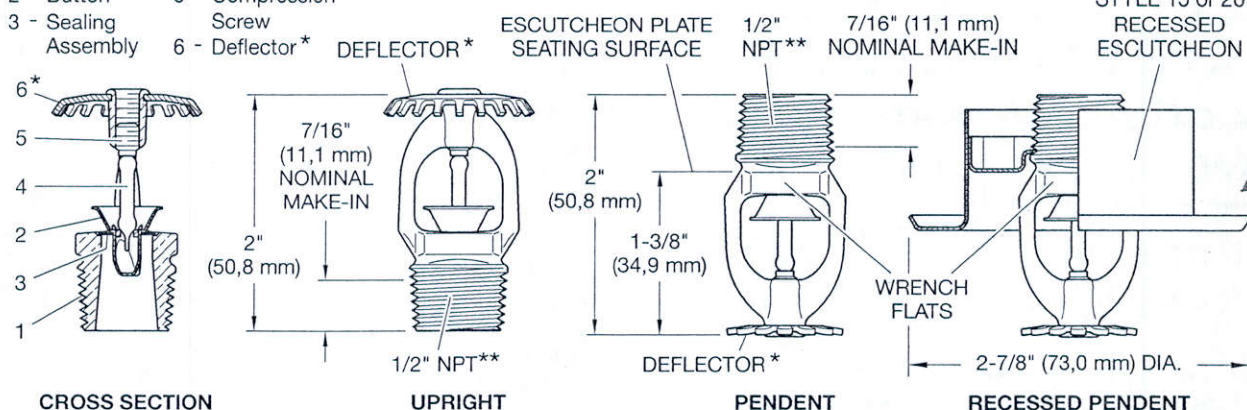


FIGURE 1
SERIES TY-FRB UPRIGHT (TY313) AND PENDENT (TY323) SPRINKLERS
5.6 K-FACTOR, 1/2 INCH NPT, QUICK RESPONSE



FIGURE 2
W-TYPE 6
SPRINKLER WRENCH

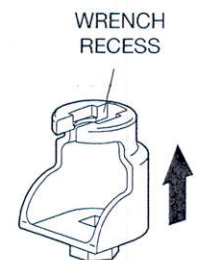


FIGURE 3
W-TYPE 7 RECESSED
SPRINKLER WRENCH

Operation

The glass bulb contains a fluid which expands when exposed to heat. When the rated temperature is reached, the fluid expands sufficiently to shatter the glass bulb, allowing the sprinkler to activate and water to flow.

Design Criteria

The TYCO Series TY-FRB, 5.6 K-factor, Upright (TY313) and Pendent (TY323) Sprinklers are intended for fire protection systems designed in accordance with the standard installation rules recognized by the applicable Listing or Approval agency (such as, UL Listing is based on the requirements of NFPA 13, and FM Approval is based on the requirements of FM's Loss Prevention Data Sheets). Only the Style 15 or Style 20 Recessed Escutcheon is to be used for recessed pendent installations.

Installation

The TYCO Series TY-FRB, 5.6 K-factor, Upright (TY313) and Pendent (TY323) Sprinklers must be installed in accordance with this section.

General Instructions

Do not install any bulb-type sprinkler if the bulb is cracked or there is a loss of liquid from the bulb. With the sprinkler held horizontally, a small air bubble should be present. The diameter of the air bubble is approximately 1/16 inch (1,6 mm) for the 135°F (57°C) and 3/32 inch (2,4 mm) for the 286°F (141°C) temperature ratings.

A leak-tight 1/2 inch NPT sprinkler joint should be obtained by applying a minimum to maximum torque of 7 to 14 ft.-lbs. (9,5 to 19,0 Nm). Higher levels of torque can distort the sprinkler Inlet with consequent leakage or impairment of the sprinkler.

Do not attempt to compensate for insufficient adjustment in the Escutcheon Plate by under- or over-tightening the sprinkler. Re-adjust the position of the sprinkler fitting to suit.

Upright and Pendent Sprinklers

The Series TY-FRB Upright and Pendent Sprinklers must be installed in accordance with the following instructions.

Step 1. Install Pendent sprinklers in the pendent position. Install upright sprinklers in the upright position.

Step 2. With pipe-thread sealant applied to the pipe threads, hand-tighten the sprinkler into the sprinkler fitting.

Step 3. Tighten the sprinkler into the sprinkler fitting using only the W-Type 6 Sprinkler Wrench (Figure 2). With reference to Figure 1, apply the W-Type 6 Sprinkler Wrench to the wrench flats. Torque sprinklers 7 to 14 ft.-lbs. (9,5 to 19,0 Nm).

Recessed Pendent Sprinklers

The Series TY-FRB Recessed Pendent Sprinklers must be installed in accordance with the following instructions.

Step A. After installing the Style 15 or Style 20 Mounting Plate over the sprinkler threads, and with pipe-thread sealant applied to the pipe threads, hand-tighten the sprinkler into the sprinkler fitting.

Step B. Tighten the sprinkler into the sprinkler fitting using only the W-Type 7 Recessed Sprinkler Wrench (Figure 3). With reference to Figure 1, apply the W-Type 7 Recessed Sprinkler Wrench to the sprinkler wrench flats. Torque sprinklers 7 to 14 ft.-lbs. (9,5 to 19,0 Nm).

Step C. After ceiling installation and finishing, slide on the Style 15 or Style 20 Closure over the Series TY-FRB Sprinkler and push the Closure over the Mounting Plate until its flange comes in contact with the ceiling.

Care and Maintenance

The TYCO Series TY-FRB, 5.6 K-factor, Upright (TY313) and Pendent (TY323) Sprinklers must be maintained and serviced in accordance with this section.

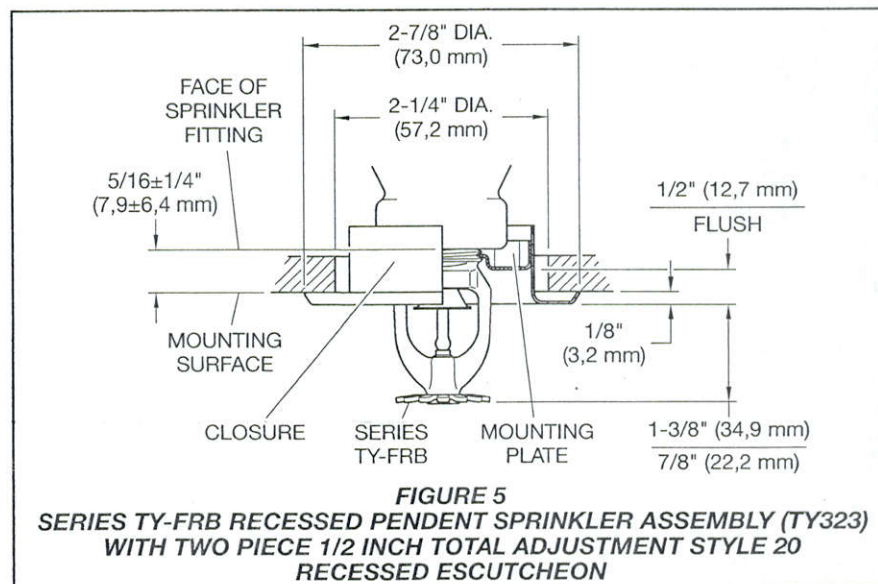
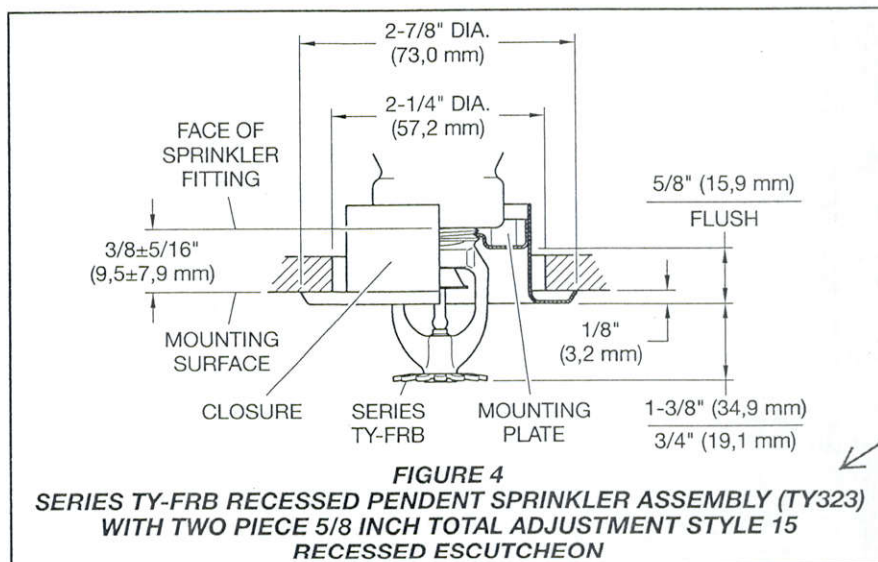
Before closing a fire protection system main control valve for maintenance work on the fire protection system that it controls, obtain permission to shut down the affected fire protection systems from the proper authorities and notify all personnel who may be affected by this action.

Absence of the outer piece of an escutcheon, which is used to cover a clearance hole, can delay sprinkler operation in a fire situation.

The owner must assure that the sprinklers are not used for hanging any objects and that the sprinklers are only cleaned by means of gently dusting with a feather duster; otherwise, non-operation in the event of a fire or inadvertent operation may result.

Sprinklers which are found to be leaking or exhibiting visible signs of corrosion must be replaced.

Automatic sprinklers must never be painted, plated, coated, or otherwise altered after leaving the factory.



Modified sprinklers must be replaced. Sprinklers that have been exposed to corrosive products of combustion, but have not operated, should be replaced if they cannot be completely cleaned by wiping the sprinkler with a cloth or by brushing it with a soft bristle brush.

Care must be exercised to avoid damage to the sprinklers before, during, and after installation. Sprinklers damaged by dropping, striking, wrench twist/slippage, or the like, must be replaced. Also, replace any sprinkler that has a cracked bulb or that has lost liquid from its bulb. (Ref. Installation Section.)

The owner is responsible for the inspection, testing, and maintenance of their fire protection system and devices in compliance with this document, as well as with the applicable standards of the National Fire Protection Association (e.g., NFPA 25), in addition to the

standards of any other authorities having jurisdiction. Contact the installing contractor or sprinkler manufacturer regarding any questions.

Automatic sprinkler systems are recommended to be inspected, tested, and maintained by a qualified Inspection Service in accordance with local requirements and/or national codes.

P/N* 77 - XXX - X - XXX			
		SIN	
370	5.6K UPRIGHT (1/2" NPT)	TY313	
371	5.6K PENDENT (1/2" NPT)	TY323	
* Use suffix "I" for ISO 7-1 connection; for example, 77-370-4-175-I			
		SPRINKLER FINISH	
1	NATURAL BRASS		
3	PURE WHITE (RAL9010)** POLYESTER		
4	SIGNAL WHITE (RAL9003) POLYESTER		
9	CHROME PLATED		
** Eastern Hemisphere sales only			
		TEMPERATURE RATINGS	
135	135°F (57°C)		
155	155°F (68°C)		
175	175°F (79°C)		
200	200°F (93°C)		
286	286°F (141°C)		

TABLE A
SERIES TY-FRB UPRIGHT AND PENDENT SPRINKLERS
PART NUMBER SELECTION

Limited Warranty

For warranty terms and conditions, visit www.tyco-fire.com.

Ordering Procedure

Contact your local distributor for availability. When placing an order, indicate the full product name and Part Number (P/N).

Sprinkler Assemblies with NPT Thread Connections

Specify: Series TY-FRB Upright or Pendent (specify) Sprinkler, SIN (specify), K=5.6, Quick Response, (specify) temperature rating, (specify) finish, P/N (specify, refer to Table A).

Recessed Escutcheon

Specify: Style 15 Recessed Escutcheon with (specify*) finish, P/N (specify*)

Specify: Style 20 Recessed Escutcheon with (specify*) finish, P/N (specify*)

* Refer to Technical Data Sheet TFP770

Sprinkler Wrench

Specify: W-Type 6 Sprinkler Wrench, P/N 56-000-6-387

Specify: W-Type 7 Sprinkler Wrench, P/N 56-850-4-001



Worldwide
Contacts

www.tyco-fire.com

Series RFI — 5.6 K-factor "Royal Flush II" Concealed Pendent Sprinklers Quick & Standard Response, Standard Coverage

General Description

The TYCO Series RFI 5.6 K-factor, "Royal Flush II" Concealed Pendent Sprinklers Quick Response (3-mm bulb) and Standard Response (5-mm bulb), are decorative sprinklers featuring a flat cover plate designed to conceal the sprinkler. These sprinklers are optimal for architecturally sensitive areas such as hotel lobbies, office buildings, churches, and restaurants.

Each sprinkler includes a Cover Plate/Retainer Assembly and a Sprinkler/Support Cup Assembly. The separable, two-piece assembly design provides the following benefits:

- Allows installation of the sprinklers and pressure testing of the fire protection system prior to installation of a suspended ceiling or application of the finish coating to a fixed ceiling.
- Permits the removal of suspended ceiling panels for access to building service equipment without having to first shut down the fire protection system and remove sprinklers.
- Provides for 1/2 inch (12,7 mm) of vertical adjustment to allow a measure of flexibility in determining the length of fixed piping to cut for the sprinkler drops.

The Series RFI Sprinklers are shipped with a Disposable Protective Cap. The Protective Cap is temporarily removed during installation and replaced to help protect the sprinkler during ceiling in-

stallation or finish. The tip of the Protective Cap can be used to mark the center of the ceiling hole into plaster board or ceiling tiles by gently pushing the ceiling product against the Protective Cap. When ceiling installation is complete, the Protective Cap is removed and the Cover Plate/Retainer Assembly is installed.

As an option, the Series RFI Standard Response (5-mm bulb) "Royal Flush II" Concealed Pendent Sprinklers can be fitted with a silicone Air and Dust Seal. (Refer to Figure 5.) The Air and Dust Seal is intended for sensitive areas where it is desirable to prevent air and dust from the area above the ceiling to pass through the cover plate.

NOTICE

The Series RFI Concealed Pendent Sprinklers described herein must be installed and maintained in compliance with this document and with the applicable standards of the National Fire Protection Association, in addition to the standards of any authorities having jurisdiction. Failure to do so may impair the performance of these devices.

The owner is responsible for maintaining their fire protection system and devices in proper operating condition. The installing contractor or sprinkler manufacturer should be contacted with any questions.

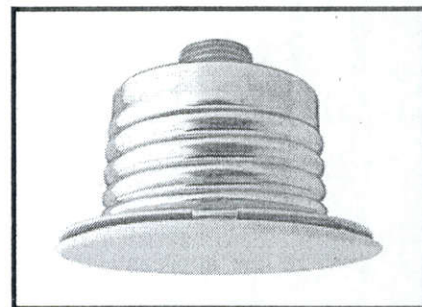
Sprinkler Identification Number (SIN)

TY3531 — 3 mm bulb
TY3551 — 5 mm bulb

Technical Data

Sprinkler Approvals

Approvals apply only to the service conditions indicated in the Design Criteria section.



- TY3531 (3-mm Bulb) is UL Listed, C-UL Listed, VdS Approved (Certificate No. G4090007), and NYC Approved (MEA 353-01-E) as Quick Response.
- TY3531 (3-mm Bulb) is FM and LPCB Approved (Ref. No. 094a/10) Approved as Standard Response. Factory Mutual and LPCB do not approve any concealed sprinklers for quick response.
- TY3551 (5-mm Bulb) is UL Listed, C-UL Listed, FM Approved, LPCB Approved (Ref. No. 094a/9), and NYC Approved (MEA 353-01-E) as Standard Response.

Approvals for Air and Dust Seal

UL and C-UL Listed for use with the RFI Standard Response Concealed Sprinkler (TY3551).

Maximum Working Pressure

Maximum 250 psi (17,3 bar) by UL, C-UL, and NYC

Maximum 175 psi (12,1 bar) by FM, VdS, and LPCB

Temperature Rating

155°F (68°C) Sprinkler with
139°F (59°C) Plate

200°F (93°C) Sprinkler with
165°F (74°C) Plate

Discharge Coefficient

K = 5.6 GPM/psi^{1/2} (80,6 LPM/bar^{1/2})

Adjustment

1/2 inch (12,7 mm)

Finishes

See the Ordering Procedure section.

IMPORTANT

Always refer to Technical Data Sheet TFP700 for the "INSTALLER WARNING" that provides cautions with respect to handling and installation of sprinkler systems and components. Improper handling and installation can permanently damage a sprinkler system or its components and cause the sprinkler to fail to operate in a fire situation or cause it to operate prematurely.

Physical Characteristics

Frame	Bronze
Support Cup	Chrome
Guide Pins	Plated Steel
Deflector	Bronze
Compression Screw	Brass
Bulb	Glass
Cap	Bronze or Copper
Sealing Assembly	Beryllium
	Nickel w/ TEFLON
Cover Plate	Brass
Retainer	Brass
Ejection Spring	Stainless Steel

Design Criteria

The TYCO Series RFI 5.6 K-factor, "Royal Flush II" Concealed Pendent Sprinklers are intended for fire protection systems designed in accordance with the standard installation rules recognized by the applicable Listing or Approval agency; for example, UL Listing is based on NFPA 13 and VdS Approval is based on the CEA 4001.

For more information on LPCB and VdS Approvals, contact Tyco Fire Protection Products at the following office:

Enschede, Netherlands
Telephone: 31-53-428-4444
Fax: 31-53-428-3377

The Series RFI Concealed Pendent Sprinklers are only listed and approved with the Series RFI Concealed Cover Plates having a factory applied finish.

NOTICE

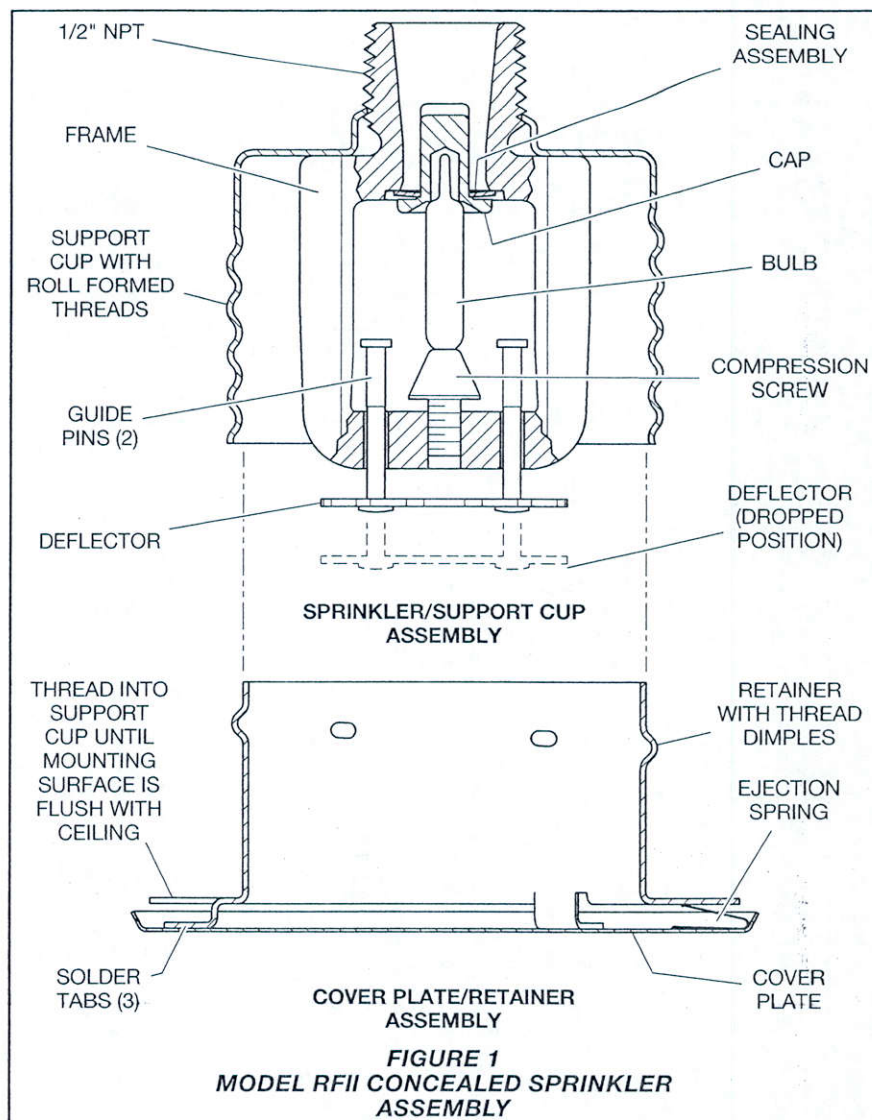
Do not use the Series RFI in applications where the air pressure above the ceiling is greater than that below. Down drafts through the Sprinkler/Support Cup Assembly can delay sprinkler operation in a fire situation.

Operation

When exposed to heat from a fire, the Cover Plate, normally soldered to the Retainer at three points, falls away to expose the Sprinkler/Support Cup Assembly.

The Deflector — supported by the Guide Pins — then drops down to its operational position.

The glass bulb contains a fluid that expands when exposed to heat. When the rated temperature is reached, the fluid expands sufficiently to shatter the glass bulb, activating the sprinkler and allowing water to flow.



Installation

The TYCO Series RFI 5.6 K-factor, "Royal Flush II" Concealed Pendent Sprinklers must be installed in accordance with this section.

General Instructions

Do not install any bulb-type sprinkler if the bulb is cracked or there is a loss of liquid from the bulb. With the sprinkler held horizontally, a small air bubble should be present. The diameter of the air bubble is approximately 1/16 inch (1,6 mm) for the 155°F (68°C) and 3/32 inch (2,4 mm) for the 200°F (93°C) temperature ratings.

A leak-tight 1/2 inch NPT sprinkler joint should be obtained by applying a minimum to maximum torque of 7 to 14 ft.-lbs. (9,5 to 19,0 Nm). Higher levels of torque can distort the sprinkler Inlet with consequent leakage or impairment of the sprinkler.

Do not attempt to compensate for insufficient adjustment in the Sprinkler by under- or over-tightening the Sprinkler/Support Cup Assembly. Re-adjust the position of the sprinkler fitting to suit.

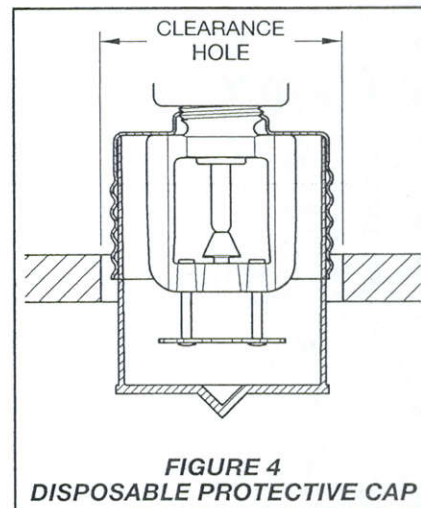
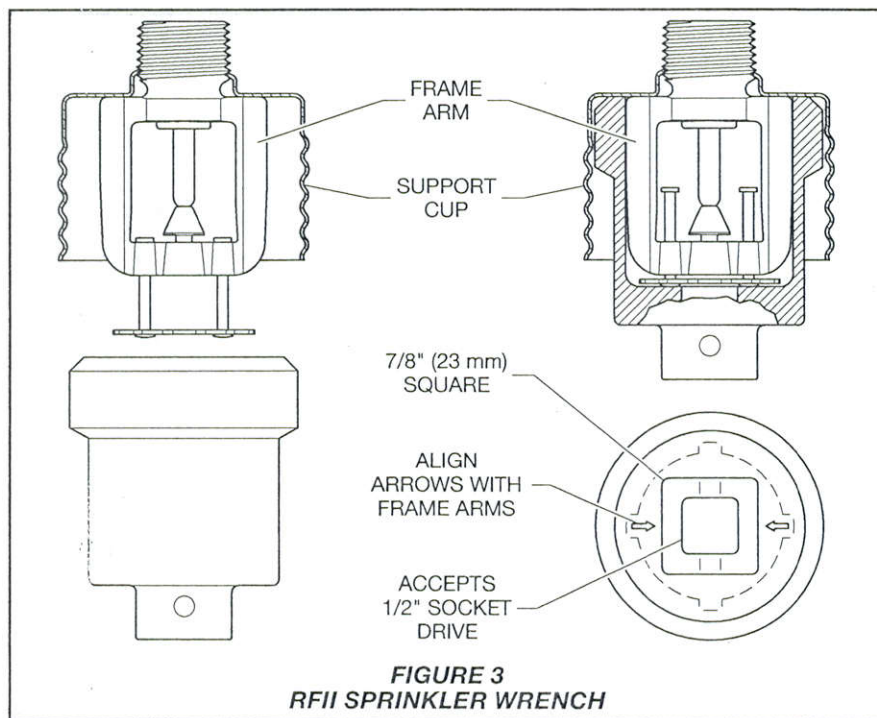
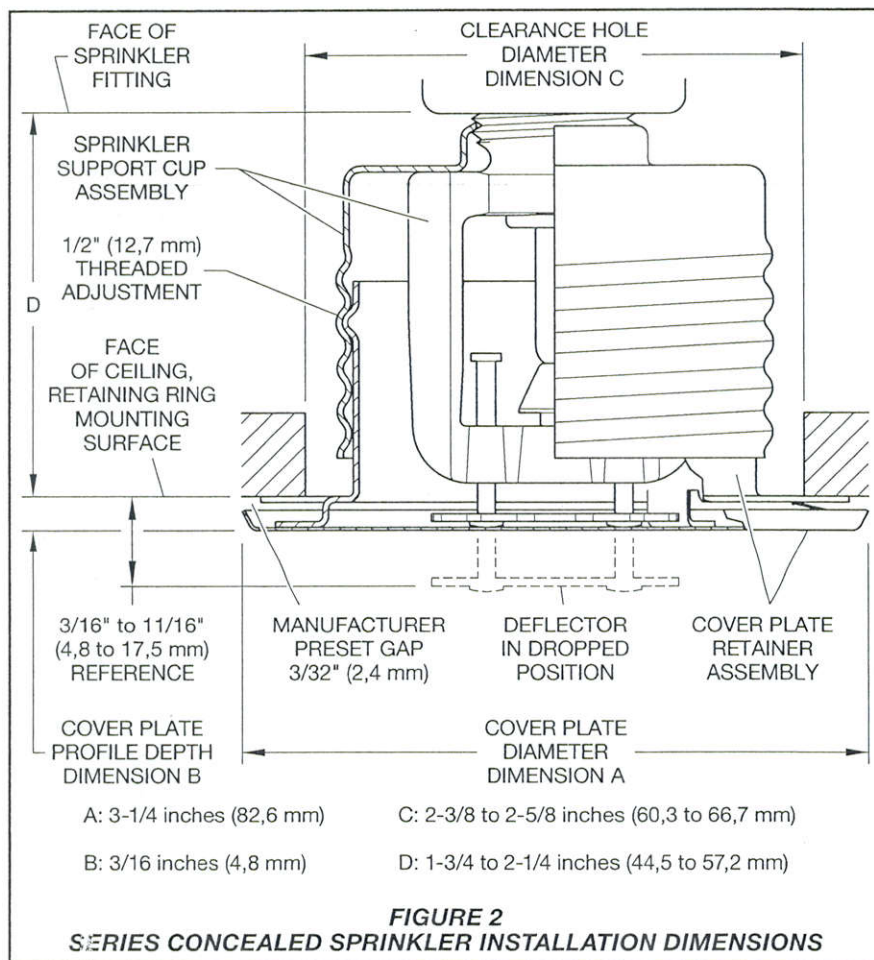
Step 1. Install the sprinkler only in the pendent position with the center-line of the sprinkler perpendicular to the mounting surface.

Step 2. Remove the Protective Cap.

Step 3. With pipe thread sealant applied to the pipe threads, hand-tighten the sprinkler into the sprinkler fitting.

Step 4. Wrench-tighten the sprinkler using only the RFI Sprinkler Wrench. (Refer to Figure 3.) Apply the RFI Sprinkler Wrench to the Sprinkler as shown in Figure 3.

Step 5. Replace the Protective Cap by pushing it upwards until it bottoms out against the Support Cup. (Refer to Figure 4.) The Protective Cap helps prevent damage to the Deflector and



Arms during ceiling installation and/or finish. You can also use the Protective Cap to locate the center of the clearance hole by gently pushing the ceiling material up against the center point of the Protective Cap.

NOTICE

As long as the Protective Cap remains in place, the system is considered "Out of Service".

Step 6. After the ceiling has been completed with the 2-1/2 inch (63,5 mm) diameter clearance hole and in preparation for installing the Cover Plate/Retainer Assembly, remove and discard the Protective Cap. Verify that the Deflector moves up and down freely.

If the Sprinkler is damaged and the Deflector does not move up and down freely, replace the entire Sprinkler. Do not attempt to modify or repair a damaged sprinkler.

Step 7. When installing an Air and Dust Seal, refer to Figure 5; otherwise, proceed to Step 8. To attach the Air and Dust Seal, verify the angle of the outside edge of the seal is oriented according to Figure 5. Start the edge of the Retainer in the grooved slot of the Air and Dust Seal and continue around the retainer until the entire Air and Dust Seal is engaged.

Step 8. Screw on the Cover Plate/Retainer Assembly until the Retainer (shown in Figure 2) or the Air and Dust Seal (shown in Figure 5) contacts the ceiling. Do not continue to screw on the Cover Plate/Retainer Assembly so that it lifts a ceiling panel out of its normal position. If you cannot engage the Cover Plate/Retainer Assembly with the Support Cup or you cannot engage the Cover Plate/Retainer Assembly sufficiently to contact the ceiling, you must reposition the Sprinkler Fitting.

Care and Maintenance

The TYCO Series RFI 5.6 K-factor, "Royal Flush II" Concealed Pendent Sprinklers must be maintained and serviced in accordance with this section.

Before closing a fire protection system main control valve for maintenance work on the fire protection system that it controls, obtain permission to shut down the affected fire protection system from the proper authorities and notify all personnel who may be affected by this action.

Absence of the Cover Plate/Retainer Assembly can delay sprinkler operation in a fire situation.

When properly installed, there is a nominal 3/32 inch (2.4 mm) air gap between the lip of the Cover Plate and the ceiling, as shown in Figure 2.

This air gap is necessary for proper operation of the sprinkler. If the ceiling requires repainting after sprinkler installation, ensure that the new paint does not seal off any of the air gap.

Do not pull the Cover Plate relative to the Enclosure. Separation may result.

Sprinklers which are found to be leaking or exhibiting visible signs of corrosion must be replaced.

Automatic sprinklers must never be painted, plated, coated, or otherwise altered after leaving the factory. Modified sprinklers must be replaced. Sprinklers that have been exposed to corrosive products of combustion, but have not operated, should be replaced if they cannot be completely cleaned by wiping the sprinkler with a cloth or by brushing it with a soft bristle brush.

Care must be exercised to avoid damage to the sprinklers - before, during, and after installation. Sprinklers damaged by dropping, striking, wrench twist/slippage, or the like, must be replaced. Also, replace any sprinkler that has a cracked bulb or that has lost liquid from its bulb. (Ref. Installation Section.)

Exercise care to avoid damage to sprinklers before, during, and after installation. Replace sprinklers damaged by dropping, striking, wrench twisting, wrench slipping, or the like. Also, replace any sprinkler that has a cracked bulb or that has lost liquid from its bulb. (Refer to the Installation section.)

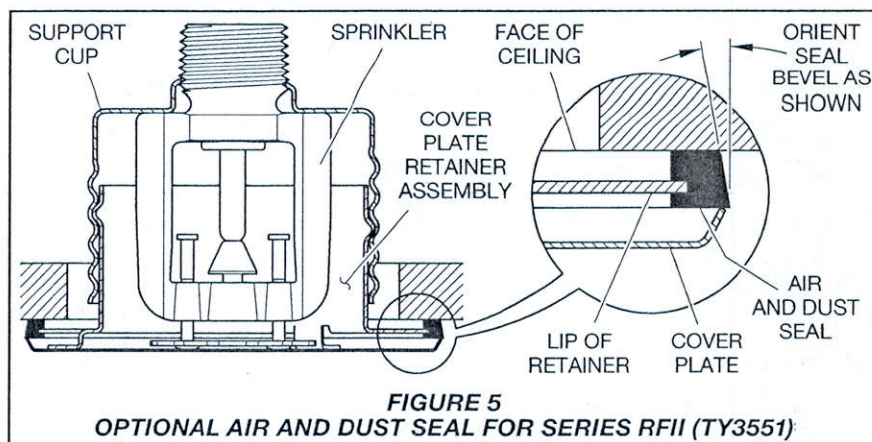


FIGURE 5
OPTIONAL AIR AND DUST SEAL FOR SERIES RFI (TY3551)

If you must remove a sprinkler, do not reinstall it or a replacement without reinstalling the Cover Plate/Retainer Assembly. If a Cover Plate/Retainer Assembly becomes dislodged during service, replace it immediately.

The owner is responsible for the inspection, testing, and maintenance of their fire protection system and devices in compliance with this document, as well as with the applicable standards of the National Fire Protection Association (e.g., NFPA 25), in addition to the standards of any other authorities having jurisdiction. Contact the installing contractor or sprinkler manufacturer regarding any questions.

Automatic sprinkler systems should be inspected, tested, and maintained by a qualified Inspection Service in accordance with local requirements and/or national code.

Ordering Procedure

Contact your local distributor for availability. When placing an order, indicate the full product name.

Sprinkler/Support Cup Assembly

Specify: Series RFI (specify SIN), K=5.6, "Royal Flush II" Pendent Sprinklers (specify) temperature rating and (specify) finish, P/N (specify).

	155°F (68°C)	200°F (93°C)
TY3531	51-792-1-155	51-792-1-200
TY3551	51-790-1-155	51-790-1-200

Separately Ordered Cover Plate/Retainer Assembly:

Specify: (temperature rating from below) Series RFI Concealed Cover Plate with (finish), P/N (specify).

	139°F (59°C)(a)	165°F (74°C)(b)
Grey White (RAL9002)	56-792-0-135	56-792-0-165
Brass	56-792-1-135	56-792-1-165
Pure White (c) (RAL9010)	56-792-3-135	56-792-3-165
Signal White (RAL9003)	56-792-4-135	56-792-4-165
Jet Black (RAL9005)	56-792-6-135	59-792-6-165
Brushed		
Chrome	56-792-8-135	56-792-8-165
Chrome	56-792-9-135	56-792-9-165
Custom	56-792-X-135	56-792-X-165

- (a) For use with 155°F (68°C) sprinklers.
(b) For use with 200°F (93°C) sprinklers.
(c) Eastern Hemisphere sales only.

Sprinkler Wrench

Specify: RFI Sprinkler Wrench, P/N 56-000-1-075.

Air and Dust Seal

Specify: Air and Dust Seal, P/N 56-908-1-001.

Series TY-FRB — 5.6 K-factor Horizontal and Vertical Sidewall Sprinklers Quick Response, Standard Coverage

General Description

The Series TY-FRB, 5.6 K-factor, Horizontal and Vertical Sidewall Sprinklers described in this data sheet are quick response -standard coverage, decorative 3 mm glass bulb type spray sprinklers designed for use in light and ordinary hazard, commercial occupancies such as banks, hotels, shopping malls, etc. They are designed for installation along a wall or the side of a beam and just beneath a smooth ceiling. Sidewall sprinklers are commonly used instead of pendent or upright sprinklers due to aesthetics or building construction considerations, where piping across the ceiling is not desirable.

The recessed version of the Series TY-FRB Horizontal Sidewall Sprinkler is intended for use in areas with a finished wall. It uses a two-piece Style 10 Recessed Escutcheon with 1/2 inch (12,7 mm) of recessed adjustment or up to 3/4 inch (19,1 mm) of total adjustment from the flush sidewall position, or a two-piece Style 20 Recessed Escutcheon with 1/4 inch (6,4 mm) of recessed adjustment or up to 1/2 inch (12,7 mm) of total adjustment from the flush sidewall position. The adjustment provided by the Recessed Escutcheon reduces the accuracy to which the fixed pipe nipples to the sprinklers must be cut.

Corrosion resistant coatings, where applicable, are utilized to extend the life of copper alloy sprinklers beyond that which would otherwise be ob-

tained when exposed to corrosive atmospheres. Although corrosion resistant coated sprinklers have passed the standard corrosion tests of the applicable approval agencies, the testing is not representative of all possible corrosive atmospheres. Consequently, it is recommended that the end user be consulted with respect to the suitability of these coatings for any given corrosive environment. The effects of ambient temperature, concentration of chemicals, and gas/chemical velocity, should be considered, as a minimum, along with the corrosive nature of the chemical to which the sprinklers will be exposed.

NOTICE

The Series TY-FRB Sprinklers described herein must be installed and maintained in compliance with this document, as well as with the applicable standards of the National Fire Protection Association, in addition to the standards of any other authorities having jurisdiction. Failure to do so may impair the performance of these devices.

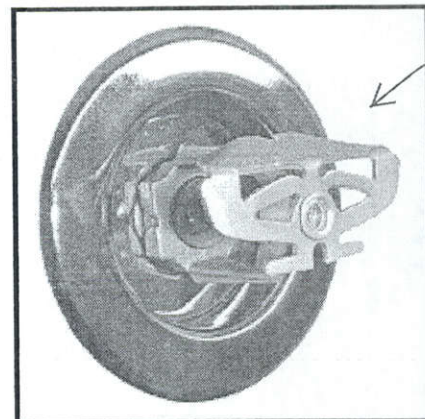
The owner is responsible for maintaining their fire protection system and devices in proper operating condition. Contact the installing contractor or sprinkler manufacturer with any questions.

Sprinkler Identification Numbers

TY3331 Horizontal
TY3431 Vertical

IMPORTANT

Always refer to Technical Data Sheet TFP700 for the "INSTALLER WARNING" that provides cautions with respect to handling and installation of sprinkler systems and components. Improper handling and installation can permanently damage a sprinkler system or its components and cause the sprinkler to fail to operate in a fire situation or cause it to operate prematurely.



Technical Data

Approvals

UL and C-UL Listed.
FM, LPCB, and NYC Approved.
(Refer to Table A for complete approval information including corrosion resistant status.)

Maximum Working Pressure

Refer to Table B.

Discharge Coefficient

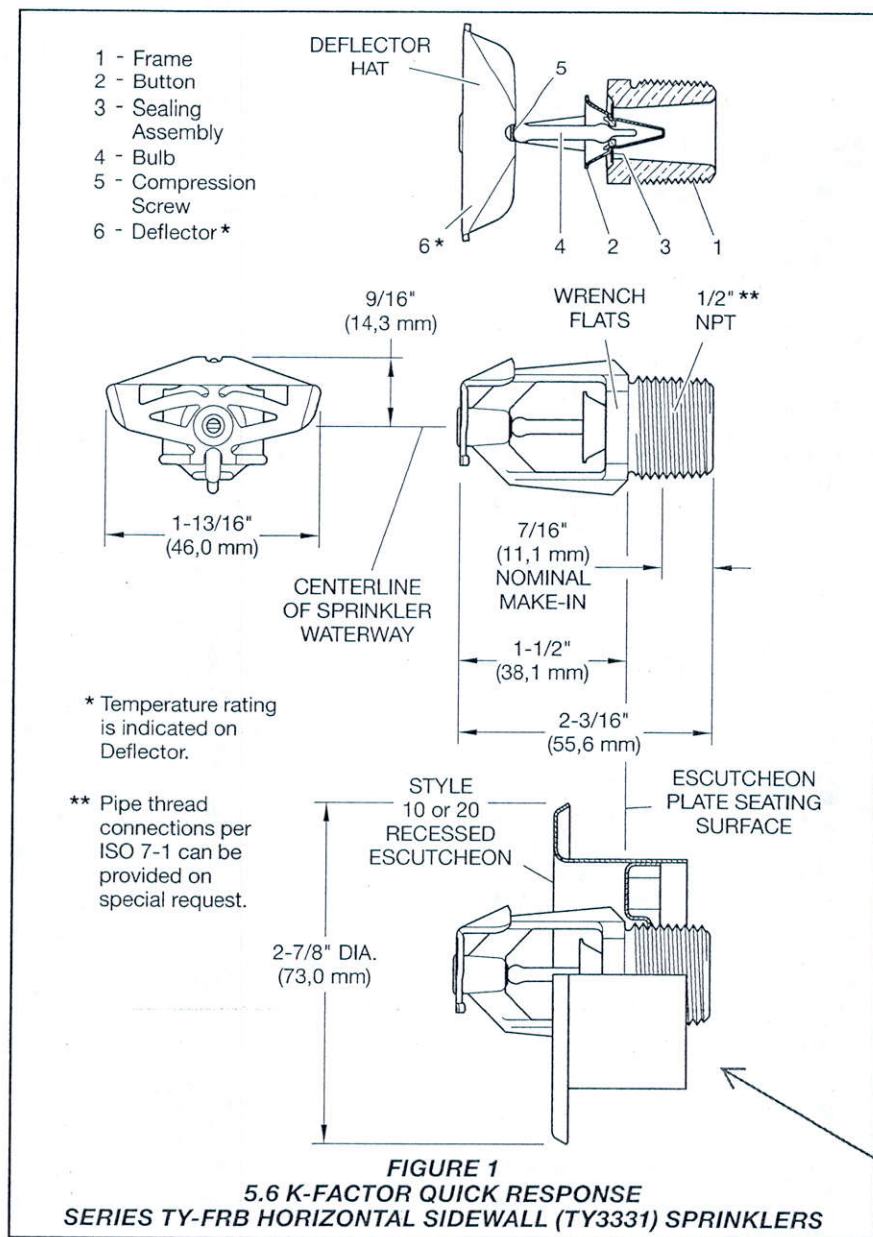
K=5.6 GPM/psi^{1/2} (80,6 LPM/bar^{1/2})

Temperature Ratings

Refer to Table A.

Finishes

Sprinkler: Refer to Table C.
Recessed Escutcheon: Signal or Pure White, Jet Black, Chrome Plated, or Brass Plated.



Physical Characteristics

Frame	Bronze
Button	Brass/Copper
Sealing Assembly	Beryllium Nickel w/ TEFLON
Bulb	Glass
Compression Screw	Bronze
HSW Deflector	Bronze
VSW Deflector	Copper

Operation

The glass bulb contains a fluid which expands when exposed to heat. When the rated temperature is reached, the fluid expands sufficiently to shatter the glass bulb, allowing the sprinkler to activate and water to flow.

Design Criteria

The Series TY-FRB, 5.6 K-factor, Horizontal and Vertical Sidewall Sprinklers are intended for fire protection systems designed in accordance with the standard installation rules recognized by the applicable Listing or Approval agency (e.g., UL Listing is based on the requirements of NFPA 13, and FM Approval is based on the requirements of FM's Loss Prevention Data Sheets). Only the Style 10 or 20 Recessed Escutcheon, as applicable, is to be used for recessed horizontal installations.

Installation

The Series TY-FRB, 5.6 K-factor, Horizontal and Vertical Sidewall Sprinklers must be installed in accordance with this section.

General Instructions

Do not install any bulb type sprinkler if the bulb is cracked or there is a loss of liquid from the bulb. With the sprinkler held horizontally, a small air bubble should be present. The diameter of the air bubble is approximately 1/16 inch (1,6 mm) for the 135°F (57°C) to 3/32 inch (2,4 mm) for the 286°F (141°C) temperature ratings.

A leak tight 1/2 inch NPT sprinkler joint should be obtained with a torque of 7 to 14 ft.-lbs. (9,5 to 19,0 Nm). Higher levels of torque may distort the sprinkler and cause leakage or impairment of the sprinkler.

Do not attempt to make-up for insufficient adjustment in the escutcheon plate by under- or over-tightening the sprinkler. Readjust the position of the sprinkler fitting to suit.

Series TY-FRB Horizontal and Vertical Sidewall Sprinkler Installation

The Series TY-FRB Horizontal and Vertical Sidewall Sprinklers must be installed in accordance with the following instructions.

Step 1. Horizontal sidewall sprinklers are to be installed in the horizontal position with their centerline of waterway perpendicular to the back wall and parallel to the ceiling. The word "TOP" on the Deflector is to face towards the ceiling.

Vertical sidewall sprinklers are to be installed in the pendent or upright position with the arrow on the Deflector pointing away from the wall.

Step 2. With pipe thread sealant applied to the pipe threads, hand tighten the sprinkler into the sprinkler fitting.

Step 3. Tighten the sprinkler into the sprinkler fitting using only the W-Type 6 Sprinkler Wrench (Ref. Figure 5). With reference to Figure 1 or 2, the W-Type 6 Sprinkler Wrench is to be applied to the wrench flats.

Series TY-FRB Recessed Horizontal Sidewall Sprinkler Installation

The Series TY-FRB Recessed Horizontal Sidewall Sprinklers must be installed in accordance with this section.

Step A. Recessed horizontal sidewall sprinklers are to be installed in the horizontal position with their centerline of waterway perpendicular to the back wall and parallel to the ceiling. The word "TOP" on the Deflector is to face towards the ceiling.

Step B. After installing the Style 10 or 20 Mounting Plate over the sprinkler threads, hand tighten the sprinkler into the sprinkler fitting.

Step C. Tighten the sprinkler into the sprinkler fitting using only the W-Type 7 Recessed Sprinkler Wrench (Ref. Figure 6). With reference to Figure 1, the W-Type 7 Recessed Sprinkler Wrench is to be applied to the sprinkler wrench flats.

Step D. After the ceiling has been installed or the finish coat has been applied, slide on the Style 10 or 20 Closure over the Series TY-FRB Sprinkler and push the Closure over the Mounting Plate until its flange comes in contact with the ceiling.

Care and Maintenance

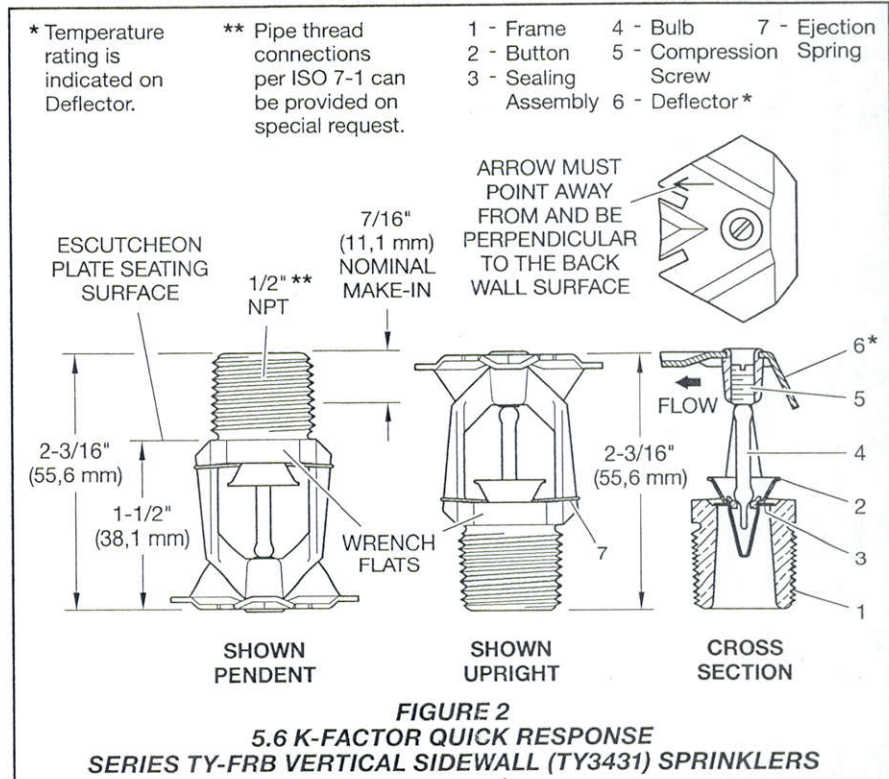
The Series TY-FRB, 5.6 K-factor, Horizontal and Vertical Sidewall Sprinklers must be maintained and serviced in accordance with this section.

Before closing a fire protection system main control valve for maintenance work on the fire protection system that it controls, permission to shut down the affected fire protection system must be obtained from the proper authorities and all personnel who may be affected by this action must be notified.

Absence of an escutcheon, which is used to cover a clearance hole, may delay the time to sprinkler operation in a fire situation.

Sprinklers that are found to be leaking or exhibiting visible signs of corrosion must be replaced.

Automatic sprinklers must never be painted, plated, coated or otherwise altered after leaving the factory. Modified sprinklers must be replaced. Sprinklers that have been exposed to corrosive products of combustion, but have not operated, should be replaced



if they cannot be completely cleaned by wiping the sprinkler with a cloth or by brushing it with a soft bristle brush.

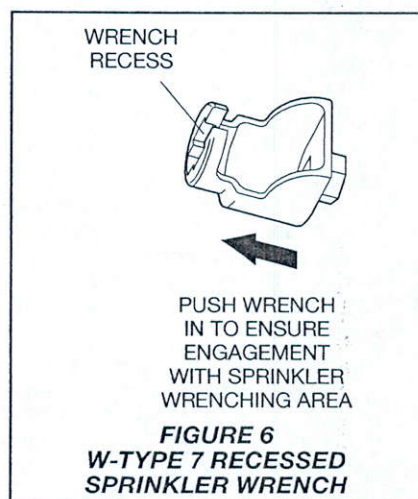
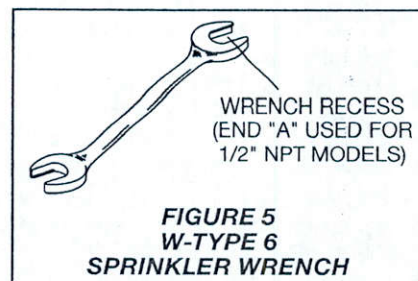
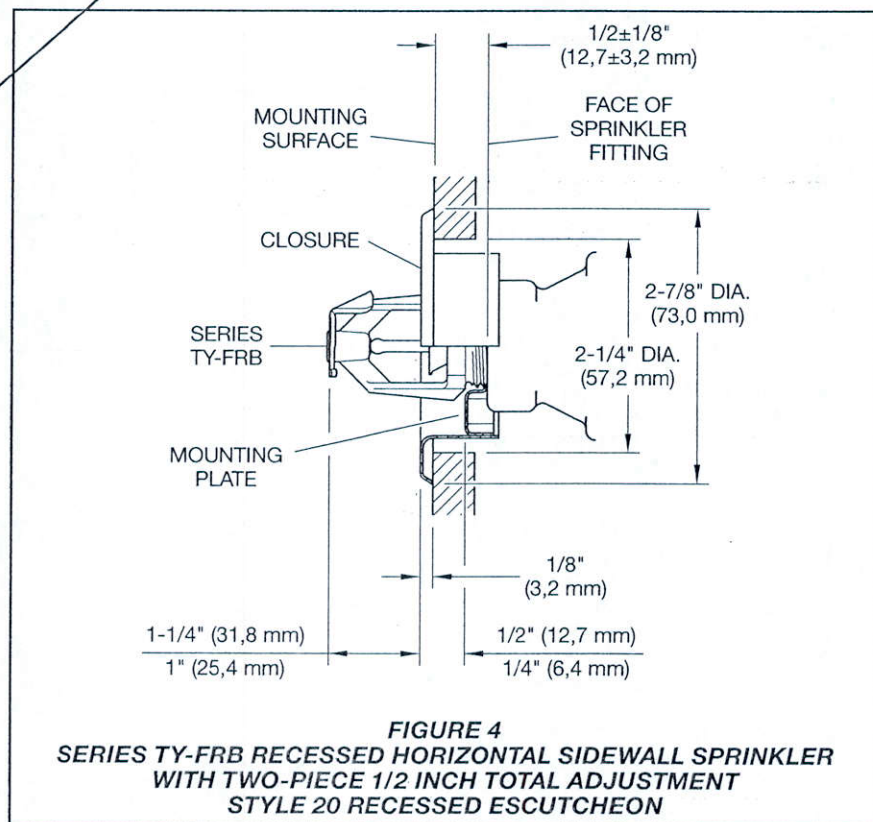
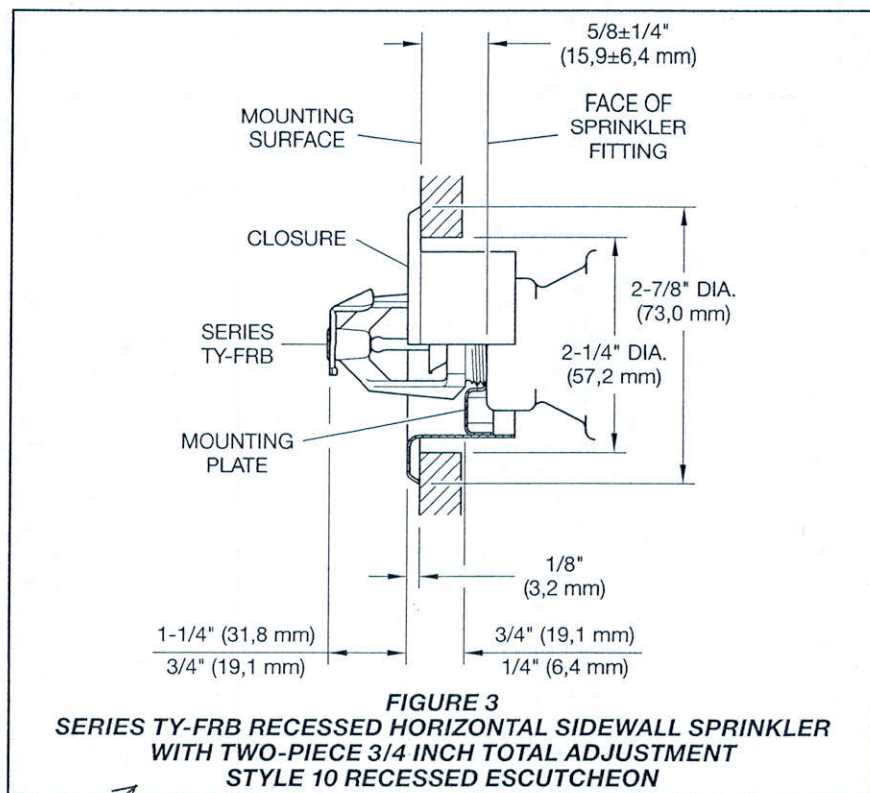
Care must be exercised to avoid damage to the sprinklers before, during, and after installation. Sprinklers damaged by dropping, striking, wrench twist/slippage, or the like, must be replaced. Also, replace any sprinkler that has a cracked bulb or that has lost liquid from its bulb. (Ref. Installation Section).

The owner must assure that the sprinklers are not used for hanging any objects and that the sprinklers are only cleaned by means of gently dusting with a feather duster; otherwise, non-operation in the event of a fire or inadvertent operation may result.

Frequent visual inspections are recommended to be initially performed for corrosion resistant coated sprinklers, after the installation has been completed, to verify the integrity of the corrosion resistant coating. Thereafter, annual inspections per NFPA 25 should suffice; however, instead of inspecting from the floor level, a random sampling of close-up visual inspections should be made, so as to better determine the exact sprinkler condition and the long term integrity of the corrosion resistant coating, as it may be affected by the corrosive conditions present.

The owner is responsible for the inspection, testing, and maintenance of their fire protection system and devices in compliance with this document, as well as with the applicable standards of the National Fire Protection Association (e.g., NFPA 25), in addition to the standards of any other authorities having jurisdiction. The installing contractor or sprinkler manufacturer should be contacted relative to any questions.

It is recommended that automatic sprinkler systems be inspected, tested, and maintained by a qualified Inspection Service in accordance with local requirements and/or national codes.



K	TYPE	TEMP.	BULB LIQUID	SPRINKLER FINISH (See Note 11)			
				NATURAL BRASS	CHROME PLATED	POLYESTER***	LEAD COATED
5.6 1/2" NPT	HORIZ. SIDEWALL (TY3331)	135°F (57°C)	Orange	1, 2, 3, 4, 9, 10		1, 2, 3, 9	1, 2, 3, 9
		155°F (68°C)	Red				
		175°F (79°C)	Yellow				
		200°F (93°C)	Green				
		286°F (141°C)	Blue				
	RECESSED HORIZ. SIDEWALL (TY3331)* Figure 3	135°F (57°C)	Orange	1, 2, 4, 9, 10		1, 2, 9	N/A
		155°F (68°C)	Red				
		175°F (79°C)	Yellow				
		200°F (93°C)	Green				
	RECESSED HORIZ. SIDEWALL (TY3331)** Figure 4	135°F (57°C)	Orange	1, 2, 3, 4, 9			N/A
		155°F (68°C)	Red				
		175°F (79°C)	Yellow				
		200°F (93°C)	Green				
5.6 1/2" NPT	VERTICAL SIDEWALL (TY3431) Installed Pendent or Upright	135°F (57°C)	Orange	5, 6, 7, 8, 9			5, 6, 7, 9
		155°F (68°C)	Red				
		175°F (79°C)	Yellow				
		200°F (93°C)	Green				
		286°F (141°C)	Blue				

NOTES:

- Listed by Underwriters Laboratories, Inc. (UL) as Quick Response Sprinklers for use in Light and Ordinary Hazard Occupancies at a 4 to 12 inch (100 to 300 mm) top of deflector to ceiling distance.
- Listed by Underwriters Laboratories Inc. for use in Canada (C-UL) as Quick Response Sprinklers for use in Light and Ordinary Hazard Occupancies at a 4 to 12 inch (100 to 300 mm) top of deflector to ceiling distance.
- Approved by Factory Mutual Research Corporation (FM) as Quick Response Sprinklers for use in Light Hazard Occupancies at a 4 to 12 inch (100 to 300 mm) top of deflector to ceiling distance.
- Approved by the Loss Prevention Certification Board (LPCB Ref. No. 007a/04) at a 4 to 6 inch (100 to 150 mm) top of deflector to ceiling distance. The LPC does not rate the thermal sensitivity of horizontal sidewall sprinklers.
- Listed by Underwriters Laboratories, Inc. as Quick Response Sprinklers for use in Light and Ordinary Hazard Occupancies.
- Listed by Underwriters Laboratories for use in Canada (C-UL) as Quick Response Sprinklers for use in Light and Ordinary Hazard Occupancies.
- Approved by Factory Mutual Research Corporation (FM) as Quick Response Sprinklers for use in Light Hazard Occupancies.
- Approved by the Loss Prevention Certification Board (LPCB Ref. No. 094a/06 & 007a/04) as Quick Response Sprinklers.
- Approved by the City of New York under MEA 354-01-E.
- Approved by the Loss Prevention Certification Board (LPCB Ref. No. 094a/06) at a 4 to 6 inch (100 to 150 mm) top of deflector to ceiling distance. The LPC does not rate the thermal sensitivity of horizontal sidewall sprinklers.
- Where Polyester Coated and Lead Coated Sprinklers are noted to be UL and C-UL Listed, the sprinklers are UL and C-UL Listed as Corrosion Resistant Sprinklers. Where Lead Coated Sprinklers are noted to be FM Approved, the sprinklers are FM Approved as Corrosion Resistant Sprinklers.

* Installed with Style 10 (1/2" NPT) 3/4" Total Adjustment Recessed Escutcheon.

** Installed with Style 20 (1/2" NPT) 1/2" Total Adjustment Recessed Escutcheon.

*** Frame and deflector only.

TABLE A
LABORATORY LISTINGS AND APPROVALS

		SPRINKLER FINISH			
K	TYPE	NATURAL BRASS	CHROME PLATED	POLYESTER	LEAD COATED
5.6 1/2" NPT	HORIZONTAL SIDEWALL (TY3331)	250 PSI (17,2 BAR) or 175PSI (12,1 BAR) (SEE NOTE 1)			
	RECESSED HORIZ. SIDEWALL (TY3331)				
	VERTICAL SIDEWALL (TY3431)	175 PSI (12,1 BAR)			

NOTES:

1. The maximum working pressure of 250 psi (17,2 bar) only applies to the Listing by Underwriters Laboratories, Inc. (UL); the Listing by Underwriters Laboratories, Inc. for use in Canada (C-UL); and, the Approval by the City of New York.

TABLE B
MAXIMUM WORKING PRESSURE

P/N 57 - XXX - X - XXX

		SIN
378	HORIZONTAL SIDEWALL	TY3331
375	VERTICAL SIDEWALL	TY3431

SPRINKLER FINISH	
1	NATURAL BRASS
3	PURE WHITE (RAL9010)* POLYESTER
4	SIGNAL WHITE (RAL9003) POLYESTER
5	JET BLACK (RAL9005)** POLYESTER
7	LEAD COATED
9	CHROME PLATED

TEMPERATURE RATINGS	
135	135°F (57°C)
155	155°F (68°C)
175	175°F (79°C)
200	200°F (93°C)
286	286°F (141°C)

* Eastern Hemisphere sales only.

** Available in 155°F (68°C) or 200°F (93°C) temperature rating only.

TABLE C
PART NUMBER SELECTION
SERIES TY-FRB HORIZONTAL AND VERTICAL SIDEWALL SPRINKLERS

Ordering Procedure

Contact your local distributor for availability. When placing an order, indicate the full product name and Part Number (P/N).

Sprinkler Assemblies with NPT Thread Connections:

Specify: Series TY-FRB (specify SIN), (specify K-factor), (specify) Horizontal Sidewall or Vertical Sidewall Sprinkler, Standard Response, Standard Coverage, (specify) temperature rating, (specify) finish or coating, P/N (specify from Table C)

Recessed Escutcheon

Specify: Style (10 or 20) Recessed Escutcheon with (specify*) finish, P/N (specify*).

* Refer to Technical Data Sheet TFP770

Sprinkler Wrench

Specify: W-Type 6 Sprinkler Wrench, P/N 56-000-6-387

Specify: W-Type 7 Sprinkler Wrench, P/N 56-850-4-001

Series DS-1 Dry-Type Sprinklers 5.6K Pendent, Upright, and Horizontal Sidewall Standard Response, Standard Coverage

General Description

TYCO Series DS-1 Dry-Type Sprinklers, 5.6K Pendent, Upright, and Horizontal Sidewall, Standard Response (5 mm Bulb) and Standard Coverage, are decorative glass bulb automatic sprinklers typically used where:

- pendent sprinklers are required on dry pipe systems that are exposed to freezing temperatures; for example, sprinkler drops from unheated portions of buildings
- sprinklers and/or a portion of the connecting piping may be exposed to freezing temperatures; for example, sprinkler drops from wet systems into freezers, sprinkler sprigs from wet systems into unheated attics, or horizontal piping extensions through a wall to protect unheated areas of a building such as loading docks, overhangs, and building exteriors
- sprinklers are used on systems that are seasonably drained to avoid freezing; for example, vacation resort areas

NOTICE

Series DS-1 Dry-Type Sprinklers described herein must be installed and maintained in compliance with this document, as well as with the applicable standards of the National Fire Protection Association, in addition to the standards of any other authorities having jurisdiction. Failure to do so may impair the performance of these devices.

IMPORTANT

Always refer to Technical Data Sheet TFP700 for the "INSTALLER WARNING" that provides cautions with respect to handling and installation of sprinkler systems and components. Improper handling and installation can permanently damage a sprinkler system or its components and cause the sprinkler to fail to operate in a fire situation or cause it to operate prematurely.

The owner is responsible for maintaining their fire protection system and devices in proper operating condition. The installing contractor or sprinkler manufacturer should be contacted with any questions.

Series DS-1 Dry-Type Sprinklers must only be installed in fittings that meet the requirements of the Design Criteria section.

Sprinkler Identification Numbers (SINs)

TY3255 - Pendent
TY3155 - Upright
TY3355 - Horizontal Sidewall

Technical Data

Approvals

UL and C-UL Listed
FM Approved
LPCB Approved: Ref No. 094a/11
CE Certified, Certificate of Conformity:
0832-CPD-2015
NYC Approved under MEA 352-01-E

Refer to Table A.

Maximum Working Pressure

175 psi (12,1 bar)

Inlet Thread Connections

1 Inch NPT (Standard Order)
ISO 7-R1

Discharge Coefficient

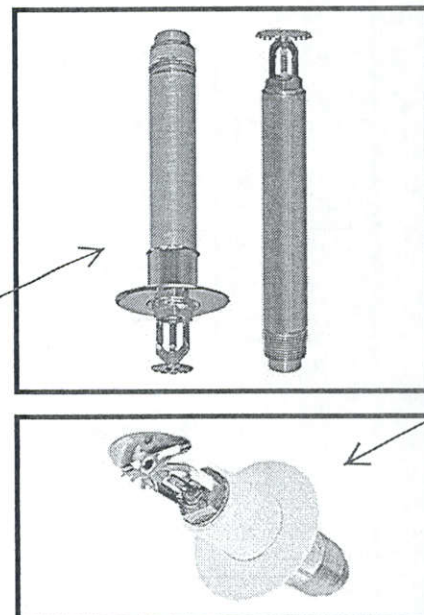
$K = 5.6 \text{ GPM/psi}^{1/2}$
(80,6 LPM/bar^{1/2})

Temperature Ratings

Refer to Table A.

Finishes

Sprinkler: Natural Brass, Chrome Plated, Signal White
Escutcheon: Signal White, Chrome Plated, Brass Plated



Physical Characteristics

Inlet	Copper
Plug	Copper
Yoke	Stainless Steel
Casing	Galvanized Carbon Steel
Insert	Bronze
Bulb Seat	Stainless Steel
Bulb	Glass
Compression Screw	Bronze
Deflector	Bronze
Frame	Bronze
Guide Tube	Stainless Steel
Water Tube	Stainless Steel
Spring	Stainless Steel
Sealing Assembly	Beryllium Nickel w/TEFLON
Escutcheon	Carbon Steel

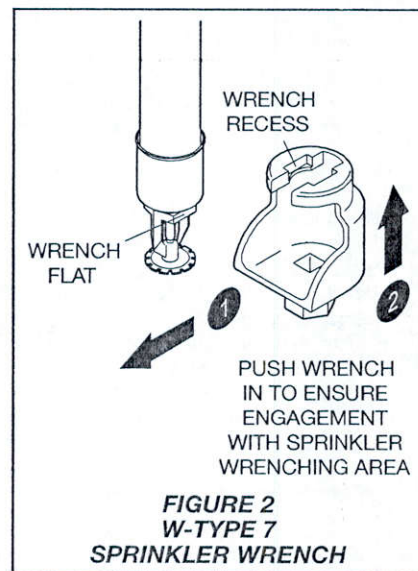
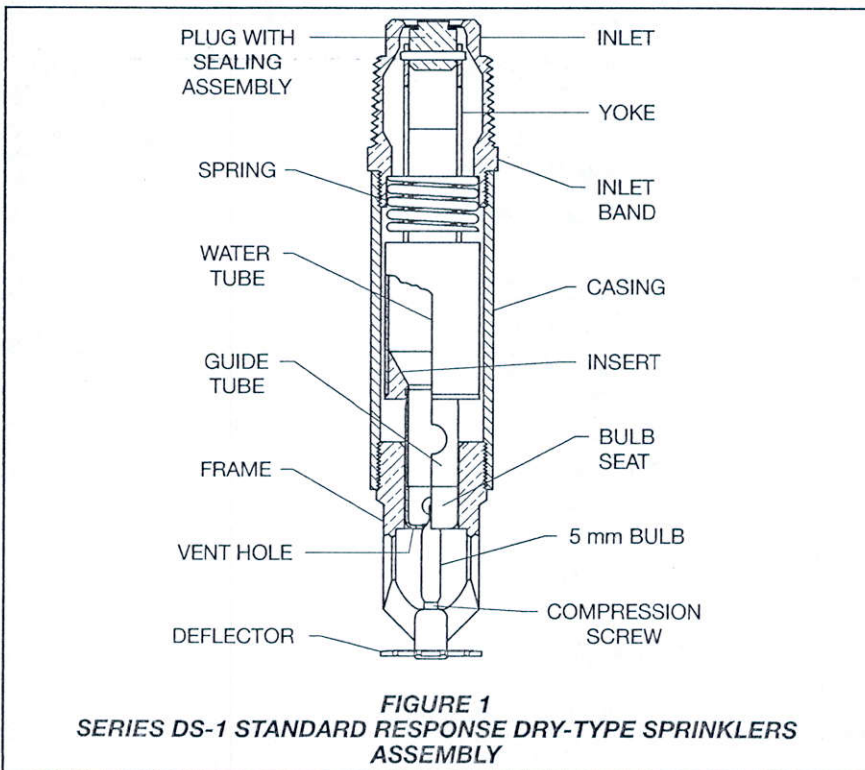
Temperature Rating	Bulb Color Code	TY3255 Pendent		TY3255 Pendent			TY3355 Horizontal Sidewall			
		with Standard Recessed Escutcheon (Figure 4)		with Standard Escutcheon (Figure 3)			with top of Deflector-to-Ceiling distance of 4 to 12 inches (100 to 300 mm)			
				with Deep Escutcheon (Figure 5)			with Standard Escutcheon (Figure 8)			
				without Escutcheon (Figure 6)			with Deep Escutcheon (Figure 9)			
				TY3155 Upright			without Escutcheon (Figure 10)			
		SPRINKLER FINISH								
		Natural Brass	Chrome Plated	White Polyester	Natural Brass	Chrome Plated	White Polyester	Natural Brass	Chrome Plated	White Polyester
135°F (57°C)	Orange	1, 2, 3, 5		1, 2, 5	1, 2, 3, 4, 5		1, 2, 4, 5		1*, 2*, 3**, 4, 5	
155°F (68°C)	Red									
175°F (79°C)	Yellow									
200°F (93°C)	Green									
286°F (141°C)	Blue	1, 2								
360°F (182°C)	Mauve	N/A			1, 2, 3		1, 2		1*, 2*, 5	
Notes										
1. Listed by Underwriters Laboratories, Inc. (maximum order length of 48 inches)					4. Loss Prevention Certification Board and CE conformity apply to these temperature ratings only					
2. Listed by Underwriters Laboratories for use in Canada (maximum order length of 48 inches)					5. Approved by the City of New York under MEA 352-01-E					
3. Approved by Factory Mutual Research Corporation (maximum order length of 48 inches)					* Light and Ordinary Hazard Occupancies Only					
					** Light Hazard Occupancies Only					
					N/A - Not Available					

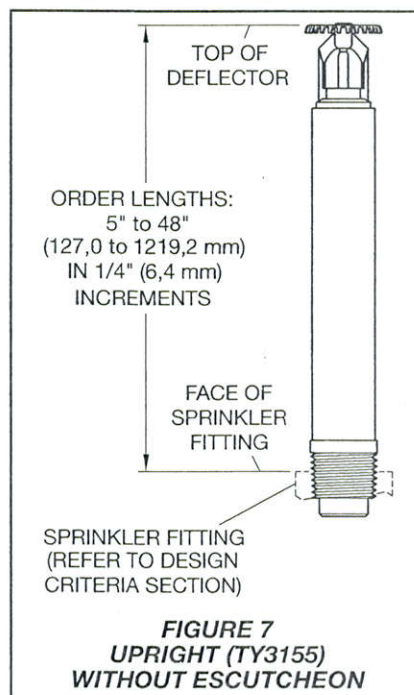
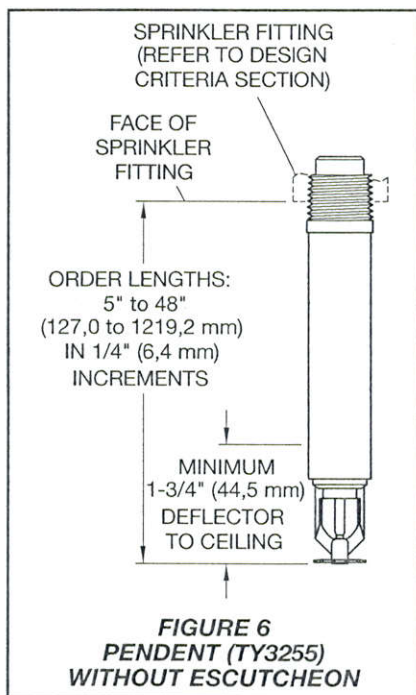
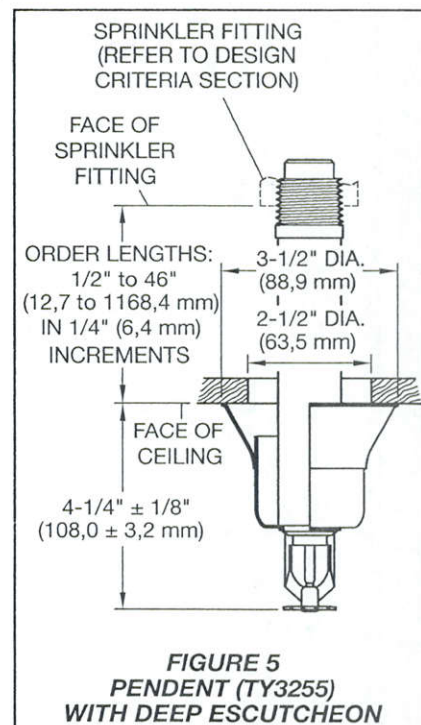
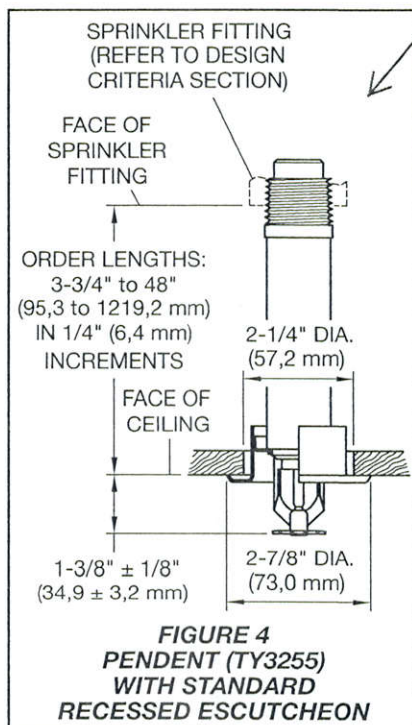
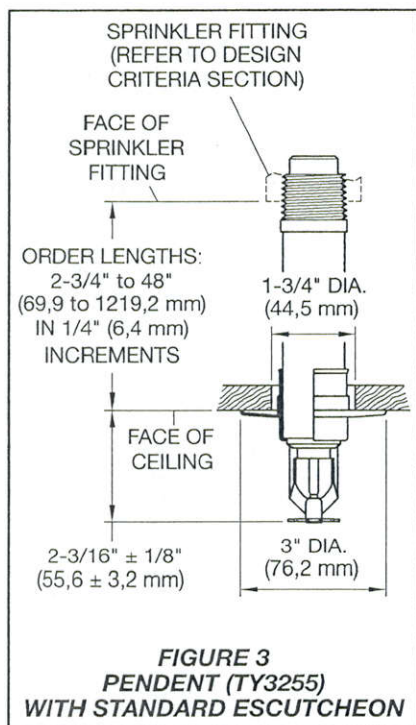
TABLE A

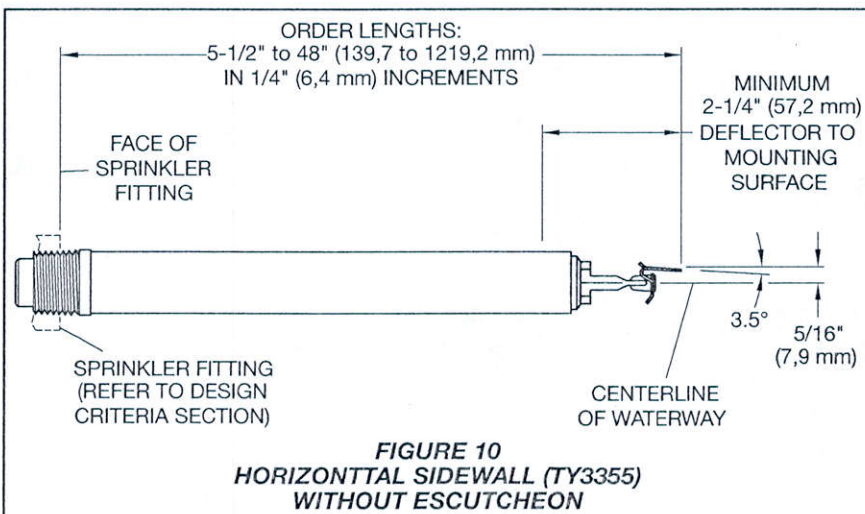
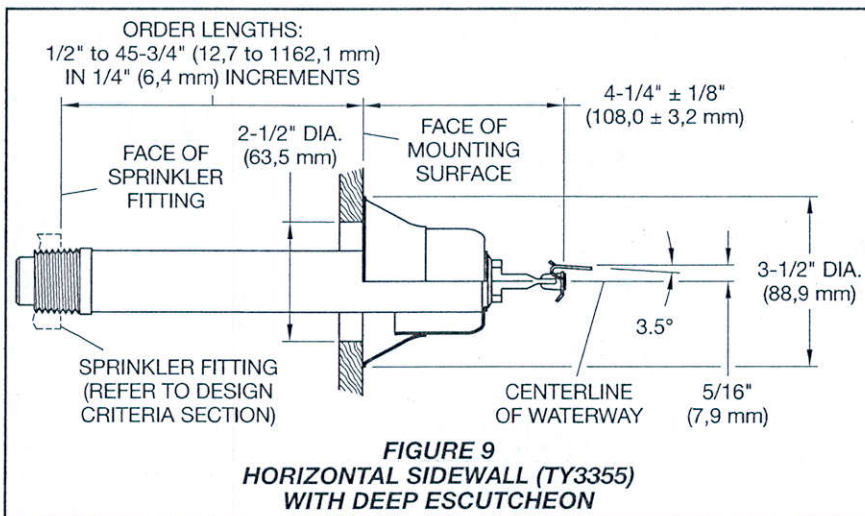
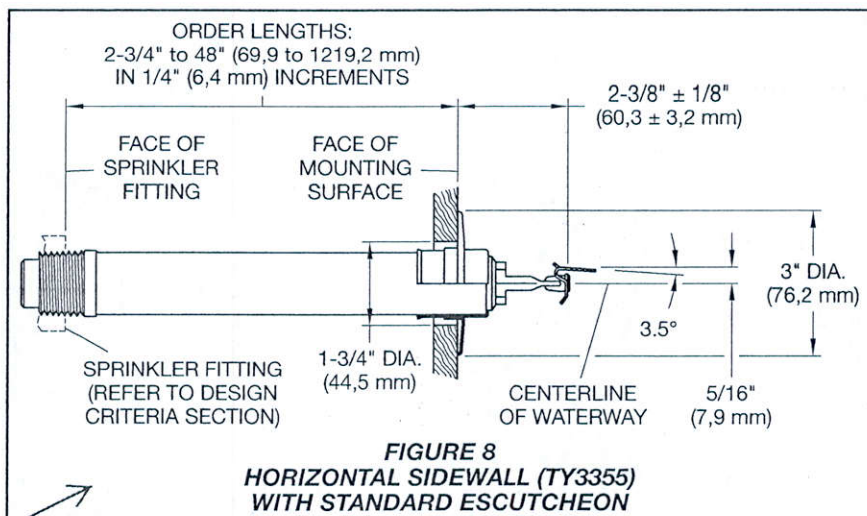
SERIES DS-1 STANDARD RESPONSE, STANDARD COVERAGE, DRY-TYPE SPRINKLERS

LABORATORY LISTINGS AND APPROVALS

TABLE A
SERIES DS-1 STANDARD RESPONSE, STANDARD COVERAGE, DRY-TYPE SPRINKLERS
LABORATORY LISTINGS AND APPROVALS







Operation

When TYCO Series DS-1 Dry-Type Sprinklers are in service, water is prevented from entering the assembly by the Plug with Sealing Assembly (Figure 1) in the Inlet of the Sprinkler.

The glass bulb contains a fluid that expands when exposed to heat. When the rated temperature is reached, the fluid expands sufficiently to shatter the glass bulb, and the Bulb Seat is released.

The compressed Spring is then able to expand and push the Water Tube as well as the Guide Tube outward. This action simultaneously pulls inward on the Yoke, withdrawing the Plug with Sealing Assembly from the Inlet, allowing the sprinkler to activate and flow water.

Design Criteria

TYCO Series DS-1 Dry-Type Sprinklers are intended for use in fire sprinkler systems designed in accordance with the standard installation rules recognized by the applicable Listing or Approval agency; for example, UL Listing is based on NFPA 13 requirements. For more information on LPCB Approval, contact TYCO Fire Suppression & Building Products at the following office:

Kopersteden 1
7547 TJ Enschede
The Netherlands
Tel: +31-(0)53-428-4444
Fax: +31-(0)53-428-3377

Sprinkler Fittings

Install 1 Inch NPT Series DS-1 Dry-Type Sprinklers are to be installed in the 1 Inch NPT outlet or run of the following fittings:

- malleable or ductile iron threaded tee fittings that meet the dimensional requirements of ANSI B16.3 (Class 150)
- cast iron threaded tee fittings that meet the dimensional requirements of ANSI B16.4 (Class 125).

Do not install Series DS-1 Dry-Type Sprinklers into elbow fittings. The Inlet of the sprinkler can contact the interior of the elbow.

The unused outlet of the threaded tee is plugged as shown in Figure 12.

You can also install Series DS-1 Dry-Type Sprinklers in the 1 Inch NPT outlet of a GRINNELL Figure 730 Mechanical Tee and GRINNELL

Ambient Temperature Exposed to Discharge End of Sprinkler	Temperatures for Heated Area ¹		
	40°F (4°C)	50°F (10°C)	60°F (16°C)
	Minimum Exposed Barrel Length, Inches (mm) ²		
40°F (4°C)	0	0	0
30°F (-1°C)	0	0	0
20°F (-7°C)	4 (100)	0	0
10°F (-12°C)	8 (200)	1 (25)	0
0°F (-18°C)	12 (305)	3 (75)	0
-10°F (-23°C)	14 (355)	4 (100)	1 (25)
-20°F (-29°C)	14 (355)	6 (150)	3 (75)
-30°F (-34°C)	16 (405)	8 (200)	4 (100)
-40°F (-40°C)	18 (455)	8 (200)	4 (100)
-50°F (-46°C)	20 (510)	10 (255)	6 (150)
-60°F (-51°C)	20 (510)	10 (255)	6 (150)

Notes

- For protected area temperatures that occur between values listed above, use the next cooler temperature.
- These lengths are inclusive of wind velocities up to 30 mph (18,6 kph).

TABLE B
EXPOSED SPRINKLER BARRELS IN WET PIPE SYSTEMS
MINIMUM RECOMMENDED LENGTHS

G-FIRE Figure 522. However, the use of the Figure 730 Tee and Figure 522 for this arrangement is limited to wet pipe systems.

The configuration shown in Figure 13 is only applicable for wet pipe systems where the sprinkler fitting and water-filled pipe above the sprinkler fitting are not subject to freezing and where the length of the Dry-Type Sprinkler has the minimum exposure length depicted in Figure 11. Refer to the Exposure Length section.

For wet pipe system installations of 1 Inch NPT Series DS-1 Dry-Type Sprinklers connected to CPVC piping, use only the following TYCO CPVC fittings:

- 1" x 1" NPT Female Adapter (P/N 80145)
- 1" x 1" x 1" NPT Sprinkler Head Adapter Tee (P/N 80249).

For dry pipe system installations, use only the side outlet of maximum 2-1/2-inch reducing tee when locating Series DS-1 Dry-Type Sprinklers directly below the branch line. Otherwise, use the configuration shown in Figure 12 to assure complete water drainage from above Series DS-1 Dry-Type Sprinklers and the branch line. Failure to do so may result in pipe freezing and water damage.

NOTICE

Do not install Series DS-1 Dry-Type Sprinklers into any other type fitting without first consulting the Technical Services Department. Failure to use the appropriate fitting may result in one of the following:

- Failure of the sprinkler to operate properly due to formation of ice over the Inlet Plug or binding of the Inlet Plug
- Insufficient engagement of the Inlet pipe-threads with consequent leakage

Drainage

In accordance with the minimum requirements of the National Fire Protection Association for dry pipe sprinkler systems, branch, cross, and feed-main piping connected to Dry Sprinklers and subject to freezing temperatures must be pitched for proper drainage.

Exposure Length

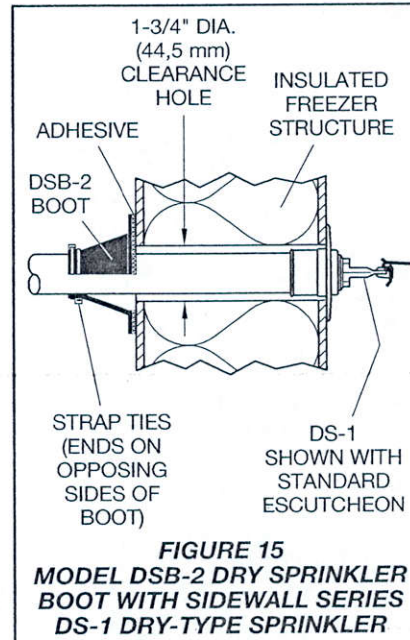
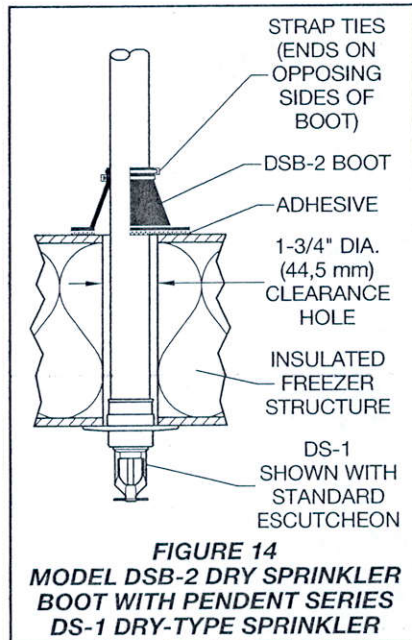
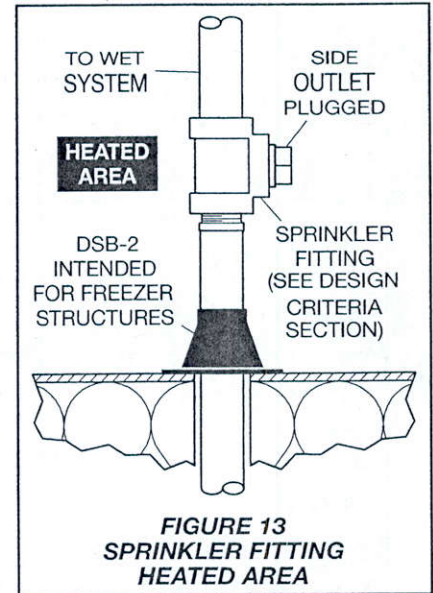
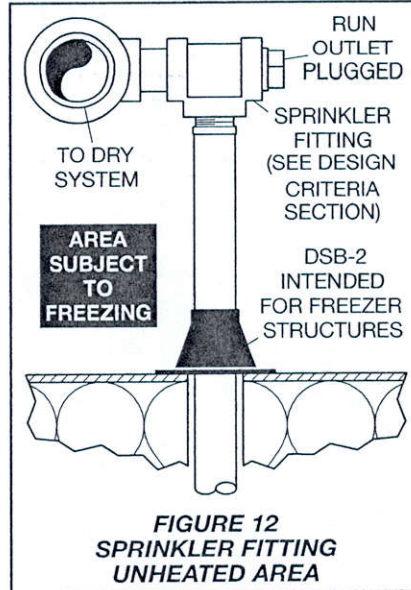
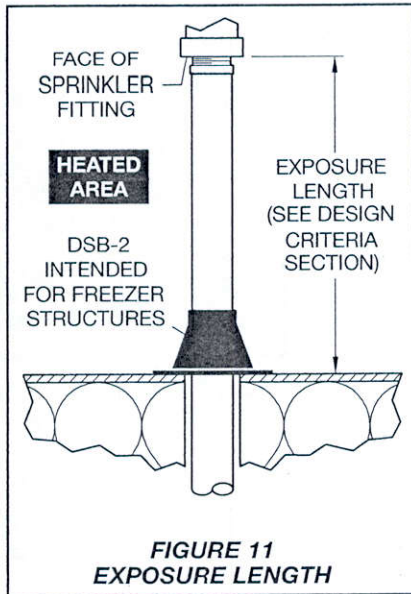
When using Dry Sprinklers in wet pipe sprinkler systems to protect areas subject to freezing temperatures, use Table B to determine a sprinkler's appropriate exposed barrel length to prevent water from freezing in the connecting pipes due to conduction. The exposed barrel length measurement must be taken from the face of the sprinkler fitting to the surface of the structure or insulation that is exposed to the heated area. Refer to Figure 11 for an example.

For protected area temperatures between those given above, the minimum recommended length from the face of the fitting to the outside of the protected area may be determined by interpolating between the indicated values.

Clearance Space

In accordance with Section 8.4.9.2 of the 2010 edition of NFPA 13, when connecting an area subject to freezing and an area containing a wet pipe sprinkler system, the clearance space around the sprinkler barrel of Dry-Type Sprinklers must be sealed. Due to temperature differences between two areas, the potential for the formation of condensation in the sprinkler and subsequent ice build-up is increased. If this condensation is not controlled, ice build-up can occur that might damage the dry-type sprinkler and/or prevent proper operation in a fire situation.

Use of the Model DSB-2 Dry Sprinkler Boot, described in technical data sheet TFP591 and shown in Figures 14 and 15, can provide the recommended seal.



Installation

TYCO Series DS-1 Dry-Type Sprinklers must be installed in accordance with this section.

General Instructions

Series DS-1 Dry-Type Sprinklers must only be installed in fittings that meet the requirements of the Design Criteria section. Refer to the Design Criteria section for other important requirements regarding piping design and sealing of the clearance space around the Sprinkler Casing.

Do not install any bulb type sprinkler if the bulb is cracked or there is a loss of liquid from the bulb. With the sprinkler held horizontally, a small air bubble should be present. The diameter of the air bubble is approximately 1/16 inch (1,6 mm) for the 135°F (57°C) rating to 1/8 inch (3,2 mm) for the 360°F (182°C) rating.

A leak-tight 1 Inch NPT sprinkler joint should be obtained by applying a minimum-to-maximum torque of 20 to 30 ft.-lbs. (26,8 to 40,2 Nm). Higher levels of torque may distort the sprinkler Inlet with consequent leakage or impairment of the sprinkler.

Do not attempt to compensate for insufficient adjustment in an Escutcheon Plate by under or over-tightening the Sprinkler. Re-adjust the position of the sprinkler fitting to suit.

Step 1. Install pendent sprinklers only in the pendent position; install upright sprinklers only in the upright position. The deflector of a pendent or upright sprinkler is to be parallel to the ceiling.

Install horizontal sidewall sprinklers in the horizontal position with their center-line of waterway perpendicular to the back wall and parallel to the ceiling. Ensure the word "TOP" on the Deflector faces the ceiling.

Step 2. With a non-hardening pipe-thread sealant such as TEFLON applied to the Inlet threads, hand-tighten the sprinkler into the sprinkler fitting.

Step 3. Wrench-tighten the sprinkler using either:

- a pipe wrench on the Inlet Band or the Casing (Figure 1).
- the W-Type 7 Sprinkler Wrench on the Wrench Flat (Figure 2).

Apply the Wrench Recess of the W-Type 7 Sprinkler Wrench to the Wrench Flat.

Note: If sprinkler removal becomes necessary, remove the sprinkler using the same wrenching method noted above. Sprinkler removal is easier when a non-hardening sealant was used and torque guidelines were followed. After removal, inspect the sprinkler for damage.

Step 4. After installing the ceiling or wall and applying a ceiling finish, slide on the outer piece of the Escutcheon until it comes in contact with the ceiling/wall. Do not lift the ceiling panel out of its normal position.

When using the Deep Escutcheon, hold the outer piece in contact with the mounting surface (ceiling or wall). Then rotate the inner piece approximately 1/4 turn with respect to the outer piece, to hold the Deep Escutcheon firmly together.

Care and Maintenance

TYCO Series DS-1 Dry-Type Sprinklers must be maintained and serviced in accordance with this section.

Before closing a fire protection system main control valve for maintenance work on the fire protection system that it controls, obtain permission to shut down the affected fire protection systems from the proper authorities and notify all personnel who may be affected by this action.

Absence of the outer piece of an escutcheon, which is used to cover a clearance hole, may delay the time to sprinkler operation in a fire situation.

A Vent Hole is provided in the Bulb Seat (Figure 1) to indicate if the Dry Sprinkler is remaining dry. Evidence of leakage from the Vent Hole indicates potential leakage past the Inlet seal and the need to remove the sprinkler to determine the cause of leakage; for example, an improper installation or an ice plug. Close the fire protection system control valve and drain the system before removing the sprinkler.

Sprinklers which are found to be leaking or exhibiting visible signs of corrosion must be replaced.

Automatic sprinklers must never be painted, plated, coated, or otherwise altered after leaving the factory. Modified sprinklers must be replaced. Sprinklers that have been exposed to corrosive products of combustion, but have not operated, should be replaced if they cannot be completely cleaned by wiping the sprinkler with a cloth or by brushing it with a soft bristle brush.

Care must be exercised to avoid damage to the sprinklers - before, during, and after installation. Sprinklers damaged by dropping, striking, wrench twist/slippage, or the like, must be replaced. Also, replace any sprinkler that has a cracked bulb or that has lost liquid from its bulb. (Ref. Installation Section.)

The owner is responsible for the inspection, testing, and maintenance of their fire protection system and devices in compliance with this document, as well as with the applicable standards of the National Fire Protection Association (e.g., NFPA 25), in addition to the standards of any other authorities having jurisdiction. The installing contractor or sprinkler manufacturer should be contacted relative to any questions.

Automatic sprinkler systems are recommended to be inspected, tested, and maintained by a qualified Inspection Service in accordance with local requirements and/or national codes.

P/N* 60 - XXX - X - XXX

		SIN
96	Pendent with Standard Escutcheon (1" NPT)	TY3255 (Figure 3)
93	Pendent with Deep Escutcheon (1" NPT)	TY3255 (Figure 5)
97	Pendent with Standard Recessed Escutcheon (1" NPT)	TY3255 (Figure 4)
92	Pendent without Escutcheon (1" NPT)	TY3255 (Figure 6)
94	Sidewall with Standard Escutcheon (1" NPT)	TY3355 (Figure 8)
53	Sidewall with Deep Escutcheon (1" NPT)	TY3355 (Figure 9)
54	Sidewall without Escutcheon (1" NPT)	TY3355 (Figure 10)
98	Upright without Escutcheon (1" NPT)	TY3155 (Figure 7)

	SPRINKLER	ESCUTCHEON ⁽¹⁾
0	CHROME PLATED	SIGNAL WHITE (RAL9003)
1	NATURAL BRASS	SIGNAL WHITE (RAL9003)
2	NATURAL BRASS	BRASS PLATED
4	SIGNAL WHITE (RAL9003)	SIGNAL WHITE (RAL9003)
9	CHROME PLATED	CHROME

	TEMPERATURE RATING ⁽²⁾	ORDER LENGTH ⁽³⁾
0	135°F (57°C)	055 5.50"
1	155°F (68°C)	082 8.25"
2	175°F (79°C)	180 18.00"
3	200°F (93°C)	187 18.75"
4	286°F (141°C)	372 37.25"
5	360°F (182°C)	480 48.00"

Notes

* Use Prefix "I" for ISO 7-R1 Connection; for example, I-60-961-1-180.

- Escutcheon applies to sprinklers provided with escutcheons.
- 360°F (182°C) temperature rating applies to non-recessed sprinkler assemblies.
- Dry-Type Sprinklers are furnished based upon "Order Length" as measured per Figures 3 through 10, as applicable, and for each individual sprinkler where it is to be installed. After the measurement is taken, round it to the nearest 1/4 inch increment.

TABLE C
SERIES DS-1 STANDARD RESPONSE, STANDARD COVERAGE, DRY-TYPE SPRINKLERS
PART NUMBER SELECTION

Ordering Procedure

Contact your local distributor for availability. When placing an order, indicate the full product name, including description and Part Number (P/N).

Dry Sprinklers

When ordering 5.6 K-Factor Series DS-1, Standard Response, Standard Coverage (5 mm Bulb), Dry-Type Automatic Sprinklers, specify the following information:

- SIN
Pendent TY3255, Upright TY3155, or Horizontal Sidewall TY3355

- Deflector Style
Upright, Pendent, and Horizontal Sidewall
- Order Length
Dry-Type Sprinklers are furnished based upon Order Length as measured per Figures 3 through 10, as applicable. After the measurement is taken, round it to the nearest 1/4 inch increment.
- Inlet Connections
1 Inch NPT or ISO 7-R1
- Temperature Rating
- Sprinkler Finish
- Escutcheon Style and Finish, as applicable

- Part Number from Table C. Part numbers are for 1 Inch NPT standard order sprinklers. Orders for all other sprinkler assemblies must be accompanied by a complete description.

Sprinkler Wrench

Specify W-Type 7 Sprinkler Wrench, P/N 56-850-4-001.

Sprinkler Boot

Specify Model DSB-2 Dry Sprinkler Boot, P/N 63-000-0-002.

This Part Number includes one Boot, two Strap Ties, and 1/3 oz. of Adhesive (a sufficient quantity for installing one boot).

OFFICE USE ONLY

IMPORTANT
A.H.B.T. - MANDATORY FEE - RESIDENTIAL

DATE:

COMMENTS:

INITIALS:

11/6/15 spoke to Mr. [unclear] Construction, advised permit already

(initials)

5/21/15 spoke to Mr. [unclear] about needing final Ocean County soils and final fire inspections. Engineering gave ICC until 6/15/15

(initials)

OFFICE DATE RECEIVED: _____

VIII. PRIOR APPROVALS CHECKLIST (office use only)	LOCAL APPROVAL		COUNTY APPROVAL		REGIONAL APPROVAL		STATE APPROVAL		COMMENTS
	Prelimin. Initial	Final Date	Prelimin. Initial	Final Date	Prelimin. Initial	Final Date	Prelimin. Initial	Final Date	
☒ Zoning Officer	<i>JK</i>	<i>5/22/18</i>							<i>2A-14-00028</i>
☐ Planning Board									
☐ Zoning Board									
☐ Sewer Authority									
☐ Water Authority									
☐ Police Department									
☐ Health Department									
☐ Soil Conservation									
☐ N.J. Department of Community Affairs									
☐ N.J. Department of Transportation									
☐ N.J. Department of Environmental Protection									
☐ Utility Dig No.									
☐									
☐									

IX. SUBCODES AND SPECIAL REGULATIONS APPLICABLE (office use only—optional)

Name of Code & Edition	Name of Code & Edition
Building _____	Energy _____
Electrical _____	Barrier Free _____
Plumbing _____	Flood Hazard _____
Fire Protection _____	As Built Elevation Cert. _____
Mechanical _____	Other _____

X. CERTIFICATES ISSUED (office use only)

	DATE ISSUED	DATE EXPIRED	DATE REISSUED	DATE EXPIRED
☐ Temporary Certificate of Occupancy	No. _____	_____	_____	_____
☐ Temporary Certificate of Compliance	No. _____	_____	_____	_____
☐ Continued Certificate of Occupancy	No. _____	_____	_____	_____
☐ Certificate of Compliance	No. _____	_____	_____	_____
☐ Certificate of Occupancy	No. _____	_____	_____	_____
☐ Certificate of Approval	No. _____	_____	_____	_____
☐ Lead Abatement Clearance Certificate	No. _____	_____	_____	_____