

Life Safety Checksheet Response

Permit #: 12-217486-000-00-RS

Date: 1/8/13

Customer name and phone number: GREG HEINZE 5035197625

Note: In the spaces below, please provide specific information concerning the changes that you have made in response to the checksheet. Note the checksheet item number, your response or a description of the revision, and the location of the change on the plans (i.e. page number and/or detail number). Use as many lines as needed. If the item is not in response to a checksheet, write "**Applicant**" in the column labeled "Checksheet item number."

Checksheet item number	Description of changes, corrections, additions, etc.	Location on plans
1	See DETAIL 10/8	Pg 8
2	CLARIFIED ON SCHEDULE	Pg 3
3	See Sec A6	Pg 6
4	see Sec 4/7	Pg 7
5	See FLOORPLANS	Pg 2/4
6	See 2/7 PER CODE	Pg 7
7	See FLOORPLAN	Pg 2
8	See 1/3	Pg 3
9	See SFT 1 "PRES. PATH"	Pg 1
10	See * NOTE	Pg 5
11	STAPLED TO FRONT / TRUSS LAYOUT	FRONT

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L/S

Plan Bin Location: 86rs



2011 Energy Efficiency Additional Measures Requirements

New dwellings shall meet the envelope requirements of ORSC Table N1101.1(1) and a minimum of 50% of permanently installed lighting fixtures shall have high efficacy lamps. Additionally, new heated buildings and additions of more than 600 SF or more than 40% of the original heated floor area shall have at least two of the Additional Measures from ORSC Table N1101.1(2), one from Envelope Enhancement and one from Conservation (see below). All Energy Efficiency components must be reflected on the plans.

Envelope Enhancement Measure (Select One)

- 1 High efficiency walls & windows:**
- Exterior walls – R-19+5 (insulation sheathing)/SIPS, and one of the following options:
 - Windows – Max 15% of conditioned area, or
 - Windows – U-0.30
- 2 High efficiency envelope:**
- Exterior walls – R-21 Intermediate framing, and
 - Vaulted ceilings – R-30 Advanced framing, and
 - Flat ceilings – R-49, and
 - Framed floors – R-38, and
 - Windows – U-0.30; and one of the following:
 - Doors – All doors U-0.20, or
 - Additional 15% of permanently installed lighting fixtures as high-efficacy lamps or Conservation Measure D and E
- 3 High efficiency ceiling, windows and duct sealing:**
(Cannot be used with Conservation Measure E)
- Vaulted ceilings – R-30 Advanced framing (not more than 50% of the heated floor area), and
 - Flat ceilings – R-49, and
 - Windows – U-0.30, and
 - Performance tested duct systems (ODOE documentation to be submitted to building inspector prior to final inspection)
- 4 High efficiency thermal envelope UA:**
- Proposed UA is 15% lower than the Code UA when calculated in Table N1104.1(1)
- 5 Building tightness testing, ventilation and duct sealing:**
- Mechanical system providing whole-building ventilation per Table N1101.1(3), or ASHRAE 62.2, and
 - Performance tested duct systems (ODOE documentation to be submitted to building inspector prior to final inspection), and
 - Blower door test report submitted to building inspector prior to final inspection showing ≤ 6.0 air changes per hour, or ≤ 5.0 air changes per hour when used with Conservation Measure E
- 6 Ducted HVAC systems within conditioned space:**
(Cannot be used with Conservation Measure B or C)
- All ducts and air handler are contained within heated building envelope

(Continued on back)

Conservation Measure (Select One)

- A High efficiency HVAC system:**
 - Gas-fired furnace or boiler with 90% minimum AFUE (sealed combustion air ducted directly from outdoors if furnace or boiler is within conditioned space), **or**
 - Air-source heat pump 8.5 minimum HSPF, **or**
 - Closed-loop ground source heat pump with 3.0 minimum COP
- B Ducted HVAC systems within conditioned space:**
 - All ducts and air handlers are within heated building envelope
- C Ductless heat pump:**
 - Replace electric resistance heating in at least the primary zone with at least one ductless mini-split heat pump with 8.5 minimum HSPF
- D High efficiency water heating and lighting:**
 - Natural gas/propane, on-demand water heating with 0.80 minimum EF, **and**
 - Minimum 75% of permanently installed lighting fixtures as CFL or linear fluorescent or minimum 40 lumens per watt
- E Energy management device & duct sealing:**
 - Whole building energy management device capable of monitoring or controlling energy consumption, **and**
 - Performance tested duct systems (ODOE documentation to be submitted to building inspector prior to final inspection), **and**
 - 75% of permanently installed lighting fixtures as high-efficacy lamps
- F Solar voltaic:**
 - Minimum 1 watt per square foot of conditioned floor space with Total Solar Resource Fraction \leq 75%
- G Solar water heating:**
 - 40 square feet minimum gross collector area with Total Solar Resource Fraction \leq 75%



Radon Control Methods

2011 Oregon Residential Specialty Code, Appendix F

New habitable residential structures shall have radon gas mitigation. Indicate the method(s) of radon gas mitigation to be installed in the structure:

Crawl space construction:

- Mechanically ventilated (detailed on plans); or
- Passive sub-membrane depressurization; or
- Permanently open foundation ventilation per R408.1 and a blower-door building tightness test. Test results to be provided to the building inspector prior to final inspection approval.

Slab-on-grade or basement construction:

- Passive depressurization system, with 4" thick layer of gas-permeable aggregate below slab.



CITY OF PORTLAND, OREGON - BUREAU OF DEVELOPMENT SERVICES

1900 SW Fourth Avenue • Portland, Oregon 97201 • 503-823-7300 • www.portlandoregon.gov/bds



Residential Fixtures Worksheet

Please list the mechanical, electrical and plumbing fixtures you are planning to install for your new single family residential construction project.

Mechanical Fixture	Quantity
Heating and Cooling	
Air conditioner (site plan required)	1
Furnace/burner including ductwork/vent/liner	1
Heat pump (site plan required)	1
Air handling unit	
Hydronic hot water system	
Residential boiler (radiator or hydronic)	
Unit heaters (fuel type, not electric): in-wall, in-duct, suspended, etc.	
Vent for appliance other than furnace	2
Gas fireplace	2
Flue vent for water heater or gas fireplace	1
Wood/pellet stove	
Chimney/liner/flue/vent	2
Range hood/other kitchen equipment	1
Clothes dryer exhaust	1
Single duct exhaust fans (bathrooms, toilet compartments, utility rooms)	4
Attic/crawl space fans	
Other: _____	
Gas Fuel Piping: indicate number of outlets	
Furnace	1
Wall/suspended/unit heater	
Water heater/boiler	1
Fireplace	1
Range	1
Barbecue	1
Clothes dryer	1
Other:	

Plumbing Fixture	Quantity
Bathrooms (full or partial)	3.5
Kitchens*	1
Laundry/utility sinks*	1
Bar sinks	
Water heaters/boilers*	1
Clothes washers*	1
Rain drain: # of feet around perimeter of house	257
Sanitary sewer: # of feet from house to property line	22
Storm sewer: # of feet from house to property line or disposal system	N/A
Water line: # of feet from house to property line	10
Fire sprinklers: # of sq. ft. of house to be sprinklered (include basement, exclude garage)	3770
Other:	

* The first kitchen, water heater, clothes washer and laundry/utility sink are included in the basic plumbing package

Electrical Fixture	Quantity
Area of house in sq. ft. to be wired (including basement and attached garage)	4451 3770
Additional circuits for detached garage	
Limited energy electrical wiring (check yes if you are installing any of the following: telephone, cable TV, security systems, doorbell, computer network cables, thermostat, vacuum system)	<input checked="" type="checkbox"/> yes <input type="checkbox"/> no
Temporary electrical service	<input type="checkbox"/> yes <input checked="" type="checkbox"/> no
Other:	



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Application for New Single Family Residential Construction (One or Two Units)

What type of home(s) are you building?

- Single family residence
 Duplex
 2-unit rowhouse
 2-unit townhouse
 Floating home
 Manufactured home on its own lot
 Detached accessory dwelling unit (ADU)
 Other: _____

If your project includes 3 or more structures built to the Oregon Residential Speciality Code or International Residential Code and are either located on a single tax lot or attached to each other, you will apply through the Batch Submittal and Review Process. Please contact Permitting Services at 503-823-7357 for more information.

Applicant Information

Company Name QH PROPERTIES
 Contact Person ERIK HEINZE
 Mailing Address 3523 SW 64th PL
 City POX State OR Zip Code 97221
 Office Phone 503 946 8484 Cell Phone 503 519 7625 FAX _____
 Email SHLBORN@me.com
 Lot Owner Name same
 Mailing Address _____
 City _____ State _____ Zip Code _____
 Contractor Name same CCB# 169564

Project Information

Tax account number: R <u>408183</u>		If you do not know the tax account number, call Multnomah County at 503-988-3326	
Cross streets: <u>LAPER & SCHOLLS FERRY</u>		Tax lot number:	
Plat name/number <u>PLEASANT HILLS</u>	Block/lot: <u>LOT 2</u>	Qtr section #:	
Living area: <u>3770</u> sq.ft.	Basement: <u>1842</u> sq.ft.	Garage/carport: <u>681</u> sq.ft.	
Is there a detached garage/carport or other accessory structure being built?		<input type="checkbox"/> yes	<input checked="" type="checkbox"/> no
Is there an existing house on the lot that will be demolished?		<input type="checkbox"/> yes	<input checked="" type="checkbox"/> no
Land Use Review case numbers:			
Plan designer/architect name: <u>SCRUTTON</u>		Plan # <u>3770</u>	
Has BDS permitted this design previously?		<input type="checkbox"/> yes	<input checked="" type="checkbox"/> no
Do you plan on building the same house plan again?		<input type="checkbox"/> yes	<input checked="" type="checkbox"/> no <input type="checkbox"/> not sure
Is this a Master House Plan?		<input type="checkbox"/> yes	<input checked="" type="checkbox"/> no MHP #

9



AFP Systems, Inc.
Automatic Fire Protection
19435 SW 129th Avenue
Tualatin, OR. 97062
(503) 692-9284
(503)692-1186 fax

6357 SW Lake Rd
TRANSMITTAL

TO: City of Portland DATE: 1 /

Attn: Plans Examiner

SUBJECT: please review submittal package for fire sprinkler system - Pleasant Hills Lot 2; AFP # 13015

(x) ENCLOSED () PLEASE FORWARD

- | | | |
|---|--------------------------------------|---|
| <input type="checkbox"/> SUBCONTRACT | <input type="checkbox"/> EXECUTED | <input type="checkbox"/> FOR APPROVAL |
| <input checked="" type="checkbox"/> DRAWINGS-3 sets | <input type="checkbox"/> APPROVED | <input type="checkbox"/> FOR SIGNATURE |
| <input checked="" type="checkbox"/> CALCULATIONS | <input type="checkbox"/> APPROVED AS | <input type="checkbox"/> FOR YOUR USE |
| <input type="checkbox"/> CHANGE ORDER | <input type="checkbox"/> NOTED | <input type="checkbox"/> FOR CORRECTION |
| <input checked="" type="checkbox"/> PRODUCT DATA | <input type="checkbox"/> UNAPPROVED | <input type="checkbox"/> FOR PAYMENT |
| <input type="checkbox"/> LIEN RELEASE | | <input type="checkbox"/> PLEASE RETURN |
| <input type="checkbox"/> PERMIT APPLICATION | | |
| <input type="checkbox"/> PERMIT CHECK FEE | | |
| <input type="checkbox"/> O & M MANUALS | | |
| <input type="checkbox"/> Other | | |

Sincerely,

AFP Systems, Inc
(503)692-9284
(503)692-1186 Fax
OR CCB 67534
WA AFPSYI*091BZ
CA 936000
CO 1263
HI 30820

RAPID RESPONSE Series LFII Residential Sprinklers 4.9 K-factor Flat-Plate Concealed Pendent Wet Pipe and Dry Pipe Systems

General Description

The TYCO RAPID RESPONSE Series LFII Residential Flat-Plate Concealed Pendent Sprinklers (TY2524) are decorative, fast response, fusible solder sprinklers designed for use in residential occupancies such as homes, apartments, dormitories, and hotels.

The Cover Plate/Retainer Assembly conceals the sprinkler operating components above the ceiling. The flat profile of the Cover Plate provides the optimum aesthetically appealing sprinkler design. Additionally, the concealed design of the Series LFII Residential Flat-Plate Concealed Pendent Sprinklers provides 1/2 inch (12,8 mm) vertical adjustment. This adjustment provides a measure of flexibility when cutting fixed sprinkler drops.

The Series LFII Residential Flat-Plate Concealed Pendent Sprinklers are intended for use in the following systems:

- wet and dry pipe residential sprinkler systems for one- and two-family dwellings and mobile homes per NFPA 13D
- wet and dry pipe residential sprinkler systems for residential occupancies up to and including four stories in height per NFPA 13R
- wet and dry pipe sprinkler systems for the residential portions of any occupancy per NFPA 13.

The Series LFII Residential Sprinklers have been designed with heat sensitivity and water distribution characteristics proven to help in the control of residen-

tial fires and to improve the chance for occupants to escape or be evacuated.

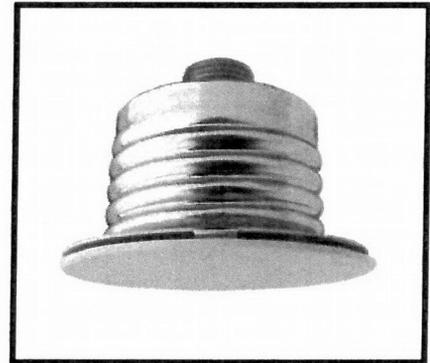
The Series LFII Residential Flat-Plate Concealed Pendent Sprinklers are shipped with a Disposable Protective Cap. The Protective Cap protects the sprinkler during ceiling installation or finish. After ceiling installation is complete, the Protective Cap is removed and the Cover Plate/Retainer Assembly is installed. Removing the Protective Cap is required for proper sprinkler performance.

Dry Pipe System Application

The Series LFII Residential Flat-Plate Concealed Pendent Sprinkler offers a laboratory approved option for designing dry pipe residential sprinkler systems, whereas, most residential sprinklers are laboratory approved for wet systems only.

Through extensive testing and as referenced in U.S. Patent 7,712,543, it has been determined that the number of design sprinklers (hydraulic design area) for the Series LFII Residential Flat-Plate Concealed Sprinklers (TY2524) need not be increased over the number of design sprinklers (hydraulic design area) specified for wet pipe sprinkler systems, as is customary for density/area sprinkler systems designed per NFPA 13, 13D, or 13R.

Consequently, the Series LFII Residential Flat-Plate Concealed Sprinklers (TY2524) offer the features of non-water filled pipe in addition to not having to increase the number of design sprinklers (hydraulic design area) for systems designed to NFPA 13, 13D, or 13R. Non-water filled pipe will permit options for areas sensitive to freezing.



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)

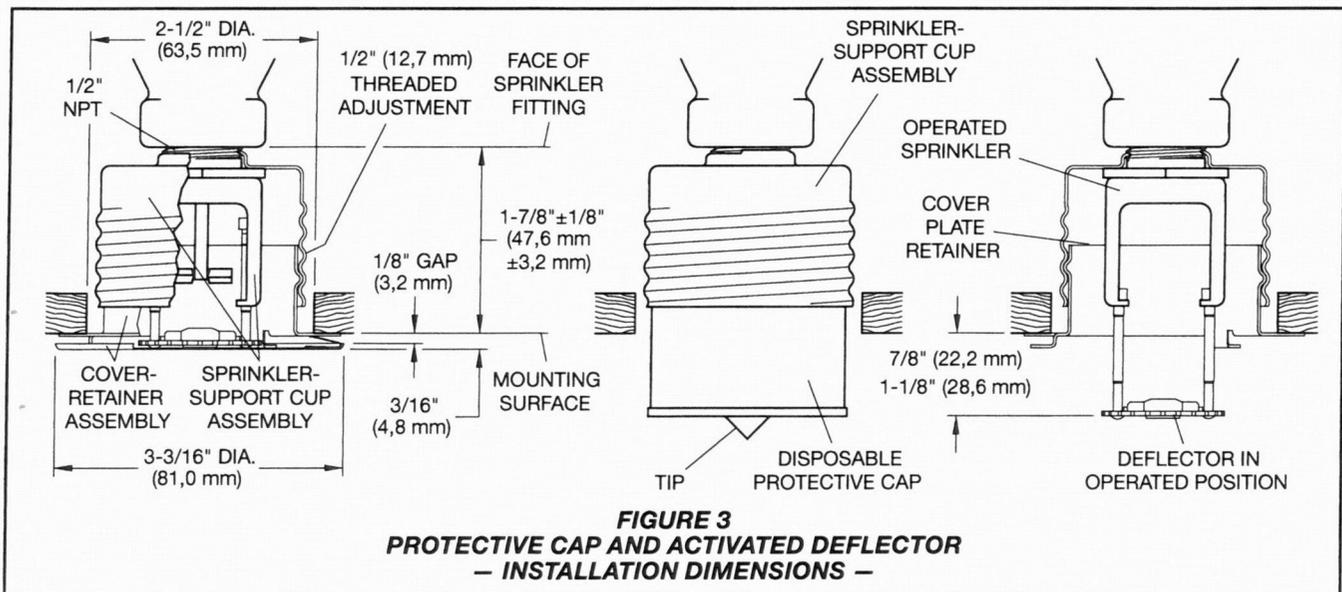
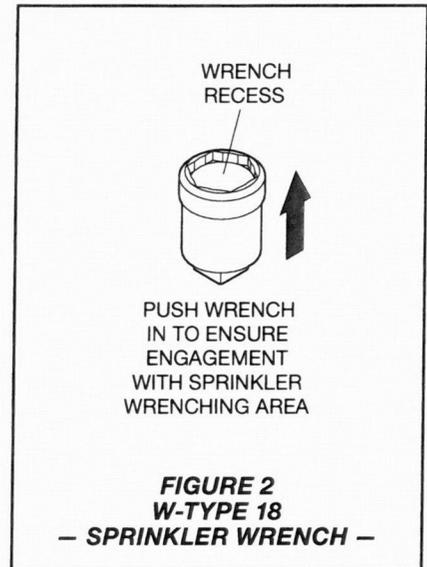
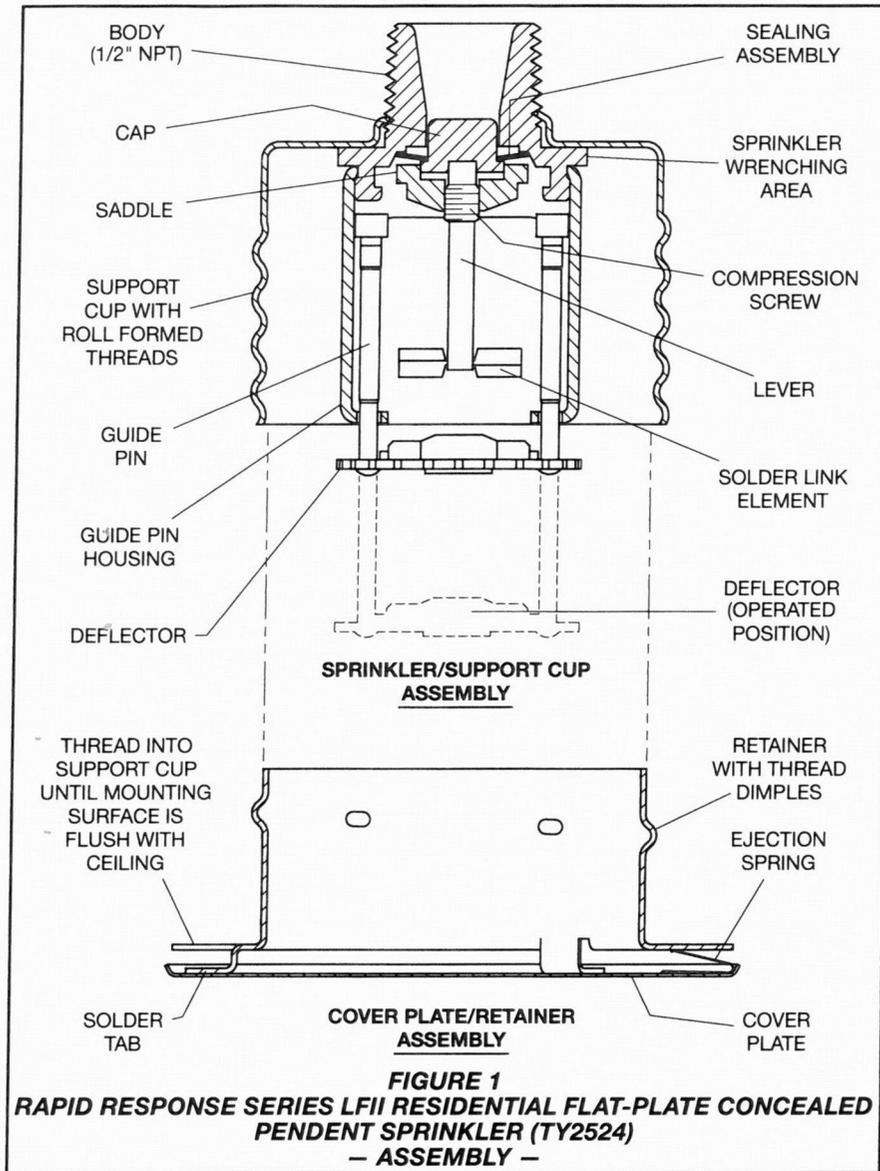
TY2524

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 Series LFII Residential Flat-Plate Concealed Pendent Sprinklers (TY2524) described herein must be installed and maintained in compliance with this document and 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.



Technical Data

Approvals

UL and C-UL Listed

The TYCO RAPID RESPONSE Series LFII Residential Flat-Plate Concealed Pendent Sprinklers are only listed with the Series LFII Concealed Cover Plates having a factory-applied finish.

For details on approvals, refer to the Design Criteria section.

Maximum Working Pressure

175 psi (12,1 bar)

Discharge Coefficient

$K=4.9 \text{ GPM/psi}^{1/2}$ (70,6 LPM/bar^{1/2})

Temperature Rating

Sprinkler: 160°F (71°C)
Cover Plate: 139°F (59°C)

Vertical Adjustment

1/2 inch (12,7 mm)

Finishes

Refer to the Ordering Procedure section.

Physical Characteristics

Cover Plate/Retainer Assembly:

Cover Plate	Copper
Ejection Spring	Stainless Steel
Retainer	Brass

Sprinkler/Support Cup Assembly:

Body	Brass
Cap	Bronze
Saddle	Brass
Sealing Assembly	Beryllium Nickel w/ TEFLON
Soldered Link Halves	Nickel
Lever	Bronze
Compression Screw	Brass
Deflector	Bronze
Guide Pin Housing	Bronze
Guide Pins	Bronze
Support Cup	Steel

Operation

When exposed to heat from a fire, the Cover Plate, which is normally soldered to the Retainer at three points, falls away to expose the Sprinkler/Support Cup Assembly. At this point, the Deflector, supported by the Guide Pins, drops down to its operated position.

The Solder Link Element of the Sprinkler/Support Cup Assembly is comprised of two link halves that are soldered together with a thin layer of solder. When the rated temperature is reached, the solder melts and the two link halves separate, allowing the sprinkler to activate and flow water.

Design Criteria

The TYCO RAPID RESPONSE Series LFII Residential Flat-Plate Concealed Pendent Sprinklers (TY2524) are UL and C-UL Listed for installation in accordance with this section:

Residential Sprinkler Design Guide

When conditions exist that are outside the scope of the provided criteria, refer to the Residential Sprinkler Design Guide TFP490 for the manufacturer's recommendations that may be acceptable to the authority having jurisdiction.

System Type

Per the UL Listing, wet pipe and dry pipe systems may be utilized. Per the C-UL Listing, only wet pipe systems may be utilized.

Refer to Technical Data Sheet TFP485 about the use of Residential Sprinklers in residential dry pipe systems.

Hydraulic Design (NFPA 13D and 13R)

For systems designed to NFPA 13D or NFPA 13R, the minimum required sprinkler flow rate are given in Tables A and B as a function of temperature rating and the maximum allowable coverage areas. The sprinkler flow rate is the minimum required discharge from each of the total number of "design sprinklers" as specified in NFPA 13D or NFPA 13R. The number of "design sprinklers" specified in NFPA 13D and 13R for wet pipe systems is to be applied when designing dry pipe systems.

Hydraulic Design (NFPA 13)

For systems designed to NFPA 13, the number of design sprinklers is to be the four most hydraulically demanding sprinklers. The minimum required discharge from each of the four sprinklers is to be the greater of the following:

- The flow rates given in Tables A and B as a function of temperature rating and the maximum allowable coverage area.
- A minimum discharge of 0.1 gpm/ft² over the "design area" comprised of the four most hydraulically demanding sprinklers for the actual coverage areas being protected by the four sprinklers.

The number of "design sprinklers" specified in NFPA 13 for wet pipe systems is to be applied when designing dry pipe systems.

Dry Pipe System Water Delivery

When using the Series LFII Residential Flat-Plate Concealed Pendent Sprinklers (TY2524) in dry pipe sprinkler systems, the time for water delivery exceed 15 seconds for the most remote operating sprinkler.

Obstruction to Water Distribution.

Sprinklers are to be located in accordance with the obstruction rules of NFPA 13D, 13R, and 13 as applicable for residential sprinklers as well as with the obstruction criteria described within the Technical Data Sheet TFP490.

Operational Sensitivity

Install sprinklers relative to the ceiling mounting surface as shown in Figure 3.

The Series LFII Residential Flat-Plate Concealed Pendent Sprinklers must not be used in applications where the air pressure above the ceiling is greater than that below. Down drafts through the Support Cup can delay sprinkler operation in a fire situation.

Sprinkler Spacing

The minimum spacing between sprinklers is 8 feet (2,4 m). The maximum spacing between sprinklers cannot exceed the length of the coverage area (Table A) being hydraulically calculated (e.g., a maximum of 12 feet for a 12 ft. x 12 ft. coverage area or 20 feet for a 20 ft. x 20 ft. coverage area.)

Maximum Coverage Area ^(a) Ft. x Ft. (m x m)	Maximum Spacing Ft. (m)	WET PIPE SYSTEM ^(b) Minimum Flow and Residual Pressure		
		Horizontal Ceiling ^(c, d, e) (Maximum 2 inch rise for 12 inch run)	Sloped Ceiling ^(c, d, e) (Greater than 2 inch rise up to maximum 4 inch rise for 12 inch run)	Sloped Ceiling ^(c, d, e) (Greater than 4 inch rise up to maximum 8 inch rise for 12 inch run)
		160°F (71°C) Sprinkler	160°F (71°C) Sprinkler	160°F (71°C) Sprinkler
12 x 12 (3,7 x 3,7)	12 (3,7)	13 GPM (49,2 LPM) 7.0 psi (0,48 bar)	17 GPM (64,3 LPM) 12.0 psi (0,83 bar)	17 GPM (64,3 LPM) 12.0 psi (0,83 bar)
14 x 14 (4,3 x 4,3)	14 (4,3)	13 GPM (49,2 LPM) 7.0 psi (0,48 bar)	17 GPM (64,3 LPM) 12.0 psi (0,83 bar)	17 GPM (64,3 LPM) 12.0 psi (0,83 bar)
16 x 16 (4,9 x 4,9)	16 (4,9)	13 GPM (49,2 LPM) 7.0 psi (0,48 bar)	17 GPM (64,3 LPM) 12.0 psi (0,83 bar)	17 GPM (64,3 LPM) 12.0 psi (0,83 bar)
18 x 18 (5,5 x 5,5)	18 (5,5)	17 GPM (64,3 LPM) 12.0 psi (0,83 bar)	22 GPM (83,3 LPM) 20.2 psi (1,39 bar)	22 GPM (83,3 LPM) 20.2 psi (1,39 bar)
20 x 20 (6,1 x 6,1)	20 (6,1)	20 GPM (75,7 LPM) 16.7 psi (1,15 bar)	24 GPM (90,8 LPM) 24.0 psi (1,65 bar)	24 GPM (90,8 LPM) 24.0 psi (1,65 bar)

(a) For coverage area dimensions less than or between those indicated, use the minimum required flow for the next highest coverage area for which Hydraulic Design section under the Design Criteria are stated.

(b) The Minimum Flow requirement is based on minimum flow in GPM (LPM) from each sprinkler. The associated residual pressures are calculated using the nominal K-factor. Refer to "Hydraulic Design" in the Design Criteria section for details.

(c) For NFPA 13D 2010 applications, Horizontal Ceiling criteria shall be used for certain sloped ceiling configurations up to 8:12 pitch. Refer to TIA 1028R for allowed sloped ceiling limitations when using horizontal ceiling criteria.

(d) For NFPA 13R applications, Horizontal Ceiling criteria may be used for sloped ceiling configurations up to 8:12 pitch when acceptable to the local authority having jurisdiction.

(e) For NFPA 13 residential applications, the greater of 0.1 gpm/ft.² over the design area or the flow in accordance with the criteria in this table must be used.

TABLE A
SERIES LFII RESIDENTIAL FLAT-PLATE CONCEALED PENDENT SPRINKLER (TY2524)
NFPA 13D, 13R, AND 13 HYDRAULIC DESIGN CRITERIA
– WET PIPE SYSTEMS –

Maximum Coverage Area ^(a) Ft. x Ft. (m x m)	Maximum Spacing Ft. (m)	DRY PIPE SYSTEM ^(b) Minimum Flow and Residual Pressure	
		Horizontal Ceiling Minimum Flow and Residual Pressure ^(c) (Maximum 2 Inch Rise for 12 Inch Run)	
		160°F (71°C) Sprinkler	
12 x 12 (3,7 x 3,7)	12 (3,7)	15 GPM (56,8 LPM) 9.4 psi (0,65 bar)	
14 x 14 (4,3 x 4,3)	14 (4,3)	15 GPM (56,8 LPM) 9.4 psi (0,65 bar)	
16 x 16 (4,9 x 4,9)	16 (4,9)	16 GPM (60,6 LPM) 10,7 psi (0,74 bar)	
18 x 18 (5,5 x 5,5)	18 (5,5)	17 GPM (64,3 LPM) 12.0 psi (0,83 bar)	
20 x 20 (6,1 x 6,1)	20 (6,1)	21 GPM (79,5 LPM) 18,4 psi (1,27 bar)	

(a) For coverage area dimensions less than or between those indicated, use the minimum required flow for the next highest coverage area for which Hydraulic Design section under the Design Criteria are stated.

(b) The Minimum Flow requirement is based on minimum flow in GPM (LPM) from each sprinkler. The associated residual pressures are calculated using the nominal K-factor. Refer to "Hydraulic Design" in the Design Criteria section for details.

(c) For NFPA 13 residential applications, the greater of 0.1 gpm/ft.² over the design area or the flow in accordance with the criteria in this table must be used.

TABLE B
SERIES LFII RESIDENTIAL FLAT-PLATE CONCEALED PENDENT SPRINKLER (TY2524)
NFPA 13D, 13R, AND 13 HYDRAULIC DESIGN CRITERIA
– DRY PIPE SYSTEMS –

Installation

The TYCO RAPID RESPONSE Series LFII Residential Flat-Plate Concealed Pendent Sprinklers must be installed in accordance with this section:

General Instructions

Damage to the Solder Link Element during installation can be avoided by handling the sprinkler by the Support Cup only; that is, do not apply pressure to the Solder Link Element (Figure 1).

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 Cover Plate/Retainer Assembly by under- or over-tightening the sprinkler. Re-adjust the position of the sprinkler fitting to suit.

Step 1. Install pendent sprinklers in the pendent position, with the centerline 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, and using the W-Type 18 Wrench shown in Figure 2, install and tighten the Sprinkler/Support Cup Assembly into the fitting. The W-Type 18 Wrench accepts a 1/2 inch ratchet drive.

Step 4. Replace the Protective Cap by pushing it upwards until it bottoms out against the Support Cup. The Protective Cap helps prevent damage to the Deflector and Guide Pins during ceiling installation and/or during application of the finish coating of the ceiling.

NOTICE

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

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

If the sprinkler has been damaged and the deflector does not move up and down freely, replace the entire sprinkler assembly. Do not attempt to modify or repair a damaged sprinkler.

Step 6. Screw on the Cover Plate/Retainer Assembly until its flange contacts the ceiling. Do not continue to screw on the Cover Plate/Retainer Assembly such that it lifts a ceiling panel out of its normal position.

If the Cover Plate/Retainer Assembly cannot be engaged with the Mounting Cup or the Cover Plate/Retainer Assembly cannot be engaged sufficiently to contact the ceiling, the Sprinkler Fitting must be repositioned.

Care and Maintenance

The TYCO RAPID RESPONSE Series LFII Residential Flat-Plate Concealed Pendent Sprinkler (TY2524) 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 a Cover Plate may delay the 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.

When properly installed, there is a nominal 1/8 inch (3,2 mm) air gap between the lip of the Cover Plate and the ceiling, as shown in Figure 3. This air gap is necessary for proper operation of the sprinkler by allowing heat flow from a fire to pass below and above the Cover Plate to help assure appropriate release of the Cover Plate in a fire situation. If the ceiling needs repainting after sprinkler installation, exercise care to ensure that the new paint does not seal off any of the air gap. Failure to do so may impair sprinkler operation.

Factory painted Cover Plates must not be repainted. They should be replaced, if necessary, by factory painted units. Non-factory applied paint may adversely delay or prevent sprinkler operation in the event of a fire.

Do not pull the Cover Plate relative to the Retainer. 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 or overheated sprinklers must be replaced.

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.

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.

Limited Warranty

Products manufactured by Tyco Fire Production Products (TFPP) 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 TFPP. No warranty is given for products or components manufactured by companies not affiliated by ownership with TFPP 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 TFPP to be defective shall be either repaired or replaced, at TFPP's sole option. TFPP neither assumes, nor authorizes any person to assume for it, any other obligation in connection with the sale of products or parts of products. TFPP 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 TFPP 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 TFPP was informed about the possibility of such damages, and in no event shall TFPP'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 description and Part Number (P/N).

Sprinkler/Support Cup Assembly
Specify: Series LFII (TY2524), K=4.9 (70,6), Residential Flat-Plate Concealed Pendent Sprinkler without Cover Plate/Retainer Assembly, P/N 51-114-1-160.

Cover Plate/Retainer Assembly for Horizontal or Sloped Ceiling Applications

Specify: Series LFII (TY2524), K=4.9 (70,6), Residential Flat-Plate Concealed Pendent Sprinkler Cover Plate/Retainer Assembly with (specify) finish, P/N (specify):

Off White	P/N 56-201-0-135
Pure White* (RAL9010)	P/N 56-201-3-135
Signal White** (RAL9003)	P/N 56-201-4-135
Standard White (Grey White) (RAL9002)	P/N 56-201-5-135
Custom	P/N 56-201-X-135

* Eastern Hemisphere sales only
** Previously known as Bright White

Note: All Custom Cover Plates are painted using Sherwin Williams Interior Latex Paint. Contact TYCO Customer Service with any questions related to custom orders.

Optional Cover Plate/Retainer Assembly for Horizontal Ceiling Applications Only

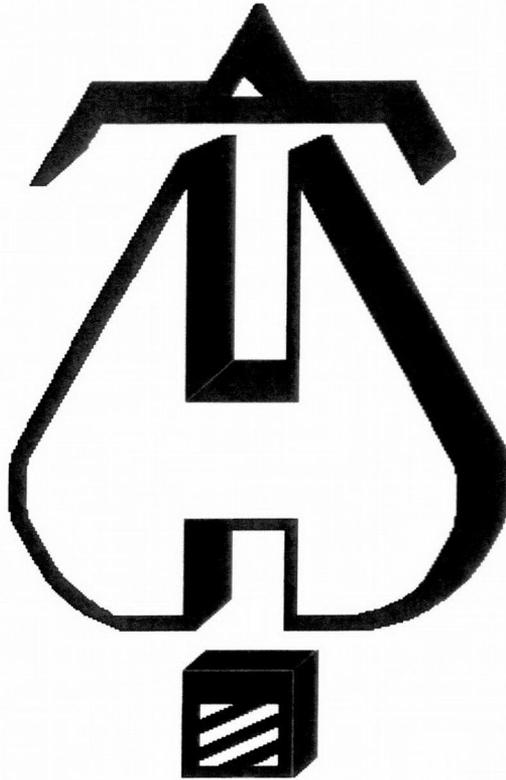
Specify: Series LFII (TY2524), K=4.9 (70,6), Residential Flat-Plate Concealed Pendent Sprinkler Cover Plate/Retainer Assembly with (specify) finish, P/N (specify):

Off White	P/N 56-122-0-135
Pure White* (RAL9010)	P/N 56-122-3-135
Signal White** (RAL9003)	P/N 56-122-4-135
Custom	P/N 56-122-X-135

* Eastern Hemisphere sales only
** Previously known as Bright White

Note: All Custom Cover Plates are painted using Sherwin Williams Interior Latex Paint. Contact TYCO Customer Service with any questions related to custom orders.

Sprinkler Wrench
Specify: W-Type 18 Sprinkler Wrench, P/N 56-000-1-265.



... Fire Protection by Computer Design

AFP Systems, Inc.
19435 SW 129th. Ave.
Your Street Address 2
Tualatin, OR.
503-692-9284

Job Name : Pleasant Hills Lot #2
Building :
Location : 6383 SW Labor Ct, Portland, OR. 97221
System : 1
Contract : 13013
Data File : Pleasant Hills Lot #2.WXF

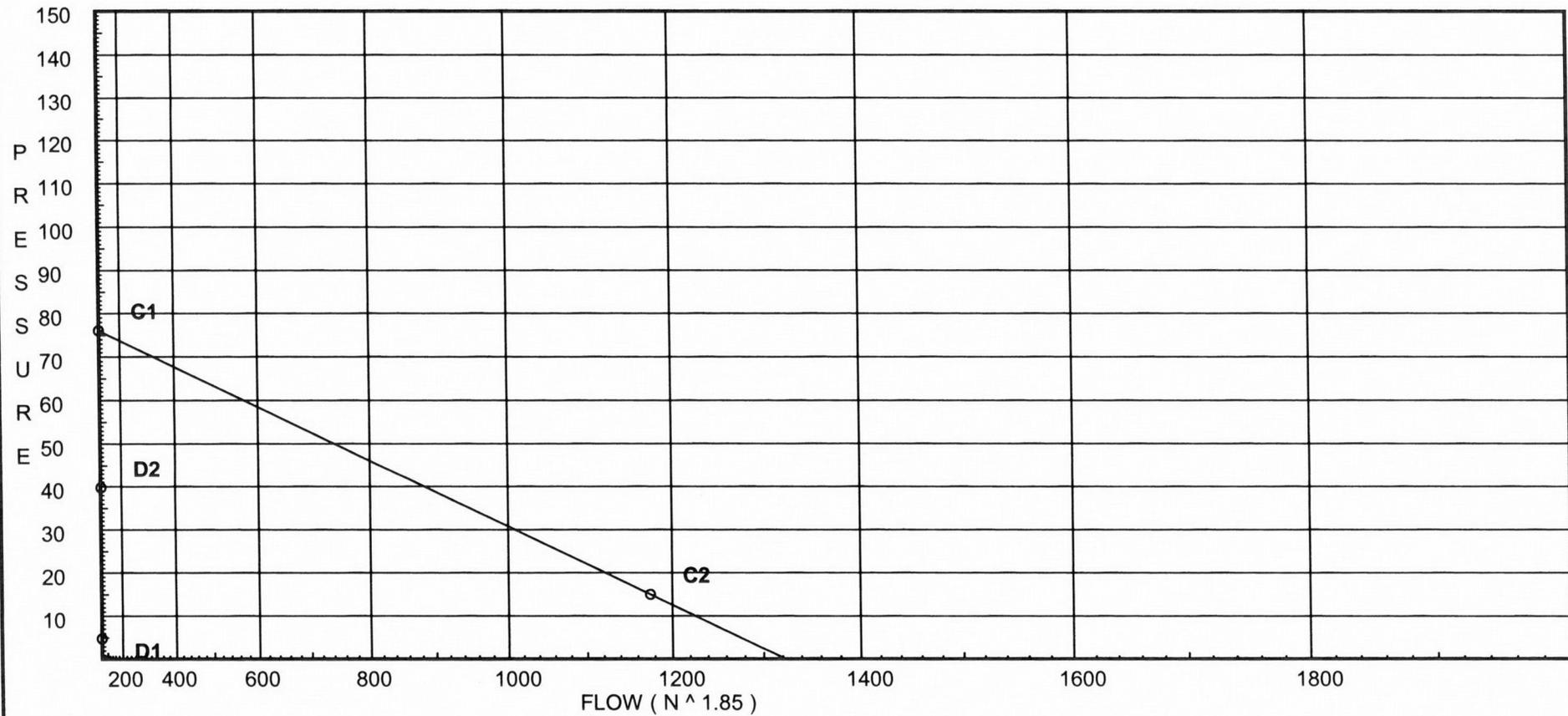
Water Supply Curve (C)

AFP Systems, Inc.
Pleasant Hills Lot #2

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City Water Supply:
C1 - Static Pressure : 76
C2 - Residual Pressure: 15
C2 - Residual Flow : 1175

Demand:
D1 - Elevation : 4.764
D2 - System Flow : 27.091
D2 - System Pressure : 39.696
Hose (Demand) :
D3 - System Demand : 27.091
Safety Margin : 36.247



Fittings Used Summary

AFP Systems, Inc.
Pleasant Hills Lot #2

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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	
N *	CPVC 90° Ell Harvel-Spears		7	7	8	9	11	12	13	0	0	0	0	0	0	0	0	0	0	0	0	0
O *	CPVC Tee - Branch	3	3	5	6	8	10	12	15	0	0	0	0	0	0	0	0	0	0	0	0	0
Zaa	Ames 2000B	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

AFP Systems, Inc.
Pleasant Hills Lot #2

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Node No.	Elevation	K-Fact	Pt Actual	Pn	Flow Actual	Density	Area	Press Req.
101	21.0	4.9	7.0	na	12.96	0.05	256	7.0
A1	21.0		7.73	na				
102	21.0		8.31	na				
A2	21.0	4.9	8.31	na	14.13	0.05	256	7.0
A	10.0		17.97	na				
TOR	10.0		20.83	na				
BOR	1.0		29.92	na				
M	0.0		31.83	na				
SCR	10.0		39.7	na				

The maximum velocity is 17.96 and it occurs in the pipe between nodes M and SCR

Final Calculations - Hazen-Williams

AFP Systems, Inc.
Pleasant Hills Lot #2

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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	*****
101	12.96	1.101	1N	7.0	17.000	7.000			K Factor = 4.90	
to		150.0		0.0	7.000	0.0				
A1	12.96	0.0305		0.0	24.000	0.732			Vel = 4.37	
A1	0.0	1.101	1O	5.0	14.000	7.732				
to		150.0		0.0	5.000	0.0				
A2	12.96	0.0305		0.0	19.000	0.580			Vel = 4.37	
	0.0									
	12.96					8.312			K Factor = 4.50	
102	0.0	1.101	1N	7.0	17.000	8.312				
to		150.0		0.0	7.000	0.0				
A2	0.0	0.0		0.0	24.000	0.0			Vel = 0	
A2	27.09	1.101	1O	5.0	29.000	8.312			K Factor = 4.90	
to		150.0	1N	7.0	12.000	4.764				
A	27.09	0.1193		0.0	41.000	4.891			Vel = 9.13	
A	0.0	1.101	2N	14.0	10.000	17.967				
to		150.0		0.0	14.000	0.0				
TOR	27.09	0.1193		0.0	24.000	2.863			Vel = 9.13	
TOR	0.0	1.101	1Zaa	0.0	10.000	20.830				
to		150.0		0.0	0.0	7.898			* Fixed loss = 4	
BOR	27.09	0.1192		0.0	10.000	1.192			Vel = 9.13	
BOR	0.0	1.598		0.0	76.000	29.920				
to		150.0		0.0	0.0	0.433				
M	27.09	0.0194		0.0	76.000	1.478			Vel = 4.33	
M	0.0	0.785		0.0	10.000	31.831				
to		150.0		0.0	0.0	1.669			* Fixed loss = 6	
SCR	27.09	0.6196		0.0	10.000	6.196			Vel = 17.96	
	0.0									
	27.09					39.696			K Factor = 4.30	