

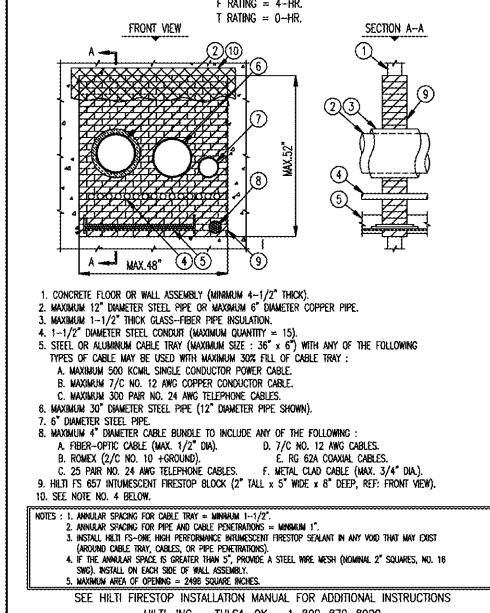
SURGE PROTECTIVE DEVICE

- A. SPD SHALL COMPLY WITH THE FOLLOWING STANDARDS:
1. UNDERWRITERS LABORATORIES, INC. ANSI/UL 1449, THIRD EDITION—SURGE PROTECTIVE DEVICES.
 2. IEEE STANDARD C62.11-2012; C62.33-1982; C62.41-2002; AND C62.45-2002.
 3. IEEE STANDARD 1100-2005 8.6.1
 4. NATIONAL ELECTRICAL CODE ARTICLE 240-21 (EQUIPMENT COMPLYING WITH TAP CONDUCTOR RULES) AND ARTICLE 110-9 (INTERRUPTING CAPACITY).
- B. ISO 9001 CERTIFIED MANUFACTURER
- C. SPECIFICATIONS FOR THE LIFE OF THE UNIT SHALL BE INCLUDED IN TERMS OF THE NUMBER OF "HITS" EACH UNIT CAN WITHSTAND IN THE LINE-TO-NEUTRAL MODE AT SPECIFIC SURGE CURRENT LEVELS BEFORE UNIT FAILURE UTILIZING THE CATEGORY C2 8X20 MICROSECOND CURRENT WAVEFORM TEST. THE SPD SHALL BE CAPABLE OF SURVIVING 20,000 REPETITIVE SURGE EVENTS BY ANSI/IEEE C62.41, CATEGORY C_T149M_T (100A) IMPULSES WITHOUT FAILURE OR DEGRADATION IN PERFORMANCE CHARACTERISTICS OF MORE THAN 10%.
- D. THE PER PHASE KILOAMPS (KA) RATINGS FOR EACH SPD DEVICE SHALL BE INCLUDED ON THE SUBMITTALS. THE MINIMUM KA RATINGS FOR THE FOLLOWING SHALL APPLY:
1. SERVICE ENTRANCE SWITCHBOARDS 240V (SSI # LSEDxxx-56)
 2. DISTRIBUTION 120-160V (SSI # SLDxxx-56)
 3. PANEL 80-120V (SSI # CKLxxx-56)
- E. SUBMIT TEST RESULTS (GRAPHS) FOR THE APPROPRIATE IEEE TESTS FOR ALL MODELS SUBMITTED SHOWING ACTUAL LET THROUGH VOLTAGES (USING 6" LEAD LENGTH AS MEASURED FROM THE POINT WHERE THE CONNECTION CONDUCTORS EXIT THE SPD ENCLOSURE).
- F. LEAD LENGTH MUST BE SPECIFIED AS WELL AS ALL APPLICABLE TEST PARAMETERS NECESSARY TO PERFORM A COMPLETE EVALUATION OF TEST RESULTS.
- G. UNITS SHALL CONSIST OF PARALLEL CONNECTIONS ONLY. SERIES ELEMENTS ARE NOT ACCEPTABLE.
- H. THE TRANSIENT SUPPRESSION DEVICE MUST BE UL LISTED UNDER THE UL 1449, 3RD EDITION, AS A COMPLETE ENTITY. LISTED UL LET THROUGH VOLTAGE RATING MUST BE CLEARLY STATED.
- I. UNIT SHALL EMPLOY METAL OXIDE VARISTORS AS THE PRIMARY SUPPRESSION TECHNOLOGY.
- J. SYSTEM VOLTAGES:
1. 480Y/277V, 3Ø, 4 WIRE
 2. 480V, 3Ø, 3 WIRE
 3. 208Y/120V, 3Ø, 4 WIRE
 4. 208V, 3Ø, 3 WIRE
 5. 120/240V, HI-LEG (PHASE B), 3Ø, 4 WIRE
- K. BASIS OF DESIGN PRODUCT IS SURGE SUPPRESSION INCORPORATED. EQUAL PRODUCTS MAY BE CONSIDERED BY ONE OF THE FOLLOWING MANUFACTURERS LISTED BELOW
1. LIEBERT
 2. CURRENT TECHNOLOGY
 3. SQUARE-D BY SCHNEIDER ELECTRIC
 4. APT
- L. ADDITIONAL FEATURES
1. LED INDICATORS SHALL BE UTILIZED TO INDICATE FAILURE OF PROTECTION MODULES.
 2. ALL UNITS SHALL BE ENCLOSED IN A WALL MOUNTABLE HEAVY DUTY ENCLOSURE EQUIVALENT TO A NEMA 1 RATING FOR INTERIOR INSTALLATIONS. ALL EXTERIOR UNITS SHALL BE ENCLOSED IN A WALL MOUNTABLE HEAVY DUTY ENCLOSURE EQUIVALENT TO A NEMA 12.
 3. 15 YEAR UNCONDITIONAL WARRANTY.
- M. UNITS SHALL BE INSTALLED OF THE SAME VOLTAGE RATING AS THE INTENDED PROTECTED EQUIPMENT.
- N. INSTALL UNITS WITH SHORTEST POSSIBLE LEAD LENGTH (MAXIMUM OF 18" FOR TYPE 1 UNITS, MAXIMUM OF 6" FOR TYPE 2 UNITS), WHERE CONDUIT IS NECESSARY TO INSTALL LEAD CONNECTION CONDUCTORS. LEADS SHALL BE INSTALLED IN RIGID NON-METALLIC CONDUIT AND SHALL NOT CONTAIN UNNECESSARY BENDS OR LOOPS.
- O. INSTALL ALL TYPE 1 AND 2 UNITS ON OR IMMEDIATELY ADJACENT TO THE DISTRIBUTION SECTION OF THE SERVICE GEAR ENCLOSURES WHERE THE CONNECTION LEAD LENGTH CAN BE KEPT AS SHORT AS POSSIBLE BUT ALSO SO THAT THE INSTALLATION WILL NOT INTERFERE WITH REMOVAL OF SERVICE GEAR PANELS. PROVIDE A DEDICATED 30A, 3-POLE CIRCUIT BREAKER IN SERVICE GEAR FOR CONNECTION TO EACH UNIT.
- P. INSTALL ALL TYPE 3 UNITS IMMEDIATELY ADJACENT TO THE PANEL ENCLOSURES.
- Q. SPD SHALL INCLUDE A SHORT CIRCUIT RATING AT ABOVE THE FAULT CURRENT AVAILABLE AT THE SERVICE ENTRANCE POINT.

1 SPD SPECIFICATIONS

NO SCALE

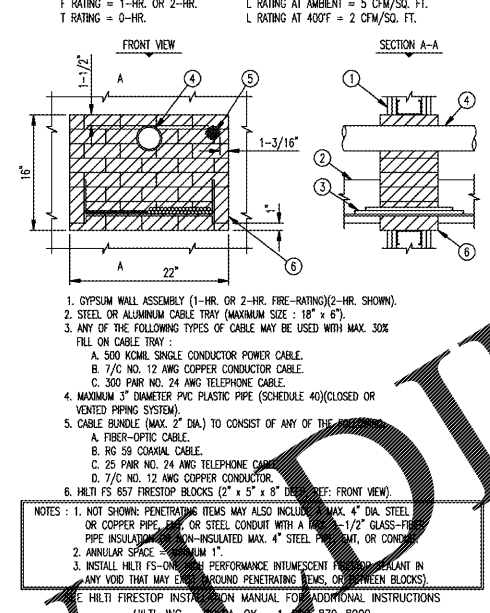
**U.L. SYSTEM NO. WJ8013
MULTIPLE PENETRATING ITEMS THROUGH CONCRETE FLOOR OR WALL**



1. CONCRETE FLOOR OR WALL ASSEMBLY (MINIMUM 4-1/2" THICK).
2. MAXIMUM 12" DIAMETER STEEL PIPE OR MAXIMUM 6" DIAMETER COPPER PIPE.
3. MAXIMUM 1-1/2" THICK GLASS-FIBER PIPE INSULATION.
4. 1-1/2" DIAMETER STEEL CONDUIT (MAXIMUM QUANTITY = 15).
5. STEEL OR ALUMINUM CABLE TRAY (MAXIMUM SIZE: 36" x 6") WITH ANY OF THE FOLLOWING TYPES OF CABLE MAY BE USED WITH MAXIMUM 30% FILL OF CABLE TRAY:
 - A. 500 KCMIL SINGLE CONDUCTOR POWER CABLE.
 - B. MAXIMUM 500 KCMIL SINGLE CONDUCTOR POWER CABLE.
 - C. 300 PAIR NO. 24 AWG TELEPHONE CABLE.
 - D. MAXIMUM 300 PAIR NO. 24 AWG TELEPHONE CABLES.
 - E. MAXIMUM 30" DIAMETER STEEL PIPE (12" DIAMETER PIPE SHOWN).
 - F. 6" DIAMETER STEEL PIPE.
 - G. MAXIMUM 4" DIAMETER CABLE BUNDLE TO INCLUDE ANY OF THE FOLLOWING:
 - A. FIBER-OPTIC CABLE (MAX. 1/2" DIA).
 - B. 7/8" NO. 12 AWG CABLES.
 - C. 25 PAIR NO. 24 AWG TELEPHONE CABLES.
 - D. 7/8" NO. 12 AWG COPPER CABLE.
 - E. RG 62A COAXIAL CABLES.
 - F. METAL CABLE (MAX. 3/4" DIA).
6. HILTI FS 857 INTUMESCENT FIRESTOP BLOCK (2" TALL x 5" WIDE x 8" DEEP, REF: FRONT VIEW).
7. SEE NOTE NO. 4 BELOW.

SEE HILTI FIRESTOP INSTALLATION MANUAL FOR ADDITIONAL INSTRUCTIONS
HILTI, INC. TULSA, OK 1-800-879-8000

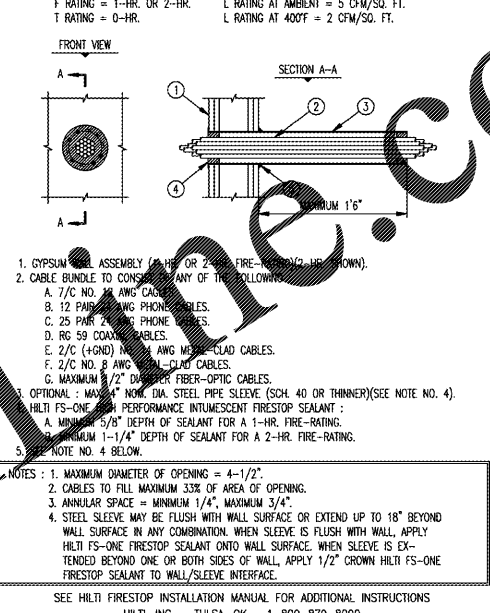
**U.L. SYSTEM NO. WL8013
MULTIPLE PENETRATIONS THROUGH 1-HR. OR 2-HR. GYPSUM WALL**



1. GYPSUM WALL ASSEMBLY (1-HR. OR 2-HR. FIRE-RATING)(2-HR. SHOWN).
2. STEEL OR ALUMINUM CABLE TRAY (MAXIMUM SIZE: 18" x 6").
3. ANY OF THE FOLLOWING TYPES OF CABLE MAY BE USED WITH MAX. 30% FILL ON CABLE TRAY:
 - A. 500 KCMIL SINGLE CONDUCTOR POWER CABLE.
 - B. 7/8" NO. 12 AWG COPPER CONDUCTOR CABLE.
 - C. 300 PAIR NO. 24 AWG TELEPHONE CABLE.
 - D. MAXIMUM 30" DIAMETER STEEL PIPE (SCHEDULE 40)(CLOSED OR VENTED PIPING SYSTEM).
 - E. 5.000 KCMIL SINGLE CONDUCTOR POWER CABLE.
 - F. 7/8" NO. 12 AWG COPPER CONDUCTOR CABLE.
 - G. 300 PAIR NO. 24 AWG TELEPHONE CABLE.
 - H. MAXIMUM 3" DIAMETER PVC PLASTIC PIPE (SCHEDULE 40)(CLOSED OR VENTED PIPING SYSTEM).
 - I. 5.000 KCMIL SINGLE CONDUCTOR POWER CABLE.
 - J. 7/8" NO. 12 AWG COPPER CONDUCTOR CABLE.
 - K. 300 PAIR NO. 24 AWG TELEPHONE CABLE.
 - L. MAXIMUM 3" DIAMETER STEEL PIPE (SCHEDULE 40)(CLOSED OR VENTED PIPING SYSTEM).
4. HILTI FS 857 INTUMESCENT FIRESTOP BLOCK (2" TALL x 5" WIDE x 8" DEEP, REF: FRONT VIEW).
5. SEE NOTE NO. 4 BELOW.

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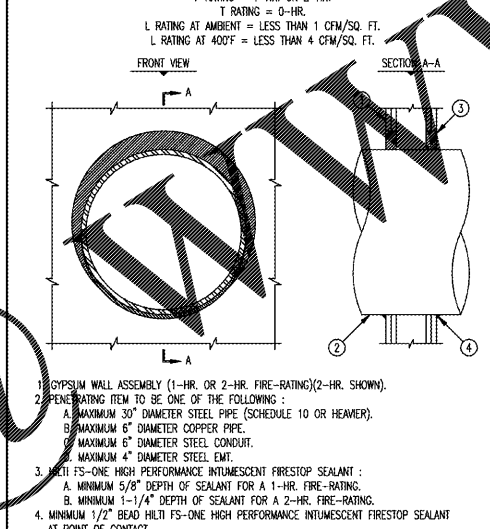
**U.L. SYSTEM NO. WL3065
CABLE BUNDLE THROUGH 1-HR. OR 2-HR. FIRE-RATED GYPSUM WALL**



1. GYPSUM WALL ASSEMBLY (1-HR. OR 2-HR. FIRE-RATING)(2-HR. SHOWN).
2. CABLE BUNDLE TO CONSIST OF ANY OF THE FOLLOWING:
 - A. 7/8" NO. 12 AWG CABLES.
 - B. 12 PAIR NO. 24 AWG TELEPHONE CABLES.
 - C. 25 PAIR NO. 24 AWG TELEPHONE CABLES.
 - D. RG 59 COAXIAL CABLES.
 - E. 2" (2") NO. 8 AWG METAL CLAD CABLES.
 - F. 2" (2") NO. 8 AWG METAL CLAD CABLES.
 - G. MAXIMUM 1/2" DIA. FIBER-OPTIC CABLES.
3. OPTIONAL: MAXIMUM 1/2" DIA. STEEL PIPE SLEEVE (SCH. 40 OR THINNER)(SEE NOTE NO. 4).
4. HILTI FS-ONE HIGH PERFORMANCE INTUMESCENT FIRESTOP SEALANT:
 - A. MINIMUM 5/8" DEPTH OF SEALANT FOR A 1-HR. FIRE-RATING.
 - B. MINIMUM 1-1/4" DEPTH OF SEALANT FOR A 2-HR. FIRE-RATING.
5. SEE NOTE NO. 4 BELOW.

SEE HILTI FIRESTOP INSTALLATION MANUAL FOR ADDITIONAL INSTRUCTIONS
HILTI, INC. TULSA, OK 1-800-879-8000

**U.L. SYSTEM NO. WL1054
METAL PIPE THROUGH GYPSUM WALL ASSEMBLY**

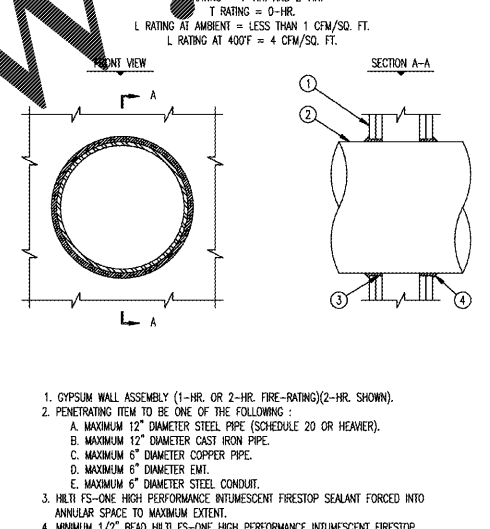


1. GYPSUM WALL ASSEMBLY (1-HR. OR 2-HR. FIRE-RATING)(2-HR. SHOWN).
2. PENETRATING ITEM TO BE ONE OF THE FOLLOWING:
 - A. MAXIMUM 30" DIAMETER STEEL PIPE (SCHEDULE 10 OR HEAVIER).
 - B. MAXIMUM 6" DIAMETER COPPER PIPE.
 - C. MAXIMUM 6" DIAMETER STEEL CONDUIT.
 - D. MAXIMUM 4" DIAMETER STEEL EMT.
3. HILTI FS-ONE HIGH PERFORMANCE INTUMESCENT FIRESTOP SEALANT:
 - A. MINIMUM 5/8" DEPTH OF SEALANT FOR A 1-HR. FIRE-RATING.
 - B. MINIMUM 1-1/4" DEPTH OF SEALANT FOR A 2-HR. FIRE-RATING.
4. MINIMUM 1/2" BEAD HILTI FS-ONE HIGH PERFORMANCE INTUMESCENT FIRESTOP SEALANT AT POINT OF CONTACT.

NOTES: 1. MAXIMUM DIAMETER OF OPENING = 32-1/4".
2. ANNULAR SPACE = MINIMUM 0", MAXIMUM 1/4".

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HILTI, INC. TULSA, OK 1-800-879-8000

**U.L. SYSTEM NO. WL1085
EMT THROUGH 1-HR. OR 2-HR. GYPSUM WALL ASSEMBLY**

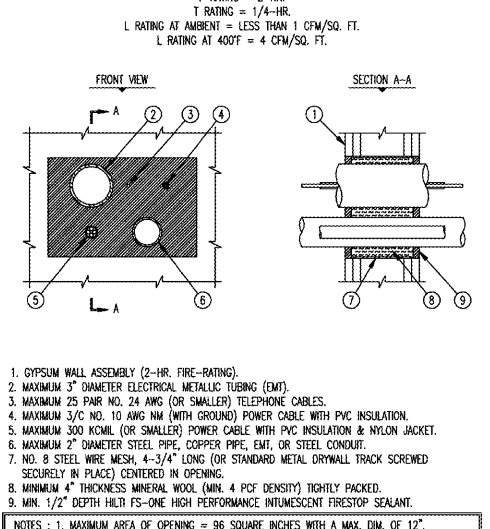


1. GYPSUM WALL ASSEMBLY (1-HR. OR 2-HR. FIRE-RATING)(2-HR. SHOWN).
2. PENETRATING ITEM TO BE ONE OF THE FOLLOWING:
 - A. MAXIMUM 12" DIAMETER STEEL PIPE (SCHEDULE 20 OR HEAVIER).
 - B. MAXIMUM 300 KCMIL (OR SMALLER) POWER CABLE WITH PVC INSULATION & NYLON JACKET.
 - C. MAXIMUM 6" DIAMETER COPPER PIPE.
 - D. MAXIMUM 6" DIAMETER STEEL CONDUIT.
 - E. MAXIMUM 6" DIAMETER STEEL EMT.
3. HILTI FS-ONE HIGH PERFORMANCE INTUMESCENT FIRESTOP SEALANT FORCED INTO ANNULAR SPACE TO MAXIMUM EXTENT.
4. MINIMUM 1/2" BEAD HILTI FS-ONE HIGH PERFORMANCE INTUMESCENT FIRESTOP SEALANT AT PIPE/GYPSUM WALLBOARD INTERFACE.

NOTE: ANNULAR SPACE = MINIMUM 0", MAXIMUM 1/4".

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**U.L. SYSTEM NO. WL8004
MULTIPLE METAL PIPE AND CABLE THROUGH 2-HR. GYPSUM WALL**

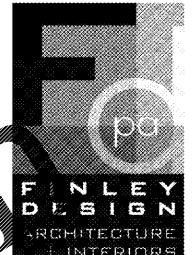


1. GYPSUM WALL ASSEMBLY (2-HR. FIRE-RATING).
2. MAXIMUM 3" DIAMETER ELECTRICAL METALLIC TUBING (EMT).
3. MAXIMUM 25 PAIR NO. 24 AWG (OR SMALLER) TELEPHONE CABLES.
4. MAXIMUM 3/8" NO. 10 AWG (WITH GROUND) POWER CABLE WITH PVC INSULATION.
5. MAXIMUM 300 KCMIL (OR SMALLER) POWER CABLE WITH PVC INSULATION & NYLON JACKET.
6. MAXIMUM 2" DIAMETER STEEL PIPE, COPPER PIPE, EMT, OR STEEL CONDUIT.
7. NO. 8 STEEL WIRE MESH, 4-3/4" LONG (OR STANDARD METAL DRYWALL TRACK SCREWED SECURELY IN PLACE) CENTERED IN OPENING.
8. MINIMUM 4" THICKNESS MINERAL WOOL (MIN. 4 PCF DENSITY) TIGHTLY PACKED.
9. MIN. 1/2" DEPTH HILTI FS-ONE HIGH PERFORMANCE INTUMESCENT FIRESTOP SEALANT.

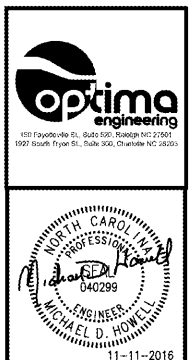
NOTES: 1. MAXIMUM AREA OF OPENING = 96 SQUARE INCHES WITH A MAX. DIA. OF 12".
2. DISTANCE BETWEEN ITEMS = MINIMUM 1-3/4", MAXIMUM 7".
3. DISTANCE FROM EDGE OF OPENING = MINIMUM 1/2", MAXIMUM 7". (EXCEPTION: 300 KCMIL POWER CABLE MUST BE MINIMUM 1-1/2" FROM EDGE OF OPENING.)

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Order Plans



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**WESTPOINT 2
DURHAM, NC**

REVISIONS

NO.	DATE	DESCRIPTION

PROJECT: 1342
DATE: 11/11/16
DRAWN BY: ASA
CHECKED BY: MDH

wall penetrations

E0.3
3 OF 24

OPTIMA # 16-0104