STRUCTURAL NOTES

DESIGN CRITERIA AND LOADS

1. The Florida Building Code 2010 Edition.

2. American Concrete Institution, Building Code requirements for reinforced concrete ACI 318, as amended.

3. American Institute or Steel Construction, Manual of Steel Construction, as Amended.

4. American Iron and Steel Institute, Standard Specifications.

5. Steel Deck Institute, Diaphragm Design Manual, 1981 Edition as Amended.

6. Welds are to conform to American Welding Society Standards.
   - A. D1.1 Structural Welding Code
   - B. D1.3 Specification for Welding Sheet Steel in Structures
   - C. D1.4 Structural Welding Code - Reinforcing Steel
   - D. Ostandards as applicable for the specific conditions.

7. Wind loads as per ASCE 7-10 Code Latest Edition.

GENERAL

1. Construction methods procedures, and sequences are the contractor's responsibility and the contractor is to take all the necessary means to maintain and protect the structural integrity of all construction at all stages.

2. Coordinate with the architectural, mechanical, plumbing and electrical drawings and verify the location and sizes of all chases, inserts, openings, sleeves, finishes, depressions, and other projects requirements not shown on the structural drawings.

3. Use manufacture's certified drawings and specifications for equipment anchorage and details.

4. All construction joints shown on the drawings shall be incorporated into the structure. Additional construction joints to facilitate construction shall be located and detailed on the shop drawing for review.

5. Horizontal construction joints shall not be permitted in walls and beams unless shown on the structural drawings.

6. Retire all beams which support walls have attained their 28 day compressive design strength.

7. The contractor is responsible for reviewing the mechanical, electrical and architectural drawings to determine where openings are required in concrete walls, beams, and slabs.

8. Not all openings and other components that are required have been shown on the drawings.

9. The contractor shall submit the shop drawings, detailing all openings, including added reinforcements as shown on typical wall, slab, and beam openings details for review.

10. All welding shall conform to A.W.S. Standards. Thickness of welds are shown, specified, or as required.

11. All structural members as shown have been designed to carry in place design loads only, the Contractors shall be responsible for the support of any additional loads and forces imposed during manufacturing, trucking, erecting, and handling.

12. All the Contractor's proposed substitutions shall be approved by the Engineer prior to any permanent work and prior to the award of the contract.

13. Elevations indicated on Site Plan drawings are relative to the National Geodetic Vertical Datum. Elevations indicated on all other drawings are relative to the finish floor Datum 0.000.

REINFORCED MASONRY

1. All block masonry walls shall have horizontal reinforcement " DUR-O-WALL Ladder type spaced 16" on center. Use prefabricated corners and tees by "DUR-O-WALL at corners and junctions of walls masonry units shall be 2 cell hollow units conforming to ASTM. C-90 with compressive strength of 1500 P.S.I. on the net cross-sectional area and shall be laid in running bond.

2. Anchors in masonry infill panels as required.

3. Where anchor bolts are set in masonry wall, fill block cells with grout for bolted course add one grouted cell above and two grouted cells below anchor elevation.

4. Grout used in the work shall conform to ASTM C476 and obtain a minimum compressive strength of 3,000 PSI in 28 days with a slump mix of 8" to 11". Provide clean- out and inspection holes at filled cells at bottom course.

5. Pour grout in lifts not to exceed 4 ft.

6. Hook top of vertical bars in all terminating columns 2" below top of slab and 3" below top of tie beam.

7. Tie beams shall have continuous reinforcement, provided by lapping splices not less than 30". Continuity shall be provided at all corners by bending 2#5 bars from each direction around the corner 30" or by adding 2#5 bent 30" each leg.

8. A Florida Registered Architect or Professional Engineer shall furnish inspection of all reinforced masonry structures.

9. Masonry block supplier shall provide certification that block supplied meets design requirements.

10. Mortar (Type M) cross webs adjacent to filled cells.

FOUNDATION

1. As per visual inspection soil conditions at this site are sand and rock with a minimum bearing capacity of 2500 PSF. Should other conditions or materials be encountered, the Architect shall be notified prior to proceeding with the work.

2. The subsurface soil profiles at this project site shall be improved by properly programmed applications of dynamic precompression treatment or a similar acceptable technique. To be implemented under the direction of a qualified Geotechnical Engineer, as to achieve the required degree of improvement and design soil bearing capacity.

3. The Geotechnical Engineer responsible for the ground applications and shall issue professional certification attesting to the satisfactory foundation soil conditions and the achievement of the design bearing value before any construction operation is allowed to start.

4. Prior to construction provide termite protection treatment to soil. A Certificate of Compliance shall be issued to the Building Department by the Licensed Pest Control Company that contains the following statement: " The building has received a complete treatment for the prevention of subterranean termites. Treatment is in accordance with the rules and laws established by the Florida Department of Agriculture and Consumer Services."

FOUNDATION (Cont'd.)

5. The area under foundations and slab on ground shall have all vegetation, stumps, roots, and foreign materials removed prior to their construction.

6. Compact interior fill to 95% of modified proctor maximum dry density as per ASTM D-1987 at optimum moisture content and compacted and tested in lifts not to exceed 12 in.

7. Excavations for foundations shall be backfilled with soil, which is free of organic material, construction debris, and large rocks.

8. Fill supporting such slabs shall be compacted under the supervision of a special inspector to a minimum of 95% of maximum dry density for all layers, as verified by field density tests.

REINFORCING STEEL

1. All bars are to be deformed new billet steel conforming to ASTM designation A615 GRADE 60. All reinforcing steel is to be securely held in place. Provide additional bars or stirrups for support as required.

2. All welding wire fabric is to low to conform to ASTM A185 minimum yield strength of 85 KSI.

3. Provided full embedment with 90 degree standard hooks for all dowels if not otherwise specified dowel size and no spacing is to be the same as main reinforcing.

4. When reinforcing steel is noted as continuous reinforcing in slabs, walls, and/or beams, splice continuous reinforcing steel only when unavoidable due to stock lengths. Stagger all splices a minimum of four feet. Adjacent bar with splices are not acceptable. Locate top bar for splices within middle half go the span and locate bottom bar splices at supports, or between supports and 1/3 span point unless noted otherwise on plans, details or schedules.

5. Provide interior and exterior horizontal lapped corner bars at all corners to match size, type and spacing of horizontal wall reinforcing.

6. Lap splices in welded wire fabric are to be made such that the overlap measured between outermost cross wires of each fabric sheet is not less then the cross wire spacing plus 3 inches.

7. Reinforcing bar lap splice length, for all members not specifically scheduled or detailed. (Class C).

STRUCTURAL STEEL

1. Structural steel shall be fabricated and erected in accordance with the latest AISC Steel Construction Manual and shall conform with the latest ASTM Specifications. Bolts shall conform to A.S.T.M. A325, anchor bolts shall conform to to ASTM A307.

2. Structural steel is to conform to ASTM A36 unless otherwise noted (U.O.N).

3. Structural steel for pipe is to conform to ASTM A501 A53, Type E or S, Grade B.

4. Structural steel for tubing is to conform as ASTM A501.

5. Structural steel for angles and miscellaneous item is to conform to ASTM A36.

6. Structural steel sizes shown are aisc rolled shapes.

7. Connections are to be bolted or welded, and are to be designed by the material supplier. (Engineered Shop Drawings)

8. Welded connections are to conform to the AWS, use E70 Series Electrodes, U.O.N.

9. Bolted connections are to be standard AISC bolted connections, use A325 bolts.

10. Survey all plans, details, sections and schedules for special connections.

11. Connections not specifically detailed are to be designed by the material supplier as determined by the AISC Tables for uniform load constants.

12. Welding in the shop or field may be done only by AWS Certified Welders.

13. Load indicator washers are to be used on friction connections.

REINFORCED CONCRETE

CONCRETE SCHEDULE:

Description	Normal & lightweight concrete 28 DAY Compressive Strength (PSI) 3,000	3,500	4,000
Spread footings	X		
Continuous footings	X		
Slab on grade	X		
Piers	X		
Columns	X		
All other concrete	X		

1. Concrete design is based upon ACI 318-05.

2. Clear cover for reinforcement shall be:

Footings permanently Exposed to Earth:	3"
Unformed Faces Exposed to Earth:	3"
Formed Faces in Contact with Earth:	2"
Slabs not in Contact with Earth:	1-½"
Slabs Exposed to Weather:	3"
Beams and Columns:	1-½"

3. Aggregates shall be clean and graded maximum sizes 3/4". concrete ASTM C-33 conforms to ASTM C-94.

4. Concrete tickets shall be time stamped when concrete is batched. The maximum time allowed from the time the mixing water is initially added until it is deposited in its final position shall not exceed 1-1/2 hours. If for any reason there is a longer delay than that stated above, the concrete shall be discarded. It shall be the responsibility of the testing lab to notify the Owner's representative and the Contractor of any noncompliance with the above.

5. Slump shall be a minimum of 3" and maximum of 5" concrete during and immediately after depositing shall by thoroughly compacted by means of mechanical vibration.

REINFORCED CONCRETE

8. Reinforcement steel shall be free of rust, flakes, mill scale, paint, oil, grease, or other contaminants that will reduce bond. All reinforcing shall be accurately located and firmly held in place before and during the placement of concrete by means of wire supports.

9. Provide 2#5 x 48" diagonally at corners of all openings wider than 15".

10. Provide at all corners 2#5 bars 60" length bent.

11. Lap continuous reinforcing a minimum of 48 bar diameters in beams & columns, 36 bar diameters in slabs.

12. Provide 12" standard aci hook minimum for all discontinuous top reinforcing.

13. Tie/ bond beams shall have continuous reinforcement, provided by lapping splices not less than 30". Continuity shall be provided at all corners by bending 2 bars from each direction around the corner 30" or by adding 2# 5 bent 30" each leg.

14. Continuity at columns shall be provided by continuing horizontal rebars through columns or by bending horizontal reinf. into columns a distance of 30".

15. Extend bottom bars 8" past all openings greater than 3'-0" on both sides.

WOOD

1. Wood in contact with concrete or masonry, and at other locations as shown on structural drawings, shall be protected with 30 # felt or pressure treated in accordance with AITC-109. Member size shown are nominal unless noted otherwise.

2. Truss manufacturer to submit 4 signed and sealed shop drawings and calculations for approval indicating all reactions and recommended truss anchoring systems to the supporting structure.

3. Coordinate truss layout with architectural drawings, if conflict is found notify Architect.

4. Beams, and girders shall be secured with approved metal ties, clips and anchors to tie beams or bearing walls.

5. All metal connectors used in locations exposed to weather shall be galvanized or Zmax or equal.

6. Nails shall penetrate the second member a distance equal to the thickness of the member being nailed thereto.

7. There shall be not less than 2 nails in any connection.

8. Roof and floor diaphragm shall comply with the design recommendations of "A.P.A. Design / Construction Guide - Diaphragms" and the Florida building code.

9. Plywood roof decking shall be 19/32" or 5/8" minimum thickness, and shall be continuous over two or more spans, with face grain perpendicular to the supports.

10. Connect plywood diaphragm to structure with 10d galvanized nails, spaced at 4"o.c. max. at edges and at 6"o.c. along intermediate supports.

11. Inspections: shall comply with the local building code requirements for inspections (by the Municipality, Architect or Engineer) of specified components of the roof structure requiring inspections.

12. Refer to truss engineering plans for exact truss locations. All girder trusses shall at a minimum have 2 # 5 filled cell (U.N.O.) directly beneath the girder truss should there be a discrepancy between the truss engineering drawing and architectural drawing the truss engineering drawing governs and notify architect immediately. It is your responsibility to notify the architect in writing and graphic form any changes and modifications from architectural layout. Failure to do so shall void our approval of the truss engineering package. Truss manufacturer shall also label all loads and uplifts on preliminary drawings sent to our office.

13. All truss to truss connections shall be the responsibility of the specialty Truss engineer but at a min. all connections shall be capable of withstanding a uplift load of 750 lb.

14. Truss Bracing Notes:
Cross bracing should be located at no more than 8'-0"o.c. at gable ends of building (as indicated on plans). 1"x4" bottom chord lateral bracing should be located at no more than 6'-0"o.c. Bottom chord lateral bracing should be close to the bottom chord panel points wherever required brace spacing permits (as indicated on plans). Continuity bottom chord lateral bracing should be continuous from one end of the building to the other and should overlap at least one truss space for continuity. Use min. 1"x4" grade marked lumber, nailed with a min. two 16d nails, in accordance with nds criteria, at each connection including intermediate trusses.

15. Members shall be free of cracks and knots. moisture content shall be 19% or less.

16. All bolts and penetrations through the top plates of all load bearing and non-load bearing partitions are to be fireblocked.

17. For trusses having an overall length of the bottom chord in excess of 35 feet or 6 feet overall height erection shall be supervised by either a registered professional engineer or registered architect retained by the contractor. A retainer letter from the registered professional engineer or registered architect shall be submitted along with the shop drawings as part of the permit document.

CONTRACTOR

1. Contractor shall be responsible for protection of adjacent structures, streets, and sidewalks during excavation and construction. Contractor shall verify all dimensions in the field. Should a discrepancy be found stop work immediately and notify architect. Work cannot proceed until architect gives his/hers written authorization to do so.

2. Contractor shall submit 2 sets of prints for all shop drawings to the Architect for approval prior to the fabrication or erection of all reinforcing and structural steel components.

3. Contractor shall locate all existing utilities prior to excavation, and reroute the utility lines to accommodate new construction.

4. Contractor shall work the Truss plans in conjunction with the architectural, mechanical, electrical, and plumbing drawings.

5. The use of scale to obtain dimensions not shown on these plans is strictly forbidden. The Architect will not be responsible for errors resulting from such action.

6. In case of discrepancies between the architectural and structural plans, the architectural plans shall govern unless strength is affected.

7. All specified materials and connectors can be substituted with equal or better, with the approval of the Architect.

9. Contractor shall verify that structure is constructed within the confines of building pad.

10. All work scheduled shall be the responsibility of the contractor. Appropriate notice must be given for any action required by Architect.

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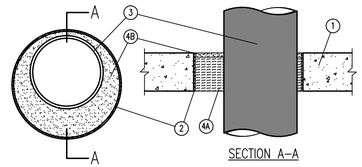
System No. C-AJ-1064

F RATINGS – 2, 3 & 4 HR (SEE ITEM 4)
USE AT CONCRETE & STEEL FLOOR UNITS
FOR FLOOR PENETRATIONS ONLY



SECTION A–A

1. FLOOR OR WALL ASSEMBLY – SEE CONFIGURATION A ABOVE. REINFORCED LIGHTWEIGHT OR NORMAL WEIGHT (100–150 PCF OR 1600–2400 KG/CU METER) CONCRETE AS SPECIFIED IN THE TABLE IN ITEM 4 BELOW. WALL MAY ALSO BE CONSTRUCTED OF ANY UL CLASSIFIED CONCRETE BLOCKS*. MAX DIAM OF SLEEVED OPENING IS 32 IN. (813 MM). SEE CONCRETE BLOCKS (CAZT) CATEGORY IN THE FIRE RESISTANCE DIRECTORY FOR NAMES OF MANUFACTURERS.

1A. FLOOR ASSEMBLY – SEE CONFIGURATION B ABOVE. MIN 6 IN. (152 MM) THICK UL CLASSIFIED HOLLOW–CORE PRECAST CONCRETE UNITS*. MAX DIAM OF OPENING IS 7 IN. (178 MM). SEE PRECAST CONCRETE UNITS (CFTV) CATEGORY IN THE FIRE RESISTANCE DIRECTORY FOR NAMES OF MANUFACTURERS.

2. STEEL SLEEVE (OPTIONAL) – NOM 32 IN. (813 MM) DIAM (OR SMALLER) SCHEDULE 10 (OR HEAVIER) STEEL PIPE SLEEVE CAST OR GROUTED INTO FLOOR OR WALL ASSEMBLY, FLUSH WITH BOTH SURFACES OF FLOOR OR WALL. AS AN OPTION, SLEEVE MAY EXTEND MAX 2 IN. ABOVE TOP SURFACE OF FLOOR OR BEYOND ONE OR BOTH SURFACES OF WALL. STEEL SLEEVE MAY BE USED IN 2 AND 3 HR F RATED SYSTEMS ONLY. W RATING APPLIES ONLY WHEN STEEL SLEEVE IS USED.

3. THROUGH PENETRANTS – ONE METALLIC PIPE, CONDUIT OR TUBING TO BE INSTALLED EITHER CONCENTRICALLY OR ECCENTRICALLY WITHIN THE FIRE STOP SYSTEM. PIPE, CONDUIT OR TUBING TO BE RIGIDLY SUPPORTED ON BOTH SIDES OF FLOOR OR WALL ASSEMBLY. SEE TABLE IN ITEM 4 FOR SIZES OF PENETRANTS A, B, D AND E THAT MAY BE USED. SEE ITEM 3C BELOW FOR SIZE OF CONDUIT THAT MAY BE USED. THE ANNULAR SPACE SHALL BE AS SPECIFIED IN TABLE IN ITEM 4 BELOW. THE FOLLOWING TYPES AND SIZES OF METALLIC PIPES, CONDUITS OR TUBING MAY BE USED:
- A. STEEL PIPE – SCHEDULE 10 (OR HEAVIER) STEEL PIPE.
- B. IRON PIPE – CAST OR DUCTILE IRON PIPE.
- C. CONDUIT – NOM 4 IN. (102 MM) DIAM (OR SMALLER) STEEL ELECTRICAL METALLIC TUBING OR NOM 6 IN. (152 MM) DIAM (OR SMALLER) STEEL CONDUIT.
- D. COPPER TUBING – TYPE L (OR HEAVIER) COPPER TUBING.
- E. COPPER PIPE – REGULAR (OR HEAVIER) COPPER PIPE. FIRESTOP SYSTEM – THE F RATING OF THE SYSTEM IS DEPENDENT UPON THE TYPE OF CONCRETE, THICKNESS OF CONCRETE, ANNULAR SPACE, FILL AND PACKING MATERIAL THICKNESS, PACKING MATERIAL DENSITY AND PENETRANT SIZE AS SHOWN IN THE TABLE BELOW. W RATING APPLIES TO ANNULAR SPACES OF MIN 0 IN. (POINT CONTACT) TO MAX 1–7/8 IN.

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F Rating hr	Min Thick Concrete In. (mm)	Annular Space In. (mm)	Min Thick Packing Mtl In. (mm)	Min Density Packing Mtl pcf (kg/cu meter)	Min Thick Fill Mtl, In. (mm)	Penetrant Size, In. (mm) Diam (or Smaller) D, E (Copper)	A, B, C (Steel, Iron)
2	4-1/2 (114)	⅛ to 32/8 (13 to 86)	3-1/2 (89)	6 (96)	½ (13)	4 (102)	16 (406)
2	5-1/2 (140)	0 to 9/8 (0 to 48)	5 (127)	4 (64)	½ (13)	4 (102)	16 (406)
3	4-1/2 (114)	⅛ to 32/8 (13 to 86)	3-1/2 (89)	6 (96)	½ (13)	4 (102)	8 (203)
3	4-1/2 (114)	0 to 2/8 (0 to 54)	4-1/4 (108)	4 (64)	¼ (6)	6 (152)	30 (762)
4	5-1/2 (140)	0 to 9/8 (0 to 48)	5 (127)	4 (64)	½ (13)	4 (102)	8 (203)

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FIRE RATED PENETRATION DETAIL 1
SCALE: N.T.S.

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System No. C-AJ-1448

F RATINGS – 3 HR
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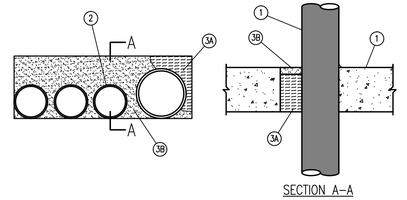
FOR FLOOR PENETRATIONS ONLY



SECTION A–A

1. FLOOR OR WALL ASSEMBLY – MIN 4–1/2 IN. THICK REINFORCED LIGHTWEIGHT OR NORMAL WEIGHT (100–150 PCF) CONCRETE FLOOR. WALL MAY ALSO BE CONSTRUCTED OF ANY UL CLASSIFIED CONCRETE BLOCKS*. MAY AREA OF OPENING IS 192 SQ IN. WITH A MAX DIMENSION OF 24 IN. SEE CONCRETE BLOCKS (CAZT) CATEGORY IN THE FIRE RESISTANCE DIRECTORY FOR NAMES OF MANUFACTURERS.

2. THROUGH PENETRANTS – ONE OR MORE PIPES, CONDUITS OR TUBING TO BE INSTALLED WITHIN THE OPENING. THE SPACE BETWEEN THE PIPES, CONDUITS OR TUBES SHALL BE MIN 1 IN. TO MAX 2 IN. THE ANNULAR SPACE BETWEEN THE PIPES, CONDUITS OR TUBING AND THE PERIPHERY OF THE OPENING SHALL BE MIN 0 IN. (POINT CONTACT) TO MAX 3–7/8 IN. PIPES, CONDUITS OR TUBING TO BE RIGIDLY SUPPORTED ON BOTH SIDES OF FLOOR OR WALL ASSEMBLY. THE FOLLOWING TYPES AND SIZES OF METALLIC PIPES, CONDUITS OR TUBING MAY BE USED:
- A. STEEL PIPE – NOM 8 IN. DIAM (OR SMALLER) SCHEDULE 5 (OR HEAVIER) STEEL PIPE.
- B. IRON PIPE – NOM 8 IN. DIAM (OR SMALLER) CAST OR DUCTILE IRON PIPE.
- C. CONDUIT – NOM 4 IN. DIAM (OR SMALLER) STEEL ELECTRICAL METALLIC TUBING (EMT) OR NOM 6 IN. DIAM (OR SMALLER) RIGID CONDUIT.
- D. COPPER PIPE – NOM 4 IN. DIAM (OR SMALLER) REGULAR (OR HEAVIER) COPPER PIPE.
- E. COPPER TUBE – NOM 4 IN. DIAM (OR SMALLER) TYPE L (OR HEAVIER) COPPER TUBE.

3. FIRESTOP SYSTEM – THE FIRESTOP SYSTEM SHALL CONSIST OF THE FOLLOWING:
- A. FORMING MATERIAL – MIN 4 IN. THICKNESS OF 4 PCF MINERAL WOOL BATT INSULATION TIGHTLY PACKED INTO THE ANNULAR SPACE, RECESSED ½ IN. FROM TOP SURFACE OF FLOOR OR BOTH SURFACES OF WALL TO ACCOMMODATE FILL MATERIAL (ITEM 3B). THE INSULATION IS FORMED FROM ONE PIECE, CUT TO THE SHAPE OF THE THROUGH OPENING, AND TIGHTLY PACKED WITH A 50 PERCENT COMPRESSION IN THE WIDTH DIRECTION. ADDITIONAL PIECES OF INSULATION TIGHTLY PACKED IN TO FILL ANY REMAINING VOIDS. PACKING MATERIAL RECESSED FROM TOP SURFACE OF FLOOR OR BOTH SURFACES OF WALL UNIT AS REQUIRED TO ACCOMMODATE FILL MATERIAL (ITEM 3B).
- B. FILL, VOID OR CAVITY MATERIAL* – CAULK – MIN 1/2 IN. THICKNESS OF FILL MATERIAL APPLIED WITHIN ANNULUS, FLUSH WITH TOP SURFACE OF FLOOR ASSEMBLY OR BOTH SURFACES OF WALL ASSEMBLY, AT POINT CONTACT LOCATIONS, MIN 1/4 IN. DIAM BEAD OF FILL MATERIAL APPLIED AT METALLIC PIPE/CONCRETE INTERFACE ON TOP SURFACE OF FLOOR OR ON BOTH SURFACES OF WALL.
  TREMCO INC – TREMSTOP INTUMESCENT ACRYLIC.

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FIRE RATED PENETRATION DETAIL 2
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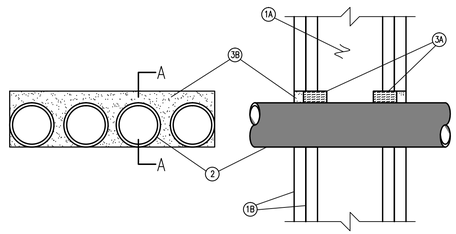
F RATINGS – 1 & 2 HR (SEE ITEM 1)
USE AT CONCRETE & STEEL FLOOR UNITS
FOR PENETRATIONS IN 1 & 2 HR PARTITIONS



SECTION A–A

1. WALL ASSEMBLY – THE 1 OR 2 HR FIRE–RATED GYPSUM WALLBOARD/STUD WALL ASSEMBLY SHALL BE CONSTRUCTED OF THE MATERIALS AND IN THE MANNER DESCRIBED IN THE INDIVIDUAL U300 OR U400 SERIES WALL OR PARTITION DESIGN IN THE UL FIRE RESISTANCE DIRECTORY AND SHALL INCLUDE THE FOLLOWING CONSTRUCTION FEATURES:
- A. STUDS – WALL FRAMING MAY CONSIST OF EITHER WOOD STUDS OR STEEL CHANNEL STUDS. WOOD STUDS TO CONSIST OF NOM 2 BY 4 IN. (51 BY 102 MM) LUMBER SPACED 16 IN. (406 MM) OC. STEEL STUDS TO BE MIN 2–1/2 IN. (64 MM) WIDE AND SPACED MAX 24 IN (610 MM) OC.
- B. GYPSUM BOARD* – ONE OR TWO LAYERS OF NOM 5/8 IN. (16 MM) THICK GYPSUM BOARD, AS SPECIFIED IN THE INDIVIDUAL WALL AND PARTITION DESIGN. MAX AREA OF OPENING IS 33 SQ IN. (213 SQ CM) WITH MAX DIMENSIONS OF 11 IN. (279 MM).

2. THROUGH PENETRANTS – ONE OR MORE PIPES, CONDUITS OR TUBING TO BE INSTALLED WITHIN THE OPENING. THE SPACE BETWEEN PIPES, CONDUITS OR TUBING SHALL BE A NOM 1/2 IN. (13 MM). THE SPACE BETWEEN PIPES, CONDUITS OR TUBING AND PERIPHERY OF OPENING SHALL BE MIN 0 IN. (POINT CONTACT) TO MAX 3/4 IN. (19 MM). PIPE, CONDUIT OR TUBING TO BE RIGIDLY SUPPORTED ON BOTH SIDES OF WALL ASSEMBLY. THE FOLLOWING TYPES AND SIZES OF PIPES, CONDUITS OR TUBING MAY BE USED:
- A. STEEL PIPE – NOM 2 IN. (51 MM) DIAM (OR SMALLER) SCHEDULE 10 (OR HEAVIER) STEEL PIPE.
- B. IRON PIPE – NOM 2 IN. (51 MM) DIAM (OR SMALLER) CAST OR DUCTILE IRON PIPE.
- C. CONDUIT – NOM 2 IN. (51 MM) DIAM (OR SMALLER) STEEL ELECTRICAL METALLIC TUBING OR RIGID STEEL CONDUIT.

3. FIRESTOP SYSTEM – THE FIRESTOP SYSTEM SHALL CONSIST OF THE FOLLOWING:
- A. PACKING MATERIAL – MIN 2–1/2 IN. (64 MM) THICKNESS OF MIN 4 PCF (64 KG/CU METER) MINERAL WOOL BATT INSULATION COMPRESSED AND FIRMLY PACKED INTO OPENING AS A PERMANENT FORM. PACKING MATERIAL RECESSED FROM BOTH SURFACES OF WALL AS REQUIRED TO ACCOMMODATE THE REQUIRED THICKNESS OF FILL MATERIAL.
- B. FILL VOID OR CAVITY MATERIALS* – SEALANT – MIN 1/2 IN. (13 MM) THICKNESS OF FILL MATERIAL APPLIED WITHIN ANNULUS, FLUSH WITH BOTH SURFACES OF WALL. TREMCO INC – TREMSTOP ACRYLIC, TREMSTOP INTUMESCENT ACRYLIC OR FYRE–SIL

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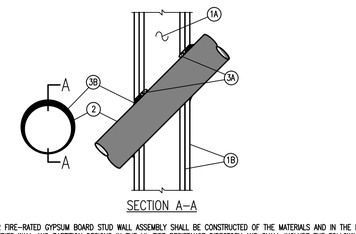
F RATINGS – 1 & 2 HR (SEE ITEM 1)
USE AT CONCRETE & STEEL FLOOR UNITS
FOR 45° PENETRATIONS IN 1 & 2 HR PARTITIONS



SECTION A–A

1. WALL ASSEMBLY – THE 1 OR 2 HOUR FIRE–RATED GYPSUM BOARD STUD WALL ASSEMBLY SHALL BE CONSTRUCTED OF THE MATERIALS AND IN THE MANNER SPECIFIED IN THE INDIVIDUAL U300, U400 OR V400 SERIES WALL AND PARTITION DESIGNS IN THE UL FIRE RESISTANCE DIRECTORY AND SHALL INCLUDE THE FOLLOWING CONSTRUCTION FEATURES:
- A. STUDS – WALL FRAMING MAY CONSIST OF EITHER WOOD STUDS OR STEEL CHANNEL STUDS. WOOD STUDS TO CONSIST OF NOM 2 BY 4 IN. (51 BY 102 MM) LUMBER SPACED 16 IN. (406 MM) OC. STEEL STUDS TO BE MIN 2–1/2 IN. (64 MM) WIDE AND SPACED MAX 24 IN. (610 MM) OC.
- B. GYPSUM BOARD* – ONE OR TWO LAYERS OF NOM 1/2 OR 5/8 IN. (13 OR 16 MM) THICK GYPSUM BOARD AS SPECIFIED IN THE INDIVIDUAL WALL AND PARTITION DESIGN. MAX DIAM OF OPENING IS 15–1/8 IN. (384 MM).
  THE HOURLY F RATING OF THE FIRESTOP SYSTEM IS EQUAL TO THE HOURLY FIRE RATING OF THE WALL ASSEMBLY IN WHICH IT IS INSTALLED.
  1A. STEEL SLEEVE – (OPTIONAL, NOT SHOWN.) CYLINDRICAL SLEEVE FABRICATED FROM MIN 0.013 IN. (0.330 MM) THICK (NO. 30 GAUGE) TO MAX 0.056 IN. (1.42 MM) (NO. 16 GAUGE) GALV STEEL SHEET AND HAVING A MIN 1 IN. (25 MM) LAP ALONG THE LONGITUDINAL SEAM. ENDS OF SLEEVE TO BE TRIMMED FLUSH WITH BOTH SURFACES OF WALL. SLEEVE TO BE INSTALLED BY COILING THE SHEET METAL TO A DIAM SMALLER THAN THE THROUGH OPENING, INSERTING THE COIL THROUGH THE OPENING AND RELEASING THE COIL TO LET IT UNCOIL AGAINST THE CIRCULAR CUTOUTS IN THE GYPSUM BOARD LAYERS.

2. THROUGH PENETRANTS – ONE METALLIC PIPE, TUBING OR CONDUIT TO BE INSTALLED EITHER CONCENTRICALLY OR ECCENTRICALLY WITHIN THE FIRESTOP SYSTEM. PIPE, TUBING OR CONDUIT TO BE RIGIDLY SUPPORTED ON BOTH SIDES OF WALL ASSEMBLY. THE PIPE, TUBING OR CONDUIT MAY BE INSTALLED AT AN ANGLE NOT GREATER THAN 45 DEGREES FROM THE PERPENDICULAR. THE ANNULAR SPACE SHALL BE MIN 0 (POINT CONTACT) IN. TO MAX 1–7/8 IN. (48 MM). THE FOLLOWING TYPES AND SIZES OF METALLIC PIPE TUBING OR CONDUIT MAY BE USED:
- A. STEEL PIPE – NOM 12 IN. (305 MM) DIAM (OR SMALLER) SCHEDULE 10 (OR HEAVIER) STEEL PIPE.
- B. IRON PIPE – NOM 12 IN. (305 MM) DIAM (OR SMALLER) CAST OR DUCTILE IRON PIPE.
- C. CONDUIT – NOM 4 IN. (102 MM) DIAM (OR SMALLER) STEEL ELECTRICAL METALLIC TUBING OR NOM 6 IN. DIAM (OR SMALLER) STEEL CONDUIT.
- D. COPPER TUBING – NOM 4 IN. (102 MM) DIAM (OR SMALLER) TYPE L (OR HEAVIER) COPPER TUBING.
- E. COPPER PIPE – NOM 4 IN. (102 MM) DIAM (OR SMALLER) REGULAR (OR HEAVIER) COPPER PIPE.

3. FIRESTOP SYSTEM – THE FIRESTOP SYSTEM SHALL CONSIST OF THE FOLLOWING:
- A. PACKING MATERIAL – (OPTIONAL) – FOAM BACKER ROD FIRMLY PACKED INTO THE OPENING AS A PERMANENT FORM. PACKING MATERIAL TO BE RECESSED FROM BOTH SURFACES OF WALL AS REQUIRED TO ACCOMMODATE THE REQUIRED THICKNESS OF FILL MATERIAL.
- B. FILL, VOID OR CAVITY MATERIAL* – (CAULK) MIN 1/2 IN. (13 MM) THICKNESS OF FILL MATERIAL APPLIED WITHIN THE ANNULUS, FLUSH WITH BOTH SURFACES OF WALL. WHEN ANNULAR SPACE EXCEEDS 1/2 IN. (13 MM), THE MIN THICKNESS OF FILL MATERIAL IS 5/8 IN. (16 MM). ADDITIONAL FILL MATERIAL TO BE INSTALLED SUCH THAT A MIN 3/8 IN. (10 MM) CROWN IS APPLIED AT THE PIPE/WALL INTERFACE AT THE POINT CONTACT LOCATION.
  TREMCO INC – TREMSTOP INTUMESCENT ACRYLIC.

*BEARING THE UL CLASSIFICATION MARK

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FIRE RATED PENETRATION DETAIL 4
SCALE: N.T.S.

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Issued Date
- ○ :Permit Set
- ○ :G.C. Bid Set
- ◉ 2-27-16:Owner Review Plan Set

Structural Notes/
Fire Penetration Details

A10

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