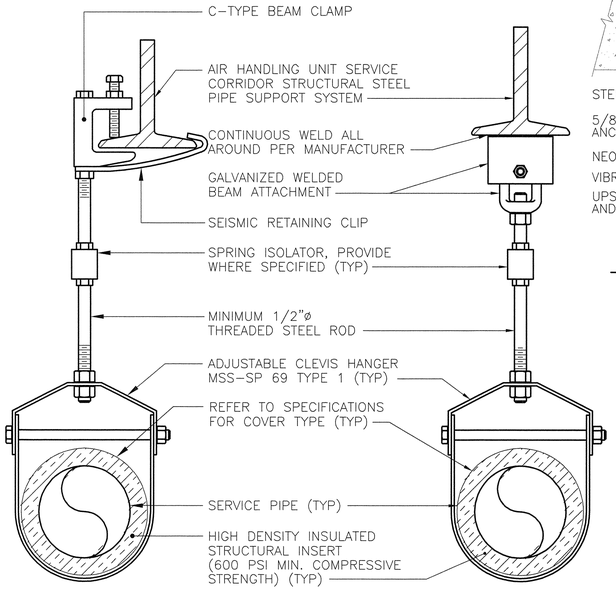
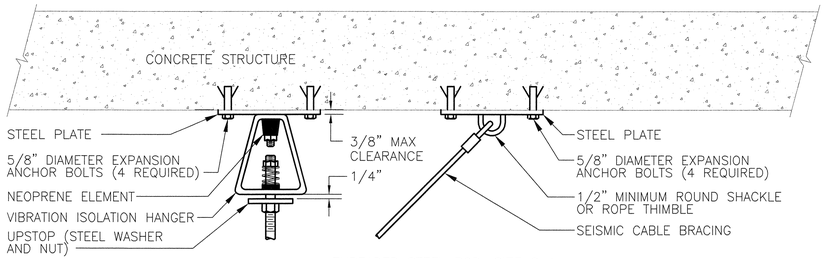
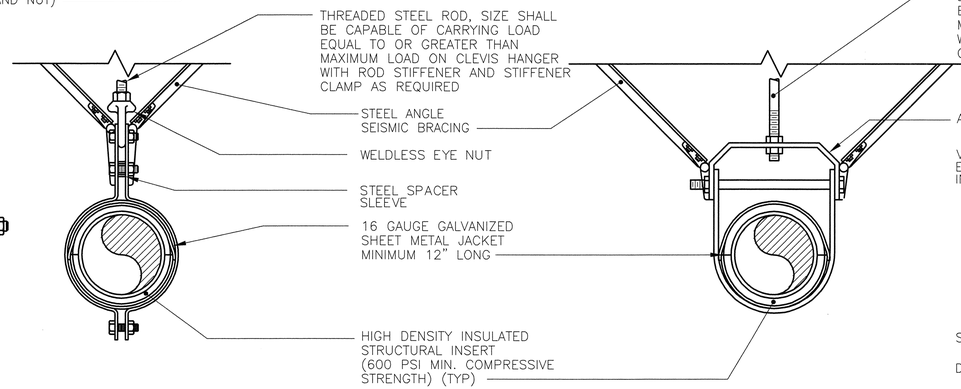
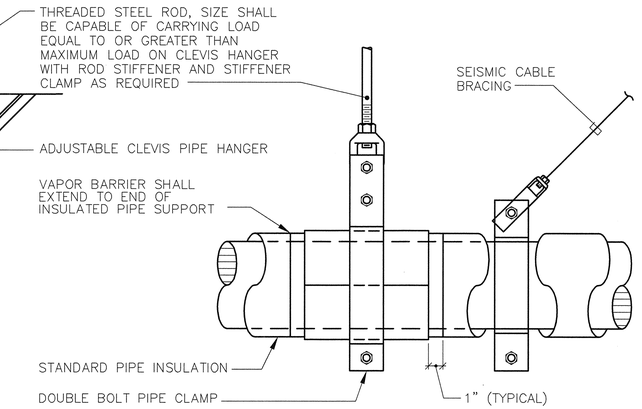



NOTES:

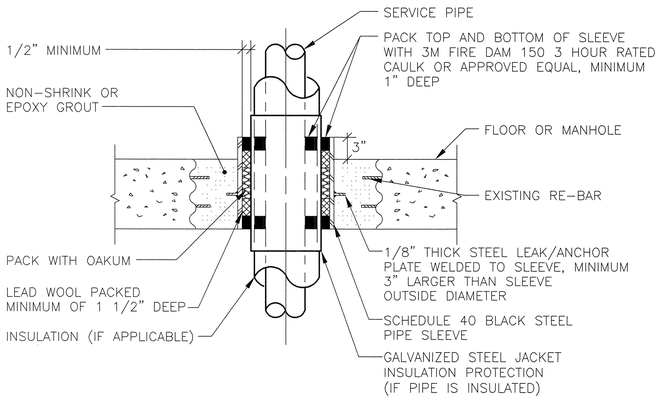
1. HANGER SPACING SHALL BE IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS.
2. CLEVIS TYPE PIPE HANGERS SHALL BE USED FOR PIPE SIZES 10" AND SMALLER AND WHEN PIPING SYSTEMS ARE STATIONARY.
3. PROVIDE SEISMIC SWAY BRACING FOR ALL PIPE HANGERS PER THE 2009 INTERNATIONAL BUILDING CODE AND THE 2009 INTERNATIONAL MECHANICAL CODE AND THE SMACNA SEISMIC RESTRAINT MANUAL GUIDELINES FOR MECHANICAL SYSTEMS SECOND EDITION-FEBRUARY, 1998 AND ADDENDUM NO. 1 SEPTEMBER, 2000.
4. VERIFY MAXIMUM LOADING ON PIPE SUPPORT ASSEMBLIES PRIOR TO INSTALLATION.




## DETAIL - PIPE HANGER

SCALE: NONE (1)




NOTE:

1. PIPE SHALL BE SUPPORTED BY RISER CLAMPS OR ABOVE AND BELOW WITH PIPE HANGERS.

## DETAIL - PIPE PENETRATION THROUGH FLOOR

SCALE: NONE (2)

X

SCALE: NONE (X)

x

SCALE: NONE (X)

Partner In Charge: DSC
Project Engineer: CRB
Drawn By: CSL
Date Drawn: 11-28-11

Revisions
No.____ Date____
No.____ Date____
No.____ Date____
No.____ Date____
No.____ Date____
No.____ Date____
No.____ Date____
No.____ Date____
No.____ Date____

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RMF ENGINEERING INC.
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C-00831
REGISTERED ENGINEERS

Project: PHRC LABORATORY 305 RENOVATION

Sheet Title: PLUMBING DETAILS

JHS Architecture: Integrated Design
1812 LINCOLN STREET
THIRD FLOOR
COLUMBIA, SC 29201-2310
PHONE: 1.803.252.2400
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Project Number: 922x06

Sheet: P4.1 Of

# THROUGH PENETRATION FIRESTOP SCHEDULE

A. THIS SCHEDULE IDENTIFIES REQUIREMENTS FOR ACCEPTABLE THROUGH PENETRATION FIRESTOPS BASED ON BARRIER TYPE, BASIS OF BARRIER CONSTRUCTION, AND PENETRANT TYPE. THIS IS A STANDARD THROUGH PENETRATION FIRESTOP SCHEDULE. SOME BARRIERS AND/OR PENETRANT TYPES MAY NOT APPEAR ON THE DRAWINGS.

B. THROUGH PENETRATION FIRESTOPS ARE NOT REQUIRED FOR FLOOR PENETRATIONS CONTAINED TOTALLY WITHIN A RATED SHAFT ENCLOSURE.

C. FOR EACH PENETRATION, SELECT A THROUGH PENETRATION FIRESTOP BASED ON ACTUAL FIELD CONDITIONS, WHICH INCLUDE BUT ARE NOT LIMITED TO PENETRATION SIZE, PENETRATION SHAPE, PENETRANT MATERIAL(S), QUANTITY OF PENETRANTS PER PENETRATION, AND LOCATION(S) OF PENETRANT(S) WITHIN PENETRATION.

D. NOMENCLATURE OF UL CLASSIFIED FIRESTOP ASSEMBLIES USED IN THIS SCHEDULE IS IDENTICAL TO THAT USED IN CATALOGS OF APPROVED FIRESTOP MANUFACTURERS (SEE DIVISION 15) AND IN UNDERWRITERS LABORATORIES "FIRE RESISTANCE DIRECTORY."

| RATED BARRIER | | FIRESTOP ASSEMBLY REQUIREMENTS | | PENETRANT TYPE | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| TYPE | BASIS OF CONSTRUCTION | | | NO PENETRANTS | METALLIC, UNINSULATED PIPE OR TUBING (EX. COPPER, IRON, STEEL) (NOTE 14) | NONMETALLIC, UNINSULATED PIPE OR TUBING (EX. PVC, PP, CPVC, GLASS, FRPP) | INSULATED PIPES (EX. COPPER, IRON PLASTIC, STEEL) IN SYSTEMS OPERATING BETWEEN 32°F AND 122°F (NOTE 1) | INSULATED PIPES (EX. COPPER, IRON PLASTIC, STEEL) IN SYSTEMS OPERATING BELOW 32°F OR ABOVE 122°F (NOTE 2) | METAL DUCT (NOTE 3) | RECESSED DEVICES (NOTE 4) |
| WALL | WOOD STUDS & GYPSUM WALLBOARD (U300 SERIES) | UL CLASSIFIED SERIES | SINGLE PENETRANT | W-L-0000 SERIES OR NOTE 5 | W-L-1000 SERIES | W-L-2000 SERIES | W-L-5000 SERIES | W-L-5000 SERIES | W-L-7000 SERIES | W-L-7000 SERIES NOTE 8 |
| | | | MULTIPLE PENETRANTS | | W-L-8000 SERIES (NOTE 6) | | W-L-8000 SERIES (NOTE 6) | W-L-8000 SERIES (NOTE 6) | N/A | |
| | | F RATING | | EQUAL TO WALL RATING | EQUAL TO WALL RATING | EQUAL TO WALL RATING | EQUAL TO WALL RATING | EQUAL TO WALL RATING | EQUAL TO WALL RATING | EQUAL TO WALL RATING |
| | | T RATING | | NOTE 10 | NOTE 10 | NOTE 10 | NOTE 10 | NOTE 10 | NOTE 10 | NOTE 10 |
| | | EXCEPTIONS/ ADDED REQUIREMENTS | | NONE | NOTE 13 | NOTE 13 | NONE | NOTE 7 | NONE | NONE |
| WALL | METAL STUDS & GYPSUM WALLBOARD (U400 SERIES) | UL CLASSIFIED SERIES | SINGLE PENETRANT | W-L-0000 SERIES OR NOTE 5 | W-L-1000 SERIES | W-L-2000 SERIES | W-L-5000 SERIES | W-L-5000 SERIES | W-L-7000 SERIES | W-L-7000 SERIES NOTE 8 |
| | | | MULTIPLE PENETRANTS | | W-L-8000 SERIES (NOTE 6) | | W-L-8000 SERIES (NOTE 6) | W-L-8000 SERIES (NOTE 6) | N/A | |
| | | F RATING | | EQUAL TO WALL RATING | EQUAL TO WALL RATING | EQUAL TO WALL RATING | EQUAL TO WALL RATING | EQUAL TO WALL RATING | EQUAL TO WALL RATING | EQUAL TO WALL RATING |
| | | T RATING | | NOTE 10 | NOTE 10 | NOTE 10 | NOTE 10 | NOTE 10 | NOTE 10 | NOTE 10 |
| | | EXCEPTIONS/ ADDED REQUIREMENTS | | NONE | NOTE 13 | NOTE 13 | NONE | NOTE 7 | NONE | NONE |
| WALL | POURED CONCRETE, CONCRETE BLOCK OR MASONRY (BLOCK & U900 SERIES) (ANY THICKNESS) | UL CLASSIFIED SERIES | SINGLE PENETRANT | W-J-0000 SERIES OR NOTE 5 | C-AJ-1000 OR W-J-1000 SERIES | C-AJ-2000 OR W-J-2000 SERIES | C-AJ-5000 OR W-J-5000 SERIES | C-AJ-5000 OR W-J-5000 SERIES | C-AJ-7000 OR W-J-7000 SERIES | NOTE 8 |
| | | | MULTIPLE PENETRANTS | | C-AJ-8000 OR W-J-8000 SERIES (NOTE 6) | | C-AJ-8000 OR W-J-8000 (NOTE 6) | C-AJ-8000 OR W-J-8000 (NOTE 6) | N/A | |
| | | F RATING | | EQUAL TO WALL RATING | EQUAL TO WALL RATING | EQUAL TO WALL RATING | EQUAL TO WALL RATING | EQUAL TO WALL RATING | EQUAL TO WALL RATING | EQUAL TO WALL RATING |
| | | T RATING | | NOTE 10 | NOTE 10 | NOTE 10 | NOTE 10 | NOTE 10 | NOTE 10 | NOTE 10 |
| | | EXCEPTIONS/ ADDED REQUIREMENTS | | NONE | NOTES 12 & 13 | NOTE 13 | NONE | NOTE 7 | NONE | NONE |
| FLOOR | POURED CONCRETE (ANY THICKNESS) | UL CLASSIFIED SERIES | SINGLE PENETRANT | C-AJ-0000 SERIES F-A-0000 SERIES OR NOTE 5 | C-AJ-1000 OR F-A-1000 SERIES | C-AJ-2000 OR F-A-2000 SERIES | C-AJ-5000 OR F-A-5000 SERIES | C-AJ-5000 OR F-A-5000 SERIES | C-AJ-7000 OR F-A-7000 SERIES | NOTE 8 |
| | | | MULTIPLE PENETRANTS | | C-AJ-8000 OR F-A-8000 SERIES (NOTE 6) | | C-AJ-8000 OR F-A-8000 (NOTE 6) | C-AJ-8000 OR F-A-8000 (NOTE 6) | N/A | |
| | | F RATING | | EQUAL TO FLOOR RATING, BUT NOT LESS THAN 1 HR | EQUAL TO FLOOR RATING, BUT NOT LESS THAN 1 HR | EQUAL TO FLOOR RATING, BUT NOT LESS THAN 1 HR | EQUAL TO FLOOR RATING, BUT NOT LESS THAN 1 HR | EQUAL TO FLOOR RATING, BUT NOT LESS THAN 1 HR | EQUAL TO FLOOR RATING, BUT NOT LESS THAN 1 HR | EQUAL TO FLOOR RATING, BUT NOT LESS THAN 1 HR |
| | | T RATING | | NOTE 11 | NOTE 11 | NOTE 11 | NOTE 11 | NOTE 11 | NOTE 11 | NOTE 11 |
| | | EXCEPTIONS/ ADDED REQUIREMENTS | | NONE | NOTE 12 | NONE | NONE | NOTE 7 | NONE | NONE |

NOTES

1. EXAMPLES OF SYSTEMS THAT OPERATE BETWEEN 32 DEGF AND 122 DEGF:

   CHILLED WATER SUPPLY & RETURN
   HEAT PUMP WATER SUPPLY & RETURN
   DOMESTIC COLD AND TEMPERED WATER
   DOMESTIC HOT WATER LESS THAN 122 DEGF
   DOMESTIC HOT WATER RECIRCULATION LESS THAN 122 DEGF

2. EXAMPLES OF SYSTEMS OPERATING BELOW 32 DEGF OR ABOVE 122 DEGF:

   STEAM SUPPLY & RETURN
   STEAM VENT
   CONDENSATE PUMP DISCHARGE
   BOILER BLOWDOWN
   CRYOGENIC VENT
   ENGINE GENERATOR EXHAUST
   HEATING HOT WATER SUPPLY & RETURN
   HOT-CHILLED WATER SUPPLY & RETURN
   GLYCOL HEATING HOT WATER SUPPLY & RETURN
   DOMESTIC HOT WATER SUPPLY 140 DEGF
   DOMESTIC HOT WATER RECIRCULATION 140 DEGF

3. THIS SCHEDULE'S DATA APPLY ONLY TO PENETRATIONS WITHOUT DAMPERS. FOR DAMPERED PENETRATIONS, REFER TO SPECIFICATIONS. AT DAMPERS, DO NOT APPLY MATERIAL THAT IS NOT INCLUDED IN THE DAMPER'S CLASSIFICATION.

4. EXAMPLES OF RECESSED DEVICES:

   MEDICAL GAS ZONE VALVES
   MEDICAL GAS OUTLETS
   FIRE VALVE CABINETS
   FIRE HOSE CABINETS
   UNIT HEATERS
   FIRE FIGHTERS' PHONE
   FIRE EXTINGUISHER CABINET
   CENTRAL VACUUM OUTLETS

5. SEAL OPENING USING BARRIER'S ORIGINAL CONSTRUCTION.

6. WHERE A SERIES 8000 CLASSIFIED SYSTEM IS NOT AVAILABLE, INSTALL PENETRANTS SINGLY, AND PROVIDE SINGLE-PENETRANT SYSTEMS.

7. FOR SYSTEMS THAT OPERATE BELOW 32°F OR ABOVE 122°F, COMPLY WITH THE FOLLOWING ADDITIONAL REQUIREMENTS:

   A. PROVIDE TPFS SYSTEM USING INTUMESCENT ELASTOMERIC WRAP STRIP AS ITS FILL, VOID, OR CAVITY MATERIAL.
   B. DO NOT USE SERIES 8000 PENETRATIONS. PROVIDE ONLY SINGLE PENETRATIONS.

8. WHERE UL CLASSIFIED SYSTEMS ARE NOT AVAILABLE FOR OTHER RECESSED DEVICES, MAINTAIN CONTINUITY OF RATED BARRIER CONSTRUCTION AROUND RECESS.

9. REQUIREMENTS FOR MEMBRANE PENETRATIONS AND THROUGH PENETRATIONS ARE IDENTICAL.

10. TEMPERATURE (T) RATINGS OF ASSEMBLIES IN WALLS MAY EQUAL ZERO.

11. TEMPERATURE (T) RATINGS OF ASSEMBLIES IN FLOORS SHALL EQUAL THE GREATER OF EITHER THE BARRIER RATING OR ONE HOUR EXCEPT AS FOLLOWS:

    A. AN ASSEMBLY'S T RATING MAY EQUAL ZERO WHEN THE PENETRANT ABOVE THE FLOOR PENETRATION IS CONTAINED AND LOCATED WITHIN THE CAVITY OF A WALL.

12. CLASSIFIED TPFS ASSEMBLY IS NOT REQUIRED WHEN ALL THE FOLLOWING CONDITIONS ARE MET:

    A. PENETRANT HAS A MAXIMUM NOMINAL DIAMETER OF 6-INCHES.
    B. PENETRATION HAS A MAXIMUM AREA OF 144 SQUARE INCHES.
    C. ANNULAR SPACE IS COMPLETELY FILLED WITH CONCRETE, GROUT, OR MORTAR THE FULL THICKNESS OF THE BARRIER.

13. OPENINGS ACCOMMODATING NONCOMBUSTIBLE CONDUITS, PIPES AND TUBES THROUGH SINGLE MEMBRANES WHICH ARE PART OF A FIRE RESISTANCE RATED WALL ASSEMBLY ARE PERMITTED WHEN:

    A. AGGREGATE AREA OF THE MEMBRANE OPENINGS DO NOT EXCEED 100 SQUARE INCHES FOR ANY 100 SQUARE FEET OF WALL AREA.

14. THIS COLUMN ALSO INCLUDES WIRES AND CABLES WITH STEEL JACKETS.

SOUTH CAROLINA LICENSED PROFESSIONAL ENGINEER No. 24044 CRAIG R. BUCK

Partner In Charge: DSC
Project Engineer: CRB
Drawn By: CSL
Date Drawn: 11-28-11

Revisions
No. Date
No. Date
No. Date
No. Date
No. Date
No. Date
No. Date
No. Date
No. Date
No. Date

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RMF PROJECT NUMBER: 311034.A0



STATE OF SOUTH CAROLINA RMF ENGINEERING INC. MOUNT PLEASANT, SC C-00831 REGISTERED ENGINEERS

Project: PHRC LABORATORY 305 RENOVATION

Sheet Title: PLUMBING SCHEDULES

JHS Architecture: Integrated Design
1812 LINCOLN STREET
THIRD FLOOR
COLUMBIA, SC 29201-2310
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Project Number: 922x06

Sheet: P5.1 Of


## PLUMBING FIXTURE SCHEDULE

| No | FIXTURE | ROUGH–IN CONNECTION | | | | | FIXTURE UNITS | | | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|
| | | CW | HW | TEPID | SAN | VENT | CW | HW | SAN | |
| P–1 | LAB SINK | 1/2" | 1/2" | – | 1 1/2" | 1 1/2" | 1.0 | 1.0 | 2 | INTEGRAL W/COUNTERTOP ① |
| P–2 | EMERGENCY EYEWASH | | | 1/2" | | | | | | TEPID WATER ① |
| P–3 | EMERGENCY EYEWASH/SHOWER | – | – | 1" | 2" | 1 1/2" | – | – | 1 | TEPID WATER ① |
| P–4 | ICE MAKER CONNECTION | 1/2" | – | – | – | – | 0.25 | – | – | RECESSED |
| | | | | | | | | | | |

① REFER TO ARCHITECT/LABORATORY PLANNER DRAWINGS FOR MORE INFORMATION. PLUMBING FIXTURE SCHEDULE IS FOR ROUGH–IN SIZES ONLY.

## LABORATORY EQUIPMENT SCHEDULE

| DESIGNATION | DESCRIPTION | ROUGH–IN CONNECTION | | | | | | | REMARKS |
|---|---|---|---|---|---|---|---|---|---|
| | | CW | HW | SAN | VENT | AIR | VAC | GAS | |
| FH–1 | FUME HOOD | 1/2" | – | 1 1/2" | 1 1/2" | 1/2" | 3/4" | 1/2" | ① |
| | | | | | | | | | |

① REFER TO ARCHITECT/LABORATORY PLANNER DRAWINGS FOR CONNECTION LOCATIONS AND MORE INFORMATION. LABORATORY EQUIPMENT SCHEDULE IS FOR ROUGH–IN SIZES ONLY.

Partner In Charge
DSC
Project Engineer
CRB
Drawn By
CSL
Date Drawn
11-28-11

Revisions
No.____ Date____
No.____ Date____
No.____ Date____
No.____ Date____
No.____ Date____
No.____ Date____
No.____ Date____
No.____ Date____
No.____ Date____
No.____ Date____

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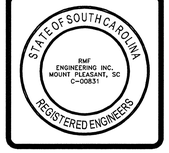


Project
PHRC LABORATORY 305 RENOVATION

Sheet Title
PLUMBING SCHEDULES

Architecture
Integrated Design
1812 LINCOLN STREET
THIRD FLOOR
COLUMBIA, SC 29201-2310
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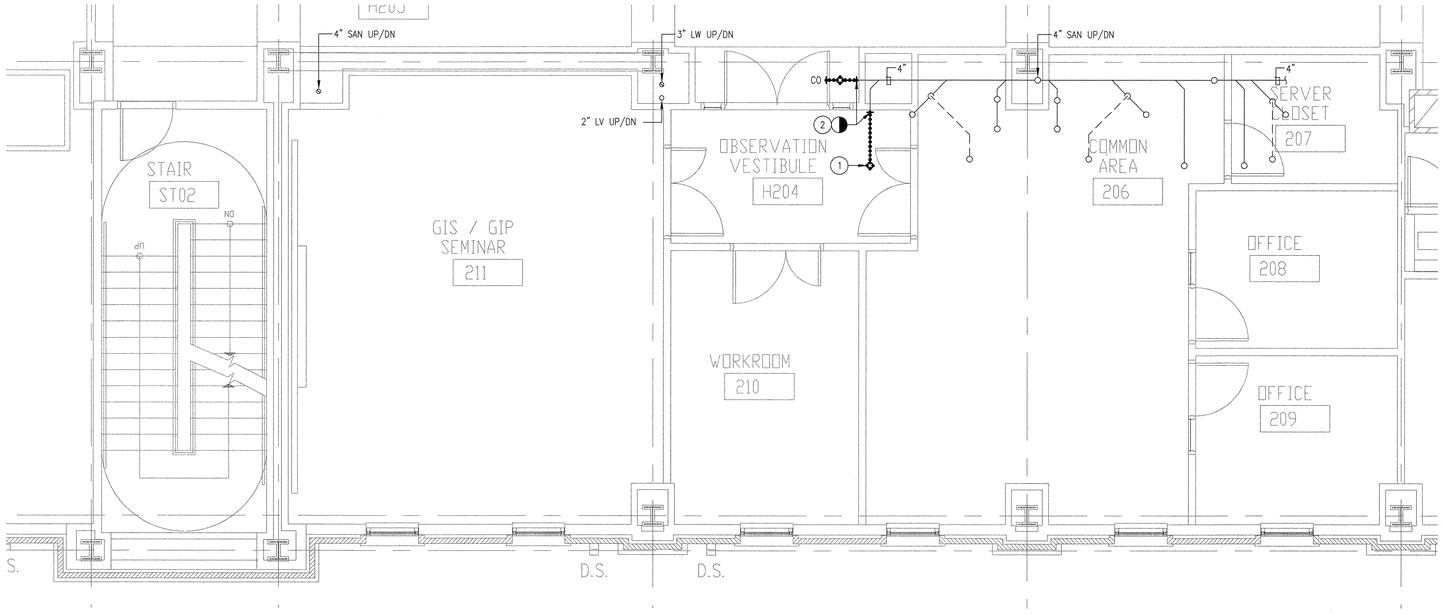
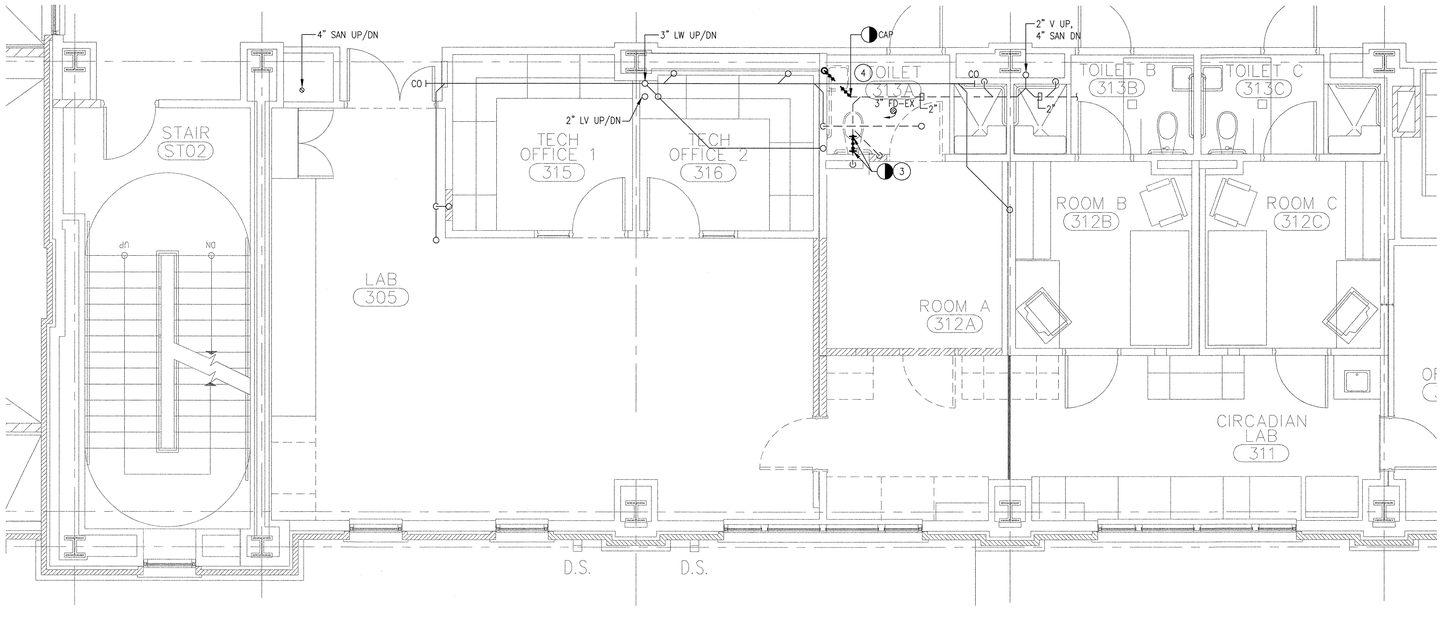
P5.2




## PARTIAL SECOND FLOOR – DEMOLITION SANITARY/VENT

SCALE: 1/4"=1'-0"




## PARTIAL THIRD FLOOR – DEMOLITION SANITARY/VENT

SCALE: 1/4"=1'-0"

GRAPHIC SCALE
4 2 0 4 8
SCALE: 1/4"=1'-0"
UNIT OF MEASURE: FEET

SOUTH CAROLINA LICENSED PROFESSIONAL ENGINEER
No. 24044
CRAIG R. BUCK

### GENERAL NOTES:

1. ALL OPENINGS IN THE SECOND FLOOR SLAB RESULTING FROM PIPE DEMOLITION SHALL BE PATCHED FLUSH TO MATCH EXISTING SLAB. REFER TO SPECIFICATIONS.
2. ALL OPENINGS IN THE THIRD FLOOR WALLS RESULTING FROM PIPE DEMOLITION SHALL BE PATCHED FLUSH TO MATCH EXISTING WALL. REFER TO SPECIFICATIONS.

### DEMOLITION NOTES:

(1) REMOVE SANITARY PIPING FLUSH TO THIRD FLOOR SLAB, CAP AND ABANDON IN PLACE.

(2) REMOVE SANITARY PIPING TO EXISTING WALL AND CLEANOUT SHALL BE INSTALLED AT OPEN END OF SANITARY PIPING.

(3) REMOVE EXISTING WATER CLOSET AND ALL ASSOCIATED SANITARY AND VENT FLUSH WITH WALL, CAP AND ABANDON IN PLACE. PATCH WALL FINISH TO MATCH EXISTING.

(4) REMOVE EXISTING LAVATORY AND ALL ASSOCIATED SANITARY AND VENT. PATCH WALL FINISH TO MATCH EXISTING.

Partner In Charge: DSC
Project Engineer: CRB
Drawn By: CSL
Date Drawn: 11-28-11

Revisions
No.____ Date____
No.____ Date____
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REGISTERED ENGINEERS

Project: PHRC LABORATORY 305 RENOVATION

Sheet Title: SECOND/THIRD FLOOR SANITARY/VENT DEMOLITION

JHS Architecture: Integrated Design
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THIRD FLOOR
COLUMBIA, SC 29201-2310
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Project Number: 922x06

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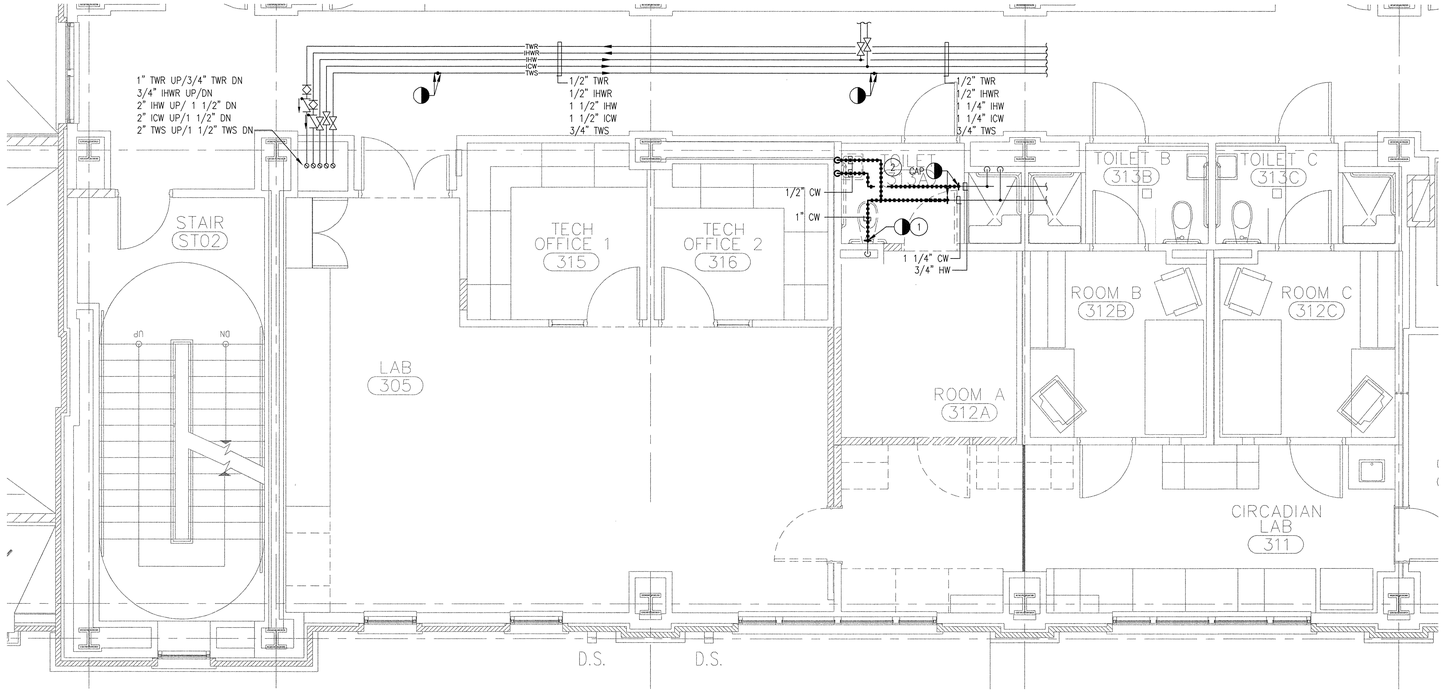
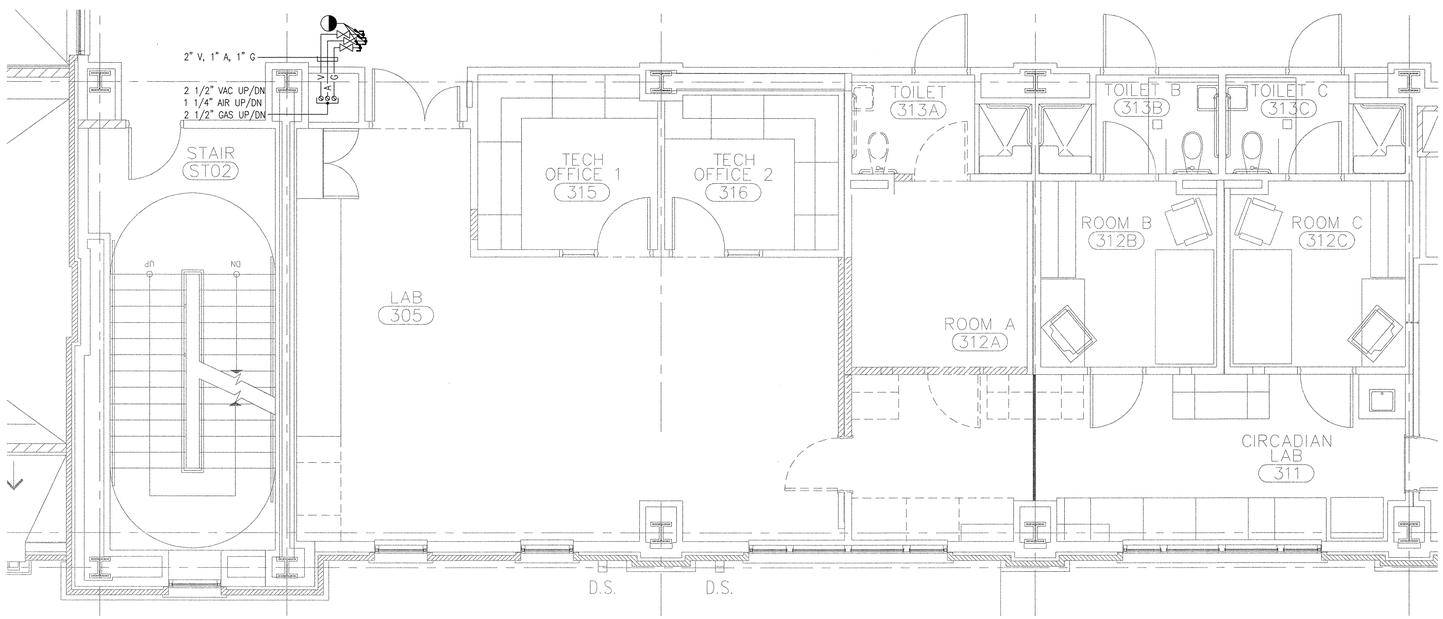



# PARTIAL THIRD FLOOR – DEMOLITION DOMESTIC WATER

SCALE: 1/4"=1'–0"




# PARTIAL THIRD FLOOR – DEMOLITION LAB GAS

SCALE: 1/4"=1'–0"

GRAPHIC SCALE
4 2 0 4 8
SCALE: 1/4"=1'–0"
UNIT OF MEASURE: FEET

STATE OF SOUTH CAROLINA
REGISTERED PROFESSIONAL ENGINEER
No. 24044
CRAIG R. BUCK

## GENERAL NOTES:

1. ALL OPENINGS IN THE THIRD FLOOR WALLS RESULTING FROM PIPE DEMOLITION SHALL BE PATCHED FLUSH TO MATCH EXISTING WALL. REFER TO SPECIFICATIONS.

## DEMOLITION NOTES:

(1) REMOVE EXISTING WATER CLOSET AND ALL ASSOCIATED DOMESTIC WATER PIPING FLUSH WITH WALL, CAP AND ABANDON IN PLACE. PATCH WALL TO MATCH EXISTING.

(2) REMOVE EXISTING LAVATORY AND ALL ASSOCIATED DOMESTIC WATER PIPING. PATCH WALL TO MATCH EXISTING.

Partner In Charge
DSC
Project Engineer
CRB
Drawn By
CSL
Date Drawn
11-28-11

Revisions
No._____ Date_____
No._____ Date_____
No._____ Date_____
No._____ Date_____
No._____ Date_____
No._____ Date_____
No._____ Date_____
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No._____ Date_____

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RMF PROJECT NUMBER: 311034.A0



STATE OF SOUTH CAROLINA
RMF ENGINEERING INC.
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C-00831
REGISTERED ENGINEERS

Project
PHRC LABORATORY 305 RENOVATION

Sheet Title
THIRD FLOOR DOMESTIC WATER AND LABORATORY GAS DEMOLITION

JHS Architecture Integrated Design
1812 LINCOLN STREET
THIRD FLOOR
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Project Number
922x06

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