Wayne State University
School of Medicine
IBio Radio Chemistry Facility
Detroit, Michigan
211-277899

Construction
June 10, 2016
PROJECT NO. 2016-01118-000
WSU PROJECT NO. 211-277899
**Repair Sequence**

**Type Vapor Retarder**

**Area to Be Removed**

**Step One**
- Schlab on grade vapor retarder
- Adhere Bituthane to exist vapor retarder
- Sticky side up
- Bituthane (leave paper backing in place on vert leg)
- Drill for dowels shown in Step 3 (prior to installing Bituthane)

**Step Two**
- Fold down Bituthane
- Remove paper backing
- #4 @ 18" OC EW or fiber per plans
- Lean conc fill epoxy set #4 dowels @ 18" OC X 12" x

**Step Three**
- Partition type as indicated on plans
- 1 1/2" x 1 1/2" lead angle cover
- Lined plywood
- Provide leaded angles at anchoring points or lead shims w/ lead discs over anchors - typ
- Cold-formed metal framing (CFMF) per partition type - cut runner to accommodate stud
- Provide 6x6 clip angle anchored to floor and CFMF @ existing partition
- Partition as indicated on plans
- At all penetrations provide shielding within cavity overlap penetration by 1'-0"
- Cold-formed metal framing (CFMF) per partition type - cut runner to accommodate stud
- Provide a 6x6 clip angle anchored to floor and CFMF @ corner
- 1'-0"
- Cont. lead angle - match thickest lead 1'-0"
- Partition as indicated on plans
- Provide a stud at gypsum panel end
- Cold-formed metal framing (CFMF) per partition type - cut runner to accommodate stud
- Provide a 6x6 clip angle anchored to floor and CFMF @ corner

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**Wayne State University**

**IBio Radio Chemistry Facility**

**Detroit, Michigan**

**26913 Northwestern Hwy**

**Suite 200**

**Southfield, Michigan**

**48033 | USA**

**(T) 248 262 1500**

**www.hed.design**

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**Wayne State University**

**WSU Project Number 211-277899**

**2016-01118-000**

**Shielding and Slab Details**

**Sheet No:**

**Sheet Title:**

**Project Number:**

**Design:**

**Issue:**

**06/10/2016 Construction**

**Scale:** 1 1/2" = 1'-0"
MECHANICAL DEMOLITION NOTES

1. REMOVE ALL PIPING INCLUDING ALL ASSOCIATED DAMPERS, HANGERS, ETC. FOR LOCATION.
2. REMOVE ALL ASSOCIATED DUCTWORK, HANGERS, ETC.
3. REMOVE AND RELOCATE GRILLE/REGISTER/DIFFUSER. REFER TO NEW WORK PLAN.
4. REMOVE GRILLE/REGISTER/DIFFUSER INCLUDING ALL ASSOCIATED DUCTWORK, HANGERS, ETC.
5. MATCH SIMILAR INSTALLATION AS OUTLINED IN THE SPECIFICATIONS. INSTALLATION
   OF NEW PIPEWORK/PLUMBING SHALL BE LEFT IN PLACE UNLESS OTHERWISE NOTED.
6. ALL MECHANICAL SYSTEMS REMOVED SHALL BE REMOVED COMPLETE WITH ALL
   PIPES RELATED ITEMS INCLUDING HANGERS, SUPPORTS, CONTROLS, ETC. CAP ALL OPEN
   ENDS WITH MATERIALS TO MATCH THE EXISTING AND PROVIDE REQUIRED FIRE
   RATING.
7. DEMOLISHED PIPING IS REMOVED AND NOT UTILIZED FOR NEW WORK SHALL BE
   FILLING METAL WITH MATERIALS TO MATCH THE EXISTING AND PROVIDE REQUIRED FIRE
   RATING.
8. REMOVE ALL HANGERS AND SUPPORTS FOR DEMOLISHED ITEMS.
9. INTERFERE WITH THE BUILDING OPERATIONAL SYSTEMS INCLUDING, BUT NOT LIMITED TO:
   Fixtures including valves, accessories and supports in its entirety. Maintain active fire suppression
   systems during construction.
10. REFER TO ARCHITECTURAL DRAWING, AG-21 FOR KEYPLAN.
11. SEE NOTE #7 ABOVE.

MECHANICAL DEMOLITION KEYNOTES

1. REMOVE ALL EXISTING PLUMBING WORK INCLUDING, BUT NOT LIMITED TO:
   DEMOLITION OF EXISTING PLUMBING WORK INCLUDING, BUT NOT LIMITED TO:
   2. REMOVE AND REMOVE ALL HANGERS AND SUPPORTS FOR DEMOLISHED ITEMS.
   3. REMOVE ALL RELEVANT COSTS IN BID. EXISTING EQUIPMENT AND/OR MATERIAL AND
      THE DEMOLITION DRAWINGS ARE INTENDED TO CONVEY A GENERAL DESCRIPTION OF
      EQUIPMENT DETAILS AND UTILITY ROUGH-IN LOCATIONS.

Hvac NOTES

1. PROVIDE ALL NECESSARY OFFSETS.
2. REFER TO ARCHITECTURAL DRAWING, AG-21 FOR KEYPLAN.
3. LOCATE ALL HOT WATER DUCT COILS AND TERMINAL UNITS IN ACCESSIBLE
   ENCLOSURES...
4. PROVIDE MANUAL VOLUME DAMPER WITH LOCKING QUADRANT IN BRANCH
   THROUGH THE ELECTRICAL EQUIPMENT ROOMS UNLESS IT SERVES THE ROOM.
5. DO NOT ROUTE ANY DUCTWORK PIPING OVER ELECTRICAL EQUIPMENT OR
   ELECTRICAL MACHINERY.
6. COORDINATE ROUGH-IN LOCATIONS FOR ALL UTILITIES WITH THE EQUIPMENT SUPPLIER AND
   BE A MINIMUM 6" ABOVE THE CEILING GRID.
7. PROVIDE ALL NECESSARY OFFSETS.
8. REFER TO ARCHITECTURAL DRAWING, AG-21 FOR KEYPLAN.
9. Provide all necessary offsets of equipment, wiring, and piping, as noted.
10. Locate all hot water duct coils and terminal units in accessible enclosures...
11. Provide all necessary offsets of equipment, wiring, and piping, as noted.
MECHANICAL PIPING GENERAL NOTES
1. PROVIDE  WET SPRINKLER SYSTEM IN ACCORDANCE WITH NFPA 13,
   FIRE PROTECTION NOTES
2. PROVIDE  WET SPRINKLER SYSTEM IN ACCORDANCE WITH NFPA 13,
   FIRE PROTECTION KEYNOTES:
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40. PROVIDE  WET SPRINKLER SYSTEM IN ACCORDANCE WITH NFPA 13,
41. PROVIDE  WET SPRINKLER SYSTEM IN ACCORDANCE WITH NFPA 13,
PROVIDE DIGITAL CONTROL LAB AIRFLOW

AND ACCESSORIES, NETWORKED TO ACHIEVE CONTROL AS NOTED IN

SEQUENCE OF OPERATION.

NOTES (LABS):

1. MOUNT LAB ROOM CONTROL PANEL ABOVE CEILING NEAR MAIN

DOOR TO CORRIDOR. PROVIDE ONE CONTROL PANEL FOR EACH LAB.

2. PROVIDE THE FOLLOWING MINIMUM POINTS OF INTERFACE FROM

THE LAB CONTROL MODULE TO THE BAS.

A. TEMPERATURE SET POINT.

B. HOT WATER VALVE POSITION.

C. SPACE TEMPERATURE.

D. SUPPLY AIR FLOW VOLUME FOR EACH VALVE.

E. SUPPLY AIR FLOW TEMPERATURE.

F. MODE OCCUPIED/UNOCCUPIED AND OVERRIDE.

G. EXHAUST AIR FLOW VOLUME FOR EACH VALVE.

1. SEQUENCE OF OPERATION: TYPICAL CONFIGURATION.

DURING THE OCCUPIED OR UNOCCUPIED MODE THE MINIMUM EXHAUST

AIR FLOW TO THE ROOM SHALL BE AS REQUIRED FOR MAKEUP AIR.

EXHAUST REQUIREMENTS OF LAB EQUIPMENT MAY OVER-RIDE MINIMUM

ACH.

THE GENERAL EXHAUST (WITH SUPPLY TRACKING) SHALL MODULATE

ABOVE THIS VOLUME AS NECESSARY TO SATISFY COOLING, HEATING AND

MAKEUP AIR DEMANDS. THE HEATING VALVE SHALL MODULATE

AS NECESSARY TO MAINTAIN THE ROOM TEMPERATURE SET POINT. SET

POINT SHALL BE (76 DEG F SUMMER/76 DEG F WINTER), ADJUSTABLE.

IN THE UNOCCUPIED MODE, AS DETERMINED BY THE BAS, THE

ROOMS SET POINT WILL BE ADJUSTED DOWN 5 DEGREES IN THE WINTER

AND UP 5 DEGREES IN THE SUMMER. ROOM TEMPERATURE CONTROLS

SHALL MAINTAIN THE SPACE TEMPERATURE @ +/- 2 DEGREES FAHRENHEIT

OF SET POINT EVENLY THROUGH OUT THE SPACE.

ALARMS:

1. IF THE FIXED OFFSET BETWEEN EXHAUST AND SUPPLY AIRFLOW

CANNOT BE MAINTAINED, THE LAB CONTROL SYSTEM SHALL

INITIATE A “LABORATORY CONTROL SYSTEM GENERAL FAULT” ALARM

AT THE BUILDING AUTOMATION SYSTEM.

2. PROVIDE GRAPHICS AT THE BAS THAT IDENTIFY SPACE TEMPERATURE

VARIATIONS IN COLOR ABOVE AND BELOW SET POINT.

3. BAS SHALL ALARM IF THERE’S A “NETWORK FAILURE” OR “LAB LOST

SIGNAL” CONDITION.

4. IF THE ROOM OFFSET IS MORE THAN 10% ABOVE OR BELOW SET

POINT AN ALARM SHALL BE INITIATED AT THE BAS.

SUPPLY AIRFLOW SHALL TRACK CHANGES IN EXHAUST AIRFLOW TO MAINTAIN A ZERO CFM OFFSET BETWEEN

THE LAB AND CORRIDOR VIA FLOW TRACKING. THE TOTAL SUPPLY AIRFLOW FROM THE LAB SHALL EQUAL

THE TOTAL EXHAUST MINUS FIXED OFFSET.

ALL SUPPLY AND EXHAUST VALVES SET POINTS SHALL BE ADJUSTABLE FROM THE BAS ACROSS

THE VALVES RANGE.

ALL SUPPLY AND EXHAUST VALVES USED SHALL BE VARIABLE VOLUME AND PROVIDE CLOSED

LOOP CONTROL WITH AIR FLOW MEASUREMENT OF EACH VALVE AVAILABLE AT THE BAS.

EACH TERMINAL UNIT CONTROLLER SHALL DENOTE THE DISCHARGE CFM

AND TEMPERATURE, DAMPER POSITION, AND HEATING VALVE POSITION TO THE BAS.

VARIABLE VOLUME TERMINAL UNIT W/ CONTROLLER (TYPICAL)

LAB ROOM CONTROL PANEL FOR EACH LAB, POWER BY LAB CONTROL CONTRACTOR

DISCHARGE AIR TEMPERATURE CONTROL:

CALIBRATE THE PID LOOPS FOR EACH LAB CONTROLLER SERVING VARIABLE VOLUME VALVES AND

THEIR ASSOCIATED HEATING CONTROL VALVES. THE SUPPLY AIR CONTROLLER CONTROLS THE REHEAT COIL

BASED ON THE DISCHARGE AIR TEMPERATURE SET POINT RESET BY THE ROOM TEMPERATURE TRANSMITTER

IN A 2:1 (ADJ) RATIO. FOR EVERY +/- 1 DEGREE CHANGE IN ROOM TEMPERATURE THE DISCHARGE TEMPERATURE

CHANGES +/- 2 DEGREES POINT.

ALL AIRFLOW RATES SHALL BE FIELD ADJUSTABLE.

TYPICAL LABORATORY AIRFLOW CONTROL DIAGRAM
NEW W. VOLTS

4.  ALL VOICE (PHONE) CABLES SHALL TERMINATE IN THE DESIGNATED TELECOMMUNICATION ROOM (0112) COORDINATE EXACT POSITION OF ELECTRONICS EQUIPMENT IN RACK AND ITS SPECIFIC COORDINATE PROVISIONS FOR TERMINATING VOICE CABLES WITH OWNER.

2.  COMPLY WITH THE LATEST EDITION OF WAYNE STATE UNIVERSITY "STANDARDS FOR COMMUNICATIONS WIRES, CABLES, AND THEIR RESPECTIVE TERMINATIONS.  ALL CABLES SHALL BE LABELED AT EACH END.

LAB ROOMS 0001 AND 0003.  VOICE/DATA OUTLETS WHERE INDICATED ON PLANS.  THIS CONTRACTOR SHALL FURNISH, INSTALL, TEST AND CROSS CONNECT.  PATCH PANELS SHALL HAVE CAPACITY FOR TERMINATING 24 DATA ADDRESSES.

C.  THOROUGHLY COORDINATE SEQUENCING OF ELECTRICAL RENOVATION WITH OTHER TRADES AND BUILDING FACTOR ON TESTED LOADS AND PROPOSED SOURCE LOADS UNLESS OTHERWISE DIRECTED BY THE OWNER.

ELECTRICAL TRADES SHALL SURVEY THE FACILITY AND LOCATE AN APPROPRIATE TEMPORARY POWER SOURCE. PERFORM AS MUCH PREP WORK AS POSSIBLE PRIOR TO SHUT DOWNS.  ARRANGE & MAINTAIN THE FUNCTIONAL USAGE OF ADJACENT SPACES, AND AS DIRECTED BY OWNER.

1.  NEW LUMINAIRES SHALL BE AS SCHEDULED HEREIN; (SAME AS EXISTING OF LIKE-KIND IN USE IN THE BUILDING).

3.  ILLUMINATION SHALL BE 4100 DEGREE KELVIN COLOR TEMPERATURE.


4.  CONNECT NO MORE THAN 1600 VA OF ELECTRICAL LOAD TO A 120 VOLT, SINGLE PHASE CIRCUIT, UNLESS IN SURFACE MOUNT MULTI-OUTLET TWO COMPARTMENT METAL RACEWAY,

INDICATES CONNECTION OR SPLICE POINT

LEVEL DESIGNATION PANEL SEQUENCE LETTER LEVEL DESIGNATION PANEL SEQUENCE LETTER LEVEL DESIGNATION

COORDINATE EXACT COLOR WITH ARCHITECT.

ORDERING.

COORDINATE EXACT POSITION OF ELECTRICAL DEVICES WITH COUNTER TOPS, BACK SPLASHES, CASEWORK, FURNITURE, AND/OR RELOCATED TO ACCOMMODATE WORK ABOVE CEILINGS.

FOR ELECTRICAL WORK ANTICIPATED TO REQUIRE ANY SUBSTITUTION OF OTHER LISTED APPROVED MANUFACTURERS EQUIPMENT TO EXISTING DISTRIBUTION SYSTEMS.  FOR ELECTRICAL WORK ANTICIPATED TO REQUIRE ANY SUBSTITUTION OF OTHER LISTED APPROVED MANUFACTURERS EQUIPMENT TO EXISTING DISTRIBUTION SYSTEMS.  INCLUDE ALL SUPPLIES AT ITS OWN EXPENSE, TO SUSTAIN OPERATION OF EXISTING ELECTRICAL SYSTEMS.  INCLUDE ALL SUPPLIES AT ITS OWN EXPENSE, TO SUSTAIN OPERATION OF EXISTING ELECTRICAL SYSTEMS.

”

THE MAXIMUM DURATION OF PERMISSIBLE POWER SYSTEM SHUTDOWN SHALL BE COORDINATED WITH OWNER.

15.  PROVIDE LAMPS FOR ALL LUMINAIRES.  FOR LUMINAIRES REQUIRED TO BE RELOCATED OR REMOVED &/OR RELOCATED TO ACCOMMODATE WORK ABOVE CEILINGS.

14.  ALL LAY-IN TROFFER LUMINAIRES SHALL HAVE EARTHQUAKE CLIPS INSTALLED.

16.  PROVIDE JACKS & FACEPLATES AS SPECIFIED, FOR VOICE & DATA CABLING.

34.  REFER TO MECHANICAL HVAC PLAN DRAWINGS FOR LOCATIONS OF AIR TERMINAL UNITS.

12.  PROVIDE JACKS & FACEPLATES AS SPECIFIED, FOR VOICE & DATA CABLING.

DATA CABLE SHALL BE GREEN AND JACKS SHALL BE ORANGE.
DISCONNECT & REMOVE EXISTING LIGHT SWITCH & ASSOCIATED CONDUIT & WIRING.

DISCONNECT & REMOVE EXISTING MOTION SENSORS & FOUR CHAIN HUNG LUMINAIRES FROM STORAGE ROOM. TURN REMOVED LUMINAIRES OVER TO OWNER. RE-INSTALL & RE-USE MOTION SENSORS IN RADIO CHEM LAB WHERE INDICATED ON DRAWING EL-00E.

THESE TWO EXISTING CHAIN HANG LUMINAIRES, TO REMAIN, (FOR USE IN NEW PUMP ROOM). RE-HANG & ADJUST POSITION AS REQUIRED, TO ACCOMMODATE NEW WALL CONSTRUCTION.

EXISTING PUMP CONTROL PANEL TO REMAIN.

RELOCATE EXISTING FIRE ALARM STROBE TO NEW PUMP ROOM AS REQUIRED, TO ACCOMMODATE NEW WALL CONSTRUCTION, PER DRAWING EM-00E.

EXISTING SIEMENS CONTROL PANEL & RELATED WIREWAY & LOW VOLTAGE TRANSFORMERS, ALL TO REMAIN, RELOCATE TO WEST FACE OF NEW WALL, WHERE INDICATED ON DRAWING EQ-0Bf.

RELOCATE EXISTING SMOKE DETECTOR AT CEILING SPACE, TO NEW PUMP ROOM AS REQUIRED, TO ACCOMMODATE NEW WALL CONSTRUCTION, PER DRAWING EM-00E.

ITEMS IN ELEC. ROOM 0100, ALL TO REMAIN.

EXISTING SUMP PUMPS, TO REMAIN.

PUMP RM 0001B EX. VET TECH WORK AREA 0101 EX. CONTROL ROOM 0005 EX. CORRIDOR X0517

EX. CORRIDOR X0511

EX. HFHS MICRO 0005.1 INSTRU. 0003 ELEC. ROOM 0100 TO REMAIN
1. Extend 2 No.12 & 1 No. 12 GRD., ¾" C. from the circuit indicated, to the junction box noted. Provide a toggle switch at the junction box, to turn off its supplied loads. Mount junction box & associated toggle switch at east wall of lab 0003, approximately 8'-0" AFF. Extend 120 volt conduit & wiring from junction box to control power transformers supplying air terminal units & lab air control valves in lab room 0001 and in lab room 0003. Coordinate exact location and quantity of control power transformers with controls contractor and mechanical trades. Refer to mechanical drawings for air terminal units. Provide permanent identification at junction box, to indicate the panel and breaker from which the branch circuit originates.

2. Extend dedicated 120 volt, 20 amp branch circuit conduit & wiring to owners' existing biosafety cabinet. (Biosafety cabinet is equipped with internal exhaust hood, built-in duplex outlets (2), internal fluorescent & ultraviolet lighting and built-in control unit. Perform field investigation of existing biosafety cabinet to determine its specific field wiring requirements and coordinate work with owners' representative and with work of other trades.

3. Extend 120 volt branch circuit conduit & wiring, circuit as indicated, to radiation detector (Ludlum Measurements, Inc., model 375-10 gamma area monitor). Provide all field wiring for radiation detector, its associated remote alarm device (120v red strobe) & 50' cable (3 pin conn.); all in accordance with equipment manufacturer's written instructions. Locate remote alarm strobe in corridor X0511, outside the radio chemistry lab. Coordinate exact location of radiation detector & associated remote alarm strobe with owners' radio chemistry lab representative.
1. In Lab 0001, luminaires shall be step-dim controlled. With occupancy detected in the room, the two switches shall each control 50% of illumination. Motion sensor shall be provided for auto-on/auto-off operation. With no occupancy detected, luminaires in the room shall automatically turn off after a preset time delay.

2. Provide new motion sensor and new light switch for operation of existing chain hung luminaires in Pump Room 0001B. With occupancy detected in the room, the switch shall be enabled for controlling room lighting. With no occupancy sensed, luminaires in the room shall automatically turn off after preset time delay. Connect to same circuit as originally supplied luminaires in this room (LP-BE-8).
NOTE:

PERFORM NEW WORK AND PROVIDE NEW AND/OR REVISED CIRCUITING AS REQUIRED, TO ACCOMMODATE NEW AND/OR REVISED WIRING DEVICES & LOADS INDICATED ON DRAWINGS. DATA INDICATED FOR EXISTING CIRCUITS IS AS COPIED FROM EXISTING PANEL SCHEDULES. FIELD VERIFY, LOCATE AND IDENTIFY LOADS & CORRESPONDING ROOM IDENTIFICATION FOR EACH CIRCUIT REVISED UNDER THIS PROJECT. FIELD VERIFY EXISTING BRANCH CIRCUITS AND PANELBOARD LOADING FOR COMPLIANCE WITH NATIONAL ELECTRICAL CODE, PRIOR TO PERFORMING BRANCH CIRCUITING MODIFICATIONS FOR WHICH INCIDENTAL LOAD MODIFICATIONS OCCUR UNDER THIS RENOVATION PROJECT.

CONNECT NEW LUMINAIRES IN RADIO CHEM. LAB 0001 TO SAME CIRCUIT AS SUPPLIED LUMINAIRES REMOVED FROM FORMER BULK STORAGE AREA.

PROVIDE NEW FUSES AT EXISTING SPARE SWITCH.

EXTEND NEW FEEDER CONDUIT & WIRING NOTED, TO NEW PANEL RP-BED, AS INDICATED ON BASEMENT PLANS.

EXISTING PANEL LP-BE

NEW PANEL RP-BED

PROVIDE ARC FLASH HAZARD LABEL FOR NEW PANEL RP-BED. NEW ARC FLASH LABEL SHALL MATCH DATA ON EXISTING ARC FLASH HAZARD LABEL AT EXISTING PANEL RP-BEC, WHERE INDICATED ON FLOOR PLAN.

LOAD ADDED: SEVEN "FA1" x 58 VA = 406 VA.

LOAD REMOVED: FOUR CHAIN HUNG LUMINAIRES x 60 VA = 240 VA.

NET LOAD ADD = 166 VA.