

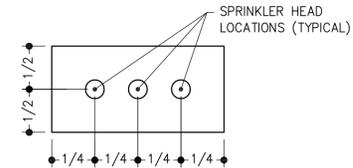
LAB 115 & 165 FIRE PROTECTION LAYOUT
SCALE: 1:50

FIRE PROTECTION LEGEND

- RELOCATE EXISTING FIRE EXTINGUISHER
- EXISTING FIRE EXTINGUISHER TO REMAIN
- REMOVE EXISTING FIRE EXTINGUISHER
- RELOCATED FIRE EXTINGUISHER
- EXISTING FIRE HOSE CABINET TO REMAIN

GENERAL NOTES:

1. REFER TO ARCHITECTURAL FOR PHASING DETAILS.
2. SPRINKLER SYSTEM LAYOUT SHALL BE CLOSELY COORDINATED WITH DUCTWORK, PLUMBING, ELECTRICAL, STRUCTURAL, ARCHITECTURAL, AND P-TUBE ELEMENTS. PIPING SHOWN ON DRAWINGS IS FOR GUIDANCE ONLY. SPRINKLER CONTRACTOR SHALL PROVIDE ALL NECESSARY PIPING FITTING REQUIRED FOR INSTALLATION.
3. SPRINKLER CONTRACTOR TO CHECK SPRINKLER COVERAGE AND PROVIDE HEADS TO MEET NFPA 13 SPACING, OBSTRUCTION RULES AND COVERAGE REQUIREMENTS.
4. WHERE SPRINKLER HEADS AND PIPING ARE NOT SHOWN, CONTRACTOR TO LOCATE SPRINKLER HEADS AND PIPING IN ACCORDANCE WITH NFPA 13.
5. WHERE SPRINKLER HEADS SHOWN TO BE REMOVED, PIPING IS TO BE CAPPED BACK TO MAIN.
6. SPRINKLER HEADS SHALL BE LOCATED IN THE CENTER OF TILES IN T-BAR CEILING IN ONE OF THE FOLLOWING LOCATIONS.



PHASING NOTES:

1. THE PROJECT WILL BE COMPLETED IN THREE (3) PHASES.
2. REQUIRED STAGES:
 1. PHASE 1 - ROOM 115, 164 AND CLEAN ROOMS ON LEVEL 3
 2. PHASE 2 - ROOM 165
 3. PHASE 3 - ROOM 225
 4. EACH PHASE SHALL BE COMPLETED, COMMISSIONED AND FULLY OPERATIONAL, PRIOR TO START OF THE NEXT PHASE.

DEMOLITION NOTES

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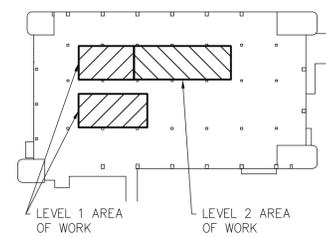
CONTRACT DRAWINGS

CONTRACT DRAWINGS FOR MECHANICAL WORK ARE IN PART DIAGRAMATIC, INTENDED TO CONVEY THE SCOPE OF WORK AND GENERAL ARRANGEMENT FOR MECHANICAL SYSTEMS, AND EQUIPMENT. CONTRACTOR TO COORDINATE LAYOUT OF MECHANICAL SYSTEMS WITH ARCHITECTURAL, STRUCTURAL, AND ELECTRICAL BUILDING COMPONENTS, AS WELL AS, OTHER MECHANICAL SYSTEMS. PROVIDE ADDITIONAL PIPING, DUCTING, FITTINGS, SUPPORTS, ETC., REQUIRED TO FACILITATE THE WORK. NO EXTRA PAYMENTS ARISING FROM FAILURE TO MAKE THIS COORDINATION WILL BE CONSIDERED.

consultant



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revision	description	date
2	ISSUED FOR TENDER	2015/05/29
1	ISSUED FOR REVIEW	2015/04/17

Do not scale drawings.
Verify all dimensions and conditions on site and immediately notify the engineer of all discrepancies.

A	Detail No.
B	No. du détail
C	drawing no. - where detail required dessin no. - où détail exigé
	drawing no. - where detailed dessin no. - où détaillé

project title
titre du projet
TORONTO HEALTH CANADA
2301 MIDLAND AVE
Ontario

LABORATORY UPGRADES

drawing title
titre du dessin
**PARTIAL LEVEL 1
FIRE PROTECTION LAYOUT**

drawn by
dessiné par
MVG

designed by
conçu par
MM

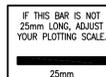
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approuvé par
MM

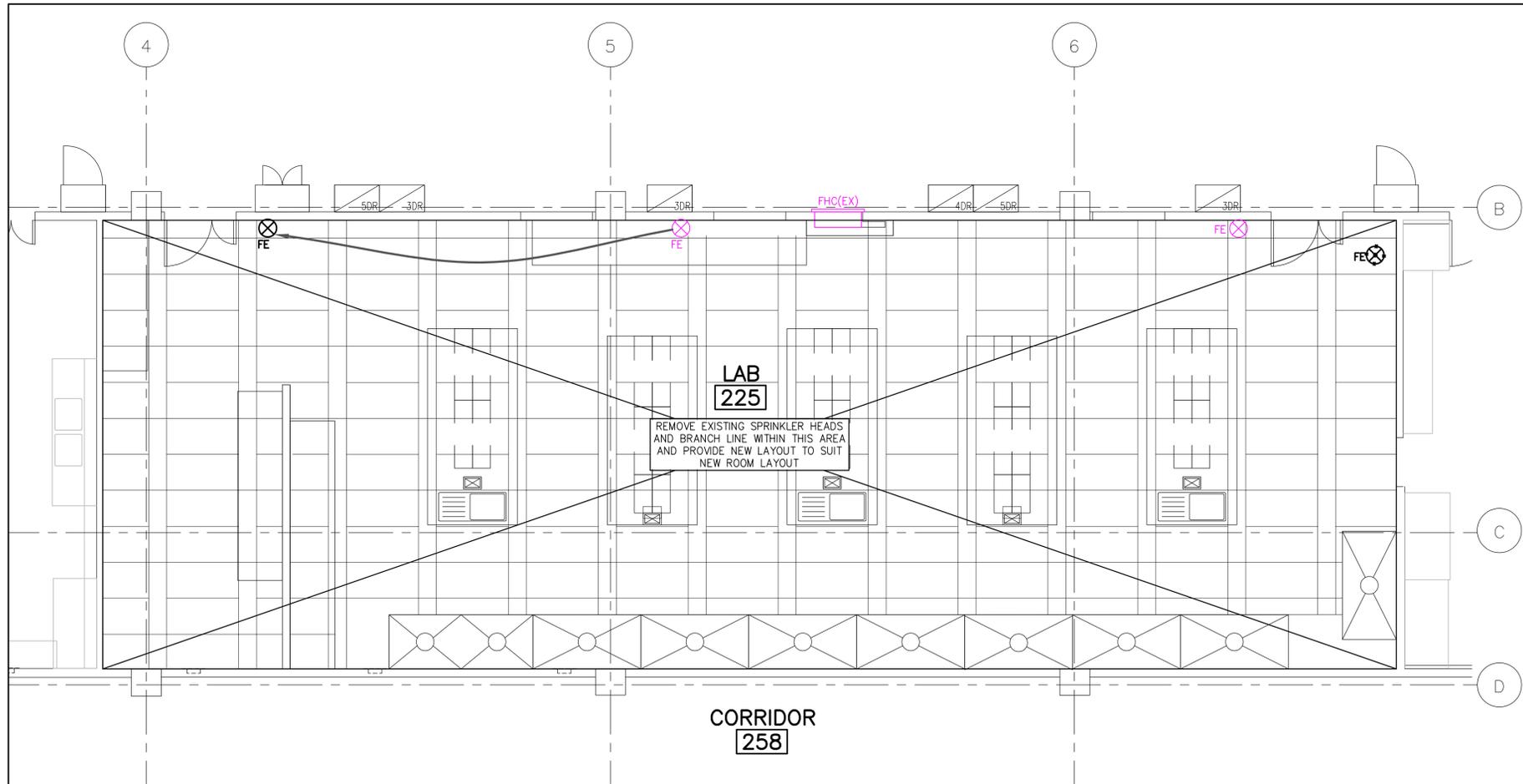
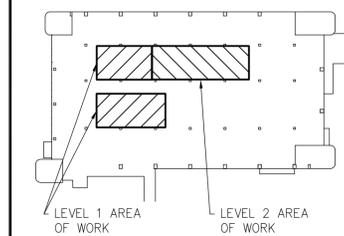
tender
soumission
AQUIL ALI project manager
administrateur de projets

project date
date du projet
2015/04/15

project no.
no. du projet
R.054345.001

drawing no.
no. du dessin
M1.1





LAB 225 FIRE PROTECTION LAYOUT
 SCALE: 1:50

revision	description	date
2	ISSUED FOR TENDER	2015/05/29
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project title
 titre du projet
TORONTO Ontario
 HEALTH CANADA
 2301 MIDLAND AVE
LABORATORY UPGRADES

drawing title
 titre du dessin
**PARTIAL LEVEL 2
 FIRE PROTECTION LAYOUT**

drawn by
 dessiné par **MVG**

designed by
 conçu par **MM**

approved by
 approuvé par **MM**

tender
 soumission **AQUIL ALI** project manager
 administrateur de projets

project date
 date du projet **2015/04/15**

project no.
 no. du projet **R.054345.001**

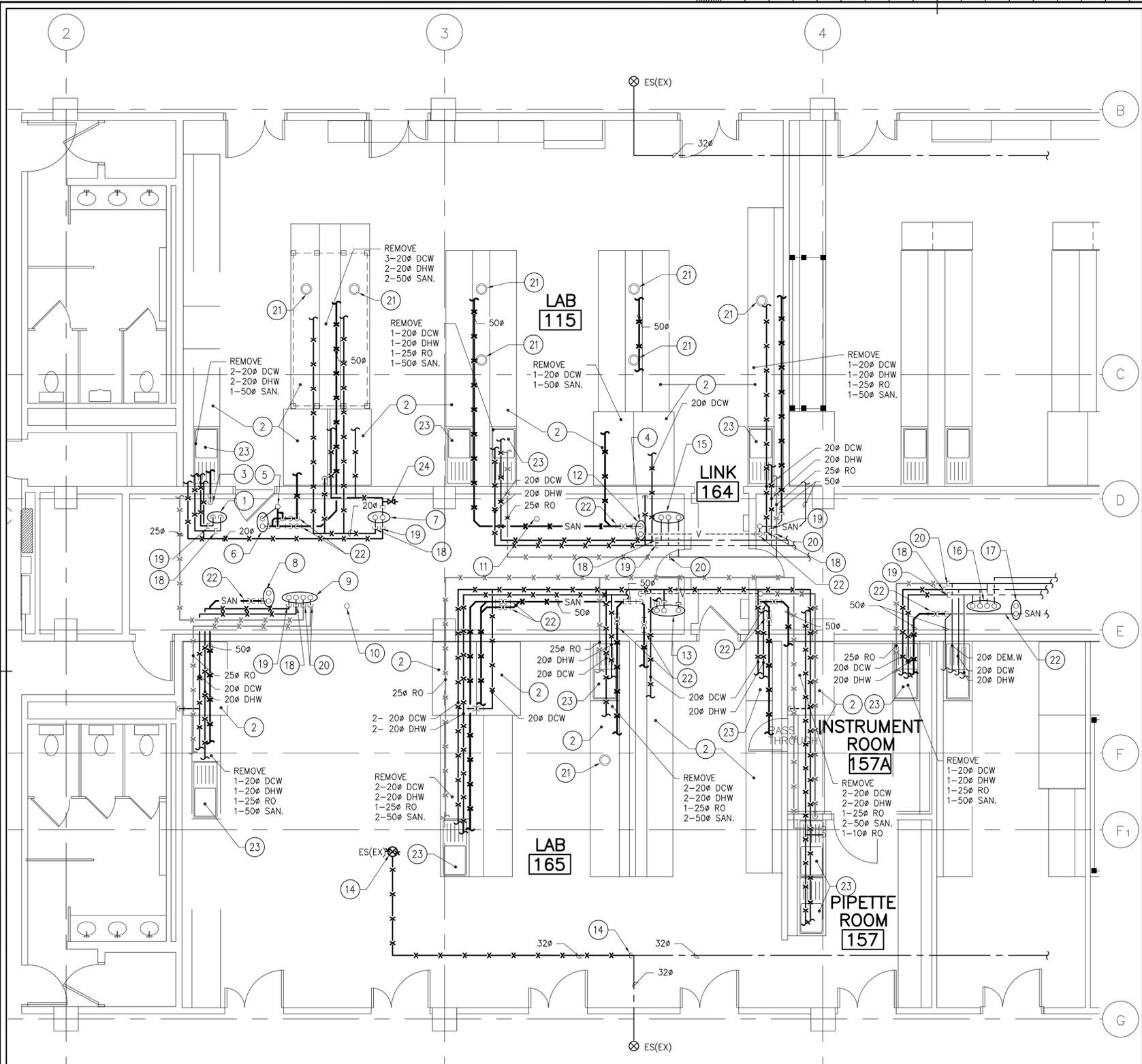
drawing no.
 no. du dessin **M1.2**

GENERAL NOTES:
 1. REFER TO DRAWING M1.1 FOR FIRE PROTECTION LEGEND.



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CONTRACT DRAWINGS
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LAB 115 & 165 PLUMBING DEMOLITION
SCALE: 1:50

PLUMBING LEGEND

	REMOVE EXISTING PIPING
	EXISTING DOMESTIC COLD WATER TO REMAIN
	NEW DOMESTIC COLD WATER
	EXISTING DOMESTIC HOT WATER TO REMAIN
	NEW DOMESTIC HOT WATER
	EXISTING DOMESTIC HOT WATER RECIRC. TO REMAIN
	NEW DOMESTIC HOT WATER RECIRC.
	EXISTING REVERSE OSMOSIS (RO) WATER TO REMAIN
	NEW REVERSE OSMOSIS (RO) WATER
	NEW CONDENSATE WATER
	NEW LOW PRESSURE STEAM (HUMIDIFICATION)
	EXISTING ACID-RESISTANT VENT TO REMAIN
	NEW ACID-RESISTANT VENT
	EXISTING ACID-RESISTANT SANITARY (ABOVE SLAB) TO REMAIN
	NEW ACID-RESISTANT SANITARY (ABOVE SLAB)
	EXISTING ACID-RESISTANT SANITARY (BELOW SLAB) TO REMAIN
	NEW ACID-RESISTANT SANITARY (BELOW SLAB)
	EXISTING CHECK VALVE
	EXISTING BALL VALVE
	NEW BALL VALVE
	CAP EXISTING PIPE
	PIPE UP TO ABOVE
	PIPE DOWN TO BELOW
	NEW SANITARY TRAP
	NEW LABORATORY SINK
	NEW EMERGENCY EYE WASH
	NEW EMERGENCY SHOWER
	EXISTING EMERGENCY SHOWER
	NEW FLOOR DRAIN
	EXISTING FLOOR DRAIN
	NEW CLEANOUT
	HUMIDITY SENSOR TO HUMIDIFIER
	- * REPRESENTS DESIGNATION OF FIXTURE
	ANALOG INPUT TO BACS
	DIGITAL OUTPUT TO BACS

LEVEL 1 PLUMBING DEMOLITION DRAWING NOTES:

- | | |
|---|--|
| 1 EXISTING 32ø DCW AND 32ø DHW | 14 REMOVE EXISTING EMERGENCY SHOWER AND ASSOCIATED DOMESTIC COLD WATER PIPING. CAP DOMESTIC COLD WATER BACK TO MAIN. |
| 2 REMOVE DCW, DHW, SAN, VENT AND RO PIPING TO LAB BENCHES AND FUME HOODS BACK TO RISER AND CAP. REMOVE ALL ISOLATION VALVES, PRVs AND SUPPORTS. REMOVE OTHER ABANDONED LAB SERVICES WITHIN BENCHES. | 15 EXISTING PLUMBING RISER: 40ø DHW, 40ø DCW, AND 20ø RO. |
| 3 EXISTING 50ø SAN, CAP 50ø SAN | 16 EXISTING PLUMBING RISER: 40ø DHW, 40ø DCW, 25ø DEM.W, 20ø DW. |
| 4 EXISTING VENT TO ABOVE | 17 EXISTING 100ø SOIL STACK AND 40ø VENT |
| 5 EXISTING 40ø VENT UP | 18 REMOVE EXISTING 20ø DCW BACK TO THIS LOCATION AND CAP. |
| 6 EXISTING 100ø SOIL STACK AND 40ø VENT | 19 REMOVE EXISTING 20ø DHW BACK TO THIS LOCATION AND CAP. |
| 7 EXISTING PLUMBING RISER: 32ø DHW AND 32ø DCW | 20 REMOVE EXISTING 20ø RO AND CAP BACK TO THIS LOCATION. |
| 8 EXISTING 100ø SOIL STACK AND 50ø VENT | 21 REMOVE EXISTING CUP SINK C/W TRIM. |
| 9 EXISTING PLUMBING RISER GROUP: 25ø RO, 32ø DCW AND 32ø DHW. | 22 REMOVE EXISTING 50ø ACID RESISTANT SANITARY DRAIN PIPING C/W ASSOCIATED TRAP AND VENT LINE. REMOVE VENT BACK TO RISER AND REPLACE VENT RISER TEE CONNECTION WITH NEW VENT PIPING AND COUPLINGS. REMOVE TRAP WITHIN FLOOR. CAP SANITARY PIPING AT RISER. |
| 10 EXISTING 40ø RO RETURN | 23 REMOVE EXISTING LABORATORY SINK C/W EYE WASH, TRIM AND WASTE FIXTURE |
| 11 EXISTING 150ø RWL | 24 REMOVE ABANDONED TRAP SEAL PRIMER. |
| 12 EXISTING 100ø SOIL STACK AND 40ø VENT | |
| 13 EXISTING PLUMBING RISER GROUP: 20ø RO, 40ø DCW AND 40ø DHW. | |

PLUMBING DEMOLITION GENERAL NOTES:

- ALL SANITARY AND VENT PIPING SHOWN TO BE DEMOLISHED IS GLASS PIPE
- FIRE STOP ALL WALL PENETRATIONS TO MAINTAIN EXISTING FIRE SEPARATION. REFER TO SPEC SECTION.
- ALL INSULATION ON EXISTING SANITARY / DRAIN PIPE SHALL BE REMOVED.

PHASING NOTES:

- THE PROJECT WILL BE COMPLETED IN THREE (3) PHASES.
- REQUIRED STAGES:
 - PHASE 1 - ROOM 115, 164 AND CLEAN ROOMS ON LEVEL 3
 - PHASE 2 - ROOM 165
 - PHASE 3 - ROOM 225
 - EACH PHASE SHALL BE COMPLETED, COMMISSIONED AND FULLY OPERATIONAL, PRIOR TO START OF THE NEXT PHASE.

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CONTRACT DRAWINGS

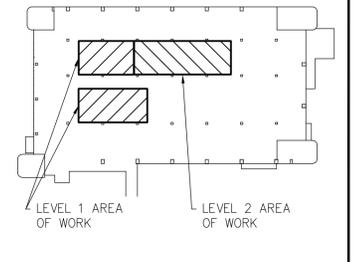
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Public Works and Government Services Canada
Architectural and Engineering Services
Ontario Region

Travaux publics et Services gouvernementaux Canada
Services d'architecture et de génie
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project title
titre du projet
TORONTO Ontario
HEALTH CANADA
2301 MIDLAND AVE

LABORATORY UPGRADES

PARTIAL LEVEL 1 PLUMBING DEMOLITION

drawing title
titre du dessin
drawn by
dessiné par **IAF**

designed by
conçu par **MM**

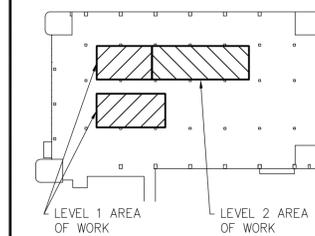
approved by
approuvé par **MM**

tender
soumission **AQUIL ALI** project manager
administrateur de projets

project date
date du projet **2015/04/15**

project no.
no. du projet **R.054345.001**

drawing no.
no. du dessin **M2.1**



revision	description	date
2	ISSUED FOR TENDER	2015/05/29
1	ISSUED FOR REVIEW	2015/04/17

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project title
titre du projet
TORONTO Ontario
HEALTH CANADA
2301 MIDLAND AVE

LABORATORY UPGRADES

drawing title
titre du dessin
**PARTIAL LEVEL 1
PLUMBING LAYOUT**

drawn by
dessiné par **MVG**

designed by
conçu par **MM**

approved by
approuvé par **MM**

tender
soumission **AQUIL ALI** project manager
administrateur de projets

project date
date du projet **2015/04/15**

project no.
no. du projet **R.054345.001**

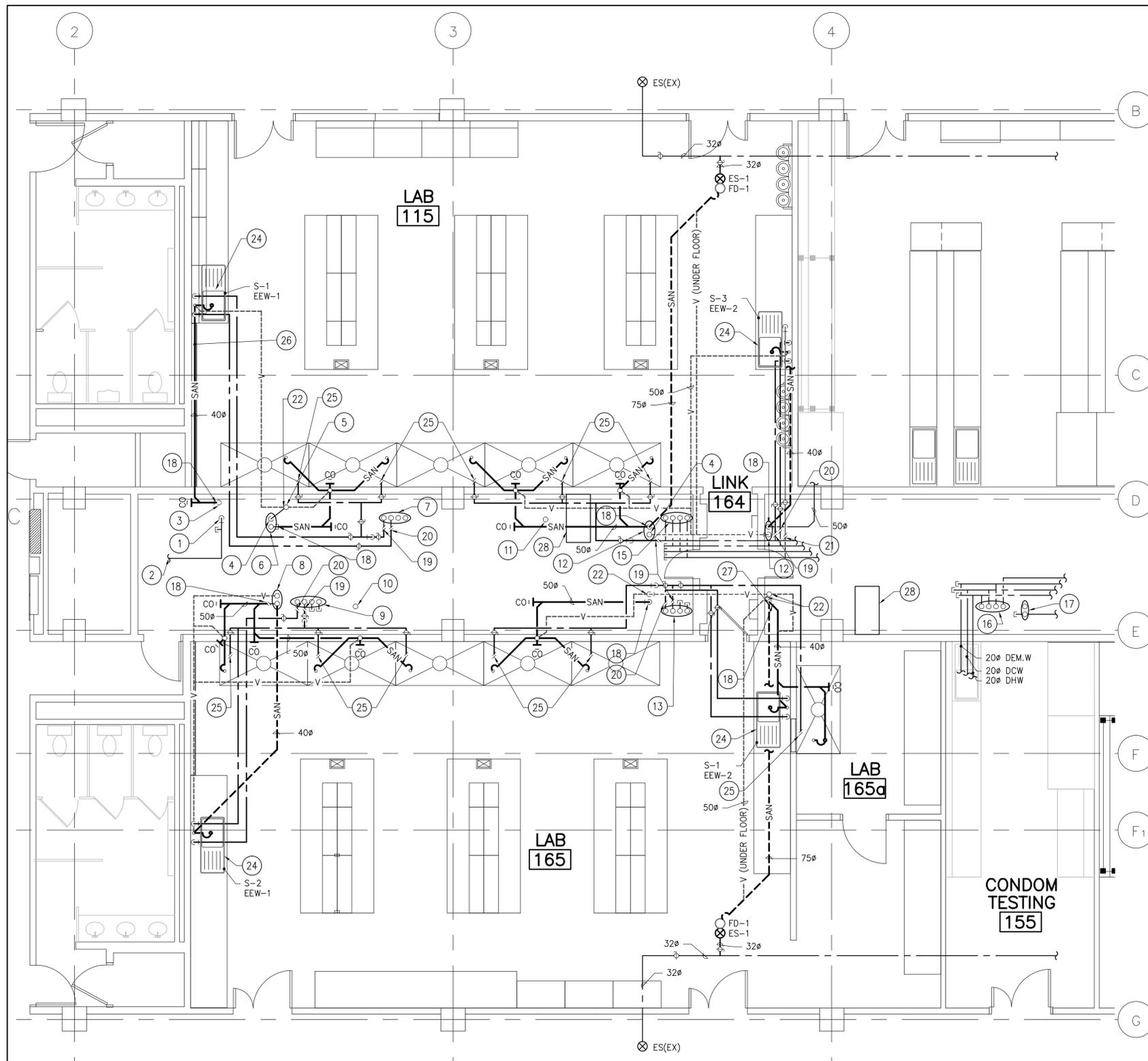
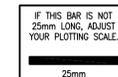
drawing no.
no. du dessin **M2.3**

GENERAL NOTES:

- REFER TO DRAWING M2.1 FOR PLUMBING LEGEND.
- FIRE STOP ALL WALL PENETRATIONS TO MAINTAIN EXISTING FIRE SEPARATION. REFER TO SPEC SECTION.

LEVEL 1 PLUMBING LAYOUT NOTES:

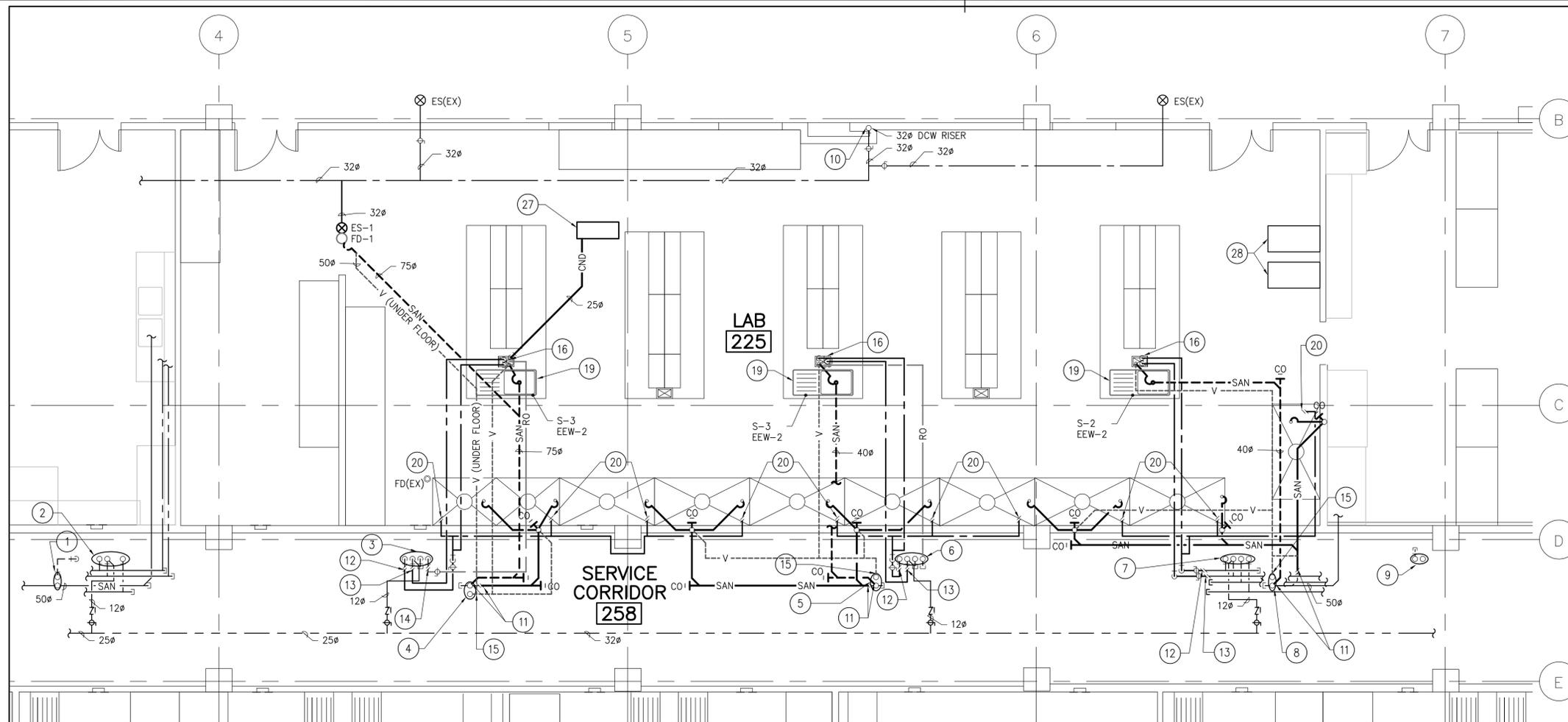
- EXISTING 32Ø DCW
- EXISTING 32Ø DCW TO EXISTING EMERGENCY SHOWER
- EXISTING 50Ø SAN
- EXISTING VENT TO ABOVE
- EXISTING VENT UP
- EXISTING 100Ø SOIL STACK AND VENT.
- EXISTING PLUMBING RISER: 32Ø DHW, 32Ø DCW, 20Ø RO.
- EXISTING 100Ø SOIL STACK AND VENT.
- EXISTING PLUMBING RISER GROUP: 20Ø RO, 40Ø DCW, 40Ø DHW.
- EXISTING 40Ø RO RETURN
- EXISTING 150Ø RWL.
- EXISTING 100Ø SOIL STACK AND VENT.
- EXISTING PLUMBING RISER GROUP: 20Ø RO, 40Ø DCW, 40Ø DHW.
- PLUMBING RISER GROUP OFFSET IN LEVEL 0 CEILING TO ACCOMMODATE LINK 164.
- EXISTING PLUMBING RISER: 40Ø DHW, 40Ø DCW, 25Ø RO.
- EXISTING PLUMBING RISER: 40Ø DHW, 40Ø DCW, 25Ø RO.
- EXISTING 4"Ø SOIL STACK AND VENT.
- PROVIDE 50Ø ACID-RESISTANT SANITARY PIPING AND CONNECT TO EXISTING SANITARY RISER AT THIS LOCATION.
- PROVIDE 20Ø DCW PIPING AND CONNECT TO EXISTING RISER AT THIS LOCATION.
- PROVIDE 20Ø DHW PIPING AND CONNECT TO EXISTING RISER AT THIS LOCATION.
- PROVIDE 20Ø RO PIPING AND CONNECT TO EXISTING RISER AT THIS LOCATION.
- PROVIDE 50Ø VENT PIPING AND CONNECT TO EXISTING 50Ø AT THIS LOCATION.
- N/A
- LABORATORY SINK.
EXTEND DCW PIPING UP TO FUME HOOD CONNECTION POINT. REFER TO MANUFACTURER FOR EXACT LOCATION. PROVIDE VALVE FOR ISOLATION WITHIN SERVICE CORRIDOR.
- SANITARY PIPE TO BE INSTALLED ABOVE FLOOR ON WALL SURFACE. GENERAL CONTRACTOR TO CONCEAL PIPE.
- CONNECT 100Ø SANITARY PIPE TO EXISTING 100Ø SOIL STACK.
- MECHANICAL EQUIPMENT SHALL NOT BE INSTALLED WITHIN 1000 MM IN FRONT OF ELECTRICAL PANEL. REFER TO ELECTRICAL FOR EXACT LOCATION OF PANEL.



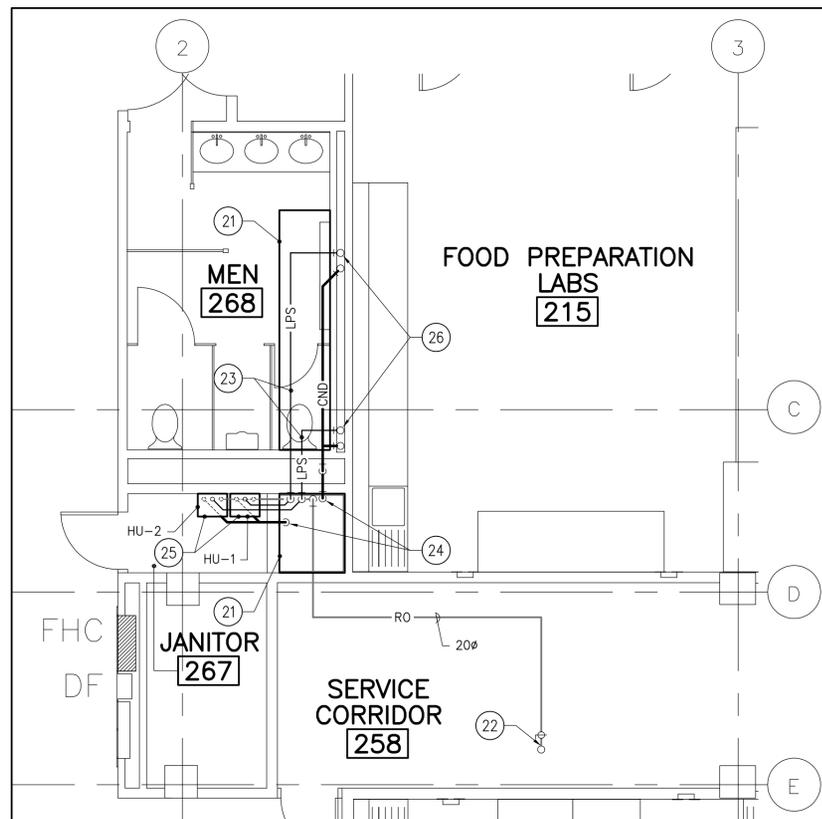
LAB 115 & 165 PLUMBING LAYOUT
SCALE: 1:50

CONTRACT DRAWINGS

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LAB 225 PLUMBING LAYOUT
SCALE: 1:50



HUMIDIFICATION PARTIAL PLUMBING LAYOUT
SCALE: 1:50

LEVEL 2 PLUMBING LAYOUT NOTES:

- 1 EXISTING 100# SOIL STACK AND 50# VENT
- 2 EXISTING PLUMBING RISER: 32# DHW, 40# DCW, 20# RO.
- 3 EXISTING PLUMBING RISER: 20# RO, 40# DCW, 32# DHW.
- 4 EXISTING 100# SOIL STACK AND 50# VENT
- 5 EXISTING 75# SOIL STACK AND 50# VENT
- 6 EXISTING PLUMBING RISER #9: 32# DHW, 32# DCW, 20# RO.
- 7 EXISTING PLUMBING RISER #11: 20# RO, 32# DCW, 32# DHW.
- 8 EXISTING 75# SOIL STACK #11 AND VENT
- 9 EXISTING VENTS TO ABOVE
- 10 EXISTING 32# DCW RISER
- 11 NEW 50# ACID-RESISTANT SANITARY PIPING AND CONNECT TO EXISTING 50# AT THIS LOCATION.
- 12 NEW 20# DCW PIPING AND CONNECT TO EXISTING 20# AT THIS LOCATION.
- 13 NEW 20# DHW PIPING AND CONNECT TO EXISTING 20# AT THIS LOCATION.
- 14 NEW 20# RO PIPING AND CONNECT TO EXISTING 20# AT THIS LOCATION.
- 15 NEW 50# VENT PIPING AND CONNECT TO EXISTING 50# AT THIS LOCATION.
- 16 PIPING TO RUN IN CEILING SPACE AND DROP DOWN IN NEW MECHANICAL CHASE AND WITHIN MILLWORK TO PLUMBING FIXTURES.
- 17 & 18 N/A
- 19 NEW LABORATORY SINK AT THIS LOCATION.
- 20 EXTEND DCW PIPING UP TO FUME HOOD / BIOLOGICAL SAFETY CABINET CONNECTION POINT. REFER TO MANUFACTURER FOR EXACT LOCATION.
- 21 CONTRACTOR TO REMOVE AND INSTALL GYPSUM CEILING TO ACCOMMODATE INSTALLATION OF PIPING IN CEILING SPACE. REFER TO GENERAL INFORMATION.
- 22 CONNECT 20# RO PIPE TO EXISTING RO RISER.
- 23 STEAM PIPE TO BE INSTALLED IN CEILING SPACE. REFER TO MANUFACTURER FOR SIZE.
- 24 CONDENSATE WATER PIPE TO BE RUN & TERMINATE ABOVE EXISTING JANITOR SINK ON LEVEL 2. REFER TO MANUFACTURER FOR SIZE.
- 25 HUMIDIFIER TO BE INSTALLED AS PER MANUFACTURER WRITTEN INSTRUCTION. FINAL LOCATION TO BE SITE VERIFIED.
- 26 STEAM PIPE UP TO ABOVE. REFER TO MANUFACTURER FOR SIZE.
- 27 PROVIDE AND INSTALL NEW DRAIN PAN BELOW COOLING COIL AND TO BE LARGE ENOUGH TO COVER VALVE PACKAGE. RUN DRAIN PIPING TO STANDPIPE LOCATED UNDER SINK.
- 28 MECHANICAL EQUIPMENT SHALL NOT BE INSTALLED WITHIN 1000 MM IN FRONT OF ELECTRICAL PANEL. REFER TO ELECTRICAL FOR EXACT LOCATION OF PANEL.

GENERAL NOTES:

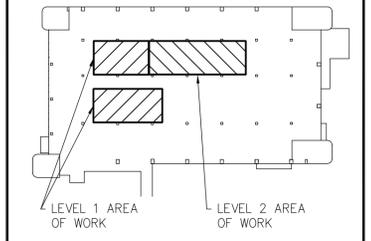
1. REFER TO DRAWING M2.1 FOR PLUMBING LEGEND.
2. FIRE STOP ALL WALL PENETRATIONS TO MAINTAIN EXISTING FIRE SEPARATION. REFER TO SPEC SECTION.
3. PROVIDE ISOLATION VALVES ON ALL NEW AND EXISTING EMERGENCY EYEWASH AND EMERGENCY SHOWERS.



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Public Works and Government Services Canada
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Ontario Region
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Services d'architecture et de génie
Région de l'Ontario

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project title
titre du projet
TORONTO Ontario
HEALTH CANADA
2301 MIDLAND AVE
LABORATORY UPGRADES

drawing title
titre du dessin
PARTIAL LEVEL 2 PLUMBING LAYOUT

drawn by
dessiné par
MVG

designed by
conçu par
MM

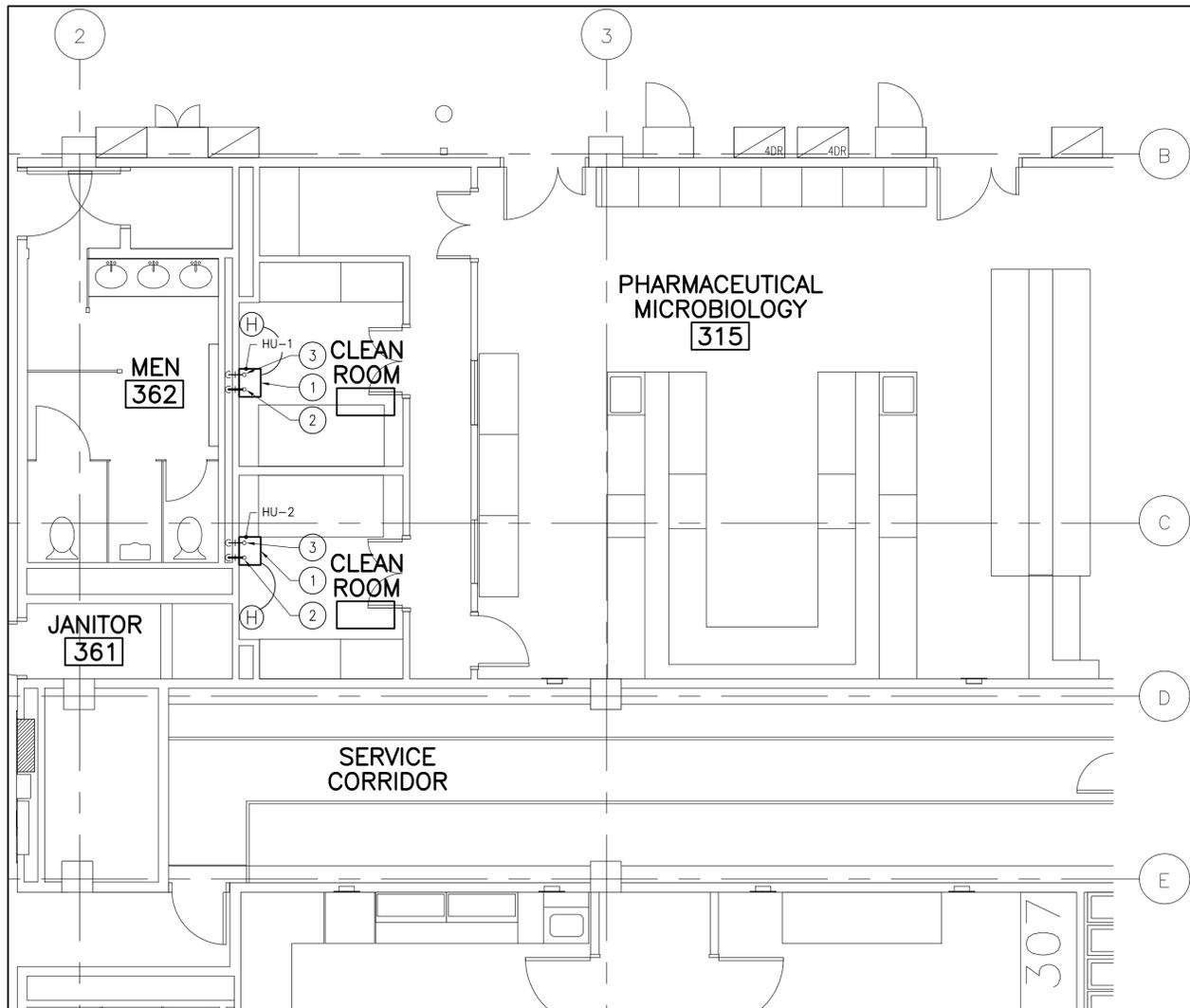
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tender
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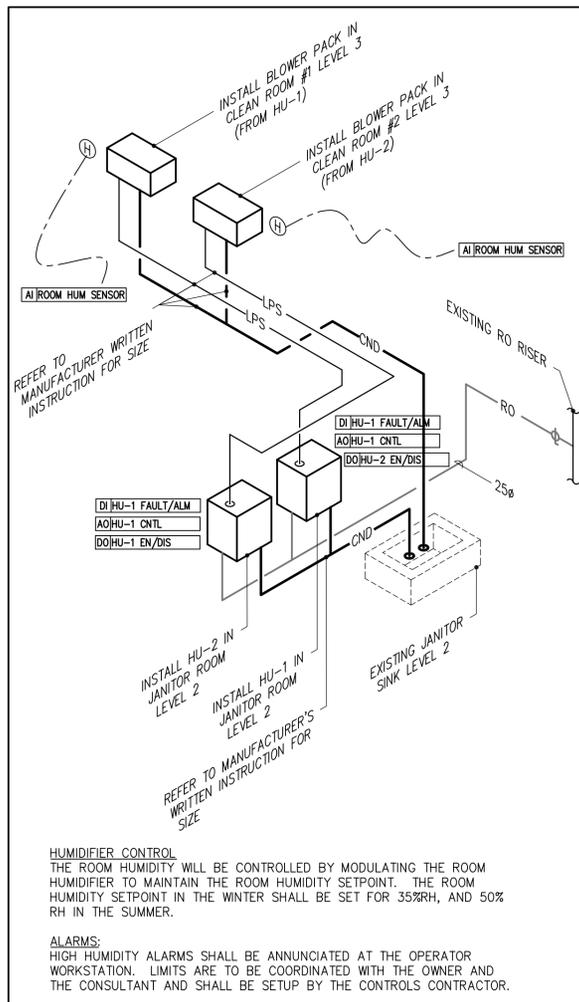
drawing no.
no. du dessin
M2.4



PARTIAL LEVEL 3 PLUMBING LAYOUT
SCALE: 1:50

PLUMBING FIXTURE SERVICING					
TAG	COLD	HOT	DRAIN	VENT	DESCRIPTION
S-1	13ø	13ø	40ø	32ø	COUNTER TOP SINK WITH RIGHT DRAINBOARD AND MANUAL FAUCET
S-2	13ø	13ø	40ø	32ø	COUNTER TOP SINK WITH LEFT DRAINBOARD AND MANUAL FAUCET
S-3	13ø	13ø	40ø	32ø	COUNTER TOP SINK WITH LEFT DRAINBOARD AND MANUAL FAUCET (WITH RO)

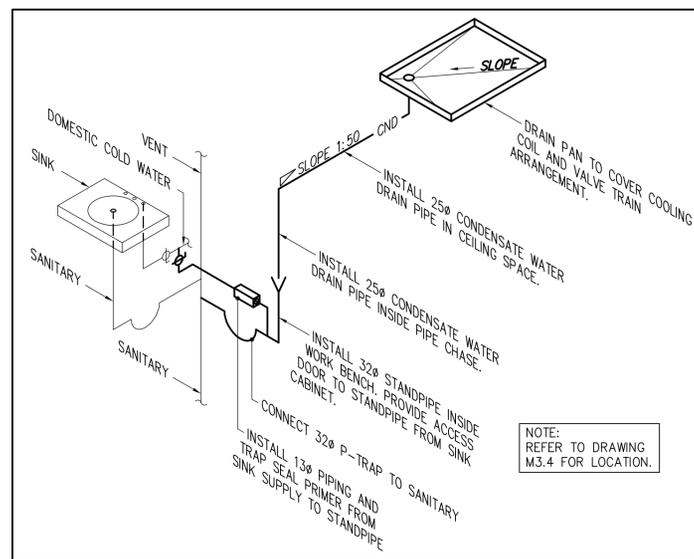
HUMIDIFIER SCHEDULE						
TAG	HUMIDIFIER			STEAM DISTRIBUTION		
	CAPACITY (kW)	TYPE	POWER CIRCUIT (V /PH /HZ)	DISPERSION TYPE	CAPACITY (KPH)	POWER CIRCUIT (V /PH /HZ)
HU-1	3.7	ELECTRODE STEAM HUMIDIFIER	208/1/60	BUILT ON BLOWER PACK	15	208/1/60
HU-2	3.7	ELECTRODE STEAM HUMIDIFIER	208/1/60	BUILT ON BLOWER PACK	15	208/1/60



HUMIDIFIER CONTROL
THE ROOM HUMIDITY WILL BE CONTROLLED BY MODULATING THE ROOM HUMIDIFIER TO MAINTAIN THE ROOM HUMIDITY SETPOINT. THE ROOM HUMIDITY SETPOINT IN THE WINTER SHALL BE SET FOR 35%RH, AND 50% RH IN THE SUMMER.

ALARMS:
HIGH HUMIDITY ALARMS SHALL BE ANNUNCIATED AT THE OPERATOR WORKSTATION. LIMITS ARE TO BE COORDINATED WITH THE OWNER AND THE CONSULTANT AND SHALL BE SETUP BY THE CONTROLS CONTRACTOR.

LEVEL 3 CLEAN ROOMS - HUMIDIFICATION SCHEMATIC
SCALE: N.T.S.



DRAIN PAN INSTALLATION SCHEMATIC
SCALE: N.T.S.

LEVEL 3 PLUMBING LAYOUT NOTES:

- NEW SPACE BLOWER PACK WALL-MOUNTED AT HIGH LEVEL. REFER TO MANUFACTURER FOR INSTALLATION DETAILS.
- RUN WATER CONDENSATE DRAIN PIPE FROM BLOWER PACK DOWN THE WALL TO LEVEL 2 JANITOR SINK. REFER TO MANUFACTURER FOR PIPE SIZE.
- STEAM PIPING FROM BELOW TO BLOWER PACK. REFER TO MANUFACTURER FOR PIPE SIZE.

GENERAL NOTES:

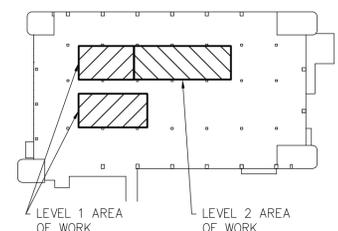
- REFER TO DRAWING M2.1 FOR PLUMBING LEGEND.
- FIRE STOP ALL WALL PENETRATIONS TO MAINTAIN EXISTING FIRE SEPARATION. REFER TO SPEC SECTION.

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revision	description	date
2	ISSUED FOR TENDER	2015/05/29
1	ISSUED FOR REVIEW	2015/04/17

Do not scale drawings.
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A	Detail No.
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C	dessin no. - où détaillé

project title
titre du projet
TORONTO Ontario
HEALTH CANADA
2301 MIDLAND AVE

LABORATORY UPGRADES

drawing title
titre du dessin
PARTIAL LEVEL 3 PLUMBING LAYOUT SCHEMATIC & SCHEDULE

drawn by
dessiné par **MVG**

designed by
conçu par **MM**

approved by
approuvé par **MM**

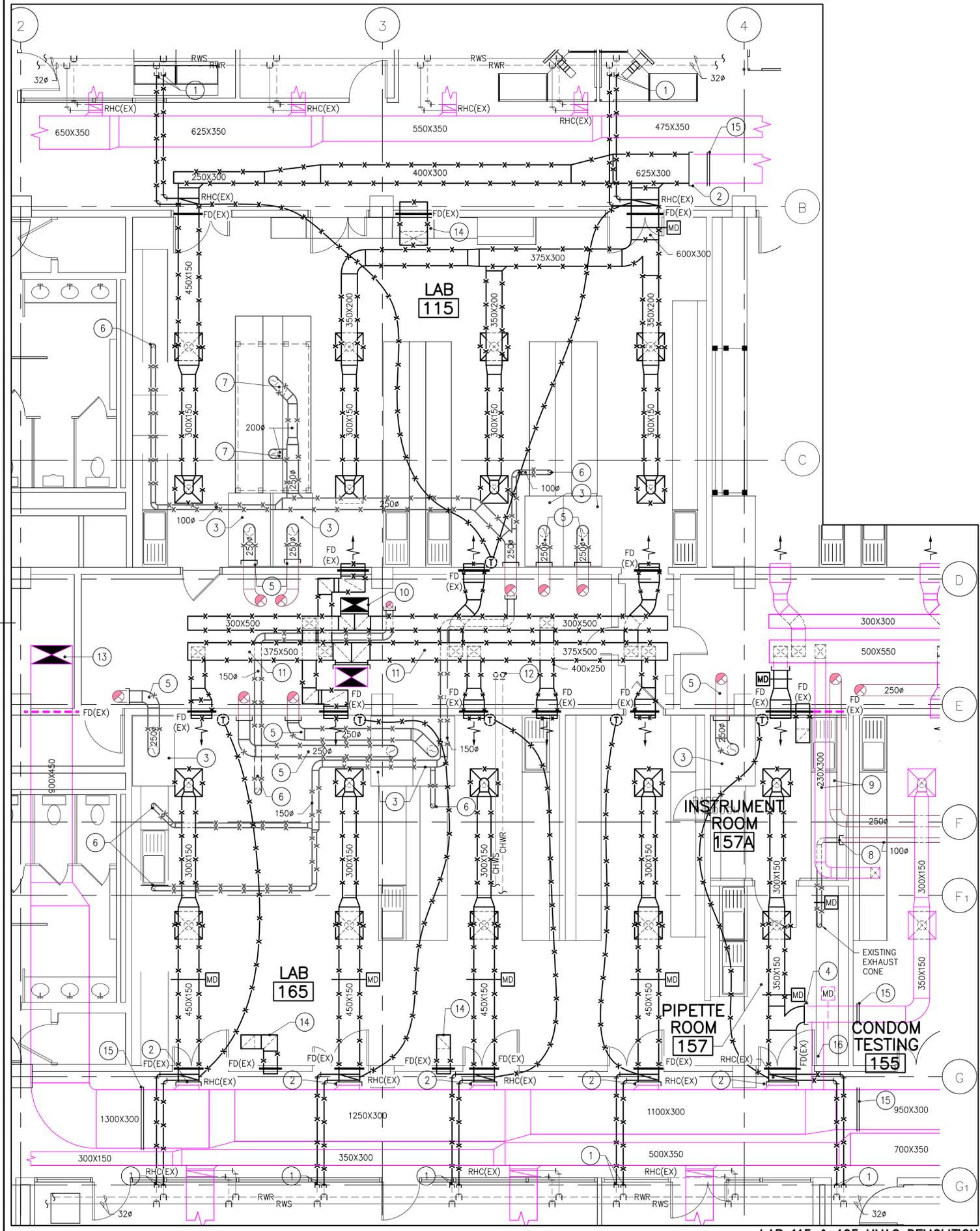
tender
soumission **AQUIL ALI** project manager
administrateur de projets

project date
date du projet **2015/04/15**

project no.
no. du projet **R.054345.001**

drawing no.
no. du dessin **M2.5**

CONTRACT DRAWINGS
CONTRACT DRAWINGS FOR MECHANICAL WORK ARE IN PART DIAGRAMMATIC, INTENDED TO CONVEY THE SCOPE OF WORK AND GENERAL ARRANGEMENT FOR MECHANICAL SYSTEMS AND EQUIPMENT. CONTRACTOR TO COORDINATE LAYOUT OF MECHANICAL SYSTEMS WITH ARCHITECTURAL, STRUCTURAL, AND ELECTRICAL BUILDING COMPONENTS, AS WELL AS, OTHER MECHANICAL SYSTEMS. PROVIDE ADDITIONAL PIPING, DUCTING, FITTINGS, SUPPORTS, ETC., REQUIRED TO FACILITATE THE WORK. NO EXTRA PAYMENTS ARISING FROM FAILURE TO MAKE THIS COORDINATION WILL BE CONSIDERED.



LAB 115 & 165 HVAC DEMOLITION
SCALE: 1:50

GENERAL NOTES:

- ALL HOT WATER SUPPLY AND RETURN PIPING IS 20# UNLESS OTHERWISE NOTED.
- FIRE STOP ALL WALL PENETRATIONS TO MAINTAIN EXISTING FIRE SEPARATION. REFER TO SPEC SECTION.

HVAC DRAWING NOTES:

- REMOVE EXISTING 20# HWS AND HWR PIPING AND CAP BACK TO MAIN.
- REMOVE EXISTING SUPPLY DUCTWORK AND ASSOCIATED EQUIPMENT/ACCESSORIES. CAP BACK TO MAIN.
- REMOVE EXISTING FUME HOOD/EXHAUST CANOPY.
- CAP EXISTING SUPPLY DUCT AT THIS LOCATION
- REMOVE EXISTING FUME HOOD EXHAUST DUCT. DISCONNECT FROM FUME HOOD AND PROVIDE TEMPORARY CAP BACK TO RISER.
- REMOVE EXISTING EXHAUST CONE AND REDUNDANT DUCTWORK. CAP BACK TO RISER
- DISCONNECT DUCTWORK FROM EXISTING EXHAUST CANOPY. REMOVE REDUNDANT EXHAUST DUCTWORK AND CAP BACK TO RISER.
- REMOVE EXISTING EXHAUST CONE AND REDUNDANT DUCTWORK. CAP BACK TO THIS LOCATION..
- RETAIN EXISTING DUCTWORK
- REMOVE EXISTING DUCTWORK AND ASSOCIATED 600X300 RISER UP TO LEVEL 3.
- REMOVE EXISTING DUCTWORK AND CAP BACK TO 750X500 SUPPLY RISER.
- EXISTING 150# CHILLED WATER RISERS TO ABOVE.
- 900X450 SUPPLY RISER TO ABOVE
- REMOVE EXISTING TRANSFER GRILLE/DUCT AND FIRE DAMPER.
- PERFORM DUCT TRAVERSE AIRFLOW READING PRIOR TO DEMOLITION
- PROVIDE TEMPORARY CONNECTION DURING CONSTRUCTION TO ENSURE AIR FLOW TO ADJACENT SPACE.

BALANCING NOTES:

- PRIOR TO DEMOLITION OF EXISTING DUCTWORK, ALL EXISTING FLOW RATES TO BE MEASURED AND THE RESULTS FORWARDED TO THE PROJECT ENGINEER FOR REVIEW.
- PERFORM DUCT AIRFLOW TRAVERSE READING AT LOCATIONS SPECIFIED ON THE DRAWING. THE RESULTS ARE TO BE FORWARDED TO THE PROJECT ENGINEER FOR REVIEW.

PHASING NOTES:

- THE PROJECT WILL BE COMPLETED IN THREE (3) PHASES.
- REQUIRED STAGES:
 - PHASE 1 - ROOM 115, 164 AND CLEAN ROOMS ON LEVEL 3
 - PHASE 2 - ROOM 165
 - PHASE 3 - ROOM 225
- EACH PHASE SHALL BE COMPLETED, COMMISSIONED AND FULLY OPERATIONAL, PRIOR TO START OF THE NEXT PHASE.
- CONTRACTOR WILL NEED TO MOBILIZE AND DEMOBILIZE DURING EACH PHASE OF A FISCAL YEAR.

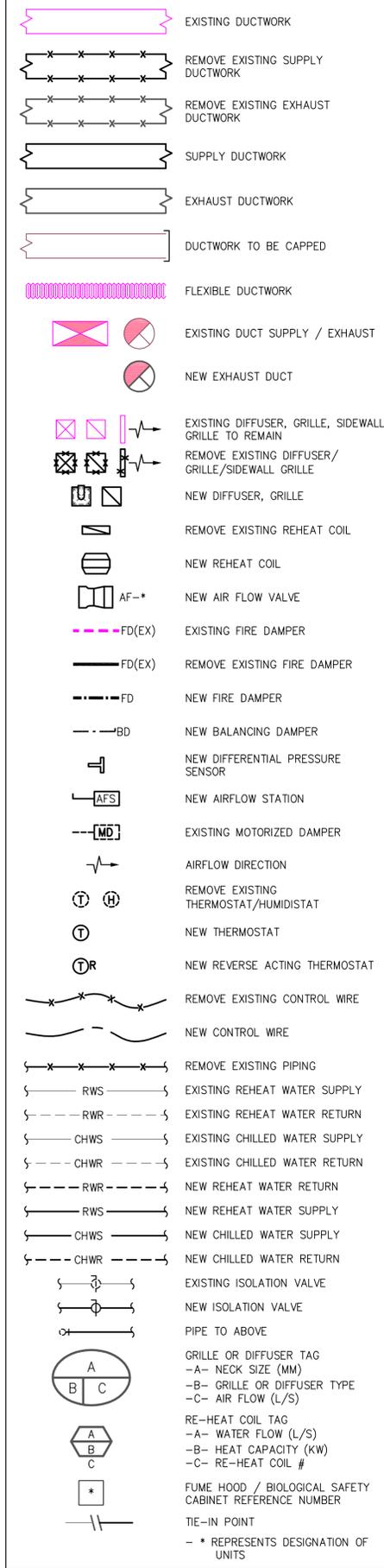
DEMOLITION NOTES

EXISTING MECHANICAL SYSTEM SHOWN IS DIAGRAMATIC AND IS BASED ON ORIGINAL DRAWINGS. THE DRAWING MAY NOT REPRESENT "AS-BUILT" CONDITIONS. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY ON SITE, PRIOR TO ISSUE QUOTE, THE EXTENT AND CONFIGURATION OF EXISTING MECHANICAL SYSTEM AND ALLOW FOR ADDITIONAL REMOVALS AS DETERMINED ON SITE TO MEET THE INTENT OF THE DEMOLITION INDICATED. NO EXTRAS WILL BE ALLOWED FOR FAILURE OF THE CONTRACTOR IN COMPLETING A THOROUGH REVIEW OF THE SITE PRIOR TO SUBMITTING TENDER PRICE.

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HVAC LEGEND

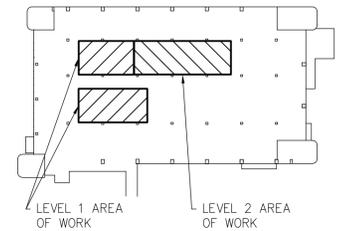


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project title
titre du projet
TORONTO HEALTH CANADA
2301 MIDLAND AVE
Ontario
LABORATORY UPGRADES

drawing title
titre du dessin
PARTIAL LEVEL 1 PLAN HVAC DEMOLITION

drawn by
dessiné par
TCQ

designed by
conçu par
MM

approved by
approuvé par
MM

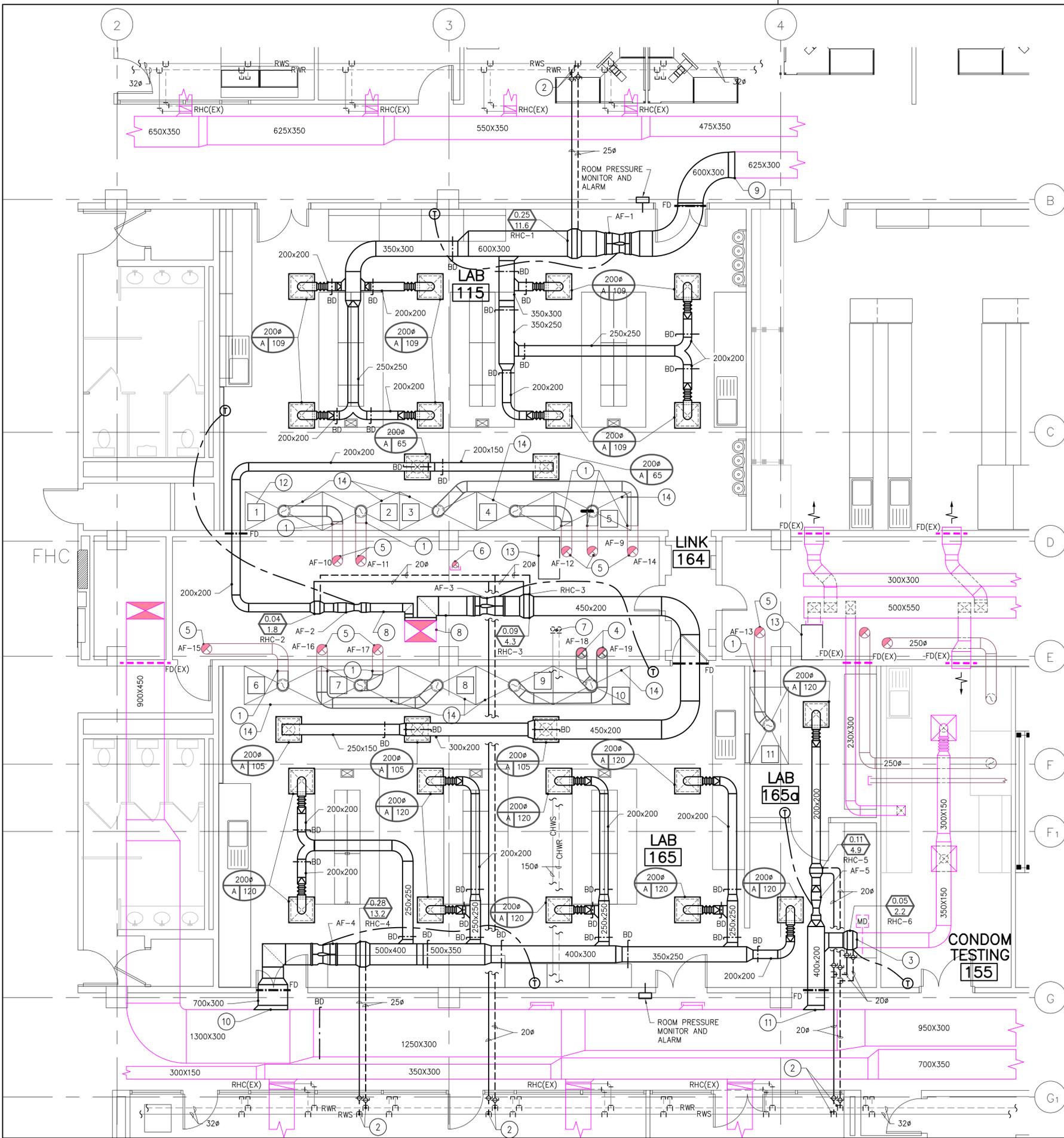
tender submission
soutmission
AQUIL ALI

project date
date du projet
2015/04/15

project no.
no. du projet
R.054345.001

drawing no.
no. du dessin
M3.1





LAB 115 & 165 HVAC LAYOUT
SCALE: 1:50

GENERAL NOTES:

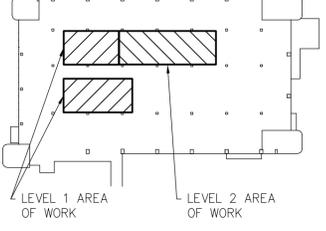
1. ALL HOT WATER SUPPLY AND RETURN PIPING IS 20Ø UNLESS NOTED OTHERWISE.
2. ALL FUME HOOD EXHAUST DUCTS SHALL BE FABRICATED OUT OF STAINLESS STEEL AND ARE 25Ø UNLESS NOTED OTHERWISE.
3. FIRE STOP ALL WALL PENETRATIONS TO MAINTAIN EXISTING FIRE SEPARATION. REFER TO SPEC SECTION.

HVAC DRAWING NOTES:

- 1 25Ø EXHAUST DUCTWORK FOR FUME HOOD. CONNECT TO EXISTING.
- 2 CONNECT NEW RWS AND RWR LINES TO EXISTING.
- 3 CONNECT NEW 350X150 SUPPLY DUCT TO EXISTING.
- 4 PROVIDE NEW 25Ø EXHAUST DUCTWORK FOR FUME HOOD. EXTEND UP TO EXISTING FLOOR PENETRATION. REFER TO PENTHOUSE LAYOUT FOR FLOOR PENETRATION LOCATION.
- 5 EXISTING 25Ø EXHAUST RISER.
- 6 EXISTING 15Ø EXHAUST RISER.
- 7 EXISTING 15Ø CHILLED WATER RISERS TO ABOVE.
- 8 CONNECT NEW 45Ø X 20Ø & 20Ø X 20Ø DUCTS TO EXISTING 75Ø X 50Ø SUPPLY RISER (TO ABOVE).
- 9 CONNECT NEW 60Ø X 30Ø SUPPLY DUCT TO EXISTING.
- 10 CONNECT NEW 70Ø X 30Ø SUPPLY DUCT TO EXISTING.
- 11 CONNECT NEW 40Ø X 20Ø SUPPLY DUCT TO EXISTING.
- 12 FOR REFERENCE TAGS ON FUME HOOD REFER TO DRAWING M3.6
- 13 MECHANICAL EQUIPMENT SHALL NOT BE INSTALLED WITHIN 1000 MM IN FRONT OF ELECTRICAL PANEL. REFER TO ELECTRICAL FOR EXACT LOCATION OF PANEL.
- 14 NEW CONVENTIONAL FUME HOOD

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TORONTO HEALTH CANADA
2301 MIDLAND AVE
Ontario
LABORATORY UPGRADES

drawing title
titre du dessin
PARTIAL LEVEL 1 PLAN HVAC LAYOUT

drawn by
dessiné par
TCQ

designed by
conçu par
MM

approved by
approuvé par
MM

tender submission
soumission
AQUIL ALI project manager
administrateur de projets

project date
date du projet
2015/04/15

project no.
no. du projet
R.054345.001

drawing no.
no. du dessin
M3.3

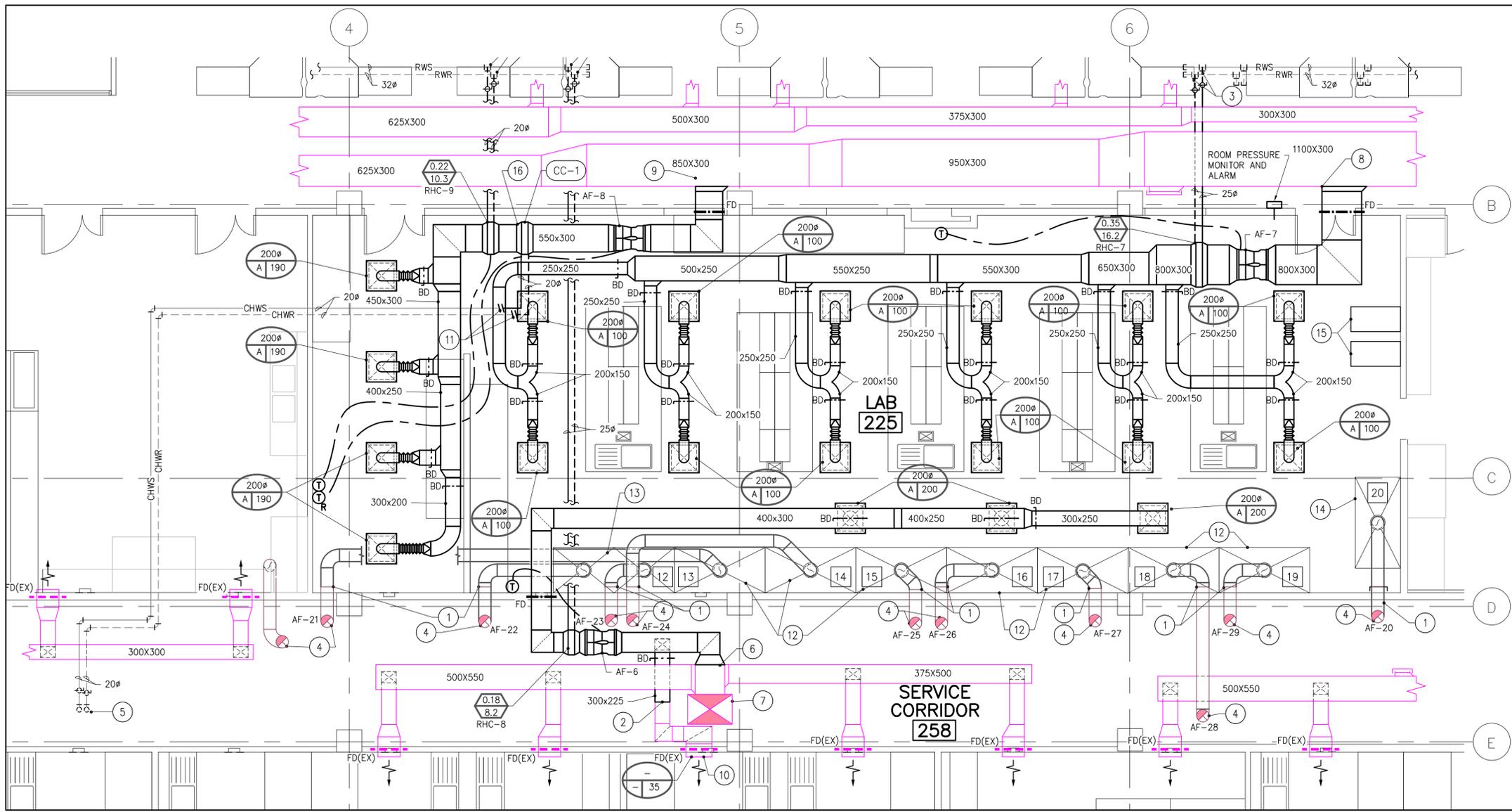
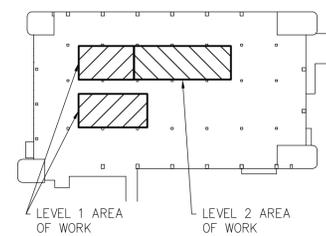
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LAB 225 HVAC LAYOUT
 SCALE: 1:50

- HVAC DRAWING NOTES:**
- 1 250ø EXHAUST DUCTWORK FOR FUME HOOD. CONNECT TO EXISTING.
 - 2 CONNECT NEW 300X225 SUPPLY DUCT TO EXISTING.
 - 3 CONNECT NEW RWS AND RWR LINES TO EXISTING
 - 4 EXISTING 250ø EXHAUST RISER.
 - 5 EXISTING 150ø CHILLED WATER RISERS.
 - 6 CONNECT NEW 400X300 DUCT TO EXISTING.
 - 7 EXISTING 900X600 SUPPLY RISER TO ABOVE.
 - 8 CONNECT NEW 800X300 SUPPLY DUCT TO EXISTING OPENING. MODIFY EXISTING OPENING TO SUIT NEW DUCT SIZES CONNECTION.
 - 9 CONNECT NEW 300X200 SUPPLY DUCT TO EXISTING.
 - 10 BALANCE EXISTING DIFFUSER AS INDICATED
 - 11 CONNECT NEW CHWS AND CHWR LINES TO EXISTING
 - 12 NEW CONVENTIONAL TYPE FUME HOOD
 - 13 OWNER SUPPLIED FUME HOOD
 - 14 NEW TYPE CLASS II B1 BIOLOGICAL SAFETY CABINET
 - 15 MECHANICAL EQUIPMENT SHALL NOT BE INSTALLED WITHIN 1000 MM IN FRONT OF ELECTRICAL PANEL. REFER TO ELECTRICAL FOR EXACT LOCATION OF PANEL.
 - 16 PROVIDE DRAIN PAN BENEATH COIL AS DETAILED ON DRAWING M2.5.

- GENERAL NOTES:**
- ALL HOT WATER SUPPLY AND RETURN AND CHILLED WATER SUPPLY AND RETURN PIPING ARE 20ø UNLESS NOTED OTHERWISE.
 - ALL FUME HOOD EXHAUST DUCTS ARE 250ø UNLESS NOTED OTHERWISE.
 - FIRE STOP ALL WALL PENETRATIONS TO MAINTAIN EXISTING FIRE SEPARATION. REFER TO SPEC SECTION.

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project title
 titre du projet
TORONTO Ontario
 HEALTH CANADA
 2301 MIDLAND AVE
LABORATORY UPGRADES

drawing title
 titre du dessin
**PARTIAL LEVEL 2 PLAN
 HVAC LAYOUT**

drawn by
 dessiné par **TCQ**

designed by
 conçu par **MM**

approved by
 approuvé par **MM**

tender
 soumission **AQUIL ALI** project manager
 administrateur de projets

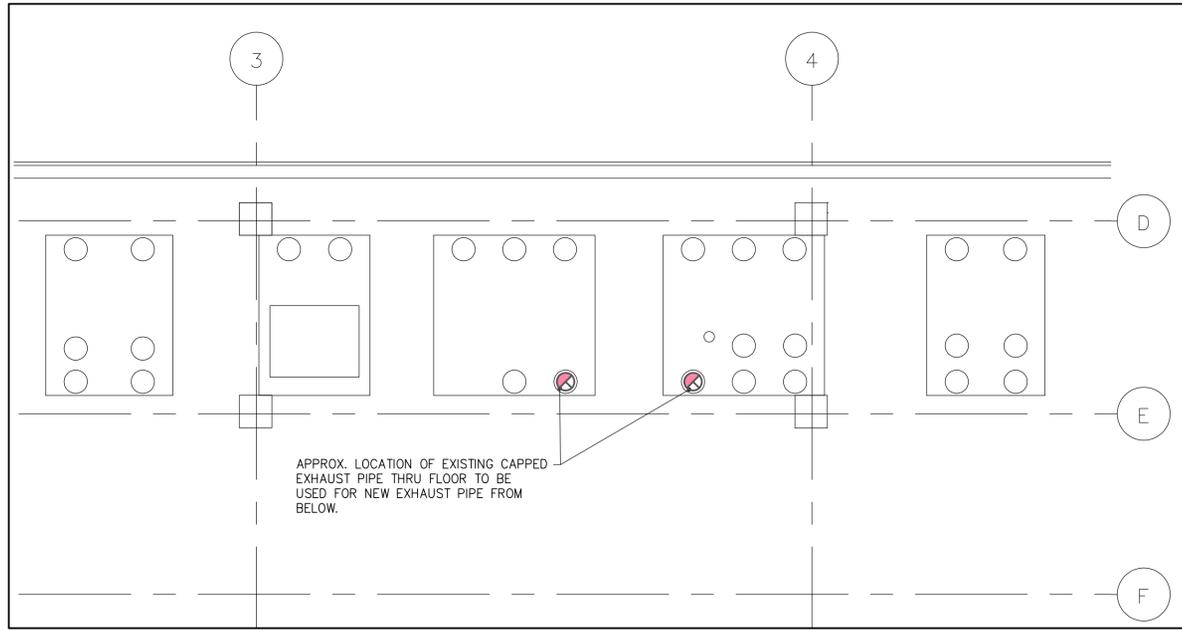
project date
 date du projet **2015/04/15**

project no.
 no. du projet **R.054345.001**

drawing no.
 no. du dessin **M3.4**

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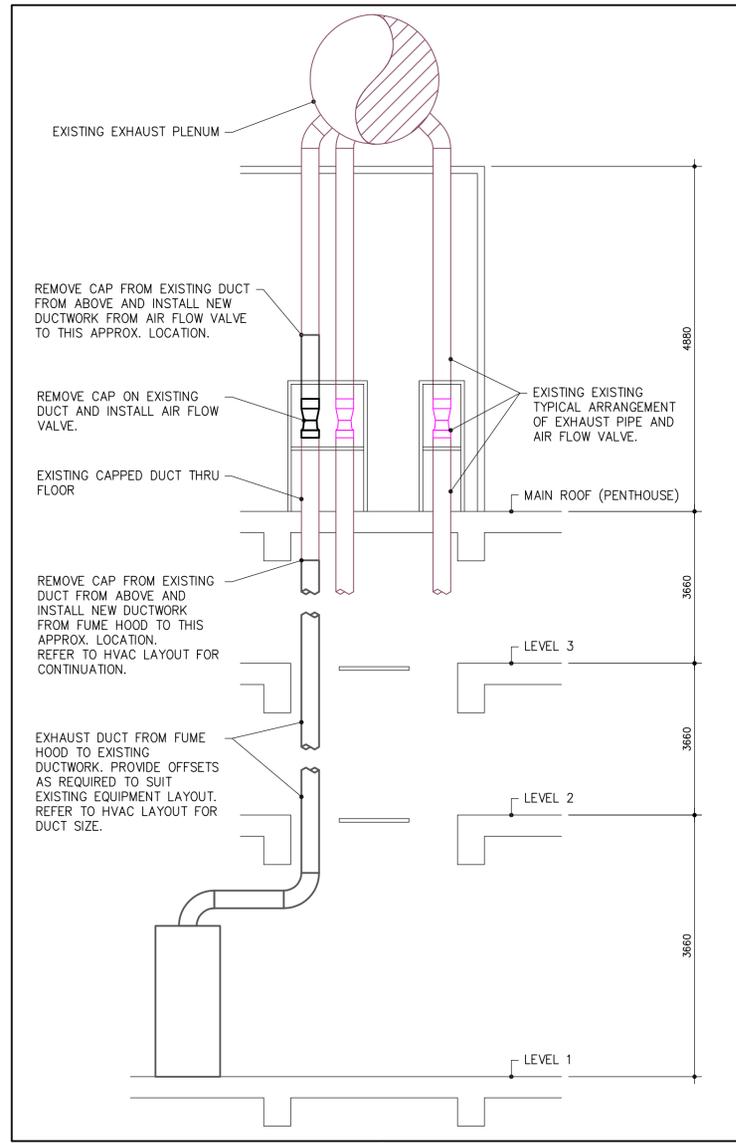
PARTIAL PENTHOUSE HVAC LAYOUT
SCALE: 1:50

FUME HOOD SCHEDULE					
TAG	LOCATION	SIZE	TYPE	SERVICES	
				WATER	AIR
1	LAB 115	1830	VAV FUME HOOD	YES	YES
2	LAB 115	1830	VAV FUME HOOD	YES	YES
3	LAB 115	1830	VAV FUME HOOD	YES	YES
4	LAB 115	1830	VAV FUME HOOD	YES	YES
5	LAB 115	1830	VAV FUME HOOD	YES	YES
6	LAB 165	1830	VAV FUME HOOD	YES	YES
7	LAB 165	1830	VAV FUME HOOD	YES	YES
8	LAB 165	1830	VAV FUME HOOD	YES	YES
9	LAB 165	1830	VAV FUME HOOD	YES	YES
10	LAB 165	1830	VAV FUME HOOD	YES	YES
11	LAB 165A	1830	VAV FUME HOOD	YES	YES
12	LAB 225	2240	SUPPLIED BY OWNER	YES	YES
13	LAB 225	1830	VAV FUME HOOD	YES	YES
14	LAB 225	1830	VAV FUME HOOD	YES	YES
15	LAB 225	1830	VAV FUME HOOD	YES	YES
16	LAB 225	1830	VAV FUME HOOD	YES	YES
17	LAB 225	1830	VAV FUME HOOD	YES	YES
18	LAB 225	1830	VAV FUME HOOD	YES	YES
19	LAB 225	1830	VAV FUME HOOD	YES	YES
20	LAB 225	1830	CLASS II B1 SAFETY CABINET	YES	YES

AIR FLOW VALVES SCHEDULE						
TAG	AIR FLOW (L/S)		DUCT SIZE MM x MM	LOCATION	SERVICE	AIR PRESSURE
	MAX	MIN				
AF-1	870	435	600 X 300	LAB 115	SUPPLY	
AF-2	130	0	200 X 200	LAB 115		
AF-3	320	0	450 X 200	LAB 165		
AF-4	1080	540	500 X 400	LAB 165		
AF-5	200	60	200 X 200	LAB 165a		
AF-6	600	210	400 X 30	LAB 225		
AF-7	1200	550	800 X 300	LAB 225		
AF-8	760	200	550 X 300	LAB 225		
AF-9	200	105	250ø	MECH. ROOM PENTHOUSE	LOW	
AF-10	200	105	250ø	MECH. ROOM PENTHOUSE		
AF-11	200	105	250ø	MECH. ROOM PENTHOUSE		
AF-12	200	105	250ø	MECH. ROOM PENTHOUSE		
AF-13	200	105	250ø	MECH. ROOM PENTHOUSE		
AF-14	200	105	250ø	MECH. ROOM PENTHOUSE		
AF-15	200	105	250ø	MECH. ROOM PENTHOUSE		
AF-16	200	105	250ø	MECH. ROOM PENTHOUSE		
AF-17	200	105	250ø	MECH. ROOM PENTHOUSE		
AF-18	200	105	250ø	MECH. ROOM PENTHOUSE		
AF-19	200	105	250ø	MECH. ROOM PENTHOUSE		
AF-20	200	105	250ø	MECH. ROOM PENTHOUSE		
AF-21	200	105	250ø	MECH. ROOM PENTHOUSE		
AF-22	708	708	250ø	MECH. ROOM PENTHOUSE		
AF-23	708	708	250ø	MECH. ROOM PENTHOUSE		
AF-24	200	105	250ø	MECH. ROOM PENTHOUSE		
AF-25	200	105	250ø	MECH. ROOM PENTHOUSE		
AF-26	200	105	250ø	MECH. ROOM PENTHOUSE		
AF-27	200	105	250ø	MECH. ROOM PENTHOUSE		
AF-28	200	105	250ø	MECH. ROOM PENTHOUSE		
AF-29	200	105	250ø	MECH. ROOM PENTHOUSE		

GRILLES & DIFFUSERS SCHEDULE						
TAG	FUNCTION	BORDER	FASTENING	FINISH	FACE SIZE	TYPE
A	SUPPLY	T-BAR	-	B12	24" x 24"	RADIAL FLOW DIFFUSER

COOLING COIL SCHEDULE															
TAG	DUCT SIZE (MMxMM)	CAPACITY		AIR				WATER				FINS PER METER	NO. ROWS		
		SENSIBLE (KW)	TOTAL (KW)	FLOW (L/S)	EAT		LAT		FLOW (L/S)	EWT (°C)	LWT (°C)			VELOCITY (M/SEC)	
					(°C)	(°C)	(°C)	(°C)							APD (MM WG)
CC-1	550x300	12.6	17.2	760	27	19	13	13	4.1 MAX.	0.3	9	13	1.2 MAX.	315	1



FUME HOOD / BSC HVAC TYPICAL ARRANGEMENT
SCALE: N.T.S.

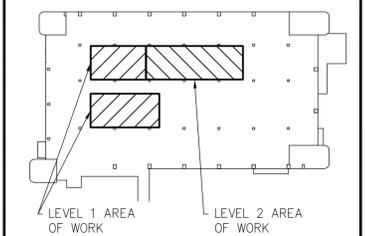
HOT WATER REHEAT COIL SCHEDULE													
TAG	DUCT SIZE (MMxMM)	CAPACITY (KW)	AIR				WATER				FINS PER METER	NO. ROWS	
			FLOW (L/S)	EAT (°C)	LAT (°C)	APD (MM WG)	FLOW (L/S)	EWT (°C)	LWT (°C)	VELOCITY (M/SEC)			
RHC-1	600x300	11.5	850				0.25						
RHC-2	200x200	1.8	130				0.04						
RHC-3	450x200	4.3	315				0.09						
RHC-4	500x400	13.1	967				0.28						
RHC-5	300x300	4.8	354	13	24	4.1 MAX.	0.10	74	63	1.2 MAX.	315	1	
RHC-6	350x150	2.2	160				0.05						
RHC-7	650x350	16.2	1200				0.35						
RHC-8	400x300	8.1	600				0.18						
RHC-9	550x300	10.3	760				0.22						



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revision	description	date
2	ISSUED FOR TENDER	2015/05/29
1	ISSUED FOR REVIEW	2015/04/17

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A	Detail No.
B	drawing no. - where detail required
C	drawing no. - where detailed

project title
titre du projet
TORONTO Ontario
HEALTH CANADA
2301 MIDLAND AVE

LABORATORY UPGRADES

drawing title
titre du dessin
PARTIAL PENTHOUSE PLAN HVAC LAYOUT SECTION & SCHEDULES

drawn by
dessiné par
TCQ

designed by
conçu par
MM

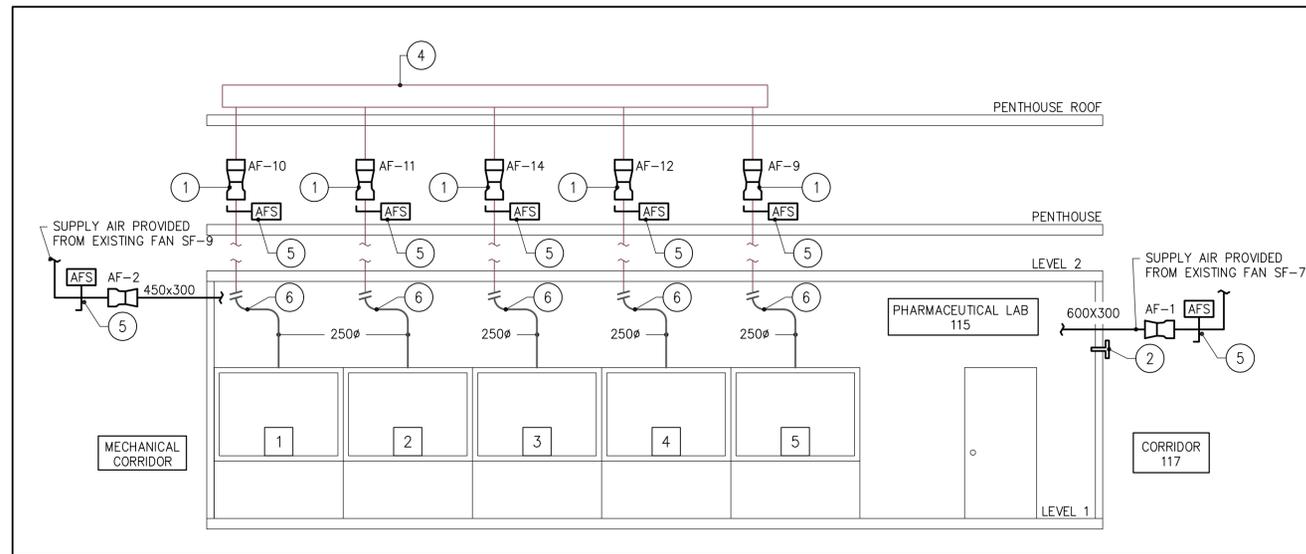
approved by
approuvé par
MM

tender
soumission
AQUIL ALI project manager
administrateur de projets

project date
date du projet
2015/04/15

project no.
no. du projet
R.054345.001

drawing no.
no. du dessin
M3.5



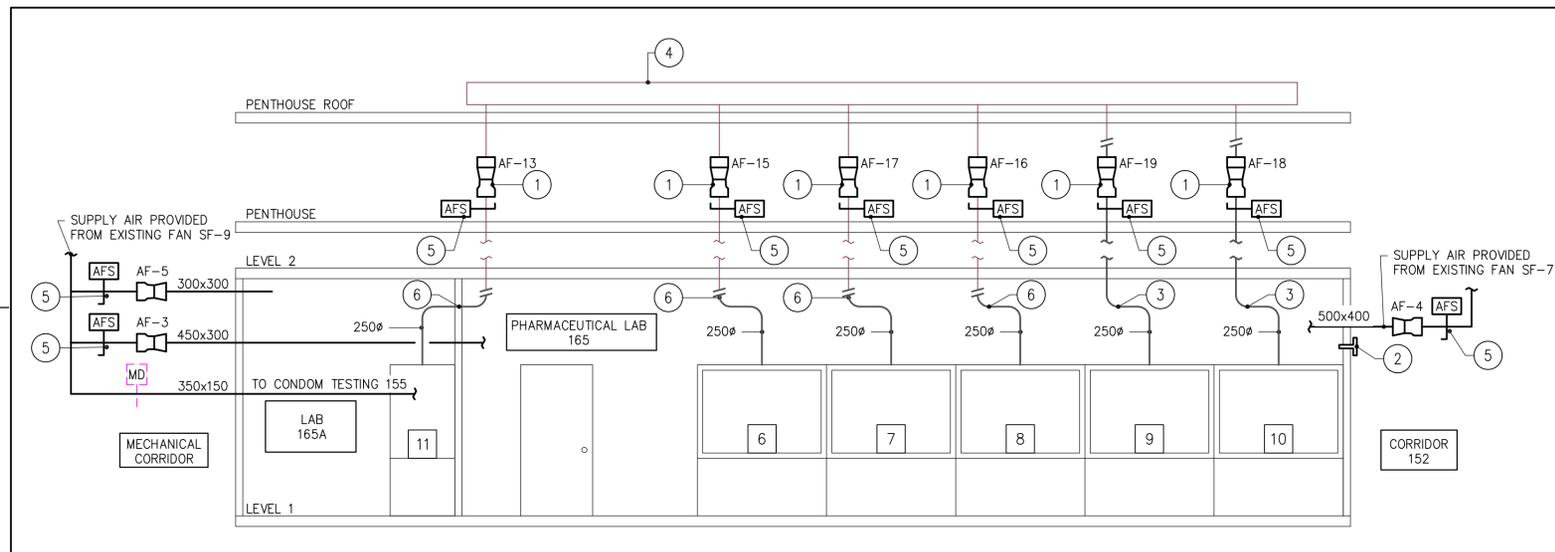
LAB 115 HVAC SCHEMATIC
SCALE: N.T.S.

HVAC DRAWING NOTES:

- 1 REMOVE EXISTING AIRFLOW VALVE AND CONTROLS AND REPLACE WITH NEW.
- 2 NEW ROOM DIFFERENTIAL PRESSURE SENSOR AND ALARM.
- 3 250ø EXHAUST DUCT RISER FROM FUME HOOD / BSC TO EXISTING EXHAUST PLENUM ON ROOF.
- 4 EXISTING EXHAUST PLENUM TO REMAIN
- 5 NEW AIR FLOW STATION.
- 6 NEW 250ø EXHAUST DUCT FROM EXISTING RISER TO FUME HOOD

SEQUENCE OF OPERATION (LAB 115):

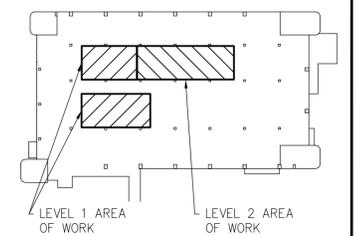
1. A MINIMUM OF SIX (6) AIR CHANGES PER HOUR FRESH AIR SHALL BE MAINTAINED.
2. THE AIR FLOW VALVES ARE TO MAINTAIN A VOLUMETRIC OFFSET OF 10% DIFFERENCE BETWEEN SUPPLY AND EXHAUST FLOW RATES AS MEASURED BY THE AIRFLOW STATION WITHIN EACH SUPPLY AND EXHAUST DUCT SERVING THE LAB. THE EXHAUST FLOW SHALL BE THE HIGHER OF THE TWO IN ORDER TO MAINTAIN NEGATIVE PRESSURE RELATIVE TO THE SURROUNDING SPACE.
3. PRESSURE DIFFERENTIAL SENSOR TO BE USED FOR MONITORING ONLY. LAB TO BE MAINTAINED AT NEGATIVE PRESSURE AT ALL TIMES. AN ALARM SHALL ANNUNCIATE AT THE MAIN BUILDING OPERATOR WORK STATION SHOULD NEGATIVE PRESSURE BE LOST. THERE SHALL BE A 60 SECOND DELAY IN ALARM. IN THE EVENT THAT A DOOR IS OPENED THIS WILL ALLOW THE DOOR TO CLOSE AND SYSTEM TO RESET.



LAB 165 HVAC SCHEMATIC
SCALE: N.T.S.

SEQUENCE OF OPERATION (LAB 165):

1. A MINIMUM OF SIX (6) AIR CHANGES PER HOUR FRESH AIR SHALL BE MAINTAINED.
2. THE AIR FLOW VALVES ARE TO MAINTAIN A VOLUMETRIC OFFSET OF 10% DIFFERENCE BETWEEN SUPPLY AND EXHAUST FLOW RATES AS MEASURED BY THE AIRFLOW STATION WITHIN EACH SUPPLY AND EXHAUST DUCT SERVING THE LAB. THE EXHAUST FLOW SHALL BE THE HIGHER OF THE TWO IN ORDER TO MAINTAIN NEGATIVE PRESSURE RELATIVE TO THE SURROUNDING SPACE.
3. PRESSURE DIFFERENTIAL SENSOR TO BE USED FOR MONITORING ONLY. LAB TO BE MAINTAINED AT NEGATIVE PRESSURE AT ALL TIMES. AN ALARM SHALL ANNUNCIATE AT THE MAIN BUILDING OPERATOR WORK STATION SHOULD NEGATIVE PRESSURE BE LOST. THERE SHALL BE A 60 SECOND DELAY IN ALARM. IN THE EVENT THAT A DOOR IS OPENED THIS WILL ALLOW THE DOOR TO CLOSE AND SYSTEM TO RESET.



revision	description	date
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project title / titre du projet
TORONTO Ontario
HEALTH CANADA
2301 MIDLAND AVE

LABORATORY UPGRADES

drawing title / titre du dessin
HVAC SCHEMATICS

drawn by / dessiné par **MVG**

designed by / conçu par **MM**

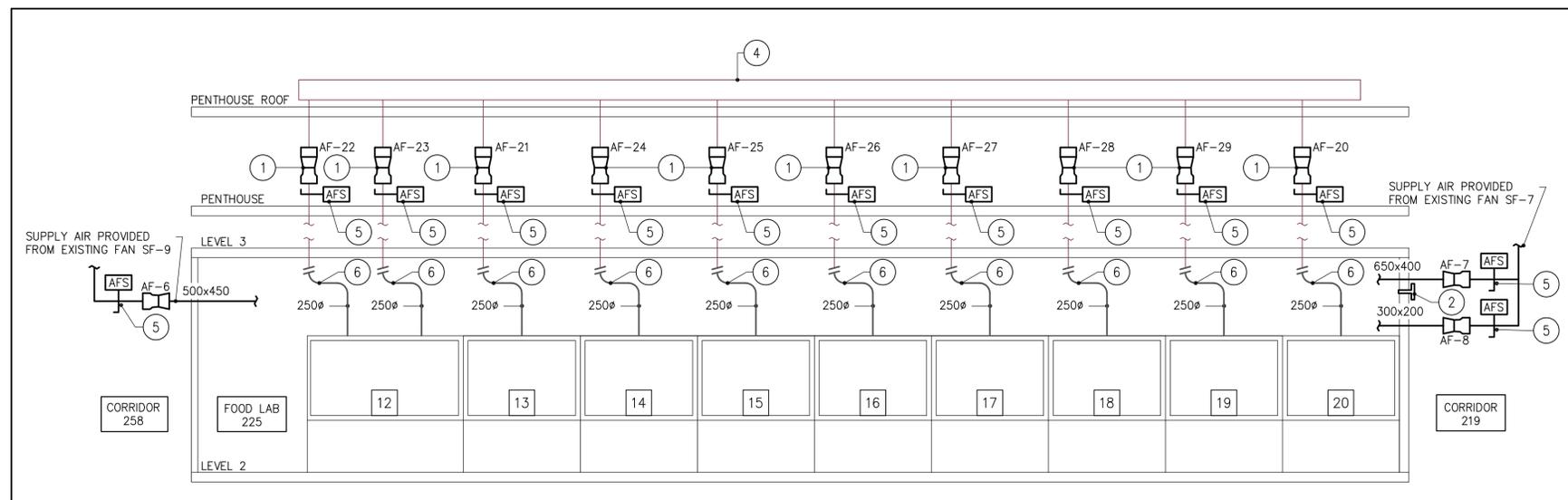
approved by / approuvé par **MM**

tender submission / project manager / soumission / administrateur de projets **AQUIL ALI**

project date / date du projet **2015/04/15**

project no. / no. du projet **R.054345.001**

drawing no. / no. du dessin **M3.6**



LAB 225 HVAC SCHEMATIC
SCALE: N.T.S.

SEQUENCE OF OPERATION (LAB 225):

1. A MINIMUM OF SIX (6) AIR CHANGES PER HOUR FRESH AIR SHALL BE MAINTAINED.
2. THE AIR FLOW VALVES ARE TO MAINTAIN A VOLUMETRIC OFFSET OF 10% DIFFERENCE BETWEEN SUPPLY AND EXHAUST FLOW RATES AS MEASURED BY THE AIRFLOW STATION WITHIN EACH SUPPLY AND EXHAUST DUCT SERVING THE LAB. THE EXHAUST FLOW SHALL BE THE HIGHER OF THE TWO IN ORDER TO MAINTAIN NEGATIVE PRESSURE RELATIVE TO THE SURROUNDING SPACE.
3. PRESSURE DIFFERENTIAL SENSOR TO BE USED FOR MONITORING ONLY. LAB TO BE MAINTAINED AT NEGATIVE PRESSURE AT ALL TIMES. AN ALARM SHALL ANNUNCIATE AT THE MAIN BUILDING OPERATOR WORK STATION SHOULD NEGATIVE PRESSURE BE LOST. THERE SHALL BE A 60 SECOND DELAY IN ALARM. IN THE EVENT THAT A DOOR IS OPENED THIS WILL ALLOW THE DOOR TO CLOSE AND SYSTEM TO RESET.



CONTRACT DRAWINGS
CONTRACT DRAWINGS FOR MECHANICAL WORK ARE IN PART DIAGRAMMATIC, INTENDED TO CONVEY THE SCOPE OF WORK AND GENERAL ARRANGEMENT FOR MECHANICAL SYSTEMS AND EQUIPMENT. CONTRACTOR TO COORDINATE LAYOUT OF MECHANICAL SYSTEMS WITH ARCHITECTURAL, STRUCTURAL, AND ELECTRICAL BUILDING COMPONENTS, AS WELL AS, OTHER MECHANICAL SYSTEMS. PROVIDE ADDITIONAL PIPING, DUCTING, FITTINGS, SUPPORTS, ETC., REQUIRED TO FACILITATE THE WORK. NO EXTRA PAYMENTS ARISING FROM FAILURE TO MAKE THIS COORDINATION WILL BE CONSIDERED.

LABORATORY AIR CONTROL SYSTEM (LACS) – GENERAL DESCRIPTION OF SYSTEMS:

1. EACH LABORATORY SHALL HAVE A DEDICATED CONTROL SYSTEM THAT SHALL MONITOR AND CONTROL AIRFLOW RATES FOR SUPPLY AIR AND FUME HOOD EXHAUST AIR WHERE APPLICABLE.
2. ALL VOLUME CONTROL DEVICES ARE VARIABLE VOLUME TYPE COMPLETE WITH HIGH SPEED ELECTRIC ACTUATOR (<1 SEC RESPONSE TIME).
3. EACH VOLUME CONTROL DEVICE SHALL COMMUNICATE VIA DISTRIBUTIVE ARCHITECTURE AND THEREFORE SHALL OPERATE INDEPENDENTLY FROM ANY OTHER DEVICE IN THE ASSOCIATED LABORATORY.
4. ALL TEMPERATURE CONTROL WITHIN THE LABORATORY WILL BE CONTROLLED BY THE LACS SYSTEM IN CONJUNCTION WITH THE BUILDING HVAC GENERAL SERVICES.
5. THE LACS NETWORK CONTROLLER (MICROSERVER) SHALL INTERFACE WITH THE BUILDING OPERATIONS NETWORK THROUGH A BACNET PROTOCOL.

LABORATORY ROOM LEVEL CONTROL:

AS THE STATIC PRESSURE IN THE EXHAUST DUCT SYSTEMS FLUCTUATE, THE PRESSURE INDEPENDENT CONE/SPRING ASSEMBLY OF EACH VENTURI VALVE SHALL MODULATE TO MAINTAIN A FIXED SET-POINT VOLUME WITHIN ONE SECOND.

AS EACH FUME HOOD'S SASH OPENING INCREASES OR DECREASES, THE SASH SENSOR SIGNAL TO THE RELATED FUME HOOD MONITOR SHALL CHANGE PROPORTIONALLY. (A SASH SENSOR AND MONITOR ARE MOUNTED ON EACH FUME HOOD.) EACH FUME HOOD SHALL OPERATE AS A CONVENTIONAL VARIABLE AIR VOLUME HOOD WITH A CONVENTIONAL FACE VELOCITY (I.E., 100 FPM).

BASED ON THE SASH POSITION INPUTS, THE FUME HOOD MONITOR SHALL SEND A 0-10 VDC LINEAR, CALIBRATED COMMAND SIGNAL TO CONTROL ITS ASSOCIATED HOOD EXHAUST VALVE, THUS MAINTAINING A CONSTANT AVERAGE FACE VELOCITY AT THE FUME HOOD OPENING.

EACH HOOD EXHAUST VALVE SHALL GENERATE A 0-10 VDC FEEDBACK SIGNAL, PROPORTIONAL TO THE VALVE'S AIRFLOW VOLUME, AND SHALL COMMUNICATE THIS SIGNAL TO THE MAKE-UP AIR CONTROLLER.

THE MAKE-UP AIR CONTROLLER SHALL CALCULATE THE TOTAL HOOD EXHAUST VOLUME BY SUMMING THE FEEDBACK SIGNALS FROM THE HOOD EXHAUST VALVES, AND SHALL GENERATE A 0-10 VDC TOTAL HOOD EXHAUST SIGNAL.

THE MAKE-UP AIR CONTROLLER SHALL MAINTAIN A CONSTANT, ADJUSTABLE NET NEGATIVE OFFSET BETWEEN THE ZONE'S TOTAL EXHAUST AND MAKE-UP AIR VOLUMES. THIS OFFSET SHALL NOT VARY WITH CHANGES IN EXHAUST VOLUME MAGNITUDE AND REPRESENTS THE VOLUME OF AIR THAT ENTERS THE ZONE FROM THE CORRIDOR OR ADJACENT SPACES.

TO ACHIEVE A NEGATIVE ROOM OFFSET VOLUME, THE MAKE-UP AIR CONTROLLER SHALL SUBTRACT THE QUANTITY OF OFFSET FROM THE TOTAL HOOD EXHAUST SIGNAL. THE RESULTANT 0-10 VDC SIGNAL IS THE MAKE-UP AIR FOR HOOD DEMAND SIGNAL AND REPRESENTS THE VOLUME OF MAKE-UP AIR REQUIRED TO SATISFY THE TOTAL HOOD EXHAUST DEMAND WITH RESPECT TO THE DESIRED ROOM OFFSET VOLUME.

THE OVERRIDE CLAMP (ON THE MAKE-UP AIR CONTROLLER) SHALL CLAMP THE MAKE-UP AIR VALVES TO A MINIMUM VOLUME THAT IS LARGE ENOUGH TO MAINTAIN THE MINIMUM VENTILATION VOLUME.

ON A RISE IN ZONE TEMPERATURE, THE THERMAL DEMAND SIGNAL SHALL BE COMPARED TO THE OVERRIDE MINIMUM CLAMP AND THE MAKE-UP AIR FOR HOOD DEMAND AND SELECT THE GREATER OF THESE THREE.

THE ZONE THERMOSTAT SHALL CONTROL THE REHEAT COIL THROUGH THE MAKE-UP AIR TEMPERATURE CONTROL PROGRAMMING.

WHEN THE DIFFERENTIAL STATIC PRESSURE ACROSS EACH HOOD EXHAUST VALVE DROPS BELOW THE VALVE'S MINIMUM OPERATING DIFFERENTIAL STATIC PRESSURE, THE DIFFERENTIAL PRESSURE SWITCH (MOUNTED ON EACH HOOD EXHAUST VALVE) SHALL OPEN, CAUSING ITS ASSOCIATED FUME HOOD MONITOR TO GENERATE AN AUDIBLE AND VISUAL FLOW ALARM, INDICATING THAT THE VALVE IS OUTSIDE OF ITS CONTROL RANGE. UPON A VALVE JAM CONDITION (I.E., FEEDBACK SIGNAL DOES NOT EQUAL COMMAND SIGNAL) THE FUME HOOD MONITOR SHALL ALSO GENERATE A FLOW ALARM. A MUTE BUTTON SHALL SILENCE THE AUDIBLE PORTION OF THE ALARM. WHEN SYSTEM CONDITIONS RETURN TO NORMAL, ALL ALARMS SHALL AUTOMATICALLY CLEAR.

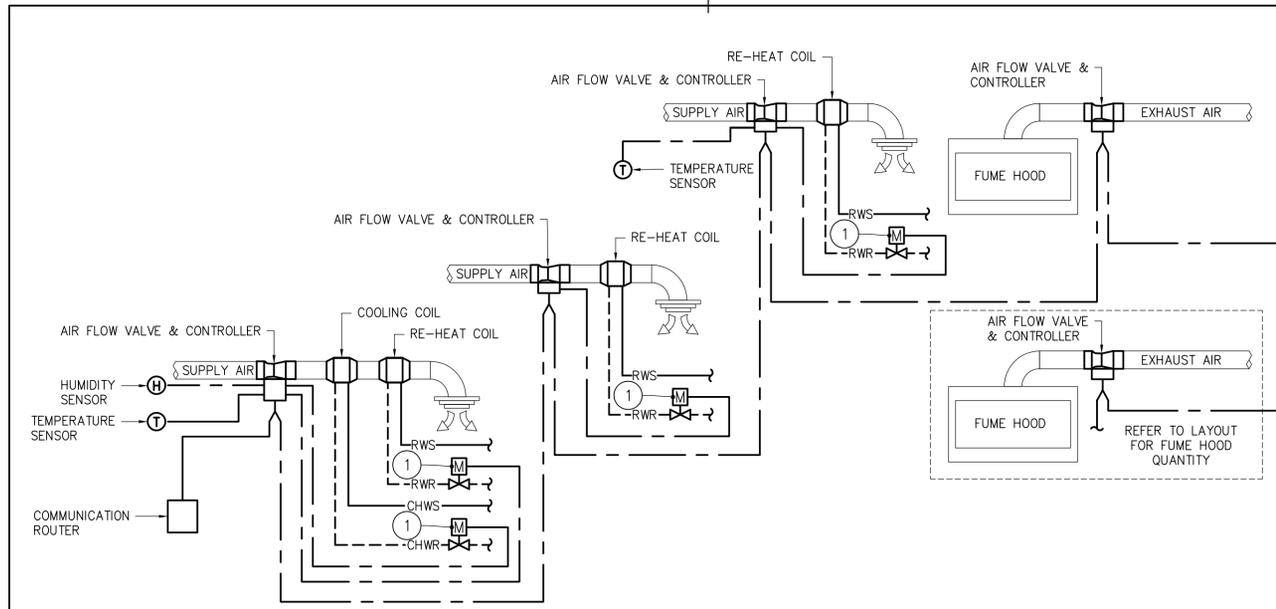
THE VALVES IN THIS APPLICATION SHALL BE CONFIGURED TO FAIL IN THE FOLLOWING MANNER. UNDER LOSS OF POWER, EACH HOOD EXHAUST VALVE AND THE GENERAL EXHAUST VALVE WILL FAIL TO THEIR MAXIMUM MECHANICAL LIMITS, AND EACH MAKE-UP AIR VALVE WILL FAIL TO ITS MINIMUM SCHEDULED POSITION. THIS ZONE FAILS IN A NEGATIVE PRESSURIZATION MODE WITH AN INCREASED OFFSET VOLUME.

SCHEMATIC NOTES:

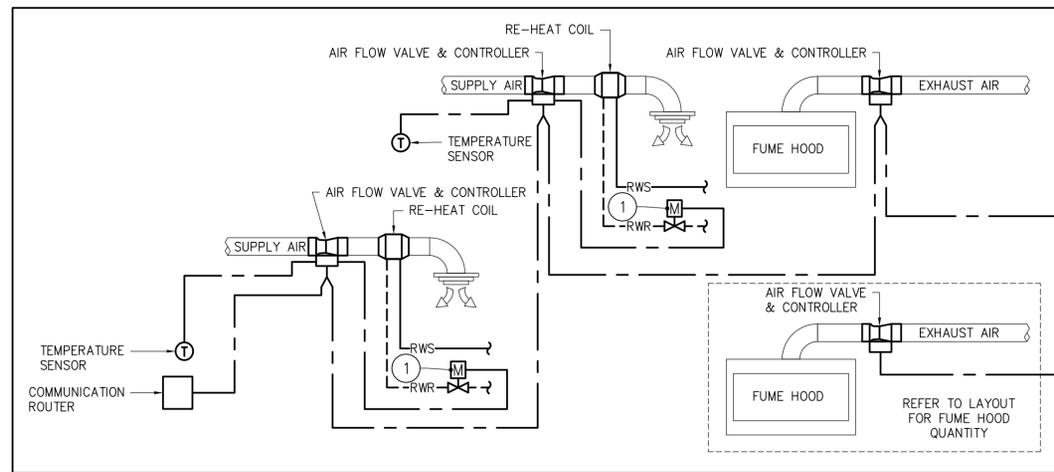
- 1 2-WAY CONTROL VALVE V-1 WITH ELECTRIC ACTUATOR.

CONTRACT DRAWINGS

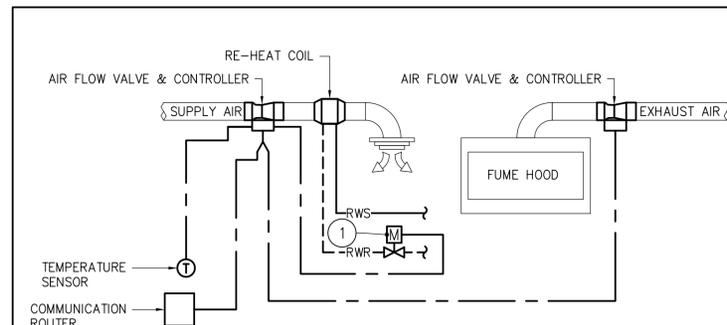
CONTRACT DRAWINGS FOR MECHANICAL WORK ARE IN PART DIAGRAMMATIC, INTENDED TO CONVEY THE SCOPE OF WORK AND GENERAL ARRANGEMENT FOR MECHANICAL SYSTEMS AND EQUIPMENT. CONTRACTOR TO COORDINATE LAYOUT OF MECHANICAL SYSTEMS WITH ARCHITECTURAL, STRUCTURAL, AND ELECTRICAL BUILDING COMPONENTS, AS WELL AS, OTHER MECHANICAL SYSTEMS. PROVIDE ADDITIONAL PIPING, DUCTING, FITTINGS, SUPPORTS, ETC., REQUIRED TO FACILITATE THE WORK. NO EXTRA PAYMENTS ARISING FROM FAILURE TO MAKE THIS COORDINATION WILL BE CONSIDERED.



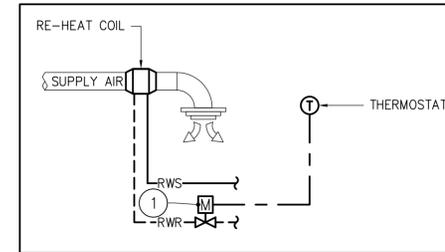
MULTIPLE SUPPLY / EXHAUST – SCHEMATIC –A
SCALE: N.T.S.



MULTIPLE SUPPLY / EXHAUST – SCHEMATIC –B
SCALE: N.T.S.



SINGLE SUPPLY / EXHAUST – SCHEMATIC –C
SCALE: N.T.S.



ROOM HEATING DEVICE – SINGLE DEVICE –D
SCALE: N.T.S.

ROOM HEATING CONTROL – SEQUENCE OF OPERATION

THE ROOM HEATING CONTROL SEQUENCE SHALL BE STARTED BY AN OCCUPANCY TIME SCHEDULE AT THE BACS.

OCCUPANCY MODE

THE TEMPERATURE SHALL BE ADJUSTABLE AND SET BY BACS.

UNOCCUPIED MODE

THE TEMPERATURE SHALL BE ADJUSTABLE AND SET BY BACS.

HUMIDITY CONTROL

THE SPACE AIR HUMIDITY SHALL BE SET AT 50%RH (ADJUSTABLE). THE SUPPLY AIR HUMIDITY SHALL BE CONTROLLED BY MODULATING THE COOLING COIL OUTPUT TO MAINTAIN A CALCULATED SUPPLY AIR HUMIDITY SETPOINT. THE SUPPLY AIR HUMIDITY SETPOINT SHALL NOT BE ALLOWED TO EXCEED 80%RH.

ROOM HEATING CONTROL – SEQUENCE OF OPERATION

THE ROOM HEATING CONTROL SEQUENCE SHALL BE STARTED BY AN OCCUPANCY TIME SCHEDULE AT THE BACS.

OCCUPANCY MODE

THE TEMPERATURE SHALL BE SET BY THERMOSTAT.

UNOCCUPIED MODE

THE TEMPERATURE SHALL BE ADJUSTABLE AND SET BY BACS.

ROOM HEATING CONTROL – SEQUENCE OF OPERATION

THE ROOM HEATING CONTROL SEQUENCE SHALL BE STARTED BY AN OCCUPANCY TIME SCHEDULE AT THE BACS.

OCCUPANCY MODE

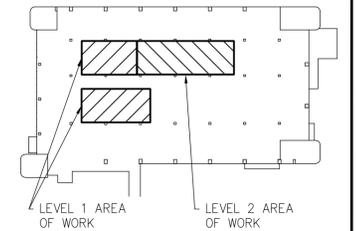
THE TEMPERATURE SHALL BE ADJUSTABLE AND SET BY BACS.

UNOCCUPIED MODE

THE TEMPERATURE SHALL BE ADJUSTABLE AND SET BY BACS.

Public Works and Government Services Canada
Architectural and Engineering Services
Ontario Region
Travaux publics et Services gouvernementaux Canada
Services d'architecture et de génie
Région de l'Ontario

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project title / titre du projet
TORONTO Ontario
HEALTH CANADA
2301 MIDLAND AVE
LABORATORY UPGRADES

drawing title / titre du dessin
SCHEMATICS AND SEQUENCES

drawn by / dessiné par **SL**

designed by / conçu par **SL**

approved by / approuvé par **MM**

tender submission / soumission **AQUIL ALI** project manager / administrateur de projets

project date / date du projet **2015/04/15**

project no. / no. du projet **R.054345.001**

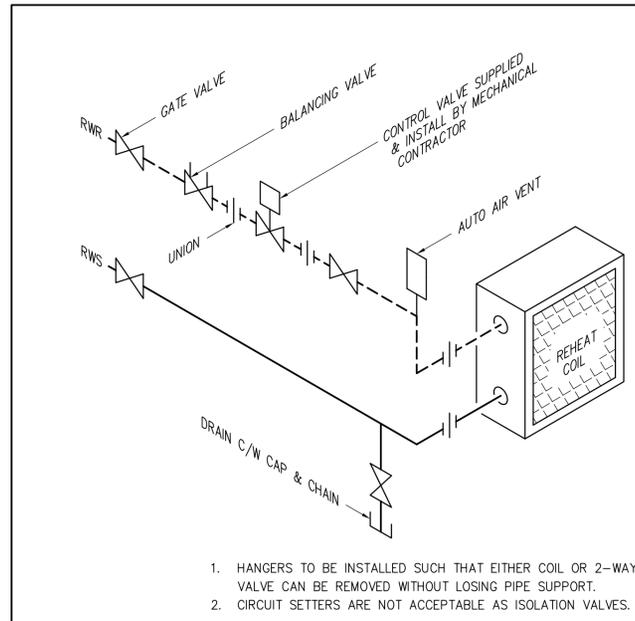
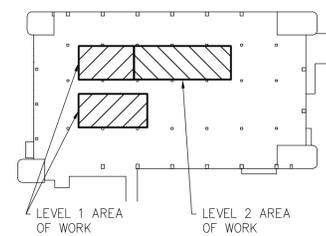
drawing no. / no. du dessin **M3.7**



consultant

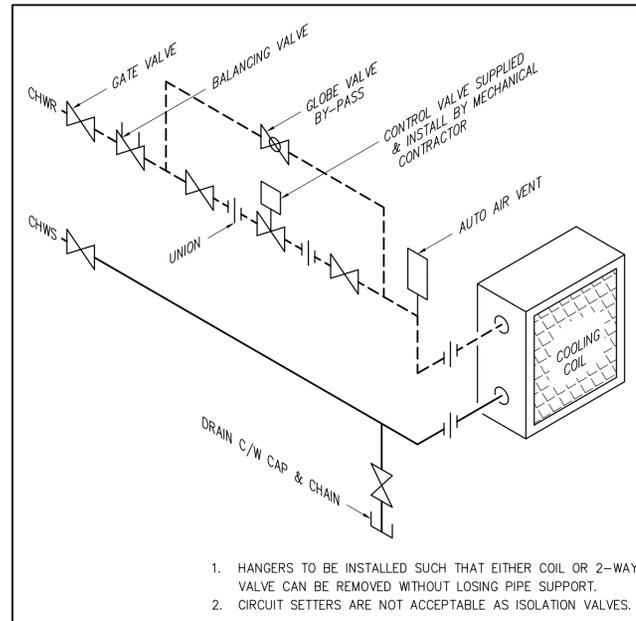


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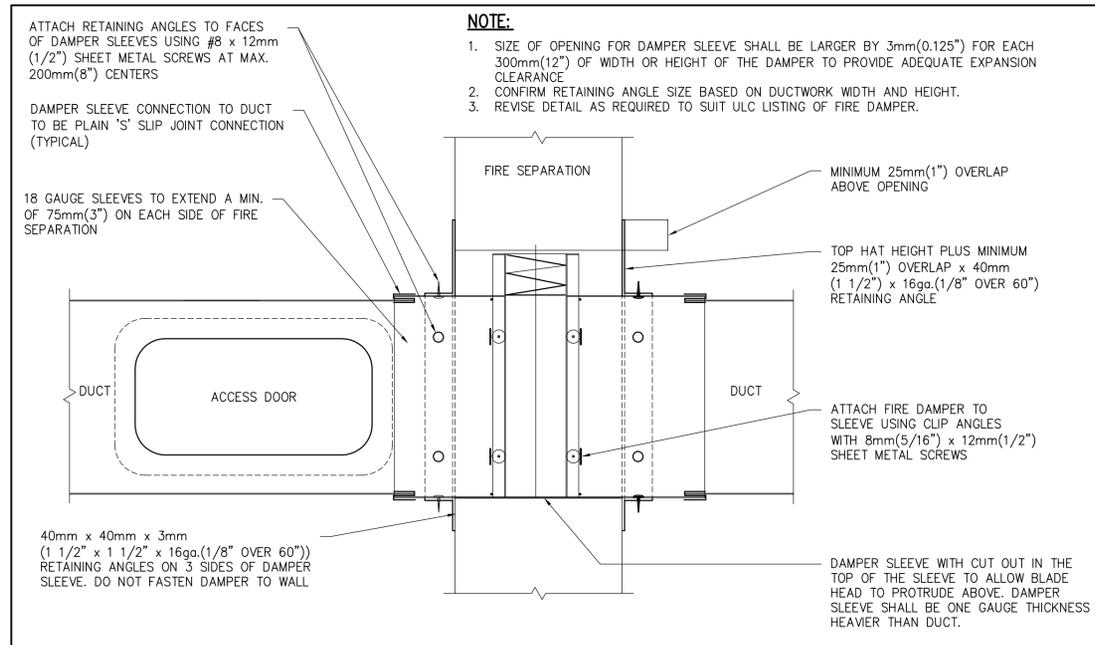
- HANGERS TO BE INSTALLED SUCH THAT EITHER COIL OR 2-WAY VALVE CAN BE REMOVED WITHOUT LOSING PIPE SUPPORT.
- CIRCUIT SETTERS ARE NOT ACCEPTABLE AS ISOLATION VALVES.

REHEAT COIL PIPING SCHEMATIC
SCALE: N.T.S.

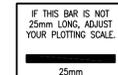


- HANGERS TO BE INSTALLED SUCH THAT EITHER COIL OR 2-WAY VALVE CAN BE REMOVED WITHOUT LOSING PIPE SUPPORT.
- CIRCUIT SETTERS ARE NOT ACCEPTABLE AS ISOLATION VALVES.

COOLING COIL PIPING SCHEMATIC
SCALE: N.T.S.



WALL FIRE DAMPER DETAIL
SCALE: N.T.S.



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project title
titre du projet
TORONTO Ontario
HEALTH CANADA
2301 MIDLAND AVE
LABORATORY UPGRADES

drawing title
titre du dessin
MECHANICAL DETAILS

drawn by
dessiné par **SL**

designed by
conçu par **SL**

approved by
approuvé par **MM**

tender
soumission **AQUIL ALI** project manager
administrateur de projets

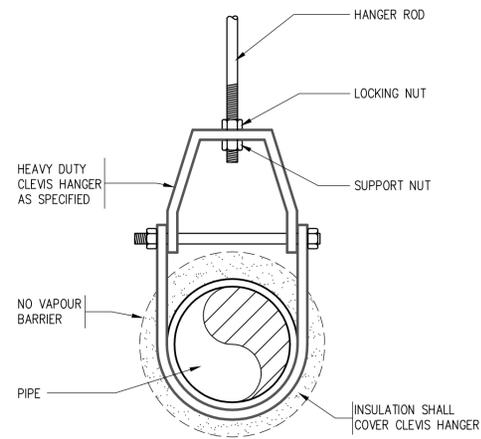
project date
date du projet **2015/04/15**

project no.
no. du projet **R.054345.001**

drawing no.
no. du dessin **M3.8**

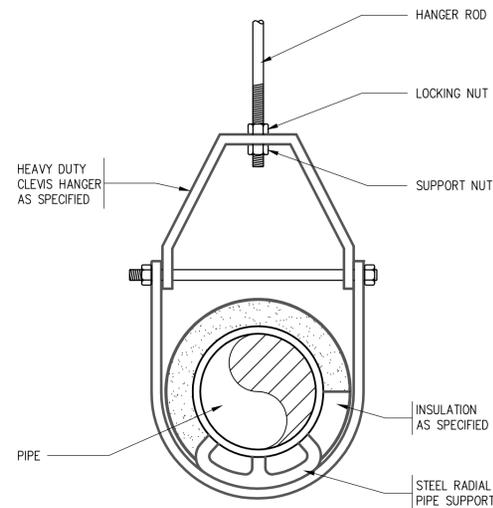
APPLICATIONS:

- HOT PIPING LESS THAN NPS 32, STEEL & COPPER WITH LESS THAN 25mm HORIZONTAL MOVEMENT DUE TO THERMAL EXPANSION.
- HOT PIPING LESS THAN NPS 32, STEEL & COPPER WITH MORE THAN 300mm HANGER ROD ATTACHMENT.



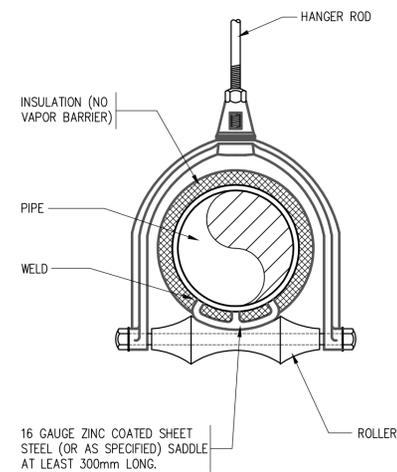
APPLICATIONS:

- HOT PIPING NPS 32 AND GREATER, STEEL & COPPER WITH LESS THAN 25mm HORIZONTAL MOVEMENT DUE TO THERMAL EXPANSION.
- HOT PIPING NPS 32 AND GREATER, STEEL & COPPER WITH MORE THAN 300mm HANGER ROD ATTACHMENT.



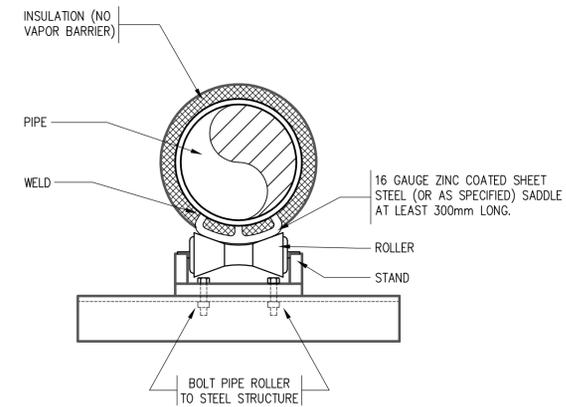
APPLICATIONS:

- SUSPENDED HOT PIPING, STEEL AND COPPER WITH HORIZONTAL MOVEMENT IN EXCESS OF 25mm AND HANGER ROD (MIDDLE ATTACHMENT) OF 300mm OR LESS



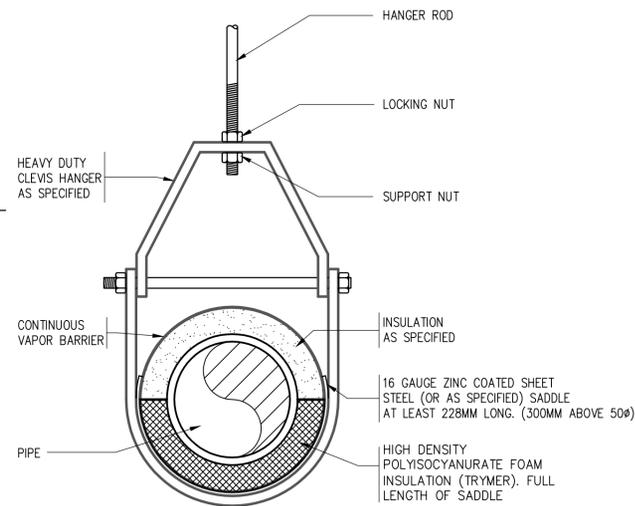
APPLICATIONS:

- BOTTOM SUPPORTED HOT PIPING STEEL AND COPPER.



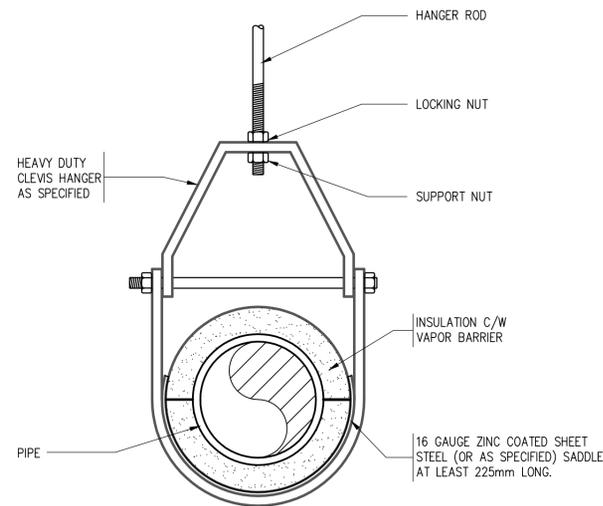
APPLICATIONS:

- COLD PIPING NPS 32 AND GREATER: STEEL, CAST IRON AND COPPER PIPING.



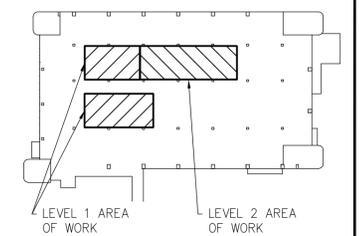
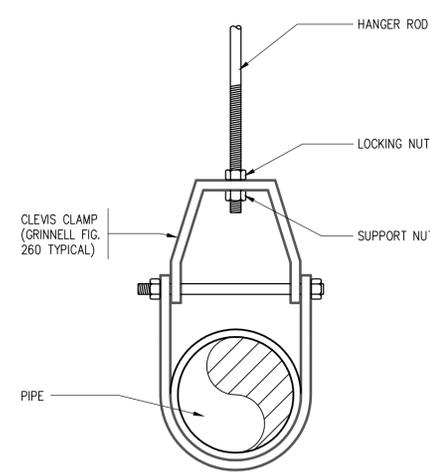
APPLICATIONS:

- COLD PIPING LESS THAN NPS 32, STEEL & COPPER.



APPLICATIONS:

- UNINSULATED PIPE



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TORONTO Ontario
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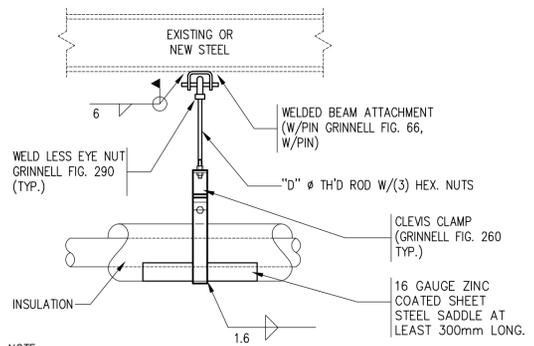
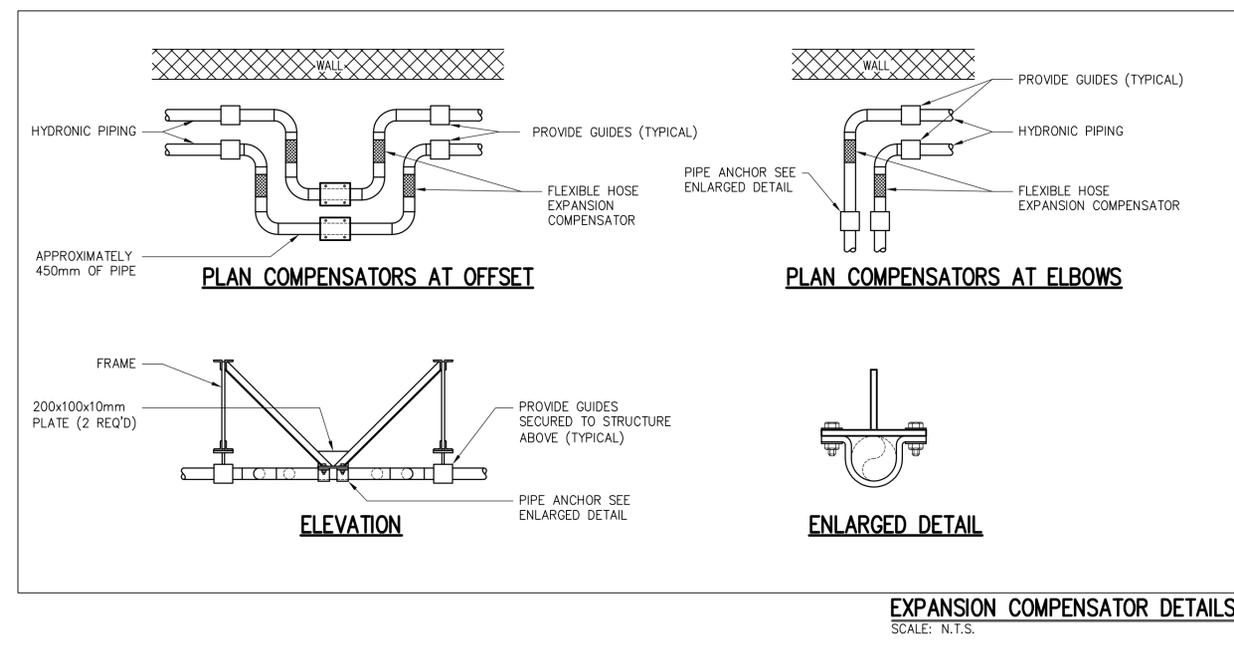
drawing title / titre du dessin
MECHANICAL DETAILS

drawn by / dessiné par	SL
designed by / conçu par	SL
approved by / approuvé par	MM
tender submission / soumission	AQUIL ALI project manager / administrateur de projets

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R.054345.001

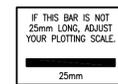
drawing no. / no. du dessin
M3.9

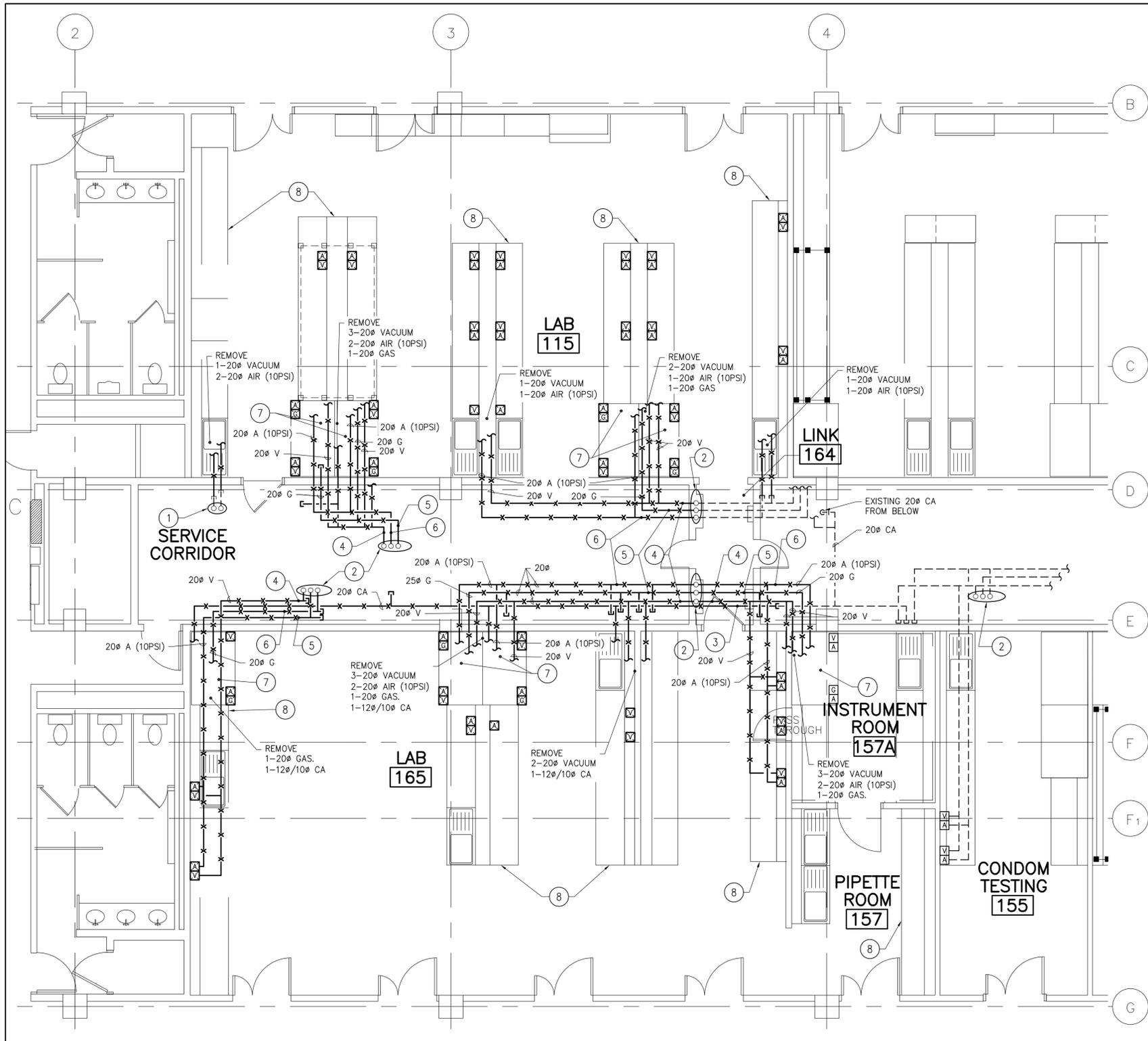


- NOTE:**
- WHERE STRUCTURE ABOVE IS CONCRETE USE HILTI DROP-IN ANCHOR (HDI) IN PLACE OF WELDED BEAM ATTACHMENT.
 - WHERE ROD LENGTH EXCEED 1.8M PROVIDE TURNBUCKLE (GRINNELL FIG. 230) FOR ADJUSTING.

PIPE SIZE ø	ROD ø "D"	MAX. LOAD (KG)
UP TO 50ø	10ø	115
65ø TO 75ø	13ø	160
100ø	15ø	180
150ø TO 200ø	20ø	410

CONTRACT DRAWINGS
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LAB 115 & 165 LABORATORY GAS DEMOLITION
SCALE: 1:50

PHASING NOTES:

1. THE PROJECT WILL BE COMPLETED IN THREE (3) PHASES.
2. REQUIRED STAGES:
 1. PHASE 1 - ROOM 115, 164 AND CLEAN ROOMS ON LEVEL 3
 2. PHASE 2 - ROOM 165
 3. PHASE 3 - ROOM 225
4. EACH PHASE SHALL BE COMPLETED, COMMISSIONED AND FULLY OPERATIONAL, PRIOR TO START OF THE NEXT PHASE.
5. CONTRACTOR WILL NEED TO MOBILIZE AND DEMOBILIZE DURING EACH PHASE OF A FISCAL YEAR.

LEVEL 1 LABORATORY GAS DEMOLITION NOTES:

1. EXISTING 20ø A (10PSI), 20ø V TO REMAIN
2. EXISTING PLUMBING RISER GROUP: 25ø G, 20ø A (10 PSI), 25ø V.
3. REMOVE EXISTING 20ø COMPRESSED AIR PIPING AND CAP WHERE INDICATED.
4. REMOVE EXISTING 20ø VACUUM PIPING AND CAP BACK AT RISER AT HIGH LEVEL.
5. REMOVE EXISTING 20ø NATURAL GAS PIPING AND CAP BACK AT RISER AT HIGH LEVEL.
6. REMOVE EXISTING 20ø COMPRESSED AIR (10 PSI) PIPING AND CAP BACK AT RISER AT HIGH LEVEL.
7. DISCONNECT EXISTING VACUUM, NATURAL GAS AND COMPRESSED AIR OUTLETS AT FUMEHOOD.
8. REMOVE ALL SUPPLIES TO LAB BENCH BACK TO RISER AND CAP. REMOVE ASSOCIATED ISOLATION VALVES AND SUPPORTS.

GENERAL NOTES:

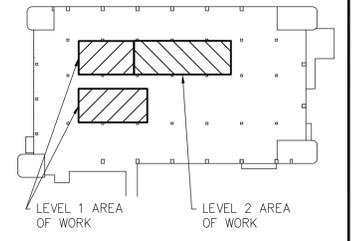
1. FIRE STOP ALL WALL PENETRATIONS TO MAINTAIN EXISTING FIRE SEPARATION. REFER TO SPEC SECTION.

LABORATORY GAS LEGEND

- x-x-x- REMOVE EXISTING PIPING
- v-v-v- EXISTING VACUUM PIPING TO REMAIN
- v- VACUUM PIPING
- g- EXISTING NATURAL GAS PIPING TO REMAIN
- A(10PSI)- EXISTING COMPRESSED AIR (10 PSI) PIPING TO REMAIN
- A(10PSI)- COMPRESSED AIR (10 PSI) PIPING
- CAP EXISTING PIPE
- PIPE UP TO ABOVE
- PIPE DOWN TO BELOW
- V EXISTING VACUUM OUTLET TO REMAIN
- A EXISTING COMPRESSED AIR OUTLET TO REMAIN
- G EXISTING NATURAL GAS OUTLET TO REMAIN
- V REMOVE EXISTING VACUUM OUTLET
- A REMOVE EXISTING COMPRESSED AIR OUTLET
- G REMOVE EXISTING NATURAL GAS OUTLET

DEMOLITION NOTES:
EXISTING MECHANICAL SYSTEM SHOWN IS DIAGRAMATIC AND IS BASED ON ORIGINAL DRAWINGS. THE DRAWING MAY NOT REPRESENT "AS-BUILT" CONDITIONS. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY ON SITE, PRIOR TO ISSUE QUOTE, THE EXTENT AND CONFIGURATION OF EXISTING MECHANICAL SYSTEM AND ALLOW FOR ADDITIONAL REMOVALS AS DETERMINED ON SITE TO MEET THE INTENT OF THE DEMOLITION INDICATED. NO EXTRAS WILL BE ALLOWED FOR FAILURE OF THE CONTRACTOR IN COMPLETING A THOROUGH REVIEW OF THE SITE PRIOR TO SUBMITTING TENDER PRICE.

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revision	description	date
2	ISSUED FOR TENDER	2015/05/29
1	ISSUED FOR REVIEW	2015/04/17

Do not scale drawings. Verify all dimensions and conditions on site and immediately notify the engineer of all discrepancies.

A	Detail No.
A	No. du détail
B	drawing no. - where detail required dessin no. - où détail exigé
C	drawing no. - where detailed dessin no. - où détaillé

project title
titre du projet
TORONTO Ontario
HEALTH CANADA
2301 MIDLAND AVE
LABORATORY UPGRADES

drawing title
titre du dessin
**PARTIAL LEVEL 1
LABORATORY GAS PIPING
DEMOLITION**

drawn by
dessiné par **IAF**

designed by
conçu par **MM**

approved by
approuvé par **MM**

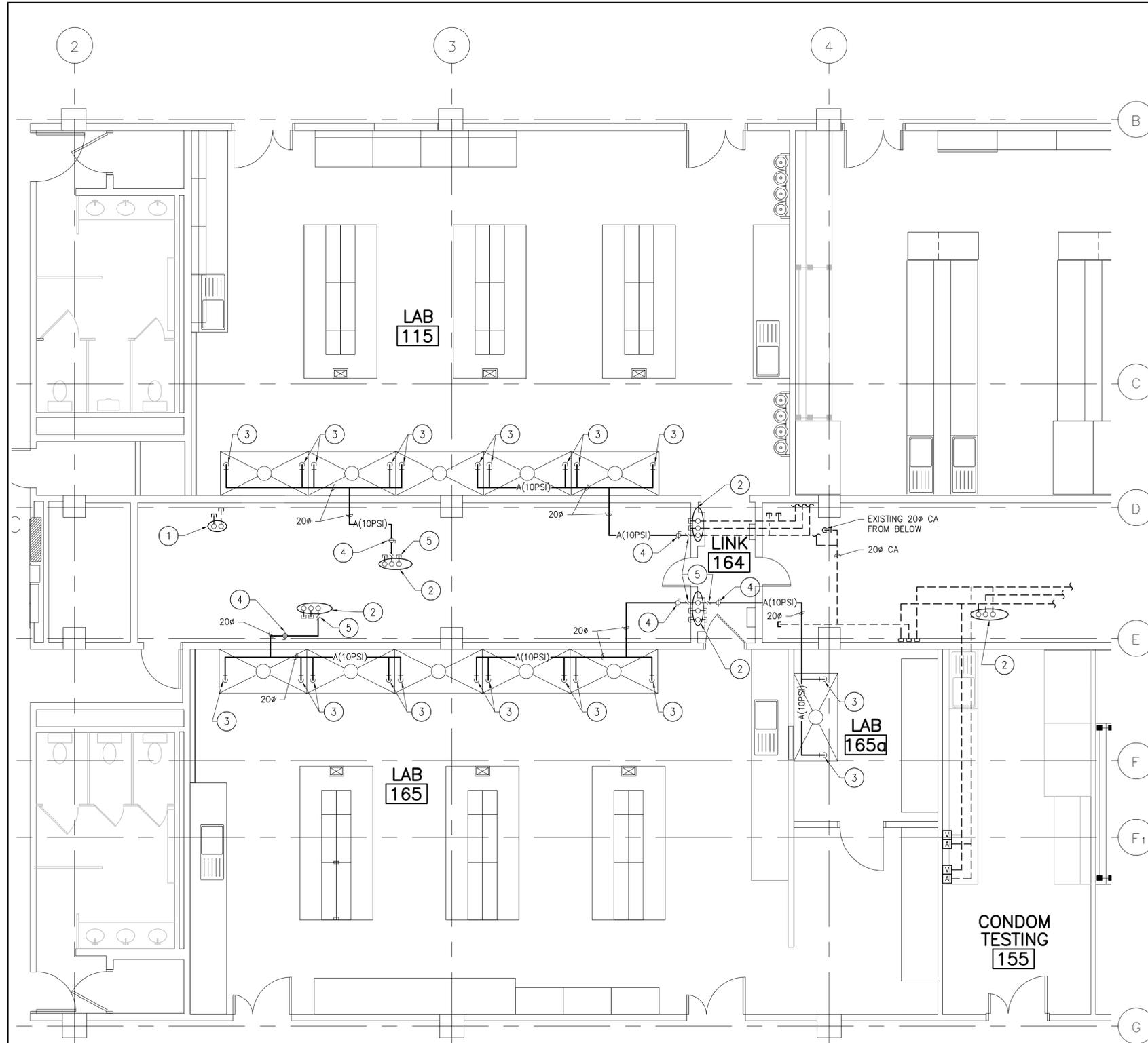
tender
soumission **AQUIL ALI** project manager
administrateur de projets

project date
date du projet **2015/04/15**

project no.
no. du projet **R.054345.001**

drawing no.
no. du dessin **M4.1**





LAB 115 & 165 LABORATORY GAS LAYOUT
SCALE: 1:50



LEVEL 1 LABORATORY GAS LAYOUT NOTES:

- 1 20ø A (10PSI), 20ø V
- 2 EXISTING PLUMBING RISER GROUP. 20ø G, 20ø A (10 PSI), 25ø V.
- 3 ASSUME 1830MM OF PIPING DOWN IN ORDER TO TIE-IN TO EQUIPMENT. REFER TO MANUFACTURER'S SPECIFICATIONS FOR EXACT LENGTH REQUIRED AND LOCATION.
- 4 PROVIDE NEW ISOLATION VALVE
- 5 20ø AIR (10 PSI) PIPING AND CONNECT TO EXISTING 20ø AT THIS LOCATION.

GENERAL NOTES:

- 1. REFER TO DRAWING M4.1 FOR LABORATORY GAS LEGEND.
- 2. FIRE STOP ALL WALL PENETRATIONS TO MAINTAIN EXISTING FIRE SEPARATION. REFER TO SPEC SECTION.

CONTRACT DRAWINGS

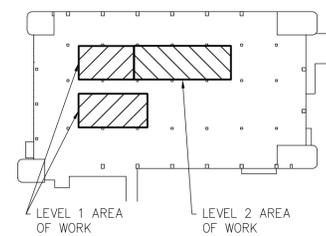
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Public Works and Government Services Canada
Architectural and Engineering Services
Ontario Region
Travaux publics et Services gouvernementaux Canada
Services d'architecture et de génie
Région de l'Ontario

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revision	description	date
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	drawing no. - where detailed dessin no. - où détaillé

project title
titre du projet
TORONTO Ontario
HEALTH CANADA
2301 MIDLAND AVE

LABORATORY UPGRADES

drawing title
titre du dessin
**PARTIAL LEVEL 1
LABORATORY GAS PIPING
LAYOUT**

drawn by
dessiné par **MVG**

designed by
conçu par **MM**

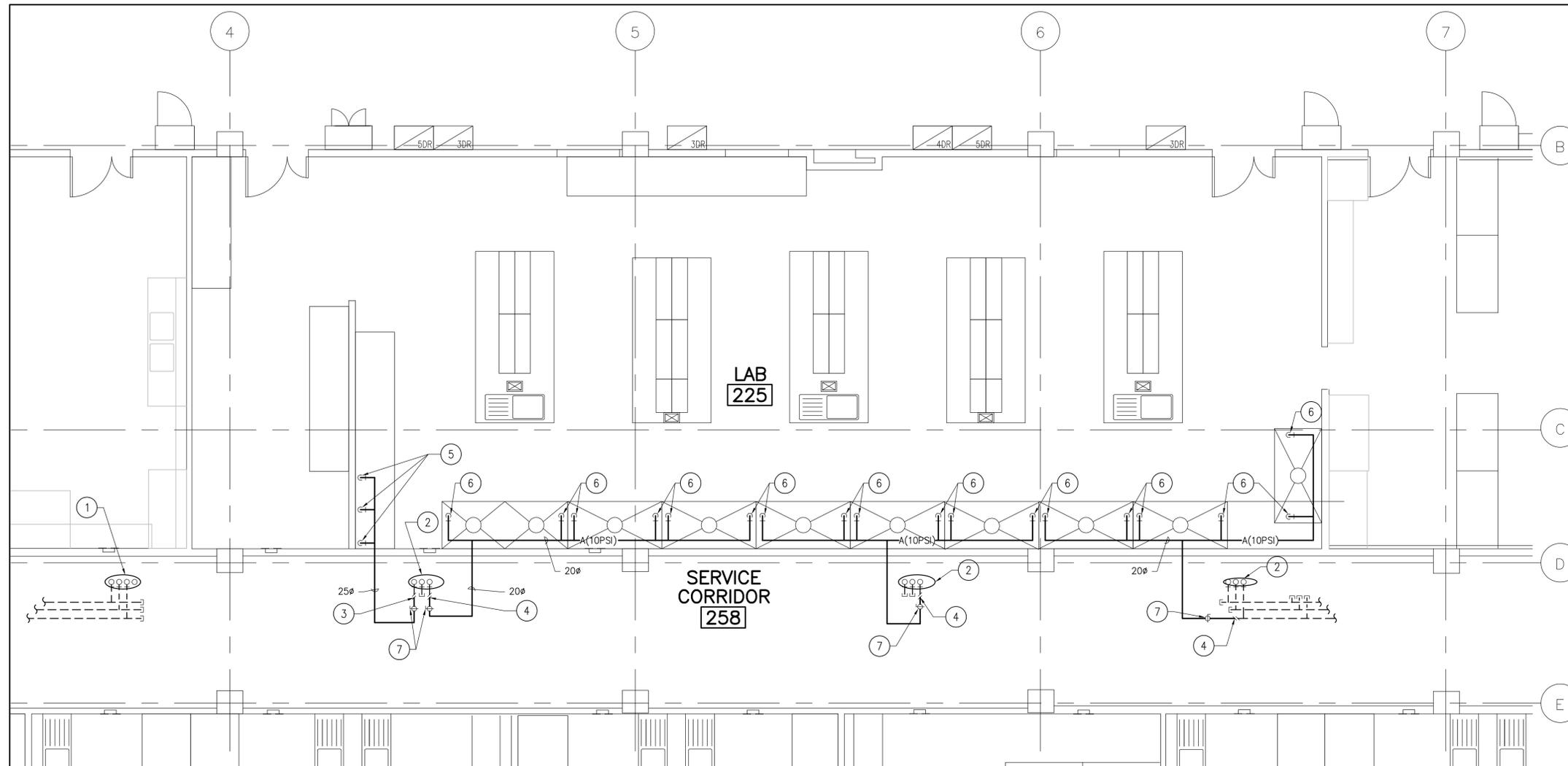
approved by
approuvé par **MM**

tender
soumission **AQUIL ALI** project manager
administrateur de projets

project date
date du projet **2015/04/15**

project no.
no. du projet **R.054345.001**

drawing no.
no. du dessin **M4.3**



LAB 225 LABORATORY GAS LAYOUT
SCALE: 1:50

GENERAL NOTES:

- REFER TO DRAWING M4.1 FOR LABORATORY GAS LEGEND.
- FIRE STOP ALL WALL PENETRATIONS TO MAINTAIN EXISTING FIRE SEPARATION. REFER TO SPEC SECTION.

LEVEL 2 LABORATORY GAS LAYOUT NOTES:

- EXISTING PLUMBING RISER: 25ø V, 20ø A(10 PSI), 20ø G.
- EXISTING PLUMBING RISER: 20ø G, 20ø A(10 PSI), 25ø V.
- 25ø VACUUM PIPING AND CONNECT TO EXISTING 25ø AT THIS LOCATION.
- 20ø AIR (10 PSI) PIPING AND CONNECT TO EXISTING 20ø AT THIS LOCATION.
- VAC PIPING TO DROP DOWN WALL AND RUN IN WALL TO OUTLETS. REFER TO ARCHITECTURAL DRAWINGS FOR EXACT LOCATION OF WALL OUTLETS.
- ASSUME 1830MM OF PIPING DOWN IN ORDER TO TIE-IN TO EQUIPMENT. REFER TO MANUFACTURER'S SPECIFICATIONS FOR EXACT LENGTH REQUIRED AND LOCATION.
- PROVIDE NEW ISOLATION VALVE



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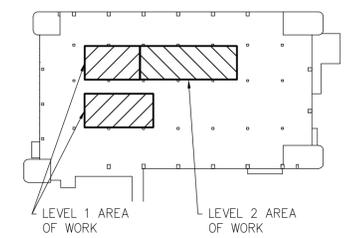
Public Works and Government Services Canada
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C drawing no. - where detailed

project title
titre du projet
TORONTO Ontario
HEALTH CANADA
2301 MIDLAND AVE

LABORATORY UPGRADES

drawing title
titre du dessin
PARTIAL LEVEL 2 LABORATORY GAS PIPING LAYOUT

drawn by
dessiné par
MVG

designed by
conçu par
MM

approved by
approuvé par
MM

tender
soumission
AQUIL ALI project manager
administrateur de projets

project date
date du projet
2015/04/15

project no.
no. du projet
R.054345.001

drawing no.
no. du dessin
M4.4