













Design & Engineering

This drawing is the property of the University of Toronto, and must be returned upon completion of the work. All information shown on this drawing is for use on this specific project. Contractor must verify all dimensions on the job and report any discrepancies to the Architect before proceeding with the work.

GENERAL LEGEND	
SYMBOL/ABBREVIATION	DESCRIPTION
=====	EXISTING TO REMAIN
=====	NEW WORK
-----	DEMOLISHED WORK
-----	BELOW GRADE/LEVEL
CTE	CONNECT TO EXISTING
GE	GENERAL EXHAUST
CAV	CONSTANT AIR VOLUME TERMINAL UNIT
SE	SANITARY EXHAUST
RE	RELIEF EXHAUST
OA	OUTSIDE AIR
RA	RETURN AIR
SA	SUPPLY AIR
FHC	FIRE HOSE CABINET

PLUMBING AND DRAINAGE SYMBOLS LEGEND

SYMBOL/ABBREVIATION	DESCRIPTION
 CO	CLEANOUT
 CO	FLOOR CLEANOUT
	PLUMBING TRAP
 HD	HUB DRAIN
 FD	FLOOR DRAIN
 RD	ROOF DRAIN
 FFD	FUNNEL FLOOR DRAIN
 BFP	BACK FLOW PREVENTER
 BWV	BACK WATER VALVE
	PIPE BREAK

PLUMBING AND DRAINAGE PIPING LEGEND	
SYMBOL/ABBREVIATION	DESCRIPTION
—	DOMESTIC COLD WATER (DCW)
—	DOMESTIC HOT WATER (DHW)
—	DOMESTIC HOT WATER (DHW)
—	DOMESTIC HOT WATER (DHW)
— T	TEMPERED WATER
— TR	TEMPERED WATER RECIRCULATION
— ET	EMERGENCY FIXTURE TEMPERED WATER
— ETR	EMERGENCY FIXTURE TEMPERED WATER RECIRC.
— ST	STORM DRAINAGE
— SAN	SANITARY DRAINAGE
— PSAN	PUMPED SANITARY DRAINAGE
— PST	PUMPED STORM DRAINAGE
— V	PLUMBING VENT
— D	CONDENSATE DRAINAGE
— CRD	CORROSION RESISTANT DRAIN
— CRV	CORROSION RESISTANT VENT
— ED	EQUIPMENT DRAIN
— NP	NOT POTABLE
— TP	TRAP SEAL PRIMER



KEY PLAN (NTS)	SEAL

481 Spadina Ave

DRAWING SHEET TITLE

**MECHANICAL LEGEND,
DRAWING LIST, KEY
PLANS & CAMPUS MAP**

UNIVERSITY PROJECT NUMBER	NORTH POINT
P164-25-078	

2026-01-21 2:38:16 PM C:\Users\makkehse\Documents\P164-25-078 M 26 Ali.makkeh\HJMA.rvt

2026-01-21 2:38:16 PM

01 00 00 - GENERAL NOTES

THE UNIVERSITY OF TORONTO SUPPLEMENTARY CONDITIONS OF THE CONTRACT (SECTION 00 73 00) AND AMENDMENTS THERETO, GENERAL INSTRUCTIONS AND INSTRUCTIONS TO TENDERS, FORM AN INTEGRAL PART OF THIS SPECIFICATION.

PROVIDE ALL MATERIALS, EQUIPMENT, LABOUR, TOOLS, SCAFFOLDING, TEMPORARY SERVICES AND OTHER ITEMS REQUIRED TO COMPLETE ALL THE WORK INDICATED ON THE DRAWINGS AND IN THE SPECIFICATIONS. PROVIDE WELL QUALIFIED TRADES PERSONS TO CARRY OUT EACH PHASE OF WORK.

DEFINITION:

"U OF T" SHALL MEAN UNIVERSITY OF TORONTO.

"FAS" SHALL MEAN UNIVERSITY OF TORONTO'S FACILITIES AND SERVICES DEPARTMENT.

REFER TO CDDC CONTRACT AND SUPPLEMENTARY GENERAL CONDITIONS FOR OTHER DEFINITIONS.

SUBSTITUTION:

REFER TO SECTION 01 60 00.

FOR ALTERNATES/SUBSTITUTE NOISE PRODUCING EQUIPMENT, CONTRACTOR SHALL PROVIDE ACOUSTIC ANALYSIS AND PROVIDE NOISE CONTROL DEVICES TO MATCH INPUT, DISCHARGE, AND RADIATED SOUND POWER LEVELS OF BASIS OF DESIGN NOISE PRODUCING EQUIPMENT AFTER NOISE CONTROL DEVICES. IF SUBSTITUTE EQUIPMENT IS APPROVED DURING THE BIDDING, THEN INCLUDE NOISE CONTROL DEVICES IN SUBSTITUTED EQUIPMENT COST.

COMMISSIONING:

REFER TO SECTION 01 91 13.

PERMITS:

APPLY, OBTAIN, AND PAY FOR INCLUDING ALL SALES TAXES AND GST/HST, CERTIFICATES OF APPROVAL, PERMITS, AND INSPECTIONS REQUIRED BY AUTHORITIES HAVING JURISDICTION. SUBMIT ALL PLANS, ETC., REQUIRED AND OBTAIN PERMITS IMMEDIATELY AFTER NOTIFICATION OF AWARD OF CONTRACT. DO NOT START WORK PRIOR TO OBTAINING APPROVAL AND PERMIT. GIVE ALL NOTICES REQUIRED FOR TEST AND INSPECTIONS. MAKE ALL CORRECTIONS AND CHARGES REQUIRED BY THE AUTHORITY HAVING JURISDICTION WITHOUT ADDITIONAL CHARGE OR EXPENSE TO THE UNIVERSITY OF TORONTO.

QUALIFICATIONS:

CONTRACTOR MUST BE REGISTERED AND CERTIFIED BY THE TECHNICAL STANDARDS AND SAFETY AUTHORITY (TSSA) OF ONTARIO FOR WORK ON PRESSURE VESSELS, BOLERS, PROCESS/POWER PIPING (INCLUDING, BUT NOT LIMITED TO FUELS AND COMPRESSED GASES), AND WELDING/BRAZING WORK.

GUARANTEE:

WARRANT ALL LABOR AND MATERIALS INSTALLED UNDER THIS DIVISION FOR A PERIOD OF ONE YEAR FROM THE DATE OF SUBSTANTIAL PERFORMANCE. PROVIDE ALL ADDITIONAL WARRANTIES PROVIDED AS STANDARD BY EQUIPMENT MANUFACTURER AND ALL ADDITIONAL WARRANTIES SPECIFIED BELOW.

LIABILITY:

ASSUME FULL RESPONSIBILITY FOR COORDINATING AND LAYOUT OF ALL WORK AND REPAIR ANY DAMAGE CAUSED TO UNIVERSITY OF TORONTO'S PROPERTY OR PROPERTY ADJACENT TO THE PLACE OF WORK OR THE WORK. ANY DAMAGES SHALL BE ESTIMATED BY THE CONSULTANT AND PAYMENT SHALL BE SET OFF FOR THAT AMOUNT UNTIL DAMAGES ARE REPAIRED TO THE SATISFACTION OF THE CONSULTANT.

ALL NEW WORK SHALL BE COMPLIANT WITH THE ONTARIO BUILDING CODE AND ANY NEW WORK THAT AFFECT EXISTING INSTALLATIONS SHALL BE COMPLIANT WITH THE ONTARIO BUILDING CODE.

PROTECTION OF PROPERTY:

ASSUME FULL RESPONSIBILITY FOR PROTECTING UNIVERSITY OF TORONTO'S PROPERTY OR PROPERTY ADJACENT TO THE PLACE OF WORK WHILE CARRYING OUT THE WORK OF THIS CONTRACT. REPAIRS SHALL BE CARRIED OUT AT OWN EXPENSE OF ALL DAMAGE CAUSED BY THIS CONTRACTOR OR BY THEIR SUB-CONTRACTORS.

SITE CONDITIONS:

EXAMINE SITE CONDITIONS BEFORE SUBMITTING TENDER TO BE SURE THAT WORK CAN BE SATISFACTORILY CARRIED OUT AS INDICATED. IF SITE EXAMINATION REVEALS ANY AMBIGUITIES, DIFFICULTIES, DISCREPANCIES, DEPARTURES FROM RELEVANT CODES HAVING JURISDICTION, AND/OR FROM GOOD PRACTICE, OBTAIN CLARIFICATION PRIOR TO SUBMITTING TENDER. FAILURE TO DO SO SHALL RESULT IN ALL ADDITIONAL COSTS BEING THE RESPONSIBILITY OF THE CONTRACTOR.

SITE VISIT:

THE CONTRACTOR SHALL ATTEND THE MANDATORY SITE VISIT AT THE TIME GIVEN IN THE TENDER DOCUMENTS PRIOR TO SUBMITTING BID. FAILURE TO ATTEND SHALL DISQUALIFY BIDDER.

EXISTING SERVICE ISOLATION:

ARRANGE WITH UTILITIES DIVISION AND MAKE CONNECTION TO / DISCONNECTING FROM EXISTING SERVICES WHERE INDICATED ON DRAWINGS. COORDINATE WITH U OF T'S REPRESENTATIVE TEN (10) WORKING DAYS BEFORE ANY ESSENTIAL SERVICE IS INTERRUPTED. COMPLY WITH INSTRUCTION FOR TIME AND DURATION OF INTERRUPTIONS. PRIOR TO CUTTING PIPES AND CAPPING, CONTRACTOR SHALL ENSURE THAT THE PIPES ARE NOT LIVE. PROVIDE STANDBY MANPOWER AND ENSURE THAT REQUIRED SERVICES ARE MAINTAINED. ADVISE THE U OF T'S REPRESENTATIVE IMMEDIATELY OF ANY DIFFICULTIES ENCOUNTERED AND REMEDIAL ACTIONS TO BE TAKEN. UTILITIES DIVISION SHALL SHUT OFF SERVICES, DRAIN AND REFILL THE SYSTEMS AND THEN REACTIVATE SERVICES INCLUDING VENTING OF SYSTEMS WHEN CONNECTIONS ARE COMPLETED BY THIS CONTRACTOR.

CONTRACTOR SHALL INCLUDE IN TENDER PRICE FOR FREEZING PIPING FOR ALL NEW PIPING CONNECTION TO EXISTING SERVICES AND DEMOLITION OF EXISTING SERVICES.

CUTTING AND PATCHING:

CUTTING, PATCHING, DRILLING AND X-RAY SCANNING OR RADAR IMAGING WILL BE PROVIDED BY GENERAL TRADES. MECHANICAL CONTRACTOR SHALL INDICATE SIZE AND LOCATION OF OPENINGS AND SUPPLY SLEEVES/ANCHORING AND DUCT/PIPE FLANGES AS REQUIRED SHALL BE INSTALLED BY GENERAL TRADES.

ALL CUTTING AND CORE DRILLING OF STRUCTURAL ELEMENTS SHALL BE APPROVED BY A STRUCTURAL ENGINEER. PROVIDE SCANNING REPORT SHOWING ALL LOCATIONS OF PROPOSED PENETRATIONS AND COORDINATE LOCATIONS WITH STRUCTURAL ENGINEER.

PIPE EXPANSION:

CONTRACTOR SHALL BE RESPONSIBLE FOR EXPANSION AND CONTRACTION OF ALL PIPING. LAYOUT AND ARRANGE PIPING WITH BENDS AND OFFSETS OR LOOPS TO COMPENSATE FOR EXPANSION AND CONTRACTION, WHERE NECESSARY. PROVIDE EXPANSION COMPENSATORS, AND EXPANSION JOINTS, TOGETHER WITH ANCHORS AND GUIDES. ARRANGE INSTALLATION SO THAT NO STRAIN IS IMPOSED ON PIPING, JOINTS AND EQUIPMENT. SUBMIT PIPING LAYOUT AS A SHOP DRAWING.

PIPE SLEEVES AND ESCUTCHEONS:

FOR PIPES PENETRATIONS: PROVIDE PIPE SLEEVES THROUGH WALLS AND FLOORS LARGE ENOUGH TO ALLOW INSULATION TO PASS THROUGH UNBRIKEN. INSTALL CHROME PLATED ESCUTCHEON PLATES ON EXPOSED PIPING THROUGH WALL OR FLOORS. PACK VOID BETWEEN SLEEVE AND PIPE FOR FULL LENGTH OF SLEEVE WITH MINERAL WOOL, AND SEAL WITH SILICONE CAULKING COMPOUND. SLEEVE SHALL BE GALVANIZED SCHEDULE 40 PIPES THROUGH MASONRY OR CONCRETE.

FIRE STOPPING:

FOR MECHANICAL SERVICES PENETRATING THROUGH FIRE RATED SEPARATIONS, PENETRATION MUST BE SEALED WITH FIRE STOP SEALING SYSTEM AND SHALL BE BY THE MECHANICAL CONTRACTOR. ENSURE ALL NEW PENETRATION THROUGH FIRE RATED SEPARATIONS ARE SEALED WITH ULG APPROVED SEALING SYSTEM. SUBMIT UL APPROVED SYSTEM AS SHOP DRAWING FOR REVIEW.

DRAWINGS:

THE MECHANICAL DRAWINGS ARE DIAGRAMMATIC IN NATURE, INTENDED TO CONVEY THE SCOPE OF THE WORK, ANY INFORMATION INVOLVING ACCURATE MEASUREMENT OF THE BUILDING AND EQUIPMENT SHALL BE TAKEN FROM THE BUILDING ITSELF. FIGURED DIMENSIONS ON ARCHITECTURAL DRAWINGS AND MECHANICAL DRAWINGS OF EQUIPMENT SHALL BE TAKEN FROM THE EQUIPMENT ITSELF.

IF AN ITEM IS INDICATED ON A PLAN, SECTION OR DETAIL, IT SHALL BE CONSIDERED AS APPEARING ON ALL VIEWS. IF THE ITEM IS CALLED FOR IN THE SPECIFICATION, IT SHALL BE CONSIDERED AS APPEARING ON THE DRAWINGS.

WHERE AN ITEM IS SPECIFIED IN A NOTE ON A DRAWING, IT SHALL BE CONSIDERED AS APPEARING IN THIS SPECIFICATION.

CLEANING:

UPON COMPLETION OF WORK, AND PORTION OF THE WORK, REMOVE FROM THE PREMISES ALL TOOLS, DEBRIS, SUPPLIES AND WASTE MATERIALS RESULTING FROM OPERATIONS UNDER THIS DIVISION. THE WORKING AREAS SHALL BE LEFT IN A CLEAN AND SATISFACTORY CONDITION. CLEAN ALL EQUIPMENT AND LEAVE ALL ITEMS IN PROPER ORDER READY FOR OPERATION.

PAINTING:

TOUCH UP ALL SCRATCHES AND OTHER DAMAGE TO PAINTED FINISH ON ALL FACTORY PAINTED EQUIPMENT. ALL OTHER PAINTING WORK SHALL BE DONE UNDER THE PAINTING DIVISION.

CONTROLS WORK:

REFER TO DIVISION OF RESPONSIBILITY MATRIX INCLUDED IN DRAWINGS.

ELECTRICAL EQUIPMENT:

ALL ELECTRICAL EQUIPMENT, INCLUDING MOTORS SHALL BE CSA OR ONTARIO ELECTRICAL SAFETY AUTHORITY INSPECTIONS APPROVED AND SHALL BE LABELED AS SUCH.

MECHANICAL EQUIPMENT:

ALL MECHANICAL EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS AND RECOMMENDATIONS.

ALL PRODUCTS AND COMPONENTS OF PRODUCTS SHALL MEET FLAME SPREAD RATING OF 25 AND SMOKE DEVELOPED CLASSIFICATION OF 50.

ALL PRODUCTS SHALL BE AS SPECIFIED OR APPROVED EQUIP AT TIME OF TENDER.

ALL PENETRATIONS AND CONNECTIONS TO OUTDOOR MECHANICAL EQUIPMENT SHALL BE WEATHER SEALED.

PROVIDE MANUFACTURER START-UP REPORTS FOR ALL EQUIPMENT AND INCLUDE AS PART OF CLOSE-OUT DOCUMENTS.

SCHEDULING AND HOURS OF WORK:

REFER TO DIVISION 1 SPECIFICATIONS FOR MORE INFO ON SCHEDULING AND HOURS OF WORK. ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE APPROVED CONSTRUCTION SCHEDULE AND ALL SPECIFIED INTERIM SCHEDULES. CONTRACTORS MUST COMPLY WITH THE GENERAL CONTRACTORS CONSTRUCTION SCHEDULE. INCLUDE IN TENDER PRICE FOR PREMIUM TIME WORK PROVIDED DURING NIGHTS, WEEKENDS OR OTHER TIMES OUTSIDE NORMAL WORKING HOURS, NECESSARY TO MAINTAIN ALL MECHANICAL SERVICES IN OPERATION AND TO MEET THE PROJECT SCHEDULE.

COORDINATION:

COORDINATE WORK WITH OTHER DIVISIONS TO AVOID INTERFERENCE WITH OTHER SERVICES. INTERFERENCES TO INCLUDE, BUT NOT LIMITED TO, CLEARANCES, AIRFLOW OBSTRUCTIONS FROM OPEN ENDED DUCTS, AND EQUIPMENT POWER REQUIREMENTS.

RECEIVING AND STORAGE:

THE CONTRACTOR SHALL BE RESPONSIBLE FOR RECEIVING, UNLOADING, STORING, SAFEKEEPING, AND PROTECTION FROM THE WEATHER OF ALL MATERIALS THAT FORM PART OF THIS CONTRACT.

DEMONSTRATE:

UPON COMPLETION OF THE WORK, SET ALL EQUIPMENT INTO OPERATION, DEMONSTRATE THE SUCCESSFUL OPERATION AND FAMILIARIZE THE OWNERS OPERATING PERSONNEL WITH THE NEW SYSTEM. EQUIPMENT AND CHANGES TO THE EXISTING SYSTEM UNDER THIS DIVISION, PRIOR TO DEMONSTRATION, THE CONTRACTOR SHALL SUBMIT THE MAINTENANCE MANUALS AND PROVE SUCCESSFUL OPERATION OF THE SYSTEM AND EQUIPMENT.

CLOSE-OUT DOCUMENTS:

PROVIDE "OPERATION AND MAINTENANCE MANUALS" IN ACCORDANCE TO DIVISION 1 SPECIFICATIONS.

"OPERATION AND MAINTENANCE MANUALS" SHALL CONTAIN INSTALLATION INSTRUCTIONS, MAINTENANCE INSTRUCTIONS AND REVISED SHOP DRAWINGS OF ALL ITEMS OF EQUIPMENT SUPPLIED UNDER THIS DIVISION. ALL BALANCE REPORTS; START UP REPORTS; TSSA PIPING SYSTEMS INSTALLATION AND TEST DATA REPORT; TEST REPORTS FOR ALL EMERGENCY PLUMBING FIXTURES AND THERMOSTATIC MIXING VALVES; AND ALL WARRANTIES.

PROVIDE DOCUMENTS AS MENTIONED IN OTHER SECTIONS.

SHOP DRAWINGS:

PRIOR TO SUBMISSION OF SHOP DRAWINGS, PROVIDE A LIST OF ALL SHOP DRAWINGS PROPOSED TO BE SUBMITTED FOR REVIEW BY THE CONSULTANT.

BEFORE EQUIPMENT IS MANUFACTURED OR SHIPPED TO THE SITE, SUBMIT SHOP DRAWING TO THE UNIVERSITY OF TORONTO, THE SHOP DRAWINGS IN PDF FORMAT THROUGH ELECTRONIC MAILS TO THE ENGINEER FOR REVIEW. ALL SHOP DRAWINGS SHALL BE STAMPED BY THE CONSULTANT. THE CONTRACTOR TO INDICATE THAT THEY HAVE REVIEWED THE SHOP DRAWINGS FOR CONFORMANCE TO ALL CONSTRUCTION DOCUMENTS. SCANNED SHOP DRAWINGS ARE NOT ACCEPTABLE.

SUBSEQUENT REVIEW BY THE UNIVERSITY OF TORONTO IS FOR GENERAL ARRANGEMENT ONLY AND DOES NOT RELIEVE THE CONTRACTOR OF ANY RESPONSIBILITY FOR THE CORRECTNESS OF THE WORK.

THE FOLLOWING INFORMATION SHALL BE GIVEN ON EACH DRAWING:

1. PERFORMANCE FIGURES AND DATA TO CONFIRM THOSE GIVEN IN THE SPECIFICATION.

2. DIMENSIONS AND WEIGHTS WHERE APPLICABLE.

3. DATES OF ISSUE OF SHOP DRAWING AND NAME AND PROJECT NUMBER OF CONTRACT. REFERENCE LETTERS AND NUMBERS OF PIECE OF EQUIPMENT.

4. THE CONTRACTOR SHALL SUPPLY SHOP DRAWINGS FOR EQUIPMENT INDICATED ON TRADES SECTIONS IN THIS SPECIFICATION.

5. THE CONTRACTOR SHALL PROVIDE CONFIRMATION THAT EQUIPMENT IS ABLE TO BE TRANSPORTED FROM OUTSIDE TO PROPOSED LOCATION ON DRAWINGS.

6. SKETCHES AND PHOTOS OF SITE CONFIRMED LOCATION OF EQUIPMENT AND CONFIGURATION/ORIENTATION TO AVOID INTERFERENCES. IF EQUIPMENT LOCATION MATCHES DRAWING, THEN PROVIDE CONFIRMATION EQUIPMENT CAN BE INSTALLED IN LOCATION SHOWN ON DRAWING WITH NO INTERFERENCES.

7. PRODUCT DELIVERY LEAD TIMES.

ORDERING OF EQUIPMENT:

PLACE ORDERS FOR EQUIPMENT IMMEDIATELY UPON RECEIPT OF AWARD OF CONTRACT, SO THAT THE MANUFACTURERS CAN COMMENCE PREPARATION OF SHOP DRAWINGS. SUBMIT PROOF THAT ORDERS ARE PLACED.

LIFTING & SCAFFOLDING:

PROVIDE ALL CRANES, HOISTS, ETC., REQUIRED FOR LIFTING AND PLACING EQUIPMENT, DUCTING AND PIPING IN POSITION ON ROOF, ON WALLS AND IN CELING AS REQUIRED.

PROVIDE ALL SCAFFOLDING REQUIRED, INCLUDING ITS DISMANTLE AND REMOVAL FROM THE SITE ON COMPLETION.

COORDINATE WITH OTHER DIVISIONS TO ENABLE THEM TO ALSO USE THE SCAFFOLDING.

THE SPACE REQUIRED AND LOCATIONS OF LIFTING EQUIPMENT AND SCAFFOLDING SHALL BE AGREED WITH THE U OF T'S REPRESENTATIVE.

PROVIDE SUFFICIENT CAUTION SIGNAGE AROUND LIFTING EQUIPMENT AND SCAFFOLDING WORKING AREAS.

PAYMENT FOR CHARGES:

PROVIDE A COMPLETE ITEMIZED COST BREAKDOWN OF ALL MATERIALS, EQUIPMENT, LABOUR COSTS AND MARK-UP FEES ASSOCIATED WITH EACH SUBMISSION FOR ADDITIONAL, OR DELETED WORK.

AS-BUILT DRAWINGS:

"AS-BUILT DRAWINGS" IN ACCORDANCE WITH GENERAL CONDITIONS OF CONTRACT IN AUTOCAD AND PDF FORMAT, AS-BUILT DRAWINGS SHALL DOCUMENT ALL CHANGES TO DESIGN.

02 41 00 - DEMOLITION

PROVIDE FOR THE REMOVAL OF EQUIPMENT AND DEVICES AS NOTED ON THE DRAWINGS.

PRIOR TO ANY DEMOLITION WORK IN THE RENOVATION AREA, INCLUDING GENERAL TRADES WORK, ALL EXISTING AIR MOVING SYSTEMS INCLUDING SUPPLY, RETURN, TRANSFER, EXHAUST AND FRESH AIR INTAKE, WHETHER ATTACHED OR NOT TO THE MAIN BUILDING SYSTEMS SHALL BE ISOLATED AND CAPPED AIRTIGHT TO AVOID CONTAMINATION AND WASTE OF ENERGY. THE CONTRACTOR SHALL LAISE WITH THE FAS UTILITIES DIVISION THROUGH THE U OF T REPRESENTATIVE TO ISOLATE THE SYSTEMS WHICH MUST INVOLVE SHUTTING DOWN AIR HANDLING EQUIPMENT, CUTTING THROUGH THE JOB SITE TO BE EXECUTED ON A DAILY BASIS IN ORDER TO MAINTAIN A CLEAN AND SAFE WORK ENVIRONMENT.

CAREFULLY REMOVE EXISTING PIPING, FIXTURES, EQUIPMENT, DUCTWORK, ETC., AS INDICATED ON THE DRAWINGS. THE U OF T'S REPRESENTATIVE SHALL DECIDE WHICH MATERIALS OR ITEMS SHALL BE DISPOSED OFF SITE BY THE CONTRACTOR, OR WHICH SHALL BE HANDED OVER TO THE U OF T. SEAL OF EXISTING SERVICES THAT ARE TO REMAIN TO ENABLE SERVICES TO BE REACTIVATED.

UNLESS OTHERWISE NOTED, EQUIPMENT SHALL BE THE PROPERTY OF THE OWNER AND EQUIPMENT NOT REUSED SHALL BE TURNED OVER TO THE OWNER. EQUIPMENT NOT WANTED BY THE OWNER SHALL BE REMOVED AND DISPOSED OF AWAY FROM THE SITE. REMOVAL OF DEBRIS AND RUBBISH FROM THE JOB SITE TO BE EXECUTED ON A DAILY BASIS IN ORDER TO MAINTAIN A CLEAN AND SAFE WORK ENVIRONMENT.

PRIOR TO DEMOLITION, MAKE NOTE OF ANY DAMAGE TO THE EXISTING SYSTEM. IDENTIFY THESE ITEMS AND INFORM THE CONSULTING ENGINEER IMMEDIATELY. FAILURE TO REPORT ANY DEFICIENCIES, PRIOR TO DEMOLITION, IMPLIES THAT THE CONTRACTOR HAS ACCEPTED THE SITE. IT SHALL BE THE RESPONSIBILITY OF THIS CONTRACTOR TO MAKE GOOD ALL EXISTING EQUIPMENT NOTED TO REMAIN FOLLOWING THE DEMOLITION WORK.

ENSURE THE CONTINUED OPERATION OF THE EXISTING HVAC, PLUMBING, DRAINAGE AND FIRE PROTECTION SYSTEMS WHICH SUPPLY THE ADJOINING SPACES.

ENSURE THE CONTINUED OPERATION OF THE LIFE-SAFETY SYSTEM DURING THE ENTIRE CONSTRUCTION OF THE PROJECT. BYPASS ONLY THE ZONES NECESSARY AND AS REQUIRED TO COMPLETE THE WORK. GIVE 24 HOURS NOTICE TO THE BUILDING OWNER FOR SYSTEM BYPASS AND NOTIFY IMMEDIATELY UPON COMPLETION OF THE WORK SO AS TO RESTORE THE FIRE-SAFETY SYSTEM TO THE ENTIRE FACILITY. IN NO CASE SHALL THE LIFE SAFETY SYSTEM, OR ANY PART OF IT, REMAIN ON BYPASS DURING THE NIGHT (AFTER NORMAL WORKING HOURS). IT IS THE RESPONSIBILITY OF THIS CONTRACTOR TO ENSURE THAT THE FIRE-SAFETY SYSTEM IS FULLY FUNCTIONAL PRIOR TO LEAVING THE SITE AT THE END OF EACH WORKING DAY.

COORDINATE IN ADVANCE WITH FAS, WORK WHICH IS TO BE CARRIED OUT AFTER "NORMAL WORKING HOURS" THIS MAY INCLUDE, BUT IS NOT LIMITED TO, THE LIFE-SAFETY SYSTEM, PLUMBING AND DRAINAGE SYSTEM, FIRE PROTECTION SYSTEM AND ANY WORK WHICH MUST BE COMPLETED IN THE ADJOINING SPACES. REMOVAL OF EQUIPMENT CONTAINING REFRIGERANT SHALL BE IN STRICT ACCORDANCE WITH CURRENT CODES AND BY-LAWS.

02 80 00 HAZARDOUS MATERIALS AND ASBESTOS REMOVAL:

FOR HAZARDOUS MATERIAL ABATEMENT AND SELECTIVE DEMOLITION SCOPE OF WORK, SPECIAL PROJECT PROCEDURES, REQUIRED ENCLOSURES, AND APPLICABLE REGULATIONS & PROGRAMS REFER TO DIVISION 0 & 1 SPECIFICATIONS.

20 05 29 - HANGERS AND SUPPORTS

GENERAL

ALL HANGERS AND SUPPORTS SHALL BE MANUFACTURED AND INSTALLED AS PER LATEST ANSISMS SP-68 - PIPE HANGERS AND SUPPORTS, AND ANSISMACNA 008 - HVAC DUCT CONSTRUCTION STANDARDS - METAL, AND FLEXIBLE.

EQUIPMENT OR SYSTEMS PROVIDED UNDER THIS CONTRACT SHALL BE NECESSARY SUPPORTS AND HANGERS TO WITHSTAND ALL STATIC AND DYNAMIC LOADING CONDITIONS WHICH ACT ON THE EQUIPMENT. THE MECHANICAL CONTRACTOR SHALL PROVIDE SHOP DRAWINGS OF ANCHORS AND GUIDES FOR ALL EQUIPMENT OR SYSTEMS WITH POTENTIAL FOR EXPANSION OR CONTRACTION. SHOP DRAWINGS SHALL BE SUBMITTED FOR REVIEW AND APPROVAL BY THE CONSULTANT PRIOR TO SUBMITTING TENDER. THE MECHANICAL CONTRACTOR SHALL INCLUDE IN TENDER PRICE FOR SELECTION, DESIGN, AND ENGINEERING OF HANGERS OR SUPPORTS FOR ALL MECHANICAL EQUIPMENT PROVIDED UNDER THIS CONTRACT.

THE MECHANICAL CONTRACTOR SHALL NOT SHARE HANGERS OR SUPPORTS WITH ANY OTHER TRADES OR EXISTING SERVICES. MECHANICAL CONTRACTOR SHALL NOT REUSE EXISTING HANGERS OR SUPPORT UNLESS PROVIDED WITH WRITTEN APPROVAL FROM THE MECHANICAL CONSULTANT.

ALL HORIZONTAL, PIPE HANGERS AND SUPPORTS SHALL BE OVERSIZED AND BE COMPLETE WITH INSULATION SHIELD TO ACCOMMODATE CONTINUOUS INSULATION INSTALLATION.

FOR ALL PIPES, DUCTS, AND CONDUTS LOCATED ON THE ROOF, PROVIDE ROOF SUPPORTS THAT SIT ON ROOF WITH EQUIPMENT AT LEAST 300MM ABOVE FINISHED ROOF.

ALL HANGERS AND SUPPORT INSTALLED OUTSIDE TO BUILDING SHALL BE GALVANIZED.

SOURCING:

ALL PIPING, FITTINGS, AND JOINTS SHALL BE PRODUCTS MADE IN CANADA.

HANGERS:

PROVIDE HANGERS FOR UNBURIED PIPING AND DUCTS. OBTAIN APPROVAL OF METHODS OF HANGING TO BUILDING BEFORE PROCEEDING. ENSURE THAT LOAD ON BUILDING STRUCTURE DOES NOT EXCEED MAXIMUM MECHANICAL LOADING PER SQUARE METER.

HANGERS SHALL BE SUSPENDED FROM BUILDING STRUCTURE DIRECTLY.

DO NOT HANG FROM STEEL DECKING OR OTHER HANGERS. PROVIDE STRUCTURAL FRAMING FROM BUILDING STRUCTURE WHERE NECESSARY TO SUPPORT WORK IN THESE AREAS.

HANG UNBURIED HORIZONTAL CAST IRON PIPES AT EACH HUB LENGTH MAX. 1500 MM WITH ADJUSTABLE CLEVIS HANGERS. WHERE GROUPS OF FITTINGS OCCUR, NOT MORE THAN 900 MM SHALL BE BETWEEN HANGERS. SUPPORT OTHER HORIZONTAL PIPING WITH ADJUSTABLE CLEVIS HANGERS AS FOLLOWS.

PIPE SIZE	MAXIMUM SPACING
<=32ø	1800MM
38ø TO 75ø	3000MM

HANG PLUMBING PIPING IN ACCORDANCE WITH MORE STRINGENT REQUIREMENTS OF PLUMBING CODE OR OTHERWISE SPECIFIED.

PROVIDE BARRIER TO PREVENT CONCRETE PIPE BEING IN CONTACT WITH FERRUS OR CINDER MATERIALS.

HANG PIPING ON WALLS WITH OFFSET WALL HOOKS FASTENED TO WALL WITH TOGGLE BOLTS OR PHILLIPS "RED HEAD" CONCRETE ANCHORS.

SUPPORTS

PROVIDE SUPPORTS, STANDS AND PLATFORMS NECESSARY FOR PROPER INSTALLATION OF EQUIPMENT AND COMPONENTS. PROVIDE NECESSARY ANCHOR BOLTS AND OTHER FASTENINGS. SECURE WORK TO CONCRETE WITH PHILLIPS "RED HEAD" CONCRETE ANCHORS.

STEEL JOISTS: SUSPEND VERTICAL LOADS FROM TOP OR BOTTOM JOIST CHORDS. LOADS SUSPENDED FROM CHORDS BETWEEN ANY TWO ADJACENT PANEL POINTS MUST NOT EXCEED 200 KG (440 LBS) TOTAL AND MUST BE CONNECTED TO CHORDS WITHIN 100 MM (4") OF PANEL POINTS. IF THE TOTAL LOAD BETWEEN ADJACENT PANEL POINTS DOES NOT EXCEED 90 KG (19 LBS), LOADS MUST BE APPLIED SO THAT THEY DO NOT CAUSE TWISTING OF THE JOISTS OR THE JOIST CHORDS. ATTACH BY EXTENDING HANGER RODS BETWEEN DOUBLE ANGLE CHORDS WHERE POSSIBLE. OTHERWISE ATTACH USING U-BOLTS WITH DOUBLE HANGERS OR OTHER DEVICES THAT WILL CENTRE THE HANGER LOAD ON THE JOIST. DO NOT CUT OR DRILL JOIST MEMBERS. LATERAL LOADS ARE NOT TO BE APPLIED TO JOIST.

STEEL BEAMS: VERTICAL LOADS MUST BE APPLIED SO THAT THEY DO NOT CAUSE TWISTING OF THE BEAMS OR EXCESSIVE BENDING OF THE FLANGES. LATERAL LOADS ARE NOT TO BE APPLIED IN WRITING BY THE CONSULTANT'S STRUCTURAL ENGINEER.

STEEL DECK: DO NOT SUSPEND LOADS FROM STEEL DECK FLOORS AND ROOF UNLESS APPROVED IN WRITING BY THE CONSULTANT'S STRUCTURAL ENGINEER.

SUPPORT VERTICAL PIPING WITH RISER CLAMPS AT EACH FLOOR LEVEL.

20 05 53 - MECHANICAL IDENTIFICATION

SCOPE:

PROVIDE IDENTIFICATION ON NEW EQUIPMENT, PIPING, VALVES, ENCLOSURES, AND NEW INSULATION ON EXISTING PIPING.

IDENTIFICATION:

1. IDENTIFY MEDIUM IN PIPING WITH MARKERS SHOWING NAME AND SERVICE INCLUDING TEMPERATURE, PRESSURE AND DIRECTIONAL FLOW ARROWS IN ACCORDANCE WITH CGSB 24_09-34.

1.1. MANUFACTURED PIPE MARKERS AND COLOR BANDS:

1.1.1. ALL IDENTIFICATION SHALL INCORPORATE DIRECTION OF FLOW ARROWS.

1.1.2. IDENTIFICATION SHALL BE MANUFACTURED FROM SEMI RIGID PLASTIC VINYL, WITH SUBSURFACE PRINTING USING QUALITY INDOOR/OUTDOOR VINYL INKS AND A UV VINYL INHIBITOR.

1.1.3. FOR OUTSIDE DIAMETERS UP TO 6" THE MARKERS SHALL BE COILED AND WRAP COMPLETELY AROUND THE PIPE WITH SIX ROWS OF WORKING IN ALTERNATE DIRECTIONS.

1.1.4. ACCEPTABLE PRODUCTS: SMS "COIL-MARK", BRADY "WRAP-AROUND", SETON SETMARK.

1.1.5. LETTER HEIGHTS SHALL BE AS FOLLOWS:

RANGE	LETTER HEIGHT
3/8" TO 5/8"	1/4"
3/4" TO 1-1/8"	1/2"
1-1/4" TO 2-3/8"	3/4"
2-1/2" TO 6"	1-1/4"

2. LOCATION:

2.1. LOCATE MARKERS AND CLASSIFYING COLORS ON PIPING SYSTEMS SO THEY CAN BE SEEN FROM FLOOR OR PLATFORM.

2.2. PIPING RUNS AT LEAST ONCE IN EACH ROOM.

2.3. MAXIMUM 50 FT (15 M) BETWEEN IDENTIFICATIONS IN OPEN AREAS.

2.4. BOTH SIDES WHERE PIPING PASSES THROUGH WALLS AND FLOORS.

2.5. AT POINT OF ENTRY AND LEAVING, WHERE PIPING IS CONCEALED IN PIPE CHASE OR OTHER CONFINED SPACE, AND AT EACH ACCESS OPENING.

2.6. AT START AND END POINTS OF RUNS AND AT EACH PIECE OF EQUIPMENT.

2.7. AT MAJOR MANUAL AND AUTOMATIC VALVES IMMEDIATELY UPSTREAM OF VALVE.

2.8. IDENTIFY BRANCH EQUIPMENT OR AREA SERVED AFTER VALVE.

3. TABLE: PIPE AND VALVE IDENTIFICATION.

3.1. CODING SHALL BE IN ACCORDANCE WITH THE FOLLOWING SCHEDULE WITH APPROVED PLASTIC BANDS:

PIPE MARKER LEGEND	LETTERING ON BAND	BAND COLOUR	LETTERING COLOUR
DOMESTIC COLD WATER	DOM. COLD WATER	GREEN	WHITE
DOMESTIC HOT WATER	DOM. HOT WATER	YELLOW	BLACK
DOMESTIC HOT WATER REGR.	DOM. H.W. REGRIC.	YELLOW	BLACK
SANITARY DRAINAGE	SANITARY DRAIN	GREEN	WHITE
REFRIGERANT LIQUID	REF. LIQ.	YELLOW	BLACK
REFRIGERANT SUCTION	REF. GAS	YELLOW	BLACK

20 07 00 - MECHANICAL INSULATION AND COVERING

GENERAL:

APPLY INSULATION AND COVERING AFTER ALL TESTS HAVE BEEN SUCCESSFULLY COMPLETED. INSTALL INSULATION IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. ALL INSULATION MATERIAL AND ADHESIVE SHALL HAVE A FLAME SPREAD RATING OF 25 AND SMOKE DEVELOPED CLASSIFICATION OF 50. WORK SHALL BE PERFORMED BY PERSONS QUALIFIED IN INSULATION WORK. APPLY INSULATION AND COVERING TO ALL DUCT/WORK, PIPING, SUPPORTS, AND HANGERS AS PER INSTALLATION SCHEDULE. REFER TO THERMAL INSULATION SCHEDULE FOR MINIMUM INSULATION THICKNESS AND COVERING MATERIAL.

INCLUDE IN TENDER PRICE TO PROVIDE NEW INSULATION FOR ABATED INSULATION ON EXISTING DUCT/WORK TO REMAIN OR EXISTING PIPING TO REMAIN. COORDINATE WITH ABATEMENT CONTRACTOR. INSULATION SHALL BE AS SPECIFIED AND IN THICKNESS THAT MATCHES EXISTING DUCT/WORK OR EXISTING PIPING.

PIPE INSULATION (EXCEPT REFRIGERANT PIPING):

MAKE GOOD INSULATION DISTURBED AT TIE-IN POINTS. MATERIAL SHALL BE FIBREGLASS PREFORMED PIPE INSULATION (THERMAL PERFORMANCE <0.23 BTU/HR/IN/RSQ FT°F @ 75°F, JOHNS MANVILLE - MANVILLE MICRO-LOK OR EQUAL) WITH THICKNESS AND TYPE OF COVERING AS INDICATED ON DRAWING. INSULATION SCHEDULE SHALL BE EXTENDED TO INCLUDE ALL JOINTS AND ROW ENDS OF INSULATION.

REFRIGERANT PIPING INSULATION:

INSULATE ALL NEW REFRIGERANT LINES, INCLUDING FITTINGS, USING EPDM CLOSED CELL FOAM INSULATION. OPERATING TEMPERATURE BETWEEN -180° AND +140° - 2500 FLAME-SMOKE RATED - NITRILE RUBBER (NBR) INSULATION SIMILAR TO ARMAFLEX AP IS NOT ACCEPTABLE. ALL FITTING COVERS SHALL BE FABRICATED FROM INTERLOCKING INSULATION AND ALL NEW LIQUID PIPING. INSULATE SUCTION PIPING AND LIQUID PIPING SEPARATELY. SUBMIT SHOP DRAWINGS.

ALL BUTT JOINTS AND SEAMS SHALL BE SEALED WITH EPDM COMPOSITE. LOW V.O.C. ADHESIVE. SUBMIT SHOP DRAWINGS.

INDOOR PROTECTIVE COVERS FOR EXPOSED AREAS SHALL BE WHITE PVC JACKETING AND FITTED PIPE FITTING COVERS TO BE MANVILLE ZESTON, 2500 FLAME-SMOKE RATED FOR INDOOR REFRIGERANT LINES. PVC JACKETING SHALL BE INSTALLED WITH PVC FITTING ADHESIVE, SELF SEALING TAPE NOT ACCEPTABLE. SUBMIT SHOP DRAWINGS.

OUTDOOR PROTECTIVE COVER FOR HARD RIDG PIPING, SHALL BE 0.4MM ALUMINUM ROL. JACKETING, EMBOSSED SURFACE. SECURE COVER WITH 1/2" WIDE ALUMINUM BANDS. JACKETING MANUFACTURER PARBCO-CHILDERS METALS OR EQUAL. SUBMIT SHOP DRAWINGS. OVERLAP ALL COVER JANTS BY AT LEAST 150MM AND SEAL WITH VAPOUR BARRIER SEALANT EQUAL TO CHILDRS CHL-891, CP-76.

OUTDOOR PROTECTIVE COVER FOR SOFT PIPING, SHALL BE 3M VENTURECLAD #1579G9V INSULATION JACKETING SYSTEM. FLAT ALUMINUM FINISH. PUNCTURE FORCE OF 300 N. SERVICE TEMPERATURE OF -70° TO 120°C. SUBMIT SHOP DRAWINGS.

22 10 00 - PLUMBING AND DRAINAGE SERVICES

SOURCING:

ALL PIPING, FITTINGS, AND JOINTS SHALL BE PRODUCTS MADE IN CANADA.

INSTALLATION & TESTING:

ALL PLUMBING WORK SHALL BE PERFORMED BY MEMBERS OF THE ASSOCIATION OF JOURNEMEN & APPRENTICES OF THE PLUMBING AND PIPE FITTING INDUSTRY OF THE UNITED STATES AND CANADA LOCAL 46. INSTALL, MAKE JOINTS, AND LEAK ALL PLUMBING WORK IN ACCORDANCE WITH THE REQUIREMENTS OF THE ONTARIO BUILDING CODE, PART 7 - PLUMBING. ANY WEEPING OR TESTING JOINTS SHALL BE CAUSE FOR REJECTION. FITTINGS SHALL BE REMOVED AND THE JOINT REMADE AND RETESTED.

DISSIMILAR METALS:

ALL CONNECTIONS BETWEEN DISSIMILAR METAL PIPING SHALL BE MADE USING DIELECTRIC FITTINGS TO PREVENT GALVANIC CORROSION.

VALVES (GENERAL):

VALVES SHALL ALL BE OF THE SAME MANUFACTURER EXCEPT WHEN SPECIFIED DIFFERENTLY. ISOLATION VALVES SHALL BE BALL TYPE. BYPASS AND THROTTLING VALVES SHALL BE GLOBE TYPE. APPROVED MANUFACTURERS ARE APOLLO, ZURICO, AND CHALLENGER.

ISOLATION VALVES: NPS 2" (50MM) AND UNDER:

LINE SIZE, THREADED, LEAD FREE, CLASS 150, FULL PORT, BALL VALVE, TWO PIECE, BRONZE OR BRASS BODY TO MATCH SPECIFICATION FOR FITTINGS. CHROME PLATED BALL, AND TEFLON SEAT AND SEALS.

VENTING:

CONTRACTOR SHALL PROVIDE A COMPLETE VENTING SYSTEM THAT IS SIZED AND INSTALLED AS PER OBC.

CLEANOUTS:

PROVIDE CLEANOUTS WHERE REQUIRED BY CODE ALSO WHERE INDICATED ON THE DRAWINGS.

CLEANOUTS IN FINISHED AREAS SHALL BE TOP, EPOXY COATED CAST IRON UNFISHED PIPE SIZE, NO HUB (M) OUTLET, ADJUSTABLE COMBINED ACCESS COVER, REVERSIBLE MEMBRANE CLAMP, ANCHOR FLANGE, PLUG WITH GASKET SEAL, 12" MM (5") SQUARE, NICKEL BRONZE COVER.

MATERIALS/FITTINGS/JOINTS:

ALL MATERIALS AND SYSTEMS SHALL BE NEW, UNMADAMGED, CLEAN, BEAR CSA STAMP WHERE APPLICABLE AND BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE ONTARIO BUILDING CODE, PART 7 - PLUMBING.

DOMESTIC WATER (INSIDE BUILDING, ABOVE GROUND)		FITTINGS		JOINTS	
PIPE SIZE	MATERIAL				
ALL	COPPER TYPE L ASTM B88	WROUGHT COPPER ANSI/ASME B16.22 CSA B125.3		LEAD FREE SOLDERED ANSI/ASME B16.18	
SANITARY AND VENT (INSIDE BUILDING, ABOVE GROUND)					
PIPE SIZE	MATERIAL		FITTINGS		JOINTS
<=75ø	COPPER DWV ASTM B396		WROUGHT COPPER ANSI/ASME B16.22 CSA B125.3		LEAD FREE SOLDERED ANSI/ASME B16.29
>75ø	HUBLESS CAST IRON (SCH 40) CSA B70		HUBLESS CAST IRON CSA B70		MECHANICAL JOINT CSA B602
PUMPED SANITARY, STORM, AND CONDENSATE DRAINAGE (INSIDE BUILDING, ABOVE GROUND)					
PIPE SIZE	MATERIAL		FITTINGS		JOINTS
ALL	COPPER TYPE L ASTM B88		WROUGHT COPPER ANSI/ASME B16.22 CSA B125.3		BRAZED

23 20 00 - REFRIGERANT PIPING SERVICES

GENERAL:

THE INSTALLATION OF REFRIGERANT SYSTEM SHALL BE PERFORMED BY A REFRIGERANT INSTALLER IN ACCORDANCE WITH THE REQUIREMENTS OF THE AUTHORITY HAVING JURISDICTION AND CERTIFIED WITH THE EQUIPMENT MANUFACTURER. PROOF OF TRAINING CERTIFICATION SHALL BE MADE AVAILABLE UPON REQUEST. PROVIDE ALL INTERCONNECTING REFRIGERANT PIPING AND ASSOCIATED CONTROLS. SUPPLY, INSTALL, TEST AND COMMISSION ALL INTERCONNECTING REFRIGERATION PIPE/WORK. ALL COMPONENTS OF THE REFRIGERATION PIPING SYSTEM SHALL HAVE A CANADIAN REGISTRATION NUMBER ORIGINALLY OBTAINED BY THE CONTRACTOR.

EQUIPMENT MANUFACTURER TO PROVIDE ENGINEER STAMPED CSA B82 COMPLIANCE LETTER AT TIME OF ASSOCIATED EQUIPMENT SHOP DRAWING.

PROVIDE TSSA PIPING SYSTEMS INSTALLATION AND TEST DATA REPORT* AS PART OF CLOSE OUT DOCUMENTS.

USE PHOSPHORUS DEOXIDIZED COPPER AND COPPER ALLOY SEAMLESS PIPES AND TUBES (CRA TUBES) AS PER STANDARD ASTM B260.

PIPE TYPE SHALL BE:

A/C R PIPE SIZE (OD)	TEMPER	NOTE
6.35ø (1/4")	060	ANNEALED (SOFT COILS)
9.52ø (3/8")	060	ANNEALED (SOFT COILS)
12.7ø (1/2")	060	ANNEALED (SOFT COILS)
15.9ø (5/8")	060	ANNEALED (SOFT COILS)
19.1ø (3/4")	H58	STRAIGHT LENGTHS (HARD PIPE)
22.2ø (7/8")	H58	STRAIGHT LENGTHS (HARD PIPE)
28.6ø (1-1/8")	H58	STRAIGHT LENGTHS (HARD PIPE)

THE METHOD OF PIPE CONNECTIONS SHALL BE AS FOLLOWS: FLARE CONNECTION FOR THE INDOOR UNITS, GAS PIPES AND LIQUID PIPES FOR OUTDOOR UNITS, BRAZED CONNECTION. NOTE THAT ALL BRANCHED SECTIONS SHALL BE BRAZED.

BE SURE THAT THE INNER AND OUTER SURFACES OF THE PIPES ARE CLEAN AND FREE OF HAZARDOUS IMPURITIES, OXIDES, DUST/DIRT, SHAVING PARTICLES, OILS, MOISTURE, OR OTHER CONTAMINANT. STORE THE PIPING TO BE USED DURING INSTALLATION INDOORS AND KEEP BOTH ENDS OF THE PIPING SEALED UNTIL JUST BEFORE BRAZING.

FITTINGS SHALL BE WROUGHT COPPER OR CAST BRASS FITTINGS. USE ELBOWS AND BENDS WITH LARGE RADIUS AT CHANGE OF DIRECTION. ALL REQUIRED BRANCH JOINTS (TYP. FITTINGS) SHALL BE SUPPLIED BY UNIT MANUFACTURER. NOTE THAT ALL OUTDOOR UNIT SHALL BE CONNECTED FROM THE FRONT. ALL REQUIRED FRONT PIPING CONNECTING KITS SHALL BE PROVIDED BY UNIT MANUFACTURER.

PROVIDE VIBRATION ISOLATION, FILTER DRYERS, AND IF NECESSARY, PROVIDE SUCCTION LINE OIL SEPARATORS.

INSTALL PIPING WITH REQUIRED SLOPES. SUPPORT PIPE TO PREVENT SAGGING.

JOINTS SILVER BRAZED WITH SIL-FOS BRAZING ALLOY, OR APPROVED EQUIP. AT TEMPERATURE EXCEEDING 540°C. CIRCULATE DRY NITROGEN THROUGH PIPES BEING BRAZED TO ELIMINATE FORMATION OF COPPER OXIDE DURING BRAZING OPERATION.

USE ESTER OIL, ETHER OIL, OR ALKYL BENZENE (SMALL AMOUNT) AS THE REFRIGERANT OIL TO COAT FLARES AND FLANGE CONNECTIONS. AFTER INSTALLATION OF PIPING AND PIPING ACCESSORIES, PROTECT PIPING FROM EXCESSIVE PRESSURE.

TESTED USING ANHYDROUS NITROGEN GAS. SPRAY THE FLANGE CONNECTION PARTS, BRAZED PARTS, FLANGES AND OTHER PARTS THAT MAY LEAK WITH A BUBBLING AGENT (E.G. KYBUKOFIL) AND VISUALLY CHECK FOR BUBBLES. START WITH 303 KPA (44 PSIG) FOR 3 MINUTES MINIMUM, THEN 1.58 KPA (227 PSIG) FOR 3 MINUTES MINIMUM, THEN 2.00 KPA (464 PSIG) FOR 3 MINUTES MINIMUM, THEN STRENGTH TEST TO 4.151 KPA (600 PSIG). CHECK THE SYSTEM FOR LEAKS AND DEFORMATION. THEN LOWER THE PRESSURE BACK TO 3.300 KPA (478 PSIG) AND PRESURE TEST FOR 24 HOURS AND CHECKED FOR LEAKS. IF BUBBLING AGENT AFTER THE TEST, APPLY FOR, OBTAIN, AND PAY FOR CERTIFICATES, REGISTRATIONS AND INSPECTIONS REQUIRED BY TSSA.

VACUUM/EVACUATE REFRIGERATION PIPING SYSTEM AND EQUIPMENT BEFORE CHARGING THE SYSTEM WITH THE REFRIGERANT. EVACUATION SHALL BE DONE PER REFRIGERATION SYSTEM MANUFACTURER'S RECOMMENDATIONS. DURING THE EVACUATION ANY MOISTURE AND AIR MUST BE REMOVED FROM ALL OF THE SYSTEM COMPONENTS AND THE REFRIGERATION PIPE/WORK.

USE LIQUID REFRIGERANT AND A VACUUM PUMP WITH A REVERSE FLOW CHECK VALVE TO FILL THE SYSTEM. REFRIGERANT CHARGE WEIGHT MUST BE CALCULATED, TO THE ACTUAL INSTALLATION, AND PIPING SHALL BE IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS. THE CHARGING SHOULD BE CARRIED OUT WITH AN APPROPRIATE CHARGING STATION.

INSTALL PIPING SYSTEM TO COMPLY WITH AIR-CONDITIONING EQUIPMENT MANUFACTURER'S RECOMMENDATIONS AND TO ENSURE OIL RETURN TO COMPRESSORS. PROVIDE LAYOUT OF ALL PIPES TO THE FRONT OF THE UNIT. PROVIDE APPROVED PIPING FOR THE APPLICATION. START UP THE SYSTEM USING FACTORY-MANUFACTURED PRE-CHARGED, SEALED LINES ARE ACCEPTABLE WHEN SUITABLE FOR THE APPLICATION. START UP THE SYSTEM USING FACTORY-TRAINED PERSONNEL FROM THE MANUFACTURER AND PROVIDE COMMISSIONING REPORT.

25 00 00 - CONTROLS (STANDALONE)

GENERAL:

REFER TO DIVISION OF RESPONSIBILITY MATRIX INCLUDED IN DRAWINGS FOR SCOPE CLARIFICATIONS FOR ELECTRICAL CONTRACTOR AND CONTROLS CONTRACTOR.

ALL CONTROL WORK SHALL BE IN ACCORDANCE WITH EQUIPMENT MANUFACTURER'S RECOMMENDATIONS. SUBMIT MANUFACTURER'S SHOP DRAWINGS OF ALL CONTROL COMPONENTS FOR U OF T'S REVIEW AND APPROVAL.

PNEUMATIC CONTROLS:

ALL PNEUMATIC CONTROL WORK SHALL BE IN ACCORDANCE WITH EQUIPMENT MANUFACTURER'S RECOMMENDATIONS. SUBMIT MANUFACTURER'S SHOP DRAWINGS OF CONTROL COMPONENTS FOR U OF T'S REVIEW AND APPROVAL.

PIPING SHALL BE SEAMLESS COPPER TYPE "L" WITH SOLDERED CONNECTIONS. FIRE RESISTANT POLYETHYLENE TUBING WITH AN OUTSIDE DIAMETER OF NOT MORE THAN 10MM (3/8") MAY BE USED FOR FINAL CONNECTIONS WITHIN 300MM OF THERMOSTAT. CONCEAL PIPING IN FINISHED AREAS. DO NOT RUN CLOSER THAN 30MM FROM HEATING PIPES. MAKE JOINTS COMPLETELY AIR TIGHT IN AN APPROVED MANNER.

CONCEALED TUBING RUNNING "FREE AIR" IN ACCESSIBLE CEILINGS SHALL BE SUPPORTED WITH J-HOOKS FIXED TO BUILDING STRUCTURE. REFER TO SECTION 20 05 29 - HANGERS AND SUPPORTS FOR MORE INFO.

ALL PNEUMATIC TUBING TO BE REUSED SHALL BE PRESSURE TESTED AND ALL LEAKS SHALL BE REPAIRED. ALL REUSED PNEUMATIC TUBING SHALL BE PURGED WITH DRY AIR OR NITROGEN.

THE EXISTING PNEUMATIC MAIN AIR SUPPLY SYSTEM SHALL BE MODIFIED AS REQUIRED AND REUSED TO SERVE EXISTING PNEUMATIC CONTROLS THAT ARE TO REMAIN AND SHALL BE EXTENDED AS NECESSARY TO SERVE NEW PNEUMATIC CONTROLS. WHERE EXISTING PNEUMATIC CONTROLS ARE REMOVED, MAIN AIR PIPING SHALL BE REMOVED BACK TO THE POINT OF CONNECTION TO THE MAIN AIR SUPPLY WHICH REMAINS IN USE AND SHALL BE CAPPED OR PLUGGED.

VENDORS:

APPROVED CONTROLS CONTRACTOR SHALL BE HONEYWELL, JOHNSON CONTROL, SIEMENS, AUTOMATED LOGIC, OR SCHNEIDER ELECTRIC.

PNEUMATIC TEMPERATURE SENSOR SHALL BE COMPATIBLE WITH THE EXISTING DUCT/DUCT SYSTEM AND SHALL OPERATE PROPERLY WITH THE BUILDING'S EXISTING COMPRESSED AIR SYSTEM. CONTRACTOR SHALL VERIFY REQUIREMENTS ON SITE.

CONDUITS:

THE CONDUITS SHALL BE OF MINIMUM SIZE 20 MM FOR CONTROL AND LOW VOLTAGE WIRING AND DATA CABLING. FINAL CONTROL CONDUITS CONNECTIONS TO VITAL ROOMS AND VITAL EQUIPMENT SHALL BE MADE USING FLEXIBLE METAL CONDUIT OR EQUAL, FOR A MAXIMUM LENGTH OF 3000MM. INTERIOR CONDUITS SHALL BE ELECTRICAL METALLIC TUBING (EMT) WITH STEEL COMPRESSION TYPE FITTINGS. EXTERIOR CONDUITS SHALL BE RIGID GALVANIZED STEEL WITH THREADED CONNECTIONS.

PROVIDE CONDUIT WHERE CONTROLS WIRING, DATA CABLING, OR PNEUMATIC TUBING WILL BE OUTDOORS, EXPOSED, OR ARE ABOVE INACCESSIBLE CEILINGS (INCLUDING BUT NOT LIMITED TO DRYWALL OR ASBESTOS CONTAINING CELLING MATERIALS).

CONTROL WIRING:

CONTROL WIRING FOR MECHANICAL EQUIPMENT CONTROLS SHALL BE MINIMUM SIZE #16 AWG COPPER AND PLENUM RATED (FT-6) FOR LOW VOLTAGE CONTROLS. PNEUMATIC WIRING SHALL BE IN ACCORDANCE WITH EQUIPMENT MANUFACTURER'S RECOMMENDATIONS. ALL WIRING SHALL BE TWISTED PAIR, FOR COMMUNICATIONS WIRING USE SHIELDED TWISTED PAIR WIRE GROUNDED AT ONE END. SPLICING OF COMMUNICATIONS CABLES IS NOT ACCEPTABLE.

CONCEALED WIRING RUNNING "FREE AIR" IN ACCESSIBLE CEILINGS SHALL BE SUPPORTED WITH J-HOOKS FIXED TO BUILDING STRUCTURE. REFER TO SECTION 20 05 29 - HANGERS AND SUPPORTS FOR MORE INFO.

POWER SUPPLY FOR THE CONTROL SYSTEMS SHALL BE PROVIDED BY ELECTRICAL CONTRACTOR.

SHOP DRAWINGS:

PROVIDE SHOP DRAWING IN UNLOCKED AND EDITABLE ADOBE PDF OR MICROSOFT WORD FORMAT. SCANNED DOCUMENTS ARE NOT ACCEPTABLE.

INCLUDE THE FOLLOWING IN THE SUBMITTAL:

1. QUALITY ASSURANCE/CONTROL PLAN FOR ALL PHASES (DESIGN, INSTALL, COMMISSIONING, WARRANTY, AND TRAINING).

2. PRODUCT DATA SHEETS FOR EACH CONTROL DEVICE, PANEL, AND ACCESSORY FURNISHED. INDICATE DIMENSIONS, CAPACITIES,

C:\Users\makhetse\Documents\P164-25-078_M_26_Ali_makhenVHUMA.rvt2026-01-21 2:38:21 PM

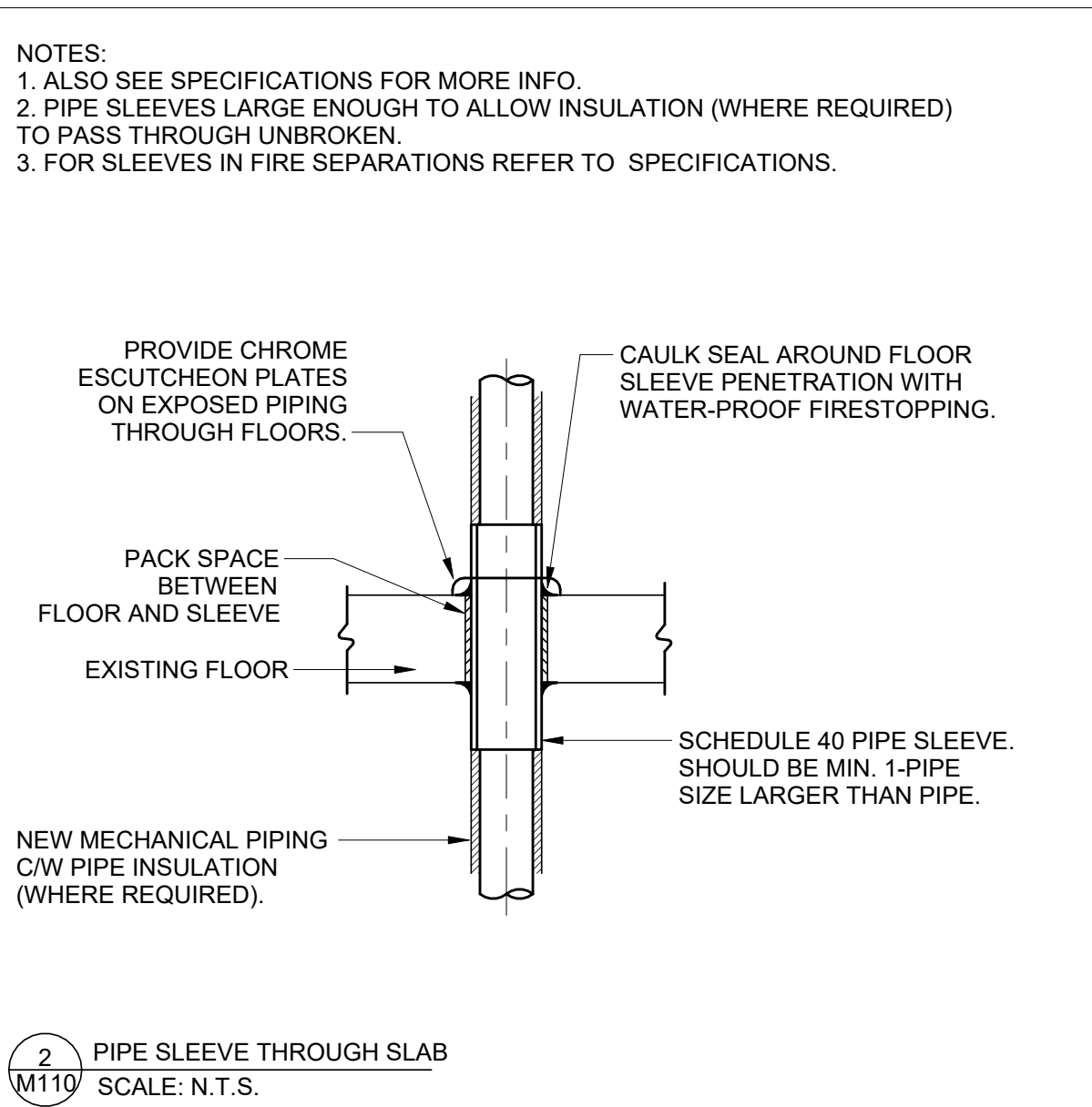
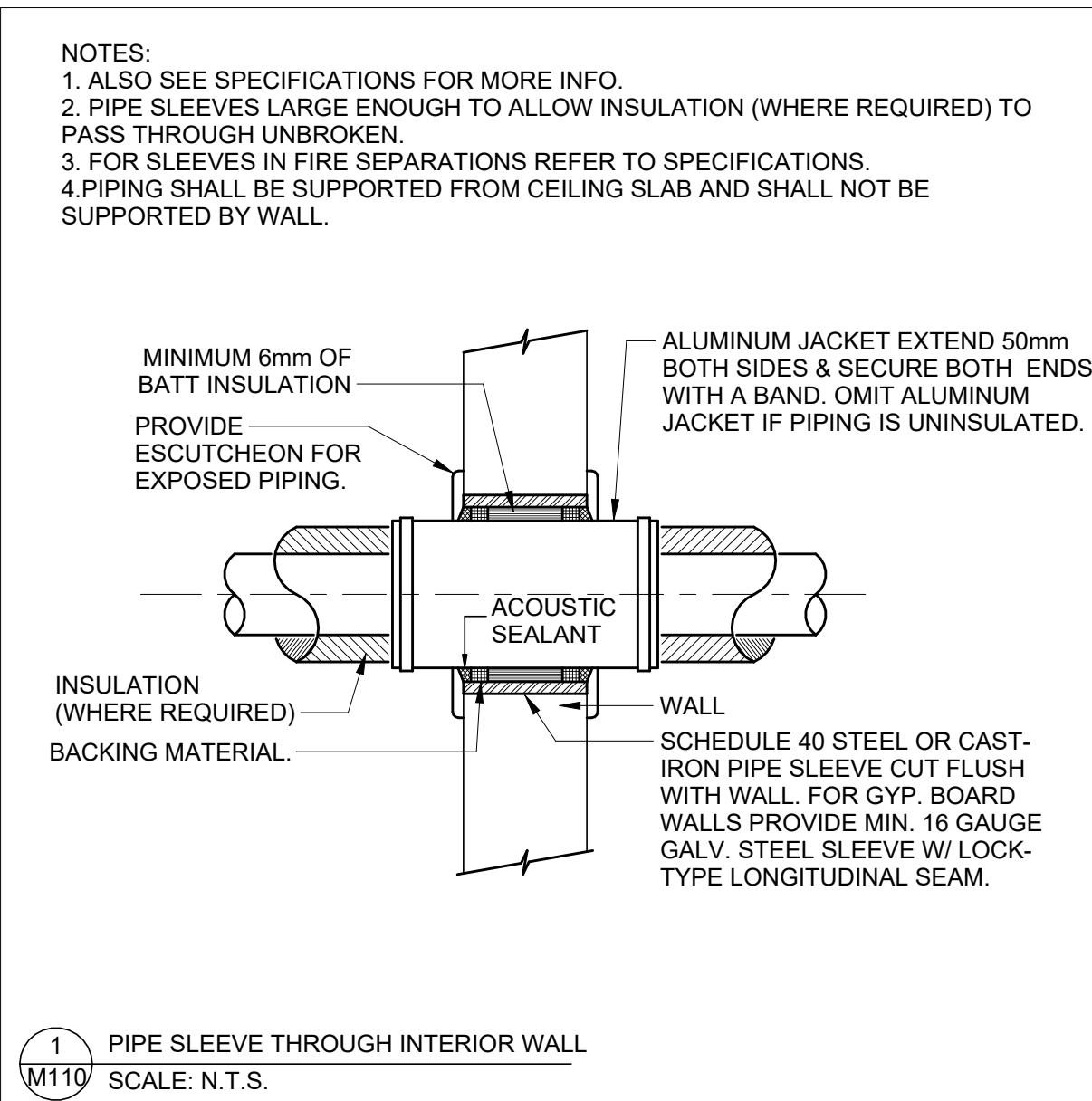
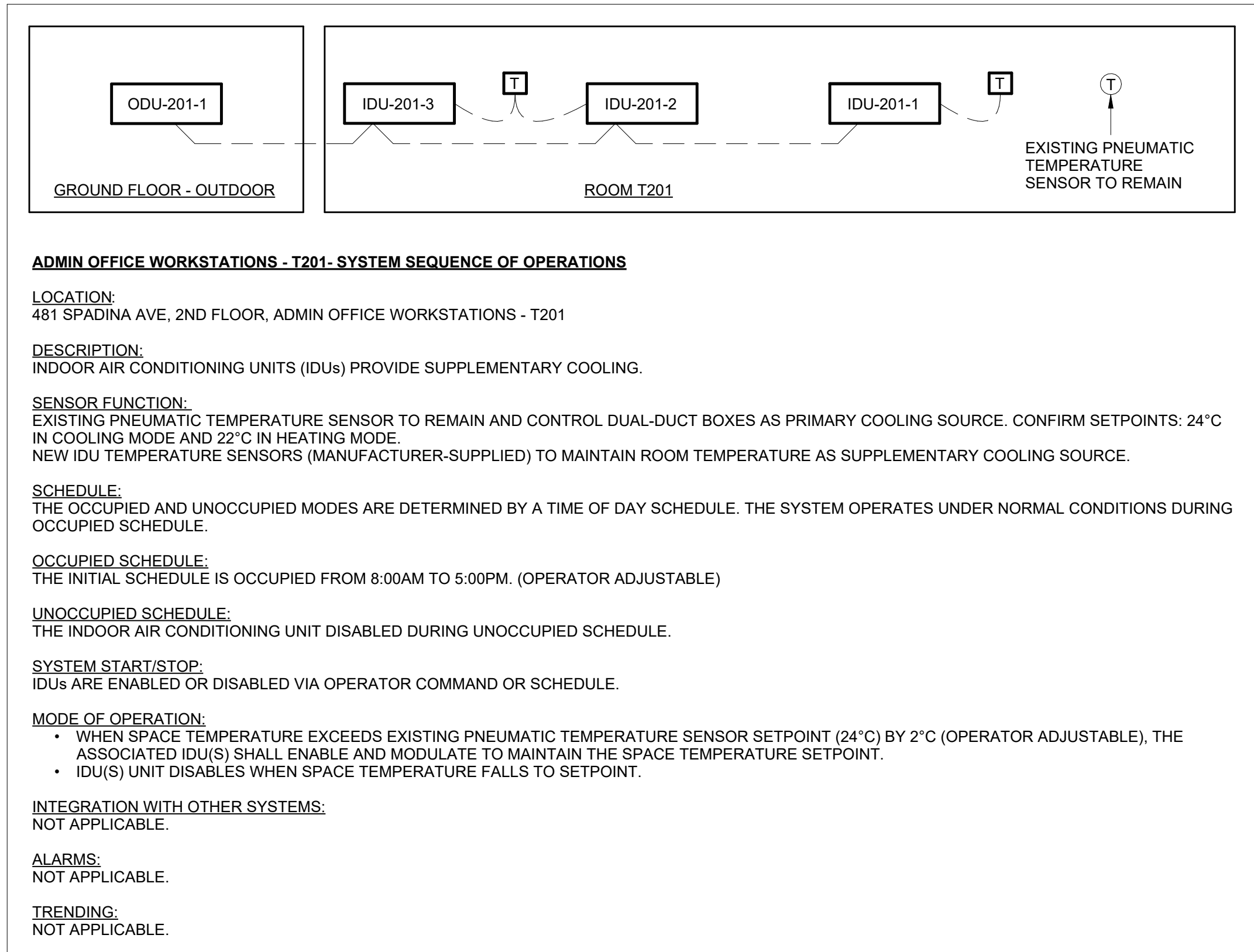
PLUMBING FIXTURE SCHEDULE	
TAG	SPECIFICATION
SK-1	BARRIER-FREE COMMERCIAL SINKS FRANKIE COMMERCIAL ALBS4006P-1 SINK - SINGLE COMPARTMENT SINK, CUSTOM HOLE DRILLINGS, COMMERCIAL SINKS, WITH OVERALL DIMENSION, 562 MM (22-1/8") LONG, 478 MM (18-13/16") WIDE, 152 MM (6") HIGH, CONSTRUCTED FROM 18 GAUGE TYPE 304 STAINLESS STEEL, POLISHED TO #4 SATIN FINISH, FACTORY INSTALLED EZ TORQUE™ FASTENERS, FACTORY APPLIED RIM SEAL, CENTER BACK WASTE LOCATION, 38 MM (1-1/2") (DN38) BRASS TAILPIECE, 89 MM (3-1/2") CRUMB CUP STRAINER, WASTE FITTING INCLUDED, UNDERCOATED TO REDUCE CONDENSATION AND RESONANCE, COMPLIANCES AND CERTIFICATIONS: ANSI A117.1 COMPLIANT, ASME A112.18.3 COMPLIANT, CSA B65.4 COMPLIANT, CHICAGO FAUCETS 895-317G2FCAB FAUCET - COUNTER MOUNTED, MANUAL, TWO HANDLES, SINK FAUCET, POLISHED CHROME FINISH, 102 MM (4") CENTERSET, LEAD FREE ANSINSPF 61 COMPLIANT ECAST88 BRASS CONSTRUCTION, 1/4 TURN COMPRESSION CARTRIDGE, 5/7 LPM (1.5 GPM) MAXIMUM FLOWRATE, FLAN END OUTLET WITH LAMINAR FLOW CONTROL, INSERT IN SPOUT INLET, RIGID SWING GOOSENECK SPOUT, 133 MM (5-1/4") SPOUT REACH, 263 MM (11-1/8") HIGH, 102 MM (4") WRIST BLADE HANDLE WITH INDEXED BUTTONS, 13 MM (1/2") NPSM SUPPLY INLET FOR 10 MM (3/8") OR 13 MM (1/2") FLEXIBLE RISER, THERMOSTATIC MIXING VALVE, WATTS #FLM495
LAV-1	LAVATORY AMERICAN STANDARD 0475047 020 BASIN - DROP-IN LAVATORY, VITREOUS CHINA, WHITE FINISH, SINGLE HOLE CENTERSET, FRONT OVERFLOW, WITH FAUCET LEDGE, OVERALL DIMENSIONS: 518 MM (20-3/8") LONG, 441 MM (17-3/8") WIDE, 178 MM (7") HIGH, BOWL DIMENSIONS: 406 MM (16") LONG, 294 MM (11 7/16") WIDE, 143 MM (5-5/8") DEEP, DELTA FAUCET MODEL 590TPA1190 DECKMOUNT HI-RISE SPOUT WITH INTEGRAL SENSOR H2OPTICS® TECHNOLOGY, BATTERY OPERATED, SURFACE MOUNT CONTROL BOX, VANDAL RESISTANT 0.35 GPM (1.32 L/MIN) NON-AERATING SPRAY OUTLET, COMPLIES WITH ASME A112.18.1 CSA B125.1 THERMOSTATIC MIXING VALVE, WATTS #FLM495
NOTES: 1. PROVIDE SHOP DRAWINGS FOR ENGINEER REVIEW AND APPROVAL PRIOR TO ORDERING. 2. PROVIDE WATER SUPPLIES TO ALL FIXTURES COMPLETE WITH METAL ANGLE STOPS, ADAPTERS, ESCUTCHEONS, FLEXIBLE METAL RISERS, AND REQUIRED VALVES, TRAPS, AND FAUCETS. PROVIDE CAST BRASS P-TRAP WITH CLEANOUT, UNION, AND ESCUTCHEON. 3. ALL PLUMBING FIXTURES SHALL BE LOW-WATER-CONSUMPTION TYPE IN ACCORDANCE WITH OBC.	

INDOOR HEAT PUMP UNIT											
TAG	LOCATION	MAKE	MODEL	SENSIBLE COOLING CAPACITY (kW)	TOTAL COOLING CAPACITY (kW)	HEATING CAPACITY (kW)	MCA (A)	MOP (A)	VOLTAGE/PH/Hz	DIMENSIONS (WxHxD) (mm)	WEIGHT (KG)
IDU-201-1	T201	DAIKIN	FXAA24AAVJU	4.3	6.0	7.7	0.6	15.0	208-230/1/60	1120 × 295 × 249	20.1
IDU-201-2	T201	DAIKIN	FXAA12AAVJU	2.2	3.0	3.9	0.4	15.0	208-230/1/60	859 × 295 × 249	12.3
IDU-201-3	T201	DAIKIN	FXAA12AAVJU	2.2	3.0	3.9	0.4	15.0	208-230/1/60	859 × 295 × 249	12.3
NOTES: 1. PROVIDE DRAIN PUMP KIT MODEL DACA-CP-1 (115W, 100 - 250VAC). 2. PROVIDE NAVIGATION REMOTE CONTROLLER MODEL BRC-19N1V1 AND THERMOSTAT GUARD. REFER TO DRAWINGS FOR QUANTITIES AND LOCATIONS. 3. PROVIDE SHOP DRAWINGS FOR ENGINEER REVIEW AND APPROVAL PRIOR TO ORDERING.											

CONDENSING UNIT										
TAG	LOCATION	MAKE	MODEL	TOTAL COOLING CAPACITY (kW)	HEATING CAPACITY @ -4°F (kW)	MCA (A)	MOP (A)	VOLTAGE/PH/Hz	DIMENSIONS (WxHxD) (mm)	WEIGHT (KG)
ODU-201-1	GROUND FLOOR - OUTSIDE	DAIKIN	RXT48AAVJU	12.4	7.3	29.4	30.0	208-230/1/60	1,100 × 871 × 460	100.2
NOTES: 1. REFRIGERANT TYPE R-32, ESTIMATED TOTAL CHARGE 4.4 KG. 2. PROVIDE WALL MOUNTING SUPPORTS. REFER TO DESIGN NOTES FOR DETAILS. 3. PROVIDE WIND BAFFLE AND DRAIN PAN HEATER (DOWN, 0.87A DRAW, 1.1 MCA, SINGLE PHASE). 4. PROVIDE SHOP DRAWINGS FOR ENGINEER REVIEW AND APPROVAL PRIOR TO ORDERING.										

WINDOW AIR CONDITIONING UNIT							
TAG	LOCATION	MAKE	MODEL	COOLING CAPACITY (W)	ELECTRIC CURRENT (A)	VOLTAGE/PH/Hz	WEIGHT (kg)
WAC-200-1	T290	FRIEDRICH	CCF10B10C	2931	9.5	115/1/60	337 × 473 × 441
WAC-200-2	T290	FRIEDRICH	CCF10B10C	2931	9.5	115/1/60	337 × 473 × 441
WAC-321-1	T321	FRIEDRICH	CCF10B10C	2931	9.5	115/1/60	337 × 473 × 441
WAC-421-1	T421	FRIEDRICH	CCF08B10C	1758	6.0	115/1/60	340 × 473 × 397
WAC-405-1	T405	FRIEDRICH	CCF10B10C	2931	9.5	115/1/60	337 × 473 × 441
WAC-405-2	T405	FRIEDRICH	CCF10B10C	2931	9.5	115/1/60	337 × 473 × 441
WAC-701-1	T701	FRIEDRICH	CCF08B10C	1758	6.0	115/1/60	340 × 473 × 397
NOTES: 1. REFRIGERANT TYPE R-32. 2. PROVIDE MOUNTING BRACKET AND WEATHER SEALING. REFER TO DESIGN NOTES AND ARCHITECTURAL DRAWINGS FOR DETAILS. 3. PROVIDE SHOP DRAWINGS FOR ENGINEER REVIEW AND APPROVAL PRIOR TO ORDERING.							

THERMAL INSULATION					
SERVICE	LOCATION	DIAMETER/SIZE	THICKNESS	VAPOUR BARRIER	COVERING
DOMESTIC COLD WATER, CONDENSATE DRAINAGE, SANITARY DRAINAGE	EXPOSED	<=32MM	15MM	YES	PVC JACKET
	CONCEALED	<=32MM	15MM	YES	WHITE KRAFT (ASJ)
	EXTERIOR/UNCONDITIONED	<=32MM	25MM	NO	NONE
DOMESTIC HOT WATER RECIRCULATION	EXPOSED	<=32MM	25MM	NO	PVC JACKET
	CONCEALED	<=32MM	25MM	NO	WHITE KRAFT (ASJ)
	EXTERIOR/UNCONDITIONED	<25MM	12MM	YES	REFER TO SPEC.
REFRIGERANT	EXPOSED	<25MM	12MM	YES	PVC JACKET
	CONCEALED	<25MM	12MM	YES	NONE
NOTES: 1. SEE MECHANICAL SPECIFICATIONS FOR ADDITIONAL INFORMATION ON THERMAL INSULATION. 2. INSULATION THICKNESS TO BE AS PER LATEST ASHRAE 90.1-2018 STANDARDS. 3. PROVIDE INSULATION INSIDE OR OVER SUPPORTS TO MAINTAIN INSULATION THICKNESS AS SPECIFIED ABOVE. 4. FOR SANITARY DRAINAGE SERVICE, PROVIDE INSULATION ONLY WHERE SHOWN ON DRAWINGS.					



4.	ISSUED FOR TENDER	2026-01-21
3.	ISSUED FOR F&S CD REVIEW	2026-01-16
2.	ISSUED FOR PERMIT	2026-01-14
1.	ISSUED FOR F&S CD REVIEW	2025-11-07
REV.	DESCRIPTION	DATE

KEY PLAN (NTS)	SEAL
----------------	------

DRAWN BY: AM	SCALE: As indicated
REVIEWED BY: AL	DATE CREATED: 2025-09-09
UNIVERSITY PROJECT NUMBER: NORTH POINT	

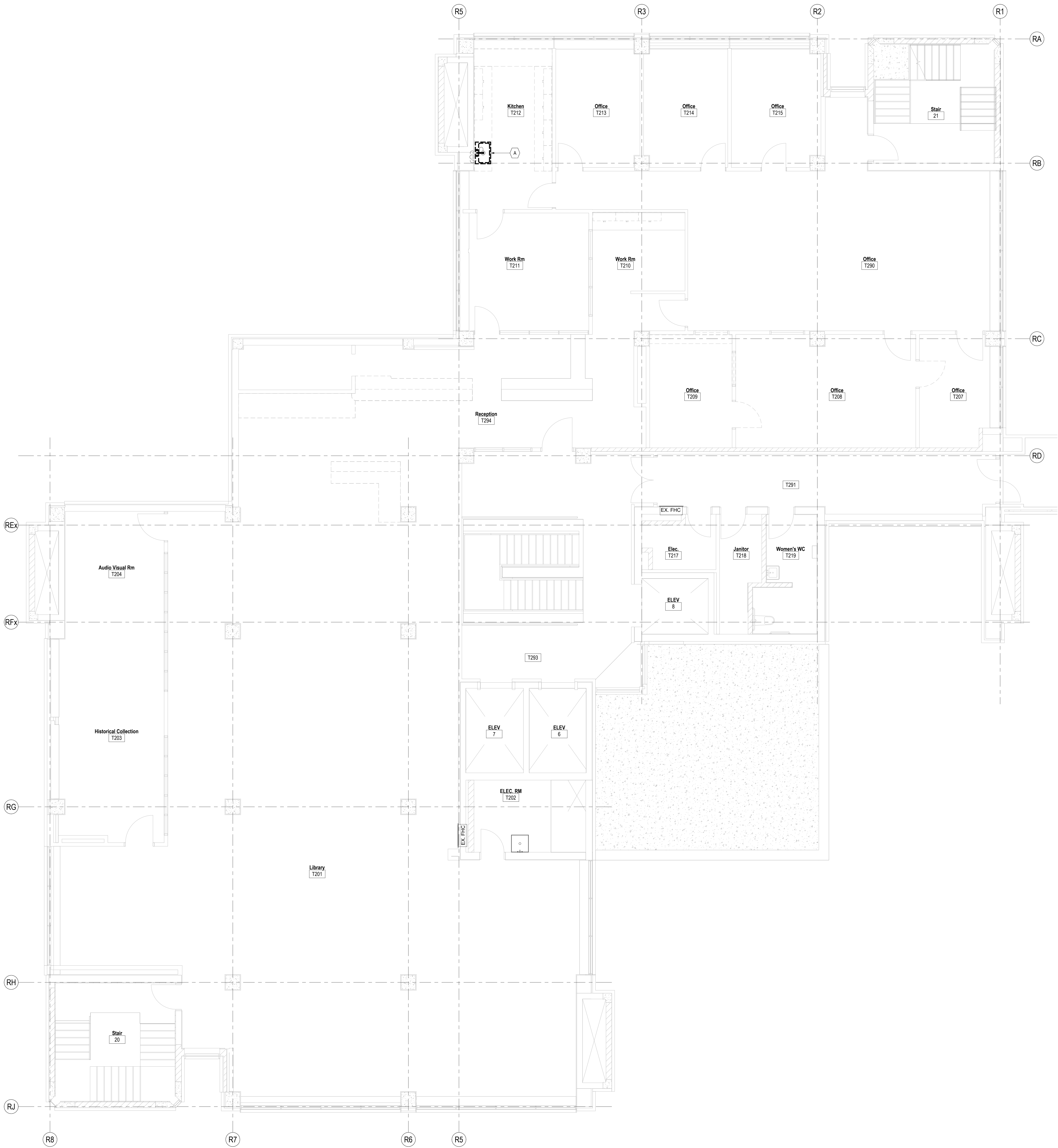
P164-25-078

DRAWING NUMBER	REV. NUMBER
----------------	-------------

M110

4

C:\Users\makkehse\Documents\P164-25-078_M_26_Ali_makkeh\HJMA.rvt2026-01-21 2:38:23 PM



MECHANICAL NOTES

A REMOVE EXISTING SINK COMPLETE WITH FAUCETS, DOMESTIC COLD AND HOT WATER PIPING BACK TO ISOLATION VALVES, AND DRAIN PIPING BACK TO WALL. CAP OFF ALL SERVICES.



University of Toronto
UNIVERSITY PLANNING,
DESIGN & CONSTRUCTION

Design & Engineering

255 McCaul Street, 4th Floor, Toronto, Ontario M5T 1W7

This drawing is the property of the University of Toronto, and must be returned upon completion of the work. All information shown on this drawing is for use on this specific project. Contractor must verify all dimensions on the job and report any discrepancies to the Architect before proceeding with the work.

4	ISSUED FOR TENDER	2026-01-21
3	ISSUED FOR F&S CD REVIEW	2026-01-16
2	ISSUED FOR PERMIT	2026-01-14
1	ISSUED FOR F&S CD REVIEW	2025-11-07
REV.	DESCRIPTION	DATE

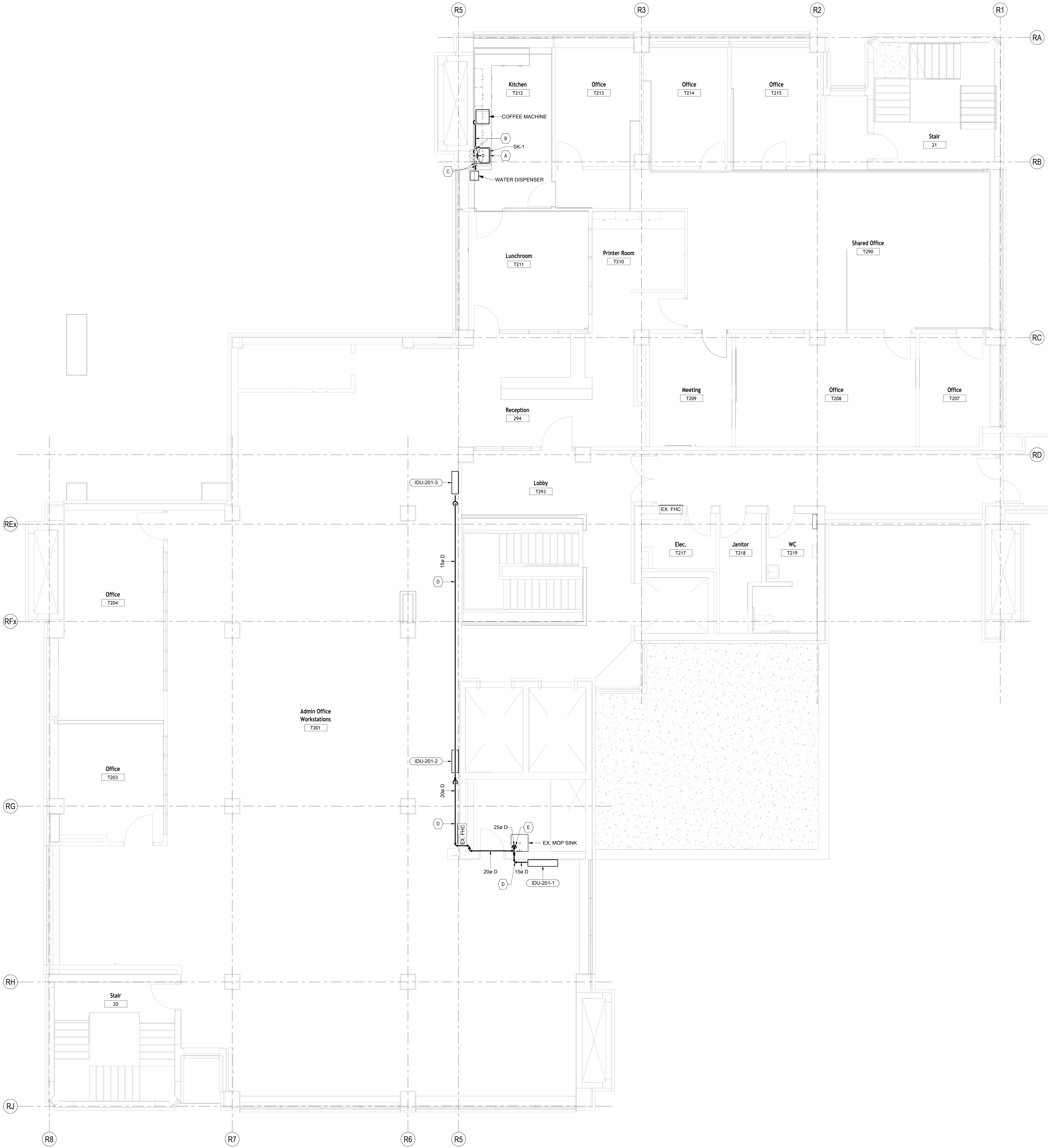
KEY PLAN (NTS)	SEAL
PROJECT TITLE: UNIVERSITY OF TORONTO Tower FOI Relocation	

481 Spadina Ave
DRAWING SHEET TITLE:
**SECOND FLOOR PLAN -
PLUMBING & DRAINAGE,
EXISTING AND REMOVAL**

DRAWN BY: AM	SCALE: 1 : 50
REVIEWED BY: AL	DATE CREATED: 2025-09-09
UNIVERSITY PROJECT NUMBER / NORTH POINT P164-25-078	

DRAWING NUMBER M220	REV. NUMBER 4
-------------------------------	-------------------------

C:\Users\makkehse\Documents\P164-25-078_M_26_Ali_makkeh\HJMA.rvt2026-01-21 2:38:24 PM



MECHANICAL NOTES

- A PROVIDE NEW SINK COMPLETE WITH FAUCET, FLEX HOSES THERMOSTATIC MIXING VALVE, P-TRAP, AND SANITARY DRAIN PIPING. REFER TO PLUMBING FIXTURE SCHEDULE FOR DETAILS.
- B PROVIDE NEW 10 mm COLD WATER LINE WITH ISOLATION VALVE FOR NEW COFFEE MACHINE AND CONNECT TO EXISTING 15 mm DCW BELOW SINK. INSTALLATION SHALL BE IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
- C PROVIDE NEW 10 mm COLD WATER LINE WITH ISOLATION VALVE FOR NEW WATER DISPENSER AND CONNECT TO EXISTING 15 mm DCW BELOW SINK. INSTALLATION SHALL BE IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
- D PROVIDE CONDENSATE DRAIN LINE COMPLETE WITH SUPPORTS BELOW T-BAR CEILING AND WHITE COLOR PVC JACKETING. INSTALL DRAIN LINE WITH CONTINUOUS SLOPE TOWARD DRAIN POINT. PROVIDE SLEEVE AT WALL PENETRATION PER SPECIFICATIONS.
- E PROVIDE CONDENSATE DRAIN PIPE RISER COMPLETE WITH SUPPORTS ALONG WALL AND TERMINATE INDIRECTLY AT EXISTING MOP SINK.



University of Toronto
UNIVERSITY PLANNING,
DESIGN & CONSTRUCTION

Design & Engineering

255 McCaul Street, 4th Floor, Toronto, Ontario M5T 1W7

This drawing is the property of the University of Toronto, and must be returned upon completion of the work. All information shown on this drawing is for use on this specific project. Contractor must verify all dimensions on the job and report any discrepancies to the Architect before proceeding with the work.

4	ISSUED FOR TENDER	2026-01-21
3	ISSUED FOR F&S CD REVIEW	2026-01-16
2	ISSUED FOR PERMIT	2026-01-14
1	ISSUED FOR F&S CD REVIEW	2025-11-07
REV.	DESCRIPTION	DATE

KEY PLAN (NTS)	SEAL
----------------	------

PROJECT TITLE:
UNIVERSITY OF TORONTO
Tower FOI Relocation

481 Spadina Ave
DRAWING SHEET TITLE:
**SECOND FLOOR PLAN -
PLUMBING & DRAINAGE
NEW WORK**

DRAWN BY: AM	SCALE: 1 : 50
REVIEWED BY: AL	DATE CREATED: 2025-09-09
UNIVERSITY PROJECT NUMBER/NORTH POINT	
P164-25-078	

DRAWING NUMBER	REV. NUMBER
M221	4

[illegible]

4	ISSUED FOR TENDER	2026-01-21
3	ISSUED FOR F&S CD REVIEW	2026-01-16
2	ISSUED FOR PERMIT	2026-01-14
1	ISSUED FOR F&S DO REVIEW	2025-11-07
REV.	DESCRIPTION	DATE

KEY PLAN (NTS)	SEAL
----------------	------

PROJECT TITLE:
UNIVERSITY OF TORONTO
Tower FOI Relocation

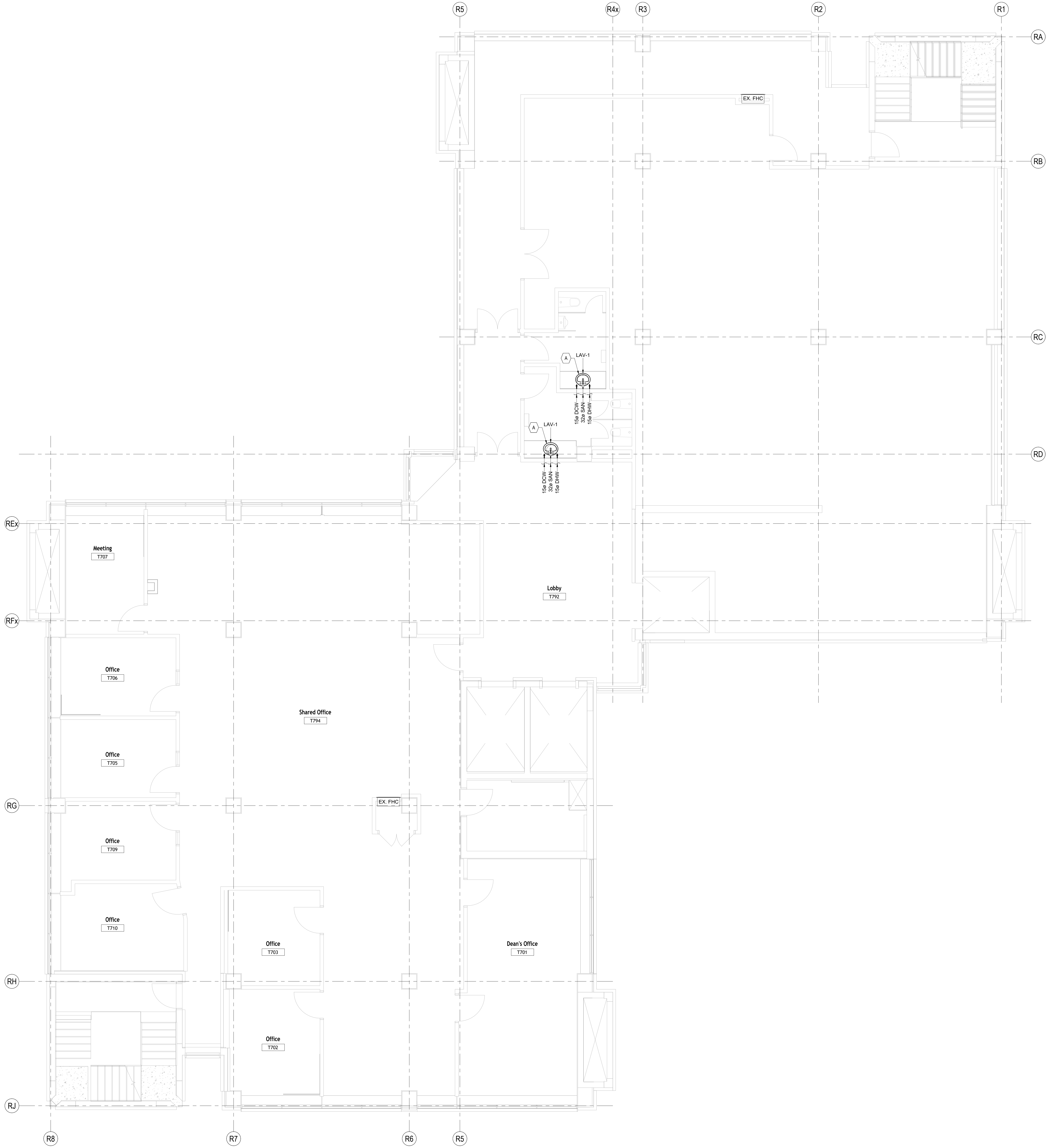
481 Spadina Ave
DRAWING SHEET TITLE
**SEVEN FLOOR PLAN -
PLUMBING & DRAINAGE,
EXISTING AND REMOVAL**

DRAWN BY: AM	SCALE: 1 : 50
REVIEWED BY: AL	DATE CREATED: 2025-09-09
UNIVERSITY PROJECT NUMBER	NORTH POINT

DRAWING NUMBER	REV. NUMBER
M270	4

C:\Users\makkehse\Documents\P164-25-078_M_26_Ali_makkeh\HJMA.rvt

2026-01-21 12:38:26 PM



MECHANICAL NOTES

A PROVIDE NEW SINK COMPLETE WITH FAUCET, FLEX HOSES, ISOLATION VALVES, THERMOSTATIC MIXING VALVE, P-TRAP, AND DOMESTIC COLD, HOT, AND SANITARY DRAIN PIPING. REFER TO SCHEDULE FOR DETAILS.



University of Toronto
UNIVERSITY PLANNING,
DESIGN & CONSTRUCTION

Design & Engineering
255 McCaul Street, 4th Floor, Toronto, Ontario M5T 1W7

This drawing is the property of the University of Toronto, and must be returned upon completion of the work. All information shown on this drawing is for use on this specific project. Contractor must verify all dimensions on the job and report any discrepancies to the Architect before proceeding with the work.

4	ISSUED FOR TENDER	2026-01-21
3	ISSUED FOR F&S CD REVIEW	2026-01-16
2	ISSUED FOR PERMIT	2026-01-14
1	ISSUED FOR F&S CD REVIEW	2025-11-07
REV.	DESCRIPTION	DATE

KEY PLAN (NTS)	SEAL
----------------	------

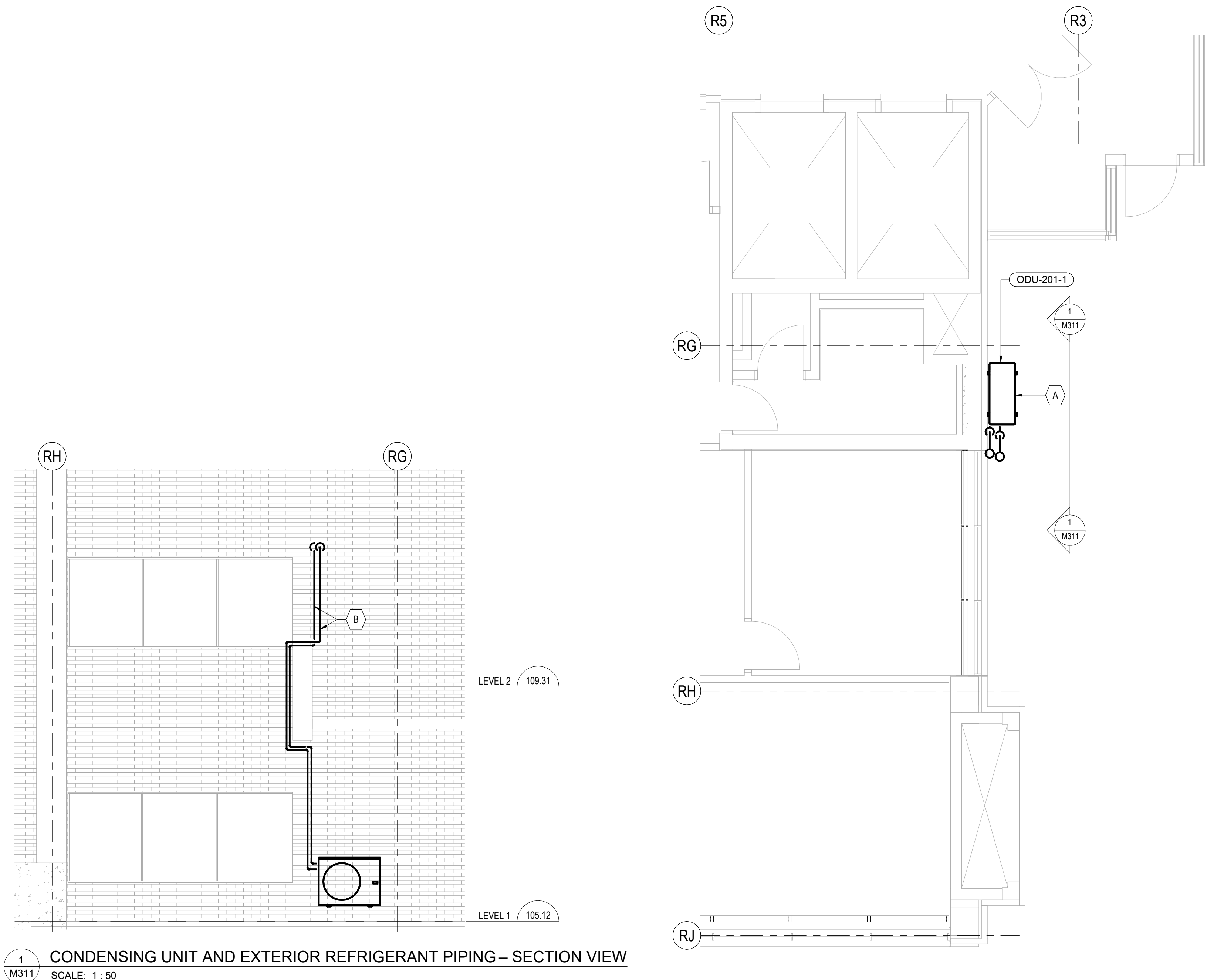
PROJECT TITLE:
UNIVERSITY OF TORONTO
Tower FOI Relocation

481 Spadina Ave
DRAWING SHEET TITLE:
**SEVEN FLOOR PLAN -
PLUMBING & DRAINAGE
NEW WORK**

DRAWN BY: AM	SCALE: 1 : 50
REVIEWED BY: AL	DATE CREATED: 2025-09-09
UNIVERSITY PROJECT NUMBER / NORTH POINT	
P164-25-078	

DRAWING NUMBER	REV. NUMBER
M271	4

2026-01-21 12:38:26 PM C:\Users\makkehse\Documents\P164-25-078_M_26_Ali_makkeh\HJMA.rvt



MECHANICAL NOTES

- A PROVIDE NEW CONDENSING UNIT COMPLETE WITH WALL MOUNTING SUPPORTS PER MANUFACTURER'S INSTRUCTIONS. REFER TO EQUIPMENT SCHEDULE FOR DETAILS. POWER CONNECTION BY ELECTRICAL CONTRACTOR.
- B PROVIDE REFRIGERANT PIPING COMPLETE WITH INSULATION AND SUPPORTS ON EXTERIOR WALL PER MANUFACTURER'S INSTRUCTIONS. PROVIDE SLEEVE AT WALL PENETRATION PER SPECIFICATIONS. REFER TO ARCHITECTURAL DRAWINGS FOR WEATHERPROOFING DETAILS.



University of Toronto
UNIVERSITY PLANNING,
DESIGN & CONSTRUCTION

Design & Engineering

255 McCaul Street, 4th Floor, Toronto, Ontario M5T 1W7

This drawing is the property of the University of Toronto, and must be returned upon completion of the work. All information shown on this drawing is for use on this specific project. Contractor must verify all dimensions on the job and report any discrepancies to the Architect before proceeding with the work.

4	ISSUED FOR TENDER	2026-01-21
3	ISSUED FOR P&S CD REVIEW	2026-01-16
2	ISSUED FOR PERMIT	2025-01-14
REV.	DESCRIPTION	DATE

KEY PLAN (NTS)	SEAL
----------------	------

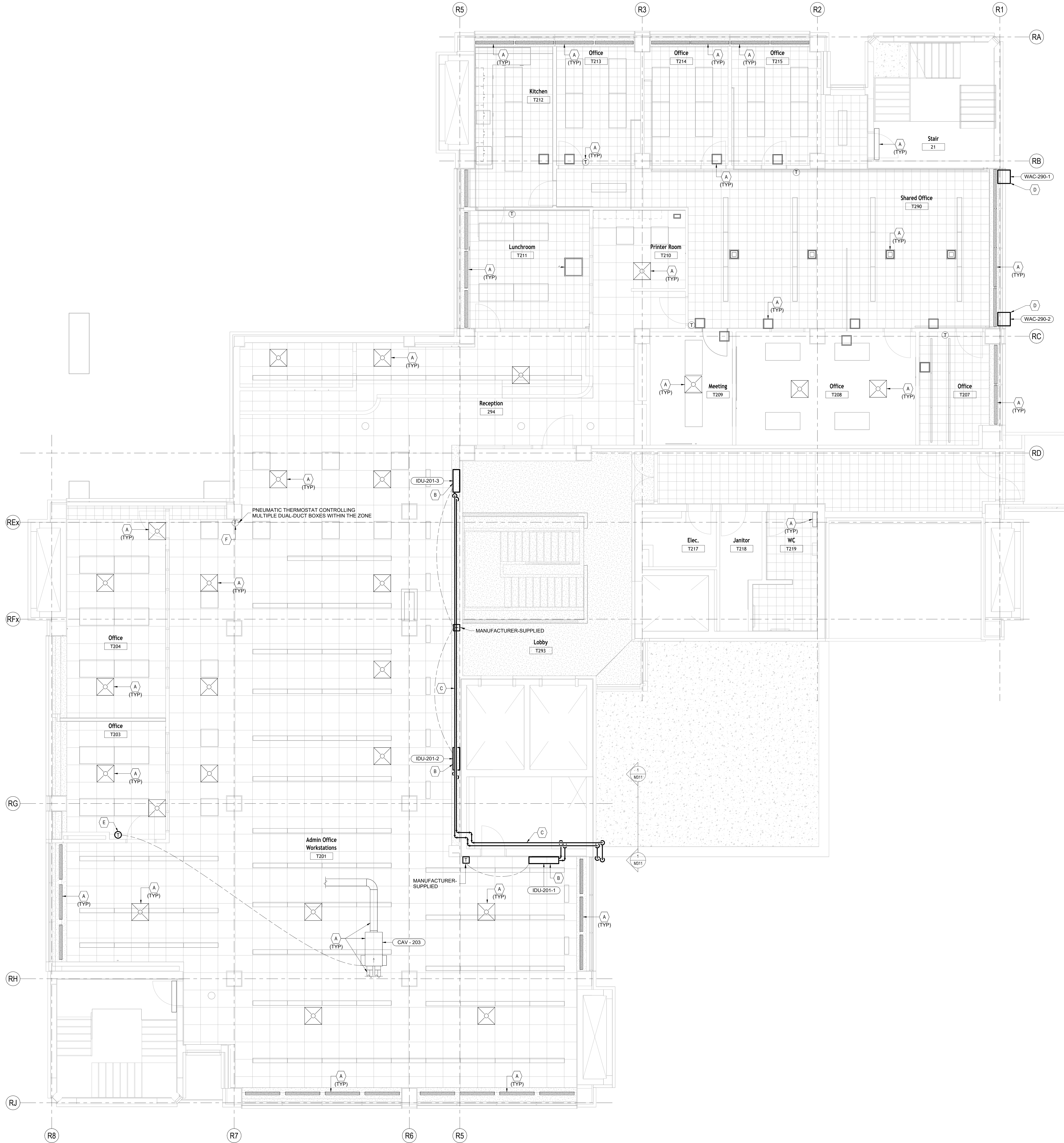
PROJECT TITLE:
UNIVERSITY OF TORONTO
Tower FOI Relocation

481 Spadina Ave
DRAWING SHEET TITLE:
**GROUND FLOOR PLAN -
HVAC NEW WORK**

DRAWN BY: BL	SCALE: 1 : 50
REVIEWED BY: AL	DATE CREATED: 2025-09-09
UNIVERSITY PROJECT NUMBER / NORTH POINT	
P164-25-078	

DRAWING NUMBER	REV. NUMBER
M311	4

C:\Users\makkehse\Documents\P164-25-078_M_26_Ali.makkeh\HJMA.rvt 2026-01-21 2:38:28 PM



MECHANICAL NOTES

- A. EXISTING HVAC SYSTEM, INCLUDING DIFFUSERS, GRILLES, DUCTWORK, AND CONTROLS, TO REMAIN.
- B. PROVIDE NEW WALL-MOUNTED INDOOR HEAT PUMP UNIT WITH TEMPERATURE SENSOR AND INTERCONNECTING CABLING TO OUTDOOR CONDENSING UNIT COMPLETE WITH CONDUIT (NOT SHOWN). HORIZONTAL RUNS SHALL BE ROUTED ABOVE T-BAR CEILING. REFER TO EQUIPMENT SCHEDULES FOR DETAILS. POWER CONNECTION BY ELECTRICAL CONTRACTOR.
- C. PROVIDE REFRIGERANT PIPING COMPLETE WITH INSULATION, SUPPORTS AND WHITE COLOR PVC JACKETING. INSTALL PIPING BELOW T-BAR CEILING. PROVIDE SLEEVES AT WALL PENETRATIONS. REFER TO ARCHITECTURAL DRAWINGS FOR DETAILS.
- D. PROVIDE WINDOW AIR CONDITIONING UNIT COMPLETE WITH REMOTE CONTROL, MOUNTING BRACKET, CONDENSATE TERMINATION, AND WEATHER SEALING. VERIFY WINDOW OPENING DIMENSIONS AND STRUCTURAL SUPPORT PRIOR TO INSTALLATION. SEAL ALL PERIMETER GAPS AIRTIGHT AND WEATHERPROOF. PROVIDE INFILL PANEL OR GLAZING AS REQUIRED. REFER TO ARCHITECTURAL DRAWINGS FOR DETAILS. MAINTAIN ACCESS FOR FILTER REMOVAL AND MAINTENANCE. POWER CONNECTION BY ELECTRICAL CONTRACTOR.
- E. PROVIDE NEW PNEUMATIC TEMPERATURE SENSOR TO CONTROL EXISTING CAV-203 (DUAL-DUCT MIXING BOX), COMPLETE WITH COMMISSIONING. DISCONNECT THE EXISTING PNEUMATIC SENSOR CONNECTION (LOCATION INDICATED ON DRAWING) TO CAV-203 AND REROUTE AIR CONTROL TUBING ABOVE THE T-BAR CEILING TO ACCOMMODATE THE NEW SENSOR LOCATION. SUPPLY THE SENSOR FROM THE EXISTING COMPRESSED AIR SYSTEM AT THE CEILING. INCLUDE MATERIAL EXTENSIONS AS REQUIRED IN TENDER PRICING.
- F. MAINTAIN EXISTING PNEUMATIC TEMPERATURE SENSOR AND ALL EXISTING CONNECTIONS, EXCEPT CAV-203, IN PLACE AND OPERATIONAL.



University of Toronto
UNIVERSITY PLANNING,
DESIGN & CONSTRUCTION

Design & Engineering

255 McCaul Street, 4th Floor, Toronto, Ontario M5T 1W7

This drawing is the property of the University of Toronto, and must be returned upon completion of the work. All information shown on this drawing is for use on this specific project. Contractor must verify all dimensions on the job and report any discrepancies to the Architect before proceeding with the work.

4	ISSUED FOR TENDER	2026-01-21
3	ISSUED FOR P&S CO REVIEW	2026-01-18
2	ISSUED FOR PERMIT	2026-01-14
REV.	DESCRIPTION	DATE

KEY PLAN (NTS)	SEAL
----------------	------

PROJECT TITLE
UNIVERSITY OF TORONTO
Tower FOI Relocation

481 Spadina Ave
DRAWING SHEET TITLE
**SECOND FLOOR PLAN -
HVAC NEW WORK**

DRAWN BY: BL SCALE: 1 : 50
REVIEWED BY: AL DATE CREATED: 2025-09-09
UNIVERSITY PROJECT NUMBER / NORTH POINT
P164-25-078

DRAWING NUMBER REV. NUMBER
M321 4

C:\Users\makkehse\Documents\P164-25-078_M_26_Ali_makkehVHUMA.rvt 2026-01-21 12:38:29 PM



MECHANICAL NOTES

- A. EXISTING HVAC SYSTEM, INCLUDING DIFFUSERS, GRILLES, DUCTWORK, AND CONTROLS, TO REMAIN.
B. PROVIDE WINDOW AIR CONDITIONING UNIT COMPLETE WITH REMOTE CONTROL, MOUNTING BRACKET, CONDENSATE TERMINATION, AND WEATHER SEALING. VERIFY WINDOW OPENING DIMENSIONS AND STRUCTURAL SUPPORT PRIOR TO INSTALLATION. SEAL ALL PERIMETER GAPS AIRTIGHT AND WEATHERPROOF. PROVIDE INFL. PANEL OR GLAZING AS REQUIRED. REFER TO ARCHITECTURAL DRAWINGS FOR DETAILS. MAINTAIN ACCESS FOR FILTER REMOVAL AND MAINTENANCE. POWER CONNECTION BY ELECTRICAL CONTRACTOR.



University of Toronto
UNIVERSITY PLANNING,
DESIGN & CONSTRUCTION

Design & Engineering

255 McCaul Street, 4th Floor, Toronto, Ontario M5T 1W7

This drawing is the property of the University of Toronto, and must be returned upon completion of the work. All information shown on this drawing is for use on this specific project. Contractor must verify all dimensions on the job and report any discrepancies to the Architect before proceeding with the work.

4	ISSUED FOR TENDER	2026-01-21
3	ISSUED FOR P&S CD REVIEW	2026-01-18
2	ISSUED FOR PERMIT	2026-01-14
REV.	DESCRIPTION	DATE

KEY PLAN (NTS)	SEAL
----------------	------

PROJECT TITLE:
UNIVERSITY OF TORONTO
Tower FOI Relocation

481 Spadina Ave
DRAWING SHEET TITLE:
**THIRD FLOOR PLAN -
HVAC NEW WORK**

DRAWN BY: BL	SCALE: 1 : 50
REVIEWED BY: AL	DATE CREATED: 2025-09-09
UNIVERSITY PROJECT NUMBER: NORTH POINT	
P164-25-078	

DRAWING NUMBER	REV. NUMBER
M331	4

C:\Users\makkehse\Documents\P164-25-078_M_26_Ali_makkeh\HJMA.rvt 2026-01-21 12:38:31 PM



MECHANICAL NOTES

- A. EXISTING HVAC SYSTEM, INCLUDING DIFFUSERS, GRILLES, DUCTWORK, AND CONTROLS, TO REMAIN.
B. SALVAGE EXISTING PNEUMATIC TEMPERATURE SENSOR AND REINSTALL AT LOCATION SHOWN ON M341. REMOVE CONTROL AIR TUBING BACK TO MAIN AIR SUPPLY AT THE CEILING AND CAP AIRTIGHT.



University of Toronto
UNIVERSITY PLANNING,
DESIGN & CONSTRUCTION

Design & Engineering

255 McCaul Street, 4th Floor, Toronto, Ontario M5T 1W7

This drawing is the property of the University of Toronto, and must be returned upon completion of the work. All information shown on this drawing is for use on this specific project. Contractor must verify all dimensions on the job and report any discrepancies to the Architect before proceeding with the work.

4	ISSUED FOR TENDER	2026-01-21
3	ISSUED FOR F&S CD REVIEW	2026-01-16
2	ISSUED FOR PERMIT	2026-01-14
1	ISSUED FOR F&S DO REVIEW	2025-11-07
REV.	DESCRIPTION	DATE

KEY PLAN (NTS)	SEAL
----------------	------

PROJECT TITLE:
UNIVERSITY OF TORONTO
Tower FOI Relocation

481 Spadina Ave
DRAWING SHEET TITLE:
**4TH FLOOR PLAN - HVAC
EXISTING AND REMOVAL**

DRAWN BY: BL	SCALE: 1 : 50
REVIEWED BY: AL	DATE CREATED: 2025-09-09
UNIVERSITY PROJECT NUMBER / NORTH POINT	

P164-25-078

DRAWING NUMBER	REV. NUMBER
M340	4

C:\Users\makkehse\Documents\P164-25-078_M_26_Ali_makkeh\HJMA.rvt 2026-01-21 12:38:32 PM



MECHANICAL NOTES

- A PROVIDE WINDOW AIR CONDITIONING UNIT COMPLETE WITH REMOTE CONTROL, MOUNTING BRACKET, CONDENSATE TERMINATION, AND WEATHER SEALING. VERIFY WINDOW OPENING DIMENSIONS AND STRUCTURAL SUPPORT PRIOR TO INSTALLATION. SEAL ALL PERIMETER GAPS AIRTIGHT AND WEATHERPROOF. PROVIDE INFILL PANEL OR GLAZING AS REQUIRED. REFER TO ARCHITECTURAL DRAWINGS FOR DETAILS. MAINTAIN ACCESS FOR FILTER REMOVAL AND MAINTENANCE. POWER CONNECTION BY ELECTRICAL CONTRACTOR.
- B REINSTALL AND COMMISSION EXISTING PNEUMATIC TEMPERATURE SENSOR AT THIS LOCATION TO CONTROL EXISTING DUAL-DUCT UNIT. SUPPLY SENSOR WITH COMPRESSED AIR FROM PREVIOUS AIR LINE CONNECTION BY PROVIDING EXTENDED AIR TUBING TO ACCOMMODATE NEW LOCATION. INSTALL HORIZONTAL AIR TUBING BELOW T-BAR CEILING AND CONCEAL IN SURFACE-MOUNTED WIREMOLD.



University of Toronto
UNIVERSITY PLANNING,
DESIGN & CONSTRUCTION

Design & Engineering

255 McCaul Street, 4th Floor, Toronto, Ontario M5T 1W7

This drawing is the property of the University of Toronto, and must be returned upon completion of the work. All information shown on this drawing is for use on this specific project. Contractor must verify all dimensions on the job and report any discrepancies to the Architect before proceeding with the work.

4	ISSUED FOR TENDER	2026-01-21
3	ISSUED FOR P&S CD REVIEW	2026-01-18
2	ISSUED FOR PERMIT	2026-01-14
REV.	DESCRIPTION	DATE

KEY PLAN (NTS)	SEAL
----------------	------

PROJECT TITLE:
UNIVERSITY OF TORONTO
Tower FOI Relocation

481 Spadina Ave
DRAWING SHEET TITLE:
**4TH FLOOR PLAN -
HVAC NEW WORK**

DRAWN BY: BL	SCALE: 1 : 50
REVIEWED BY: AL	DATE CREATED: 2025-09-09
UNIVERSITY PROJECT NUMBER / NORTH POINT	

P164-25-078

DRAWING NUMBER	REV. NUMBER
M341	4

C:\Users\makkehse\Documents\P164-25-078_M_26_Ali_makkeh\HJMA.rvt

2026-01-21 2:38:34 PM



MECHANICAL NOTES

- A. EXISTING HVAC SYSTEM, INCLUDING DIFFUSERS, GRILLES, DUCTWORK, AND CONTROLS, TO REMAIN.
B. SALVAGE EXISTING PNEUMATIC TEMPERATURE SENSOR AND REINSTALL AT LOCATION SHOWN ON M371. REMOVE CONTROL AIR TUBING BACK TO MAIN AIR SUPPLY AT THE CEILING AND CAP AIRTIGHT.



University of Toronto
UNIVERSITY PLANNING,
DESIGN & CONSTRUCTION

Design & Engineering

255 McCaul Street, 4th Floor, Toronto, Ontario M5T 1W7

This drawing is the property of the University of Toronto, and must be returned upon completion of the work. All information shown on this drawing is for use on this specific project. Contractor must verify all dimensions on the job and report any discrepancies to the Architect before proceeding with the work.

4	ISSUED FOR TENDER	2026-01-21
3	ISSUED FOR F&S CD REVIEW	2026-01-16
2	ISSUED FOR PERMIT	2026-01-14
1	ISSUED FOR F&S CD REVIEW	2025-11-07
REV.	DESCRIPTION	DATE

KEY PLAN (NTS)	SEAL
----------------	------

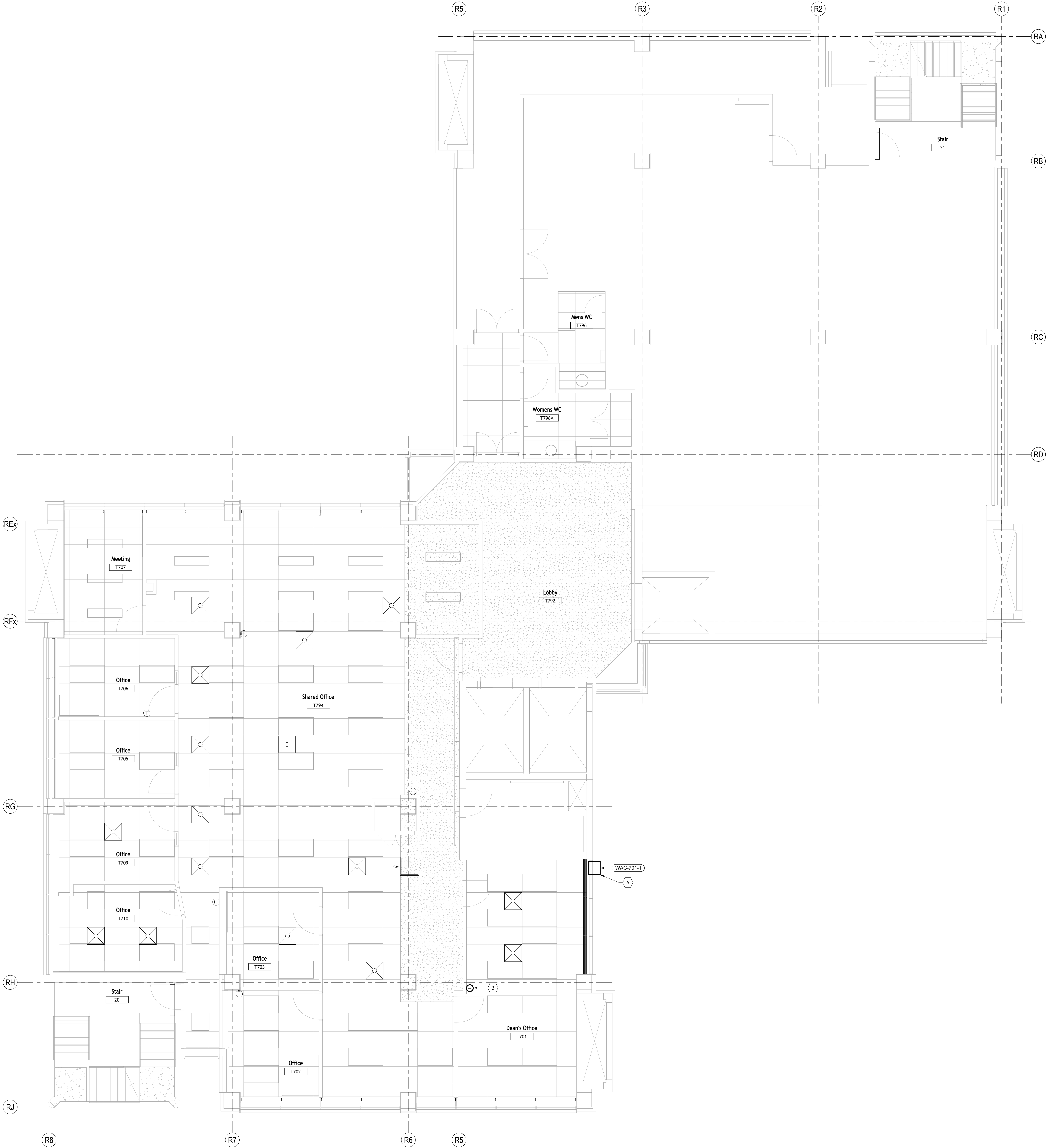
PROJECT TITLE:
UNIVERSITY OF TORONTO
Tower FOI Relocation

481 Spadina Ave
DRAWING SHEET TITLE:
**7TH FLOOR PLAN - HVAC
EXISTING AND REMOVAL**

DRAWN BY: BL	SCALE: 1 : 50
REVIEWED BY: AL	DATE CREATED: 2025-09-09
UNIVERSITY PROJECT NUMBER/NORTH POINT	
P164-25-078	

DRAWING NUMBER	REV. NUMBER
M370	4

C:\Users\makkehse\Documents\P164-25-078_M_26_Ali_makkeh\HJMA.rvt 2026-01-21 12:38:35 PM



MECHANICAL NOTES

- A PROVIDE WINDOW AIR CONDITIONING UNIT COMPLETE WITH REMOTE CONTROL, MOUNTING BRACKET, CONDENSATE TERMINATION, AND WEATHER SEALING. VERIFY WINDOW OPENING DIMENSIONS AND STRUCTURAL SUPPORT PRIOR TO INSTALLATION. SEAL ALL PERIMETER GAPS AIRTIGHT AND WEATHERPROOF. PROVIDE INFILL PANEL OR GLAZING AS REQUIRED. REFER TO ARCHITECTURAL DRAWINGS FOR DETAILS. MAINTAIN ACCESS FOR FILTER REMOVAL AND MAINTENANCE. POWER CONNECTION BY ELECTRICAL CONTRACTOR.
- B REINSTALL AND COMMISSION EXISTING PNEUMATIC TEMPERATURE SENSOR AT THIS LOCATION TO CONTROL EXISTING DUAL-DUCT UNIT. SUPPLY SENSOR WITH COMPRESSED AIR FROM PREVIOUS AIR LINE CONNECTION BY PROVIDING EXTENDED AIR TUBING ABOVE T-BAR CEILING TO ACCOMMODATE NEW LOCATION.



University of Toronto
UNIVERSITY PLANNING,
DESIGN & CONSTRUCTION

Design & Engineering

255 McCaul Street, 4th Floor, Toronto, Ontario M5T 1W7

This drawing is the property of the University of Toronto, and must be returned upon completion of the work. All information shown on this drawing is for use on this specific project. Contractor must verify all dimensions on the job and report any discrepancies to the Architect before proceeding with the work.

4	ISSUED FOR TENDER	2026-01-21
3	ISSUED FOR P&S CD REVIEW	2026-01-18
2	ISSUED FOR PERMIT	2025-01-14
REV.	DESCRIPTION	DATE

KEY PLAN (NTS)	SEAL
----------------	------

PROJECT TITLE:
UNIVERSITY OF TORONTO
Tower FOI Relocation

481 Spadina Ave
DRAWING SHEET TITLE:
**7TH FLOOR PLAN - HVAC
NEW WORK**

DRAWN BY: BL SCALE: 1 : 50
REVIEWED BY: AL DATE CREATED: 2025-09-09
UNIVERSITY PROJECT NUMBER / NORTH POINT
P164-25-078

DRAWING NUMBER REV. NUMBER
M371 4