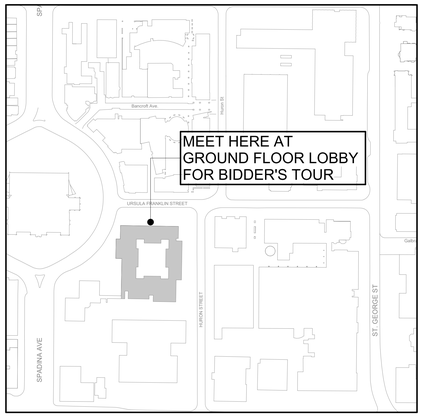


1 E101 CAMPUS MAP
SCALE: NTS

ELECTRICAL GENERAL NOTES

1. CONTRACTOR SHALL VISIT THE SITE TO VERIFY THE SCOPE OF WORK & EXISTING CONDITIONS. CONTRACTOR SHALL ALSO EXAMINE ALL EXISTING CONDITIONS WHICH AFFECT THE WORK, PRIOR TO SUBMITTING TENDER PRICE. NO EXTRAS WILL BE ALLOWED FOR FAILURE TO DO SO.
2. VERIFY FIELD MEASUREMENTS AND CIRCUITING ARRANGEMENTS ARE AS SHOWN ON DRAWINGS.
3. VERIFY THAT ABANDONED WIRING AND EQUIPMENT SERVE ONLY ABANDONED FACILITIES.
4. DEMOLITION DRAWINGS ARE BASED ON CASUAL FIELD OBSERVATION. REPORT DISCREPANCIES TO UNIVERSITY OF TORONTO BEFORE DISTURBING EXISTING INSTALLATION.
5. SCHEDULE & COORDINATE ALL WORK WITH U OF T STAFF AND OTHER TRADES ON SITE.
6. ANY INTERRUPTIONS TO POWER SUPPLY TO EXISTING LIGHTING OR DEVICES SHALL BE COORDINATED ON SITE. REFER TO ARCHITECTURAL & MECHANICAL DRAWINGS FOR FULL SCOPE OF WORK.
7. DISCONNECT ELECTRICAL SYSTEMS IN WALLS, FLOORS, AND CEILINGS SCHEDULED FOR REMOVAL.
8. THE CONTRACTOR TO ENSURE CONTINUITY OF SYSTEMS THROUGH RENOVATION SPACE
9. MODIFY/EXTEND/REPLACE EXISTING CONDUITS/WIRING/BACKBOXES AS REQUIRED FOR THE RELOCATED AND EXISTING TO REMAIN EQUIPMENT/DEVICES FOR FULLY OPERATIONAL SYSTEM.
10. PROVIDE BLANK STAINLESS STEEL COVER PLATES WHERE OUTLETS ARE REMOVED FROM EXISTING WALLS TO REMAIN.
11. REROUTE AS REQUIRED TO MAINTAIN CONTINUITY FOR ALL SYSTEMS TO REMAIN WHICH ARE AFFECTED BY THE DEMOLITION OR ALTERATION.
12. REMOVE ABANDONED WIRING TO SOURCE OF SUPPLY.
13. PROVIDE TEMPORARY WIRING AND CONNECTIONS TO MAINTAIN EXISTING SYSTEMS IN SERVICE DURING CONSTRUCTION. WHEN WORK MUST BE PERFORMED ON ENERGIZED EQUIPMENT OR CIRCUITS, USE PERSONNEL EXPERIENCED IN SUCH OPERATIONS.
14. EXISTING ELECTRICAL SERVICE: MAINTAIN EXISTING SYSTEM IN SERVICE UNTIL NEW SYSTEM IS COMPLETE AND READY FOR SERVICE. DISABLE SYSTEM ONLY TO MAKE SWITCHOVERS AND CONNECTIONS. FOLLOW UNIVERSITY OF TORONTO PROCEDURES FOR SCHEDULING SHUTDOWNS. MINIMIZE OUTAGE DURATION.
15. REMOVE EXPOSED ABANDONED CONDUIT, INCLUDING ABANDONED CONDUIT ABOVE ACCESSIBLE CEILING SPACE. CUT CONDUIT FLUSH WITH WALLS AND FLOORS, AND PATCH SURFACES AS REQUIRED.
16. DISCONNECT AND REMOVE ABANDONED PANELBOARDS AND DISTRIBUTION EQUIPMENT, WHERE INDICATED.
17. DISCONNECT AND REMOVE ELECTRICAL DEVICES AND EQUIPMENT SERVING UTILIZATION EQUIPMENT THAT HAS BEEN REMOVED.
18. DISCONNECT AND REMOVE ABANDONED LUMINAIRES. REMOVE BRACKETS, STEMS, HANGERS, AND OTHER ACCESSORIES. RECYCLE ALL ELEMENTS WHERE POSSIBLE. DISPOSE OFHAZARDOUS MATERIALS AT APPROPRIATE FACILITIES.
19. REPAIR ADJACENT CONSTRUCTION AND FINISHES DAMAGED DURING DEMOLITION AND EXTENSION WORK.
20. MAINTAIN ACCESS TO EXISTING ELECTRICAL INSTALLATIONS WHICH REMAIN ACTIVE. MODIFY INSTALLATION OR PROVIDE ACCESS PANEL AS APPROPRIATE.
21. EXTEND EXISTING INSTALLATIONS USING MATERIALS AND METHODS COMPATIBLE WITH EXISTING ELECTRICAL INSTALLATIONS, OR AS SPECIFIED.
22. CLEAN AND REPAIR EXISTING MATERIALS AND EQUIPMENT WHICH REMAIN OR ARE TO BE REUSED.
23. DISCONNECT & REMOVE EXISTING LIGHTING FIXTURES AND ASSOCIATED WIRING & CONDUIT BACK TO JUNCTION BOX/SOURCE AS INDICATED.
24. DISCONNECT & REMOVE EXISTING DATA & TELEPHONE OUTLETS AND ASSOCIATED CABLING BACK TO RESPECTIVE DATA RACK AND TELEPHONE BACKBOARD AS INDICATED.
25. DISCONNECT & REMOVE EXISTING POWER OUTLETS & DEVICES ALONG WITH ASSOCIATED OUTLETS, CONDUITS & WIRING BACK TO THE RESPECTIVE SOURCE OF ORIGIN AS REQUIRED.
26. DISCONNECT & REMOVE ALL ABANDONED CONDUITS, CABLES & LOOSE BX WIRING AS REQUIRED, WHETHER SHOWN ON THIS DRAWING OR NOT. RE-SUPPORT/ARRANGE EXISTING WIRING IN CEILING SPACE TO SATISFY ESA INSPECTION AS REQUIRED.
27. PROVIDE FIRESTOPPING AT ALL ELECTRICAL PENETRATIONS THROUGH FIRE SEPARATIONS AS REQUIRED TO MAINTAIN THE INTEGRITY OF THE FIRE SEPARATION. REFER TO ARCHITECTURAL DRAWINGS FOR FIRE SEPARATION LOCATIONS AND FIRE RESISTANCE RATING REQUIREMENTS.
27. ALL NEW ELECTRICAL INSTALLATIONS ARE TO BE SURFACE MOUNTED WITH WIREMOLD, UNLESS NOTED OTHERWISE.
29. CONTRACTOR SHALL PERFORM VOLTAGE DROP CALCULATIONS FOR ALL BRANCH CIRCUITS (LIGHTING AS WELL AS POWER) AND SHALL MAINTAIN VOLTAGE DROP WITHIN PERMISSIBLE LIMITS AS PER O.E.S.C. REQUIREMENTS AND PROVIDE PROPER WIRE SIZES, ACCORDINGLY, PRIOR TO COMMENCING OF ROUGH-IN INSTALLATION. THE VOLTAGE DROP CALCULATIONS SHALL BE BASED ON MAXIMUM CIRCUIT AMPACITY.
30. ALL RECEPTACLES SHALL BE IDENTIFIED USING PROFESSIONAL GRADE, HIGH GLOSS LABELS INDICATING CIRCUIT NUMBER & PANEL SOURCE.
31. PROVIDE UPDATED AND NEW 'TYPED' PANEL DIRECTORY CARD FOR EXISTING & NEW PANELS IN THE AREA OF WORK AS REQUIRED.

DIVISION OF RESPONSIBILITY - DEMOLITION

CATEGORY	DESCRIPTION	MECHANICAL	ELECTRICAL
WIRING, BACK-BOXES & CONDUITS	LINE VOLTAGE POWER WIRING AND ASSOCIATED BACK-BOXES & CONDUITS		•
	LINE & LOW VOLTAGE CONTROL WIRING AND ASSOCIATED BACK-BOXES & CONDUITS	•	
EQUIPMENT & DEVICES	DISCONNECT SWITCHES, VFD'S, STARTERS & LINE VOLTAGE CONTROL DEVICES		•
	LOW VOLTAGE CONTROL DEVICES	•	
	HEAT TRACING, SNOWMELT SYSTEMS, ELECTRIC COILS & PACKAGED ELECTRIC SPACE HEATING EQUIPMENT	•	
COMMUNICATIONS	BAS DATA CABLING, PATCH CABLING & ASSOCIATED CONDUITS FROM MECHANICAL EQUIPMENT CONTROLLER TO FACILITIES & SERVICES (F&S) NETWORK SWITCH	•	

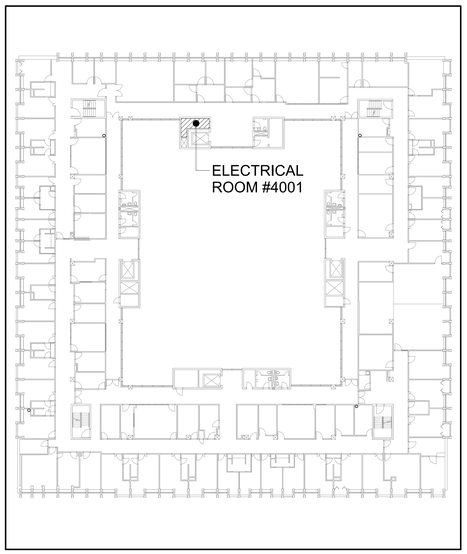
DIVISION OF RESPONSIBILITY - NEW WORK

CATEGORY	DESCRIPTION	MECHANICAL	ELECTRICAL
WIRING, BACK-BOXES & CONDUITS	LINE VOLTAGE POWER WIRING AND ASSOCIATED BACK-BOXES & CONDUITS		PROVIDE
	LINE & LOW VOLTAGE CONTROL WIRING AND ASSOCIATED BACK-BOXES & CONDUITS	PROVIDE	
	BACK-BOXES FOR STEP-DOWN TRANSFORMERS & RELAYS SERVING MECHANICAL EQUIPMENT		PROVIDE
EQUIPMENT & DEVICES	VFD'S, STARTERS, SPEED CONTROLLERS, & LINE VOLTAGE CONTROL DEVICES SERVING MECHANICAL EQUIPMENT	SUPPLY	INSTALL
	LOW VOLTAGE CONTROL DEVICES	PROVIDE	
	LOW VOLTAGE STEP-DOWN TRANSFORMERS & RELAYS SERVING MECHANICAL EQUIPMENT	SUPPLY	INSTALL
	HEAT TRACING, ELECTRIC COILS & PACKAGED ELECTRIC SPACE HEATING EQUIPMENT	PROVIDE	
	ELECTRIC SNOWMELT SYSTEMS		PROVIDE
COMMUNICATIONS	BAS DATA CABLING, PATCH CABLING & ASSOCIATED CONDUITS FROM MECHANICAL EQUIPMENT CONTROLLER TO FACILITIES & SERVICES (F&S) NETWORK SWITCH	PROVIDE	

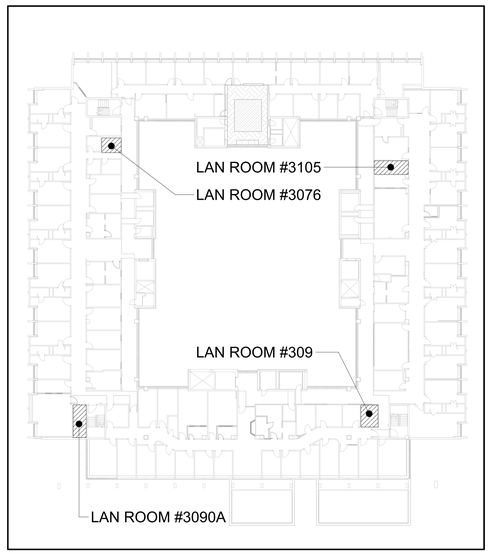
NOTES:
1. LOW VOLTAGE IS DEFINED AS BELOW 30 VOLTS.
2. ALL ELECTRICAL WORK INCLUDING CONTROLS WORK SHALL BE PERFORMED BY THE CONTRACTOR ON BEHALF OF THE OWNER THAT FALLS UNDER THE PROVISIONS OF ANY COLLECTIVE AGREEMENTS BY WHICH THE OWNER IS BOUND, OR WHICH THE OWNER IS CONTRACTUALLY REQUIRED TO APPLY TO THE PROJECT. SHALL IN EACH CASE BE PERFORMED BY EMPLOYEES COVERED BY THE APPLICABLE COLLECTIVE AGREEMENT. REFER TO SPECIFICATIONS SECTION 00 21 13 - INSTRUCTIONS TO BIDDERS, AND CCDC2 SUPPLEMENTARY CONDITIONS.

ELECTRICAL DRAWING LIST

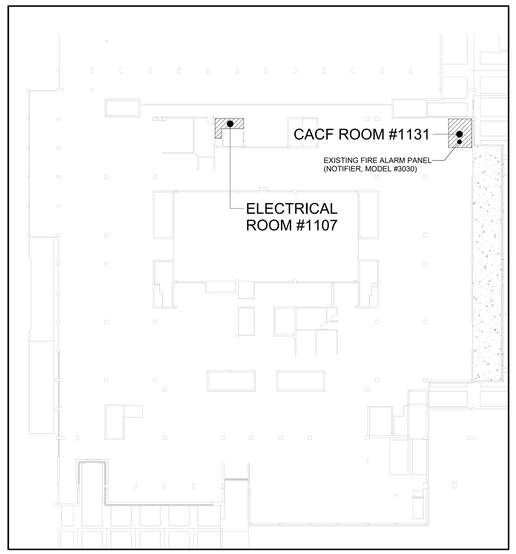
SHEET NUMBER	SHEET NAME
E101	ELECTRICAL LEGEND, DRAWING LIST, KEY PLANS & CAMPUS MAP
E102	ELECTRICAL & COMMUNICATIONS SPECIFICATION
E201	SECOND FLOOR PLAN - ELECTRICAL DEMOLITION LAYOUT
E202	THIRD FLOOR PLAN - ELECTRICAL DEMOLITION LAYOUT
E203	THIRD FLOOR PLAN - LIGHTING DEMOLITION LAYOUT
E301	SECOND FLOOR PLAN - NEW ELECTRICAL & LIGHTING LAYOUTS
E302	THIRD FLOOR PLAN - NEW ELECTRICAL LAYOUT
E303	THIRD FLOOR PLAN - NEW LIGHTING LAYOUT
E401	SINGLE LINE DIAGRAMS & PANEL SCHEDULES
E402	COMMUNICATION MAIN CONDUIT LAYOUT & ELECTRICAL DETAILS
E501	LIGHTING CONTROL DETAILS & LUMINAIRE SCHEDULE



4 E101 KEY PLAN - FOURTH FLOOR
SCALE: NTS



3 E101 KEY PLAN - THIRD FLOOR
SCALE: NTS



2 E101 KEY PLAN - FIRST FLOOR
SCALE: NTS

LEGEND OF SYMBOLS

SYMBOL	DESCRIPTION
	EXISTING LIGHTING FIXTURE TO BE REMOVED.
	EXISTING LIGHTING FIXTURE TO BE RELOCATED.
'A' / 'B' C	NEW LIGHTING FIXTURE. LETER DESIGNATES FIXTURE TYPE. REFER TO DRAWING #E301 FOR FIXTURE SCHEDULE.
E	LIGHTING FIXTURE WIRED ON EMERGENCY CIRCUIT.
	CEILING MOUNTED EXIT SIGN (GREEN PICTOGRAM TYPE). LUMACELL, LA SERIES, CAT. #LA-3-W-U OR APPROVED EQUAL.
	WALL MOUNTED EXIT SIGN (GREEN PICTOGRAM TYPE). LUMACELL, LA SERIES, CAT. #LA-3-W-U OR APPROVED EQUAL.
$	LIGHT SWITCH
$ DS	TOGGLE DISCONNECT SWITCH
$ OS	WALL MOUNTED DUAL -TECHNOLOGY OCCUPANCY SENSOR SWITCH
$ LV	LOW VOLTAGE LIGHT SWITCH
OS	CEILING MOUNTED OCCUPANCY SENSOR
DL	CEILING MOUNTED DAYLIGHT SENSOR
QSM	CEILING MOUNTED LIGHTING CONTROL WIRELESS RECEIVER
DIN	LIGHTING CONTROL POWER SUPPLY — RC: LIGHTING CONTROLLER / PANEL
	15A, 120V DUPLEX RECEPTACLE (5-15R)
	FLOOR MOUNTED 15A, 120V DUPLEX RECEPTACLE (5-15R)
	CEILING MOUNTED 15A, 120V DUPLEX RECEPTACLE (5-15R)
	15A, 120V SINGLE RECEPTACLE
	20A, 120V DUPLEX RECEPTACLE (5-20R)
L5-20R	20A, 120V SINGLE LOCKING RECEPTACLE
	15A, 120V QUAD RECEPTACLE (DOUBLE 15A DUPLEX RECEPTACLES)
	20A, 120V QUAD RECEPTACLE (DOUBLE 20A DUPLEX RECEPTACLES)
	1P/2P DIRECT CONNECTION
	3P DIRECT CONNECTION
	ELECTRICAL PANEL
JB JB PB PB	JUNCTION BOX / PULL BOX
	FIRE ALARM SMOKE DETECTOR
	FIRE ALARM HEAT DETECTOR
	WALL-MOUNTED FIRE ALARM STROBE
F	CEILING-MOUNTED FIRE ALARM SPEAKER
F	CEILING-MOUNTED FIRE ALARM SPEAKER STROBE
	FIRE ALARM PULL STATION
#	DATA OUTLET (# DENOTES DATA DROPS QUANTITY)
#	FLOOR MOUNTED DATA OUTLET (# DENOTES DATA DROPS QUANTITY)
#	CEILING MOUNTED DATA OUTLET (# DENOTES DATA DROPS QUANTITY)
	AUDIO/VIDEO OUTLET
	FLOOR MOUNTED AUDIO/VIDEO OUTLET
	TELEPHONE OUTLET
# WAP	WIRELESS ACCESS POINT (# DENOTES DATA DROPS QUANTITY)
ADO	AUTOMATIC DOOR OPERATOR
	DOOR ACTIVATION DEVICE
DL	DOOR LOCK DEVICE
AR	ASSISTANCE REQUESTED / REQUIRED DEVICE
EX	EXISTING TO REMAIN
R	EXISTING TO BE REMOVED
ER	EXISTING TO BE RELOCATED
RE	RELOCATED EXISTING DEVICES
OC	OVER COUNTER — UC: UNDER COUNTER
HL	HIGH LEVEL — CLG: CEILING MOUNTED
GFI	GROUND FAULT CIRCUIT INTERRUPTER (AS PER ESA)
AFF	ABOVE FINISHED FLOOR

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.

REV.	DESCRIPTION	DATE
	ISSUED FOR TENDER	2026-04-22
	ISSUED FOR 80% CD	2026-03-09
	ISSUED FOR PERMIT	2026-02-27
	ISSUED FOR CLASS A COSTING	2026-02-18
	ISSUED FOR 100% DD	2026-01-23
	ISSUED FOR CLASS B COSTING	2026-01-16
	ISSUED FOR 50% DD	2025-11-28
	ISSUED FOR 100% SCHEMATIC DESIGN	2025-09-19
	ISSUED FOR CLASS C COSTING	2025-09-05

KEY PLAN (NTS) | SEAL

PROJECT TITLE:
UNIVERSITY OF TORONTO
33 URSULA FRANKLIN MATH OFFICE RENOVATION

33 Ursula Franklin Street

DRAWING SHEET TITLE
ELECTRICAL LEGEND, DRAWING LIST, KEY PLANS & CAMPUS MAP

DRAWN BY: GDP | SCALE: As indicated
REVIEWED BY: JW | DATE CREATED: 2025-05-27
UNIVERSITY PROJECT NUMBER: P164-24-165 | NORTH POINT

DRAWING NUMBER: **E101** | REV. NUMBER

ELECTRICAL SPECIFICATION

A) GENERAL REQUIREMENTS

1. THE UNIVERSITY OF TORONTO GENERAL CONDITIONS OF THE CONTRACT, AND INSTRUCTIONS TO TENDERS FORM AN INTEGRAL PART OF THIS SPECIFICATION.
2. ALL ELECTRICAL CONSTRUCTION WORK MUST BE PERFORMED BY MEMBERS OF THE INTERNATIONAL BROTHERHOOD OF ELECTRICAL WORKERS, LOCAL 353.
3. THIS CONTRACTOR SHALL BE RESPONSIBLE FOR VISITING THE SITE AND EXAMINING ALL CONDITIONS AFFECTING THE ELECTRICAL INSTALLATION. NO CONSIDERATION WILL BE GIVEN TO CLAIMS FOR EXTRA COSTS ARISING FROM FAILURE TO VISIT SITE.
4. THE UNIVERSITY OF TORONTO HAS THE RIGHT TO RELOCATE OUTLETS UP TO TEN FEET, PRIOR TO INSTALLATION, WITHOUT EXTRA CHARGE.
5. THE WORD "PROVIDE" SHALL MEAN SUPPLY, INSTALL, CONNECT AND TEST.
6. PROVIDE ALL EQUIPMENT AND MATERIALS, LABOUR, TOOLS, SCAFFOLDING, TEMPORARY POWER AND ANY OTHER ITEMS NECESSARY FOR THE COMPLETE ELECTRICAL INSTALLATION.
7. THIS CONTRACTOR SHALL REMOVE ALL HIS DEBRIS (CARTONS, WIRING REELS, CONNECTORS, WIRING, ETC.) FROM ELECTRICAL ROOMS IN WHICH HE IS WORKING.
8. THIS CONTRACTOR SHALL CO-ORDINATE HIS WORK WITH ALL OTHER TRADES TO AVOID INTERFERENCE WITH OTHER SERVICES. ASSUME FULL RESPONSIBILITY FOR LAYOUT FOR ALL WORK AND FOR ANY DAMAGE CAUSED TO U OF T PROPERTY, OR THE WORK OF OTHER DIVISIONS BY IMPROPER LOCATION OR CARRYING OUT OF THIS WORK. ANY REPAIRS SHALL BE CARRIED OUT AT OWN EXPENSE OF ANY DAMAGE CAUSED BY THIS CONTRACTOR OR BY HIS SUBCONTRACTORS.
9. COORDINATE WITH GENERAL CONTRACTOR FOR DRILLING, CUTTING, PATCHING AND PAINTING REQUIRED FOR ALL ELECTRICAL WORK AND SHALL BE PROVIDED BY GENERAL CONTRACTOR. X-RAY THE FLOORS PRIOR TO ANY CORE DRILLING. USE COVERMETER TO LOCATE BOTTOM REINFORCING LOCALLY, AND IF NECESSARY, ADJUST LOCATION OF BOLTS TO AVOID DRILLING THROUGH BOTTOM REINFORCING. PAINT ALL EXPOSED CONDUITS AND SURFACE MOUNTED WIREWAY IN FINISHED AREAS TO MATCH ADJACENT SURFACES.
10. ALL ELECTRICAL POWER SUPPLY INTERRUPTIONS SHALL BE ARRANGED WITH THE U OF T CONSTRUCTION SUPERVISOR AT LEAST 15 WORKING DAYS IN ADVANCE AND SHALL BE CARRIED OUT ONLY OUTSIDE NORMAL WORKING HOURS.
11. REMOVAL OF EXISTING BREAKERS FROM THE EXISTING ELECTRICAL PANELS AND INSTALLATION OF NEW BREAKERS IN THE EXISTING ELECTRICAL PANELS SHALL BE CARRIED OUT ONLY OUTSIDE NORMAL WORKING HOURS WITH PROPER POWER SHUT DOWN PROCEDURES AND SHALL BE COORDINATED WITH U OF T UTILITIES DIVISION.
12. ALL ELECTRICAL EQUIPMENT DEEMED FOR DEMOLITION OR DECOMMISSIONING SHALL BE REMOVED BACK TO THE SOURCE OF SUPPLY. THIS INCLUDES ALL CONDUIT, WIRE, JUNCTION/PULL BOXES, ETC. IT IS UNACCEPTABLE TO 'ABANDON' AND MAKE SAFE, REGARDLESS OF SITE CONDITIONS.
13. KNOCKOUT(S) SHALL BE FILLED WHEN REMOVING CIRCUITS FROM ANY PANELBOARD OR SPLITTER.
14. CONTRACTORS WORKING ON LIVE EQUIPMENT OF 30 VOLTS OR MORE WITHOUT A POWER SHUTDOWN TO THE EQUIPMENT WILL BE LIABLE FOR INJURIES AND/OR DAMAGES FOR ANY POWER DISRUPTION THAT MAY BE CAUSED, EVEN IF PERMISSION IS GRANTED TO WORK ON LIVE EQUIPMENT.
15. FIRE ALARM ISOLATION SHALL BE ARRANGED WITH THE U OF T CONSTRUCTION SUPERVISOR AT LEAST 48 HOURS IN ADVANCE.
16. ALL ELECTRICAL WORK SHALL COMPLY WITH THE LATEST EDITION OF THE ONTARIO ELECTRICAL SAFETY CODE, ONTARIO BUILDING CODE AND APPLICABLE C.S.A. AND U.L.C STANDARDS. ONTARIO ELECTRICAL SAFETY AUTHORITY INSPECTION SHALL BE APPLIED AND PAID FOR BY THIS CONTRACTOR.
17. PROVIDE ONTARIO ELECTRICAL SAFETY AUTHORITY INSPECTION CERTIFICATE PRIOR TO FINAL ACCEPTANCE OF THE WORK.
18. ALL MATERIALS AND EQUIPMENT SHALL BE CSA OR ONTARIO ELECTRICAL SAFETY SPECIAL INSPECTION APPROVED AND BEAR EVIDENCE OF SAME.
19. THE DRAWINGS FOR ELECTRICAL WORK ARE DIAGRAMMATIC IN NATURE, INTENDED TO CONVEY THE SCOPE OF WORK. THE DRAWINGS DO NOT SHOW INTERIOR DESIGN, ARCHITECTURAL, MECHANICAL, STRUCTURAL OR BASE BUILDING DETAILS. BE RESPONSIBLE FOR A THOROUGH KNOWLEDGE OF SAME BEFORE PROCEEDING WITH WORK.
20. SUBMIT ONE (1) SETS OF SHOP DRAWINGS ELECTRONICALLY FOR NEW ELECTRICAL MATERIAL, DEVICES AND EQUIPMENT FOR THE REVIEW OF U OF T, PRIOR TO ORDERING.

B) INTERFERENCE DRAWINGS

1. CONTRACTOR MUST SUBMIT INTERFERENCE DRAWINGS PRIOR TO COMMENCING WITH THE INSTALLATION OF CONDUITS/CABLE TRAYS. THESE DRAWINGS MUST INDICATE THE CONDUITS/CABLE TRAYS ROUTING AND PULL BOX LOCATIONS WITH REFERENCE MEASUREMENTS FROM TWO WALLS OR PERMANENT FIXTURES.
2. INCLUDE CONSTRUCTION NOTES DESCRIBING ELEVATION CHANGES, WALL PENETRATIONS AND INFORMATION WITH REGARDS TO EXISTING FIXTURES THAT MAY BE AFFECTED BY THE INSTALLATION OF THE CONDUITS.

C) SHOP DRAWINGS:

1. BEFORE FABRICATION OF ANY MATERIALS OR EQUIPMENT, SUBMIT ONE (1) PDF COPY OF DETAILED MANUFACTURER'S SHOP DRAWINGS OF MATERIAL, EQUIPMENT AND DEVICES FOR REVIEW. DO NOT ORDER MATERIALS UNTIL REVIEW PROCESS IS COMPLETE. IF CORRECTIONS ARE REQUIRED, COPIES WILL BE RETURNED WITH CORRECTIONS NOTED. CORRECTED COPIES SHALL BE RESUBMITTED FOR REVIEW AND DISTRIBUTION. SUBMISSIONS SHALL BE MADE IN AMPLE TIME TO AVOID DELAYS IN THE WORK. THE REVIEW OF THE SHOP DRAWINGS SHALL BE, AND IS MUTUALLY UNDERSTOOD TO BE, IN REFERENCE TO GENERAL DESIGN ONLY. IF ERRORS IN THE DETAILED DIMENSIONS OR INTERFERENCE WITH THE WORKS ARE NOTICED, THE ATTENTION OF THE CONTRACTOR WILL BE CALLED TO SUCH ERRORS OR INTERFERENCE, BUT REVIEW OF THE DRAWINGS SHALL NOT IN ANY WAY RELIEVE THIS CONTRACTOR OF RESPONSIBILITY FOR ERRORS OR INTERFERENCE, OR FROM THE NECESSITY OF FURNISHING SUCH WORKS AND MATERIALS AS MAY BE REQUIRED FOR THE COMPLETION OF THE WORK AT ANY TIME UNTIL FORMAL ACCEPTANCE.
2. SUBMIT SAMPLE FOR ALL LIGHTING FIXTURES ALONG WITH LIGHTING SHOP DRAWINGS FOR THE ARCHITECT AND CLIENT'S APPROVAL, PRIOR TO PLACING MATERIAL ORDERING.
3. THE CONTRACTOR SHALL SUBMIT STAMPED DETAILED DRAWINGS INDICATING THE SUPPORTING SYSTEM THAT CARRYING ELECTRICAL DEVICES OR EQUIPMENT. THE DRAWINGS SHALL INCLUDE SPECIFICATIONS OF SUPPORTS, THREADED RODS, SCREWS, ANCHORS AND OTHER MATERIALS REQUIRED FOR SAFE INSTALLATION.

D) GROUNDING AND BONDING:

1. PROVIDE ALL GROUNDING TO CONFORM WITH THE REQUIREMENTS OF ONTARIO ELECTRICAL SAFETY CODE AND ALL OTHER AUTHORITIES HAVING JURISDICTION, REGARDLESS OF WHETHER OR NOT IT IS SHOWN ON THE DRAWINGS. A SEPARATE INSULATED GREEN GROUND WIRE SHALL BE INSTALLED IN EACH POWER CONDUIT OR RACEWAY, SIZED PER ONTARIO ELECTRICAL SAFETY CODE BUT NO LESS THAN #14 AWG.

E) WIRING AND FEEDERS

1. ALL ELECTRICAL POWER WIRING SHALL BE COPPER, MINIMUM SIZE NO. 12 AWG, TYPE RW90XLPE, 600V INSULATION. ALL ELECTRICAL WIRING SHALL BE STRANDED. POWER WIRING SHALL BE INSTALLED IN METALLIC CONDUIT, OR METALLIC RACEWAY, UNLESS NOTED OTHERWISE. ALL OUTDOOR WIRING SHALL HAVE COPPER CONDUCTORS WITH RWU-90, X-LINK, -40°F, 600V INSULATION. FOR ALL APPLICATIONS WHERE FLEXIBILITY IS REQUIRED, USE SEAL TIGHT FLEXIBLE METALLIC CONDUIT, UNLESS NOTED OTHERWISE. TERMINATION LUGS FOR FEEDER CABLES SHALL BE COMPRESSION TYPE. FINAL WIRING CONNECTIONS TO ALL ROTATING AND VIBRATING EQUIPMENT SHALL BE MADE USING LIQUISEAL FLEXIBLE METAL CONDUIT OR EQUAL.
2. PERFORM VOLTAGE DROP CALCULATIONS TO ENSURE COMPLIANCE WITH OESC REQUIREMENTS AND SIZE WIRING AND FEEDERS ACCORDINGLY. HOME RUNS TO LIGHTING AND RECEPTACLE PANELS WHICH EXCEED 25M (75'-0") SHALL BE MINIMUM NO. 10 AWG.
3. CABLES SHALL BE NEATLY INSTALLED, COORDINATED, AND ALIGNED WITH ADJACENT SURFACES. CABLES SHALL BE INDEPENDENTLY AND APPROPRIATELY SUPPORTED AND SHALL NOT REST ON CEILING TILES OR SUPPORTS.
4. ALL LV CABLES SHALL BE INSULATION RESISTANCE TESTED FOR 1 MINUTE AT 1000VDC, FOLLOWING INSTALLATION, BEFORE FINAL TERMINATIONS. EACH PHASE SHALL BE TESTED SEPARATELY. SUBMIT TESTING REPORT TO THE ENGINEER FOR REVIEW AND RECORD.
5. TERMINATION LUGS FOR FEEDER CABLES SHALL BE OF THE COMPRESSION TYPE. MECHANICAL LUGS ARE NOT ACCEPTABLE FOR FEEDERS.
6. NO SPLICES SHALL BE PERMITTED ON ANY LOW VOLTAGE FEEDERS.
7. FOR AREAS WITH DRYWALL PARTITIONS, TYPE AC90 ARMOURED CABLE SHALL ONLY BE USED FOR:
   a) FIXTURE DOWN DROPS ABOVE ACCESSIBLE DROP CEILINGS WITH A MAXIMUM DOWN DROP NOT GREATER THAN 6M (20 FEET) FROM THE CEILING JUNCTION BOX TO FIXTURE. FINISHED CABLE LENGTH SHALL BE THE SHORTEST DISTANCE PERMISSIBLE BETWEEN JUNCTION BOX AND FIXTURE.
   b) SINGLE AND MULTI-BRANCH CIRCUIT INSTALLATIONS WITHIN WALL SPACE, PROVIDED THE LENGTH OF ARMOURED CABLE DOES NOT EXCEED 3M; OR FOR OPEN OFFICE AREAS USING SYSTEM FURNITURE AND PARTITIONS WHERE UNDERFLOOR WIRING IS IMPRACTICAL.
8. ANY FEEDER(S) BEING REUSED OR RE-PURPOSED SHALL BE PROVEN WITH AN INSULATION RESISTANCE TEST WITH NETA MTS AS THE THRESHOLD FOR PASSING. ELECTRICAL CONTRACTOR TO PERFORM.
9. PERFORM INSULATION/MEGGER TEST FOR ALL NEW FEEDERS AND BRANCH WIRING AFTER HEY ARE BEING PULLED IN CONDUITS/RACEWAYS. SUBMIT DETAILED TESTING REPORT TO THE ENGINEER FOR REVIEW AND INCLUDE ALL ASSOCIATED COST IN TENDER, AS REQUIRED.
10. WIRING FOR FIRE ALARM INITIATING DEVICES SHALL BE COPPER, MINIMUM SIZE NO.14 AWG, OR SPECIAL CABLES REQUIRED AS PER FIRE ALARM SYSTEM MANUFACTURER RECOMMENDATIONS, INSTALLED IN EMT. WIRING FOR SIGNAL CIRCUITS SHALL BE #12 AWG MINIMUM INSTALLED IN EMT.

F) CONDUITS AND RACEWAYS:

1. MINIMUM CONDUIT SIZE 3/4" DIAMETER, EXCEPT BY SPECIAL PERMISSION AND/OR AS NOTED OTHERWISE.
2. CONDUITS FOR INDOOR INSTALLATIONS SHALL BE EMT WITH STEEL COMPRESSION TYPE FITTINGS UNLESS OF OTHERWISE INDICATED TO USE WIREMOLD SYSTEM.
3. ALL CONDUCTORS FOR PANELBOARDS, SWITCHGEAR, TRANSFORMER AND OTHER ELECTRICAL EQUIPMENT SHALL BE RAIN TIGHT AND SUITABLE FOR WET LOCATION.
4. CONDUITS FOR OUTDOOR INSTALLATIONS SHALL BE RIGID GALVANIZED STEEL WITH THREADED CONNECTORS.
5. THE UNDERGROUND CONDUITS SHALL BE PVC TYPE 2 COMPLETE WITH APPROVED FITTINGS.
6. MOTOR FEEDER DROPS SHALL BE IN A THREADED GALVANIZED RIGID CONDUIT. A MAXIMUM OF 1M (39") MAY BE OF ARMOURED FLEXIBLE LIQUID-TIGHT CONDUIT FOR FINAL CONNECTION TO MOTOR TERMINATION ENCLOSURE.
7. PROVIDE WIREMOLD SYSTEM FOR WALL MOUNTED POWER OUTLET AS INDICATED ON THE DRAWINGS FROM OUTLET TO RESPECTIVE PANEL.
8. WIREMOLD FOR POWER WIRING SHALL BE METALLIC, WHITE COLOR, COMPLETE WITH COVERS & ALL REQUIRED ACCESSORIES.
9. WIREMOLD ACCESSORIES MUST BE PROVIDED FROM THE SAME MANUFACTURER, INCLUDING BUT NOT LIMITED TO ELBOWS, TEES, TRANSITION DEVICES, OUTLETS & DEVICES BOXES. BASE BID MANUFACTURER IS LEGRAND. ALTERNATIVE MANUFACTURER IS HUBBELL OR APPROVED EQUAL.
10. EXPANSION FITTINGS SHALL BE INSTALLED IN CONDUITS CROSSING EXPANSION JOINTS.
11. FISH WIRES SHALL BE INSTALLED IN ALL EMPTY CONDUITS.
12. CONDUITS FOR COMPUTER SYSTEMS SHALL COMPLY WITH THE UNIVERSITY'S COMMUNICATIONS INFRASTRUCTURE SPECIFICATIONS, STANDARDS AND PRACTICES STANDARDS.
13. HORIZONTAL RUNS OF CONDUITS SHALL BE INSTALLED ABOVE SUSPENDED CEILINGS AND FASTENED TO THE BUILDING STRUCTURE. PROVIDE CONDUIT SUPPORTS AS REQUIRED BY THE LATEST EDITION OF THE ONTARIO ELECTRICAL SAFETY CODE. THE DOWN DROPS ON EXISTING WALLS SHALL BE INSTALLED WITH SURFACE MOUNTED WIREWAY SIZED TO SUIT THE APPLICATION, UNLESS NOTED OTHERWISE. THE CONDUITS SHALL BE CONCEALED IN NEW WALLS, UNLESS NOTED OTHERWISE.
14. ALL CONDUITS SHALL RUN PARALLEL TO BUILDING LINES.
15. AVOID RUNNING CONDUITS THROUGH OR DOWN "FEATURE WALLS". REFER TO ARCHITECTURAL DRAWINGS FOR "FEATURE WALLS" LOCATION.
16. ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR FIRE STOPPING AND SMOKE SEALS WITHIN ELECTRICAL ASSEMBLIES, WHERE THEY PENETRATE FIRE-RATED SEPARATIONS. COORDINATE WITH THE GENERAL TRADES ON SITE.
17. EXACT CONDUIT ROUTING TO BE DETERMINED ON SITE. COORDINATE WITH GENERAL TRADE.

G) DISCONNECTING MEANS:

1. FUSED DISCONNECT SWITCHES ARE NOT ACCEPTABLE TO BE USED ACROSS THE CAMPUS.
2. NON-FUSED DISCONNECT SWITCHES SHALL HAVE A MINIMUM NEMA-1 RATING, UNLESS OTHERWISE INDICATED IN ITEMS #3 & 4 BELOW:
3. NON-FUSED DISCONNECT SWITCHES INSTALLED WITHIN MECHANICAL SPACES SHALL BE NEMA-3R RATING.
4. NON-FUSED DISCONNECT SWITCHES FOR OUTDOOR APPLICATION SHALL HAVE A MINIMUM NEMA-3R RATING.

H) BOXES AND WIRING DEVICES

1. PROVIDE ALL WIRING DEVICES, COMPLETE WITH OUTLET BOXES AND STAINLESS STEEL COVER PLATES AS CALLED FOR ON THE DRAWINGS. WIRING DEVICES SHALL BE COMMERCIAL GRADE 'HUBBELL' OR APPROVED EQUAL.
2. ALL RECEPTACLES TO BE LABELLED WITH MACHINE GENERATED ADHESIVE LABELS TO INDICATE THE CORRESPONDING CIRCUIT NUMBERS.
4. RECEPTACLES ON EMERGENCY POWER SHALL BE COLOURED RED. ISOLATED GROUND RECEPTACLES SHALL BE COLOURED ORANGE.
5. LINE VOLTAGE LIGHTING SWITCHES SHALL BE WHITE DECORA STYLE MOUNTED AT 1100MM (43") FROM FLOOR TO THE CENTRE OF THE SWITCH.
6. OUTLET, JUNCTION AND PULL BOXES SHALL BE SIZED TO SUIT PARTICULAR DEVICE AND APPLICATION. IN NEW WALLS, OUTLET BOXES SHALL BE FLUSH-MOUNTED. USE 4 GANG BACK BOXES WITH BARRIER AT LOCATIONS WHERE POWER/DATA/TELEPHONE OUTLETS ARE RECESSED TOGETHER IN WALLS. ON EXISTING WALLS, OUTLET BOXES SHALL BE SURFACE MOUNTED BOXES, UNLESS NOTED OTHERWISE. OUTLET BOXES IN NEW WALLS AND PARTITIONS SHALL NOT BE MOUNTED BACK-TO-BACK.
7. PROVIDE A MINIMUM HORIZONTAL SEPARATION OF 6" BETWEEN OPPOSING BOXES. FLOOR MOUNTED OUTLET BOXES SHALL BE NEPCO SERIES 900, UNLESS NOTED OTHERWISE.
8. ELECTRICAL BOXES OCCURRING IN ACOUSTIC WALLS SHALL BE INSTALLED WITH PREFORMED NEOPRENE BOX SEALS.
9. REFER TO LIGHTING CONTROL DETAILS FOR SPECIFICATION OF LIGHTING CONTROLS DEVICES.

I) PANELBOARDS

1. PROVIDE PANELBOARDS AS CALLED FOR ON THE DRAWINGS. PANELBOARDS SHALL BE INDUSTRIAL QUALITY, COMPLETE WITH COPPER BUS & COPPER GROUND BAR, MAIN BREAKER, DESIGNED FOR USE WITH BOLT-ON, THERMALLY COMPENSATED, TRIP-FREE CIRCUIT BREAKERS; 2 POLE AND 3 POLE CIRCUIT BREAKERS SHALL HAVE COMMON TRIP HANDLES. TIE HANDLES ARE NOT ACCEPTABLE. PANELBOARDS SHALL BE RATED AT MINIMUM 10KA IC FOR 208V & 14KA IC FOR 600V.
2. PANELBOARD ENCLOSURE SHALL BE DEAD FRONT CONSTRUCTION WITH HINGED DOOR HAVING LATCH AND TWO KEY, AND FACTORY-FINISHED GREY ASA NO. 61, UNLESS OTHERWISE INDICATED.
3. PANELBOARDS ARE TO BE MOUNTED SO THAT THE TOP OF THE PANELS ARE LOCATED 2M (78 IN) ABOVE FINISHED FLOOR.
4. PANELBOARD DIRECTORIES SHALL BE TYPEWRITTEN USING THE TEMPLATES PROVIDED BY THE UNIVERSITY.
5. FILLER PLATES SHALL BE PROVIDED ON ALL BLANK BREAKER SPACES.
6. EMERGENCY PANELS SHALL HAVE GREEN COLOR FRONT COVER. SUBMIT COLOR SAMPLES & COLOR CODE FOR APPROVAL BEFORE ORDERING.
7. PANELBOARDS SHALL BE COMPLETED WITH 200% RATED NEUTRAL.
8. SURFACE-MOUNTED PANELBOARDS SHALL BE COMPLETE WITH DRIP SHIELD AND WEATHER PROOF CONNECTORS, AND FIRE RETARDANT PLYWOOD BACKBOARD.
9. BALANCE THE CONNECTED LOADS ACROSS THE PHASES ON THE PANEL, WITHIN 5%.
10. PROVIDE TWO 25MM (1") EMPTY CONDUITS FROM EACH FLUSH MOUNTED PANELBOARD TO THE CEILING SPACES ABOVE FOR FUTURE INSTALLATION OF WIRING. THE CONDUITS SHALL TERMINATE IN JUNCTION BOXES WITH FISH WIRES.
11. PANELBOARDS SHALL BE SINGLE-TUB MANUFACTURED BY SCHNEIDER ELECTRIC, SIEMENS OR EATON.
12. WHEREVER NEW BREAKERS/DISCONNECT SWITCHES ARE REQUIRED TO BE ADDED IN EXISTING SWITCHBOARDS/DISTRIBUTION PANELS/PANELS AS INDICATED ON THE DRAWINGS, ELECTRICAL CONTRACTOR SHALL MODIFY, RETROFIT AND RE-CONFIGURE EXISTING RESPECTIVE SWITCHBOARD/ DISTRIBUTION PANEL/PANEL IN ORDER TO ALLOW FOR THE INSTALLATION OF THE NEW REQUIRED/INDICATED BREAKERS/DISCONNECT SWITCHES WITHIN THE EXISTING ELECTRICAL PANEL. CONTRACTOR SHALL VERIFY ON SITE FOR THE SCOPE AND EXTENT OF WORK AND SHALL CO-ORDINATE WITH PANEL MANUFACTURER FOR MORE DETAILS AND THEN PROCEED ACCORDINGLY. CONTRACTOR SHALL PROVIDE ALL NECESSARY MATERIALS (INCLUDING BUT NOT LIMITED TO: CUSTOM MADE PARTS, BUS ASSEMBLY, BRACKETS HARDWARE ETC.). LABOR ETC. FOR FULLY OPERATIONAL SYSTEM. THE NEW BREAKERS/DISCONNECT SWITCHES TO BE ADDED SHALL BE FROM THE SAME MANUFACTURER AS EXISTING. KA RATING OF THE NEW BREAKERS/DISCONNECT SWITCHES SHALL MATCH EXISTING OR NEXT HIGHER AVAILABLE VALUE. INCLUDE ALL ASSOCIATED COST IN TENDER PRICE AS REQUIRED.

J) PANELBOARD SCHEDULES/DIRECTORIES

1. A PRINTED VERSION OF SCHEDULES SHALL BE INSTALLED INSIDE THE PANEL ON THE BACKSIDE OF THE DOOR.
2. CHANGES TO THE PANEL SCHEDULES (ESPECIALLY ON EXISTING PANELS) SHALL BE INDICATED ON A NEWLY PRINTED SCHEDULE FROM TEMPLATE WITH REVISION DATE FOR EACH CHANGE. HANDWRITTEN OR MARKED UP COPY OF EXISTING SCHEDULE IS NOT PERMITTED.
3. THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR ENTERING BOTH EXISTING AND NEW CIRCUIT TAGS/LOADS INTO THE TEMPLATE, WITH EXISTING IN RED AND NEW IN BLACK. LOADING INFORMATION ON EXISTING LOADS IS NOT REQUIRED.
4. ELECTRONIC FILE FOR SCHEDULES SHALL BE PROVIDED TO THE UNIVERSITY AS PART OF THE CLOSE-OUT DOCUMENTS.

K) SHORT CIRCUIT AND ARC FLASH STUDIES

1. ELECTRICAL CONTRACTOR SHALL SUBMIT SHORT CIRCUIT COORDINATION STUDY AND ARC FLASH CALCULATION REPORTS ALONG WITH POWER DISTRIBUTION SHOP DRAWINGS TO ENSURE CORRECT SELECTION OF 'kA' RATING OF NEW BREAKERS AND ALSO TO VERIFY NEW BREAKERS ARE COORDINATED WITH UPSTREAM BREAKERS. ARC FLASH LABELS SHALL BE PROVIDED TO ALL NEW EQUIPMENT AS PER ARC FLASH REPORT. INCLUDE ALL ASSOCIATED COSTS IN TENDER PRICE AS REQUIRED.
2. ALL ARC FLASH AND SHORT CIRCUIT STUDIES SHALL BE PERFORMED USING ETAP SOFTWARE (VERSION 24 OR HIGHER) AND UPDATED ELECTRICAL MODELS SHALL BE MADE AVAILABLE TO THE UNIVERSITY AT PROJECT CLOSEOUT. THE RETURNED ETAP FILE VERSION MUST MATCH THE ORIGINAL ETAP FILE PROVIDED.
3. ALL NEW ELECTRICAL DISTRIBUTION EQUIPMENT (INCLUDING BRANCH CIRCUIT PANELBOARDS) SHALL BE PROVIDED WITH ARC FLASH LABELS, BASED ON SHORT CIRCUIT, COORDINATION, AND ARC FLASH STUDY REPORT.
4. THE ARC FLASH LABELS SHALL DETAIL ARC AND SHOCK HAZARDS AS PER CSA-Z462. FINAL LABEL CONFIGURATION SHALL BE APPROVED BY THE UNIVERSITY BEFORE INSTALLATION.

L) FIRE ALARM SYSTEM INSTALLATION AND VERIFICATION

1. AFFECTED FIRE ALARM DEVICES SHALL BE DISCONNECTED AND REMOVED BY UNIVERSITY OF TORONTO'S FIRE ALARM TESTING & MAINTENANCE GROUP. THE ELECTRICAL CONTRACTOR SHALL RE-INSTALL RELOCATED FIRE ALARM DEVICES IN NEW LOCATIONS & PROVIDE NEW CONDUITS, JUNCTION BOXES & WIRING TO EXTEND EXISTING FIRE ALARM SYSTEM AS REQUIRED.
2. ALL EXISTING FIRE ALARM SYSTEM MODIFICATIONS AND NEW INSTALLATIONS SHALL BE INSTALLED IN ACCORDANCE WITH THE REQUIREMENTS OF THE ONTARIO BUILDING CODE, ONTARIO FIRE CODE AND CAN/ULC-S524. FIRE ALARM SYSTEM SHALL BE VERIFIED IN ACCORDANCE WITH CAN/ULC-S537. THE CONTRACTOR SHALL INCLUDE THE COST OF HIRING A THIRD PARTY FIRE ALARM SYSTEM SPECIALIST (CHUBB, JOHNSON CONTROLS OR SIEMENS) TO PERFORM VERIFICATION WORK AS REQUIRED. THE CONTRACTOR (THROUGH THE PROJECT MANAGER) SHALL COORDINATE & SCHEDULE THE THIRD PARTY VERIFICATION WITH THE UNIVERSITY OF TORONTO FIRE PREVENTION OFFICE (ON THE APPROPRIATE FORM) AT LEAST TWO WEEKS IN ADVANCE OF ITS COMMENCEMENT. FIRE ALARM SYSTEM VERIFICATION SHALL BE CARRIED OUT ONLY OUTSIDE NORMAL WORKING HOURS.
3. WHERE FIRE PROTECTION, LIFE SAFETY SYSTEMS, OR OTHER SYSTEMS WITH FIRE PROTECTION OR LIFE SAFETY FUNCTIONS (E.G. ELEVATORS, PRESSURIZATION FANS & EMERGENCY GENERATORS) ARE INTEGRATED AS PART OF THE PROJECT SCOPE, THE INTEGRATED SYSTEM AS A WHOLE MUST BE TESTED AND THE OPERATION OF THE VARIOUS COMPONENTS CONFIRMED, IN ACCORDANCE WITH THE CAN/ULC-S1001 STANDARD FOR INTEGRATED SYSTEMS TESTING OF FIRE PROTECTION AND LIFE SAFETY SYSTEMS.

M) LIGHTING AND LIGHTING CONTROLS

1. PROVIDE LIGHTING FIXTURES & LIGHTING CONTROL SYSTEM AS CALLED FOR ON THE DRAWINGS.
2. THE SUPPORTS REQUIRED FOR MOUNTING AND INSTALLATION OF LIGHTING FIXTURES SHALL BE SUPPLIED AND INSTALLED BY THIS CONTRACTOR. THE SUPPORTS SHALL BE ATTACHED TO THE STRUCTURE. THE DROP CEILING SYSTEM SHALL NOT BE USED AS A SUPPORTING MEANS.
3. ALL LIGHTING FIXTURES SHALL BE INDEPENDENTLY SUPPORTED FROM THE BUILDING STRUCTURE.
4. PERFORM FUNCTIONAL TESTING FOR ALL LIGHTING CONTROL DEVICES AND SYSTEMS AS SPECIFIED IN CONSTRUCTION DOCUMENTS, TO ENSURE COMPLIANCE WITH OBC AND ASHRAE 90.1 REQUIREMENTS.
5. ELECTRICAL CONTRACTOR SHALL ALLOW FOR **ADDITIONAL TWO (2) VISITS** OF A LIGHTING CONTROL SPECIALIST AFTER OCCUPANCY IN ORDER TO PERFORM ANY ADJUSTMENTS OR REPROGRAMMING TO LIGHTING CONTROL SYSTEMS TO FULFILL CLIENT/OCCUPANTS REQUESTS. INCLUDE ALL ASSOCIATED COST IN TENDER PRICE AS REQUIRED.

N) IDENTIFICATION OF ELECTRICAL EQUIPMENT

1. ALL ELECTRICAL EQUIPMENT SHALL HAVE PERMANENT IDENTIFICATION LAMICOID NAME PLATES IDENTIFYING SOURCE OF POWER SUPPLY AND CONNECTED LOAD. LIGHTING FIXTURES CONNECTED ON EMERGENCY POWER SHALL BE LABELED WITH RED DOT MARKING.
2. LAMACOID SHALL HAVE WHITE TEXT WITH HEIGHT AS INDICATED BELOW:

   SIZE A: 25MM
   SIZE B: 13MM
   SIZE C: 6MM

3. WHEN IDENTIFYING PIECES OF ELECTRICAL EQUIPMENT, EXCEPT FOR BREAKERS/SWITCHES, THE PRIMARY LAMACOID OF SIZE A SHALL INDICATE THE EQUIPMENT IDENTIFIER TAG.
4. THE SECONDARY LAMACOID OF SIZE C SHALL BE INSTALLED IMMEDIATELY BELOW THE PRIMARY AND INDICATE THE SOURCE OF SUPPLY IDENTIFIER TAG AND ROOM NUMBER.
5. LAMACOID BACKGROUND COLOUR SHALL BE BLACK EXCEPT IN THE FOLLOWING CASES:
   a. GREEN FOR EMERGENCY (BOTH LIFE, AND NON-LIFE SAFETY),
   b. BLUE FOR UPS.
6. LAMACOIDS OF SIZE B SHALL BE INSTALLED NEXT TO EACH NEW, REPLACED OR MODIFIED (SPARE) CIRCUIT BREAKER, DETAILING THE PANELBOARD OR EQUIPMENT IT IS FEEDING, INCLUDING ROOM NUMBER WHERE THE FEEDER TERMINATES.

O) COLOUR CODES FOR ELECTRICAL EQUIPMENT

1. ALL ELECTRICAL EQUIPMENT SHALL BE ANSI 61 GREY UNLESS OTHERWISE SPECIFIED.
2. EMERGENCY PANELBOARDS SHALL BE PANTONE 335 C (GREEN) AND UPS PANELBOARDS SHALL BE PANTONE 285 C (BLUE).
3. ALL JUNCTION BOX COVER PLATES ON VARIOUS SYSTEMS SHALL BE COLOUR-CODED ACCORDING TO BELOW:

   120/208V NORMAL LIGHTING AND POWER = WHITE
   120/208V EMERGENCY POWER = WHITE / RED
   120/208V UPS = WHITE / BLUE
   240/416V NORMAL LIGHTING AND POWER = PINK
   240/416V EMERGENCY POWER = PINK / RED
   240/416V UPS = PINK / BLUE
   347/600V NORMAL LIGHTING AND POWER = YELLOW
   347/600V EMERGENCY POWER = YELLOW / RED
   347/600V UPS = YELLOW / BLUE
   FIRE ALARM = RED
   TELEPHONE = ORANGE
   CABLE TV = PURPLE
   DATA = BROWN
   CONTROL HVAC = GREEN
   CONTROL L.V. LIGHTING = GREEN / BLACK
   SECURITY = GREY
   SURVEILLANCE, CCTV = GREY / BLACK
   PUBLIC ADDRESS = 'PA'
   AUDIO VISUAL = 'AV'
   PAGING = 'PG'
   INTERCOM = 'ICOM'

4. NOTE THAT, LIGHT COLOURS SHALL BE CHOSEN FOR GREEN, BLUE, BROWN, AND GREY.

P) AS BUILT AND CLOSEOUT DOCUMENTS:

1. THE CONTRACTOR SHALL MARK ALL CHANGES AND DEVIATIONS FROM CONSTRUCTION DRAWINGS IN RED PEN ON ONE (1) SET OF CLEAN PRINTS AND SUBMIT TO DESIGN ENGINEER (IN PDF FORMAT) UPON COMPLETION OF WORK.
2. THE CONTRACTOR SHALL PROVIDE ONE HARD COPY OF COMPLETE ELECTRICAL AS-BUILT DRAWINGS ON ANSI SIZE E PAPER, PLUS AN ELECTRONIC COPY OF AS-BUILT DRAWINGS IN CAD FORMAT (.DWG FILES) AS PART OF THE CLOSEOUT DOCUMENTS PACKAGE. AS-BUILT DRAWINGS SHALL INCORPORATE ALL RED PEN MARKUPS AND ANY CHANGES THAT OCCUR DURING CONSTRUCTION.
3. THE PACKAGE SHALL ALSO CONTAIN A PDF COPY OF EACH CAD DRAWING ALONG WITH ELECTRONIC VERSION OF PANELBOARD SCHEDULES (IN EXCEL FORMAT) ON THE UNIVERSITY'S TEMPLATES OF SCHEDULES.
4. WARRANT ALL LABOUR AND MATERIALS INSTALLED UNDER THIS DIVISION FOR A PERIOD OF ONE YEAR FROM THE DATE OF SUBSTANTIAL PERFORMANCE AND SUBMIT WARRANTY CERTIFICATE TO U OF T.
5. SUBMIT THE FOLLOWING DOCUMENTS FOR THE ENGINEER'S REVIEW UPON COMPLETION OF PROJECT:
   a. ESA FINAL INSPECTION CERTIFICATE
   b. FIRE ALARM VERIFICATION & TESTING REPORT
   c. EMERGENCY LIGHTING TEST REPORT
   d. O & M MANUALS
   e. PRODUCTS WARRANTY CERTIFICATES
   f. AS-BUILT DRAWINGS (CAD & PDF FORMAT)
   g. UPDATED PANELBOARD SCHEDULES
   h. SHORT CIRCUIT COORDINATION & ARC FLASH STUDY REPORT (PDF FORMAT)
   i. ETAP MODEL

COMMUNICATION SPECIFICATION

A) GENERAL SCOPE OF WORK

1. THIS DOCUMENT INCLUDES SPECIFICATIONS FOR CABLING COMPONENTS, CONDUIT & RACEWAY INFRASTRUCTURE, CABLE TERMINATIONS, TESTING AND "AS-BUILT" DOCUMENTATION WITHIN THE DESIGNATED AREAS.
2. THE CONTRACTOR IS TO PROVIDE CABLING INFRASTRUCTURE AND TERMINATION HARDWARE INSTALLED, TERMINATED AND TESTED. EMT CONDUITS & CABLE TRAYS ARE TO BE PROVIDED AS REQUIRED.
3. ALL WORK MUST CONFORM TO THE FOLLOWING; INDUSTRY ACCEPTED PRACTICES, MANUFACTURERS COMPONENT INSTALLATION GUIDELINES AND THE LATEST VERSIONS OF THE APPLICABLE CODES INCLUDING ANY TECHNICAL SERVICES BULLETINS AND ADDENDA. THESE INCLUDE, BUT NOT LIMITED TO, THE ONTARIO BUILDING CODE, THE CANADIAN ELECTRICAL CODE PART I, ONTARIO HYDRO ELECTRIC SAFETY CODE, AND THE FOLLOWING COMMUNICATIONS STANDARDS:

STANDARD	TITLE
ANSI/TIA-568-D.0	GENERIC TELECOMMUNICATIONS CABLING FOR CUSTOMER PREMISES
ANSI/TIA-568-D.1	COMMERCIAL BUILDING TELECOMMUNICATIONS CABLING STANDARD
ANSI/TIA-568-C.2	BALANCED TWISTED-PAIR TELECOMMUNICATION CABLING AND COMPONENTS STANDARD
ANSI/TIA-568-D.3	OPTICAL FIBER CABLING COMPONENTS STANDARD
ANSI/TIA-606-C	ADMINISTRATION STANDARD FOR THE TELECOMMUNICATIONS INFRASTRUCTURE
CSA T526-7-A	TEST PROCEDURES FOR INSTALLED SINGLEMODE FIBER CABLE PLANT
CSA C22.2 NO. 232-M	FIBER OPTIC CABLES
CSA-C22.2 NO. 182.4-M9	PLUGS, RECEPTACLES AND CONNECTORS FOR COMMUNICATION SYSTEMS
CSA-C22.2 NO.214-94	COMMUNICATIONS CABLES
ANSI/TIA-598-C	OPTICAL FIBER CABLE COLOR CODING
ANSI/TIA-604-3	FOCIS 3 FIBER CONNECTOR INTERMINABILITY STANDARD

4. ALL CABLING INSTALLATIONS MUST BE PERFORMED BY LICENSED UNIONIZED (IBEW) ELECTRICIANS. THE ELECTRICIANS MUST FOLLOW THE LATEST SAFETY REQUIREMENTS FROM THE MINISTRY OF LABOUR.
5. THE CONTRACTOR SHALL UPDATE CONSTRUCTION DRAWINGS IDENTIFYING CABLE ROUTING AND NEW INFRASTRUCTURE INSTALLED. IT IS THE CONTRACTOR'S RESPONSIBILITY TO RECORD THE DISTANCES OF THE FIBRE/COPPER RUNS ON DRAWINGS.
6. IT IS THE CONTRACTOR'S RESPONSIBILITY TO ENSURE THAT ALL PART NUMBERS IDENTIFIED IN THE SCOPE AND DRAWINGS ARE ACCURATE WITH THE MANUFACTURERS. ALSO, THE CONTRACTOR'S RESPONSIBILITY IS TO ENSURE ALL LOCATIONS & DISTANCES IDENTIFIED IN THIS DOCUMENT ARE ACCURATE. ANY DEVIATIONS MUST BE BROUGHT FORWARD FOR THE ENGINEER'S REVIEW & APPROVAL, PRIOR TO ORDERING THE MATERIALS OR COMMENCING THE WORK ON SITE.
7. INSTALLED SYSTEM SHALL BE END-TO-END CERTIFIED WITH **MINIMUM 25 YEAR WARRANTY** FROM THE MANUFACTURER. THE CONTRACTOR SHALL PROVIDE CONFIRMATION FROM MANUFACTURER THAT THE INSTALLER IS LICENSED TO PROVIDE A CERTIFIED END-TO-END SYSTEM.
8. SUBMIT SHOP DRAWINGS FOR ALL NEW MATERIALS, DEVICES AND EQUIPMENT FOR THE REVIEW OF U OF T, PRIOR TO ORDERING. SHOP DRAWINGS SHALL INCLUDE BUT NOT LIMITED TO: RACKS, CABLING, JACKS, PATCH PANELS, WIRE MANAGEMENT, CABLE TRAYS, ETC.
9. BASE BID MANUFACTURER IS **PANDUIT**. APPROVED ALTERNATIVES ARE BELDEN, COMMSCOPE & HUBBELL.

B) INTERFERENCE DRAWINGS:

1. THE CONTRACTOR MUST SUBMIT INTERFERENCE DRAWINGS PRIOR TO COMMENCING WITH THE INSTALLATION OF CONDUITS/CABLE TRAYS. THESE DRAWINGS MUST INDICATE THE CONDUIT/CABLE TRAYS ROUTING AND PULL BOX LOCATIONS WITH REFERENCE MEASUREMENTS FROM TWO WALLS OR PERMANENT FIXTURES.
2. INCLUDE CONSTRUCTION NOTES DESCRIBING ELEVATION CHANGES, WALL PENETRATIONS AND INFORMATION WITH REGARDS TO EXISTING FIXTURES THAT MAY BE AFFECTED BY THE INSTALLATION OF THE CONDUIT.

C) SHOP DRAWINGS:

1. BEFORE FABRICATION OF ANY MATERIALS OR EQUIPMENT, SUBMIT ONE (1) PDF COPY OF DETAILED MANUFACTURER'S SHOP DRAWINGS OF MATERIAL, EQUIPMENT AND DEVICES FOR REVIEW. DO NOT ORDER MATERIALS UNTIL REVIEW PROCESS IS COMPLETE. IF CORRECTIONS ARE REQUIRED, COPIES WILL BE RETURNED WITH CORRECTIONS NOTED. CORRECTED COPIES SHALL BE RESUBMITTED FOR REVIEW AND DISTRIBUTION. SUBMISSIONS SHALL BE MADE IN AMPLE TIME TO AVOID DELAYS IN THE WORK. THE REVIEW OF THE SHOP DRAWINGS SHALL BE, AND IS MUTUALLY UNDERSTOOD TO BE, IN REFERENCE TO GENERAL DESIGN ONLY. IF ERRORS IN THE DETAILED DIMENSIONS OR INTERFERENCE WITH THE WORKS ARE NOTICED, THE ATTENTION OF THE CONTRACTOR WILL BE CALLED TO SUCH ERRORS OR INTERFERENCE, BUT REVIEW OF THE DRAWINGS SHALL NOT IN ANY WAY RELIEVE THIS CONTRACTOR OF RESPONSIBILITY FOR ERRORS OR INTERFERENCE, OR FROM THE NECESSITY OF FURNISHING SUCH WORKS AND MATERIALS AS MAY BE REQUIRED FOR THE COMPLETION OF THE WORK AT ANY TIME UNTIL FORMAL ACCEPTANCE.
2. THE CONTRACTOR SHALL SUBMIT STAMPED DETAILED DRAWINGS BY A QUALIFIED PROFESSIONAL ENGINEER (WHERE REQUIRED) INDICATING THE SUPPORTING SYSTEM THAT CARRYING ELECTRICAL DEVICES OR EQUIPMENT. THE DRAWINGS SHALL INCLUDE SPECIFICATIONS OF SUPPORTS, THREADED RODS, SCREWS, ANCHORS AND OTHER MATERIALS REQUIRED FOR SAFE INSTALLATION.

D) CABLING PATHWAYS

1. GENERAL REQUIREMENTS:
   a) ALL CONDUIT ENDS SHALL BE FITTED WITH PLASTIC BUSHINGS
   b) MAXIMUM DISTANCE OF CONDUIT RUN BETWEEN TWO PULL BOXES TO BE 30M. THE PULL BOXES SHALL HAVE SCREW TYPE COVER NOT HINGED. ALL PULL BOXES MUST BE ACCESSIBLE WITH A MINIMUM 24" X 24" HINGED ACCESS HATCH PROVIDED WHERE REQUIRED. PULL BOXES FOR VERTICAL (8) TIMES THE SIZE OF THE INNER DIAMETER OF THE LARGEST CONDUIT CONNECTED TO IT.
   c) THERE ARE TO BE NO MORE THAN TWO 90° BENDS OR THE EQUIVALENT BETWEEN PULL BOXES.
   d) CONDUITS SHALL HAVE A BEND RADIUS AS RECOMMENDED BY THE FIBER CABLING MANUFACTURER.
2. PROVIDE FIRE STOPPING AND SEALANT AT ALL LOCATIONS WHERE CONDUITS PENETRATE WALLS AND FLOORS TO MAINTAIN FIRE RATING OF EXISTING WALLS.
3. PROVIDE FIRE BARRIER PILLOW (3M) AT ALL LOCATIONS WHERE CABLE TRAYS PENETRATE WALLS AND FLOORS.
4. PULL STRINGS MUST BE PROVIDED IN ALL NEW AND REWORKED CONDUITS.

E) CAT 6A DATA CABLING & COMPONENTS

1. THE APPROVED HORIZONTAL DATA CABLING SHALL BE SOLID COPPER, BLUE FOR THE DATA NETWORK, UNSHIELDED TWISTED PAIR (UTP), 4-PAIR, 23 AWG, CMP RATED (FT6), CATEGORY 6A CABLE AS APPLICABLE. THE CABLE SHALL BE, BELDON IBDN 2400, HUBBELL, OR COMMSCOPE SYSTIMAX GIGASPEED XL & PANDUIT.
2. ALL CABLES SHOULD BE INSTALLED IN A WAY TO COMPLY WITH THE ANSI/TIA/EIA-568-C.2 WIRING STANDARD.
3. PROVIDE TWO (2) CAT 6A DATA CABLES IN CONDUIT, FROM EACH ACCESS POINT LOCATION TO THE WAP PATCH PANEL IN THE DATA RACK IN TELECOMMUNICATIONS ROOM AS INDICATED, ENSURING THAT THE TOTAL WIRE LENGTH OF 90M IS NOT EXCEEDED.
4. CROSS CONNECTS TO DATA NETWORK SWITCH BY U OF T CLIENT AND NOTIFY U OF T PROJECT MANAGER TO COORDINATE FOR CROSS CONNECTIONS.
5. PROVIDE AS REQUIRED 2U 48 PORT PATCH 19" PANELS, CATEGORY 6A COMPLIANT, MODULAR JACKS IN DATA RELAY RACK. MODULAR JACKS TO BE COLOR BLUE IN THE RELAY RACK. ONE HORIZONTAL CABLE MANAGER PER COPPER PATCH PANEL IS TO BE PROVIDED. MANAGERS ARE TO BE 1U FOR 24 PORT PANEL AND 2U FOR 48 PORT PANEL.
6. PROVIDE:
   a) BLUE, 2M LENGTH, CATEGORY 6A RATED, PATCH CORD CABLE AT THE RELAY RACK LOCATION (ONE FOR EACH DATA DROP CONNECTION) TO BE INSTALLED BY UofT ITS..
   b) BLUE, 3M LENGTH, CATEGORY 6A RATED, PATCH CORD CABLE AT EACH USER LOCATION (ONE FOR EACH DATA DROP CONNECTION).

F) CAT 6A DATA CABLING & COMPONENTS (FOR WIRELESS CONNECTIONS - WAP)

1. THE APPROVED HORIZONTAL DATA CABLING SHALL BE SOLID COPPER, BLUE FOR THE DATA NETWORK, UNSHIELDED TWISTED PAIR (UTP), 4-PAIR, 23 AWG, CMP RATED (FT6), CATEGORY 6A CABLE AS APPLICABLE. THE CABLE SHALL BE, BELDON IBDN 2400, HUBBELL, OR COMMSCOPE SYSTIMAX GIGASPEED XL & PANDUIT.
2. ALL CABLES SHOULD BE INSTALLED IN A WAY TO COMPLY WITH THE ANSI/TIA/EIA-568-C.2 WIRING STANDARD.
3. PROVIDE TWO (2) CAT 6A DATA CABLES IN CONDUIT, FROM EACH ACCESS POINT LOCATION TO THE WAP PATCH PANEL IN THE DATA RACK IN TELECOMMUNICATIONS ROOM AS INDICATED, ENSURING THAT THE TOTAL WIRE LENGTH OF 90M IS NOT EXCEEDED.
4. FACEPLATES SHALL BE SINGLE GANG, CREAM COLORED WITH MODULAR JACKS. PROVIDE BLANKS FOR ALL UNUSED JACKS. CONFIRM COLOR WITH ARCHITECT IN EACH SPACE PRIOR TO PURCHASING.
5. PROVIDE:
   a) ORANGE, 6" LENGTH, CATEGORY 6A RATED, 28 AWG PATCH CORD CABLE AT THE RELAY RACK LOCATION (ONE FOR EACH DATA DROP), TO BE INSTALLED BY UofT ITS.
   b) WHITE, 1'-0" LENGTH FOR CEILING MOUNTED, CATEGORY 6A RATED, 28 AWG PATCH CORD CABLE BETWEEN THE WAP & THE DATA OUTLET (ONE FOR EACH DATA DROP), TO BE INSTALLED BY ELECTRICAL CONTRACTOR.
   c) WHITE, 6" LENGTH FOR WALL MOUNTED, CATEGORY 6A RATED, 28 AWG PATCH CORD CABLE BETWEEN THE WAP & THE DATA OUTLET (ONE FOR EACH DATA DROP), TO BE INSTALLED BY ELECTRICAL CONTRACTOR.

   CAT 6A CABLING SHALL BE TERMINATED IN MODULAR ORANGE DATA JACKS AT THE PATCH PANEL END AND MODULAR WHITE DATA JACKS AT THE ACCESS POINT END. MODULES TO BE WIRED AS PER T568A.
6. U OF T TO SUPPLY THE WIRELESS ACCESS POINTS TO BE MOUNTED AT LOCATIONS ON DRAWINGS, ADJACENT TO CORRESPONDING DATA OUTLETS. WALL MOUNTED ACCESS POINTS TO BE INSTALLED APPROXIMATELY 10'-0" A.F.F. CEILING MOUNTED ACCESS POINTS TO BE POSITIONED BELOW THE CEILING. CONTRACTOR SHALL INSTALL THE ACCESS POINT & CONNECT THE CAT. 6A, WHITE DATA UTP CABLE FROM ACCESS POINT TO WIRELESS DATA OUTLET.
7. TERMINATE CABLES WITH CATEGORY 6A COMPLIANT, MODULAR JACKS IN EXISTING PATCH PANEL. MODULAR JACKS TO BE COLOR BLUE IN THE RELAY RACK.
8. WIRELESS ACCESS POINTS SHALL BE PROVIDED BY U OF T INFORMATION TECHNOLOGY GROUP (ITS) AND BE PICKED UP BY THE ELECTRICAL CONTRACTOR. TWO WEEKS NOTICE IS REQUIRED BEFORE PICK UP. PICK-UP LOCATION IS:

   UNIVERSITY OF TORONTO I+TS
   4 BANCROFT AVE., ROOM #103

   IN ADDITION, ITS GROUP MUST BE NOTIFIED BEFORE REMOVAL OF ANY EXISTING WAP'S. COORDINATE WITH PROJECT MANAGER ACCORDINGLY.

G) SPIRAL WRAP

1. CABLES RUNNING FROM SYSTEM FURNITURE FEED POINTS TO THE SYSTEM FURNITURE SHALL BE NEATLY WRAPPED WITH PANDUIT T50R-C SERIES SPIRAL WRAP AND OR PW SERIES PAN WRAP OR EQUIVALENT. CABLING CONTRACTOR TO SIZE THE SPIRAL WRAP ACCORDINGLY.

H) TESTING:

1. THE CABLING CONTRACTOR IS TO USE THE FLUKE DTX SERIES OR EQUIVALENT WITH THE LATEST VERSION OF FIRMWARE TO TEST THE UTP CABLING SYSTEM. A LIGHT SOURCE AND POWER METER WILL BE USED TO FOR ALL FIBRE OPTIC CABLES. THE CABLING CONTRACTOR MUST ENSURE THAT ALL CABLING IS TESTED IN ACCORDANCE TO THE PROPOSED SPECIFICATIONS OF THE CATEGORY INSTALLED.
2. UPON COMPLETION OF TESTING BY THE CABLING CONTRACTOR, A UNIVERSITY REPRESENTATIVE MAY CHOOSE TO WITNESS THE CABLES BEING TESTED.
3. ALL DEFICIENCIES MUST BE CORRECTED BEFORE THE PROJECT MANAGER WILL PROVIDE A CERTIFICATE TO RELEASE THE HOLDBACK ON THE PROJECT.
4. CATEGORY 6/6A FIELD TEST PARAMETERS SHALL BE. TESTING OF ALL 4 PAIRS AND 25 PAIR IS TO INCLUDE BUT NOT BE LIMITED TO THE FOLLOWING:
   a. WIRE MAP
   b. INSERTION LOSS
   c. EQUAL LEVEL FAR END CROSS TALK (ELFEXT)
   d. POWER SUM EQUAL LEVEL FAR END CROSS TALK (PSELFEXT)
   e. DELAY SKEW
   f. ATTENUATION (PSACR)
   g. NEAR END CROSS TALK (NEXT)
   h. PROPAGATION DELAY
   i. CABLE LENGTH
   j. POWER SUM NEAR END CROSS TALK (PSNEXT)
   k. RETURN LOSS
5. A TESTER WITH THE MOST RECENT VERSION OF ITS SOFTWARE AND FIRMWARE MUST PERFORM ALL TESTS IN ACCORDANCE TO ANSI/EIA/TIA TSB-67. THE NOMINAL VELOCITY OF PROPAGATION (NVP) MUST BE SET SPECIFIC TO EACH CABLE MANUFACTURER BEFORE TESTING. PORTABLE TESTERS TO BE CALIBRATED ON A MINIMUM ANNUAL BASIS. FLUKE DTX OR EQUIVALENT SHALL BE USED.
6. TEST PATCH CORDS FOR THE TESTER MUST BE DESIGNED AND APPROVED FOR TESTING BY THE MANUFACTURER. FIELD ASSEMBLED PATCH CORDS ARE NOT ACCEPTABLE.
7. ALL CABLE FAULTS MUST BE CORRECTED. SPLICING OF ANY CABLES WILL NOT BE PERMITTED, FOR ANY REASON, UNLESS PRIOR AUTHORIZATION IF RECEIVED IN WRITING BY THE UNIVERSITY OF TORONTO.

K) LABELLING:

1. CABLE LABELS SHALL BE OF SELF-LAMINATING VINYL CONSTRUCTION WITH A WHITE PRINTING AREA AND A CLEAR TAIL THAT SELF LAMINATES THE PRINTED AREA WHEN WRAPPED AROUND A CABLE. THE CLEAR AREA SHOULD BE OF SUFFICIENT LENGTH TO WRAP AROUND THE CABLE AT LEAST ONE AND ONE-HALF TIMES AND BE INSTALLED WITHIN 2" OF THE TERMINATION POINT OF THE CABLE, PATCH CORD OR PIGTAIL.
2. ALL ADHESIVE CABLE LABELS SHALL MEET THE LEGIBILITY, DEFACEMENT, AND ADHESION REQUIREMENTS SPECIFIED IN UL 969 (REF. D-16). IN ADDITION THE LABELS SHALL MEET THE GENERAL EXPOSURE REQUIREMENTS IN UL 969 FOR INDOOR USE.
3. ALL CABLE LABELS SHALL BE COMPLIANT WITH THE TIA/EIA-606(A) SECTION 6.2.2 CABLE LABELING, SECTION 6.2.4 TERMINATION HARDWARE LABELING, AND SECTION 6.2.6 TERMINATION POSITION LABELING.
4. ALL PATCH PANEL AND 110 BLOCK LABELS ARE TO BE MECHANICALLY PRINTED AND ARE TO FOLLOW THE GUIDELINES IN CSA-T528-93 FOR COLOUR CODING OF TERMINATION FIELDS.
5. LABEL ALL CABLING IN ACCORDANCE WITH CSA-528 SPECIFICATIONS. ONE LABEL SHOULD BE ATTACHED TO THE FRONT OF THE PATCH PANEL, AND ONE AT EACH END OF THE CABLE.
6. PROVIDE PROPER LABEL ON EACH NEW CABLE INSIDE THE PULL BOXES.
7. THE HORIZONTAL DATA CABLES SHALL BE LABELED IN THE FORMAT TYPE [DATA]-FLOOR#-ROOM#-CABLE#. THE PER ROOM CABLE NUMBERS SHALL BE SEQUENTIAL BEGINNING AT 1.

   EXAMPLE:
   D04-415-2 REPRESENTS A SECOND DATA CABLE TO ROOM 415 OF THE FOURTH FLOOR.

L) EXECUTION:

1. THE CONTRACTOR SHALL INSTALL PULLING STRING/ROPE IN ALL NEW CONDUITS. ROPES SHALL REMAIN IN CONDUITS UPON COMPLETION OF CABLE INSTALLATION.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CLEANUP OF ALL FACILITIES AND BUILDINGS RELATED TO THE PROJECT, DURING AND AT COMPLETION.
3. THE WORK SITE AND ADJACENT AREAS SHALL BE LEFT IN THE SAME CONDITION OR CLEANER THAN WHEN STARTING A SHIFT. THIS MUST BE DONE ON A DAILY BASIS.
4. THE CONTRACTOR SHALL PROTECT BUILDING EQUIPMENT, EXTERIOR AND INTERIOR, IN THE IMMEDIATE AND ADJACENT WORK AREAS.
5. THE CONTRACTOR SHALL PROTECT EXISTING BUILDING FINISHES AND SERVICES NOT AFFECTED BY THE MODIFICATIONS.
6. ALL CABLES WILL BE INSTALLED WITH 10-FOOT (~3 METER) SERVICE COILS AT ALL TERMINATION POINTS AND TRANSITION CLOSETS. SERVICE LOOPS MAY BE STORED ON BACKBOARDS, IN UNOCCUPIED SECTIONS OF CABLE TRAY OR IN CONDUIT PULL BOXES. DO NOT STORE SERVICE LOOPS IN THE FIBRE CABLE IN THE CONNECTOR TRAY.
7. ALL CABLE AND COMPONENTS MUST BE INSTALLED AS PER THE MANUFACTURER'S SPECIFICATIONS. CONNECTORS SHOULD BE LC TYPE, CERAMIC FERRULE: PHYSICAL CONTACT FINISH WITH NO ALUMINUM CONSTRUCTION.
8. FOR NEW INSTALLATIONS, ONLY FUSION SPLICE TERMINATIONS ARE ACCEPTED. THIS IS TO BE DONE IN CONJUNCTION WITH MANUFACTURED PIGTAIL ASSEMBLIES WITH LC CONNECTORS. NO FIELD TERMINATION OF CONNECTORS WILL BE PERMITTED. NO MECHANICAL SPLICE METHODS WILL BE PERMITTED.
9. LUBRICATION: IF CABLE PULLING LUBRICANT IS USED FOR FIBRE OPTIC CABLE INSTALLATIONS, THE CONTRACTOR MUST PROVIDE IN WRITING THE MANUFACTURER AND PRODUCT SPECIFIC SPECIFICATION SHEET.

M) CLOSEOUT DOCUMENTS

1. AS BUILT DRAWINGS:
   a. THE CONTRACTOR SHALL MARK ALL THE CHANGES AND DEVIATIONS FROM CONSTRUCTION DRAWINGS IN RED PEN ON ONE (1) SET OF CLEAN PRINTS AND SUBMIT TO DESIGN ENGINEER (IN PDF FORMAT) UPON COMPLETION OF WORK.
   b. THE CABLING CONTRACTOR IS REQUIRED TO PROVIDE AS-BUILT DRAWINGS OF THE CABLES INSTALLATION IN PDF AS WELL AS IN CAD FORMATS. THIS SHALL INCLUDE THE PATHWAY OF THE CABLES FROM THE LECOMMUNICATIONS ROOMS TO THE WORKSTATION. THE AS-BUILT DRAWINGS SHALL ALSO INCLUDE AS ALL RED PEN MARKUPS AND ANY ANGES THAT OCCUR DURING CONSTRUCTION. THE CABLING CONTRACTOR SHALL PROVIDE THE AS-BUILT DRAWINGS TO THE UNIVERSITY OF TORONTO WITHIN 7 BUSINESS DAYS OF THE COMPLETION OF THE PROJECT. THE DRAWINGS MUST CONTAIN BUT NOT LIMITED TO THE FOLLOWING DETAIL:
      i. CONDUIT & PULL BOX LOCATIONS, ROUTING AND SIZES
      ii. EXACT DISTANCES OF FIBER RUNS.
      iii. PHOTO OF EACH PULL BOX SHOWING THE CABLE LABELS.
1. CABLE TEST RESULTS

   THE CABLING CONTRACTOR SHALL PROVIDE ALL TEST RESULTS IN SOFT COPY TO THE UNIVERSITY OF TORONTO. IF SENT ELECTRONICALLY, ENSURE THE TEST RESULTS ARE SENT IN THE PROPER TESTER FORMAT. TEST RESULTS SHALL INCLUDE ALL VOICE AND DATA HORIZONTAL CABLES AND ALL BACKBONE CABLES. THE REPORT SHOULD INDICATE FOR EACH CABLE, WHEN IT WAS TESTED SUCCESSFULLY AND THE SIGNATURE OF THE TECHNICIAN THAT PERFORMED THE TEST. THE ENTIRE REPORT MUST BE SIGNED BY AN AUTHORIZED PERSON FOR THE CABLING CONTRACTOR AT THE END OF THE PROJECT.
2. EXCEPT OTHERWISE INDICATED ON THIS SPECIFICATION, WARRANT ALL LABOUR AND MATERIALS INSTALLED UNDER THIS DIVISION FOR A PERIOD OF ONE YEAR FROM THE DATE OF SUBSTANTIAL PERFORMANCE AND SUBMIT THE FOLLOWING TO U OF T UPON COMPLETION OF THE PROJECT.
   a. CABLE TEST REPORTS
   b. O & M MANUALS
   c. PRODUCTS WARRANTY CERTIFICATES (25 YEAR FROM MANUFACTURER)
   d. AS-BUILT DRAWINGS (CAD & PDF FORMAT)
   e. LABELING CHART FOR CABLES AND EQUIPMENT

TABLE 'AA' - CONDUITS SIZES FOR DATA CABLES

FOR CATEGORY 6A CABLES:

CONDUIT SIZE:	16 (½")	21 (3/4")	27 (1")	35 (1¼")	41 (1½")	53 (2")	63 (2½")	78 (3")	103 (4")
CABLE CAPACITY:	-	2	3	5	8	16	32	48	72

TABLE 'BB' - DATA JACK / PATCH CABLE COLORS

SYSTEM	DATA JACKS		PATCH CABLES	
	PATCH PANEL	END DEVICE	PATCH PANEL	END DEVICE
NORMAL DATA	BLUE	BLUE	BLUE	BLUE
WIRELESS	ORANGE	WHITE	ORANGE	WHITE
SECURITY (HONEYWELL, VIDEO CAMERAS)	RED	RED	RED	RED
SECURITY (SALTO, KEY BOXES, BIOMETRIC HAND SCANNER)	YELLOW	YELLOW	YELLOW	YELLOW
LIGHTING CONTROL & BAS	GREEN	GREEN	GREEN	GREEN

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.

REV.	DESCRIPTION	DATE
	ISSUED FOR TENDER	2026-04-22
	ISSUED FOR 80% CD	2026-03-09
	ISSUED FOR PERMIT	2026-02-27
	ISSUED FOR CLASS A COSTING	2026-02-18
	ISSUED FOR 100% DD	2026-01-23
	ISSUED FOR CLASS B COSTING	2026-01-16
	ISSUED FOR 50% DD	2025-11-28
	ISSUED FOR 100% SCHEMATIC DESIGN	2025-09-19
	ISSUED FOR CLASS C COSTING	2025-09-05

KEY PLAN (NTS)
SEAL

PROJECT TITLE:
UNIVERSITY OF TORONTO
33 URSULA FRANKLIN MATH OFFICE RENOVATION

33 Ursula Franklin Street

DRAWING SHEET TITLE
ELECTRICAL & COMMUNICATIONS SPECIFICATION

DRAWN BY: GDP
SCALE: N/A
REVIEWED BY: JW
DATE CREATED: 2025-05-27
UNIVERSITY PROJECT NUMBER: P164-24-165
NORTH POINT
DRAWING NUMBER: **E102**
REV. NUMBER

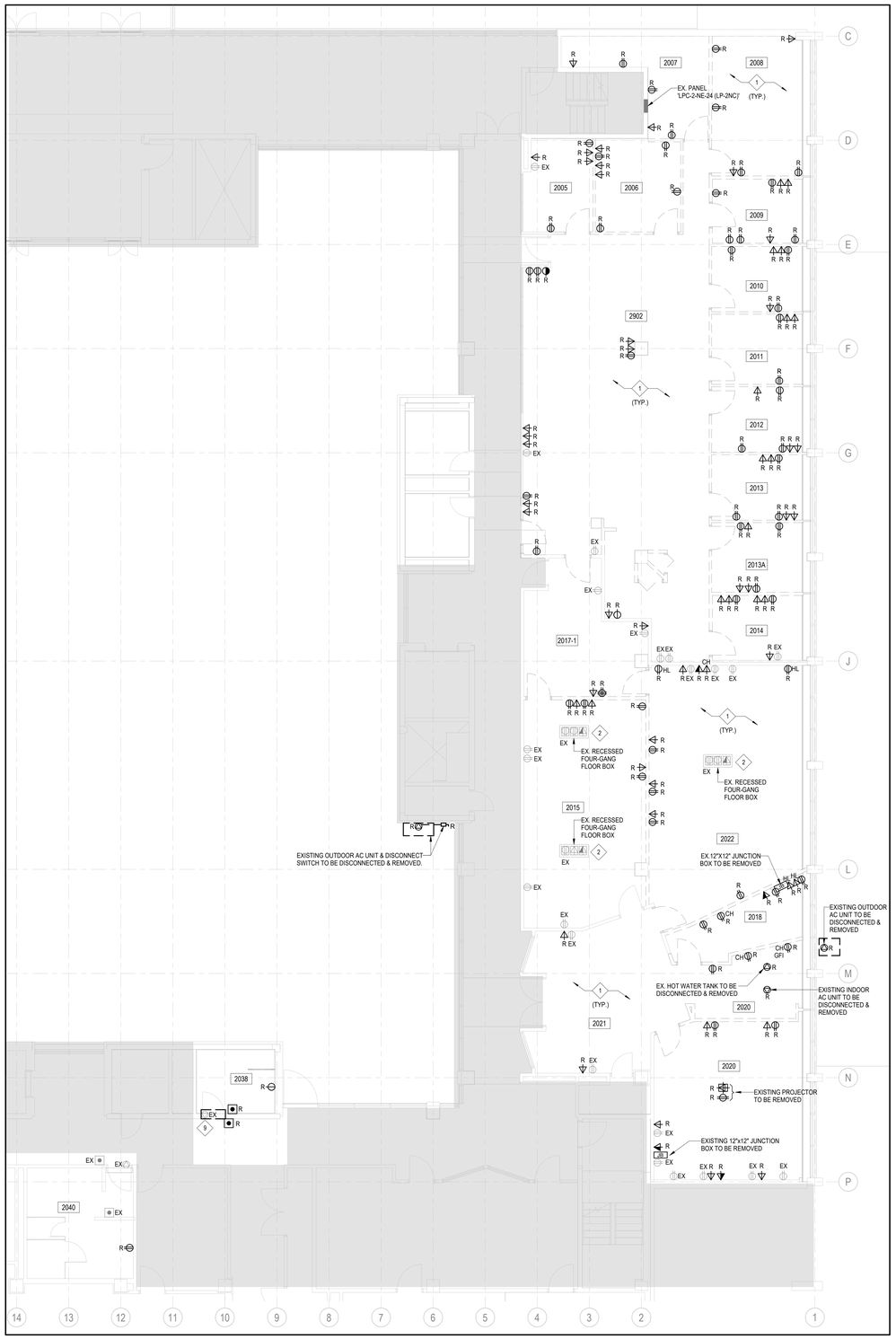
ALTERNATIVE PRICE #4

ELECTRICAL CONTRACTOR SHALL PROVIDE THE ITEM BELOW AS AN ALTERNATIVE PRICE:

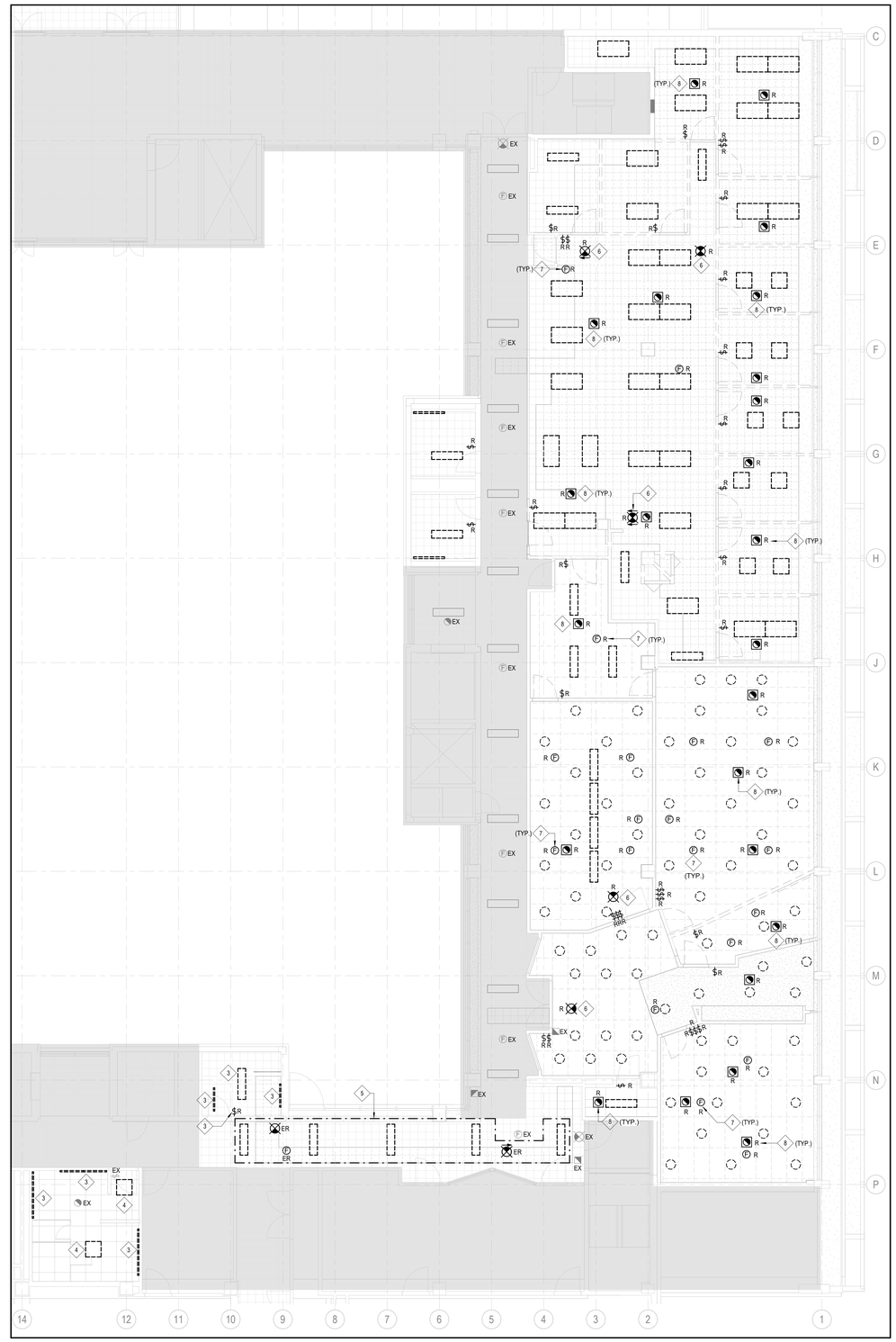
- FOR THE ENTIRE RENOVATION AREA, ELECTRICAL CONTRACTOR TO REPLACE ALL PLUGS AND COVER PLATES OF ALL EXISTING RECEPTACLES TO REMAIN. REFER TO KEYED NOTE #1 ON THIS DRAWING.

DEMOLITION KEYED NOTES

1. FOR ALL RENOVATION AREA, REPLACE ALL EXISTING RECEPTACLES (PLUGS) THAT ARE TO REMAIN WITH NEW RECEPTACLES (PLUGS) AND STAINLES STEEL COVERPLATES. EXISTING BACKBOXES AND WIRING TO REMAIN.
2. DISCONNECT & REMOVE EXISTING AV AND/OR DATA CABLING BACK TO SOURCE. PROVIDE NEW STAINLESS STEEL BLANK COVERPLATES FOR REMOVED AV OR DATA OUTLES.
3. DISCONNECT & REMOVE EXISTING LIGHTING FIXTURE AND LIGHTING CONTROL DEVICES C/W WIRING, CONDUIT AND BOX BACK TO SOURCE.
4. DISCONNECT & REMOVE EXISTING LIGHTING FIXTURE. UTILIZE EXISTING BRANCH WIRING TO FEED NEW LIGHTING FIXTURE ON THE NORMAL POWER CIRCUIT. REFER TO DRAWING E301 FOR NEW LAYOUT.
5. CAREFULLY DISCONNECT & REMOVE EXISTING LIGHTING FIXTURES, EXIT SIGNS AND FIRE ALARM SPEAKER IN THIS AREA. RE-INSTALL ALL EXISTING DEVICES AT THE SAME LOCATION SHOWN ON DRAWING #E301.
6. DISCONNECT & REMOVE EXISTING EXIT SIGN AND REMOVE WIRING AND CONDUIT BACK TO NEAREST JUNCTION BOX. UTILIZE EXISTING BRANCH WIRING TO FEED NEW EXIT SIGNS. REFER TO DRAWING E301 FOR NEW LAYOUT.
7. DISCONNECT & REMOVE EXISTING FIRE ALARM SPEAKERS AND REMOVE WIRING AND CONDUIT BACK TO NEAREST JUNCTION BOX. PROVIDE NEW FIRE ALARM SPEAKER WIRING FROM EXISTING FIRE ALARM JUNCTION BOX TO NEW FIRE ALARM SPEAKER AND SPEAKER/STROBE SHOWN ON THE NEW LAYOUT. PROVIDE FIRE ALARM VERIFICATION REPORT AS REQUIRED.
8. DISCONNECT & REMOVE EXISTING FIRE ALARM DETECTORS (HEAT AND SMOKE) AND REMOVE WIRING AND CONDUIT BACK TO NEAREST JUNCTION BOX. PROVIDE NEW FIRE ALARM WIRING FROM THE EXISTING FIRE ALARM JUNCTION BOX TO NEW DEVICES AS SHOWN IN DRAWING E301. PROVIDE FIRE ALARM VERIFICATION REPORT AS REQUIRED.
9. DISCONNECT & REMOVE EXISTING AUTOMATIC DOOR OPENER. UTLIZE EXISTING BRANCH WIRING TO FEED NEW AUTOMATIC DOOR OPENER. MODIFY/EXTEND EXISTING WIRING AS REQUIRED.



2 E201 PART 2ND FLOOR PLAN (EAST) - ELECTRICAL DEMOLITION LAYOUT
SCALE: 1 : 75



1 E201 PART 2ND FLOOR PLAN (EAST) - LIGHTING DEMOLITION LAYOUT
SCALE: 1 : 75

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.

REV.	DESCRIPTION	DATE
	ISSUED FOR TENDER	2026-04-22
	ISSUED FOR 80% CD	2026-03-09
	ISSUED FOR PERMIT	2026-02-27
	ISSUED FOR CLASS A COSTING	2026-02-18
	ISSUED FOR 100% DD	2026-01-23
	ISSUED FOR CLASS B COSTING	2026-01-16
	ISSUED FOR 50% DD	2025-11-28
	ISSUED FOR 100% SCHEMATIC DESIGN	2025-09-19
	ISSUED FOR CLASS C COSTING	2025-09-05

KEY PLAN (NTS)

SEAL

PROJECT TITLE:
UNIVERSITY OF TORONTO
33 URSULA FRANKLIN MATH OFFICE RENOVATION

33 Ursula Franklin Street

DRAWING SHEET TITLE
SECOND FLOOR PLAN - ELECTRICAL DEMOLITION LAYOUT

DRAWN BY: GDP
SCALE: As indicated
REVIEWED BY: JW
DATE CREATED: 2025-05-27
UNIVERSITY PROJECT NUMBER: P164-24-165
NORTH POINT

DRAWING NUMBER: **E201**
REV. NUMBER

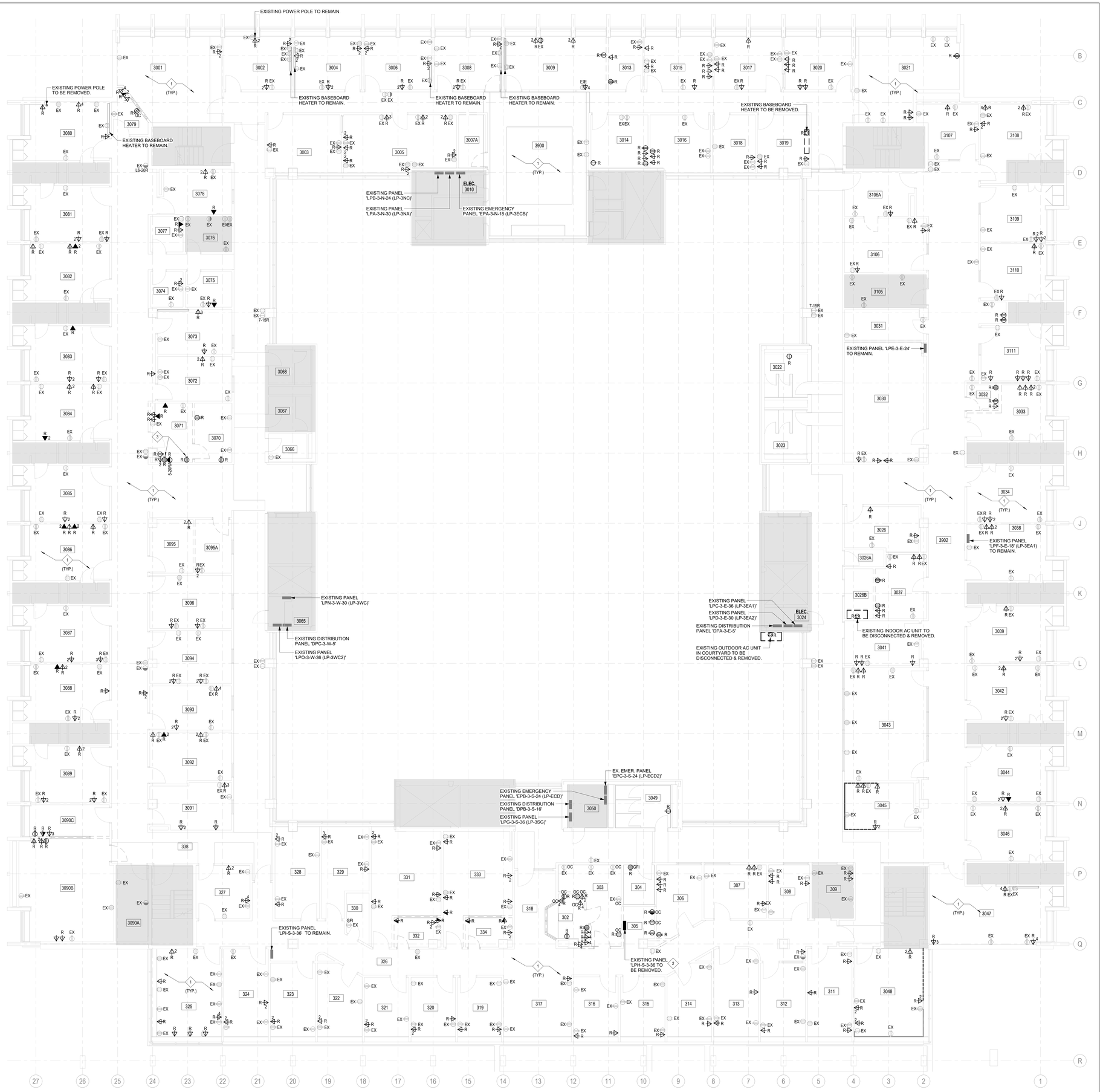
ALTERNATIVE PRICE #4

ELECTRICAL CONTRACTOR SHALL PROVIDE THE ITEM BELOW AS AN ALTERNATIVE PRICE:

- FOR THE ENTIRE RENOVATION AREA, ELECTRICAL CONTRACTOR TO REPLACE ALL PLUGS AND COVER PLATES OF ALL EXISTING RECEPTACLES TO REMAIN. REFER TO KEYED NOTE #1 ON THIS DRAWING.

DEMOLITION KEYED NOTES

1. FOR ALL RENOVATION AREA, REPLACE ALL EXISTING RECEPTACLES (PLUGS) THAT ARE TO REMAIN WITH NEW RECEPTACLES (PLUGS) AND STAINLESS STEEL COVERPLATES. EXISTING BACKBOXES AND WIRING TO REMAIN.
2. DISCONNECT & REMOVE EXISTING MAIN FEEDER TO THIS PANEL. UTILIZE EXISTING CONDUIT TO RUN 4#4 AWG CU + GND TO FEED NEW PANEL AS REQUIRED. TRANSFER EXISTING BRANCH CIRCUITS FROM EXISTING PANEL TO NEW PANEL. REFER TO SINGLE LINE DIAGRAM & PANEL SCHEDULES FOR DETAILS. MODIFY AND/OR EXTEND EXISTING CONDUIT & WIRING AS REQUIRED.
3. DISCONNECT & REMOVE EXISTING RECEPTACLE. EXTEND EXISTING BRANCH WIRING TO COUNTER HEIGHT LEVEL. REFER TO DRAWING #E302 FOR NEW RECEPTACLE LOCATION.



1 / E202 3RD FLOOR PLAN - ELECTRICAL DEMOLITION LAYOUT

SCALE: 1 : 75

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.

REV.	DESCRIPTION	DATE
	ISSUED FOR TENDER	2026-04-22
	ISSUED FOR 80% CD	2026-03-09
	ISSUED FOR PERMIT	2026-02-27
	ISSUED FOR CLASS A COSTING	2026-02-18
	ISSUED FOR 100% DD	2026-01-23
	ISSUED FOR CLASS B COSTING	2026-01-16
	ISSUED FOR 50% DD	2025-11-28
	ISSUED FOR 100% SCHEMATIC DESIGN	2025-09-19
	ISSUED FOR CLASS C COSTING	2025-09-05

KEY PLAN (NTS)

SEAL

PROJECT TITLE:
UNIVERSITY OF TORONTO
33 URSULA FRANKLIN MATH OFFICE RENOVATION

33 Ursula Franklin Street

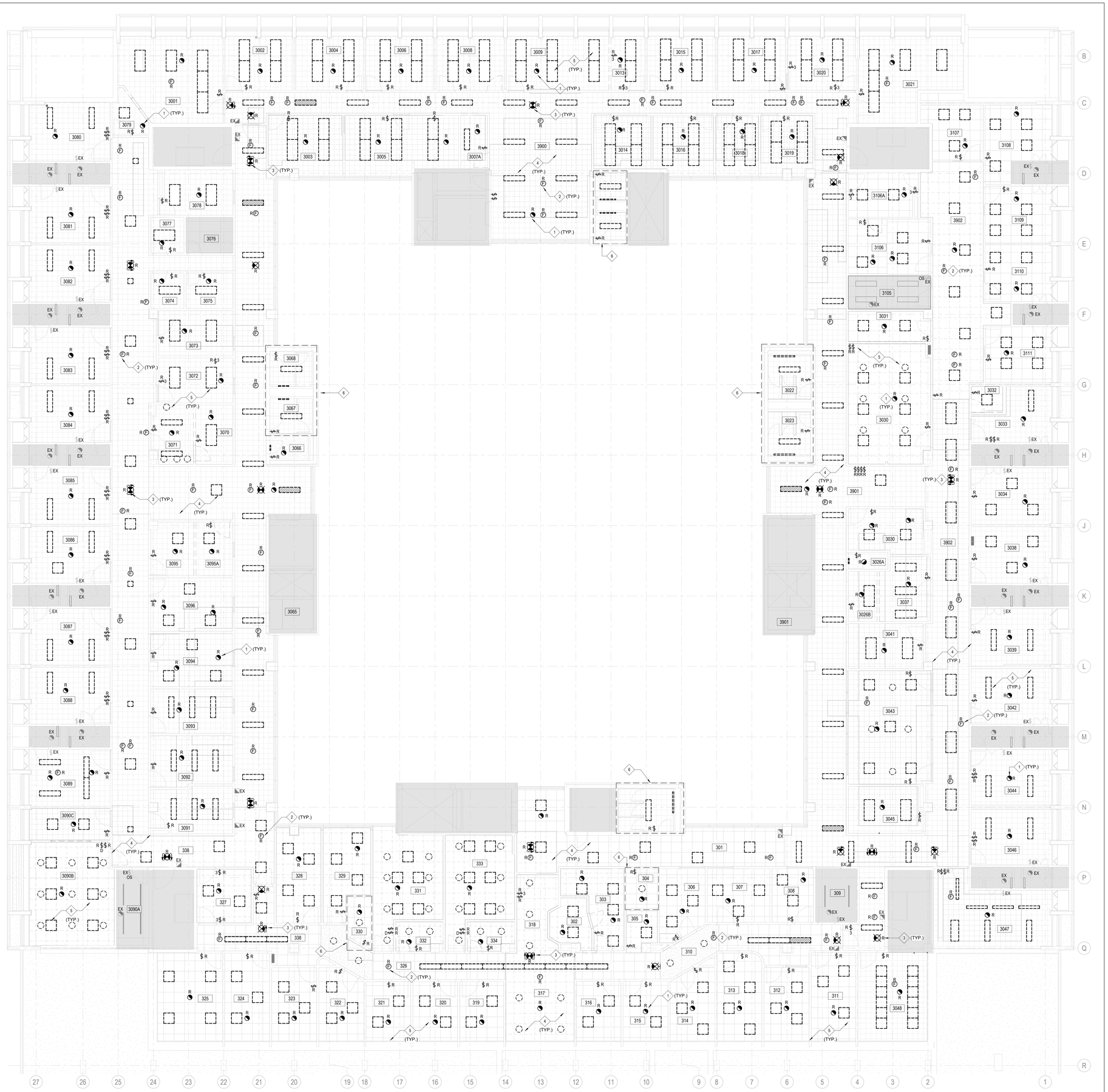
DRAWING SHEET TITLE
THIRD FLOOR PLAN - ELECTRICAL DEMOLITION LAYOUT

DRAWN BY: GDP
SCALE: As indicated
REVIEWED BY: JW
DATE CREATED: 2025-05-27
UNIVERSITY PROJECT NUMBER: P164-24-165
NORTH POINT

DRAWING NUMBER: **E202**
REV. NUMBER

DEMOLITION KEYED NOTES

1. FOR ALL RENOVATION AREA, DISCONNECT & REMOVE EXISTING FIRE ALARM DETECTORS (HEAT AND SMOKE). INSTALL NEW FIRE ALARM DETECTORS IN THE SAME LOCATION WEHERE POSSIBLE. UTILIZE EXISING FIRE ALARM WIRING TO SUIT. PROVIDE FIRE ALARM VERIFICATION REPORT AS REQUIRED.
2. FOR ALL RENOVATION AREA, DISCONNECT & REMOVE EXISTING FIRE ALARM SPEAKERS. RE-USE EXISING WIRING FOR NEW FIRE ALARM SPEAKER AND SPEAKER/STROBE SHOWN ON THE NEW LAYOUT. PROVIDE FIRE ALARM VERIFICATION REPORT AS REQUIRED.
3. FOR ALL RENOVATION AREA, DISCONNECT & REMOVE EXISTING EXIT SIGNS. MODIFY AND/OR EXTEND EXISTING BRNACH WIRING FOR NEW GREEN RUNNING MAN EXIT SIGNS AS REQUIRED. REFER TO DRAWING #E302 FOR NEW LAYOUT.
4. DISCONNECT & REMOVE EXISTING FIXTURES AND LIGHTING CONTROL DEVICES C/W BACKBOX, WIRING AND CONDUIT IN CORRIDORS BACK TO SOURCE. NEW LIGHTING FIXTURES ON NORMAL POWER CIRCUITS IN CORRIDORS TO BE FED FROM NEW PANEL AS INDICATED. NEW LIGHTING FIXTURES ON EMERGENCY CIRCUIT IN CORRIDORS TO BE FED FROM EXISTING EMERGECNY CIRCUIT(S) WITH SPARE CAPACITY. MODIFY AND EXTEND EXISTING EMERGENCY BRANCH WIRING AS REQUIRED. REFER TO DRAWING #E302 FOR NEW LAYOUT.
5. FOR ALL RENOVATION AREA, DISCONNECT & REMOVE EXISTING LIGHTING FIXTURES AND LIGHTING CONTROL DEVICES IN ALL ENCLOSED OFFICES/ROOMS. MODIFY AND/OR EXTEND EXISTING BRNACH WIRING FOR NEW LIGHTING FIXTURES AND SWITCHE AS REQUIRED. UTLIZLED EXISTING LIGHT SWITCH BACKBOX AND WIRING WHERE POSSIBLE. REFER TO DRAWING #E302 FOR NEW LAYOUT.
6. DISCONNECT & REMOVE EXISTING LIGHTING FIXTURES AND LIGHTING CONTROL DEVICES C/W BACKBOX, WIRING AND CONDUIT IN WASHROOMS BACK TO SOURE. NEW LIGHTING FIXTURES IN WASHROOMS TO BE FED FROM EXISTING EMERGENCY LIGHTING CIRCUIT WITH SPARE CAPACITY. REFER TO DRAWING #E302 FOR NEW LAYOUT.



1 / E203 3RD FLOOR PLAN - LIGHTING DEMOLITION LAYOUT
SCALE: 1 : 75

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.

REV.	DESCRIPTION	DATE
	ISSUED FOR TENDER	2026-04-22
	ISSUED FOR 80% CD	2026-03-09
	ISSUED FOR PERMIT	2026-02-27
	ISSUED FOR CLASS A COSTING	2026-02-18
	ISSUED FOR 100% DD	2026-01-23
	ISSUED FOR CLASS B COSTING	2026-01-16
	ISSUED FOR 50% DD	2025-11-28
	ISSUED FOR 100% SCHEMATIC DESIGN	2025-09-19
	ISSUED FOR CLASS C COSTING	2025-09-05

KEY PLAN (NTS)

SEAL

PROJECT TITLE:
UNIVERSITY OF TORONTO
33 URSULA FRANKLIN MATH OFFICE RENOVATION

33 Ursula Franklin Street

DRAWING SHEET TITLE
THIRD FLOOR PLAN - LIGHTING DEMOLITION LAYOUT

DRAWN BY: GDP	SCALE: 1 : 75
REVIEWED BY: JW	DATE CREATED: 2025-05-27
UNIVERSITY PROJECT NUMBER: P164-24-165	NORTH POINT
DRAWING NUMBER: **E203**	REV. NUMBER

NEW GENERAL NOTES

1. NEW AND/OR RELOCATED LIGHTING FIXTURES SHALL BE INDEPENDENTLY SUPPORTED BY BUILDING STRUCTURE.
2. FOR ALL NEW AND/OR RELOCATED CONDUITS WHICH PASS THROUGH FIRE RATED ASSEMBLES, ELECTRICAL CONTRACTOR SHALL FILL OPENINGS WITH CUL LISTED AND APPROVED WATERPROOF AND FIREPROOF FILLER MATERIALS TO MAINTAIN EXISITING FIRE RATING.
3. **ELECTRICAL CONTRACTOR SHALL INCLUDE IN THE TENDER PRICE FOR THE SUPPLY, INSTALLATION OF FOUR (4) EXIT SIGNS IF REQUIRED BY THE INSPECTOR ON FINAL INSPECTION.**
4. ELECTRICAL CONTRACTOR SHALL ACCOMPANY FIRE ALARM CONTRACTOR DURING THE FIRE ALARM TEST TO ADJUST FIRE ALARM SPEAKER WATTAGE AS REQUIRED TO MEET THE O.B.C. REQUIREMENTS.
5. **ELECTRICAL CONTRACTOR SHALL INCLUDE IN THE TENDER PRICE FOR THE SUPPLY, INSTALLATION AND VERIFICATION OF THREE (3) FIRE ALARM SPEAKER/STROBE IF REQUIRED BY THE FIRE MARSHAL ON FINAL INSPECTION AND/OR AFTER THE FIRE ALARM AUDIBILITY TESTING.**
6. ALL NEW RECEPTACLES AND COMMUNICATION OUTLETS SHALL BE RECESSED UNLESS OTHERWISE NOTED.
7. THE GENERAL CONTRACTOR IS CARRYING THE AV DESIGN & BUILD AS PART OF THEIR SCOPE. THE COST FOR ADDITIONAL RECEPTACLES & DATA OUTLETS SHALL BE CARRIED BY THE GENERAL CONTRACTOR.
8. **ALL COMMUNICATION CABLING ON 2ND FLOOR RENOVATION AREA SHALL BE TERMINATED IN LAN ROOM #3105 ON 3RD FLOOR.**

NEW KEYED NOTES

A PROVIDE TYPE 'WM1' SURFACE-MOUNTED WIREMOLD RACEWAY, 1-GANG OUTLET BOX & ACCESSORIES FOR INDICATED RECEPTACLE. RUN THE WIREMOLD TO ACCESSIBLE CEILING SPACE VIA THE NEAREST FULL-HEIGHT PARTITION. REFER TO WIREMOLD TYPE SCHEDULE ON THIS DRAWING.

B PROVIDE NEW FIRE ALARM BOOSTER PANEL C/W BATTERY TO ALLOW NEW STROBE CIRCUITS FOR THE RENOVATION AREA. RUN NEW CONDUIT BETWEEN THE BOOSTER PANEL AND MAIN FIRE ALARM PANEL IN CACF ROOM #1131. PROVIDE ALL NECESSARY ACCESSORIES TO ENSURE A COMPLETE INSTALLATION.

C RECEPTACLES AND DATA OUTLETS SHOWN ON HIGHLIGHTED AREA FOR AV SYSTEM. THE ELECTRICAL CONTRACTOR SHALL CONFIRM RECEPTACLE AND DATA OUTLET LOCATIONS WITH THE GENERAL CONTRACTOR PRIOR TO ROUGH-INS.

D PROVIDE POWER CONNECTIONS TO INDICATED MECHANICAL UNIT WITH NEW LOCAL DISCONNECT SWITCH, WIRING AND CONDUIT. COORDINATE WITH MECHANICAL ON SITE PRIOR TO ROUGH-INS.

E CONNECT NEW EXIT SIGNS TO NEAREST EXISTING EMERGENCY LIGHTING CIRCUIT WITH SPARE CAPACITY TO SUIT. MODIFY AND/OR EXTEND EXISTING BRAHCN WIRING AS REQUIRED. ENSURE CIRCUIT NOT TO BE OVERLOADED.

F ALL TYPE 'D1' DOWNLIGHTS EXCLUDING EMERGENCY LIGHTS AND DWONLIGHTS IN LIGHTING CONTROL ZONE 'Z3A' IN ROOM #2902 SHALL BE LIGHTING CONTOL ZONE 'Z3B'.

G CONNECT INDICATED LIGHTING FIXTURE TO NEAREST EXISTING 120V EMERGENCY LIGHTING CIRCUIT WITH SPARE CAPACITY TO SUIT.

H PROVIDE CEILING-MOUNTED DUAL TECHNOLOGY OCCUPANCY SENSOR AS SPECIFIED. MODIFY EXISTING LIGHTING CIRCUIT IN THIS WASHROOM TO ENSURE NORMAL LIGHTING CIRCUIT TO BE CONTOLLED BY THIS SENSOR.

I PROVIDE NEW FIRE ALARM STROBE CIRCUIT(S) FROM NEW FIRE ALARM BOOSTER PANEL TO FIRE ALARM STROBES AND FIRE ALARM SPEAKER STROBES IN RENOVATION AREA. PROVIDE ALL NECESSARY ACCESSOIREIS TO ENSURE A COMPLETE FUNCTIONAL INSTALLATION.

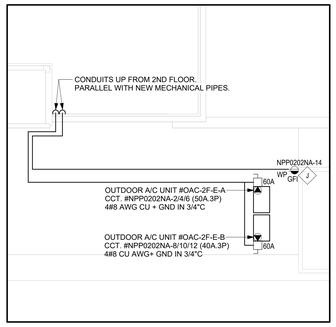
J PROVIDE WEATHERPROOF 20A, 120V, GFI DUPLEX RECEPTACLE C/W 1-GANG EXTRA-DUTY METALLIC WHILE-IN-USE WEATHERPROOF COVER (HUBBELL, CAT. #WP8EH) FOR HORIZONTAL MOUNTING AT 750mm ABOVE FLOOR LEVEL. PROVIDE MOUNTING SUPPORT AS REQUIRED AND COORDINATE WITH GENERAL TRADE.

LIGHTING ZONE CIRCUITS - 2ND FLOOR

RM No.	SWITCH No.	LTG ZONE	WATTAGE	CIRCUIT No.	LPD (W/m2)	SB-10 LPD (W/m2)
2902A	N/A	N/A	42	NRP0202NA-6	7.69	6.8
2902B	N/A	N/A	31	NRP0202NA-6	11.97	4.6
2902	S3A	Z3A	308	NRP0202NA-4	6.12	11.5
	S3B	Z3B	280			
	S3C	Z3C	756			
	N/A	N/A	196	EX. EMERGENCY LIGHTING CIRCUIT		
2015	S2A	Z2A	114	NRP0202NA-6	5.69	11.5
	S2B	Z2B	312			
	N/A	N/A	190	EX. EMERGENCY LIGHTING CIRCUIT		
2021	S1A	Z1A	140	NRP0202NA-8	6.27	6.7
	N/A	N/A	28	EX. EMERGENCY LIGHTING CIRCUIT		
	S1B	Z1B	252	NRP0202NA-8	10.47	11.5
	S1C	Z1C	280			
	N/A	N/A	56	EX. EMERGENCY LIGHTING CIRCUIT		
2021A	N/A	N/A	31	NRP0202NA-8	8.73	10.4
2002	N/A	N/A	42	EX. LIGHTING CIRCUIT	6.52	9.1
2003	N/A	N/A	42	EX. LIGHTING CIRCUIT	6.55	9.1
				TOTAL ALLOWED WATTAGE:	5124.81	
				TOTAL CONNECTED WATTAGE:	3068.80	

LIGHTING SEQUENCE OF OPERATION - 2ND FLOOR

1. LIGHTS SHALL BE MANUALLY SWITCHED ON.
2. DEFAULT LIGHTING LEVEL FOR ALL LIGHTING ZONES SHALL BE SET TO 60%.
3. LIGHTS SHALL AUTOMATICALLY SHUT OFF WHEN THE SPACE HAS BEEN VACANT FOR 20 MINUTES.
4. EMERGENCY LIGHTS SHALL NOT BE CONTROLLED BY THE LIGHTING CONTROL SYSTEM.
5. ONLY LIGHTING ZONES Z1B-1, Z2A & Z3A SHALL AUTOMATICALLY DIM VIA DAYLIGHTING SENSORS INSTALLED WITHIN THE SAME ZONE.



6 / E301 PART ROOF PLAN - NEW ELECTRICAL LAYOUT
SCALE: 1 : 100

FIELD DEVICE LEGEND

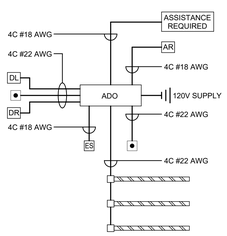
SYM.	DESCRIPTION	SYM.	DESCRIPTION
ADO	AUTOMATIC DOOR OPERATOR	AR	"ASSISTANCE REQUESTED" DEVICE
●	DOOR ACTIVATION DEVICE	ASSISTANCE REQUIRED	"ASSISTANCE REQUIRED" SIGN
ES	ELECTRIC STRIKE		
DL	DOOR LOCK DEVICE (PUSH TO LOCK PLATE SWITCH)		EMERGENCY CALL STRIP. "EMERGENCY ALARM - PRESS FOR ASSISTANCE". BLACK LETTERING ON YELLOW BACKGROUND. PROVIDE LAMACOID PLATE. 1/4" HIGH RED LETTERS ON WHITE BACKGROUND TO READ, "EMERGENCY PUSH STRIP - USE ONLY IN AN EMERGENCY." MOUNT LABEL ABOVE EACH PUSH STRIP.
DR	DOOR RESET BUTTON. PROVIDE LAMACOID PLATE, 1/8" HIGH BLACK LETTERS ON WHITE BACKGROUND TO READ "PRESS TO RESET".		

SEQUENCE OF OPERATION (ACCESSIBLE WASHROOM):

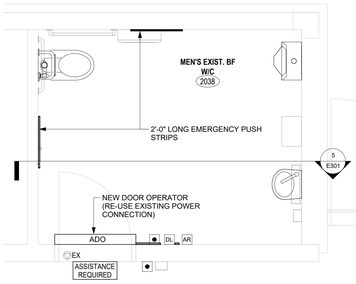
a. DOOR ACTIVATION DEVICE OPENS DOOR.
b. DOOR LOCK DEVICE DEACTIVATES EXTERIOR DOOR ACTIVATION DEVICE, LOCKS THE DOOR & ACTIVATES THE IN USE SIGN.
c. INTERIOR DOOR ACTIVATION DEVICE UNLOCKS AND OPENS THE DOOR & DEACTIVATES THE IN USE SIGN.
d. EMERGENCY CALL STRIPS ACTIVATE THE ASSISTANCE REQUIRED SIGN, THE AUDIBLE BUZZER & UNLOCKS THE DOOR.
e. DOOR RESET BUTTON RETURNS THE SYSTEM TO NORMAL MODE.

NOTES:

1. FOR EXACT HEIGHTS, REFER TO ARCHITECTURAL DRAWINGS.
2. LOW VOLTAGE WIRING SHALL BE COPPER CONDUCTORS.
3. ALL LOW VOLTAGE WIRING SHALL BE STRANDED & SHIELDED INSTALLED IN CONDUIT OR PLENUM RATED IN HOLLOW METAL DOOR FRAME WHERE ACCESSIBLE.
4. RUN WIRES IN TO HEADER OF AUTOMATIC DOOR OPERATOR OPPOSITE HINGE SIDE ABOVE DOOR JAMB TO ALLOW FOR ORGANIZED LOW VOLTAGE WIRING DUE TO LOCATION OF RELAY.
5. MINIMUM CONDUIT SIZE TO BE 3/4".



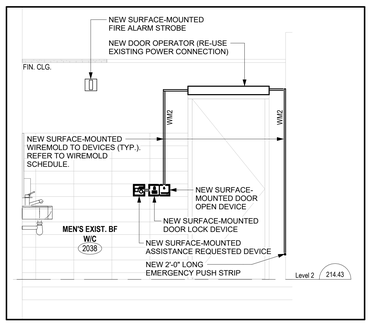
LOCKABLE & ALARMED WASHROOM DOOR SCHEMATIC



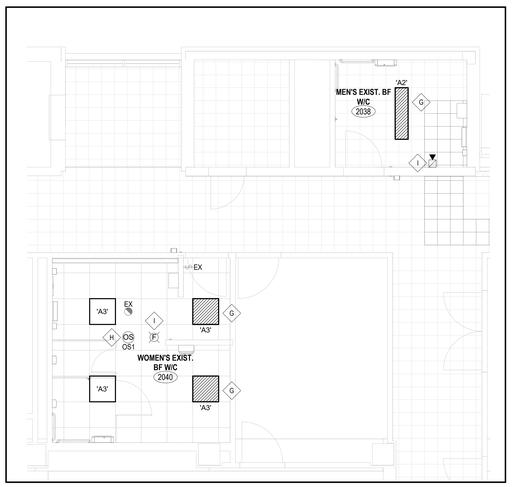
4 / E301 WASHROOM #2038 - DOOR WIRING SCHEMATIC & NEW ELECTRICAL LAYOUT
SCALE: 1 : 25

WIREMOLD TYPE SCHEDULE

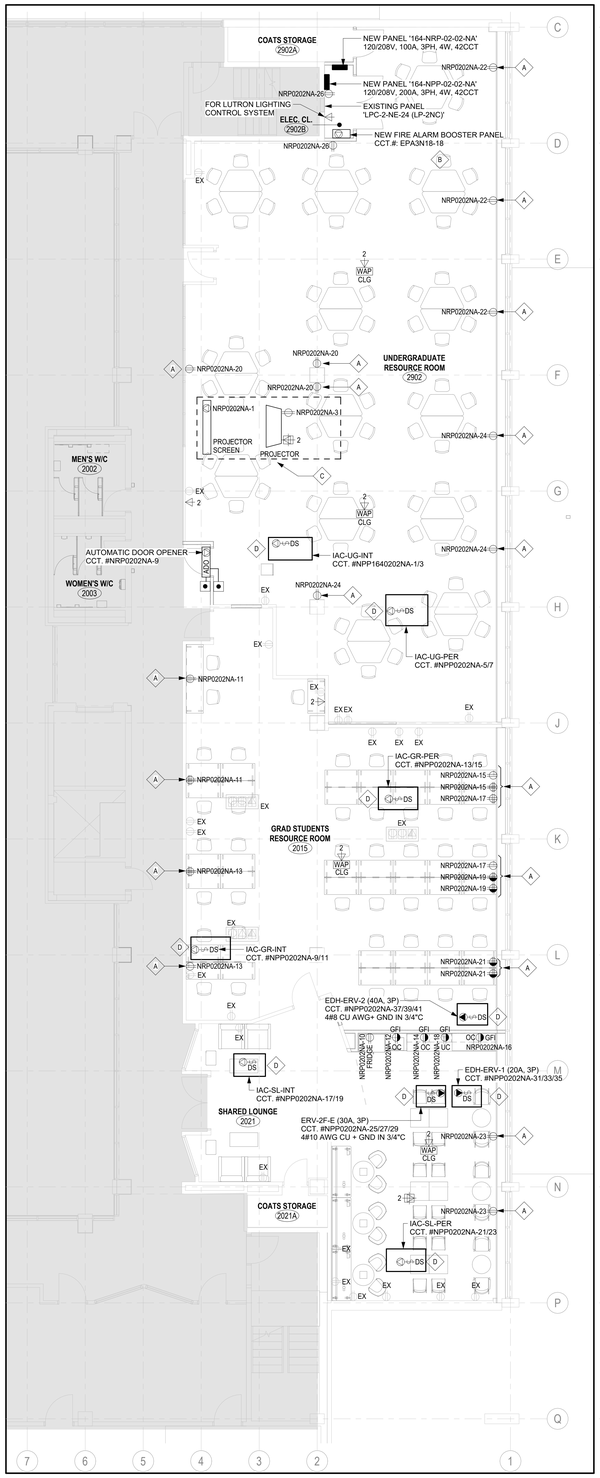
SYMBOL	TYPE	MATERIAL	COLOR	NOTES
WM1	LEGRAND 500 SERIES WIREMOLD	METALLIC	WHITE (STANDARD)	COMPLETE WITH ALL REQUIRED ACCESSORIES
WM2	LEGRAND 700 SERIES WIREMOLD	METALLIC	WHITE (STANDARD)	COMPLETE WITH ALL REQUIRED ACCESSORIES
WM3	LEGRAND PN05L WIREMOLD	NON-METALLIC	WHITE (STANDARD)	COMPLETE WITH ALL REQUIRED ACCESSORIES



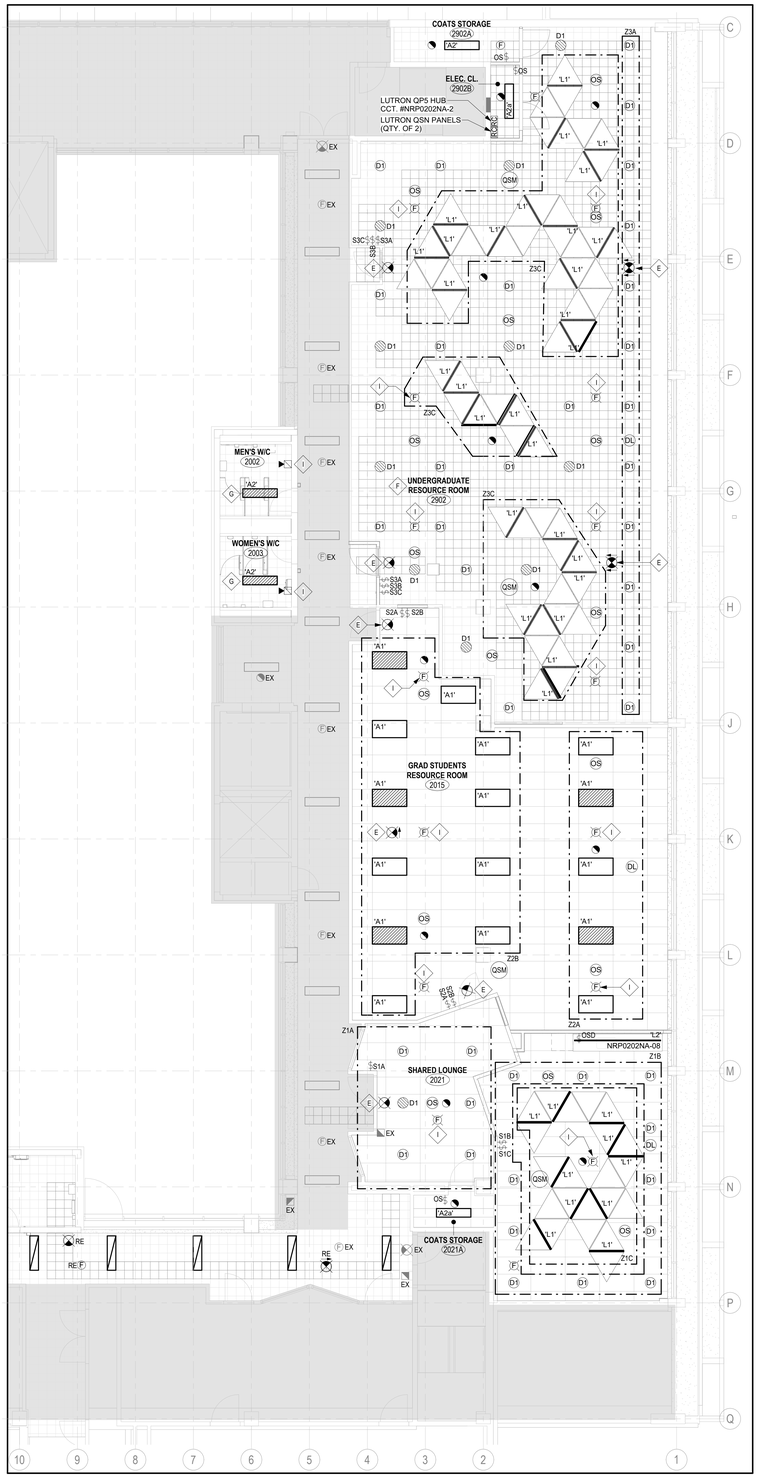
5 / E301 WR #2038 SOUTH ELEVATION - NEW ELECTRICAL LAYOUT
SCALE: 1 : 25



3 / E301 PART 2ND FLOOR PLAN (SOUTH WASHROOMS) - NEW LIGHTING LAYOUT
SCALE: 1 : 50



2 / E301 PART 2ND FLOOR PLAN (EAST) - NEW ELECTRICAL LAYOUT
SCALE: 1 : 75



1 / E301 PART 2ND FLOOR PLAN (EAST) - NEW LIGHTING LAYOUT
SCALE: 1 : 75

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.

REV.	DESCRIPTION	DATE
	ISSUED FOR TENDER	2026-04-22
	ISSUED FOR 80% CD	2026-03-09
	ISSUED FOR PERMIT	2026-02-27
	ISSUED FOR CLASS A COSTING	2026-02-18
	ISSUED FOR 100% DD	2026-01-23
	ISSUED FOR CLASS B COSTING	2026-01-16
	ISSUED FOR 50% DD	2025-11-28
	ISSUED FOR 100% SCHEMATIC DESIGN	2025-09-19
	ISSUED FOR CLASS C COSTING	2025-09-05

KEY PLAN (NTS) | SEAL

PROJECT TITLE:
UNIVERSITY OF TORONTO
33 URSULA FRANKLIN MATH OFFICE RENOVATION

33 Ursula Franklin Street

DRAWING SHEET TITLE
SECOND FLOOR PLAN - NEW ELECTRICAL & LIGHTING LAYOUTS

DRAWN BY: GDP | SCALE: As indicated
REVIEWED BY: JW | DATE CREATED: 2025-05-27
UNIVERSITY PROJECT NUMBER: P164-24-165 | NORTH POINT

DRAWING NUMBER: **E301** | REV. NUMBER

NEW KEYED NOTES

A PROVIDE TYPE 'WM1' SURFACE-MOUNTED WIREMOLD RACEWAY, 1-GANG OUTLET BOX & ACCESSORIES FOR INDICATED RECEPTACLE. RUN THE WIREMOLD TO ACCESSIBLE CEILING SPACE VIA THE NEAREST FULL-HEIGHT PARTITION. REFER TO WIREMOLD TYPE SCHEDULE ON THIS DRAWING.

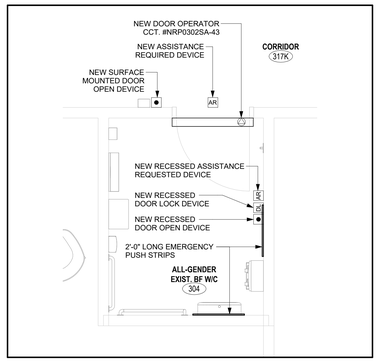
B PROVIDE TYPE 'WM3' SURFACE-MOUNTED WIREMOLD RACEWAY, 1-GANG OUTLET BOX & ACCESSORIES FOR INDICATED DATA OUTLET. RUN THE WIREMOLD TO ACCESSIBLE CEILING SPACE VIA THE NEAREST FULL-HEIGHT PARTITION. REFER TO WIREMOLD TYPE SCHEDULE ON DRAWING E301.

C RECEPTACLES AND DATA OUTLETS SHOWN ON HIGHLIGHTED AREA FOR AV SYSTEM. THE ELECTRICAL CONTRACTOR SHALL CONFIRM RECEPTACLE AND DATA OUTLET LOCATIONS WITH THE GENERAL CONTRACTOR PRIOR TO ROUGH-INS.

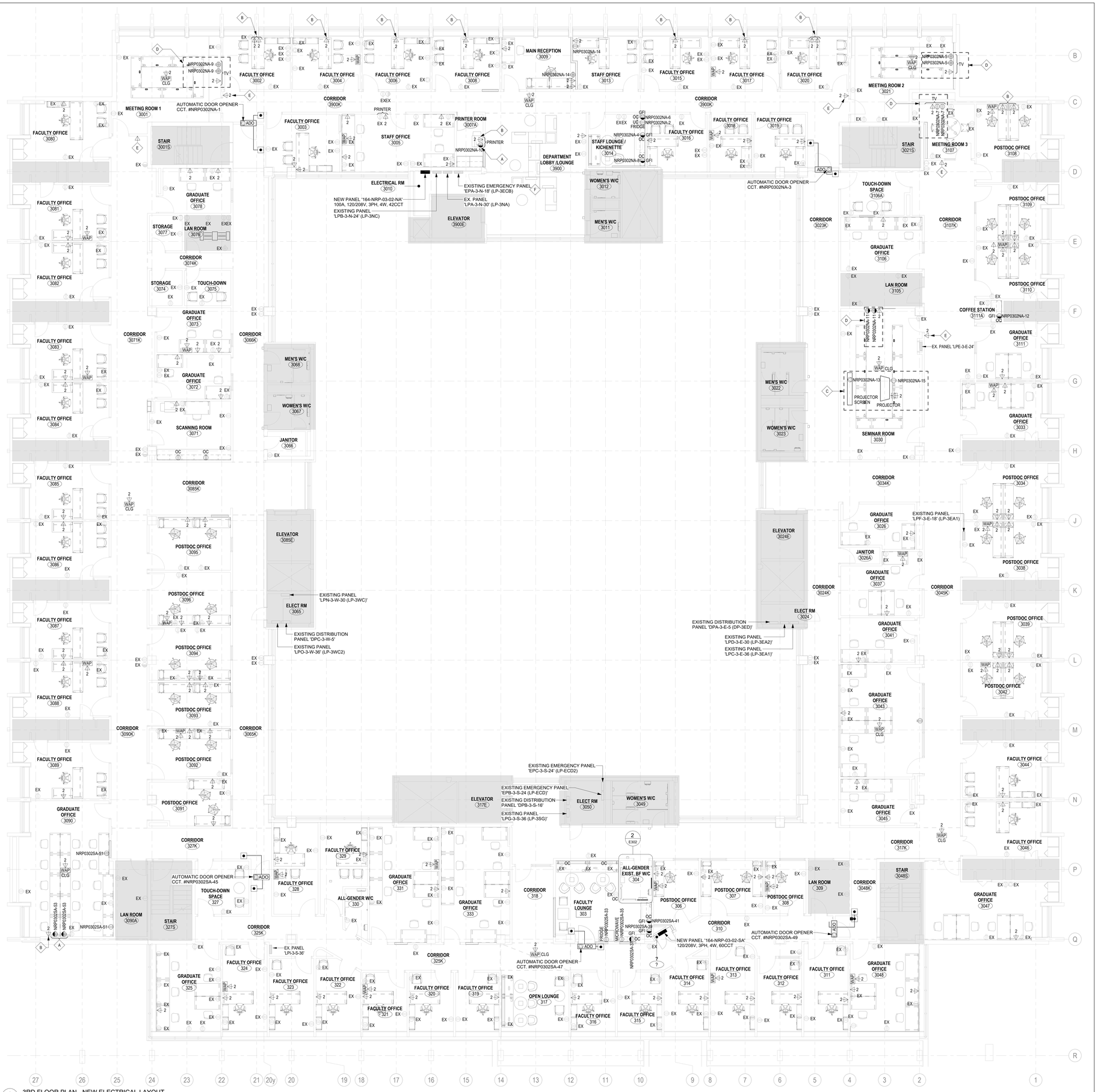
D RECEPTACLES AND DATA OUTLETS SHOWN ON HIGHLIGHTED AREA ARE RECEESED FOR AV SYSTEM. THE ELECTRICAL CONTRACTOR SHALL CONFIRM RECEPTACLE AND DATA OUTLET LOCATIONS WITH THE GENERAL CONTRACTOR PRIOR TO ROUGH-INS. COORDINATE WITH GENERAL CONTRACOTR FOR DRYWALL REPAIR.

E INDICATED DATA OUTLET IS FOR ROOM BOOKING SYSTEM. COORDINATE EXACT LOCATION WITH AV CONTRACTOR PRIOR TO ROUGH-INS.

F PROVIDE ONE (1) 15A/1P BREAKER IN EXISTING PANEL (CANADIAN GENERAL ELECTRIC, ANLB) TO FEED NEW FIRE ALARM BOOSTER PANEL IN ELECTRICAL CLOSET #2902B.



2 E302 WASHROOM #304 PLAN - NEW ELECTRICAL LAYOUT
SCALE: 1 : 25



1 E302 3RD FLOOR PLAN - NEW ELECTRICAL LAYOUT
SCALE: 1 : 75

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.

REV.	DESCRIPTION	DATE
	ISSUED FOR TENDER	2026-04-22
	ISSUED FOR 80% CD	2026-03-09
	ISSUED FOR PERMIT	2026-02-27
	ISSUED FOR CLASS A COSTING	2026-02-18
	ISSUED FOR 100% DD	2026-01-23
	ISSUED FOR CLASS B COSTING	2026-01-16
	ISSUED FOR 50% DD	2025-11-28
	ISSUED FOR 100% SCHEMATIC DESIGN	2025-09-19
	ISSUED FOR CLASS C COSTING	2025-09-05

KEY PLAN (NTS)

SEAL

PROJECT TITLE:
UNIVERSITY OF TORONTO
33 URSULA FRANKLIN MATH OFFICE RENOVATION

33 Ursula Franklin Street

DRAWING SHEET TITLE
THIRD FLOOR PLAN - NEW ELECTRICAL LAYOUT

DRAWN BY: GDP
SCALE: As indicated
REVIEWED BY: JW
DATE CREATED: 2025-05-27
UNIVERSITY PROJECT NUMBER: P164-24-165
NORTH POINT

DRAWING NUMBER
E302
REV. NUMBER

NEW KEYED NOTES

A PROVIDE FIRE ALARM SMOKE DETECTOR C/W AUXILIARY CONTACTS. CONNECT THIS DETECTOR TO FIRE ALARM SYSTEMA AND ELEVATOR CONTROL PANEL FOR EMERGENCY RECALL.

B CONNECT NEW EXIT SIGNS TO NEAREST EXISTING EMERGENCY LIGHTING CIRCUIT WITH SPARE CAPACITY TO SUIT. MODIFY AND/OR EXTEND EXISTING BRAHCN WIRING AS REQUIRED. ENSURE CIRCUIT NOT TO BE OVERLOADED.

C PROVIDE LUTRON PICO WIRLESS LOW VOLTAGE SWITCHES (QTY. OF 8) AS SPECIFIED FOR CORRIDOR LIGHTING ZONES (LIGHTING ZONES Z4A TO Z4H).

D PROVIDE 3/4" CONDUIT BETWEEN LUTRON QSN PANELS TO LUTRON HUB IN ELEC CLOSET #2902B FOR QS LINKS.

E PROVIDE LUTRON POWPAK DIMMING MODULE (CAT #: RMJS-8T-DV-B) FOR INDATED ROOM. REFER TO DETAIL 1 ON DRAWING E501. PROVIDE ALL NECESSARY ACCESSOIRES TO ENSURE A COMPLETE INSTALLATION.

F UNDER CABINET LIGHTS 'L3a' & 'L3b' SHALL BE CONTROLLED BY THE SAME OCCUPANCY SENSOR DIMMER SWITCH AND FED FROM THE SAME POWER SUPPLY. JUMPING CABLE SHALL NOT BE USED.

G LUTRON DIN RAIL POWER SUPPLY (CAT.#: QSPS-DH-1-75) TO BE INSTALLED IN AN ENCLOSURE ABOVE THE CEILING SPACE. PROVIDE 120V/15A POWER CONNECTION AS INDICATED.

H PROVIDE NEW FIRE ALARM STROBE CIRCUIT(S) FROM NEW FIRE ALARM BOOSTER PANEL TO FIRE ALARM STROBES AND FIRE ALARM SPEAKER STROBES IN RENOVATION AREA. PROVIDE ALL NECESSARY ACCESSOIREIS TO ENSURE A COMPLETE FUNCTIONAL INSTALLATION.

I PROVIDE TYPE 'WM1' SURFACE-MOUNTED WIREMOLD RACEWAY, 1-GANG OUTLET BOX & ACCESSORIES FOR INDICATED SENSOR SWITCH. RUN THE WIREMOLD TO ACCESSIBLE CEILING SPACE VIA THE NEAREST FULL-HEIGHT PARTITION. REFER TO WIREMOLD TYPE SCHEDULE ON THIS DRAWING.

LIGHTING ZONE CIRCUITS - 3RD FLOOR

RM No.	SWITCH No.	LTG ZONE	WATTAGE	CIRCUIT No.	LPD (W/m2)	SB-10 LPD (W/m2)
3900	S4A	Z4A	294	NRP0302NA-34	9.02	10.8
	N/A		252	EX. EMERGENCY LIGHTING CIRCUIT		
3900K	S4A		364	NRP0302NA-34	10.26	7.1
	N/A		56	EX. EMERGENCY LIGHTING CIRCUIT		
3023K	S4B	Z4B	168	NRP0302NA-36	7.43	
	N/A		84	EX. EMERGENCY LIGHTING CIRCUIT		
3024K	S4B		210	NRP0302NA-36	8.02	
	N/A		84	EX. EMERGENCY LIGHTING CIRCUIT		
3034K	S4B		30	NRP0302NA-36	3.91	
	N/A		42	EX. EMERGENCY LIGHTING CIRCUIT		
3017K	S4C	Z4C	162	NRP0302NA-36	6.11	
	N/A		102	EX. EMERGENCY LIGHTING CIRCUIT		
3045K	S4C		210	NRP0302NA-36	5.83	
	N/A		84	EX. EMERGENCY LIGHTING CIRCUIT		
325K	S4D	Z4D	204	NRP0302NA-38	6.44	
	N/A		174	EX. EMERGENCY LIGHTING CIRCUIT		
3048K	S4D		42	NRP0302NA-38	9.67	
	N/A		42	EX. EMERGENCY LIGHTING CIRCUIT		
310	S4E	Z4E	118	NRP0302NA-38	7.72	
	N/A		88	EX. EMERGENCY LIGHTING CIRCUIT		
318K	S4E		30	NRP0302NA-38	5.46	
	N/A		30	EX. EMERGENCY LIGHTING CIRCUIT		
325K	S4E		148	NRP0302NA-38	8.01	
	N/A		118	EX. EMERGENCY LIGHTING CIRCUIT		
317	S4E		168	NRP0302NA-38	14.31	10.8
	N/A		56	EX. EMERGENCY LIGHTING CIRCUIT		
327K	S4F	Z4F	90	NRP0302NA-38	8.16	7.1
	N/A		60	EX. EMERGENCY LIGHTING CIRCUIT		
3071K	S4G	Z4G	150	NRP0302NA-38	5.37	
	N/A		90	EX. EMERGENCY LIGHTING CIRCUIT		
3090K	S4G		150	NRP0302NA-38	6.14	
	N/A		90	EX. EMERGENCY LIGHTING CIRCUIT		
3066K	S4H	Z4H	168	NRP0302NA-40	7.56	
	N/A		126	EX. EMERGENCY LIGHTING CIRCUIT		
3085K	S4H		102	NRP0302NA-40	4.98	
	N/A		72	EX. EMERGENCY LIGHTING CIRCUIT		
3065K	S4H		126	NRP0302NA-40	5.66	
	N/A		84	EX. EMERGENCY LIGHTING CIRCUIT		
				TOTAL ALLOWED WATTAGE:	4543.24	
				TOTAL CONNECTED WATTAGE:	4402.00	

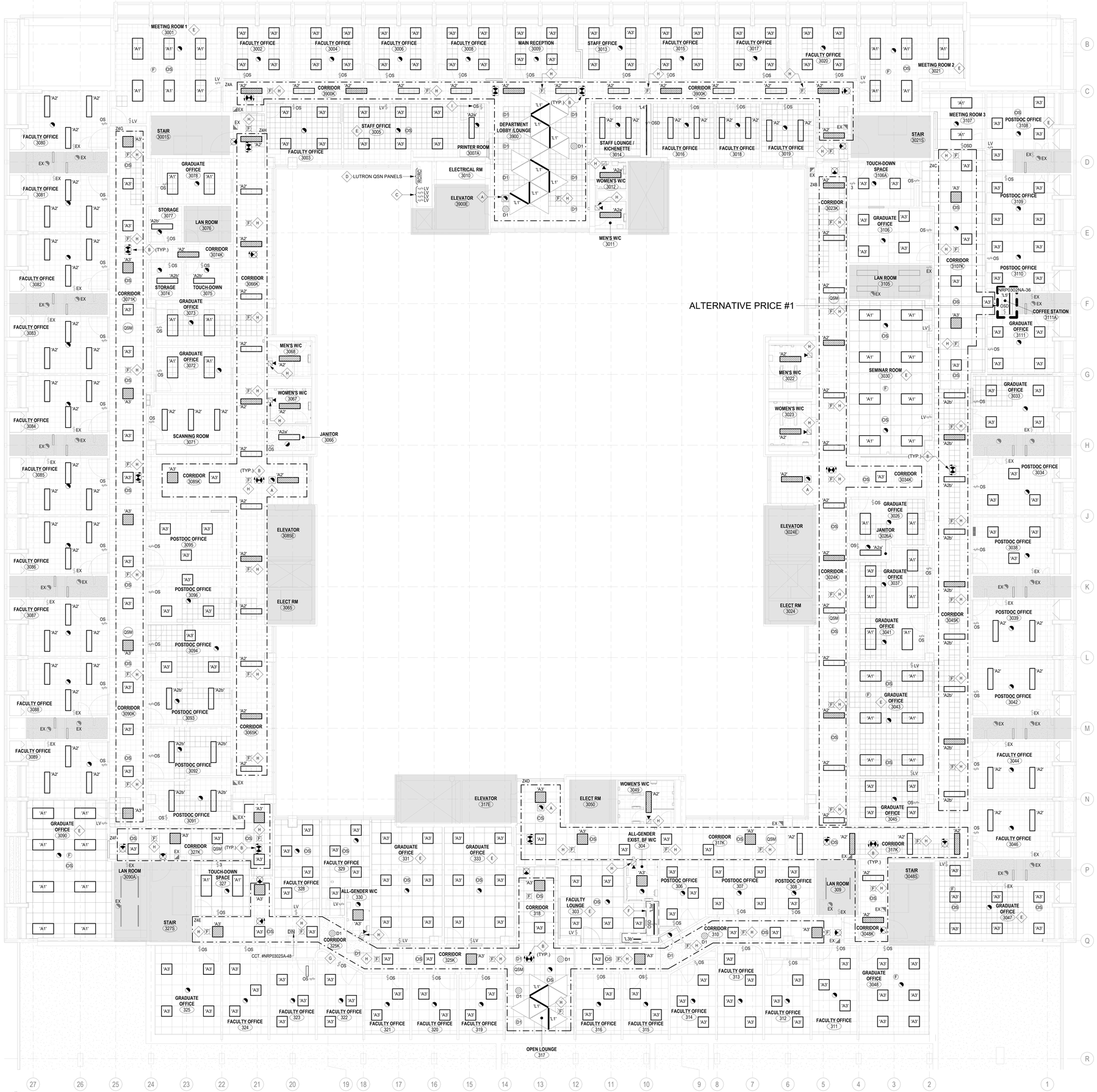
LIGHTING SEQUENCE OF OPERATION - 3RD FLOOR

1. DEFAULT CORRIDOR LIGHTING LEVEL SHALL BE SET TO 80%.
2. LIGHTS SHALL AUTOMATICALLY DIM DOWN TO 20% WHEN THE SPACE HAS BEEN VACANT FOR 20 MINUTES.
3. EMERGENCY LIGHTS SHALL NOT BE CONTROLLED BY THE LIGHTING CONTROL SYSTEM.

ALTERNATIVE PRICE #1

ELECTRICAL CONTRACTOR SHALL PROVIDE THE ITEM BELOW AS AN ALTERNATIVE PRICE

- PROVIDE ONE (1) TYPE 'L5' UNDER CABINET LIGHT AND ONE (1) WALL MOUNTED OCCUPANCY SENSOR DIMMER SWITCH AS SPECIFIED AND CONNECT TO CIRCUIT AS NOTED.



1 E303 3RD FLOOR PLAN - NEW LIGHTING LAYOUT
SCALE: 1 : 75

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.

REV.	DESCRIPTION	DATE
	ISSUED FOR TENDER	2026-04-22
	ISSUED FOR 80% CD	2026-03-09
	ISSUED FOR PERMIT	2026-02-27
	ISSUED FOR CLASS A COSTING	2026-02-18
	ISSUED FOR 100% DD	2026-01-23
	ISSUED FOR CLASS B COSTING	2026-01-16
	ISSUED FOR 50% DD	2025-11-28
	ISSUED FOR 100% SCHEMATIC DESIGN	2025-09-19
	ISSUED FOR CLASS C COSTING	2025-09-05

KEY PLAN (NTS) | SEAL

PROJECT TITLE:
UNIVERSITY OF TORONTO
33 URSULA FRANKLIN MATH OFFICE RENOVATION

33 Ursula Franklin Street

DRAWING SHEET TITLE
THIRD FLOOR PLAN - NEW LIGHTING LAYOUT

DRAWN BY: GDP | SCALE: As indicated
REVIEWED BY: JW | DATE CREATED: 2025-05-27
UNIVERSITY PROJECT NUMBER: P164-24-165 | NORTH POINT

DRAWING NUMBER: **E303** | REV. NUMBER

BLDG #: 164 PANEL TAG: 164-NRP-02-02-NA DATE MODIFIED:

CONNECTED LOAD (W)	DEMAND FACTOR	TOTAL DEMAND	DESCRIPTION (Item, Room Number[s]):	BKR (A)	CT	CT	BKR (A)	DESCRIPTION (Item, Room Number[s]):	CONNECTED LOAD (W)	DEMAND FACTOR	TOTAL DEMAND
300	0.50	150	RM #2902 - PROJECTOR SCREEN	15A	1 A	2	15A	LIGHTING CONTROL PANELS	200	1.00	200
300	0.50	150	RM #2902 - PROJECTOR	15A	3 B	4	15A	RM #2902 - LIGHTING	1316	1.00	1316
		0	SPARE	15A	5 C	6	15A	RM #2015, 2902A & 2902B - LIGHTING	453	1.00	453
		0	SPARE	15A	7 A	8	15A	RM #2021 - LIGHTING	703	1.00	703
300	0.50	150	DOOR #2902 - AUTOMATIC DOOR OPENER	15A	9 B	10	15A	RM #2021 - FRIDGE	500	0.80	400
1200	0.50	600	RM #2015 - RECEPTACLES (QTY. 2)	15A	11 C	12	20A	RM #2021 - COUNTERTOP RECEPTACLE	1000	0.80	800
1200	0.50	600	RM #2015 - RECEPTACLES (QTY. 2)	15A	13 A	14	20A	RM #2021 - COUNTERTOP RECEPTACLE	1000	0.80	800
1200	0.50	600	RM #2015 - RECEPTACLES (QTY. 2)	15A	15 B	16	20A	RM #2021 - COUNTERTOP RECEPTACLE	1000	0.80	800
1200	0.50	600	RM #2015 - RECEPTACLES (QTY. 2)	15A	17 C	18	15A	RM #2021 - INSTANT HOT WATER	1500	0.50	750
1600	0.50	800	RM #2015 - RECEPTACLES (QTY. 2)	20A	19 A	20	15A	RM #2902 - RECEPTACLES (QTY. 3)	600	0.50	300
1600	0.50	800	RM #2015 - RECEPTACLES (QTY. 2)	20A	21 B	22	15A	RM #2902 - RECEPTACLES (QTY. 3)	600	0.50	300
400	0.50	200	RM #2021 - RECEPTACLES (QTY. 2)	15A	23 C	24	15A	RM #2902 - RECEPTACLES (QTY. 3)	600	0.50	300
		0	SPARE	15A	25 A	26	15A	RM #2902 & #2902B - RECEPTACLES (QTY. 2)	400	0.50	200
		0	SPARE	15A	27 B	28	15A	SPARE			0
		0	SPARE	15A	29 C	30	15A	SPARE			0
		0	SPARE	20A	31 A	32	15A	SPARE			0
		0	SPARE	20A	33 B	34	15A	SPARE			0
		0	SPACE		35 C	36		SPACE			0
		0	SPACE		37 A	38		SPACE			0
		0	SPACE		39 B	40		SPACE			0
		0	SPACE		41 C	42		SPACE			0

BLDG: 164 FLOOR: 2nd Floor ROOM: 2902B NEW TAG: 164-NRP-02-02-NA

RATINGS: 100A 120/208V 3 PHASE 4 WIRE S.C.: 18kAIC

FED FROM:	PANEL TAG:	BLDG #:	ROOM #:	BREAKER SIZE	FEEDER SIZE:
	DPA-3-E-5 (DP-3ED)	164	3024	100A	4#3 CU + GND

BLDG #: 164 PANEL TAG: 164-NPP-02-02-NA DATE MODIFIED:

CONNECTED LOAD (W)	DEMAND FACTOR	TOTAL DEMAND	DESCRIPTION (Item, Room Number[s]):	BKR (A)	CT	CT	BKR (A)	DESCRIPTION (Item, Room Number[s]):	CONNECTED LOAD (W)	DEMAND FACTOR	TOTAL DEMAND
375	0.50	187.5	RM#2092 - IAC-UG-INT	15A / 2P	1 A	2	50A / 3P	ROOF - OAC-2F-E-A	5740	0.50	2870.12
375	0.50	187.5			3 B	4			5740	0.50	2870.12
710	0.50	355	RM#2092 - IAC-UG-PER	15A / 2P	5 C	6			5740	0.50	2870.12
710	0.50	355			7 A	8	40A / 3P	ROOF - OAC-2F-E-B	4383	0.50	2191.62
312	0.50	156	RM#2015 - IAC-GR-INT	15A / 2P	9 B	10			4383	0.50	2191.62
312	0.50	156			11 C	12			4383	0.50	2191.62
374	0.50	187.2	RM#2015 - IAC-GR-PER	15A / 2P	13 A	14	20A	ROOF - GFI RECEPTACLE	200	0.50	100
374	0.50	187.2			15 B	16		SPACE			0
198	0.50	98.8	RM#2021 - IAC-SL-INT	15A / 2P	17 C	18		SPACE			0
198	0.50	98.8			19 A	20		SPACE			0
322	0.50	161.2	RM#2021 - IAC-SL-PER	15A / 2P	21 B	22		SPACE			0
322	0.50	161.2			23 C	24		SPACE			0
1621	0.50	810.6	RM#2021 - ERV-2F-E	30A / 3P	25 A	26		SPACE			0
1621	0.50	810.6			27 B	28		SPACE			0
1621	0.50	810.6			29 C	30		SPACE			0
2084	0.50	1041.77	RM#2021 - EDH-ERV-1	20A / 3P	31 A	32		SPACE			0
2084	0.50	1041.77			33 B	34		SPACE			0
2084	0.50	1041.77			35 C	36		SPACE			0
4376	0.50	2187.87	RM#2021 - EDH-ERV-2	40A / 3P	37 A	38		SPACE			0
4376	0.50	2187.87			39 B	40		SPACE			0
4376	0.50	2187.87			41 C	42		SPACE			0

BLDG: 164 FLOOR: 2nd Floor ROOM: 2902B NEW TAG: 164-NPP-02-02-NA

RATINGS: 200A 120/208V 3 PHASE 4 WIRE S.C.: 18kAIC

FED FROM:	PANEL TAG:	BLDG #:	ROOM #:	BREAKER SIZE	FEEDER SIZE:
	DPC-1-N-12 (DP-1NA)	164	1107	200A	4 #3/0 CU + GND

BLDG #: 164 PANEL TAG: 164-NRP-03-02-NA DATE MODIFIED:

CONNECTED LOAD (W)	DEMAND FACTOR	TOTAL DEMAND	DESCRIPTION (Item, Room Number[s]):	BKR (A)	CT	CT	BKR (A)	DESCRIPTION (Item, Room Number[s]):	CONNECTED LOAD (W)	DEMAND FACTOR	TOTAL DEMAND
300	0.50	150	DOOR #3066K - AUTOMATIC DOOR OPENER	15A	1 A	2	15A	RM #3014 - FRIDGE	500	0.80	400
300	0.50	150	DOOR #3900K - AUTOMATIC DOOR OPENER	15A	3 B	4	20A	RM #3014 - COUNTERTOP RECEPTACLE	1000	0.80	800
300	0.50	150	RM #3021 - TV RECEPTACLE	15A	5 C	6	20A	RM #3014 - COUNTERTOP RECEPTACLE	1000	0.80	800
300	0.50	150	RM #3107 - TV RECEPTACLE	15A	7 A	8	20A	RM #3014 - COUNTERTOP RECEPTACLE	1000	0.80	800
300	0.50	150	RM #3001 - TV RECEPTACLE	15A	9 B	10	20A	RM #3007A - PRINTER	500	0.80	400
1000	0.50	500	RM #3030 - AV RACK	20A	11 C	12	20A	RM #3111A - COUNTERTOP RECEPTACLE	1000	0.80	800
300	0.50	150	RM #3030 - PROJECTOR SCREEN	15A	13 A	14	15A	OFFICE #3009 & #3013 - RECEPTACLES (QTY. 2)	600	0.80	480
300	0.50	150	RM #3030 - PROJECTOR	15A	15 B	16	15A	SPARE			0
		0	SPARE	15A	17 C	18	15A	SPARE			0
		0	SPARE	15A	19 A	20	15A	SPARE			0
		0	SPARE	15A	21 B	22		SPACE			0
		0	SPACE		23 C	24		SPACE			0
		0	SPACE		25 A	26		SPACE			0
		0	SPACE		27 B	28		SPACE			0
		0	SPACE		29 C	30		SPACE			0
		0	SPACE		31 A	32		SPACE			0
		0	SPACE		33 B	34	15A	CORR. #3900K & LOBBY #3900 - LIGHTING (Z4A)	658	1.00	658
		0	SPACE		35 C	36	15A	CORR. #317K, #3040K, #310, #318, #325K, #327K & LOUNGE #317 - LIGHTING (Z4B & Z4C)	766	1.00	766
		0	SPACE		37 A	38	15A	CORR. #3071K, #3090K, #3055K, #3065K & #3066K - LIGHTING (Z4D, Z4E & Z4F)	800	1.00	800
		0	SPACE		39 B	40	15A	CORR. #3071K, #3090K, #3055K, #3065K & #3066K - LIGHTING (Z4G & Z4H)	695	1.00	695
		0	SPACE		41 C	42	15A	LIGHTING CONTROL PANELS	200	1.00	200

BLDG: 164 FLOOR: 3rd Floor ROOM: 3010 NEW TAG: 164-NRP-03-02-NA

RATINGS: 100A 120/208V 3 PHASE 4 WIRE S.C.: 18kAIC

FED FROM:	PANEL TAG:	BLDG #:	ROOM #:	BREAKER SIZE	FEEDER SIZE:
	DPA-4-N-16 (DP-4NB)	164	4001	100A	4#3 CU + GND

BLDG #: 164 PANEL TAG: 164-NRP-03-02-SA DATE MODIFIED:

CONNECTED LOAD (W)	DEMAND FACTOR	TOTAL DEMAND	DESCRIPTION (Item, Room Number[s]):	BKR (A)	CT	CT	BKR (A)	DESCRIPTION (Item, Room Number[s]):	CONNECTED LOAD (W)	DEMAND FACTOR	TOTAL DEMAND
		0	TRANSFERRED LOADS - PLUGS	15A	1 A	2	15A	TRANSFERRED LOADS - LIGHTS			0
		0	TRANSFERRED LOADS - PLUGS	15A	3 B	4	15A	TRANSFERRED LOADS - LIGHTS			0
		0	TRANSFERRED LOADS - LIGHTS	15A	5 C	6	15A	TRANSFERRED LOADS - PLUGS			0
		0	TRANSFERRED LOADS - LIGHTS	15A	7 A	8	15A	TRANSFERRED LOADS - PLUGS			0
		0	TRANSFERRED LOADS - LIGHTS	15A	9 B	10	15A	TRANSFERRED LOADS - PLUGS			0
		0	TRANSFERRED LOADS - PLUGS	15A	11 C	12	15A	TRANSFERRED LOADS - PLUGS			0
		0	TRANSFERRED LOADS	15A	13 A	14	15A	TRANSFERRED LOADS - LIGHTS			0
		0	TRANSFERRED LOADS - PLUGS GFI WR	15A	15 B	16	15A	TRANSFERRED LOADS - LIGHTS			0
		0	TRANSFERRED LOADS - PLUGS	15A	17 C	18	15A	TRANSFERRED LOADS			0
		0	TRANSFERRED LOADS - PLUGS	15A	19 A	20	15A	TRANSFERRED LOADS			0
		0	TRANSFERRED LOADS - PLUGS	15A	21 B	22	15A	TRANSFERRED LOADS - PLUGS			0
		0	TRANSFERRED LOADS - PLUGS	15A	23 C	24	15A	TRANSFERRED LOADS - PLUGS			0
		0	TRANSFERRED LOADS - PLUGS	15A	25 A	26	20A	TRANSFERRED LOADS - PLUGS			**0**
		0	TRANSFERRED LOADS - PLUGS	15A	27 B	28	20A	TRANSFERRED LOADS - PLUGS			**0**
		0	TRANSFERRED LOADS - PLUGS	15A	29 C	30	20A	TRANSFERRED LOADS			**0**
		0	TRANSFERRED LOADS	20A	31 A	32	15A	TRANSFERRED LOADS - HEATER 3048			**0**
500	0.80	400	RM #303 - FRIDGE	15A	33 B	34	15A	TRANSFERRED LOADS			0
1000	0.80	800	RM #303 - MICROWAVE	15A	35 C	36	15A	TRANSFERRED LOADS			0
1000	0.80	800	RM #303 - COUNTER RECEPTACLE	20A	37 A	38	15A	TRANSFERRED LOADS			0
1000	0.80	800	RM #303 - COUNTER RECEPTACLE	20A	39 B	40	15A	TRANSFERRED LOADS			0
1000	0.80	800	RM #303 - COUNTER RECEPTACLE	20A	41 C	42	15A	TRANSFERRED LOADS			0
300	0.50	150	WR #304 - AUTOMATIC DOOR OPENER	15A	43 A	44	15A	TRANSFERRED LOADS			0
300	0.50	150	DOOR #327K - AUTOMATIC DOOR OPENER	15A	45 B	46	15A	TRANSFERRED LOADS			0
300	0.50	150	DOOR #304 - AUTOMATIC DOOR OPENER	15A	47 C	48	15A	LUTRON POWER SUPPLY	100	1.00	100
300	0.50	150	DOOR #348K - AUTOMATIC DOOR OPENER	15A	49 A	50		SPACE			0
600	0.50	300	OFFICE #3090 - RECEPTACLES (QTY. 2)	15A	51 B	52		SPACE			0
1600	0.50	800	OFFICE #3090 - RECEPTACLES (QTY. 2)	20A	53 C	54		SPACE			0
		0	SPARE	15A	55 A	56		SPACE			0
		0	SPARE	15A	57 B	58		SPACE			0
		0	SPARE	15A	59 C	60		SPACE			0

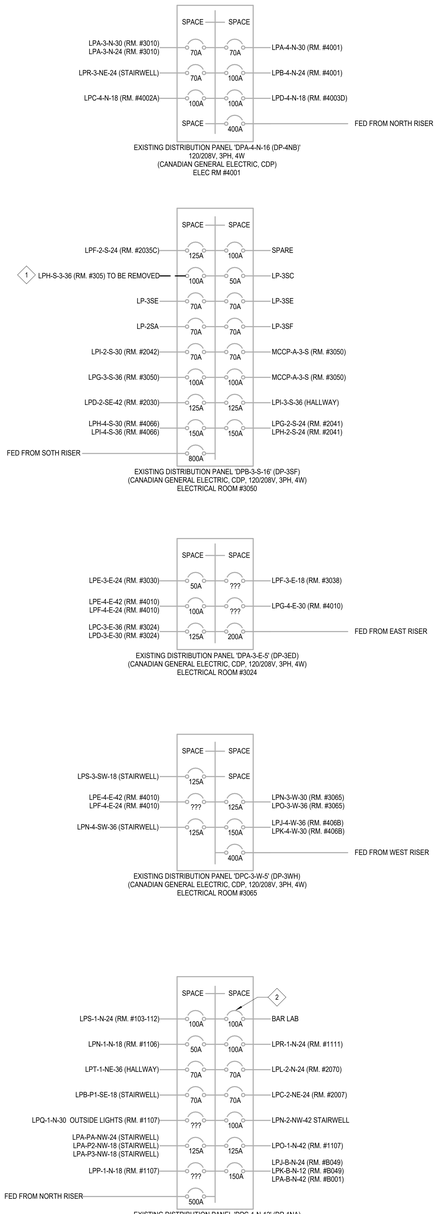
BLDG: 164 FLOOR: 3rd Floor ROOM: 310A NEW TAG: 164-NRP-03-02-SA

RATINGS: 100A 120/208V 3 PHASE 4 WIRE S.C.: 18kAIC

FED FROM:	PANEL TAG:	BLDG #:	ROOM #:	BREAKER SIZE	FEEDER SIZE:
	DPB-3-S-16 (DP-3SF)	164	3050	100A	4#3 AWG CU + GND

DEMOLITION KEYED NOTES

1. DISCONNECT & REMOVE EXISTING MAIN FEEDER TO THIS PANEL. UTILIZE EXISTING CONDUIT & RE-USE WITH A NEW FEEDER TO FEED NEW PANEL AS REQUIRED.
2. RELOCATE EXISTING 100A/3P BREAKER TO A DIFFERENT CELL TO ALLOW INSTALLATION OF A NEW 200A/3P BREAKER IN EXISTING DISTRIBUTION PANEL. MODIFY EXISTING FEEDER AS REQUIRED.



PARTIAL DEMOLITION SINGLE LINE DIAGRAM

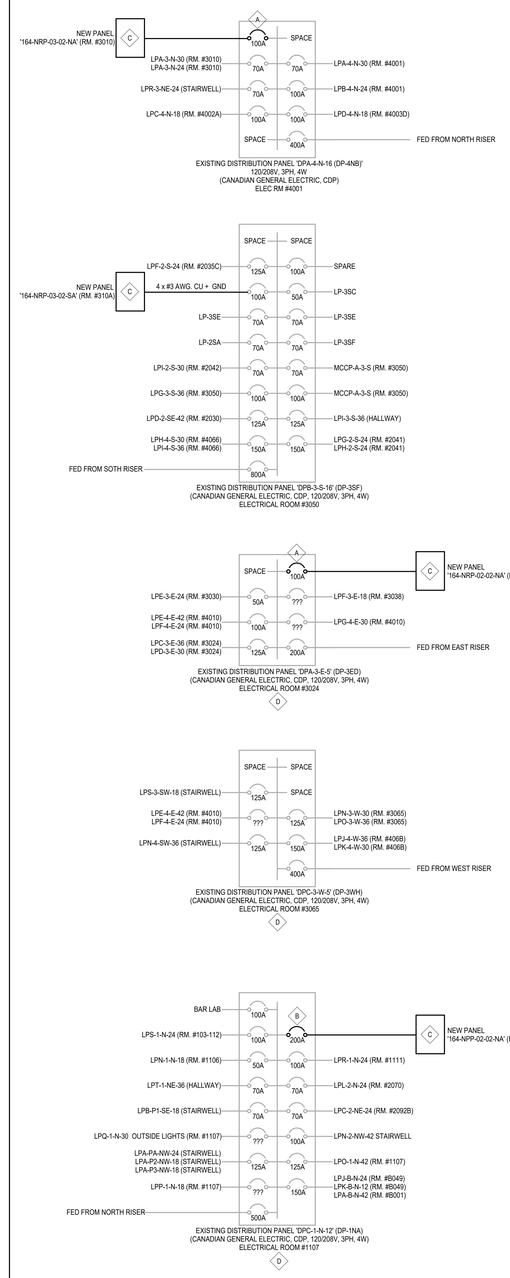
NEW KEYED NOTES

A. PROVIDE NEW 100A, 3P BREAKER IN THE EXISTING CANADIAN GENERAL ELECTRIC DISTRIBUTION PANEL C/W 4 x #3 AWG. CU + GND IN 35mm CONDUIT TO FEED NEW PANEL AS REQUIRED.

B. PROVIDE NEW 200A, 3P BREAKER IN THE EXISTING CANADIAN GENERAL ELECTRIC DISTRIBUTION PANEL C/W 4 x #3/0 AWG. CU + GND IN 53mm CONDUIT TO FEED NEW PANEL AS REQUIRED.

C. PROVIDE NEW PANELS AS INDICATED IN PANELS SCHEDULE. PROVIDE ARC FLASH STUDY IN ETAP VERSION 24 & AFFIX ARC FLASH LABELS ON PANELS AFTER INSTALLATION IS COMPLETE.

D. ELECTRICAL CONTRACTOR TO VERIFY THE BREAKER SIZE MAKRED AS "???" ON THIS DRAWING AND PROVIDE THE INFORMATION ON THE AS-BUILT DRAWING.



PARTIAL NEW SINGLE LINE DIAGRAM

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.

REV.	DESCRIPTION	DATE
	ISSUED FOR TENDER	2026-04-22
	ISSUED FOR 80% CD	2026-03-09
	ISSUED FOR PERMIT	2026-02-27
	ISSUED FOR CLASS A COSTING	2026-02-18
	ISSUED FOR 100% DD	2026-01-23
	ISSUED FOR CLASS B COSTING	2026-01-16
	ISSUED FOR 50% DD	2025-11-28
	ISSUED FOR 100% SCHEMATIC DESIGN	2025-09-19

KEY PLAN (NTS) | SEAL

PROJECT TITLE:
UNIVERSITY OF TORONTO
33 URSULA FRANKLIN MATH OFFICE RENOVATION

33 Ursula Franklin Street

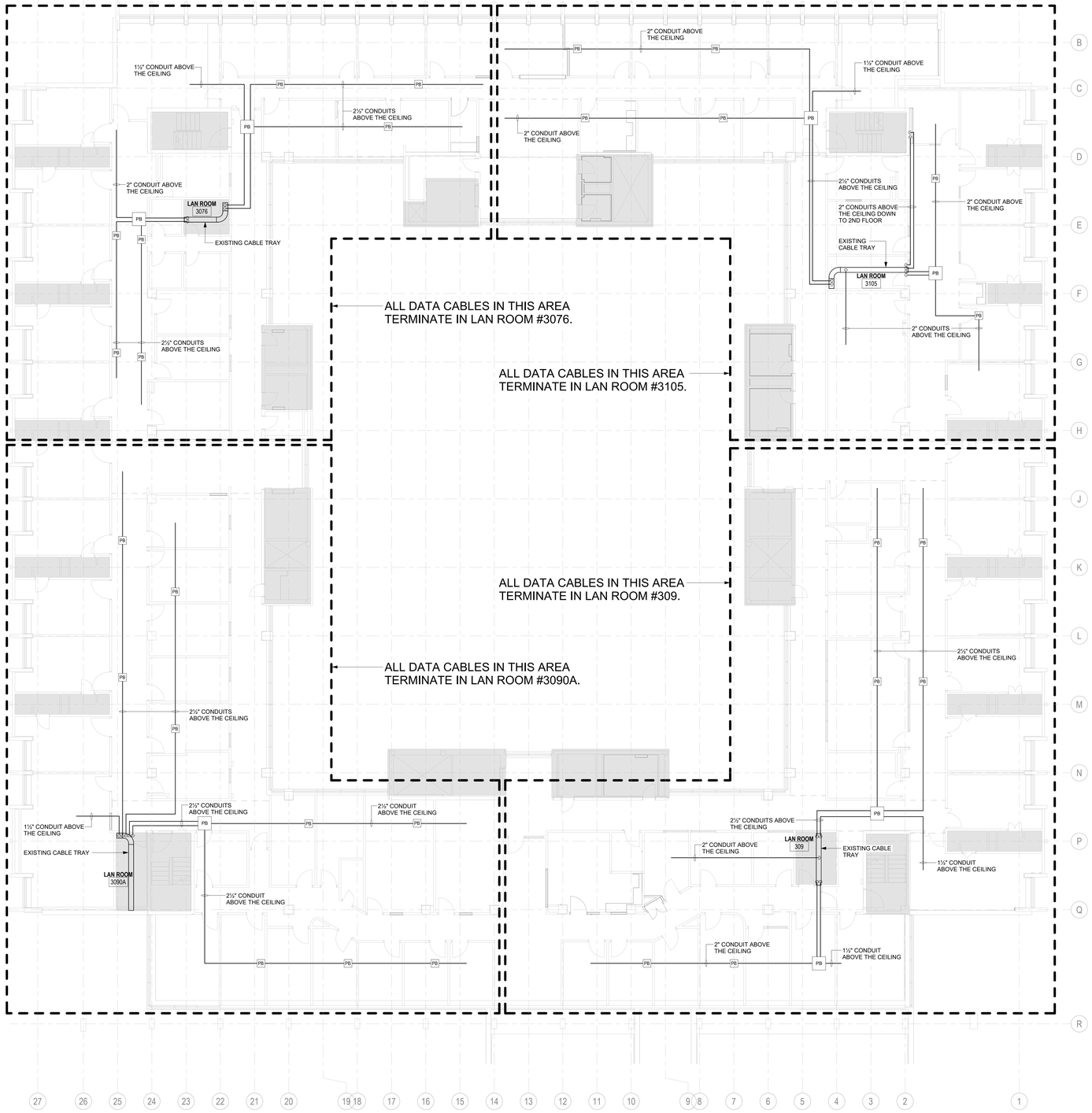
DRAWING SHEET TITLE
SINGLE LINE DIAGRAMS & PANEL SCHEDULES

DRAWN BY: GDP | SCALE: N/A
REVIEWED BY: JW | DATE CREATED: 2025-05-27
UNIVERSITY PROJECT NUMBER: NORTH POINT
P164-24-165

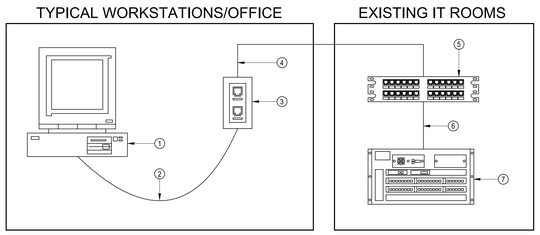
DRAWING NUMBER: **E401** | REV. NUMBER

GENERAL DRAWING NOTES

1. PROPOSED COMMUNICATION MAIN CONDUITS ROUTING LAYOUT IS FOR REFERENCE ONLY.
2. PROPOSED PULL BOX LOCATIONS ARE FOR REFERENCE ONLY. ELECTRICAL CONTRACTOR TO PROVIDE QUANTITIES & SIZES AS REQUIRED TO COMPLETE THE INSTALLATION.
3. ALL COMMUNICATION CONDUITS IN EXISTING LAN ROOMS SHALL STOP AT THE TOP OF THE EXISTING CABLE LADDER TRAY.
4. PROVIDE TWO (2) 1U, 48-PORTS COMPATIBLE PATCH PANELS FOR REGULAR DATA (EXCLUDING WAPs) IN LAN ROOM 309, 3090A & 3076 (6 IN TOTAL).
5. PROVIDE THREE (3) 1U, 48-PORTS COMPATIBLE PATCH PANELS FOR REGULAR DATA (EXCLUDING WAPs) IN LAN ROOM 3105.
6. NETWORK SWITCHES TO BE SUPPLIED BY THE U of T AND INSTALLED BY THE CONTRACTOR.
7. CONTRACTOR SHALL COORDINATE WITH CONSULTANT PRIOR TO INSTALLING PATCH PANELS & SWITCHES.



1 / E402 3RD FLOOR PLAN - MAIN COMMUNICATION CONDUIT LAYOUT
SCALE: 1 : 100



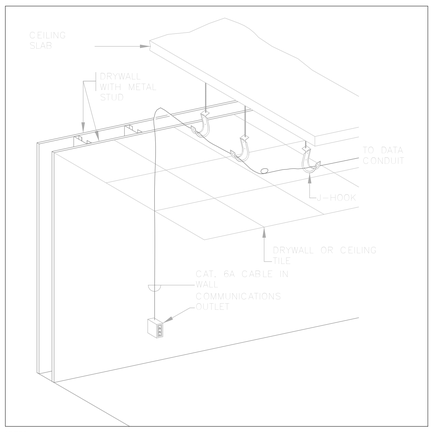
LEGEND

(1) COMPUTER (BY U OF T).
(2) PATCH CORDS (SUPPLIED BY CONTRACTOR, INSTALLED BY U OF T).
(3) MULTI-PORT COMMUNICATIONS OUTLET.
(4) 4-PAIR UTP CABLE, AS PER SPECIFICATION, TO BE INSTALLED IN CABLE TRAY & CONDUITS.
(5) 48 PORT PATCH PANEL
(6) PATCH CORDS (SUPPLIED BY CONTRACTOR, INSTALLED BY U OF T).
(7) ACTIVE EQUIPMENT (BY U OF T)

NOTES:

A. THIS IS A SCHEMATIC DRAWING ONLY. REFER TO FLOOR PLANS AND ELEVATIONS FOR QUANTITIES. FOR ALL MATERIALS REFER TO SPECIFICATIONS.

3 / E402 TYPICAL DATA CONNECTITY SCHEMATIC
SCALE: NTS



NOTES:

1. NEW DATA OUTLET TO BE RECESSED UNLESS OTHERWISE NOTED.
2. CONTRACTOR TO FISH COMMUNICATION CABLE THROUGH EXISTING DRYWALL.
3. PRIOR TO INSTALLATION OF NEW LIGHTING FIXTURES, USE EXISTING OPENINGS FOR INSTALLATION OF COMMUNICATION CABLING.

2 / E402 DATA OUTLET DETAILS
SCALE: NTS

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.

REV.	DESCRIPTION	DATE
	ISSUED FOR TENDER	2026-04-22
	ISSUED FOR 80% CD	2026-03-09

KEY PLAN (NTS)

SEAL

PROJECT TITLE:
UNIVERSITY OF TORONTO
33 URSULA FRANKLIN MATH OFFICE RENOVATION

33 Ursula Franklin Street

DRAWING SHEET TITLE
COMMUNICATION MAIN CONDUIT LAYOUT & ELECTRICAL DETAILS

DRAWN BY: GDP
SCALE: N/A
REVIEWED BY: JW
DATE CREATED: 2025-05-27
UNIVERSITY PROJECT NUMBER: P164-24-165
NORTH POINT

DRAWING NUMBER: **E402**
REV. NUMBER

LUMINAIRE SCHEDULE

TYPE	DESCRIPTIONS	INSTALLATION	MODEL #	VOLTAGE	DIMMING	WATTAGE	LUMENS	COLOR TEMP.	CRI
'A1'	2' x 4' LED PANEL	RECESSED	ORACLE LIGHTING (BY ELITE LIGHTING), CAT.#: 24-FPL1-LUGR+LED-4000L/5000L/6000L-DIM10-MVOLT-35K/40K/50K-85	120V	0-10V	46.0 W	6000 lm	3500 K	85
'A2'	1' x 4' LED PANEL	RECESSED	ORACLE LIGHTING (BY ELITE LIGHTING), CAT.#: 14-FPL1-LED-2000L/3000L/4000L-DIM10-MVOLT-35K/40K/50K-85	120V	0-10V	42.0 W	4000 lm	3500 K	85
'A2a'	1' x 4' LED PANEL	RECESSED	ORACLE LIGHTING (BY ELITE LIGHTING), CAT.#: 14-FPL1-LED-2000L/3000L/4000L-DIM10-MVOLT-35K/40K/50K-85	120V	0-10V	31.0 W	3000 lm	3500 K	85
'A2b'	1' x 4' LED PANEL	SURFACE	ORACLE LIGHTING (BY ELITE LIGHTING), CAT.#: 14-FPL1-LED-2000L/3000L/4000L-DIM10-MVOLT-35K/40K/50K-85 & 22-FPL1-LED-SMK	120V	0-10V	42.0 W	4000 lm	3500 K	85
'A3'	2' x 2' LED PANEL	RECESSED	ORACLE LIGHTING (BY ELITE LIGHTING), CAT.#: 22-FPL-BL-LED-4000L/5000L/6000L-DIM10-MVOLT-35K/40K/50K-85	120V	0-10V	30.0 W	4000 lm	3500 K	85
'L1'	4' LED LINEAR	SUSPENDED	AXIS,SCULPT, CAT.#: SCD-500-90-35-FL-4FT-BLK-UNV-DP-1-CA48/120INCH	120V	0-10V	22.4 W	2000 lm	3500 K	90+
'L2'	120" UNDER CABINET LIGHTS	SURFACE	LUMINII BARA SURFACE STATIC WHITE, CAT.#:BAR-120INCH-HE64LO-35K-F-FC-SA-LPE & PS-UNI-30W-24	120V	0-10V	19.0 W	2000 lm	3500 K	90
'L3a'	70" UNDER CABINET LIGHTS	SURFACE	LUMINII BARA SURFACE STATIC WHITE, CAT.#:BAR-70INCH-HE64LO-35K-F-FC-SA-LPE & PS-UNI-30W-24	120V	0-10V	11.0 W	1166 lm	3500 K	95
'L3b'	16" UNDER CABINET LIGHTS	SURFACE	LUMINII BARA SURFACE STATIC WHITE, CAT.#:BAR-16INCH-HE64LO-35K-F-FC-SA-LPE	120V	0-10V	3.0 W	300 lm	3500 K	95
'L4'	114" UNDER CABINET LIGHTS	SURFACE	LUMINII BARA SURFACE STATIC WHITE, CAT.#:BAR-114INCH-HE64LO-35K-F-FC-SA-LPE & PS-UNI-30W-24	120V	0-10V	18.0 W	1900 lm	3500 K	59
'L5'	48" UNDER CABINET LIGHTS	SURFACE	LUMINII BARA SURFACE STATIC WHITE, CAT.#:BAR-48INCH-HE64LO-35K-F-FC-SA-LPE & PS-UNI-30W-24	120V	0-10V	7.6 W	800 lm	3500 K	95
D1	4" DOWNLIGHT LED FIXTURE	RECESSED, TRIMLESS	LUMENWERX, CAT.#: AE4RR-TLMP-SW-OF-NA-UNV-28W-D1-NA & AE4RPB-SW-28W-80DEG-2STP-90CRI-35K-TLMP-FTMW-TWMW-NA	120V	0-10V	28.0 W	2775 lm	3500 K	90+

NOTES

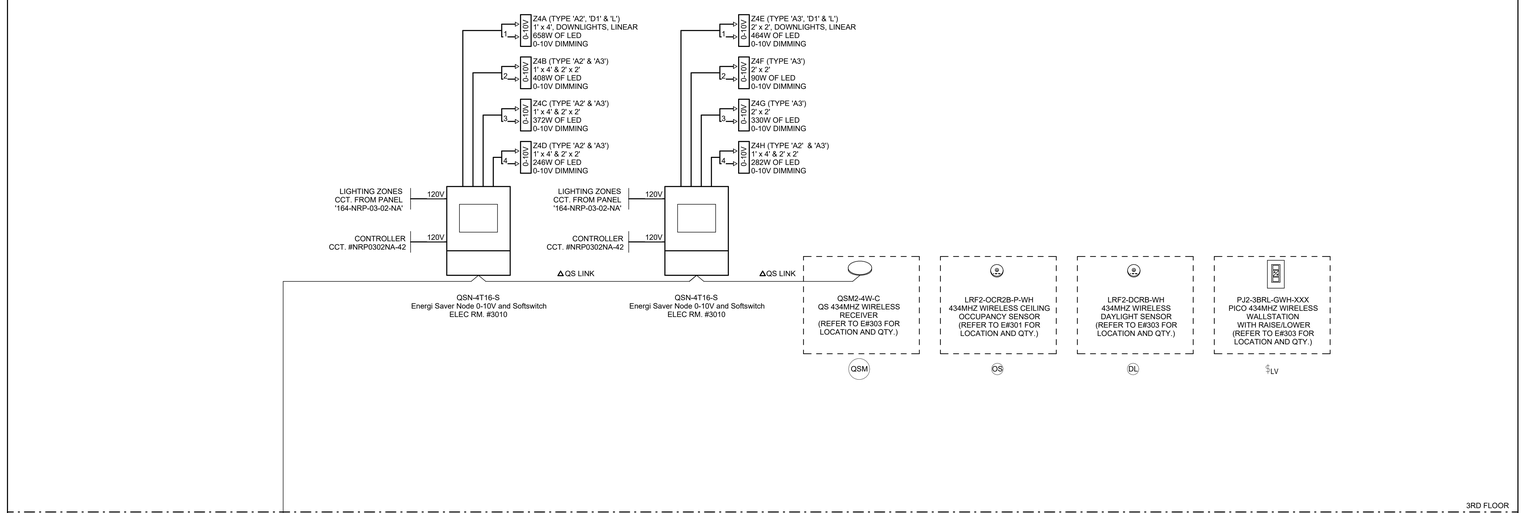
1. THIS DETAIL IS DIAGRAMMATIC ONLY FOR LUTRON LIGHTING CONTROL SYSTEM. REFER TO PLANS FOR QUANTITY AND LOCATION OF ZONES AND DEVICES.
2. PROVIDE FULLY FUNCTIONAL STANDALONE SYSTEM C/W WITH ALL DEVICES, WIRING, ACCESSORIES, PROGRAMMING, TESTING ETC.
3. INSTALL ALL DEVICES AS PER MANUFACTURER'S RECOMMENDATIONS.
4. ALL LOW VOLTAGE WIRING CABLING, AS NOTED ON THIS SCHEMATIC, SHALL BE INSTALLED INSIDE CONDUIT.
5. DIMMING SYSTEM SHALL BE BASED ON LUTRON ATHENA DIMMING SYSTEM.
6. ELECTRICAL CONTRACTOR SHALL CARRY LUTRON FOR COMMISSIONING, PROGRAMMING& TRAINING OF THE LIGHTING CONTROL SYSTEM IN BASE BID.
7. WIRING DETAIL SHOWN TO BE CONFIRMED & COORDINATED WITH LUTRON.
8. ELECTRICAL CONTRACTOR SHALL ALLOW FOR **ADDITIONAL TWO (2) VISITS** OF A LIGHTING CONTROL SPECIALIST AFTER OCCUPANCY IN ORDER TO PERFORM ANY ADJUSTMENTS OR REPROGRAMMING TO LIGHTING CONTROL SYSTEM TO FULFILL CLIENT'S REQUESTS IN BASE BID.

WIRE LEGEND

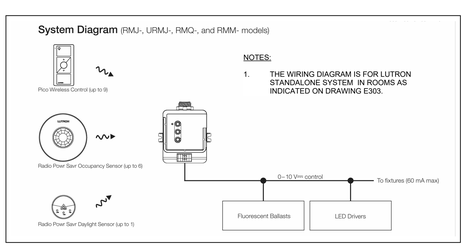
△	QS CONTROL LINK (CONNECT WIRES 1, 2, 3, AND 4)*
▲	QS CONTROL LINK (CONNECT WIRES 1, 3, AND 4. DO NOT CONNECT WIRE 2)*
△ OR ▲	TOTAL LENGTH OF QS LINK MUST NOT EXCEED 2000 FT. FOR CONTROL LINK LESS THAN 500 FT USE LUTRON CABLE GRX-CBL-346S OR GRX-PCBL-346S. OTHERWISE USE 2#18 AWG + 2#22 AWG. FOR LINK LENGTH BETWEEN 500 FT TO 2000 FT USE LUTRON CABLE GRX-CBL-46-L OR GRX-PCBL-46L. OTHERWISE USE 2#12 AWG + 2#22 AWG.
∞	CONTACT CLOSURE SIGNAL 3 #18 AWG

LIGHTING CONTROL DEVICES LEGEND

S#A S#B S#C S#LV	LUTRON WIRELESS 3- BUTTON PICO SWITCH WITH RAISE/LOWER, CAT. #PJ2-3BRL-GWH-L01
OSD	LUTRON DUAL TECHNOLOGY LINE VOLTAGE OCCUPANCY SENSOR SWITCH, CAT. #MS-B102-WH (AUTO-OFF, MANUAL-ON)
OSD	LUTRON LINE VOLTAGE OCCUPANCY SENSOR DIMMER SWITCH, CAT. #MS-Z101-WH (AUTO-OFF, MANUAL-ON)
OS	LUTRON WIRELESS CEILING MOUNTED OCCUPANCY SENSOR, CAT. #LRF2-OCR2B-P-WH
OS OS1	LUTRON LOW VOLTAGE CEILING MOUNTED OCCUPANCY SENSOR WITH POWER PACK, CAT. #LOS-CDT-2000-WH & PP-DV
DL	LUTRON WIRELESS CEILING MOUNTED DAYLIGHT SENSOR, CAT. #LRF2-DCRB-WH
QSM	LUTRON WIRELESS RECEIVER, CAT. #QSM2-4W-C



1 E501 LUTRON WIRING DIAGRAM
SCALE: NTS



2 E501 LUTRON STANDALONE LIGHTING CONTROL WIRING DIAGRAM
SCALE: NTS

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.

REV.	DESCRIPTION	DATE
	ISSUED FOR TENDER	2026-04-22
	ISSUED FOR 80% CD	2026-03-09
	ISSUED FOR PERMIT	2026-02-27
	ISSUED FOR CLASS A COSTING	2026-02-18
	ISSUED FOR 100% DD	2026-01-23
	ISSUED FOR CLASS B COSTING	2026-01-16
	ISSUED FOR 50% DD	2025-11-28

KEY PLAN (NTS)

SEAL

PROJECT TITLE:
UNIVERSITY OF TORONTO
33 URSULA FRANKLIN MATH OFFICE RENOVATION

33 Ursula Franklin Street

DRAWING SHEET TITLE
LIGHTING CONTROL DETAILS & LUMINAIRE SCHEDULE

DRAWN BY: GDP
SCALE: N/A
REVIEWED BY: JW
DATE CREATED: 2025-05-27
UNIVERSITY PROJECT NUMBER: NORTH POINT
P164-24-165

DRAWING NUMBER
E501
REV. NUMBER