

1
E101
CAMPUS MAP
SCALE: NTS

ELECTRICAL GENERAL NOTES

- 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.
- VERIFY FIELD MEASUREMENTS AND CIRCUITING ARRANGEMENTS ARE AS SHOWN ON DRAWINGS.
- VERIFY THAT ABANDONED WIRING AND EQUIPMENT SERVE ONLY ABANDONED FACILITIES.
- DEMOLITION DRAWINGS ARE BASED ON CASUAL FIELD OBSERVATION. REPORT DISCREPANCIES TO UNIVERSITY OF TORONTO BEFORE DISTURBING EXISTING INSTALLATION.
- SCHEDULE & COORDINATE ALL WORK WITH U OF T STAFF AND OTHER TRADES ON SITE.
- 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.
- DISCONNECT ELECTRICAL SYSTEMS IN WALLS, FLOORS, AND CEILINGS SCHEDULED FOR REMOVAL.
- THE CONTRACTOR TO ENSURE CONTINUITY OF SYSTEMS THROUGH RENOVATION SPACE
- MODIFY/EXTEND/REPLACE EXISTING CONDUITS/WIRING/BACKBOXES AS REQUIRED FOR THE RELOCATED AND EXISTING TO REMAIN EQUIPMENT/DEVICES FOR FULLY OPERATIONAL SYSTEM.
- PROVIDE BLANK STAINLESS STEEL COVER PLATES WHERE OUTLETS ARE REMOVED FROM EXISTING WALLS TO REMAIN.
- REROUTE AS REQUIRED TO MAINTAIN CONTINUITY FOR ALL SYSTEMS TO REMAIN WHICH ARE AFFECTED BY THE DEMOLITION OR ALTERATION.
- REMOVE ABANDONED WIRING TO SOURCE OF SUPPLY.
- 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.
- 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.
- REMOVE EXPOSED ABANDONED CONDUIT, INCLUDING ABANDONED CONDUIT ABOVE ACCESSIBLE CEILING SPACE. CUT CONDUIT FLUSH WITH WALLS AND FLOORS, AND PATCH SURFACES AS REQUIRED.
- DISCONNECT AND REMOVE ABANDONED PANELBOARDS AND DISTRIBUTION EQUIPMENT, WHERE INDICATED.
- DISCONNECT AND REMOVE ELECTRICAL DEVICES AND EQUIPMENT SERVING UTILIZATION EQUIPMENT THAT HAS BEEN REMOVED.
- DISCONNECT AND REMOVE ABANDONED LUMINAIRES. REMOVE BRACKETS, STEMS, HANGERS, AND OTHER ACCESSORIES. RECYCLE ALL ELEMENTS WHERE POSSIBLE. DISPOSE OF HAZARDOUS MATERIALS AT APPROPRIATE FACILITIES.
- REPAIR ADJACENT CONSTRUCTION AND FINISHES DAMAGED DURING DEMOLITION AND EXTENSION WORK.
- MAINTAIN ACCESS TO EXISTING ELECTRICAL INSTALLATIONS WHICH REMAIN ACTIVE. MODIFY INSTALLATION OR PROVIDE ACCESS PANEL AS APPROPRIATE.
- EXTEND EXISTING INSTALLATIONS USING MATERIALS AND METHODS COMPATIBLE WITH EXISTING ELECTRICAL INSTALLATIONS, OR AS SPECIFIED.
- CLEAN AND REPAIR EXISTING MATERIALS AND EQUIPMENT WHICH REMAIN OR ARE TO BE REUSED.
- DISCONNECT & REMOVE EXISTING LIGHTING FIXTURES AND ASSOCIATED WIRING & CONDUIT BACK TO JUNCTION BOX/SOURCE AS INDICATED.
- DISCONNECT & REMOVE EXISTING DATA & TELEPHONE OUTLETS AND ASSOCIATED CABLING BACK TO RESPECTIVE DATA RACK AND TELEPHONE BACKBOARD AS INDICATED.
- DISCONNECT & REMOVE EXISTING POWER OUTLETS & DEVICES ALONG WITH ASSOCIATED OUTLETS, CONDUITS & WIRING BACK TO THE RESPECTIVE SOURCE OF ORIGIN AS REQUIRED.
- 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.
- 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.
- ALL NEW ELECTRICAL INSTALLATIONS ARE TO BE SURFACE MOUNTED WITH WIREMOLD, UNLESS NOTED OTHERWISE.
- 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.
- ALL RECEPTACLES SHALL BE IDENTIFIED USING PROFESSIONAL GRADE, HIGH GLOSS LABELS INDICATING CIRCUIT NUMBER & PANEL SOURCE.
- 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	•	
COMMUNICATIONS	HEAT TRACING, SNOWMELT SYSTEMS, ELECTRIC COILS & PACKAGED ELECTRIC SPACE HEATING EQUIPMENT	•	
	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	
EQUIPMENT & DEVICES	BACK-BOXES FOR STEP-DOWN TRANSFORMERS & RELAYS SERVING MECHANICAL EQUIPMENT		PROVIDE
	VFD'S, STARTERS, SPEED CONTROLLERS, & LINE VOLTAGE CONTROL DEVICES SERVING MECHANICAL EQUIPMENT	SUPPLY	INSTALL
COMMUNICATIONS	LOW VOLTAGE CONTROL DEVICES	PROVIDE	
	LOW VOLTAGE STEP-DOWN TRANSFORMERS & RELAYS SERVING MECHANICAL EQUIPMENT	SUPPLY	INSTALL
COMMUNICATIONS	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	

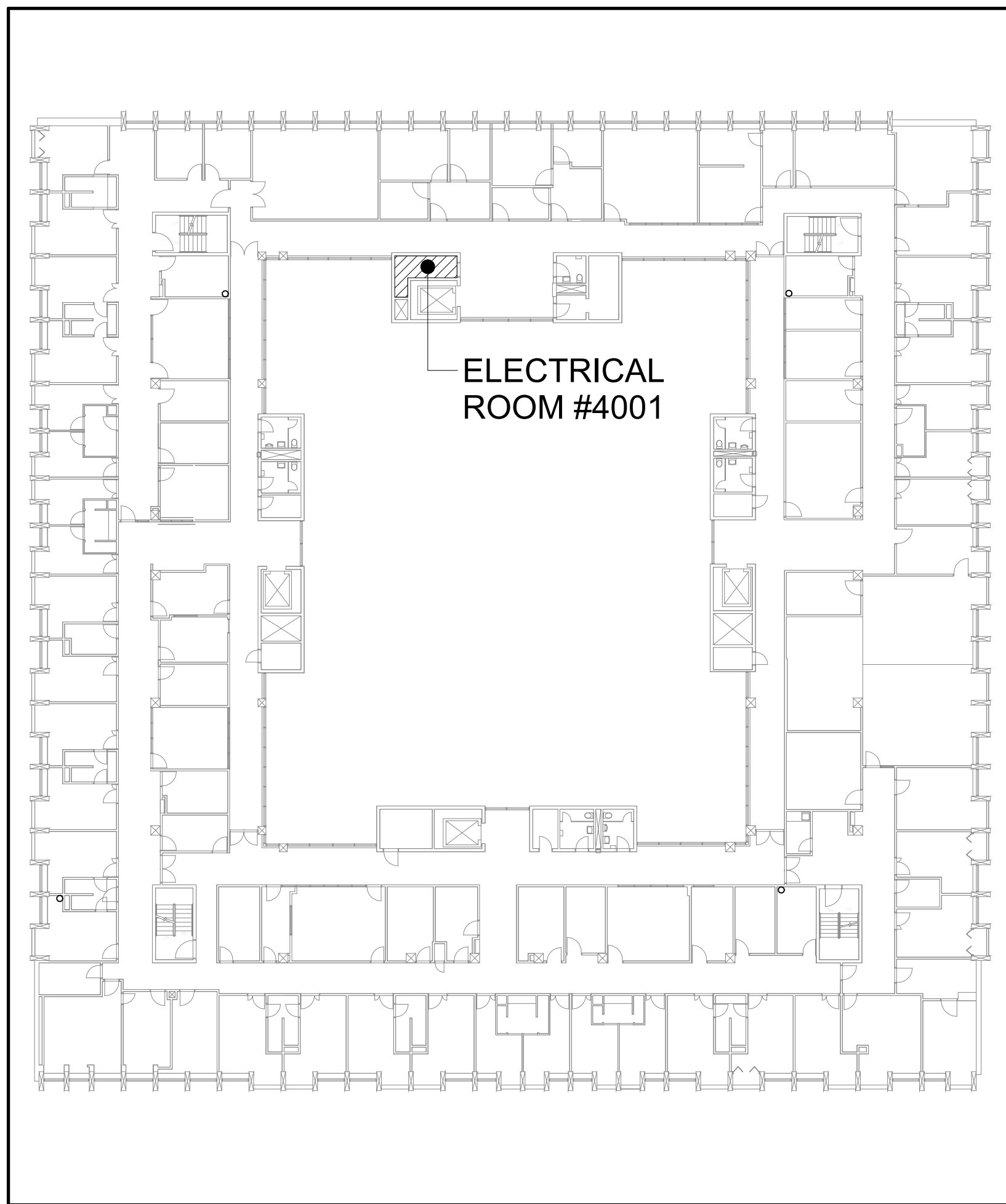
NOTES:
1. LOW VOLTAGE IS DEFINED AS BELOW 30 VOLTS.
2. ALL ELECTRICAL WORK INCLUDING CONTROLS WORK SHALL BE PERFORMED BY THE CONTRACTOR ON BEHALF OF THE OWNER THAT FALLS UNDER THE PROVISIONS OF ANY COLLECTIVE AGREEMENTS BY WHICH THE OWNER IS BOUND, OR WHICH THE OWNER IS CONTRACTUALLY REQUIRED TO APPLY 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 CDDC2 SUPPLEMENTARY CONDITIONS.

ELECTRICAL DRAWING LIST

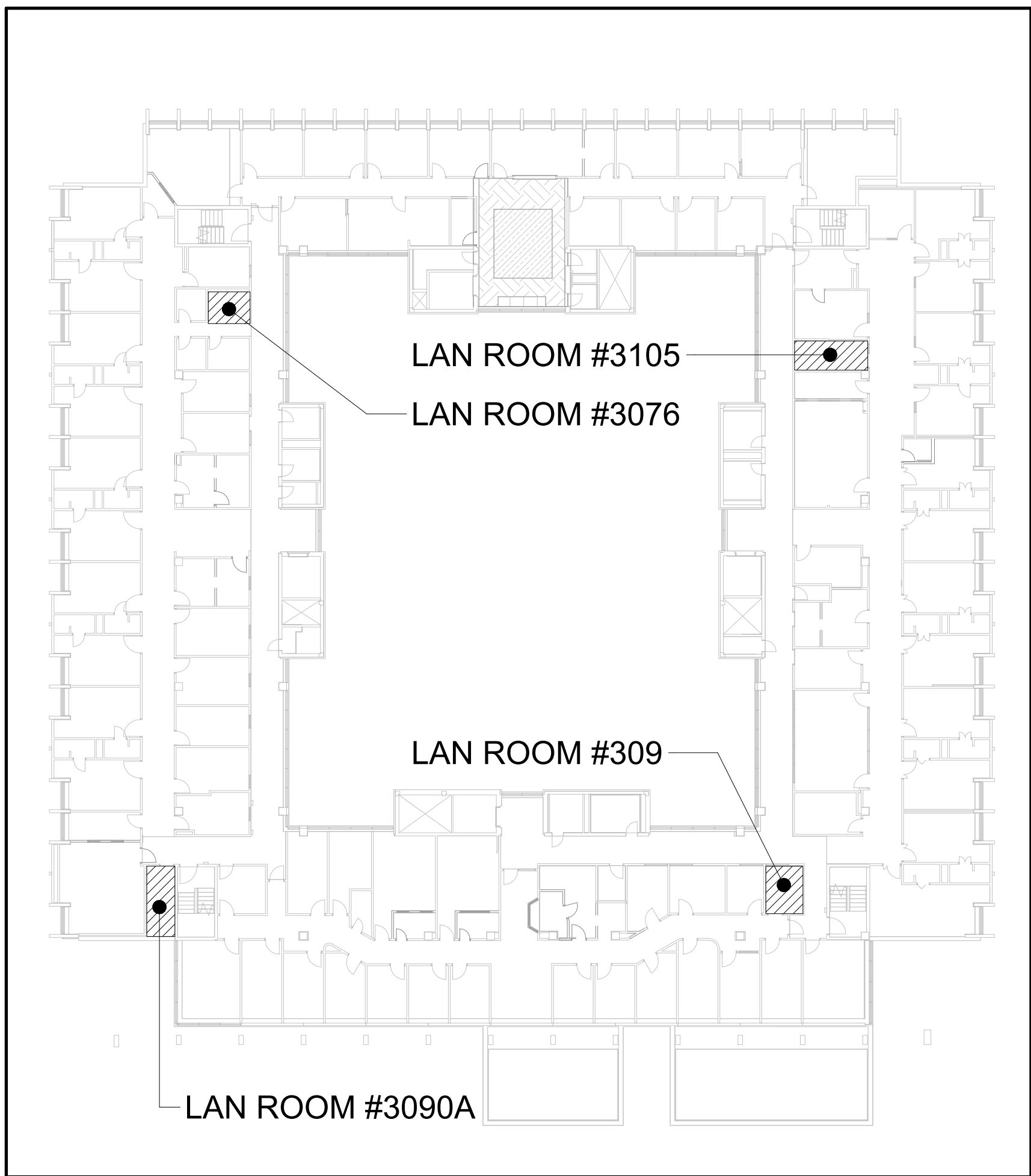
SHEET NUMBER	SHEET NAME
E101	ELECTRICAL LEGEND, DRAWING LIST, KEY PLANS & CAMPUS MAP
E102	ELECTRICAL & COMMUNICATIONS SPECIFICATION
E201	SECOND FLOOR PLAN - ELECTRICAL DEMOLITION LAYOUT
E202	THIRD FLOOR PLAN - ELECTRICAL DEMOLITION LAYOUT
E203	THIRD FLOOR PLAN - LIGHTING DEMOLITION LAYOUT
E301	SECOND 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 WIRING CONDUIT LAYOUT & ELECTRICAL DETAILS
E501	LIGHTING CONTROL DETAILS & LUMINAIRE SCHEDULE

LEGEND OF SYMBOLS

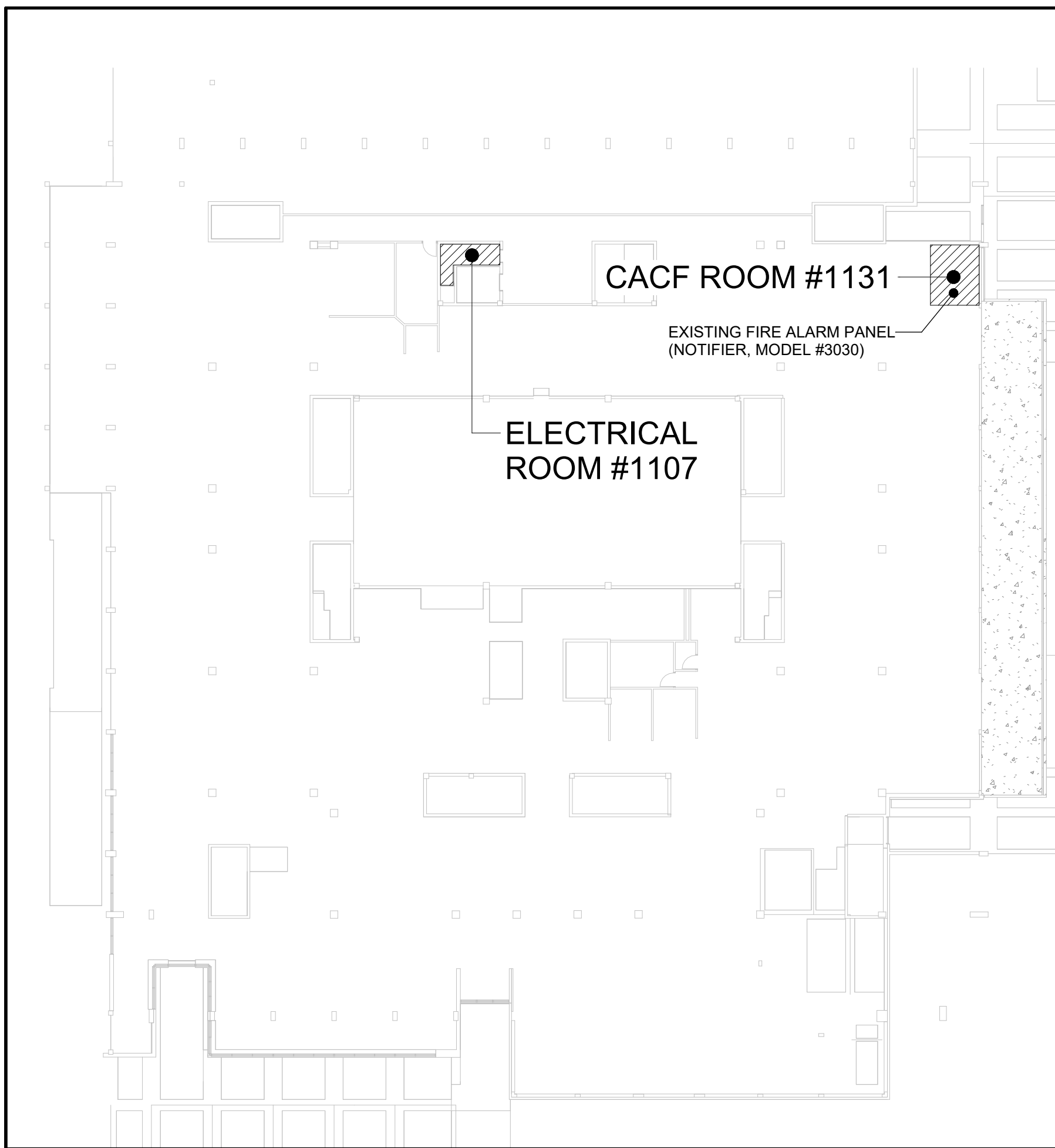
SYMBOL	DESCRIPTION
	EXISTING LIGHTING FIXTURE TO BE REMOVED.
	EXISTING LIGHTING FIXTURE TO BE RELOCATED.
	NEW LIGHTING FIXTURE. LETTER DESIGNATES FIXTURE TYPE. REFER TO DRAWING #E301 FOR FIXTURE SCHEDULE.
	LIGHTING FIXTURE WIRED ON EMERGENCY CIRCUIT.
	CEILING MOUNTED EXIT SIGN (GREEN PICTOGRAM TYPE). 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
	TOGGLE DISCONNECT SWITCH
	WALL MOUNTED DUAL TECHNOLOGY OCCUPANCY SENSOR SWITCH
	LOW VOLTAGE LIGHT SWITCH
	CEILING MOUNTED OCCUPANCY SENSOR
	CEILING MOUNTED DAYLIGHT SENSOR
	CEILING MOUNTED LIGHTING CONTROL WIRELESS RECEIVER
	LIGHTING CONTROL POWER SUPPLY
	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)
	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
	JUNCTION BOX / PULL BOX
	FIRE ALARM SMOKE DETECTOR
	FIRE ALARM HEAT DETECTOR
	WALL-MOUNTED FIRE ALARM STROBE
	CEILING-MOUNTED FIRE ALARM SPEAKER
	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
	WIRELESS ACCESS POINT (# DENOTES DATA DROPS QUANTITY)
	AUTOMATIC DOOR OPERATOR
	DOOR ACTIVATION DEVICE
	CARD READER
	DOOR LOCK DEVICE
	ASSISTANCE REQUESTED / REQUIRED DEVICE
	EXISTING TO REMAIN
	EXISTING TO BE REMOVED
	EXISTING TO BE RELOCATED
	RELOCATED EXISTING DEVICES
	OVER COUNTER
	UNDER COUNTER
	HIGH LEVEL
	CEILING MOUNTED
	GROUND FAULT CIRCUIT INTERRUPTER (AS PER ESA)
	ABOVE FINISHED FLOOR



4
E101
KEY PLAN - FOURTH FLOOR
SCALE: NTS



3
E101
KEY PLAN - THIRD FLOOR
SCALE: NTS



2
E101
KEY PLAN - FIRST FLOOR
SCALE: NTS



University of Toronto
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1	ISSUED FOR ADDENDUM 06	2025-05-26
	ISSUED FOR TENDER	2025-04-22
	ISSUED FOR 90% CD	2025-03-09
	ISSUED FOR PERMIT	2025-02-27
	ISSUED FOR CLASS A COSTING	2025-02-18
	ISSUED FOR 100% CD	2025-01-23
	ISSUED FOR CLASS B COSTING	2025-01-16
	ISSUED FOR 90% CD	2025-11-28
	ISSUED FOR 100% SCHEMATIC DESIGN	2025-09-19
	ISSUED FOR CLASS C COSTING	2025-09-05
REV.	DESCRIPTION	DATE

KEY PLAN (NTS)	SEAL
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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
REVIEWED BY: JW

SCALE: As Indicated
DATE CREATED: 2025-05-27

UNIVERSITY PROJECT NUMBER/NORTH POINT

P164-24-165

DRAWING NUMBER

REV. NUMBER

E101

1

ELECTRICAL SPECIFICATION			COMMUNICATION SPECIFICATION		
<div><div><div>A) GENERAL REQUIREMENTS.</div><div>1. THE UNIVERSITY OF TORONTO GENERAL CONDITIONS OF THE CONTRACT, AND INSTRUCTIONS TO TENDERS FORM AN INTEGRAL PART OF THIS SPECIFICATION.</div><div>2. ALL ELECTRICAL CONSTRUCTION WORK MUST BE PERFORMED BY MEMBERS OF THE INTERNATIONAL BROTHERHOOD OF ELECTRICAL WORKERS, LOCAL 353.</div><div>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.</div><div>4. THE UNIVERSITY OF TORONTO HAS THE RIGHT TO RELOCATE OUTLETS UP TO TEN FEET, PRIOR TO INSTALLATION, WITHOUT EXTRA CHARGE.</div><div>5. THE WORD "PROVIDE" SHALL MEAN SUPPLY, INSTALL, CONTECT AND TEST.</div><div>6. PROVIDE ALL EQUIPMENT AND MATERIALS, LABOUR, TOOLS, SCAFFOLDING, TEMPORARY POWER AND ANY OTHER ITEMS NECESSARY FOR THE COMPLETE ELECTRICAL INSTALLATION.</div><div>7. THIS CONTRACTOR SHALL REMOVE ALL HIS DEBRIS (CARTRONS, WIRING REELS, CONNECTORS, WIRING, ETC.) FROM ELECTRICAL ROOMS IN WHICH HE IS WORKING.</div><div>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.</div><div>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 LAUL, 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.</div><div>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.</div><div>11. REMOVAL OF EXISTING BREAKERS FROM THE EXISTING ELECTRICAL PANELS & 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.</div><div>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.</div><div>13. KNOCKOUT(S) SHALL BE FILLED WHEN REMOVING CIRCUITS FROM ANY PANELBOARD OR SPLITTER.</div><div>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.</div><div>15. FIRE ALARM ISOLATION SHALL BE ARRANGED WITH THE U OF T CONSTRUCTION SUPERVISOR AT LEAST 48 HOURS IN ADVANCE.</div><div>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.</div><div>17. PROVIDE ONTARIO ELECTRICAL SAFETY AUTHORITY INSPECTION CERTIFICATE PRIOR TO FINAL ACCEPTANCE OF THE WORK.</div><div>18. ALL MATERIALS AND EQUIPMENT SHALL BE CSA OR ONTARIO ELECTRICAL SAFETY SPECIAL INSPECTION APPROVED AND BEAR EVIDENCE OF SAME.</div><div>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.</div><div>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.</div></div><div><div>B) INTERFERENCE DRAWINGS</div><div>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.</div><div>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.</div></div><div><div>C) SHOP DRAWINGS:</div><div>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 REQUIRED FOR THE COMPLETION OF THE WORK AT ANY TIME UNTIL FORMAL ACCEPTANCE.</div><div>2. SUBMIT SAMPLE FOR ALL LIGHTING FIXTURES ALONG WITH LIGHTING SHOP DRAWINGS FOR THE ARCHITECT AND CLIENT'S APPROVAL, PRIOR TO PLACING MATERIAL, ORDERING.</div><div>3. THE CONTRACTOR SHALL SUBMIT STAMPED DETAILED DRAWINGS INDICATING THE SUPPORTING SYSTEM THAT CARRYING ELECTRICAL DEVICES OR EQUIPMENT. THE DRAWINGS SHALL RE-INSTALL RELOCATED FIRE ALARM DEVICES IN NEW LOCATIONS & PROVIDE NEW CONDUITS, JUNCTION BOXES & WIRING TO EXTEND EXISTING FIRE ALARM SYSTEM AS REQUIRED.</div></div><div><div>D) GROUNDING AND BONDING:</div><div>1. PROVIDE ALL GROUNDING TO CONFORM WITH THE REQUIREMENTS OF ONTARIO ELECTRICAL SAFETY CODE AND ALL OTHER AUTHORITIES HAVING JURSDICTION, 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.</div></div><div><div>E) WIRING AND FEEDERS</div><div>1. ALL ELECTRICAL POWER WIRING SHALL BE COPPER, MINIMUM SIZE NO. 12 AWG, TYPE RW90XLP, 600V INSULATION. ALL ELECTRICAL WIRING SHALL BE STRATEGICALLY SIZED TO CARRY THE LOADS OF THE EQUIPMENT IT IS SUPPOSED TO SERVE. UNLESS NOTED OTHERWISE, ALL OUTDOOR WIRING SHALL HAVE COPPER CONDUCTORS WITH RW10-90, XLNLC, -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 LIQUESEAL FLEXIBLE METAL CONDUIT OR EQUAL.</div><div>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.</div><div>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.</div><div>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.</div><div>5. TERMINATION LUGS FOR FEEDER CABLES SHALL BE OF THE COMPRESSION TYPE. MECHANICAL LUGS ARE NOT ACCEPTABLE FOR FEEDERS.</div><div>6. NO SPLICES SHALL BE PERMITTED ON ANY LOW VOLTAGE FEEDERS.</div><div>7. FOR AREAS WITH DRYWALL PARTITIONS, TYPE A60 ARMoured CABLE SHALL ONLY BE USED FOR:<div><div>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.</div><div>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.</div></div></div><div>8. ANY FEEDERS 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.</div><div>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.</div><div>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.</div></div><div><div>F) CONDUITS AND RACEWAYS:</div><div>1. MINIMUM CONDUIT SIZE 3/4" DIAMETER, EXCEPT BY SPECIAL PERMISSION AND/OR AS NOTED OTHERWISE.</div><div>2. CONDUITS FOR INDOOR INSTALLATIONS SHALL BE EMT WITH STEEL COMPRESSION TYPE FITTINGS UNLESS OTHERWISE INDICATED TO USE WIREMOLD SYSTEM.</div><div>3. ALL CONDUCTORS FOR PANELBOARDS, SWITCHGEAR, TRANSFORMER AND OTHER ELECTRICAL EQUIPMENT SHALL BE RAIN TIGHT AND SUITABLE FOR WET LOCATION.</div><div>4. CONDUITS FOR OUTDOOR INSTALLATIONS SHALL BE RIGID GALVANIZED STEEL WITH THREADED CONNECTORS.</div><div>5. THE UNDERGROUND CONDUITS SHALL BE PVC TYPE 2 COMPLIANT WITH APPROVED FITTINGS.</div><div>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.</div><div>7. PROVIDE WIREMOLD SYSTEM FOR WALL MOUNTED POWER OUTLET AS INDICATED ON THE DRAWINGS FROM OUTLET TO RESPECTIVE PANEL.</div><div>8. WIREMOLD FOR POWER WIRING SHALL BE METALLIC, WHITE COLOR, COMPLETE WITH COVERS & ALL REQUIRED ACCESSORIES.</div><div>9. WIREMOLD ACCESSORIES MUST BE PROVIDED FROM THE SAME MANUFACTURER, INCLUDING BUT NOT LIMITED TO ELBOWS, TEES, TRANSITION DEVICES, OUTLETS ITS DEVICES BOXES. BASE BID MANUFACTURER IS LEGRAND. ALTERNATIVE MANUFACTURER IS HUBBELL OR APPROVED EQUAL.</div><div>10. EXPANSION FITTINGS SHALL BE INSTALLED IN CONDUITS CROSSING EXPANSION JOINTS.</div><div>11. FISH WIRES SHALL BE INSTALLED IN ALL EMPT CONDUITS.</div><div>12. CONDUITS FOR COMPUTER SYSTEMS SHALL COMPLY WITH THE UNIVERSITY'S COMMUNICATIONS INFRASTRUCTURE SPECIFICATIONS, STANDARDS AND PRACTICES STANDARDS.</div><div>13. HORIZONTAL RUNS OF CONDUIT 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.</div><div>14. CONDUITS SHALL RUN PARALLEL TO BUILDING LINES.</div><div>15. AVOID RUNNING CONDUITS THROUGH OR DOWN "FEATURE WALLS". REFER TO ARCHITECTURAL DRAWINGS FOR "FEATURE WALLS" LOCATION.</div><div>16. ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR FIRE STOPPING AND SMOKE SEALS WITH ELECTRICAL ASSEMBLIES, WHERE THEY PENETRATE FIRE-RATED SEPARATIONS. COORDINATE WITH THE GENERAL TRADES ON SITE.</div><div>17. EXACT CONDUIT ROUTING TO BE DETERMINED ON SITE. COORDINATE WITH GENERAL TRADES.</div></div><div><div>G) DISCONNECTING MEANS:</div><div>1. FUSED DISCONNECT SWITCHES ARE NOT ACCEPTABLE TO BE USED ACROSS THE CAMPUS.</div><div>2. NON-FUSED DISCONNECT SWITCHES SHALL HAVE A MINIMUM NEMA-1 RATING, UNLESS OTHERWISE INDICATED IN ITEMS #3 & 4 BELOW.</div><div>3. NON-FUSED DISCONNECT SWITCHES INSTALLED WITHIN MECHANICAL SPACES SHALL BE NEMA-3R RATING.</div><div>4. NON-FUSED DISCONNECT SWITCHES FOR OUTDOOR APPLICATION SHALL HAVE A MINIMUM NEMA-3R RATING.</div></div><div><div>H) BOXES AND WIRING DEVICES</div><div>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.</div><div>2. ALL RECEPTACLES TO BE LABELLED WITH MACHINE GENERATED ADHESIVE LABELS TO INDICATE THE CORRESPONDING CIRCUIT NUMBERS.</div><div>3. RECEPTACLES ON EMERGENCY POWER SHALL BE COLOURED RED. ISOLATED GROUND RECEPTACLES SHALL BE COLOURED ORANGE.</div><div>4. LINE VOLTAGE LIGHTING SWITCHES SHALL BE WHITE DECORA STYLE MOUNTED AT 1100MM (43") FROM FLOOR TO THE CENTRE OF THE SWITCH.</div><div>5. OUTLET, JUNCTION AND PULL BOXES SHALL BE SIZED TO SUIT PARTICULAR DEVIDE 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 REGRESSED 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.</div><div>6. PROVIDE A MINIMUM HORIZONTAL SEPARATION OF 6" BETWEEN OPPOSING BOXES. FLOOR MOUNTED OUTLET BOXES SHALL BE NEPCO SERIES 900, UNLESS NOTED OTHERWISE.</div><div>7. ELECTRICAL BOXES OCCURRING IN ACOUSTIC WALLS SHALL BE INSTALLED WITH PREFORMED NEOPRENE BOX SEALS.</div><div>8. REFER TO LIGHTING CONTROL DETAILS FOR SPECIFICATION OF LIGHTING CONTROLS DEVICES.</div></div><div><div>I) PANELBOARDS</div><div>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 COMBINATION TRIP HANDLES. THE HANDLES ARE NOT ACCEPTABLE. PANELBOARDS SHALL BE RATED AT MINIMUM 100A IC FOR 208V & 140A IC FOR 600V.</div><div>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.</div><div>3. PANELBOARDS ARE TO BE MOUNTED SO THAT THE TOP OF THE PANELS ARE LOCATED 2M (78 IN) ABOVE FINISHED FLOOR.</div><div>4. PANELBOARD DIRECTORIES SHALL BE TYPEWRITTEN USING THE TEMPLATES PROVIDED BY THE UNIVERSITY.</div><div>5. FILLER PLATES SHALL BE PROVIDED ON ALL BLANK BREAKER SPACES.</div><div>6. EMERGENCY PANELS SHALL HAVE GREEN COLOR FRONT COVER. SUBMIT COLOR SAMPLES & COLOR CODE FOR APPROVAL. COPIES ARE NOT PERMITTED.</div><div>7. PANELBOARDS SHALL BE COMPLETED WITH 200% RATED NEUTRAL.</div><div>8. SURFACE-MOUNTED PANELBOARDS SHALL BE COMPLETE WITH DRIP SHIELD AND WEATHER PROOF CONNECTORS, AND FIRE RETARDANT PLYWOOD BACKBOARD.</div><div>9. BALANCE THE CONNECTED LOADS ACROSS THE PHASES ON THE PANEL, WITHIN 5%.</div><div>10. PROVIDE 20 25MM (1") EMPT 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.</div><div>11. PANELBOARDS SHALL BE SINGLE-TUB MANUFACTURED BY SCHNEIDER ELECTRIC, SIEMENS OR Eaton.</div><div>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 REQUIREMENT/REQUIRED 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.</div></div><div><div>J) PANELBOARD SCHEDULES/DIRECTORIES</div><div>1. A PRINTED VERSION OF SCHEDULES SHALL BE INSTALLED INSIDE THE PANEL ON THE BACKSIDE OF THE DOOR.</div><div>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 SCHEDULES IS NOT PERMITTED.</div><div>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.</div><div>4. ELECTRONIC FILE FOR SCHEDULES SHALL BE PROVIDED TO THE UNIVERSITY AS PART OF THE CLOSE-OUT DOCUMENTS.</div></div><div><div>K) SHORT CIRCUIT AND ARC FLASH STUDIES</div><div>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 'X' 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.</div><div>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.</div><div>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.</div><div>4. THE ARC FLASH LABELS SHALL DETAIL ARC AND SHOCK HAZARDS AS PER CSA-2462. FINAL LABEL CONFIGURATION SHALL BE APPROVED BY THE UNIVERSITY BEFORE INSTALLATION.</div></div><div><div>L) FIRE ALARM SYSTEM INSTALLATION AND VERIFICATION</div><div>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.</div><div>2. ALL EXISTING FIRE ALARM SYSTEM MODIFICATIONS AND NEW INSTALLATIONS SHALL BE INSTALLED IN ACCORDANCE WITH THE REQUIREMENTS OF THE ONTARIO BUILDING CODE AND CANULC-352-4. FIRE ALARM SYSTEM SHALL BE VERIFIED IN ACCORDANCE WITH CANULC-3537. THE CONTRACTOR SHALL INCLUDE THE COST OF HIRING A THIRD PARTY FIRE ALARM SYSTEM SPECIALIST 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.</div><div>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 CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING WITH THE APPROPRIATE SPECIALIST TO PERFORM VERIFICATION WORK AS REQUIRED. THE CONTRACTOR SHALL INCLUDE THE COST OF HIRING A THIRD PARTY 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.</div></div><div><div>M) LIGHTING AND LIGHTING CONTROLS</div><div>1. PROVIDE LIGHTING FIXTURES & LIGHTING CONTROL SYSTEM AS CALLED FOR ON THE DRAWINGS.</div><div>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.</div><div>3. ALL LIGHTING FIXTURES SHALL BE INDEPENDENTLY SUPPORTED FROM THE BUILDING STRUCTURE.</div><div>4. PERFORM FUNCTIONAL TESTING FOR ALL LIGHTING CONTROL DEVICES AND SYSTEMS AS SPECIFIED IN CONSTRUCTION DOCUMENTS, TO ENSURE COMPLIANCE WITH CBC AND ASHRAE 91.1 REQUIREMENTS.</div><div>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.</div></div><div><div>N) IDENTIFICATION OF ELECTRICAL EQUIPMENT</div><div>1. ALL ELECTRICAL EQUIPMENT SHALL HAVE PERMANENT IDENTIFICATION LAMICOID NAME PLATES IDENTIFYING SOURCE OF POWER SUPPLY & CONNECTED LOAD. LIGHTING FIXTURES CONNECTED ON EMERGENCY POWER SHALL BE LABELLED WITH RED DOT MARKING.</div><div>2. LAMACOID SHALL HAVE WHITE TEXT WITH HEIGHT AS INDICATED BELOW:<div><div>SIZE A: 25MM</div><div>SIZE B: 13MM</div><div>SIZE C: 6MM</div></div></div><div>3. WHEN IDENTIFYING PIECES OF ELECTRICAL EQUIPMENT, EXCEPT FOR BREAKERS/SWITCHES, THE PRIMARY LAMACOID OF SIZE A SHALL INDICATE THE EQUIPMENT IDENTIFIER TAG.</div><div>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.</div><div>5. LAMACOID BACKGROUND COLOUR SHALL BE BLACK EXCEPT IN THE FOLLOWING CASES:<div><div>a. GREEN FOR EMERGENCY (BOTH LIFE, AND NON-LIFE SAFETY).</div><div>b. BLUE FOR UPS.</div></div></div><div>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.</div></div><div><div>O) COLOUR CODES FOR ELECTRICAL EQUIPMENT</div><div>1. ALL ELECTRICAL EQUIPMENT SHALL BE ANSI 61 GREY UNLESS OTHERWISE SPECIFIED.</div><div>2. EMERGENCY PANELBOARDS SHALL BE PANTONE 355 C (GREEN) AND UPS PANELBOARDS SHALL BE PANTONE 285 C (BLUE).</div><div>3. ALL JUNCTION BOX COVER PLATES ON ANY OTHER SYSTEMS SHALL BE COLOUR-CODED ACCORDING TO BELOW:<div><div>120208V NORMAL LIGHTING AND POWER = WHITE</div><div>120208V EMERGENCY POWER = WHITE / RED</div><div>120208V UPS = WHITE / BLUE</div><div>240416V NORMAL LIGHTING AND POWER = PINK</div><div>240416V EMERGENCY POWER = PINK / RED</div><div>240416V UPS = PINK / BLUE</div><div>347800V NORMAL LIGHTING AND POWER = YELLOW</div><div>347800V EMERGENCY POWER = YELLOW / RED</div><div>347800V UPS = YELLOW / BLUE</div><div>FIRE ALARM = RED</div><div>TELEPHONE = ORANGE</div><div>CABLE TV = PURPLE</div><div>DATA = BROWN</div><div>CONTROL HVAC = GREEN</div><div>CONTROL L.V. LIGHTING = GREEN / BLACK</div><div>SECURITY = GREY</div><div>SURVEILLANCE, CCTV = GREY / BLACK</div><div>PUBLIC ADDRESS = PA</div><div>AUDIO VISUAL = AV</div><div>PAGING = PG</div><div>INTERCOM = ICOM</div></div></div><div>4. NOTE THAT, LIGHT COLOURS SHALL BE CHOSEN FOR GREEN, BLUE, BROWN, AND GREY.</div></div><div><div>P) AS-BUILT AND CLOSEOUT DOCUMENTS:</div><div>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.</div><div>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 MARKINGS AND ANY CHANGES THAT OCCUR DURING CONSTRUCTION.</div><div>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.</div><div>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.</div><div>5. SUBMIT THE FOLLOWING DOCUMENTS FOR THE ENGINEERS REVIEW UPON COMPLETION OF PROJECT:<div><div>a. ESA FINAL INSPECTION CERTIFICATE</div><div>b. FIRE ALARM VERIFICATION & TESTING REPORT</div><div>c. EMERGENCY LIGHTING TEST REPORT</div><div>d. O & M MANUALS</div><div>e. PRODUCTS WARRANTY CERTIFICATES</div><div>f. AS-BUILT DRAWINGS (CAD & PDF FORMAT)</div><div>g. UPDATED PANELBOARD SCHEDULES</div><div>h. SHORT CIRCUIT COORDINATION & ARC FLASH STUDY REPORT (PDF FORMAT)</div><div>i. ETAP MODEL</div></div></div></div><div><div>Q) SPIRAL WRAP</div><div>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. CABLEING CONTRACTOR TO SIZE THE SPIRAL WRAP ACCORDINGLY.</div></div><div><div>R) TESTING:</div><div>1. THE CABLEING CONTRACTOR IS TO USE THE FLUKE DTX SERIES OR EQUIVALENT WITH THE LATEST VERSION OF FIRMWARE. TO TEST THE UTP CABLEING SYSTEM, A LIGHT SOURCE AND POWER METER WILL BE USED TO TEST FOR ALL FIBRE OPTIC CABLES. THE CABLEING CONTRACTOR MUST ENSURE THAT ALL CABLEING IS TESTED IN ACCORDANCE TO THE PROPOSED SPECIFICATIONS OF THE CATEGORY INSTALLED.</div><div>2. UPON COMPLETION OF TESTING BY THE CABLEING CONTRACTOR, A UNIVERSITY REPRESENTATIVE MAY CHOOSE TO WITNESS THE CABLES BEING TESTED.</div><div>3. ALL DEFICIENCIES MUST BE CORRECTED BEFORE THE PROJECT MANAGER WILL PROVIDE A CERTIFICATE TO RELEASE THE HOLDBACK ON THE PROJECT.</div></div></div> <div><div>A) GENERAL SCOPE OF WORK:</div><div>1. THIS DOCUMENT INCLUDES SPECIFICATIONS FOR CABLEING COMPONENTS, CONDUIT & RACEWAY INFRASTRUCTURE, CABLE TERMINATIONS, TESTING AND 'AS-BUILT' DOCUMENTATION WITHIN THE DESIGNATED AREAS.</div><div>2. THE CONTRACTOR IS TO PROVIDE CABLEING INFRASTRUCTURE AND TERMINATION HARDWARE INSTALLED, TERMINATED AND TESTED. EMT CONDUITS & CABLE TRAYS SHALL BE PROVIDED AS PER THE GENERAL EXPOSURE REQUIREMENTS IN U.L. 969 FOR INDOOR USE.</div><div>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:<div><div>STANDARD</div><div>TITLE</div><div>ANSI/TIA-568-D.0</div><div>GENERIC TELECOMMUNICATIONS CABLEING FOR CUSTOMER PREMISES</div><div>ANSI/TIA-568-D.1</div><div>COMMERCIAL BUILDING TELECOMMUNICATIONS CABLEING STANDARD</div><div>ANSI/TIA-568-C.2</div><div>BALANCED TWISTED-PAIR TELECOMMUNICATION CABLEING AND COMPONENTS STANDARD</div><div>ANSI/TIA-568-D.3</div><div>OPTICAL FIBER CABLEING COMPONENTS STANDARD</div><div>ANSI/TIA-606-C</div><div>ADMINISTRATION STANDARD FOR THE TELECOMMUNICATIONS INFRASTRUCTURE</div><div>CSA T526.7-4</div><div>FIBER OPTIC CABLES</div><div>CSA C22.2 NO. 232-M</div><div>PLUGS, RECEPTABLES AND CONNECTORS FOR COMMUNICATION SYSTEMS</div><div>CSA C22.2 NO. 212-14-M</div><div>COMMUNICATION CABLES</div><div>ANSI/TIA-598-C</div><div>OPTICAL FIBER CABLE COLOR CODING</div><div>ANSI/TIA-604-B.3</div><div>FOCS 3 FIBER CONNECTOR INTERMEDIATE STANDARD</div></div></div><div>4. ALL CABLEING INSTALLATIONS MUST BE PERFORMED BY LICENSED UNIONIZED (REW) ELECTRICIANS. THE ELECTRICIANS MUST FOLLOW THE LATEST SAFETY REQUIREMENTS FROM THE MINISTRY OF LABOUR.</div><div>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.</div><div>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 ENGINEERS REVIEW & APPROVAL, PRIOR TO ORDERING THE MATERIALS OR COMMENCING THE WORK ON SITE.</div><div>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.</div><div>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 MANIFIEST, CABLE TRAYS, ETC.</div><div>9. BASE BID MANUFACTURER IS PANDUIT. APPROVED ALTERNATIVES ARE BELDEN, COMMSCOPE & HUBBELL.</div></div> <div><div>B) INTERFERENCE DRAWINGS:</div><div>1. THE 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.</div><div>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.</div></div> <div><div>C) SHOP DRAWINGS:</div><div>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 REQUIRED FOR THE COMPLETION OF THE WORK AT ANY TIME UNTIL FORMAL ACCEPTANCE.</div><div>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.</div></div> <div><div>D) CABLEING PATHWAYS</div><div>1. GENERAL REQUIREMENTS:<div><div>a. ALL CONDUIT ENDS SHALL BE FITTED WITH PLASTIC BUSHINGS</div><div>b. MAXIMUM DISTANCE OF CONDUIT RUN BETWEEN TWO PULL BOXES TO BE 30M. THE PULL BOXES SHALL HAVE SCREW TYPE COVER NEW MATERIALS. ALL PULL BOXES MUST BE ACCESSIBLE WITH A MINIMUM 24" X 24" HINGED ACCESS HATCH PROVIDED WHERE REQUIRED. PULL BOXES FOR VERTICAL (6") TIMES THE SIZE OF THE INNER DIAMETER OF THE LARGEST CONDUIT CONNECTED TO IT.</div><div>c. THERE ARE TO BE NO MORE THAN 20 90° BENDS OR THE EQUIVALENT BETWEEN PULL BOXES.</div><div>d. CONDUITS SHALL HAVE A BEND RADIUS AS RECOMMENDED BY THE FIBER CABLEING MANUFACTURER.</div></div></div><div>2. PROVIDE FIRE STOPPING AND SEALANT AT ALL LOCATIONS WHERE CONDUITS PENETRATE WALLS AND FLOORS TO MAINTAIN FIRE RATING OF EXISTING WALLS.</div><div>3. PROVIDE FIRE BARRIER PILLOW (3M) AT ALL LOCATIONS WHERE CABLE TRAYS PENETRATE WALLS AND FLOORS.</div><div>4. PULL STRINGS MUST BE PROVIDED IN ALL NEW AND REWORKED CONDUITS.</div></div> <div><div>E) CAT 6A DATA CABLEING & COMPONENTS</div><div>1. THE APPROVED HORIZONTAL DATA CABLEING SHALL BE SOLID COPPER, BLUE FOR THE DATA NETWORK, UNSHIELDED TWISTED PAIR (UTP), 4-PAIR, 23 AWG, CMP RATED (FTE), CATEGORY 6A CABLE AS APPLICABLE. THE CABLE SHALL BE, BELDON BDN 2400, HUBBELL, OR COMMSCOPE SYSTIMAX GIGASPEED XL & PANDUIT.</div><div>2. ALL CABLES SHOULD BE INSTALLED IN A WAY TO COMPLY WITH THE ANSI/TIA/EIA-568-C.2 WIRING STANDARD.</div><div>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.</div><div>4. CROSS CONNECTS TO DATA NETWORK SWITCH BY U OF T CLIENT AND NOTIFY U OF T PROJECT MANAGER TO COORDINATE FOR CROSS CONNECTIONS.</div><div>5. PROVIDE AS REQUIRED 24 24 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.</div><div>6. PROVIDE:<div><div>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 UoT ITS</div><div>b. BLUE, 3M LENGTH, CATEGORY 6A RATED, PATCH CORD CABLE AT EACH USER LOCATION (ONE FOR EACH DATA DROP CONNECTION)</div></div></div><div><div>F) CAT 6A DATA CABLEING & COMPONENTS (FOR WIRELESS CONNECTIONS - WAP)</div><div>1. THE APPROVED HORIZONTAL DATA CABLEING SHALL BE SOLID COPPER, BLUE FOR THE DATA NETWORK, UNSHIELDED TWISTED PAIR (UTP), 4-PAIR, 23 AWG, CMP RATED (FTE), CATEGORY 6A CABLE AS APPLICABLE. THE CABLE SHALL BE, BELDON BDN 2400, HUBBELL, OR COMMSCOPE SYSTIMAX GIGASPEED XL & PANDUIT.</div><div>2. ALL CABLES SHOULD BE INSTALLED IN A WAY TO COMPLY WITH THE ANSI/TIA/EIA-568-C.2 WIRING STANDARD.</div><div>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.</div><div>4. FACEPLATES SHALL BE SINGLE GANG, CREAM COLOURED WITH MODULAR JACKS. PROVIDE BLANKS FOR ALL UNUSED JACKS. CONFIRM COLOR WITH ARCHITECT IN EACH SPACE PRIOR TO PURCHASING.</div><div>5. PROVIDE:<div><div>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 UoT ITS</div><div>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.</div><div>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.</div></div></div><div>6. CAT 6A CABLEING SHALL BE TERMINATED IN MODULAR ORANGE DATA JACKS AT THE PATCH PANEL END AND MODULAR WHITE DATA JACKS AT THE ACCESS POINT END. THE MODULES TO BE WIRED AS PER T569A.</div><div>7. 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.</div><div>7. TERMINATE CABLES WITH CATEGORY 6A COMPLIANT, MODULAR JACKS IN EXISTING PATCH PANEL. MODULAR JACKS TO BE COLOR BLUE IN THE RELAY RACK.</div><div>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:<div><div>UNIVERSITY OF TORONTO - ITS</div><div>4 BANCROFT AVE., ROOM #103</div></div></div><div>9. IN ADDITION, ITS GROUP MUST BE NOTIFIED BEFORE REMOVAL OF ANY EXISTING WAPs. COORDINATE WITH PROJECT MANAGER FOR ACCESS.</div></div><div><div>G) CAT 6 DATA CABLEING & COMPONENTS FOR SECURITY CONNECTIONS</div><div>1. PROVIDE ONE CAT. 6 DATA CABLE IN CONDUIT, FROM EACH SECURITY DEVICE LOCATION TO THE F&S PATCH PANEL IN THE DATA RACK IN TELECOMMUNICATIONS ROOM AS INDICATED, ENSURING THAT THE TOTAL WIRE LENGTH OF 90M IS NOT EXCEEDED.</div><div>2. CAT. 6 CABLEING SHALL BE TERMINATED IN THE FOLLOWING MODULAR COLORED JACKS:<div><div>a. RED DATA JACKS FOR HONEYWELL SYSTEM & SECURITY CAMERAS AT THE PATCH PANEL END AND AT THE SECURITY DEVICE END.</div><div>b. YELLOW DATA JACKS FOR SALTO SYSTEM AT THE PATCH PANEL END AND AT THE SECURITY DEVICE END.</div></div></div><div>3. PROVIDE:<div><div>a. RED FOR HONEYWELL & SECURITY CAMERAS), 7'-0" LENGTH, CATEGORY 6 RATED, 28 AWG PATCH CORD CABLE AT THE RELAY RACK. LOCATION, TO BE INSTALLED BY UoT ITS OR LOCKSHOP.</div><div>b. YELLOW (FOR SALTO), 7'-0" LENGTH, CATEGORY 6 RATED, 28 AWG PATCH CORD CABLE AT THE RELAY RACK LOCATION, TO BE INSTALLED BY UoT ITS OR LOCKSHOP.</div><div>c. CAT 6A CABLEING CONNECTED TO F&S SWITCH</div></div></div></div><div><div>H) SPIRAL WRAP</div><div>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. CABLEING CONTRACTOR TO SIZE THE SPIRAL WRAP ACCORDINGLY.</div></div><div><div>I) TESTING:</div><div>1. THE CABLEING CONTRACTOR IS TO USE THE FLUKE DTX SERIES OR EQUIVALENT WITH THE LATEST VERSION OF FIRMWARE. TO TEST THE UTP CABLEING SYSTEM, A LIGHT SOURCE AND POWER METER WILL BE USED TO TEST FOR ALL FIBRE OPTIC CABLES. THE CABLEING CONTRACTOR MUST ENSURE THAT ALL CABLEING IS TESTED IN ACCORDANCE TO THE PROPOSED SPECIFICATIONS OF THE CATEGORY INSTALLED.</div><div>2. UPON COMPLETION OF TESTING BY THE CABLEING CONTRACTOR, A UNIVERSITY REPRESENTATIVE MAY CHOOSE TO WITNESS THE CABLES BEING TESTED.</div><div>3. ALL DEFICIENCIES MUST BE CORRECTED BEFORE THE PROJECT MANAGER WILL PROVIDE A CERTIFICATE TO RELEASE THE HOLDBACK ON THE PROJECT.</div></div></div> <div><div>4. CATEGORY 68A FIELD TEST PARAMETERS SHALL BE. TESTING OF ALL 4 PAIRS AND 25 PAIR IS TO INCLUDE BUT NOT BE LIMITED TO THE FOLLOWING:<div><div>a. WIRE MAP</div><div>b. INSERTION LOSS</div><div>c. EQUAL LEVEL FAR END CROSS TALK (ELFEXT)</div><div>d. POWER SUM EQUAL LEVEL FAR END CROSS TALK (PSELFEXT)</div><div>e. DELAY SKEW</div><div>f. ATTENUATION (PAGCR)</div><div>g. NEAR END CROSS TALK (NEXT)</div><div>h. PROPAGATION DELAY</div><div>i. CABLE LENGTH</div><div>j. POWER SUM NEAR END CROSS TALK (PSNEXT)</div><div>k. RETURN LOSS</div></div></div><div>5. A TESTER WITH THE MOST RECENT VERSION OF ITS SOFTWARE AND FIRMWARE MUST PERFORM ALL TESTS IN ACCORDANCE TO ANSI/EIA T568-7, 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.</div><div>6. TEST PATCH CORDS FOR THE TESTER MUST BE DESIGNED AND APPROVED FOR TESTING BY THE MANUFACTURER. FIELD ASSEMBLED PATCH CORDS ARE NOT ACCEPTABLE.</div><div>7. ALL CABLE FAULTS MUST BE CORRECTED. SPLICING OF ANY CABLES WILL NOT BE PERMITTED, FOR ANY REASONUNLESS PRIOR AUTHORIZATION IF RECEIVED IN WRITING BY THE UNIVERSITY OF TORONTO.</div></div> <div><div>J) LABELLING:</div><div>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.</div><div>2. ALL ADHESIVE CABLE LABELS SHALL MEET THE LEGIBILITY, DEFAECATION, AND ADHESION REQUIREMENTS SPECIFIED IN UL 969 (REF. D-10). IN ADDITION THE LABELS SHALL MEET THE GENERAL EXPOSURE REQUIREMENTS IN U.L. 969 FOR INDOOR USE.</div><div>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.</div><div>4. ALL PATCH PANEL AND 110 BLOCK LABELS ARE TO BE MECHANICALLY PRINTED AND ARE TO FOLLOW THE GUIDELINES IN CSA-T528-83 FOR COLOR CODING OF TERMINATION FIELDINGS.</div><div>5. LABEL ALL CABLEING 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.</div><div>6. PROVIDE PROPER LABEL ON EACH NEW CABLE INSIDE THE PULL BOXES.</div><div>7. THE HORIZONTAL DATA CABLES SHALL BE LABELLED IN THE FORMAT TYPE [DATA]-FLOOR-ROOM-CABLE#. THE PER ROOM CABLE NUMBERS SHALL BE SEQUENTIAL BEGINNING AT</div></div>					



NEW GENERAL NOTES

- NEW AND/OR RELOCATED LIGHTING FIXTURES SHALL BE INDEPENDENTLY SUPPORTED BY BUILDING STRUCTURE.
- FOR ALL NEW AND/OR RELOCATED CONDUITS WHICH PASS THROUGH FIRE RATED ASSEMBLIES, ELECTRICAL CONTRACTOR SHALL FILL OPENINGS WITH CUL LISTED AND APPROVED WATERPROOF AND FIREPROOF FILLER MATERIALS TO MAINTAIN EXISTING FIRE RATING.
- 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.**
- 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.
- 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.**
- ALL NEW RECEPTACLES AND COMMUNICATION OUTLETS SHALL BE RECESSED UNLESS OTHERWISE NOTED.
- 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.
- ALL COMMUNICATION CABLEING ON 2ND FLOOR RENOVATION AREA SHALL BE TERMINATED IN LAN ROOM #315 ON 3RD FLOOR.**

NEW KEYED NOTES

- 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.
- 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 CAFÉ ROOM #131. PROVIDE ALL NECESSARY ACCESSORIES TO ENSURE A COMPLETE INSTALLATION.
- 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.
- PROVIDE POWER CONNECTIONS TO INDICATED MECHANICAL UNIT WITH NEW LOCAL DISCONNECT SWITCH, WIRING AND CONDUIT. COORDINATE WITH MECHANICAL ON SITE PRIOR TO ROUGH-INS.
- CONNECT NEW EXIT SIGNS TO NEAREST EXISTING EMERGENCY LIGHTING CIRCUIT WITH SPARE CAPACITY TO SUIT. MODIFY AND/OR EXTEND EXISTING BRANCH WIRING AS REQUIRED. ENSURE CIRCUIT NOT TO BE OVERLOADED.
- ALL TYPE 'D1' DOWNLIGHTS EXCLUDING EMERGENCY LIGHTS AND DOWNLIGHTS IN LIGHTING CONTROL ZONE 'Z3A' IN ROOM #202 SHALL BE LIGHTING CONTROL ZONE 'Z3B'.
- CONNECT INDICATED LIGHTING FIXTURE TO NEAREST EXISTING 120V EMERGENCY LIGHTING CIRCUIT WITH SPARE CAPACITY TO SUIT.
- PROVIDE CEILING-MOUNTED DUAL TECHNOLOGY OCCUPANCY SENSOR AS SPECIFIED. MODIFY EXISTING LIGHTING CIRCUIT IN THIS WASHROOM TO ENSURE NORMAL LIGHTING CIRCUIT TO BE CONTROLLED BY THIS SENSOR.
- 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 ACCESSORIES TO ENSURE A COMPLETE FUNCTIONAL INSTALLATION.
- 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 NECESSARY SUPPORT (ANCHOR UNITS) AND COORDINATE WITH GENERAL TRADE.
- REFER TO DETAIL 4 ON DRAWING E402 FOR DOOR HARDWARE CONNECTION WIRING DIAGRAM.

LIGHTING ZONE CIRCUITS - 2ND FLOOR

RM No.	SWITCH No.	LTG ZONE	WATTAGE	CIRCUIT No.	LPD (W/m2)	SB-10 LPD (W/m2)
2002A	N/A	N/A	42	NRP0202NA-6	7.69	6.8
2002B	N/A	N/A	31	NRP0202NA-6	11.97	4.6
2002	S3A	Z3A	308	NRP0202NA-4	6.12	11.5
	S3B	Z3B	280			
	S3C	Z3C	756			
	N/A	N/A	190	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		
	S1A	Z1A	140	NRP0202NA-8		
2021	N/A	N/A	28	EX. EMERGENCY LIGHTING CIRCUIT	6.27	6.7
	S1B	Z1B	252			
	S1C	Z1C	280			
	N/A	N/A	59	NRP0202NA-8		
2021A	N/A	N/A	31	EX. EMERGENCY LIGHTING CIRCUIT	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

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

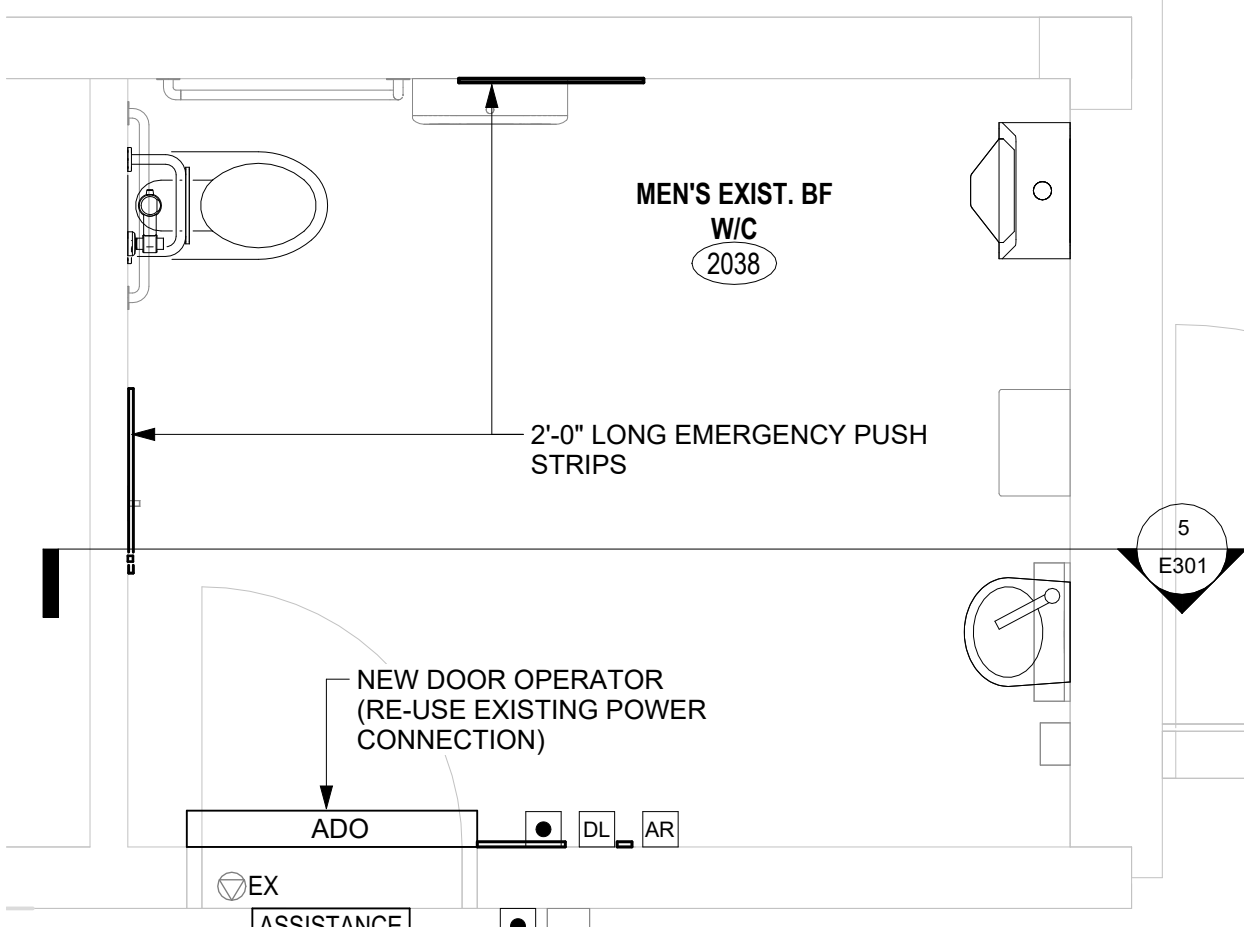
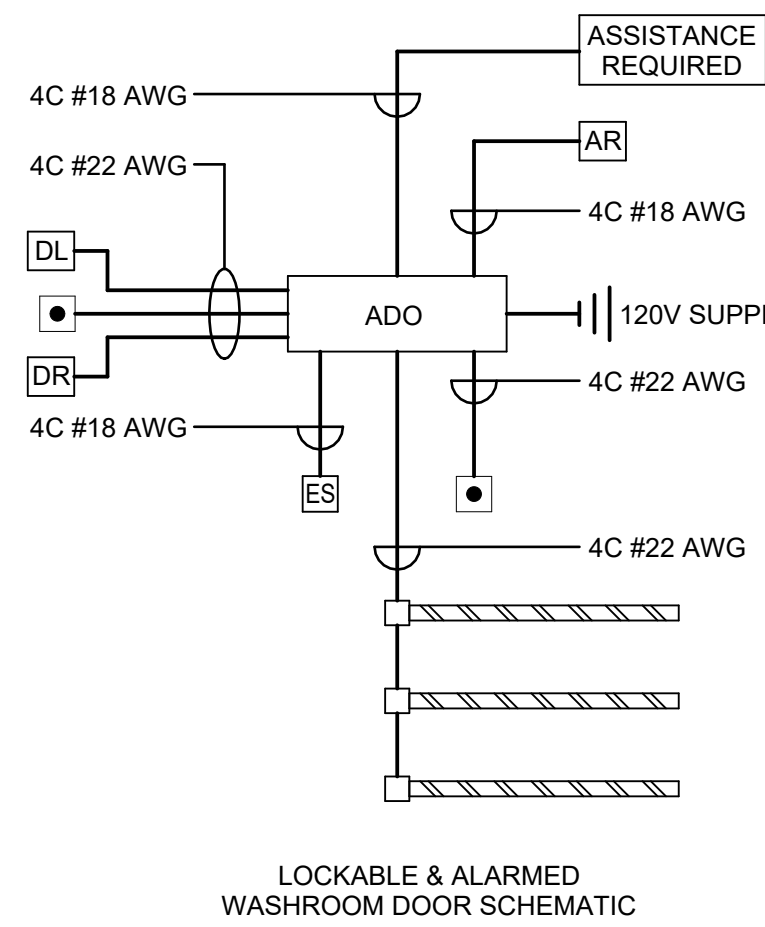
PART ROOF PLAN - NEW ELECTRICAL LAYOUT

SCALE: 1 : 100

FIELD DEVICE LEGEND			
SYM.	DESCRIPTION	SYM.	DESCRIPTION
[ADO]	AUTOMATIC DOOR OPERATOR	[AR]	"ASSISTANCE REQUESTED" DEVICE
[ES]	ELECTRIC STRIKE	[ASSISTANCE REQUIRED]	"ASSISTANCE REQUIRED" SIGN
[DL]	DOOR LOCK DEVICE (PUSH TO LOCK PLATE SWITCH)		
[DR]	DOOR RESET BUTTON - PROVIDE LAMACOID PLATE, 1/8" HIGH BLACK LETTERS ON WHITE BACKGROUND TO READ "PRESS TO RESET"		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.

- SEQUENCE OF OPERATION (ACCESSIBLE WASHROOM):
- DOOR ACTIVATION DEVICE OPENS DOOR.
 - DOOR LOCK DEVICE DEACTIVATES EXTERIOR DOOR ACTIVATION DEVICE, LOCKS THE DOOR & ACTIVATES THE IN USE SIGN.
 - INTERIOR DOOR ACTIVATION DEVICE UNLOCKS AND OPENS THE DOOR & DEACTIVATES THE IN USE SIGN.
 - EMERGENCY CALL STRIPS ACTIVATE THE ASSISTANCE REQUIRED SIGN, THE AUDIBLE BUZZER & UNLOCKS THE DOOR.
 - DOOR RESET BUTTON RETURNS THE SYSTEM TO NORMAL MODE.

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

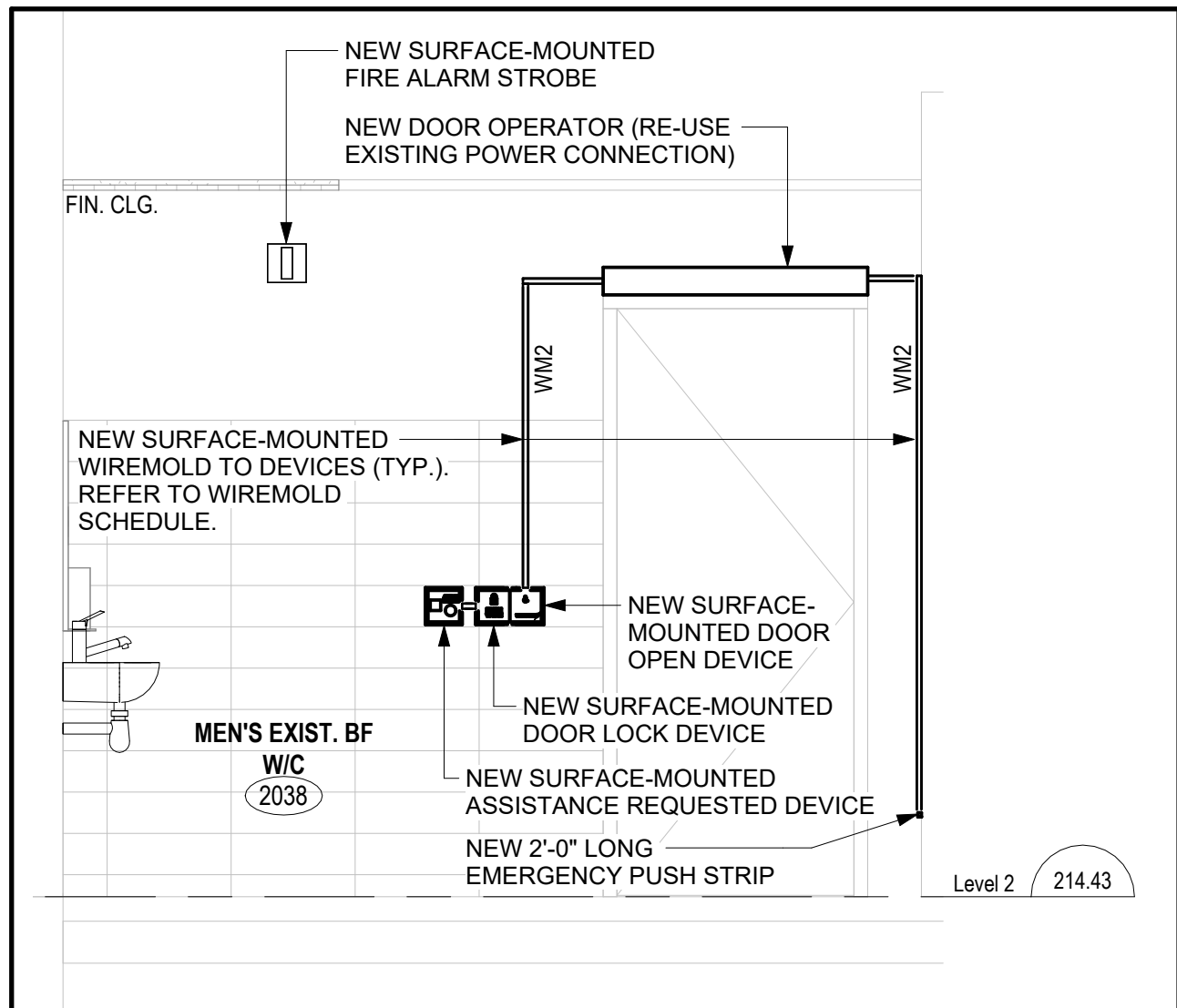


WASHROOM #2038 - DOOR WIRING SCHEMATIC & NEW ELECTRICAL LAYOUT

SCALE: 1 : 25

WIREMOLD TYPE SCHEDULE

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

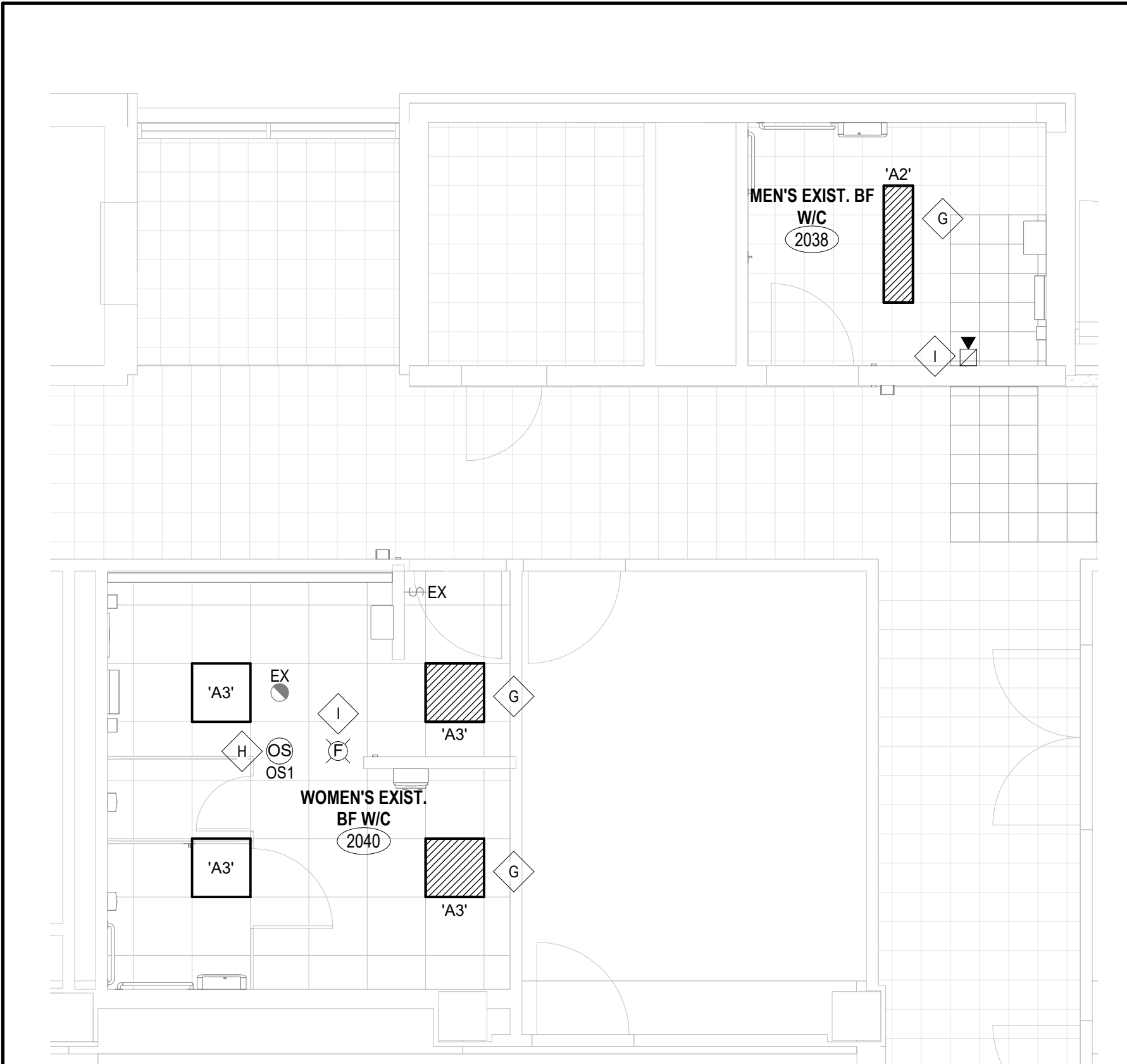


WR #2038 SOUTH ELEVATION - NEW ELECTRICAL LAYOUT

SCALE: 1 : 25

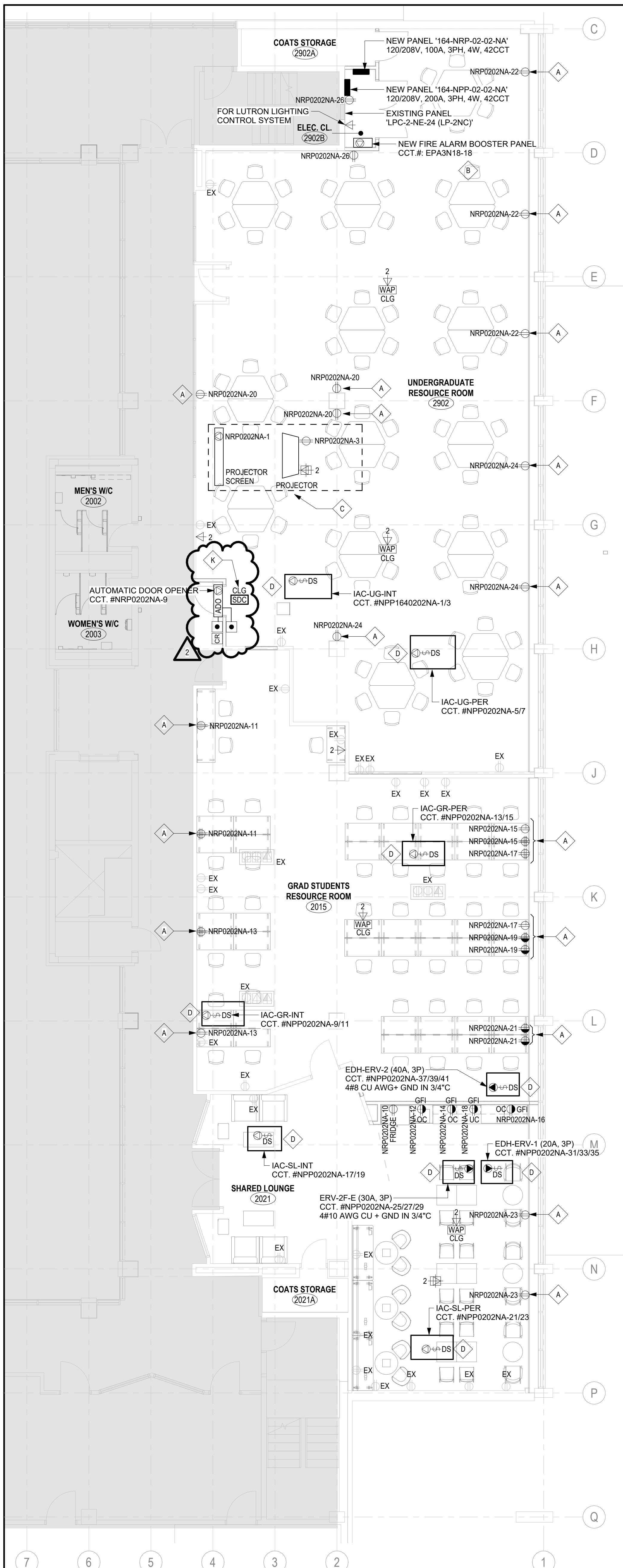
PART 2ND FLOOR PLAN (SOUTH WASHROOMS) - NEW LIGHTING LAYOUT

SCALE: 1 : 50



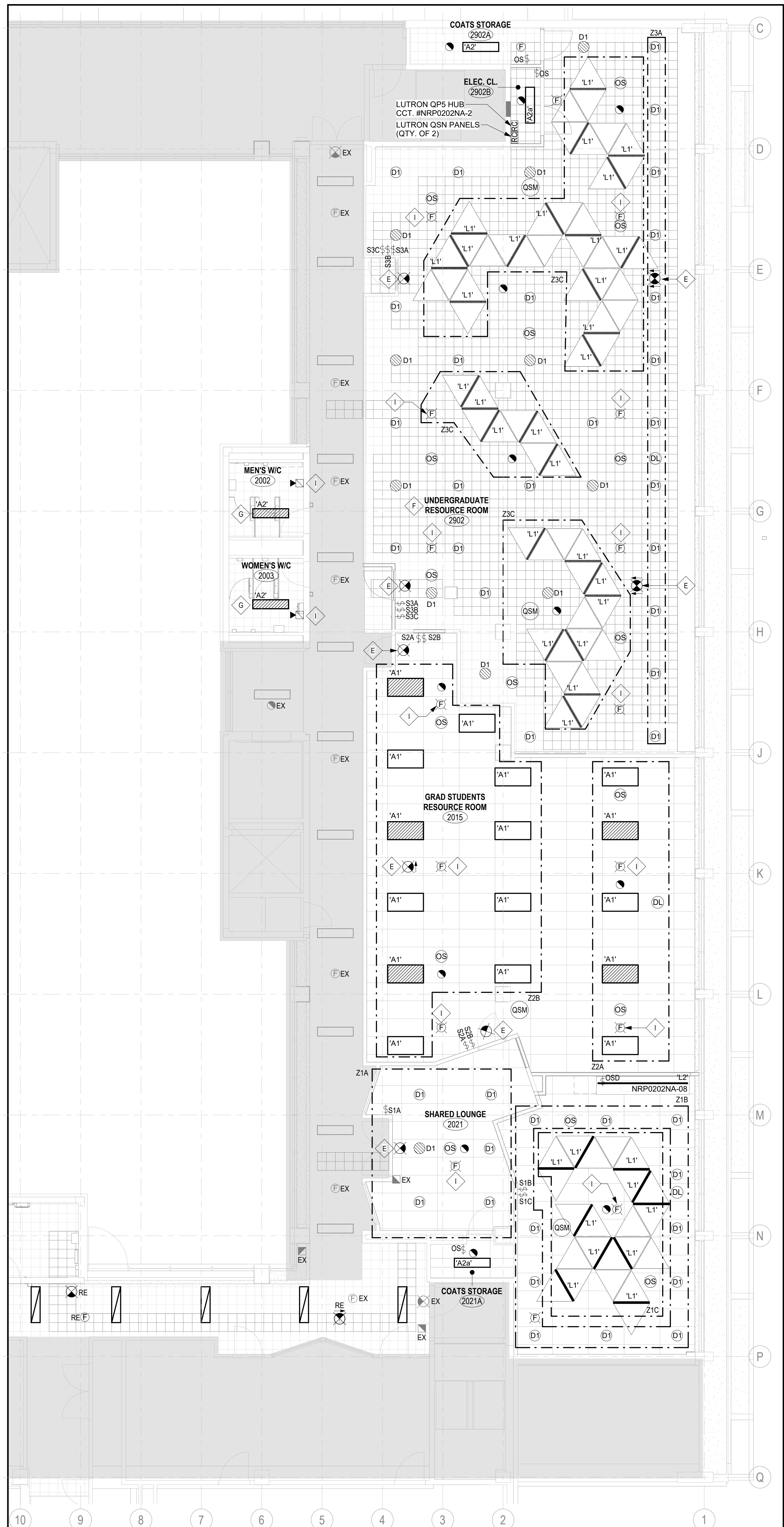
PART 2ND FLOOR PLAN (EAST) - NEW ELECTRICAL LAYOUT

SCALE: 1 : 75



PART 2ND FLOOR PLAN (EAST) - NEW LIGHTING LAYOUT

SCALE: 1 : 75



REV.	DESCRIPTION	DATE
2	ISSUED FOR ADDENDUM 06	2026-05-26
1	ISSUED FOR ADDENDUM 01	2025-05-06
	ISSUED FOR TENDER	2026-04-22
	ISSUED FOR REV. C.D.	2026-03-09
	ISSUED FOR PERMIT	2025-02-27
	ISSUED FOR CLASS A COSTING	2026-02-18
	ISSUED FOR 10% D.D.	2025-01-23
	ISSUED FOR CLASS B COSTING	2026-01-16
	ISSUED FOR 50% D.D.	2025-11-28
	ISSUED FOR 10% 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

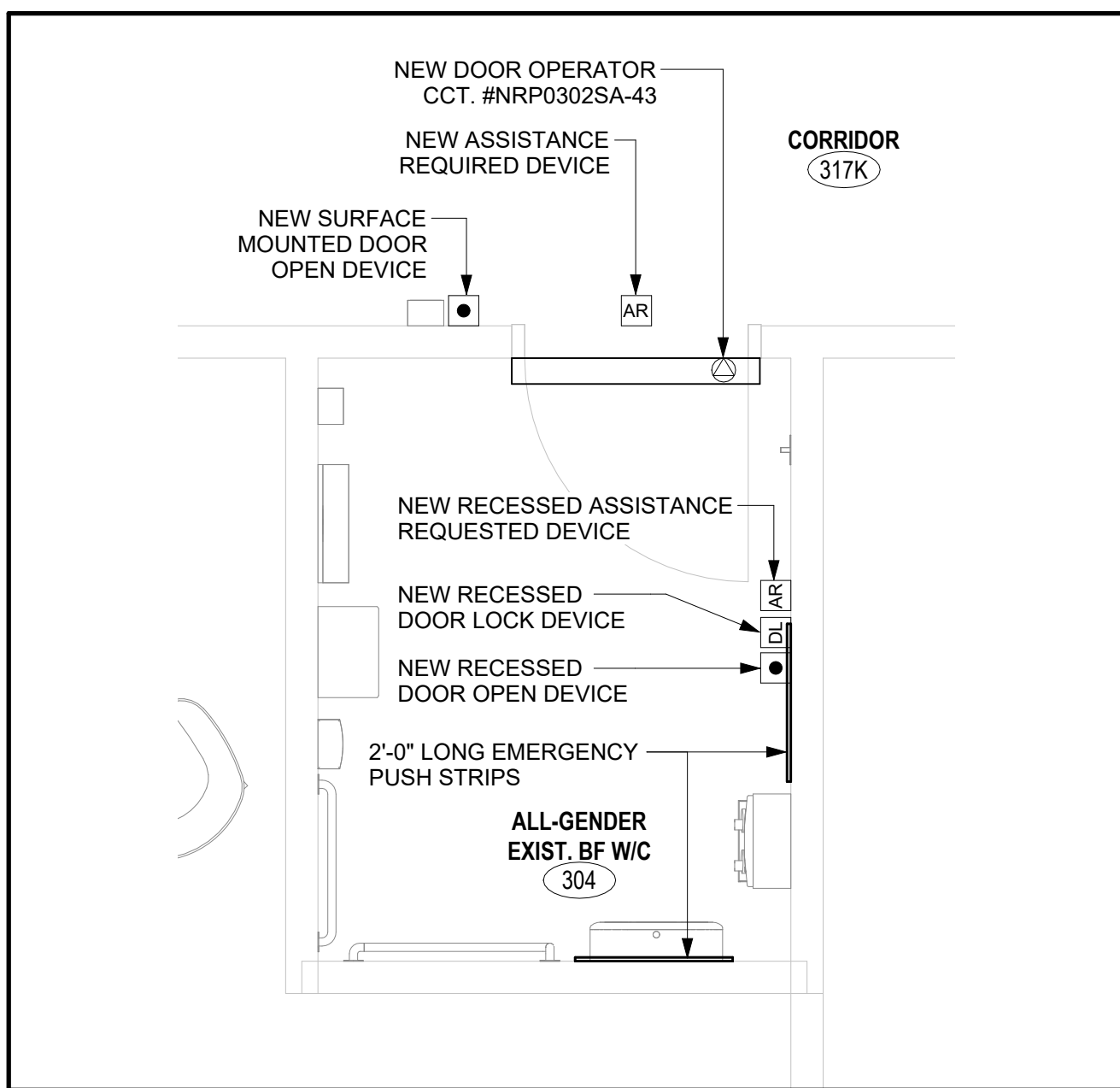
UNIVERSITY PROJECT NUMBER: NORTH POINT

P164-24-165

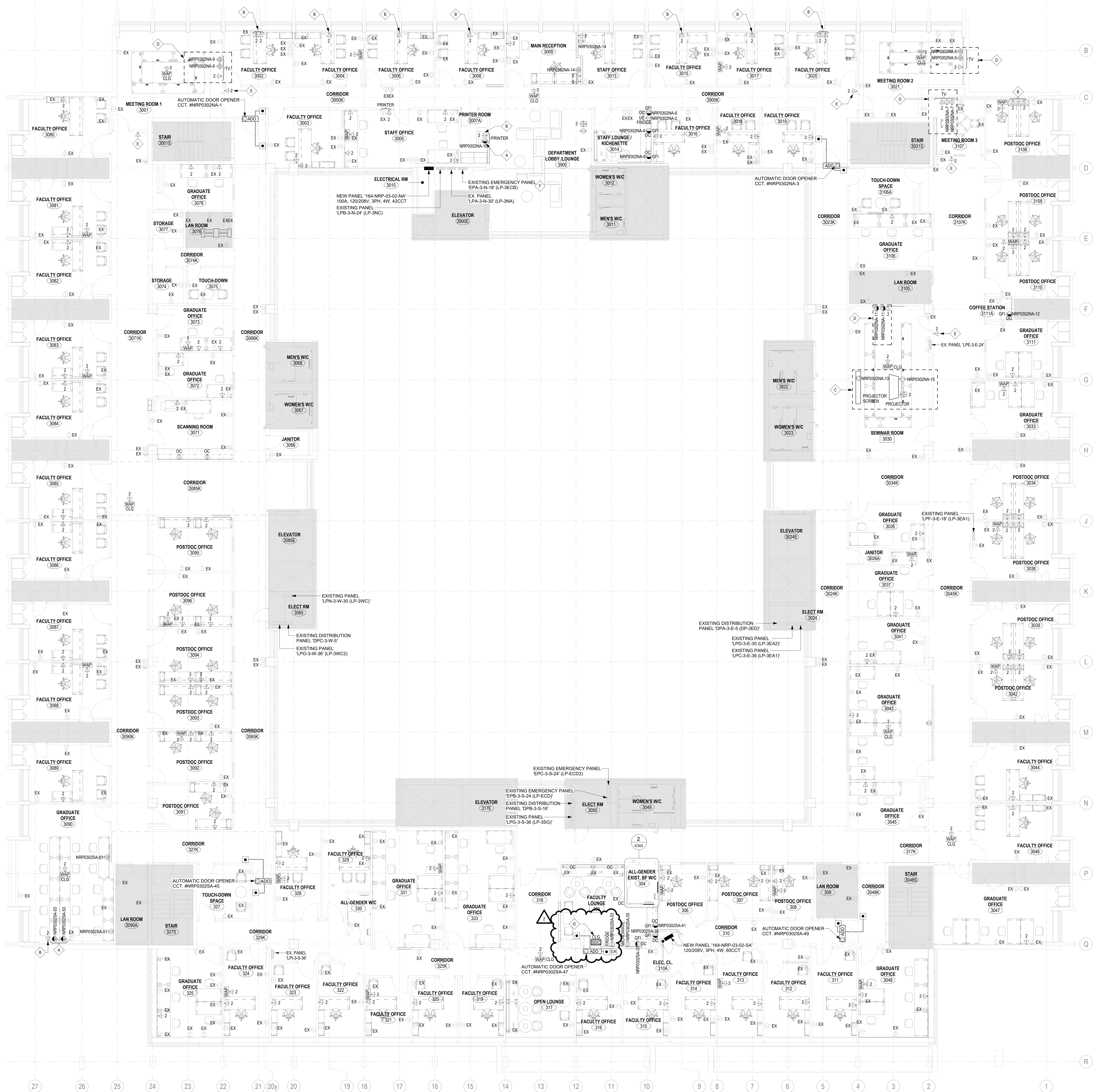
DRAWING NUMBER REV NUMBER

E301 2

- 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 RECESSED FOR AV SYSTEM. THE ELECTRICAL CONTRACTOR SHALL CONFIRM RECEPTACLE AND DATA OUTLET LOCATIONS WITH THE GENERAL CONTRACTOR PRIOR TO ROUGH-INS. COORDINATE WITH GENERAL CONTRACTOR 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 BELL PANEL IN ELECTRICAL PANEL E2202B.
- G. REFER TO DETAIL 4 ON DRAWING E402 FOR DOOR HARDWARE CONNECTION WIRING DIAGRAM.



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

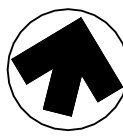


1
E302 3RD FLOOR PLAN - NEW ELECTRICAL LAYOUT
SCALE: 1:75

2	ISSUED FOR ADDENDUM 06	2016-05-26
1	ISSUED FOR ADDENDUM 01	2016-05-06
	ISSUED FOR TENDER	2016-04-22
	ISSUED FOR RFP 03	2016-03-09
	ISSUED FOR RFP 01	2016-02-27
	ISSUED FOR CLASS A COSTING	2016-02-18
	ISSUED FOR 10% DD	2016-01-23
	ISSUED FOR CLASS B COSTING	2016-01-16
	ISSUED FOR 50% DD	2015-11-28
	ISSUED FOR 10% SCHEMATIC DESIGN	2015-09-19
	ISSUED FOR CLASS C COSTING	2015-09-09
REV.	DESCRIPTION	DATE

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: NORTH POINT	
P164-24-165	
DRAWING NUMBER	REV NUMBER
E302	2



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.

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

B CONNECT NEW EXIT SIGNS TO NEAREST EXISTING EXISTING LIGHTING CIRCUIT WITH SPARE CAPACITY TO SUIT. MODIFY AND EXTEND EXISTING BRANCH WIRING AS REQUIRED. ENSURE CIRCUITRY CAN BE OVERLOADED.

C PROVIDE LUTRON PICO WIRELESS LOW VOLTAGE SWITCHES (QTY. OF 6) AS SPECIFIED FOR CORRIDOR LIGHTING ZONES (LIGHTING ZONES 2/4A TO 2/4H).

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

E PROVIDE LUTRON POWPINK DIMMING MODULE (CAT. # RAJLS-2T-DV-B) FOR INDICATED ROOM. REFER TO DETAIL Z ON DRAWING E01. PROVIDE ALL NECESSARY ACCESSORIES TO ENSURE A COMPLETE INSTALLATION.

F UNDER CABINET LIGHTS 1/3" & 1/3" SHALL BE CONTROLLED BY THE SAME OCCUPANCY SENSOR DIMMER SWITCH AND FED FROM THE SAME POWER SUPPLY. INSTALLING CABLE SHALL NOT BE USED.

G LUTRON DIN RAIL POWER SUPPLY (CAT. # GSPS-DH-1.75) TO BE PLUMPED IN AN ENCLOSURE ABOVE THE CEILING SPACE. PROVIDE 120V/15A POWER CONNECTION AS INDICATED.

H PROVIDE NEW FIRE ALARM STROBE CIRCUITS (C/W NEW FIRE ALARM BOOSTER PANEL TO FIRE ALARM STROBES AND FIRE ALARM SPOKERS STROBE IN RENOVATION AREA. PROVIDE ALL NECESSARY ACCESSORIES TO ENSURE A COMPLETE FUNCTIONAL INSTALLATION.

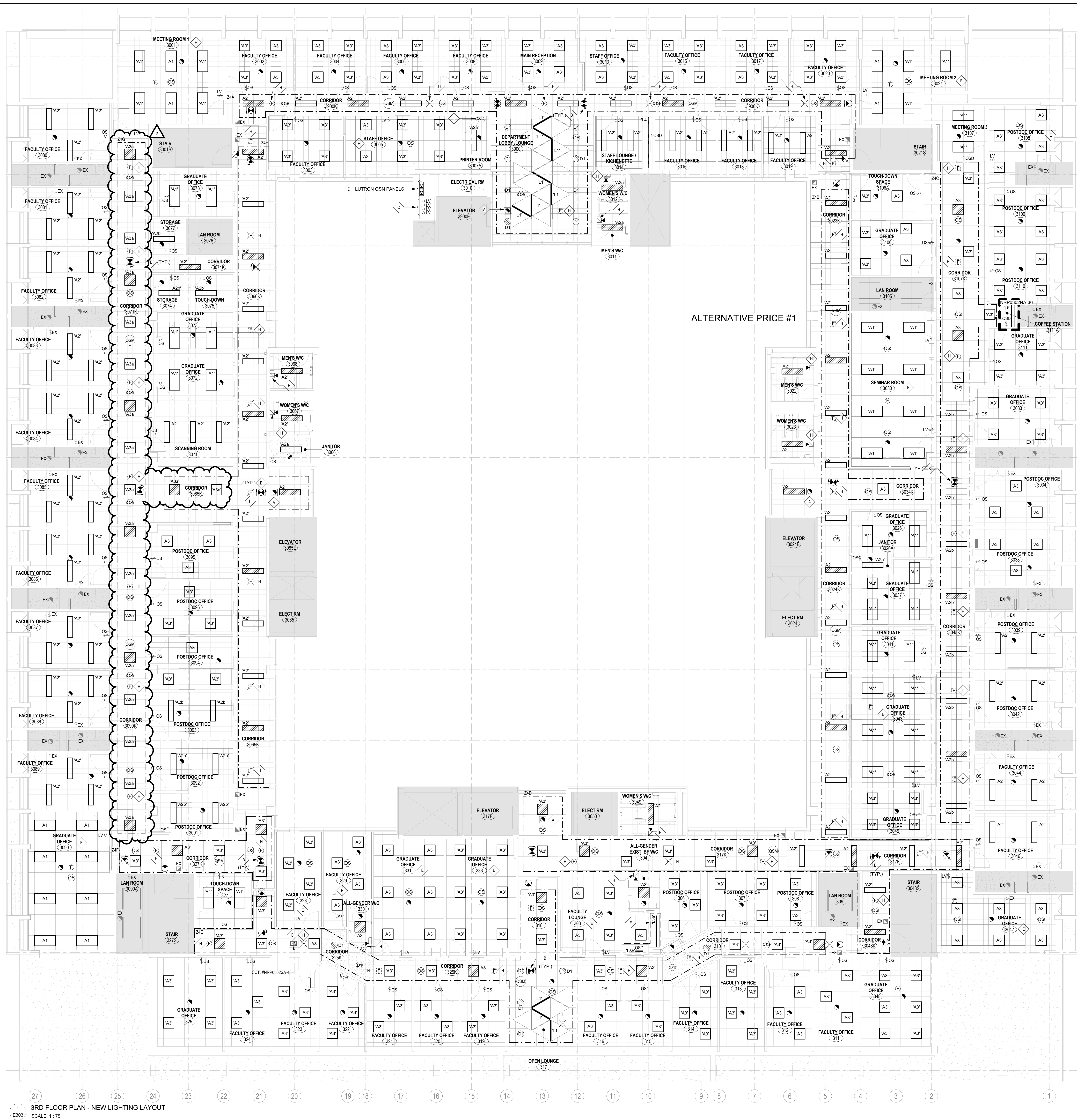
I PROVIDE TYPE WM1 SURFACE-MOUNTED WIREMOLD RACEWAY - 1 GANG OUTLET BOX & ACCESSORIES FOR INDICATED-SWITCH PANEL. RUN THE WIREMOLD TO ACCESSIBLE CING SPACE VIA THE NEAREST FULL-HEIGHT PARTITION. REFER TO WIREMOLD TYPE SCHEDULE ON THIS DRAWING.

RM No.	SWITCH NO.	LTG ZONE	WATTAGE	CIRCUIT No.	LPD (W/m ²)	SB-10 LPD (W/m ²)
3900	S4A	24A	294	NRP0302NA-34	9.02	10.8
	N/A		252	EX. EMERGENCY LIGHTING CIRCUIT		
	S4A		364	NRP0302NA-34		
3900K	S4B		56	EX. EMERGENCY LIGHTING CIRCUIT	10.26	
	S4B		168	NRP0302NA-36	7.43	
3023K	N/A	24B	84	EX. EMERGENCY LIGHTING CIRCUIT		
	S4B		210	EX. EMERGENCY LIGHTING CIRCUIT		
3024K	N/A		84	EX. EMERGENCY LIGHTING CIRCUIT		
	S4B		30	NRP0302NA-36	3.91	
	N/A	42	EX. EMERGENCY LIGHTING CIRCUIT			
3017K	S4C		162	NRP0302NA-36		
	N/A		102	EX. EMERGENCY LIGHTING CIRCUIT	6.11	
	S4C	24C	210	NRP0302NA-36		
3045K	N/A		84	EX. EMERGENCY LIGHTING CIRCUIT		
	S4D		204	NRP0302NA-38		
325K	N/A	24D	174	EX. EMERGENCY LIGHTING CIRCUIT	6.44	
	S4D		42	NRP0302NA-38		
3048K	N/A		42	EX. EMERGENCY LIGHTING CIRCUIT		
	S4E		118	NRP0302NA-38	7.72	
310	N/A	24E	88	EX. EMERGENCY LIGHTING CIRCUIT		
	S4E		30	NRP0302NA-38		
318K	N/A		30	EX. EMERGENCY LIGHTING CIRCUIT		
	S4E		148	NRP0302NA-38	8.01	
325K	N/A	24F	118	EX. EMERGENCY LIGHTING CIRCUIT		
	S4E		168	NRP0302NA-38		
317	N/A		56	EX. EMERGENCY LIGHTING CIRCUIT		
	S4F		90	NRP0302NA-38	8.16	
327K	N/A	24G	60	EX. EMERGENCY LIGHTING CIRCUIT		
	S4G		150	NRP0302NA-38		
3071K	N/A		90	EX. EMERGENCY LIGHTING CIRCUIT		
	S4G		150	NRP0302NA-38	6.14	
3090K	N/A	24H	90	EX. EMERGENCY LIGHTING CIRCUIT		
	S4H		168	NRP0302NA-40		
3066K	N/A		128	EX. EMERGENCY LIGHTING CIRCUIT		
	S4H		102	NRP0302NA-40	4.98	
3085K	N/A	24H	72	EX. EMERGENCY LIGHTING CIRCUIT		
	S4H		128	EX. EMERGENCY LIGHTING CIRCUIT		
3065K	N/A		84	EX. EMERGENCY LIGHTING CIRCUIT		

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.

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.



2	ISSUED FOR ADDENDUM 06	2026-05-28
1	ISSUED FOR ADDENDUM 04	2026-05-21
	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
REV.	DESCRIPTION	DATE

KEY PLAN (NTS)	SEAL
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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
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REVIEWED BY: JW	DATE CREATED: 2025-05-27
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UNIVERSITY PROJECT NUMBER	NORTH POINT
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P164-24-165

DRAWING NUMBER	REV. NUMBER
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E303	2
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L303	2
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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	120V	0-10V	42.0 W	4000 lm	3500 K	85	
A2c'	1' x 4' LED PANEL	SURFACE	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	
A3a'	2' x 2' LED PANEL	SURFACE	ORACLE LIGHTING (BY ELITE LIGHTING), CAT # 22-FPL1-LED-2000L/3000L/4000L-DIM10-MVOLT-35K/40K/50K-85	120V	0-10V	30.0 W	4000 lm	3500 K	85	
A3b'	2' x 2' LED PANEL	SURFACE	ORACLE LIGHTING (BY ELITE LIGHTING), CAT # 22-FPL1-LED-2000L/3000L/4000L-DIM10-MVOLT-35K/40K/50K-85	120V	0-10V	30.0 W	4000 lm	3500 K	85	
L1'	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 & AE4RPS-SW-28W-90DEG-OSTP-90CRI-35K-TLMP-FTMW-TYMM-NA	120V	0-10V	28.0 W	2775 lm	3500 K	90+	

NOTES

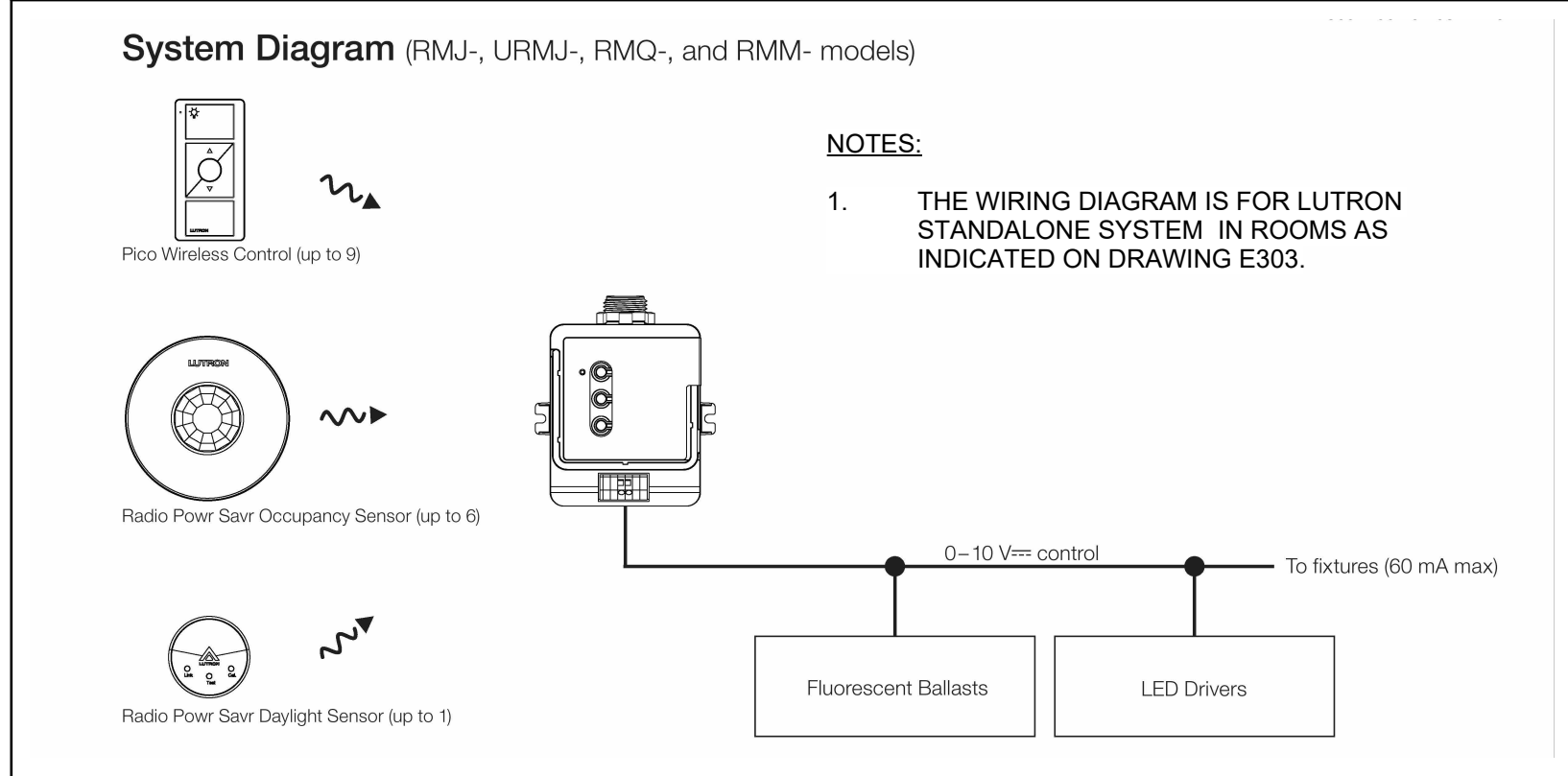
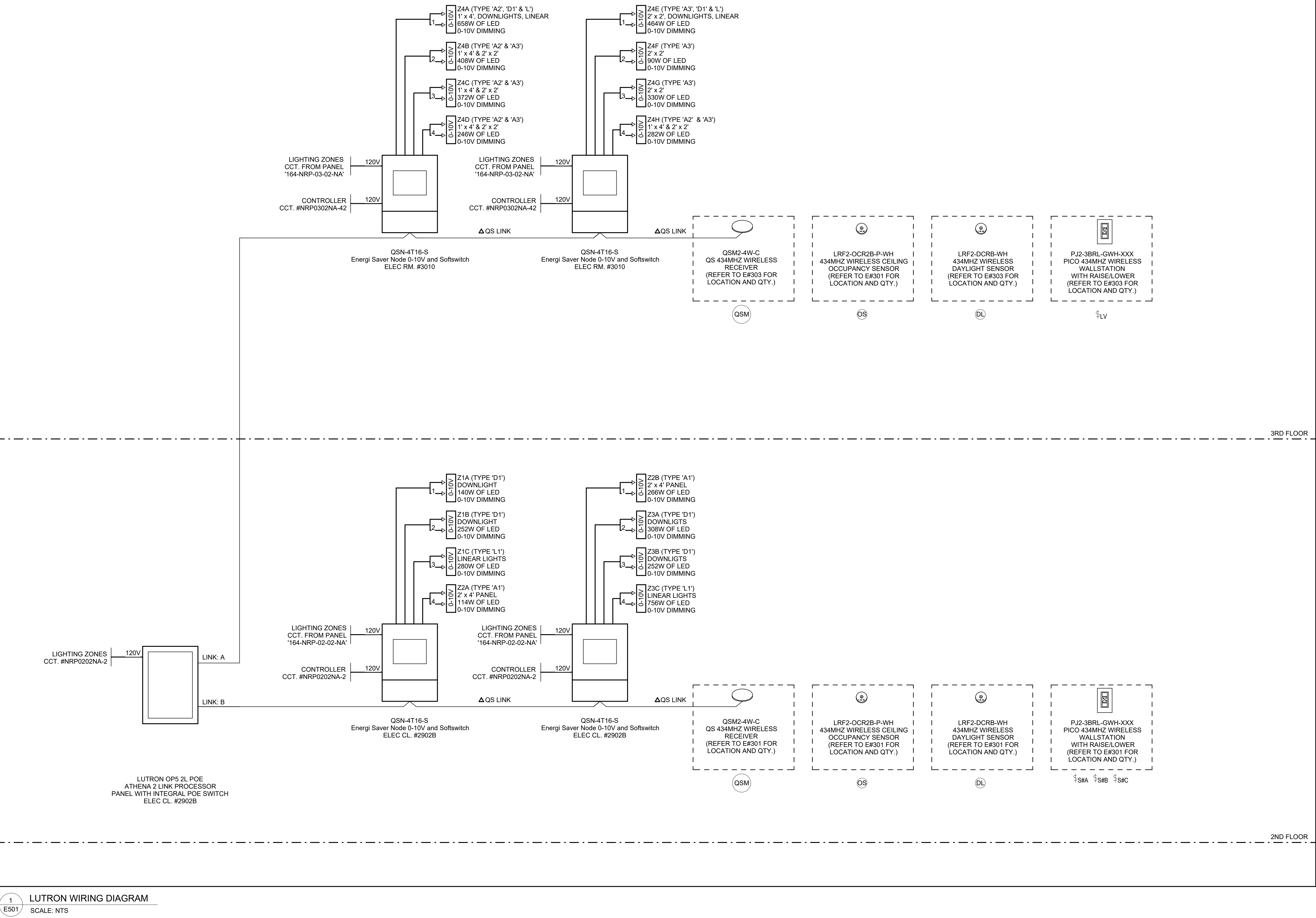
- THIS DETAIL IS DIAGRAMMATIC ONLY FOR LUTRON LIGHTING CONTROL SYSTEM. REFER TO PLANS FOR QUANTITY AND LOCATION OF ZONES AND DEVICES.
- PROVIDE FULLY FUNCTIONAL STANDALONE SYSTEM C/W WITH ALL DEVICES, WIRING, ACCESSORIES, PROGRAMMING, TESTING ETC.
- INSTALL ALL DEVICES AS PER MANUFACTURER'S RECOMMENDATIONS.
- ALL LOW VOLTAGE WIRING CABLING, AS NOTED ON THIS SCHEMATIC, SHALL BE INSTALLED INSIDE CONDUIT.
- DIMMING SYSTEM SHALL BE BASED ON LUTRON ATHENA DIMMING SYSTEM.
- ELECTRICAL CONTRACTOR SHALL CARRY LUTRON FOR COMMISSIONING, PROGRAMMING & TRAINING OF THE LIGHTING CONTROL SYSTEM IN BASE BID.
- WIRING DETAIL SHOWN TO BE CONFIRMED & COORDINATED WITH LUTRON.
- 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, 2, 3, AND 4. DO NOT CONNECT WIRE 2')
- 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-46L OR GRX-PCBL-46L. OTHERWISE USE 2#12 AWG + 2#22 AWG.
- CONTACT CLOSURE SIGNAL 3 #18 AWG

LIGHTING CONTROL DEVICES LEGEND

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



2 E501 LUTRON STANDALONE LIGHTING CONTROL WIRING DIAGRAM
SCALE: NTS

1 E501 LUTRON WIRING DIAGRAM
SCALE: NTS

ISSUED FOR ADDENDUM 06	2016-05-26
ISSUED FOR TENDER	2016-04-22
ISSUED FOR RFP CD	2016-03-09
ISSUED FOR PERMIT	2016-02-27
ISSUED FOR CLASS A COSTING	2016-02-18
ISSUED FOR 100% CD	2016-01-23
ISSUED FOR CLASS B COSTING	2015-01-16
ISSUED FOR 50% CD	2015-11-28

REV.	DESCRIPTION	DATE
1	ISSUED FOR ADDENDUM 06	2016-05-26
2	ISSUED FOR TENDER	2016-04-22
3	ISSUED FOR RFP CD	2016-03-09
4	ISSUED FOR PERMIT	2016-02-27
5	ISSUED FOR CLASS A COSTING	2016-02-18
6	ISSUED FOR 100% CD	2016-01-23
7	ISSUED FOR CLASS B COSTING	2015-01-16
8	ISSUED FOR 50% CD	2015-11-28

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	REV. NUMBER
E501	1