

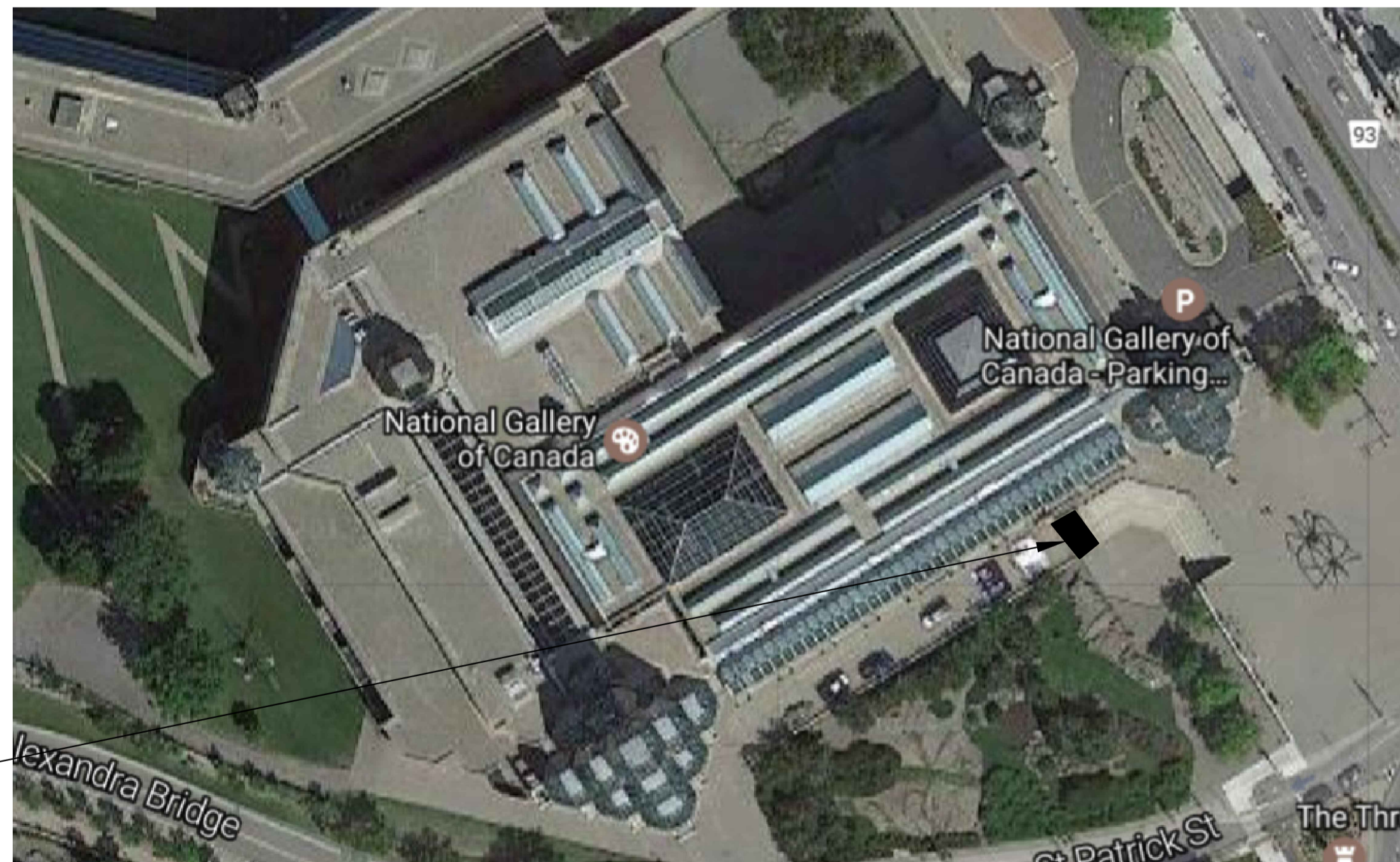
ELECTRICAL LEGEND	
ITEM	DESCRIPTION
	FLUORESCENT LIGHT FIXTURE T-BAR CEILING MOUNTED TYPE AS INDICATED
	ELECTRICAL PANEL
	JUNCTION BOX (12"x12"x6")
	FIRE ALARM PULL STATION
	FIRE ALARM SMOKE DETECTOR CEILING MOUNTED
	FIRE ALARM BELL
	10"x10"x3" PULL BOX, SECURE SIDE
	10"x10"x3" PULL BOX, SECURE SIDE
	SINGLE GANG BOX (2"x4"), NON SECURE SIDE
	SINGLE GANG BOX (2"x4"), SECURE SIDE
	SINGLE PHASE MOTOR
	DIRECT CONNECTION
	DISCONNECT SWITCH
	BASEBOARD HEATER (BASE BUILDING)
	DIMMER SWITCH
	EMERGENCY EXIT SIGN c/w INTERGAL BATTERY PACK
	5-20R GFCI DUPLEX RECEPTACLE c/w WEATHER PROOF BOX AND COVER.
	EMERGENCY LIGHT c/w INTERGAL BATTERY PACK

NOT ALL SYMBOLS SHOWN IN LEGEND SET ARE NECESSARILY USED IN DRAWING SET.

PARTIAL GROUND FLOOR PLAN – TEMPORARY POWER DISTRIBUTION
SCALE 1:250

DRAWING NOTES:

- ① PROVIDE NEW TEMPORARY PANEL SET-UP FOR DIRECT CONNECTION TO SERVICE PANELS AS REQUIRED. THESE PANELS ARE LOCATED OUTDOORS BELOW AT OUTDOOR THEATRE ENTRANCE. PROVIDE TEMPORARY SET UP c/w 60AMP PANEL, 3PH-4 WIRE, 18CCT PANEL, SURFACE MOUNTED, PRIMARY DISCONNECT, STEP DOWN TRANSFORMER IF REQUIRED AND LOCKABLE ENCLOSURE AS REQUIRED BY ESA. PANEL LABEL TO READ: TEMPORARY PANEL "T1". PROVIDE HINGED, WEATHER PROOF ENCLOSURE ENSURE THERE IS NO ACCESS BY PUBLIC. PROVIDE STRUCTURE c/w BALLAST ENGINEERED SUCH THAT TIP OVER IS NOT POSSIBLE.
- ② TYPICAL: PROVIDE NEW 5-20R RECEPTACLE AS INDICATED c/w ALL ASSOCIATED CONDUIT, WIRING, HARDWARE, FASTENERS AND FITTINGS BACK TO NEW PANEL. PROVIDE NEW BREAKER IN NEAREST EXISTING PANEL FOR EACH CIRCUIT SHOWN. ELECTRICAL CONTRACTOR SHALL PROVIDE UPDATED PANEL SCHEDULES FOR ALL PANEL EFFECTED BY THIS UPGRADE.



KEY PLAN – APPROXIMATE SERVICE PANEL LOCATION

GENERAL NOTES:

- ① ALL ELECTRICAL EQUIPMENT SHOWN IN THIN SOLID LINES IS EXISTING TO REMAIN.
- ② ALL ELECTRICAL EQUIPMENT SHOWN IN THICK SOLID LINES IS NEW TO BE PROVIDED UNDER THIS CONTRACT, TOGETHER WITH ALL ASSOCIATED CONDUITS AND WIRING.
- ③ ALL ELECTRICAL EQUIPMENT SHOWN IN THICK DASHED LINES WITH LETTER "R" IS EXISTING TO BE RELOCATED AS SHOWN. EXTEND ALL CONDUITS AND WIRING TO SUIT.
- ④ ALL ELECTRICAL EQUIPMENT SHOWN IN THICK DASHED LINES WITH LETTER "X" IS EXISTING TO BE REMOVED c/w ALL CONDUIT, WIRING AND ASSOCIATED HARDWARE BACK TO NEAREST J/B.
- ⑤ FOR ANY REQUIRED SHUT DOWN, CONTRACTOR TO COORDINATE WITH SITE MANAGER AND OBTAIN APPROVAL BEFORE SHUT DOWN CAN BE PERFORMED.
- ⑥ PROVIDE NEW BREAKERS AS REQUIRED IN EXISTING ELECTRICAL PANELS TO ACCOMMODATE NEW CONNECTIONS, ALSO PROVIDE BLANK PLATES WHERE CIRCUIT BREAKERS ARE NOT INSTALLED, PROVIDE NEW TYPED PANEL LEGEND TYPICAL FOR ALL PANELS TOUCHED BY THIS CONTRACT. TURN OVER TO THE OWNER ALL BREAKERS REMOVED UNDER THIS CONTRACT.
- ⑦ ALL EXISTING AND NEW CONDUITS AND WIRING PASSING THRU FLOOR AND FIRE RATED WALLS TO BE FIRE STOP USING 3M FIRE RETARDANT MASTIC SEALANT NO EQUIVALENT.
- ⑧ ALL WIRING TO BE R/RW90, MINIMUM SIZE #12AWG COPPER, IN EMT CONDUIT UNLESS OTHERWISE NOTED.
- ⑨ ALL ELECTRICAL CIRCUITS ARE SHOWN FOR GROUPING PURPOSES ONLY. CONTRACTOR TO USE AVAILABLE CIRCUITS IN EXISTING ELECTRICAL PANELS. REUSE EXISTING AND/OR PROVIDE NEW ELECTRICAL BREAKERS AS REQUIRED.
- ⑩ REGROUP CIRCUITS AS REQUIRED.
- ⑪ COORDINATE ALL WORK WITH ARCHITECTURAL AND MECHANICAL CONTRACTORS.
- ⑫ THIS DRAWING WAS BASED ON PARTIAL SITE REVIEW ONLY. ALL EQUIPMENT, ACCESSORIES, SIZES, LOCATIONS AND DETAILS OF INSTALLATIONS TO BE CONFIRMED ON SITE.
- ⑬ THE ELECTRICAL CONTRACTOR SHALL REFEED ALL EXISTING ELECTRICAL EQUIPMENT IN THE NEW SPACE FROM THE NEW PANELS (A & B) INSTALLED UNDER THIS CONTRACT. VERIFY ALL CIRCUITING AND PROVIDE NEW BREAKERS IN THE NEW PANELS AS REQUIRED FOR A COMPLETE AND OPERATIONAL SYSTEM. (SUITABLE FOR ALL EXISTING EQUIPMENT THAT IS NOT FED FROM THE BUILDINGS BASE BUILDING ELECTRICAL SYSTEM).
- ⑭ THESE GENERAL NOTES APPLY TO ALL ELECTRICAL DRAWINGS IN THE DRAWING PACKAGE.

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1	ISSUED FOR TENDER	APR. 7 2017
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REVISIONS

client:
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project:
TEMPORARY WORK FOR COLONNADE & MAIN ENTRANCE WINDOW/ROOF & SLOPED SILL
380 SUSSEX DR.
OTTAWA, ONTARIO

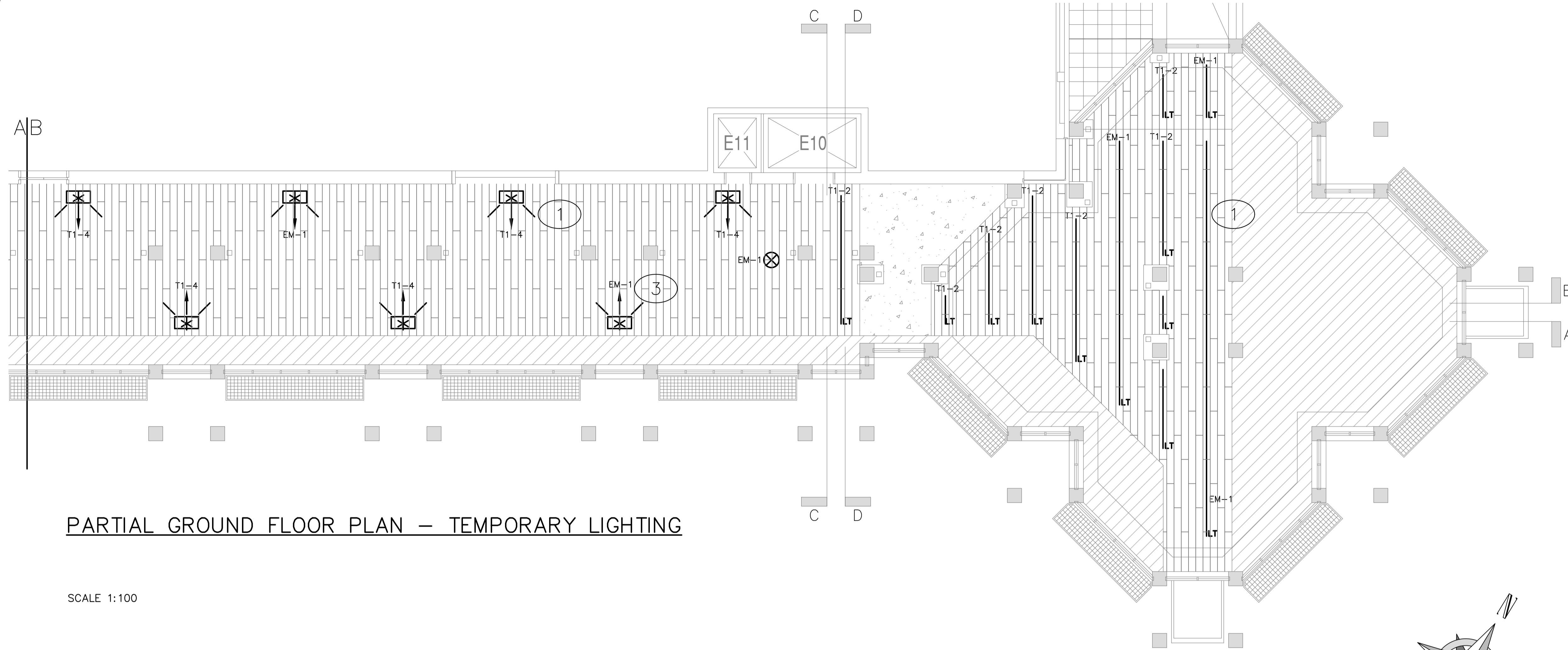
drawing title:
TEMPORARY POWER DISTRIBUTION AND DETAILS

scale:	AS SHOWN	drawn by:	M.G.
designed by:	M.G.	reviewed by:	J.R.P.
approved by:	J.R.P.	date:	APR. 2017

project no.:	100-17S	drawing no.:	E-1
revision:	<0>		1 of 3

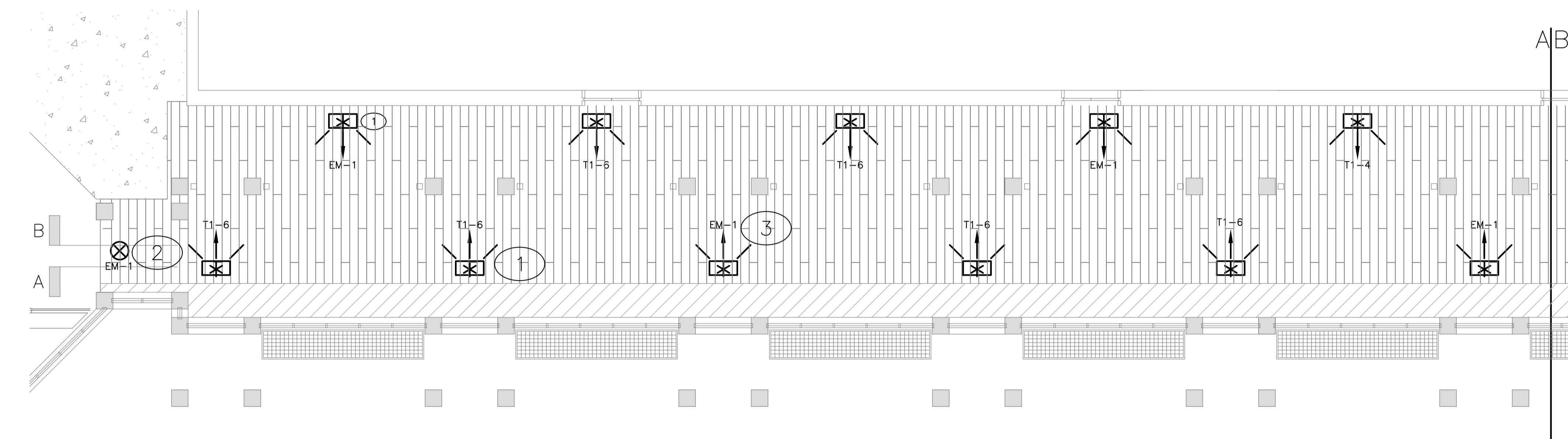
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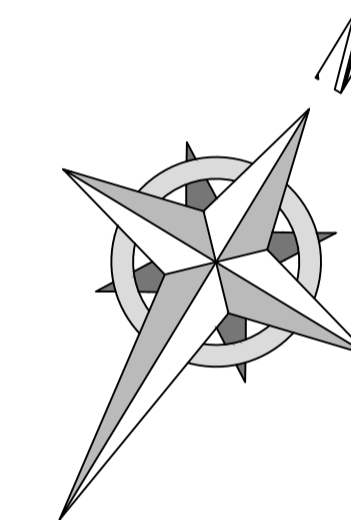
PARTIAL GROUND FLOOR PLAN – TEMPORARY LIGHTING

SCALE 1:100



PARTIAL GROUND FLOOR PLAN – TEMPORARY LIGHTING CONTINUED..

SCALE 1:100



DRAWING NOTES:

- ① TYPICAL: PROVIDE NEW LIGHTING AS INDICATED. CIRCUIT AS NOTED. PROVIDE PHOTOCELL FOR CONTROL OF EACH LIGHTING CIRCUIT.
- ② TYPICAL: PROVIDE NEW EXIT LIGHTING AS INDICATED. CIRCUIT AS NOTED.
- ③ TYPICAL: PROVIDE EMERGENCY POWER CIRCUIT FROM NEAREST AVAILABLE PANEL.

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REVISIONS	

client:
NATIONAL GALLERY OF CANADA

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380 SUSSEX DR.
OTTAWA, ONTARIO

drawing title:
ELECTRICAL TEMPORARY LIGHTING

scale:	AS SHOWN	drawn by:	M.G.
designed by:	M.G.	reviewed by:	J.R.P.
approved by:	J.R.P.	date:	APR. 2017

project no.:	100-17S	drawing no.:	E-2
revision:	<0>		2 of 3

LIGHTING FIXTURE SCHEDULE

SYM	FIXTURE MANUFACTURER	MODEL	MOUNT	LAMPS	NOTES
	WAC LIGHTING – RUBIX	LED WALL MOUNTED (UPIGHT) MODEL #W5-W2510	WALL	HIGH OUTPUT LED	IP65 RATED
	PRESOLITE – ARCHITRAK	SURFACE MOUNTED TRACK c/w HEADS SIZE TRACK AND MODEL NUMBERS AS INDICATED ON THE DRAWINGS; Track: ARTK-021 Heads: AKTMCLD	SURFACE	LED	COORDINATED ALL REQUIRED COMPONENTS AND TRACK LENGTHS WITH DRAWINGS.

GENERAL INSTRUCTIONS

- CONDITIONS OF CONTRACT**
- THE OWNERS INSTRUCTIONS TO BIDDERS AND THE GENERAL CONDITIONS OF THE DESIGNERS SPECIFICATIONS ARE AN INTEGRAL PART OF THIS CONTRACT AND SHALL BE READ IN CONJUNCTION HEREWITH. THESE INSTRUCTIONS TO BIDDERS AND GENERAL CONDITIONS SHALL BE FULLY BINDING ON THE GENERAL CONTRACTOR AND HIS SUB-CONTRACTORS TO THE FULL SATISFACTION OF THE DESIGNER, ENGINEER AND OWNER.
 - THE RESPONSIBILITY AND SCOPE OF EACH SUB-TRADE RESTS SOLELY WITH THE CONTRACTOR. EXTRAS WILL NOT BE CONSIDERED BASED ON THE GROUNDS OF DIFFERENCE IN INTERPRETATION OF SPECIFICATIONS AND DRAWINGS AS TO WHICH TRADE INVOLVED SHALL PROVIDE CERTAIN SPECIALITIES OR MATERIALS.
 - IT IS A CONDITION OF THIS CONTRACT, THAT THE CONTRACTOR WILL, IN THE PERFORMANCE OF THE SERVICES FOR THE OWNER AS DESCRIBED IN THIS CONTRACT, PERFORM WORK IN ACCORDANCE WITH ONTARIO BUILDING CODE LATEST EDITION, THE ONTARIO HYDRO ELECTRICAL SAFETY CODE, THE SEWAGE SYSTEMS ENVIRONMENTAL PROTECTION ACT ONTARIO, WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM (WHMIS), O.REG 644/88, THE ONTARIO GAS UTILIZATION CODE, AND ANY OTHER CODE OF PROVINCIAL OR LOCAL APPLICATION, INCLUDING HOURS OF WORK, RATES OF PAY, JOB SAFETY AND ALL OTHER MATTERS IN WHICH THE MUNICIPAL OR FEDERAL AUTHORITIES HAVE JURISDICTION, PROVIDED THAT IN ANY CASE OF CONFLICT OR DISCREPANCY, THE MORE STRINGENT REQUIREMENTS SHALL APPLY.
 - COMPLY WITH STANDARD FOR BUILDING CONSTRUCTION OPERATIONS, ISSUED BY THE ONTARIO FIRE MARSHALL'S OFFICE AND ALL APPLICABLE FIRE SAFETY CODES, LAWS, AND REGULATIONS.
 - IT IS INCUMBENT UPON THE CONTRACTOR TO INFORM ITSELF OF ANY SUCH LEGISLATION AND THE CONTRACTOR AGREES THAT IN THE EVENT OF NON-COMPLIANCE WITH THIS LEGISLATION, IT WILL INDEMNIFY AND HOLD HARMLESS THE OWNER FROM ANY COSTS AND DAMAGES RESULTING FROM SUCH NON-COMPLIANCE.
 - ALL WORK SHALL BE CARRIED OUT IN ACCORDANCE WITH STANDARDS OF GOOD PRACTICE SUCH AS, BUT NOT LIMITED TO, SMACNA AND ASHRAE, MEET OR EXCEED REQUIREMENTS OF CONTRACT DOCUMENTS, SPECIFIED STANDARDS, CODES AND REFERENCED DOCUMENTS DESCRIBED IN THESE INSTRUCTIONS.

- EXAMINATION OF WORK**
- THIS PROJECT INVOLVES RENOVATIONS TO EXISTING BUILDING, THEREFORE EXAMINE THE SITE AND LOCAL CONDITIONS TO DETERMINE THE DIFFICULTIES IN CARRYING OUT THE WORK INDICATED AND SPECIFIED PRIOR TO SUBMITTING FINAL PRICE.

- INTENT**
- IT IS THE INTENT OF THIS SPECIFICATION AND DRAWINGS TO PROVIDE FOR A COMPLETE AND FULLY OPERATING SYSTEM IN COMPLETE ACCORD WITH ALL APPLICABLE CODES. THESE DOCUMENTS MAY NOT SHOW OR DESCRIBE EACH AND EVERY ITEM REQUIRED FOR THE COMPLETE INSTALLATION; THEREFORE, THE CONTRACTOR SHALL MAKE PROVISIONS FOR ALL LABOUR, MATERIAL AND EQUIPMENT DEEMED NECESSARY TO COMPLETE THE WORK INDICATED OR REASONABLY IMPLIED ON ALL DRAWINGS.

- LIABILITY**
- THIS CONTRACTOR SHALL ASSUME FULL RESPONSIBILITY FOR LAYING OUT HIS WORK AND FOR ANY DAMAGE OR EXTRA COSTS CAUSED TO THE OWNER OR OTHER CONTRACTORS BY IMPROPER LOCATION OR CARRYING OUT OF HIS WORK. CARRY ALL NECESSARY INSURANCE COVERAGE.

- PERMITS, CERTIFICATES, FEES, ETC.**
- GIVE ALL NOTICES, OBTAIN ALL PERMITS AND PAY ALL FEES SO THAT THE WORK SPECIFIED HEREIN MAY BE CARRIED OUT, EXCEPT FOR OCCUPANCY PERMIT WHICH WILL BE OBTAINED BY THE OWNER. AT THE ENGINEER'S REQUEST, FURNISH ANY CERTIFICATES AS EVIDENCE THAT THE WORK INSTALLED CONFORMS WITH THE LAWS AND REGULATIONS OF ALL AUTHORITIES HAVING JURISDICTION.

- GUARANTEE**
- THE CONTRACTOR, AS A CONDITION PRECEDENT TO FINAL PAYMENT AFTER COMPLETION OF THIS WORK, SHALL GIVE THE OWNER A WRITTEN GUARANTEE WARRANTING ALL APPARATUS FURNISHED UNDER THE CONTRACT TO REMAIN IN PERFECT SERVICEABLE CONDITION FOR A PERIOD OF ONE YEAR FROM THE DATE OF SUBSTANTIAL PERFORMANCE OF HIS WORK AS ESTABLISHED BY THE PROJECT MANAGER AND ENGINEER.

- DOCUMENTS REQUIRED**
- MAINTAIN AT JOB SITE ONE COPY OF EACH OF THE FOLLOWING DOCUMENTS:
 - DRAWINGS.
 - SPECIFICATIONS.
 - ADDENDA.
 - CHANGE ORDERS.
 - OTHER MODIFICATIONS TO CONTRACT.
 - FIELD TEST REPORTS.
 - MANUFACTURERS' INSTALLATION AND APPLICATION INSTRUCTIONS.

- EXTRA WORK**
- NO EXTRA WORK IS TO BE CARRIED OUT WITHOUT WRITTEN AUTHORIZATION FROM THE ENGINEER OR THE OWNER'S REPRESENTATIVE.
 - CONTRACTOR SHALL PROVIDE QUOTATIONS FOR EXTRA WORK AS DIRECTED UNDER CONTEMPLATED CHANGE NOTICES (CCN'S) ISSUED IN WRITING BY THE ENGINEER OR THE OWNER'S REPRESENTATIVE.
 - CONTRACTOR TO SUBMIT ITEMIZED BREAKDOWN FOR BOTH MATERIAL AND LABOUR FOR ALL CONTEMPLATED CHANGE NOTICES. CONTRACTOR WILL USE THE CCN FORMS PROVIDED WITH THE TENDER DOCUMENTS. ALL COLUMNS TO BE USED WHERE APPLICABLE AND EXTENSIONS MADE.
 - AT THE START OF THE PROJECT THE CONTRACTOR SHALL SUBMIT FOR REVIEW THE HOURLY LABOUR RATE THAT IS PROPOSED FOR PRICING ON ALL EXTRA WORK THAT MAY ARISE ON THE PROJECT.
 - LABOUR RATE TO INCLUDE ONLY:
 - PAY AND VACATION PAY.
 - WELFARE AS PER UNION COLLECTIVE AGREEMENT (ACCEPTED ONLY IF CONTRACTOR IS A UNION CONTRACTOR).
 - E.I. OR C.P.P. AS PER FEDERAL GOVERNMENT REQUIREMENTS.
 - W.C.B. PAYMENTS AS PER ONTARIO REGULATIONS.
 - INSURANCE AS PER REQUIREMENTS OR REGULATING BODY.
 - MATERIAL WILL BE PRICES AT THE CONTRACTOR'S COST. COPIES OF SUPPLIER'S INVOICES MAY BE REQUIRED TO SUBSTANTIATE MATERIAL COSTS WHEN REQUESTED.
 - THE AMOUNT OF MARK-UP ALLOWED FOR PROFIT AND OVERHEAD WILL BE IN ACCORDANCE WITH THOSE IN THE CONTRACT DOCUMENTS WITH THE TENDER. TO BE MODIFIED TO REFLECT THE ALLOWED PROFIT AND OVERHEAD STATED IN THE CONTRACT DOCUMENTS.
 - THE MARK-UPS APPLY TO THE NET WHERE A CHANGE INCLUDES BOTH EXTRAS AND CREDITS.
 - COST OF WORK BY A SUB-TRADE TO THE DIVISION 26 CONTRACTOR WILL BE DETERMINED BY THE SUB-TRADE USING THE SAME ITEMIZED BREAKDOWN FORMAT AND THE SAME CCN FORM.
 - A MARK-UP OF 5% WILL BE PERMITTED BY THE DIVISION 26 CONTRACTOR FOR SUB-TRADE WORK.

- PROGRESS BILLING**
- CONTRACTOR TO SUBMIT ITEMIZED BREAKDOWN FOR THE PROJECT BASED ON THE CONTRACT PRICE AGREED TO FOR THIS PROJECT. CONTEMPLATED CHANGE NOTICES ONCE AUTHORIZED BY THE OWNER WILL BE ADDED TO THE MONTHLY PROGRESS CLAIM.
 - CLAIMS FOR PAYMENT SHALL BE SUBMITTED FOR REVIEW PRIOR TO THE END OF THE PAY PERIOD TO ALLOW FOR A TIMELY REVIEW BY THE ENGINEER.
 - CONTRACTOR SHALL SUBMIT PROGRESS CLAIMS FOR REVIEW AND PAYMENT AUTHORIZATION IN ACCORDANCE WITH THE TERMS OF THE CONTRACT.

- AS-BUILT AND RECORD DRAWINGS**
- OWNERS REPRESENTATIVE WILL PROVIDE TWO(2) SETS OF DRAWINGS AT THE START OF CONSTRUCTION TO ALLOW THE CONTRACTOR TO KEEP AND MAINTAIN ACCURATE AS-BUILT DRAWINGS.
 - ONE SET SHALL BE KEPT ON SITE TO RECORD THE INFORMATION REFLECTING CHANGES AND INSTALLATION ON A DAILY BASIS DURING CONSTRUCTION. AT THE END OF THE PROJECT ALL INFORMATION FROM THE CONSTRUCTION SET SHALL BE TRANSFERRED ONTO THE CLEAN SET AND SENT TO THE ENGINEER FOR THE FINAL REVIEW.
 - FAILURE TO KEEP UP TO DATE AS-BUILT DRAWING MAY JEOPARDIZE MONTHLY PROGRESS PAYMENTS. AS-BUILT DRAWING WILL BE REVIEWED AT THE SAME TIME AS MONTHLY PROGRESS PAYMENT INSPECTIONS ARE CONDUCTED.

- SHOP DRAWINGS**
- BEFORE FABRICATION OR DELIVERY OF ANY MATERIALS OR EQUIPMENT, SUBMIT ELECTRONIC COPIES OF SHOP DRAWINGS AND DATA SHEETS COVERING ALL ITEMS OF EQUIPMENT FURNISHED AND INTENDED FOR INSTALLATION UNDER THIS CONTRACT FOR APPROVAL BY THE ENGINEER.

- TEMPORARY AND TRIAL USAGE**
- TEMPORARY OR TRIAL USAGE BY THE OWNER OF ANY MACHINERY, APPARATUS, EQUIPMENT OR ANY OTHER WORK OR MATERIALS SUPPLIED UNDER THE CONTRACT BEFORE FINAL WRITTEN ACCEPTANCE BY THE ENGINEER IS NOT TO BE CONSTRUED AS EVIDENCE OF THE ACCEPTANCE OF SAME BY THE OWNER. THE OWNER SHALL HAVE THE PRIVILEGE OF SUCH TEMPORARY AND TRIAL USAGE AS SOON AS THIS CONTRACTOR CLAIMS THAT SAID WORK IS COMPLETED. ANY DAMAGE CAUSED BY DEFECTIVE MATERIAL OR WORKMANSHIP THROUGH TEMPORARY OR TRIAL USAGE BY THE OWNER SHALL BE THE RESPONSIBILITY OF THIS CONTRACTOR.
 - ANY PERMANENT EQUIPMENT USED TEMPORARILY FOR TEMPORARY HEAT OR OTHERWISE WILL BE COMPLETELY REPAIRED, REPLACED, AND CLEANED TO THE FULL SATISFACTION OF THE OWNER.

- EXPLOSIVES ACTUATED FASTENING DEVICES**
- DO NOT EMPLOY POWER GUNS USING EXPLOSIVES, UNLESS EXPRESSLY PERMITTED BY THE PROJECT MANAGER; COMPLY WITH REQUIREMENTS OF CSA Z-166 (SAFETY CODE FOR EXPLOSIVE ACTUATED TOOLS).

- STORAGE**
- THE SECURITY OF THE CONTRACTOR'S EQUIPMENT AND MATERIALS SHALL BE HIS RESPONSIBILITY. CONTRACTOR SHALL LIAISE WITH THE BUILDING OPERATOR AS NECESSARY.

- SIGNS**
- PROVIDE WARNING SIGNS IN LOCATIONS WHERE RENOVATIONS AND ALTERATION WORK IS ADJACENT TO AREAS AFFECTING THE PUBLIC.

- EQUIPMENT AND SITE CLEANLINESS**
- DUCTS AND EQUIPMENT SHALL BE THOROUGHLY CLEANED OF DIRT, CUTTINGS AND OTHER FOREIGN SUBSTANCES. DISCONNECT, CLEAN AND RECONNECT WHENEVER NECESSARY FOR THE PURPOSE OF LOCATING AND REMOVING OBSTRUCTIONS. REPAIR WORK DAMAGED IN THE COURSE OF REMOVING OBSTRUCTIONS.
 - THE CONTRACTOR SHALL AT ALL TIMES KEEP THE PREMISES FREE FROM THE ACCUMULATION OF WASTE MATERIAL TO THE SATISFACTION OF THE PROJECT MANAGER. PLACE DUST PROTECTION IN THE FORM OF COVER SHEETS OVER EQUIPMENT AND FURNITURE TO ENSURE NO DUST INFILTRATION. CLEANING TO BE COMPLETED AT THE END OF EACH SHIFT TO THE SATISFACTION OF THE PROJECT MANAGER.

- OPERATING AND MAINTENANCE DATA**
- FURNISH THREE (3) SETS OF OPERATING AND MAINTENANCE DATA FOR ALL NEW EQUIPMENT AND SYSTEMS. DATA SHALL BE ASSEMBLED IN BOOKLET FORM WITH HARD COVER AND INDEX. IDENTIFY FRONT COVER WITH NAME AND LOCATION OF THE PROJECT, CONSULTING ENGINEER AND CONTRACTOR. SUBMIT ONE COPY TO THE ENGINEER FOR APPROVAL.

- MATERIALS**
- MATERIALS AND EQUIPMENT INSTALLED SHALL BE NEW, FULL WEIGHT AND OF BEST QUALITY SPECIFIED. USE SAME BRAND OF MANUFACTURER FOR EACH SPECIFIC APPLICATION. STATICALLY AND DYNAMICALLY BALANCE ROTATING EQUIPMENT FOR MINIMUM VIBRATION AND LOW OPERATING NOISE LEVEL. REPLACE MATERIAL OR WORKMANSHIP BELOW SPECIFIED QUALITY AND RELOCATE WORK WRONGLY PLACED TO THE SATISFACTION OF THE ENGINEER.

- APPROVALS**
- THE PRICE SUBMITTED FOR THIS CONTRACT SHALL BE BASED ON THE USE OF MATERIALS AND EQUIPMENT AS SPECIFIED. IF THIS CONTRACTOR WISHES TO QUOTE ON EQUIVALENT MATERIALS AND EQUIPMENT, HE MUST QUOTE ON PRODUCTS APPROVED BY THE ENGINEER, IN WRITING, AS AN EQUIVALENT TO THE PRODUCT SPECIFIED. THIS CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR ANY ADDITIONAL WORK OR MATERIALS REQUIRED BY ALL OTHER CONTRACTORS TO ACCOMMODATE APPROVED EQUIVALENT MATERIALS OR EQUIPMENT. EXTRAS WILL NOT BE APPROVED TO COVER SUCH WORK.

- CUTTING AND PATCHING**
- THE CONTRACTOR IS RESPONSIBLE FOR THIS WORK AND SHALL CO-ORDINATE PATCHES FOR ALL HOLES FOR PIPES, DUCTS THROUGH FLOORS AND ROOF, ETC., AND PROVIDE SLEEVES REQUIRED TO EXECUTE THE INSTALLATION. X-RAY FLOORS AND STRUCTURAL WALLS BEFORE CUTTING TO LOCATE EXISTING REBAR AND CONDUITS, AND MUST OBTAIN PROJECT MANAGER'S APPROVAL FOR PROPOSED CUTTING BEFORE PROCEEDING. PROVIDE ULG APPROVED FIRE STOPPING SYSTEM FOR ALL PENETRATIONS THROUGH RAISED ASSEMBLIES.

- SHUTDOWNS**
- ANY SHUTDOWN THAT MAY BE REQUIRED OF EXISTING EQUIPMENT MUST HAVE PRIOR APPROVAL FROM THE PROJECT MANAGER AND ENGINEER. PROVIDE A MINIMUM OF 48 HOURS NOTICE.

- MATERIALS REMOVED**
- ALL MATERIALS REMOVED DURING DEMOLITION SHALL BECOME THE PROPERTY OF THE OWNER AND STOCKPILED AS DIRECTED ON SITE. MATERIAL REJECTED BY THE OWNER SHALL BE REMOVED FROM THE SITE BY THE CONTRACTOR.

ELECTRICAL SPECIFICATIONS

- MINIMUM STANDARDS**
- ELECTRICAL INSTALLATION: TO CSA C22.1-LATEST EDITION
 - LIGHTING FIXTURES: TO CSA C22.2 No. 9-LATEST EDITION
 - ONTARIO BUILDING CODE-LATEST EDITION
 - ONTARIO ELECTRICAL SAFETY CODE-LATEST EDITION

- DEMOLITION**
- CONTRACTOR TO CO-ORDINATE WITH OTHER TRADES TO ENSURE THAT ELECTRICAL EQUIPMENT AND FEEDERS ASSOCIATED WITH MECHANICAL EQUIPMENT AND/OR IS LOCATED IN WALLS BEING DEMOLISHED IS ALSO BEING REMOVED.
 - EXISTING EQUIPMENT SHOWN AS RELOCATED TO BE CLEANED AND MADE OPERATIONAL BY THIS CONTRACTOR PRIOR TO ITS RELOCATION.
 - CONTRACTOR TO REPLACE BROKEN AND DISCOLOURED LIGHT FIXTURE ACRYLIC LENSES AS INDICATED BY THE ENGINEER.

- EQUIPMENT SHUT-DOWN**
- ANY SHUTDOWN THAT MAY BE REQUIRED OF EXISTING EQUIPMENT, MUST HAVE PRIOR APPROVAL FROM THE ENGINEER.

- IDENTIFICATION**
- IDENTIFY WITH LAMACOID NAMEPLATES ALL ELECTRICAL EQUIPMENT SHOWN ON THE DRAWINGS AND/OR MENTIONED IN THE SPECIFICATION SUCH AS MOTORS, SWITCHES, STARTERS, PANEL BOARDS, TRANSFORMERS, CONTROLS, AND SPECIAL RECEPTACLES; REGARDLESS OF WHETHER OR NOT THE ELECTRICAL EQUIPMENT WAS FURNISHED UNDER THIS SECTION OF THE SPECIFICATION. IDENTIFICATION REVIEWED BY ENGINEER.
 - UNLESS OTHERWISE SPECIFIED, NAMEPLATES SHALL BE RIGID LAMACOID, MINIMUM 1.5mm THICK WITH BLACK LETTERS ENGRAVED ON A WHITE BACKGROUND. NAMEPLATES TO BE NEATLY PLACED, AND SQUARE TO SURROUNDING BUILDING OR EQUIPMENT LINES, AND FASTENED IN PLACE WITH MECHANICAL FASTENERS (SCREWS OR POP RIVETS) AS REVIEWED BY ENGINEER.

- PROVIDE NEATLY TYPED UPDATED CIRCUIT DIRECTORIES IN A PLASTIC HOLDER ON THE INSIDE DOOR OF NEW PANEL BOARDS, WITH COPY IN MANUAL.
- IDENTIFY ALL PULL AND JUNCTION BOXES, WITH P-TOUCH LABEL IDENTIFICATION, INDICATING SOURCE PANEL AND CIRCUIT NUMBERS.
- IDENTIFY ALL RECEPTACLES AND SWITCHES WITH P-TOUCH LABELS, BLACK LETTERING ON TRANSPARENT TAPE, INDICATING SOURCE PANEL AND CIRCUIT NUMBER. LABELS TO BE LOCATED ON FRONT OF COVERPLATE.

- LOCATION OF OUTLETS**
- LOCATE OUTLETS AS SHOWN ON DRAWINGS. REFER TO INTERIOR DESIGNER DRAWINGS FOR LOCATION OF OUTLETS WHICH ARE DIMENSIONED OR OTHERWISE LOCATED.
 - DO NOT INSTALL OUTLETS BACK-TO-BACK IN WALL; ALLOW MINIMUM 150mm HORIZONTAL CLEARANCE BETWEEN BOXES, AND LOCATE IN SEPARATE STUD CAVITIES WHEREVER POSSIBLE.
 - CHANGE LOCATION OF OUTLETS AT NO EXTRA COST OR CREDIT, PROVIDING DISTANCE DOES NOT EXCEED 3 METERS AND INFORMATION IS GIVEN BEFORE INSTALLATION.

- SCOPE OF WORK**
- MODIFICATION AND ADDITION TO RACEWAY SYSTEM FOR TELECOMMUNICATION SYSTEM INCLUDING CABLE TV SYSTEM.

- WIRING**
- ALL WIRING TO BE COPPER, R90 XLPE, STRANDED WITH 'BRADY LABEL' MAKING SLEEVES AT EACH END, UNLESS OTHERWISE NOTED ON DRAWINGS. WIRING TO BE COLOUR CODED AS PER CODE. MINIMUM WIRE SIZE TO BE No.12 AWG FOR POWER AND LIGHTING.
 - LEAVE ADEQUATE LENGTHS OF WIRE IN JUNCTION BOXES FOR CONNECTIONS TO EQUIPMENT.
 - 'BX' WIRING IN WALLS ONLY.
 - RUN A GREEN INSULATED GROUND WIRE SIZED AS PER CODE IN ALL CONDUIT RUNS. DO NOT RELY ON CONDUIT AS GROUND.

- CONDUITS**
- EACH LENGTH OF CONDUIT TO BE NEW AND BEAR CSA STAMP OF APPROVAL.
 - ALL CONDUITS RUN ABOVE THE SUSPENDED CEILING TO BE 'EMT'.
 - PROVIDE NYLON PULLROPES IN ALL EMPTY CONDUIT RUNS.
 - MODULAR TO MATCH EXISTING: NOCOM MODULAR WIRING CABLES SYSTEM FOR CONNECTION OF FLUORESCENT TROFFER LIGHT FIXTURES, CONSISTENT WITH BASE BUILDING.
 - SMART-CONNECT CABLES: START, JOINER, DROP, SWITCH DROP CABLES AS REQUIRED.
 - CONNECTORS: MOULDED PVC RECEPTACLES AND ADAPTERS.
 - REMOVE AND RECONNECT AS REQUIRED TO OBTAIN LIGHTING CIRCUITS INDICATED AND ACCORDING TO MANUFACTURER'S RECOMMENDATIONS.
 - TERMINATE STARTER AND DROP CABLES AT LIGHT SWITCHES AND LIGHT FIXTURES NOT OUTFITTED WITH NOCOM RECEPTACLES.
 - TURN OVER UNUSED CABLES TO BUILDING OWNER.

- OUTLET BOXES**
- ELECTRO-GALVANIZED STEEL, COATING EQUAL TO THAT TO THE CONDUIT.
 - MINIMUM 37 mm DEEP 100 mm SQUARE OR OCTAGONAL AS REQUIRED.
 - EQUIP WITH PLASTER RINGS DEEP ENOUGH FOR WALL FINISH MATERIAL TO FIT OVER THE BOX AND WITHIN 6 mm OF THE COVER OPENING.

- PULL BOXES**
- PROVIDE PULLBOXES WHERE RUNS EXCEED 30 METERS IN LENGTH AND HAVE MORE THAN 2-90° BENDS.
- TELEPHONE DATA AND CABLEVISION**
- COMPLETE EMPTY RACEWAYS SYSTEM CONSISTS OF OUTLET BOXES, CONDUITS, FISH WIRES.
 - CONDUITS:
 - 21mm 'EMT' RISERS BETWEEN DOUBLE GANGED DEVICES BOXES AND CEILING PLENUM BY DIVISION 26. EXACT LOCATION TO BE DETERMINED ON SITE.
 - FISH WIRE: POLYPROPYLENE TYPE.
 - COVERPLATES INSTALLED BY OTHERS.

- COVERPLATES**
- POLISHED STAINLESS STEEL COVER PLATES, THICKNESS 1.0mm FOR WIRING DEVICES MOUNTED IN A FLUSH MOUNTED BOX.
 - INSTALL COVER PLATES ONLY AFTER PAINTING AND OTHER WORK IS FINISHED.
 - INSTALL SUITABLE COMMON COVER PLATES WHERE WIRING DEVICES ARE GROUPED.
 - COVER PLATES FOR WIRING DEVICES. COMMUNICATION OUTLET COVERLETS PROVIDED BY SYSTEM CONTRACTOR.
 - COVER PLATES FROM ONE MANUFACTURER THROUGHOUT PROJECT.

- CIRCUIT BREAKERS**
- PROVIDE CIRCUIT BREAKERS IN PANEL BOARD AS INDICATED.
 - BRANCH CIRCUIT BREAKERS QUICK MAKE, QUICK BREAK, AMBIENT COMPENSATED, COMMON TRIP ON ALL MULTIPOLE BREAKERS, TRIP INDICATING CLEARLY SHOWN BY BREAKER HANDLE TAKING POSITION MIDWAY BETWEEN ON AND OFF.
 - BREAKER INTERRUPTING CAPACITY:
 - 250V PANELBOARDS AND CDP PANELBOARDS: MATCH EXISTING

- DISCONNECT SWITCH**
- DISCONNECT SWITCH TO BE RATED HORSEPOWER AND BE EQUIPPED WITH PROVISIONS FOR THREE(3) LOCKING DEVICES AND TO BE NEMA 1 UNLESS OTHERWISE INDICATED. AMPERAGE AS INDICATED ON DRAWINGS AND MOUNTED 1500mm ABOVE FINISHED FLOOR TO CENTRELINE OF HANDLE.

- LIGHTING**
- LED, 3000 LUMENS, 4100°K
 - RATING: 120 VOLT, 60HZ
 - TOTALLY ENCASED AND DESIGNED FOR 40°C AMBIENT TEMPERATURE.
 - POWER FACTOR: MINIMUM 95%.
 - INTEGRATED ELECTRONIC CIRCUITRY BALLAST CONNECTED FOR PARALLEL OPERATION OF LAMPS.
 - SOUND RATING: A.
 - HARMONIC DISTORTION LESS THAN 10%.
 - THERMAL PROTECTION: AUTO RESET.
 - LUMINAIRES: AS SPECIFIED IN LIGHT FIXTURES SCHEDULE.
 - SUPPORTS:
 - SUPPORT ALL NEW AND RELOCATED LUMINARIES MOUNTED IN CEILING GRID INDEPENDENTLY OF CEILING GRID BY CHAINS IN ACCORDANCE WITH LOCAL INSPECTION REQUIREMENTS.
 - ALL LUMINARIES REQUIRING REMOVAL AND REINSTALLATION DUE TO REPLACEMENT OF CEILING GRID TO BE SUPPORTED INDEPENDENTLY OF CEILING GRID BY CHAINS IN ACCORDANCE WITH LOCAL INSPECTION REQUIREMENTS.

- EXIT LIGHTS**
- FACE AND BACK PLATES: SATIN ALUMINIUM OR GREY PAINTED STEEL.
 - LED TYPE, INPUT VOLTAGE 120 VOLTS. NO SECONDARY DC VOLTAGE REQUIRED.
 - LIFE EXPECTANCY OF THE LEDS TO BE 25 YEARS.
 - 150mm HIGH x 19mm WIDE LETTERS RED ON WHITE READING EXIT/SORTIE.
 - FACE PLATE TO REMAIN CAPTIVE FOR RELAMPING.
 - UNIVERSAL MOUNTING.
 - ARROW RIGHT, LEFT, BOTH DIRECTIONS AS SHOWN ON DRAWINGS.
 - IMPACT RESISTANT PROTECTIVE PANEL WITH EXTRUDED ALUMINIUM ENCLOSURE.
 - CEILING OR WALL MOUNTING CANOPY AND MOUNTING PLATE FOR INSTALLATION ON 100mm OCTAGONAL JUNCTION BOX.
 - INSTALL EXIT LIGHTS AS INDICATED, TO REQUIREMENTS OF OBC-2012
 - CONNECT FIXTURES TO EXISTING EXIT LIGHT CIRCUITS AS INDICATED.

JRP ENGINEERING
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No	DESCRIPTION	DATE
1	ISSUED FOR TENDER	APR. 7 2017
0	ISSUED FOR REVIEW	MAR. 15 2017
REVISIONS		

client:

NATIONAL GALLERY OF CANADA

project:

TEMPORARY WORK FOR COLONNADE & MAIN ENTRANCE WINDOW/ROOF & SLOPED SILL
380 SUSSEX DR. OTTAWA, ONTARIO

drawing title:

ELECTRICAL SPECIFICATION

scale:	AS SHOWN	drawn by:	M.G.
designed by:	M.G.	reviewed by:	J.R.P.
approved by:	J.R.P.	date:	APR. 2017

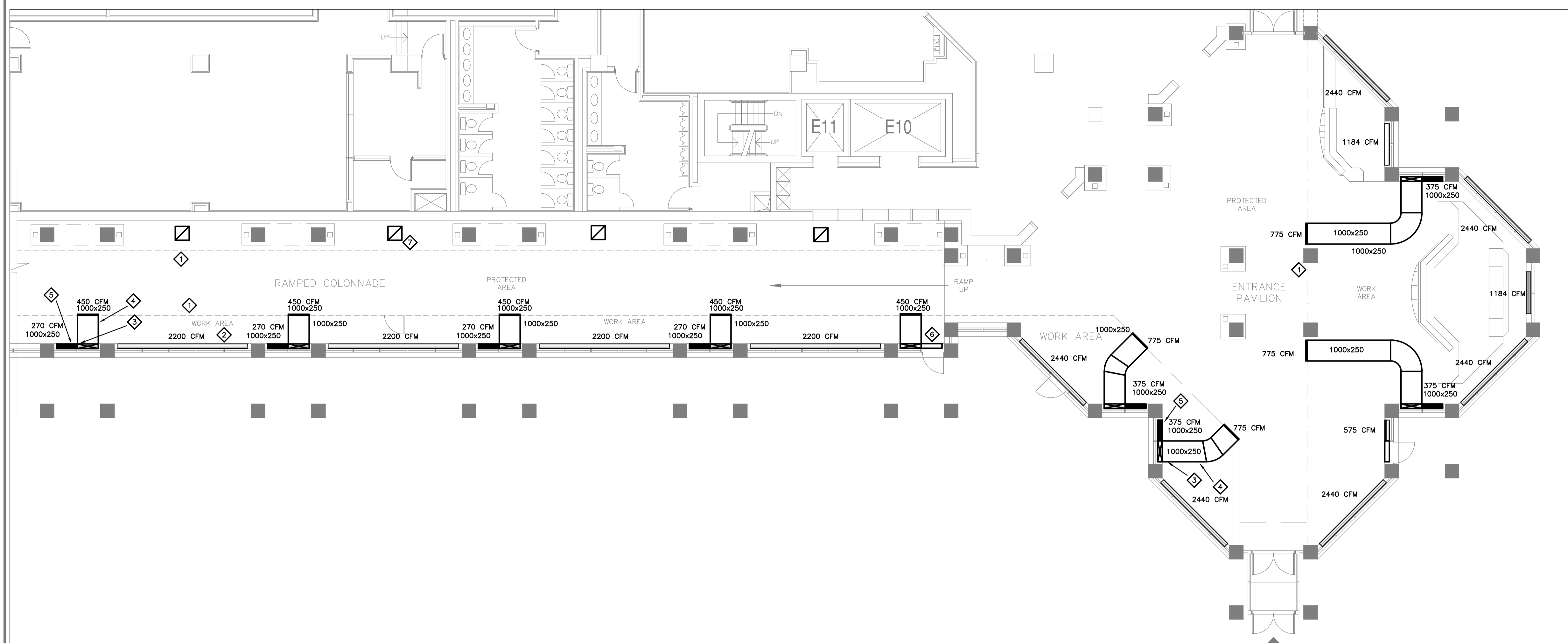
project no.:	100-17S	drawing no.:	E-3
revision:	<0>		3 of 3

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PARTIAL GROUND FLOOR PLAN – TEMPORARY H.V.A.C.
SCALE 1:100

DRAWING NOTES:

- ① TYPICAL: BOUNDARY OF WORK AND PROTECTED AREAS.
- ② TYPICAL: EXISTING LINEAR DIFFUSER TO REMAIN AND BE BALANCED AS INDICATED.
- ③ TYPICAL: REMOVE EXISTING LINEAR GRILLE, PROVIDE DUCTWORK PLENUM BOX AND CONNECT TO EXISTING PLENUM, BOX IN WORK AREA, EXACT SIZE TO BE CONFIRMED ON-SITE AND COORDINATED WITH SCAFFOLDING LOCATION.
- ④ TYPICAL: PROVIDE DUCTWORK BRANCH FROM PLENUM IN WORK AREA TO PROTECTED AREA, SIZE AS INDICATED. CONTRACTOR TO COORDINATE DUCTWORK LOCATION WITH PROPOSED SCAFFOLDING LOCATION AND CLIENT. PROVIDE DOUBLE DEFLECTION LINEAR GRILLE IN PROTECTED AREA C/W INTEGRAL BALANCING DAMPER. BALANCE AS INDICATED. REFER TO DETAIL ON DRAWING M-2.
- ⑤ TYPICAL: PROVIDE 500 DUCTWORK BRANCH FROM PLENUM IN WORK AREA, SIZE AS INDICATED. CONTRACTOR TO COORDINATE DUCTWORK LOCATION WITH PROPOSED SCAFFOLDING LOCATION. PROVIDE DOUBLE DEFLECTION LINEAR GRILLE C/W INTEGRAL BALANCING DAMPER. BALANCE AS INDICATED. REFER TO DETAIL ON DRAWING M-2.
- ⑥ TYPICAL: EXISTING SEGMENT OF LINEAR GRILLE TO BE BLANKED, CONTRACTOR TO COORDINATE LOCATION WITH ACCESS DOORS.
- ⑦ TYPICAL: PROVIDE 600X600 RETURN AIR OPENING IN HORIZONTAL HOARDING CEILING C/W 25MM FILTER AND FRAME.

GENERAL NOTES:

- ① ALL MECHANICAL EQUIPMENT SHOWN IN THIN SOLID LINES IS EXISTING TO REMAIN.
- ② ALL MECHANICAL EQUIPMENT SHOWN IN THICK SOLID LINES IS NEW TO BE PROVIDED UNDER THIS CONTRACT.
- ③ ALL MECHANICAL EQUIPMENT SHOWN IN DASHED LINES WITH LETTER 'R' IS EXISTING TO BE RELOCATED AS SHOWN.
- ④ ALL MECHANICAL EQUIPMENT SHOWN IN DASHED LINES WITH LETTER 'X' IS EXISTING TO BE REMOVED BACK TO SOURCE.
- ⑤ THIS DRAWING WAS BASED ON PARTIAL SITE REVIEW. ALL EQUIPMENT, DUCTS, PIPING AND ALL ACCESSORIES' SIZES, LOCATIONS AND DETAILS OF INSTALLATIONS TO BE CONFIRMED BY MECHANICAL CONTRACTOR ON SITE.
- ⑥ MECHANICAL CONTRACTOR SHALL BE RESPONSIBLE FOR ALL ROOF, WALL AND BUILDING ENVELOPE CUTTING, PATCHING AND REPAIRS, AS REQUIRED FOR EXECUTION OF WORK INCLUDED IN THIS CONTRACT.
- ⑦ PROVIDE ALL NEW EQUIPMENT, CONTROLS, DUCTWORK, PIPING, VALVES AND ACCESSORIES AS SHOWN AND NOTED ON DETAILS AND AS REQUIRED FOR COMPLETE FUNCTIONING SYSTEMS.
- ⑧ PROVIDE ADDITIONAL DUCTWORK, PIPING, FITTINGS AND OFFSETS WHERE REQUIRED TO SUIT EXISTING CONDITIONS AND TO AVOID COLLISIONS WITH EXISTING SYSTEMS AND BUILDING STRUCTURE.
- ⑨ SEISMIC RESTRAINT SYSTEM (SRS) – PROVIDE DESIGN, SUPPLY AND INSTALLATION OF COMPLETE SRS FOR ALL SYSTEMS, EQUIPMENT SPECIFIED FOR INSTALLATION ON THIS PROJECT AS PER ONTARIO BUILDING CODE LATEST EDITION. LETTER TO BE PROVIDED BY SEISMIC ENGINEER REGISTERED WITH PROFESSIONAL ENGINEER'S ONTARIO (PEO).
- ⑩ CONTRACTOR TO CARRY FOR COMPLETE PROFESSIONAL DUCT CLEANING IN WORK AREA.

LEGEND	
SYMBOL	DESCRIPTION
①	THERMOSTAT
—	NEW DUCTWORK
-x-x-	DUCT OR MATERIAL TO BE REMOVED
—	ACOUSTICALLY INSULATED DUCT
—	THERMALLY INSULATED DUCT
110 CFM	S/A BALANCING INFORMATION
⊗	SQUARE S/A DIFFUSER
—	LINEAR GRILLE
⊘	RETURN AIR GRILLE
⊙	NEW CONICAL SIDE TAKE-OFF C/W BALANCING DAMPER
⊕	NOTE ID TAG
#	GRILLE OR DIFFUSER TYPE – REFER

NOT ALL SYMBOLS SHOWN IN LEGEND ARE NECESSARILY USED IN THE DRAWING SET.

No	DESCRIPTION	DATE
1	ISSUED FOR TENDER	APR. 07 2017
0	ISSUED FOR REVIEW	MAR. 15 2017

REVISIONS

client:
NATIONAL GALLERY OF CANADA

project:
TEMPORARY WORK FOR COLONNADE & MAIN ENTRANCE WINDOW/ROOF & SLOPED SILL
380 SUSSEX DR.
OTTAWA, ONTARIO

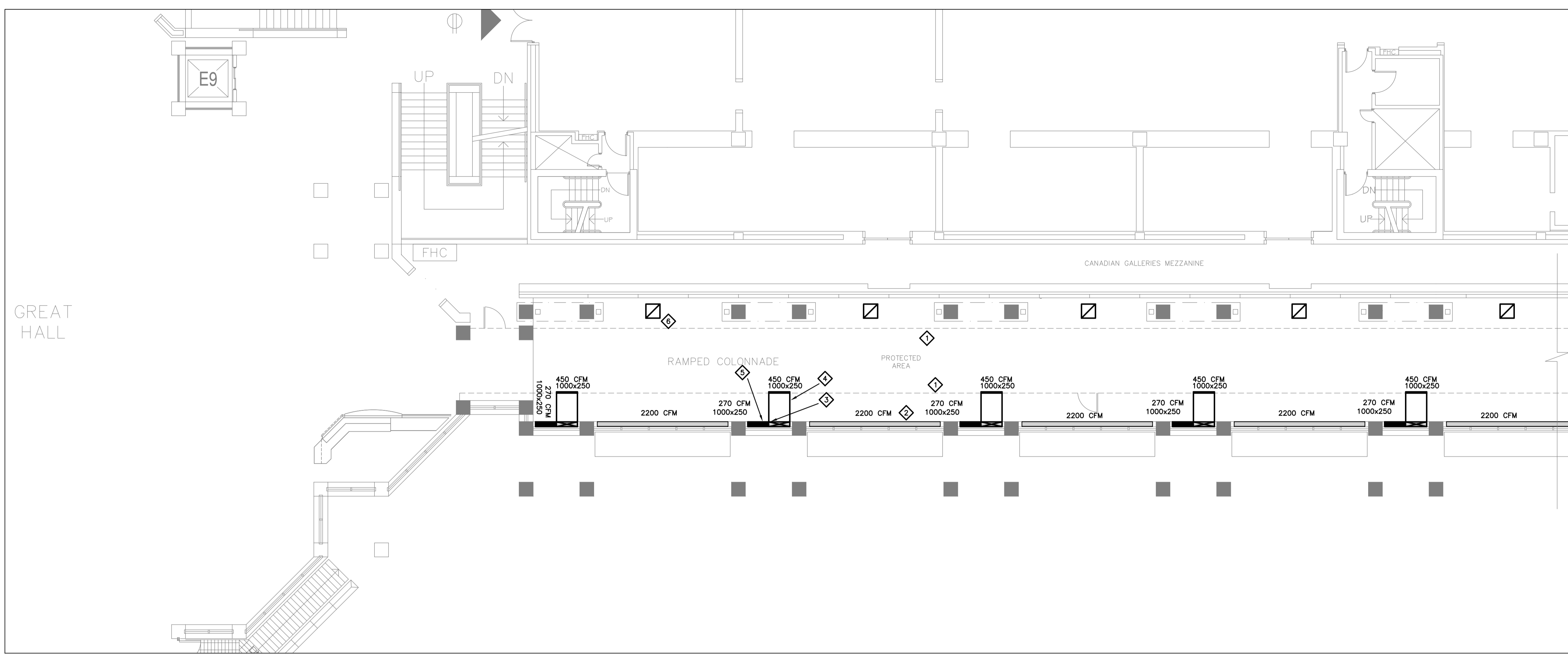
drawing title:
LEVEL 3000

scale:	AS SHOWN	drawn by:	M.M.K.
designed by:	M.M.K.	reviewed by:	J.R.P.
approved by:	J.R.P.	date:	MAR. 2017

project no.:	100-17S	drawing no.:	M-1
revision:	<0>		of 3

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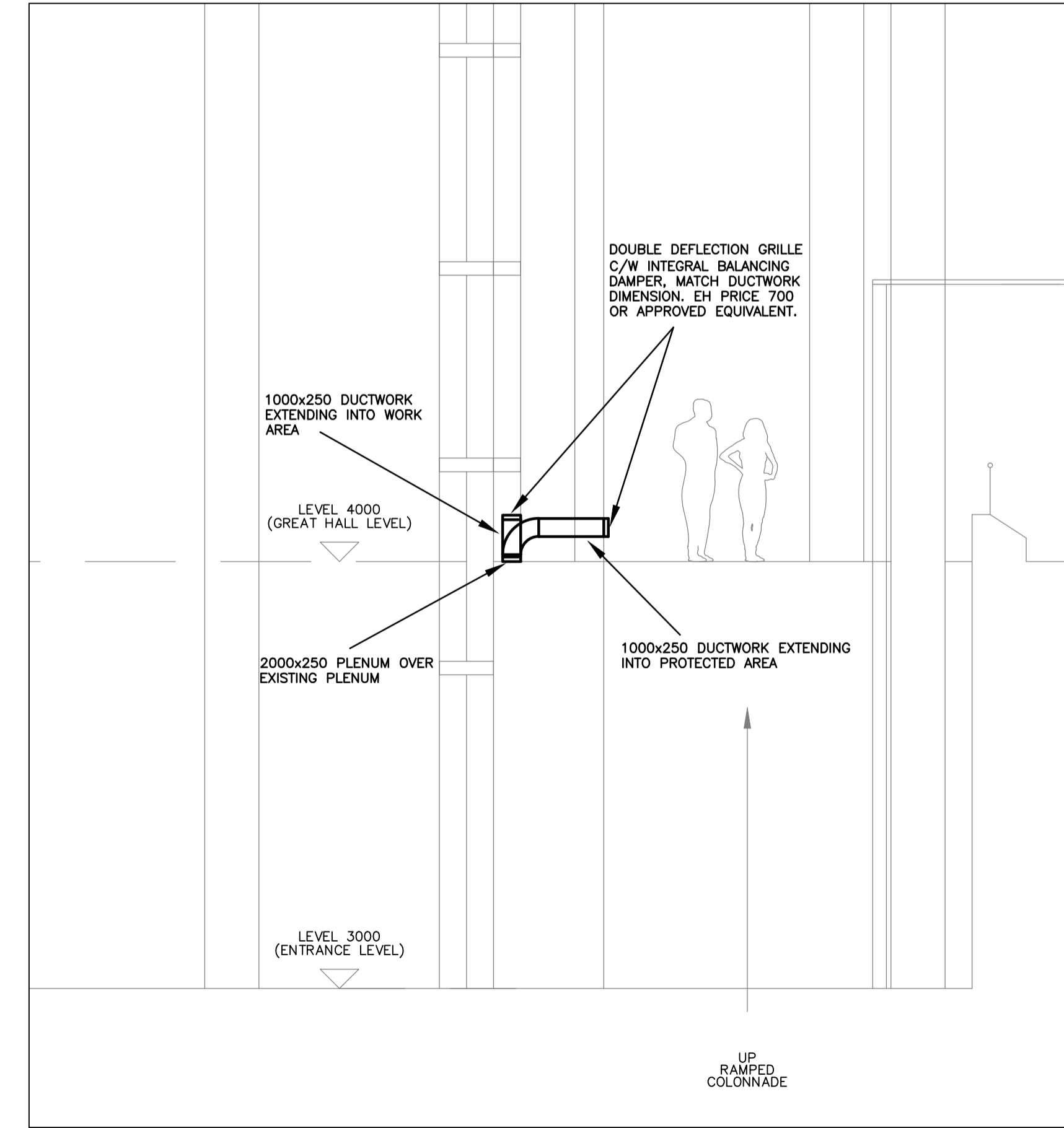
Authorized modifications must be signed and sealed by an engineer and this engineer will be completely responsible for these modifications. J.R.P. Engineering is not and will not be responsible for the consequences of these modifications or for modifications carried out without its consent.



PARTIAL GROUND FLOOR PLAN – TEMPORARY H.V.A.C.
SCALE 1:100

DRAWING NOTES:

- 1 TYPICAL: BOUNDARY OF WORK AND PROTECTED AREAS.
- 2 TYPICAL: EXISTING LINEAR DIFFUSER TO REMAIN AND BE BALANCED AS INDICATED.
- 3 TYPICAL: REMOVE EXISTING LINEAR GRILLE, PROVIDE DUCTWORK PLENUM BOX AND CONNECT TO EXISTING PLENUM, BOX IN WORK AREA, EXACT SIZE TO BE CONFIRMED ON-SITE AND COORDINATED WITH SCAFFOLDING LOCATION.
- 4 TYPICAL: PROVIDE DUCTWORK BRANCH FROM PLENUM IN WORK AREA TO PROTECTED AREA, SIZE AS INDICATED. CONTRACTOR TO COORDINATE DUCTWORK LOCATION WITH PROPOSED SCAFFOLDING LOCATION AND CLIENT. PROVIDE DOUBLE DEFLECTION LINEAR GRILLE IN PROTECTED AREA C/W INTEGRAL BALANCING DAMPER, BALANCE AS INDICATED. REFER TO DETAIL ON THIS DRAWING.
- 5 TYPICAL: PROVIDE 500 DUCTWORK BRANCH FROM PLENUM IN WORK AREA, SIZE AS INDICATED. CONTRACTOR TO COORDINATE DUCTWORK LOCATION WITH PROPOSED SCAFFOLDING LOCATION. PROVIDE DOUBLE DEFLECTION LINEAR GRILLE C/W INTEGRAL BALANCING DAMPER, BALANCE AS INDICATED. REFER TO DETAIL ON THIS DRAWING.
- 6 TYPICAL: PROVIDE 600X600 RETURN AIR OPENING IN HORIZONTAL HOARDING CEILING C/W 25MM FILTER AND FRAME.



TEMPORARY H.V.A.C. TYPICAL DETAIL
SCALE 1:50

No	DESCRIPTION	DATE
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REVISIONS

client:
NATIONAL GALLERY OF CANADA

project:
TEMPORARY WORK FOR COLONNADE & MAIN ENTRANCE WINDOW/ROOF & SLOPED SILL
380 SUSSEX DR.
OTTAWA, ONTARIO

drawing title:
LEVEL 4000

scale:	AS SHOWN	drawn by:	M.M.K.
designed by:	M.M.K.	reviewed by:	J.R.P.
approved by:	J.R.P.	date:	MAR. 2017

project no.:	100-17S	drawing no.:	M-2
revision:	<0>		of 3

GENERAL

Conditions of Contract

The instructions to Bidders and the General Conditions are an integral part of this Division and shall be read in conjunction herewith. These instructions to Bidders and General Conditions shall be fully binding on the General Contractor and his sub-contractors to the full satisfaction of the Engineer and Owner.

The responsibility and scope of each sub-trade rest solely with the Mechanical Contractor. Extras will not be considered based on the grounds of difference in interpretation of specifications and drawings as to which trade involved shall provide certain specialties or materials.

Examination of Work

Examine the site and local conditions likely to affect work indicated and specified prior to submitting final price.

This project involves changes to the building, which is presently occupied. Therefore examine the site and local conditions to determine the difficulties in carrying out the work indicated and specified prior to submitting final price.

Liability

This contractor shall assume full responsibility for laying out his work and for any damage caused to the Owner and other contractor by improper location or carrying out of this work. Carry all necessary insurance coverage.

This contractor shall protect all finished and unfinished work of his own and other contractors including existing from damage due to the carrying out of his work.

Intent

It is the intent of this specification and drawings to provide for a complete and fully operating system in complete accord with all applicable codes. These specifications may not cover each and every item required for the complete mechanical installation; therefore, the Contractor shall make provisions for all labour, material and equipment deemed necessary to complete the mechanical system.

Certificates, Fees, etc.

Pay all fees and obtain all permits. Provide authorities with plans and information for acceptance certificates. Furnish inspection certificates as evidence that work conforms with requirements of authority having jurisdiction.

Cutting and Patching

The Mechanical Contractor will confer with the General Contractor in regards to this work and shall give locations for all holes for pipes, ducts through floors and roof, etc., and provide sleeves required to execute the mechanical installation.

Pipe Hangers, Supports and Sleeves

Hangers and supports shall secure pipes in place, prevent vibration, maintain grade by adjustment, provide for expansion and contraction and shall be directly supported from the structure.

Perforated strap hangers are not acceptable.

Testing

Test all equipment and material where required by specifications or authorities having jurisdiction to demonstrate its proper operation to the Owner's representative. Test procedures shall be in accordance with the applicable portions of the ASME, ASHRAE, and other recognized test codes as far as field conditions permit.

Perform the following test and upon completion of the mechanical installation, turn over to the Owner a certification of the test with the detailed data as required by each. Test shall be itemized as to the time performed and personnel responsible for the test. Hydraulic tests shall be carried out for a period of 8 hours and pressure maintained with no appreciable pressure drop. Where leakage occurs, repairs shall be made and the entire system retested. All tests to be made before backfilling and furring.

- .1 All low and high velocity duct systems, including supply shall be checked for tightness. All leaks shall be repaired before ducts are furred in to ensure total outlet capacity is within 5% of the quantity being supplied by the air system.
- .2 Hydraulically test on hydronic piping systems at 1-1/2 times system operating pressure or minimum 860 kPa, whichever is greater.

Record "As-Built" Drawings

Keep in the job office an extra set of white prints and specifications on which all changes and deviations shall be recorded daily. At completion of the project, turn over to the Engineer two sets of neat "as-built" record drawings and specifications. These extra sets of white prints and specifications will be provided by the Engineer.

Shop Drawings

Before fabrication of major equipment and materials, submit through the General Contractor a minimum of 6 complete sets of shop drawings and data sheets covering all items of equipment furnished and installed under this Contract for approval by the Engineer.

Temporary and Trial Usage

Any permanent equipment used temporarily for temporary heat or otherwise will be completely repaired or replaced to the full satisfaction of the Owner.

Equipment Clean-up

Ducts and equipment shall be thoroughly cleaned of dirt, cuttings and other foreign substances. Disconnect, clean and reconnect whenever necessary for the purpose of locating and removing obstructions. Repair work damaged in the course of removing obstructions. Ducts shall be power vacuum cleaned before being turned over to the Owner.

Guarantee

The Mechanical Contractor, as a condition precedent to final payment after completion of this work, shall give the Owner a written guarantee warranting all apparatus furnished under the contract to remain in perfect serviceable condition for a period of one year from the date of final acceptance of his work by the Owner and Engineer.

Installation

Install equipment in accordance to manufacturer's instructions.

Operating and Maintenance Data

Furnish three sets of operating and maintenance data for all equipment and systems. Data shall be assembled in booklet form with soft cover and index. Identify front cover with name and location of the project, Consulting Engineer and Contractor. Submit one copy to the Engineer for approval.

Materials

Replace material and workmanship below specified quality and relocate work wrongly placed to the satisfaction of the Engineer.

Materials and equipment installed shall be new, full weight and of best quality specified. Use same brand of manufacturer for each specific application. Statically and dynamically balance rotating equipment for minimum vibration and low operating noise level.

Approvals

The price submitted for this Contract shall be based on the use of materials and equipment as specified. If this contractor wishes to quote on equivalent materials and equipment, he must quote on products approved by the Engineer in writing, as an equivalent to the product specified. Manufacturers listed in specifications do not have to request approval but must meet all performance requirements.

This Contractor shall be fully responsible for any additional work or materials required by the mechanical trade or other Contractors to accommodate approved equivalent materials or equipment. Extras will not be approved to cover such work.

VENTILATION AND AIR CONDITIONING

Ductwork

Ductwork shall be of galvanized steel and shall be lock forming quality. All ductwork shall be constructed, braced, connected and jointed as recommended in the latest issue of ASHRAE Guide and the Duct Construction Standards issued by the Sheet Metal National Association Inc. (SMACNA). All ductwork shall be installed to conform to the National Building Code, the CFIA Pamphlets 90A and 91 and in accordance with applicable codes. The minimum sheet metal thickness for ducts shall be as follows:

Rectangular Ducts Maximum Width	Gauge
Up to 300mm	26 USga
325mm to 750mm	24 USga
775mm to 1350mm	22 USga

Round ductwork shall be suspended by band iron hangers.

Rectangular ductwork shall be supported at maximum 2.4m (8 ft.) spacing.

Sheet Metal screws will be acceptable for ducting.

Flexible duct to be triple lock aluminum, maximum length 3.0m (10 feet).

Seal Classification as follows:

Maximum Pressure (Pa)	SMACNA Seal Class
1000 and over	A
750	B
500	C

Seal Classification

Class A: longitudinal seams, transverse joints, duct wall penetrations and connections made airtight with sealant and tape.

Class B: longitudinal seams, transverse joints and connections made airtight with sealant, tape or combination thereof.

Class C: transverse joints and connections made air tight with gaskets, sealant, tape or combination thereof. Longitudinal seams unsealed.

Volume Dampers

Install at each take-off from main as noted on drawing; single blade with locking quadrant, equal to Duro-Dyne k-9.

Air Outlets and Inlets

All new supply diffusers and return grilles as indicated on drawing.

Air System Testing and Balancing

Contractor to measure airflow of existing system prior to construction and report results.

Balance systems for rated air flow, room temperature control and current draw after installation is complete and in full working order. Adjust controls for continuous air circulation and minimum energy consumption. Adjust fan speeds as required to obtain specific performance. Balancing work to be performed by independent balancing contractor. Electronic copy of report to be issued to engineers for review.

SEISMIC RESTRAINT SYSTEM (SRS)

Provide design, supply and installation of complete SRS for all systems, equipment specified for installation on this project as per Ontario Building Code latest edition and NFPA13.

Design to be by professional engineer specializing in design of SRS and registered in the province of Ontario. Mechanical contractor to include costs associated with this work as it relates to mechanical contractor installations. Submit design sketches/drawings prior to start of installations, c/w installation requirements.

Provide letter from seismic engineer stating all mechanical installations have been installed in conformance with seismic restraint requirements as per Ontario Building Code.

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REVISIONS

client:
NATIONAL GALLERY OF CANADA

project:
TEMPORARY WORK FOR COLONNADE & MAIN ENTRANCE WINDOW/ROOF & SLOPED SILL
380 SUSSEX DR. OTTAWA, ONTARIO

drawing title:
SPECIFICATIONS

scale:	AS SHOWN	drawn by:	M.M.K.
designed by:	M.M.K.	reviewed by:	J.R.P.
approved by:	J.R.P.	date:	MAR. 2017

project no.:	100-17S	drawing no.:	M-3
revision:	<0>		of 3